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‘There’s a whole set of existing infrastructure which isn’t ready for the climate that’s going to hit it. It will be an extraordinary cost to society – cities will overheat and run out of energy’
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Work in progress

There is a ‘fair way to go’ before a truly diverse workforce is achieved in the building services industry.

That is the opinion of Buro Happold’s head of inclusive design, Neil Smith, who says the lack of diversity means industry is missing out on new ideas and good quality staff.

The situation is changing – the Disability Discrimination Act and Equality Act have encouraged more diversity, says Smith, and the number of female members of CIBSE is steadily climbing, albeit from a fairly low base of 84% in 2008 to 1,501 now.

Encouraging more people into engineering from all sectors of society isn’t just the right thing to do, it’s vital if engineering is to avoid an acute skills shortage. There will be an annual shortfall of about 40,000 skilled engineers up to 2020, according to EngineeringUK.

The changing demographics of the workforce means industry has to recruit workers with more diverse backgrounds. Traditionally, engineers have been white men aged under 45, but Education for Engineering says they make up only about 20% of the working population (see page 28).

Professional Engineering Institutions (PEI) such as CIBSE are now starting to tackle the barriers to diversity. Eight PEIs signed a pledge to increase diversity among their professional membership and communicate their commitment to equality. It is hoped the agreement will extend to all 36 PEIs.

CIBSE has taken its own steps by launching a Diversity Panel chaired by Andy Ford, and by supporting the new WiBSE network, which has already attracted 375 members this year.

Diversity is a key theme in George Adams’ presidential year (see page 20) and he says fresh thinking brought about by more diverse working environments will help engineers tackle the challenge of cutting the carbon output of our cities.

One factor that Adams felt was putting off young people coming into the industry was the sense that their input on building projects was not being measured in terms of building performance. British Land is an example of a firm that is monitoring the energy performance of its buildings and making huge savings as a result (page 24). It is upping its carbon cutting targets by 50% from a 2009 base and believes it will do so, in part, by re-commissioning plant and reducing its capacity. That will please the occupiers who have also saved £5.2m on their energy bills in four years.

Alex Smith, Editor
asmith@cibsejournal.com
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IN BRIEF

BRITISH LAND HITS TARGETS
Developer British Land has delivered 4.9m ft² of BREEAM Excellent office and retail space over the last four years, according to its latest corporate reporting. Ninety five per cent of development waste was diverted from landfill, it added. It also reported ‘strong progress on Community Charter commitments’, with local procurement and employment initiatives at its 5 Broadgate and The Leadenhall Building projects. See Energy Masters feature on page 24.

STRONGS IN ADMINISTRATION
The Liverpool-based building services contractor Strongs is now being run by administrators from Duff & Phelps. Strongs, founded in 1969, had diversified into renewable energy systems, including solar panels and heat pumps.

CLYDE PULLS OUT OF BOILERS
UK Heating Group (UKHG) has announced that its Clyde division has stopped selling new boilers, spares and service. The company made the decision following a review of the commercial heating market. UKHG will now focus on the commercial radiator market.

Clients should pay for Soft Landings, says government

● Contractors must expect to be engaged for three years on Whitehall projects

Contractors will be expected to remain involved in central government projects for three years after handover at clients’ expense under the Government’s ‘Soft Landings’ (GSL) framework.

Roy Evans, head of the GSL Work Stream for the Government’s BIM Task Group, said GSL would be in place for such projects from 2016 with an obligation on the client to engage the engineering team to return ‘at least once a year’ after handover.

‘There will be a time payment element built into the contract,’ he told the Crystal Clear BIM conference, organised by Amtech, last month. ‘This is a good investment, because it will cut clients’ running costs.’

‘We want contractors to remain involved for three years post-occupancy – rather than just getting into an argument with clients about performance,’ said Evans, who also called for more time to be allowed for the commissioning process.

The Ministry of Justice has already imposed GSL on its projects and is enjoying significant running cost-savings, according to Evans. Project teams will be expected to appoint a ‘GSL champion’ to ensure there is end-user engagement in the design and construction process.

Urban growth raises power stakes

The rapid growth of urban populations will accelerate the pace of development for smart grids and energy demand management systems, according to a leading engineering strategist.

Julie Alexander, director of urban development at Siemens, said the UK was very close to having power cuts, which were only being averted by demand management control systems that divert power from industrial users at times of peak residential demand.

‘Smart grids and demand management will be vital to reduce the huge cost of increasing national power generation capacity,’ she told the Crystal Clear BIM conference.

Cities have to take a close look at how they manage future requirements, said Alexander, as they account for 70% of global emissions and will contain 70% of the world population by 2050.
In brief

RIBA SIMPLIFIES PLAN OF WORK
The Royal Institute of British Architects has published the much-anticipated 2013 version of its Plan of Work. This version, which replaces the 2007 plan, is a simplification with the original 11 stages, designated by letters, reduced to eight, numbered 0-7. The plan is available online via the RIBA website at www.architecture.com/planofwork

ASHDEN AWARD WINNERS
Sustainable Energy Academy (SEA)/United House and Monodraught have won Ashden Awards for practical, local energy solutions. SEA/United House were awarded the overall UK Gold Award for the interior wall installation process. Monodraught secured the Impax Ashden Award for Energy Innovation for its Cool-Phase cooling and ventilation system. It also won the Energy-using Product Award at the CIBSE Building Performance Awards in 2012.

CORRECTION
New Honorary Fellows David Mackay and Peter Sheaves were incorrectly labelled in last month’s CIBSE Journal. They were awarded Honorary Fellowships, alongside Robin Nicholson, by CIBSE’s immediate past president David Fisk at the presidential inauguration of George Adams. The correctly labelled images appear on page 13, along with details of the Silver Medal awarded to David Cooper, whose picture also appeared in the article.

Renewables could cause fall in living standards, says think tank

- Renewables Obligation would need to rise to £1.6bn to achieve targets

Renewables are not economically viable and will force thousands of families into fuel poverty, according to the independent think tank Civitas.

In a new report, Are green times just around the corner?, it argues that renewables cannot realistically maintain modern living standards because they are too expensive. Shifting to renewable heating would add £300 to the typical household annual bill, leading to the first fall in living standards ‘for hundreds of years’.

Civitas calculates that the Renewables Obligation would need to rise to about £1.6bn by 2020 to achieve the government’s target to increase renewables’ share of energy use from the current 6% to 15% by 2020. This would work out at a cost of almost £500 per household; one third of which would be repaid through energy bills.

The report also said that subsidising renewables ‘discouraged invention and innovation’.

‘Many homes in rural areas, which currently rely on oil, are unsuitable for renewables without major renovations to the fabric of the building, or replacement of the entire heating system,’ said director general Jeremy Hawksley.

‘Off-gas households would be better off upgrading existing boilers to high-efficiency condensing ones.’
Specialists congratulate ‘enlightened’ TfL

M&E contractors have welcomed a new procurement model announced by Transport for London (TfL).

The major engineering client is revamping the framework contracts it uses to procure £700m of projects annually in favour of more direct links with specialist contractors. Formerly, its system was biased towards major multi-service firms.

The new contracts will offer four-year specialist engineering packages and is designed to encourage bids from smaller, specialist contractors and joint ventures, according to commercial director Andrew Quincey. He said the new procurement approach would improve ‘the efficiency of project delivery’.

“We’ve started developing a new set of framework agreements, which will allow us to keep improving and maintaining London’s transport services for our customers while delivering the best possible value for money,” said Quincey.

As well as its major civil engineering schemes, TfL procures large M&E packages; project management; and environmental services. It said it hoped the new frameworks would improve relationships with specialist contractors.

‘It is great news that such a major client has recognised the value of encouraging direct working with specialist M&E firms,’ said Roderick Pettigrew, deputy chief executive of the Building & Engineering Services Association. ‘It has been shown time and again that involving experts with specific project knowledge early in the design process leads to significant financial savings and improved delivery.’

Interested parties should email PSFW@tfl.gov.uk

Construction turning the corner

A resurgence in housebuilding activity is leading a slow recovery in the construction sector, according to a number of sources.

Activity rose in May for the first time since last October on the back of the government’s Funding for Lending and Help to Buy schemes. This prompted some analysts to predict up to 2% growth across the economy for the rest of 2013.

The Chancellor George Osborne’s observation that the economy was ‘healing’ was supported by the Halifax, which reported that house prices rose by 2.6% in the three months to May. Morgan Stanley said prices could be up 8% by the end of next year and 4,000 planned homes could be up 8% by the end of next year and 4,000 planned homes have been reserved under the Help to Buy loan scheme, which was introduced in March.

Gloomy construction figures from the Office for National Statistics were dismissed as being behind the times.

‘The construction industry’s long lag times mean there is usually a disconnect between official construction output figures and clients’ commitment to projects,’ said Steve McGuckin, managing director of the global construction consultancy, Turner & Townsend.

In brief

BIRTHDAY HONOURS LIST
The following building services and energy figures have been recognised in the Queen’s Birthday Honours:

Jim Skea, Professor of Sustainable Energy, Centre for Environmental Policy, Imperial College London, for services to sustainable energy; Professor Jeremy Watson, Arup’s director of global research, for services to engineering; and Nicholas Kendall, assistant manager of building services at the British Museum, for services to the British Museum Collections.

SYMPOSIUM CALLS FOR PAPERS
The fourth CIBSE Technical Symposium, co-hosted with ASHRAE, will be in Dublin on April 3-4, 2014. There is opportunity to present fully reviewed papers and posters as well as case studies. Moving to a New World of Building Systems Performance aims to showcase practice and research including:

- Enhanced building engineering solutions through modelling and prediction
- Innovation in passive and active building systems
- Design and operation of future cities
- Improving operation of built environments
- Maintaining and improving legacy building systems
- The development and impact of benchmarks, standards and regulations
- Communication, skills and workforce development

www.cibse.org/symposium2014

News

This autumn, the award-winning exhibitions for building services professionals are bringing the best brands & the brightest ideas to your region!

PLUS...
ENERGY EFFICIENCY & RENEWABLES AWARD
Part L faces further delay

The government is still committed to zero carbon homes by 2016.

Building Regulation may not be implemented until April 2014

Fears are growing that the implementation of changes to Part L of the Building Regulations may be pushed back by six months to April 2014.

The Department for Communities and Local Government (DCLG) missed its own deadline to publish 'a detailed plan' by May, following the consultation process that ended in April 2012.

The Department for Communities and Local Government (DCLG) missed its own deadline to publish 'a detailed plan' by May, following the consultation process that ended in April 2012.

The government is still committed to zero carbon homes by 2016.

A meeting of the Building Regulations Advisory Committee (BRAC), due to be held in early June, was cancelled. It is normal practice for the government to consult with BRAC before any changes to the regulations are announced.

Officially, the new Part L is still on track to be implemented this October, but many observers now believe this is unlikely because of the tradition that the government gives industry six months to prepare for new regulations. It is also normal practice for new regulations to come into force in October or April.

CIBSE technical director Hywel Davies said the Institution’s members were getting increasingly concerned about the future role of Part L.

‘The government says it is still committed to zero carbon new homes by 2016, but that deadline is getting very tight,’ he said. ‘The whole thing is looking flaky.’

Davies added that there was ‘a serious risk that key chunks of the regulations will be dispensed of’ and criticised the failure of senior political figures to commit to energy efficiency measures.

‘This government has a real appetite for deregulation, which it sees as removing a burden on industry – the U-turn on consequential improvements being a case in point.’

Meanwhile, the Association for the Conservation of Energy (ACE) confirmed it was pressing ahead with its legal challenge to the decision to omit ‘consequential improvements’ from Part L. It said it was hopeful of a ‘speedy resolution’ so that the benefits identified during the consultation could be realised.

These include £1bn savings to the economy and 2.2m more households benefiting from the Green Deal, an ACE statement said.

Humidity control can cut flu outbreaks

Maintaining relative humidity (RH) at 40% and above can significantly reduce airborne transmission of the influenza virus, according to a study by the US National Institute for Occupational Safety and Health (NIOSH).

An estimated 7.6m working days are lost in the UK each year as a result of flu-related illness at a cost to our economy of more than £1.35bn.

To test the effects of humidity on airborne flu, NIOSH arranged for aerosols of the virus to be ‘coughed’ into a room’s atmosphere by a mechanical manikin at humidity ranging from 7.73% RH. At the same time, the air intake from a breathing manikin in the room was monitored.

The research showed that maintaining relative indoor humidity at 40%RH and above significantly reduced the infectivity of the influenza virus.

‘This study shows how important it is to maintain an optimum humidity in the workplace to reduce absenteeism, especially in areas of high risk to airborne viruses, such as hospitals and doctors’ surgeries,’ said Tim Scott, director at JS Humidifiers.

‘Although many professional bodies – including BSR, CIBSE and the HSE – recommend indoor humidity at above 40%RH, it is not uncommon to see humidification systems being turned off to reduce operating costs.’

Lower humidity is less noticeable to employees than changes in temperature, so this can go unnoticed, added Scott. ‘However, the true cost of not maintaining indoor humidity can be poor staff health and an increase in absenteeism, which can far outweigh the cost of operating a humidification system.’

Public votes on smart meters

Three quarters of the British public think smart meters are a good idea, according to a survey for the Energy Saving Trust (EST). While 44% of households would like to have their energy use displayed on an in-home unit – 9% would prefer to use a smart phone.

More than 50% would like to compare their energy bill with friends and neighbours, and 45% of households would like to be able to compare their energy use with similar homes, according to the survey of 2,000 UK homes conducted by IPSOS Mori.

The study follows the decision to omit ‘consequential improvements’ from Part L. It said it was hopeful of a ‘speedy resolution’ so that the benefits identified during the consultation could be realised.

These include £1bn savings to the economy and 2.2m more households benefiting from the Green Deal, an ACE statement said.

‘Over 50% would like to compare their energy bill with friends and neighbours.’

Stephen Passmore, technical delivery manager at the EST, said: ‘Research has shown that people use less energy if they are more engaged with how much they are using and where and how it is being used.’

However, Julie Alexander of smart technology provider Siemens said there needed to be a rethink of the government’s smart meter strategy.

‘We need a new model because many of the technical proposals are not working,’ said Alexander, who highlighted problems with smart meter communication links.
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Entries for SoPHE Young Engineers Award now open

Entries are now being accepted for the Society of Public Health Engineers (SoPHE) Young Engineers Award 2013.

The challenge is to develop an innovative system for urine management, which minimises contamination in small towns where conventional sewerage networks are not appropriate or financially viable, such as in Tanzania.

The winning team will make an in-country technical visit, in conjunction with WaterAid, to verify the applicability of their design.

Submissions must be received by 6 September. Full details are available at www.cibse.org/sophe.

CIBSE TV series airs on Sky

The latest episode of programmes produced by Business Channel.tv, in association with CIBSE, was screened on 18 June.

The Innovative Engineering and Building Performance series focused on the business case for specifying the latest products and services to meet challenges faced by CIBSE members. It explored innovations in building engineering, as well as new solutions to facilitate saving energy, reducing carbon and achieving efficiency for clients.

With buildings accounting for almost 50% of damaging carbon emissions, innovative services design is essential in bringing improvements in energy efficiency.

Expert commentary came from Fronius, Nationwide Filter, Lowara Xylem, SAS International and Victaulic.

Programmes are broadcast on Sky Channel 212 and Freesat channel 401. Previous episodes, and this latest programme, can be found at www.thebusinesschannel.tv or from the link on the CIBSE homepage, www.cibse.org.

CarbonBuzz debuts at City Hall

London’s Living Room at City Hall was full to capacity on 6 June, when more than 160 delegates gathered to celebrate the launch of the new CarbonBuzz energy benchmarking platform.

CarbonBuzz is a free online tool that enables users to record, share and compare the real energy use of their buildings, and track the operational energy use of existing buildings against design intent.

Keynote speakers, Justin Snodall, head of the business group at British Land, and Ian Taylor, partner studio leader at FCB Studios introduced the platform.

‘Benchmarking building energy data and sharing knowledge is key to firms ensuring that they manage energy performance more comprehensively,’ said Snodall. ‘We recognise there is a disconnect between the design and management process and we believe that through CarbonBuzz, we can close this gap.

Over the next 12 months, British Land will feed the data acquired from its buildings into the CIBSE standards to share best practice and enable objective comparisons to be made against similar buildings.’

The keynote speakers were joined on stage by Judit Kimpian, director of sustainable architecture and research at Aedas, and Richard Jackson, head of environmental sustainability at UCL, for a panel discussion chaired by Hywel Davies, technical director at CIBSE. "We are encouraging architects and building services designers to upload their projects to CarbonBuzz," said Davies.

CIBSE and RIBA have helped spearhead the publication of a project’s energy consumption data through their annual awards, and CarbonBuzz is a way for entrants to the CIBSE Building Performance Awards to demonstrate their energy credentials.

The event included a demonstration of the platform by Sophie Chisholm, building performance specialist at Aedas. She explained how annualised energy records were stored to capture the year-on-year energy consumption of buildings. She highlighted how the anonymised database and published datasets can be filtered and reports generated to assess the energy consumption of projects.

The tool caters for the needs of a broad range of stakeholders, including local authorities; government portfolio managers; developers; landlords; investors; architects; engineers; and facilities managers, and has been piloted extensively with them.

For more details, visit www.carbonbuzz.org.

SLL rewards excellence at AGM

The Society of Light and Lighting’s (SLL) 2013 Presidential Address and Annual Awards took place at the London Irish Centre, Camden in May, with the evening incorporating the society’s AGM.

The awards recognised those individuals who had made outstanding contributions to the society or lighting industry over the past year. Among the awards presented were the Lighting Award to David Holmes for his efforts with technical publications, and the Presidential Medal, awarded to Dr Peter Boyle for his contributions to the industry in a career spanning more than 50 years.

At the AGM, Dr Kevin Kelly, who was inaugurated as SLL president, said he planned to focus on collaborative working, holistic building design and proper measurement of systems during his time in office.

The evening ended with a drinks reception.

The full presidential address and details of the awards can be viewed at www.sll.org.uk.
Announcing the three Ken Dale Travel Bursary winners

International travel secured for three research projects

Three young building services engineers have won Ken Dale Travel Bursaries. The awards give the opportunity to experience technical, economic, environmental, social and political conditions in another country, and examine how these factors impact upon building services engineering. The three winners are funded by the Ken Dale Bursary, Society of Public Health Engineers and the Richard Tully Fund.

The three winners are:

- **Angela Reid**
  - Katie Wallace
  - Kayley Lockhead

Angela Reid, associate sustainability consultant for Wallace Whittle, has identified three international sustainable mixed-use developments in Vancouver, Sydney and Beijing that she will visit to research overall sustainability, focusing on energy reduction and supply. The research will investigate what lessons can be learned and applied to similar projects.

Katie Wallace
- will undertake her research into ‘CO₂ heat reclaim’ in Scandinavia, focusing on CO₂ refrigeration in supermarkets. As an energy efficiency consultant for Sainsbury’s, Wallace is developing a theoretical model of heat reclaim as a retrofit option for existing stores. This research will enable her to learn from the experts.

Kayley Lockhead
- has elected to study renewable technologies in Africa to alleviate poverty and protect the environment. This research will take her to Tanzania, Kenya and Uganda, where she will visit existing renewable energy systems and contact local policy makers to discuss constraints, benefits and progress development.

For more information on the Ken Dale Travel Bursary visit www.cibse.org/bursaries

New publications on overheating

The next CIBSE Technical Memorandum is TM52: The limits of thermal comfort: avoiding overheating in European buildings. Sponsored by CIBSE’s Overheating Task Force, the report will help designers, developers and others responsible for defining the environment in buildings.

TM52 is an update to advice given in CIBSE Guide A (2006) and will be available in August to download or purchase in hard copy at www.cibseknowledgeportal.co.uk. This will be complemented by TM45: Probabilistic design summer years for London, which will be published online. Future reports will be published in the journal on TM13: Minimising the risk of Legionnaires’ disease and TM54: Evaluating energy performance of buildings at the design stage.

Honorary Fellows and Silver Medallist

Immediate past president David Fisk presented Honorary Fellowships to David MacKay, Peter Sheaves and Robin Nicholson OBE during George Adams’ inaugural address as CIBSE president in May. MacKay is the chief scientific adviser at the Department of Energy and Climate Change and author of ‘Sustainable energy – without the hot air’. Sheaves was managing director at Sainsbury’s and has been influential in the lifts and escalator sector. Architect Nicholson is a senior member of Cullinan Studio and is convener of the Edge think-tank, which debates cross-disciplinary issues.

David Cooper, was presented with the Silver Medal for his contribution to CIBSE. David has been influential in the lifts and escalator sector and has been an expert witness and project director on many significant schemes.

Board dinner success

The Athenaeum Club in London’s Pall Mall played host to the CIBSE Board and its 30 guests in June. Multiple sectors of the industry were represented, including consultants, contractors, clients and building operators, with guests enjoying an evening of networking, discussing issues that directly affect the profession and society. Justin Snoxell, of British Land, gave a talk on the role of landlords in ensuring buildings operate efficiently.

Last call for Employer awards

If you put the development of young engineers at the heart of your business, then you could be eligible to enter the CIBSE Employer of the Year Awards. The awards recognise those employers – large and small – which have shown excellence and innovation in developing the engineers of the future. Judging will take place across three categories – small, medium and large companies – with the overall winner being announced at the Institution of Mechanical Engineers (IMechE) on 9 October, where they will receive the prestigious Employer of the Year trophy and £1,000 of CIBSE training vouchers.

The awards close on 31 July. Entry forms and full details are available at www.cibse.org/yea

www.cibsejournal.com
Annual general meeting

David Fisk introduced the Annual Report for 2012, referring to the Institution’s focus on strategy during the year. The Olympics had been a great success for the construction industry, with CIBSE members making a significant contribution. However, the wider economic situation had proved challenging, as had the international position. It was important for CIBSE to be as fit for purpose as possible. He referred to his call for a return to normal engineering, which he believed was being reflected in society.

David Fisk went on to refer to the 2012 Annual Lecture by Alistair Buchanan, which had highlighted the insecurity of UK energy supply. CIBSE raised its engagement with DECC during the year, and the importance of building services engineering in relation to the demand for energy was becoming better recognised.

The CIBSE Knowledge Portal was launched in 2012, and has been a considerable success. The Knowledge Management committee was created to ensure that CIBSE continued to develop its knowledge, and David Hughes was thanked for his work as chair of the committee. The need for authenticated knowledge was stressed, as reflected in the number of downloads from the portal.

Efforts to strengthen the future of the industry included engagement with social media and with international development. Regional activities continued to be important for the Institution, and the establishment of the Diversity Panel was also noted. Internationally, particular attention was drawn to the 25th Anniversary of the Australia and New Zealand region. David Fisk noted the recent death of Grahame Gibbs, one of the founders, and a past chair of the region, but was thankful that Grahame had been able to participate in the anniversary celebrations of the region he had helped establish.

The success of the Building Performance Awards was noted, and David Fisk also recorded his appreciation for those entrants who did not win awards.

Finally, David Fisk expressed his thanks to others for their work, acknowledging in particular the support of Andy Ford as Immediate Past President and George Adams as President Elect. He thanked the volunteers who supported the Institution and particularly those who served on council for their advice and guidance to the board. He also thanked the staff, noting that Marie Dignan and Tiny Cardy had moved on from the Institution, and had been replaced by Car lyn Clements and Elaine Rafferty. He recorded his personal thanks to Stephen Matthews as chief executive and Janet Wigglesworth for managing the President’s diary.

In response to questions, it was confirmed that all regional chairs continued to be members of the CIBSE consultative council.

David Fisk then introduced Bill Devitt, Audit Partner of Chantrey Vellacott DFK LLP, who read the audit report and confirmed that the accounts provided a true and fair view of the Institution’s affairs and had been prepared in accordance with all relevant standards.

Nick Mead then introduced the financial statements, stating that total income was somewhat increased over 2011, with subscriptions and investment income up. The breakdown of income was noted. CIBSE Services was a key component of income, and a more detailed breakdown of its income was presented. CIBSE expenditure had also risen slightly, and the detailed breakdown of expenditure was noted. Members also heard that improved investment values had produced a substantial impact on the accounts. As a result, the Institution’s net assets were now just over £3m.

In response to questions on the improvement of the pension scheme deficit figure, it was explained that changed investment managers, and improved market conditions, had made a significant impact.

David Fisk summarised that the financial position was positive, membership had increased, and CIBSE’s influence and knowledge were both being developed. It was noted, however, that conditions remained challenging, with the industry facing continuing difficulties.

AUDITORS

Nick Mead proposed that Chantrey Vellacott be appointed as the Institution’s auditors for 2013, and that the board be empowered to agree their remuneration. This was seconded by Andy Eastwell and approved unanimously.

SPECIAL RESOLUTION

Nick Mead presented the special resolution for membership subscriptions for 2014, drawing attention to the proposal for free membership for full-time students following the introduction of this initiative during the last year.

Nick Mead proposed adoption of the special resolution, as set out in the calling notice for the meeting, and this was seconded by George Adams.

In response to questions about the need for an increase, Nick Mead explained that while the financial position was positive, the Institution needed to continue to develop and, in particular, the development of content for the Knowledge Portal had to move forward more quickly than in the past. Stephen Matthews also explained that the Institution had embarked on a major IT strategy development. This involved substantial costs, but was needed to allow CIBSE to meet members’ expectations alongside much larger

Continued on page 58
The rebirth of fire damper installation

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Advanced Air
HCFCs, sometimes called ‘F-gases’, contain fluorine and are powerful greenhouse gases. Many are also ozone-depleting substances (ODS), which damage the ozone layer in the upper atmosphere. They are widely used in refrigeration and air-conditioning equipment, heat pumps, firefighting fluids and high voltage switchgear, as well as aerosols, solvents and foam-blowing agents used in insulation products. End users, system designers, contractors, equipment manufacturers and distributors may all have obligations under these regulations.

Regulation (EC) No. 1005/2009 on substances that deplete the ozone layer controls the production; import, export; placing on the market; recovery, recycling, reclamation; and destruction of substances that deplete the ozone layer. The Regulation prohibited the use of virgin hydrochlorofluorocarbons (HCFCs) from 1 January 2010 (even if the HCFC was obtained before that date). The next deadline under the Regulation is the total ban on the use of HCFCs, which takes effect from 1 January 2015.

The main effect of the ban is to make it illegal to operate any system that uses an HCFC refrigerant, of which R22 is probably the best-known example. This will present the owners of such systems with two options. They can either modify the system to operate with a legal alternative refrigerant, or they can replace part, or all, of the system.

If they take the first option, CIBSE Guide B advises that numerous refrigerants have been developed as drop-in replacements for HCFCs. But it warns that ‘most, if not all, will result in reduced capacity and/or efficiency and may require oil flushing and replacement and some system modifications.’ Guidance from the manufacturer of the proposed replacement refrigerant should be sought.

If they opt for the second option, then they should reassess their requirements and consider whether the system is still essential, and, if so, what the most appropriate replacement is. Either way, the ban on using the systems is only 18 months away, so there is an urgent need to assess existing systems, plan conversion or replacement, and make the necessary arrangements.

Whichever option is chosen, it is also vital to remember that other rules cover maintenance and replacement of these systems, as well as the disposal of the refrigerants that they contain.

Existing regulations require system operators to minimise leaks and to carry out – and keep –records of regular leak testing and any supply of refrigerant. They also require that services are only carried out with HCFCs set to be banned in Europe from 2015, Hywel Davies explores the impact on those who design, install, maintain and manufacture air conditioning and refrigeration systems.
Enforcement
The Regulations empower the Environment Agency and local environmental health officers to enforce them. It is notable that the powers available to them in connection with these Regulations enable them to serve an enforcement notice and, if that notice has not been complied with after 28 days, to have the work required to achieve compliance undertaken, and submit the invoice to the offending party. It is also an offence to obstruct enforcement, or to provide false or misleading information to an enforcement officer.

These are significantly greater enforcement powers than under the Energy Performance of Buildings (EPB) Regulations for air conditioning inspection reports. Under these regulations, trading standards officers (TSO) have no power to challenge occupiers who claim not to need an inspection. Even if one is installed, TSOs have no power to request any information about the system, only a copy of the report.

An air conditioning inspection will almost certainly identify those systems which will have to be shut down on 31 December 2014, and will also provide much of the information needed to make a decision about whether to convert to an alternative refrigerant or replace the system.

It is curious that the government has given far greater powers to enforce the F-gas and Ozone Depletion Regulations than they give TSOs for the EPB Regulations. The recast EPBD requires member states to set penalties for breaches of the EPB Regulations, which must be 'effective, proportionate and dissuasive', and member states should ensure that they are implemented. The F-gas provisions are welcome: is it time that similar requirements were also applied to air conditioning inspections?

BIS guidance
Managing fluorinated gases and ozone-depleting substances contains guidance from the Department of Business, Innovation and Skills for commercial, industrial and public sector organisations using fluorinated greenhouse gases and ozone depleting substances. It is online at https://www.gov.uk/managing-fluorinated-gases-and-ozone-depleting-substances. It also contains links to a number of additional factsheets.

F-gas support
For all enquiries relating to the F-Gas and ODS Regulations, contact the Environment Agency: f-gasupport@environment-agency.gov.uk National Customer Contact Centre tel no: 03708 506506

HYWEL DAVIES is technical director of CIBSE www.cibse.org

TIME FOR A RETHINK?

In last month’s CIBSE Journal, Steve Hale suggested building engineers needed to improve their communication skills. The overwhelming response on LinkedIn suggests he may have struck a chord.

Janet T Beckett
One of my first networking encounters was with a Chamber of Commerce guy in a grey suit at a breakfast meeting.

He looked me up and down and said ‘Not another energy consultant?’ I didn’t even know what he meant. In my world, the snake oil salesmen didn’t exist or, if they did, they were not like me. I was wrong. Engineers are not salesmen, but maybe we need a rethink?

Mike Barber
An incandescent bulb has flickered to life in my head. What if increased diversity could improve CIBSE? The more diverse an organisation, the better it would have to communicate, internally and externally?

Tony Johnstone
Talking with one voice from an informed position and allowing no alternative view to be unanswered is the trick. We don’t do that – we talk with individual opinions – when the opposition is organised into enthusiastic or powerful pressure groups.

Andrew Wolstenholme
There is a plethora of initiatives, including Green Deal, CRC, EPBD, RHI, FITs, BREEAM and LEED, giving multiple opportunities for sales folk to sell the entire sustainability, low carbon, save-a-fortune packages on the back of ‘free’ consultancy.

Steve Hale
It strikes me that the issue starts when engineers start their training. We spend so much time on technical subjects, there is no time left for softer subjects. It is important for us as employers to ensure that we focus on communication skills in the mentoring of our young engineers.

Simon Owen
I think non-technical people do well because they give a solution, talk knowledgeably, have shiny marketing and the same corporate accreditations as everyone else. A ‘no jargon’ guarantee may help.

Zack Taylor
I have found that giving clear decisive and informed opinions to clients gives a better impression of your reliability, knowledge and experience, over the guy who just turns up and tells a client that they should put a ground source heat pump into their 100m2 modular office.

Paul Norton
Unfortunately, we are still seen by many as the poorer cousins of the architect, structural engineer and PQS. There is still that blank look on people’s faces when you say ‘I am a building services engineer’. If we are to present ideas on how we can save energy, then simple pictures/diagrams, graphs and life-cycle costs are often the most effective way of communicating.

Karl Redmond
Some CIBSE people will have the skills required to communicate the right message to the client. Others will miss the points and talk in a language the client will not absorb or understand, which is counter-productive.

Join the debate on the CIBSE LinkedIn group at www.linkedin.com
**WHAT’S THE COLOUR OF YOUR BUILDING**

Do you know how much energy your building uses? David Clark says embodied carbon and transport should be taken into account when calculating a structure’s carbon footprint.

Increasingly more stringent building regulations are leading to energy efficient building designs. Unfortunately, we are rarely delivering low energy buildings.

The UK government in particular has failed to grasp the significant difference between efficiency and consumption. We are congratulating ourselves with A-rated Energy Performance Certificates (EPCs) while ignoring real energy reduction. Studies show there is almost no correlation between an EPC and energy use in commercial buildings.

How many of you know whether the office you’re sitting in has operating carbon emissions of less than 100 kgCO\(_2\)/m\(^2\) – and whether this is good or bad? What floor area did you use? What emission factors to convert electricity and gas into CO\(_2\)?

This is why we need to use simple benchmarking tools based on actual energy consumption and stop relying on virtual reality – EPCs – to inform the design and operation of buildings.

In most offices, energy represents less than 1% of the tenants’ costs – people (90%), rent and rates are the main expense. So reputation usually becomes the biggest driver to tackle energy consumption. However, until real energy performance is placed in the public domain, there is little incentive for the decision makers sitting in boardrooms to do anything about it.

The property industry needs reliable energy data so that we can all learn from what is really happening in buildings, rather than what the computer models tell us could be happening.

If design teams had to guarantee the actual carbon performance of a building in its first five years, it would lead to a very different approach – we’d gain a deeper understanding of how buildings work and how people’s behaviour influences energy use. We’d also get proficient at arguing whose fault it was the targets weren’t reached. Perhaps this is an argument we need to have to make the next leap forward.

The embodied carbon of buildings, – the CO\(_2\) released during the manufacture, transport and installation of materials – is gaining attention. It is equivalent to the emissions arising from about five to 10 years’ operating energy in offices. Should older inefficient buildings be knocked down and replaced, or should they be refurbished to a higher standard to provide a lower overall carbon footprint?

Until the industry can agree common carbon measurement metrics and benchmarks for operating and embodied carbon, it is difficult to answer this question definitively.

The embodied carbon of building services equipment is particularly poorly understood and could account for 10 to 20% of the initial construction carbon.

The embodied carbon of buildings, – the CO\(_2\) released during the manufacture, transport and installation of materials – is gaining attention. It is equivalent to the emissions arising from about five to 10 years’ operating energy in offices. Should older inefficient buildings be knocked down and replaced, or should they be refurbished to a higher standard to provide a lower overall carbon footprint?

The embodied carbon of building services equipment is particularly poorly understood and could account for 10 to 20% of the initial construction carbon. However, the services are replaced more regularly over time than the building fabric, so services could represent a higher proportion of the embodied carbon over the life of the building. We need more data and Environmental Product Declarations from suppliers to start tackling this issue.

Then there is the component usually missing from whole carbon footprint assessments – how people get to and from a building. The whole carbon footprint of a low energy rural office may not be dissimilar from that of a typical city centre building. This is because most people travel to city centre buildings by public transport, whereas out-of-town buildings rely more on cars.

When the commuting emissions are added to operating energy, the answers can be surprising. Because rural buildings usually have more opportunities for natural ventilation and renewable energy – they tend to be low rise with narrower floor plates and have less noise and air pollution issues – should they be required to meet higher energy performance standards than urban buildings? An interesting philosophical debate.

Ultimately, we need to start benchmarking the whole carbon footprint of buildings in operation so that we make informed decisions when planning, designing, constructing and maintaining the built environment.

**David Clark** is a partner at Cundall and author of *What Colour Is Your Building: defining and reducing the whole carbon footprint of buildings*, to be published by RIBA Publishing on 25 June.

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It’s a wonderful world, let’s keep it that way.
Building services engineers are in the frontline when it comes to tackling climate change and play a huge part in creating great buildings in which to live, play and work. This was George Adams’ message at his inauguration as CIBSE president at the Royal Society in May.

Adams reminded the audience that carbon dioxide levels in the atmosphere had reached 400 parts per million for the first time in several hundred millennia, and that the decarbonisation of cities was key to limiting global temperature rises.

Engineers will need to take a leading role improving the energy efficiency of the existing built environment as well as minimising CO₂ in new and refurbished buildings, said Adams.

To address how CIBSE engineers could contribute to the adaptation of cities to mitigate against climate change, Adams hosted a roundtable debate with past presidents David Fisk and Andy Ford, and president-elect Peter Kinsella.

Together with CIBSE chief executive Stephen Matthews and technical director Hywel Davies, the gathering represented years of engineering expertise across the industry, from consultants and contractors, to academics and government scientists.

The group discussed key themes in Adams’ manifesto, including the challenge of existing cities; how facilities management can be integrated into building delivery; and how young people could be attracted into building services engineering.

The ensuing discussion threw up a lively debate that has been distilled into a special CIBSE Journal presidents’ briefing, which offers thoughts and actions on how CIBSE can help building services engineers across
industry get to grips with some of the many challenges of climate change.

**The briefing**

Engineers have a role beyond the design of services in buildings. A global temperature rise of just 1°C will see a huge rise in peak summertime temperatures in cities, and lead to overheating and energy shortages in urban areas. Adaptation was, for a long time, a pariah word because if you could adapt cities to deal with overheating, it was seen as reducing the pressure for abating emissions. But as the globe sets to hit at least 3°C of global warming, we don’t have a choice but to help prepare cities for what is to come.

The knowledge of CIBSE engineers will be key to making city living bearable in the future. For example, through *CIBSE Guide A: Environmental Design*, engineers understand what temperatures are tolerable and what they should be designing to.

**Closing the feedback loop**

Engineers need to understand how their buildings actually perform. For too long the industry has had no idea whether energy efficiency measures actually work. It has never collected evidence of performance and this makes it difficult to persuade clients to adopt energy efficiency solutions.

The government needs to focus on outputs rather than inputs. There have been about 8,000 heat pumps installed under the Community Energy Saving Programme (CESP), but nobody knows if any of them actually work. The theory behind the renewable heat incentive is that people are paid to produce heat, but it’s not known how well boilers are performing – whether they were balanced properly or achieved the right return temperature. Improving the feedback loop will make us better engineers.

More people would adopt energy efficiency schemes if they thought they would work. The most successful low energy initiatives such as LED lights are being rolled out in huge numbers because you know exactly how much energy will be saved.

In other industries, such as the aeronautical business, where the outcomes are precisely measured, it is possible to identify individual contribution. There is a risk that the best talent will be deterred from entering the building services industry because they cannot see how

There’s a whole set of existing infrastructure which isn’t ready for the climate that’s going to hit it. It will be an extraordinary cost to society – cities will overheat and run out of energy.

*David Fisk*

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We need to move on from just concern about individual buildings to the wider challenge of decarbonising and adaptation of our existing cities as well.

*George Adams*
If there is funding available based on providing feedback, then that would shortcut a lot of the learning cycle.

*Peter Kinsella*

Their skills and vocation will have a positive impact on the world.

Project teams should be encouraged to share performance data using platforms such as CarbonBuzz, a joint venture between CIBSE and RIBA that was launched last month. It has always been incredibly difficult for organisations to share data from post-occupancy evaluations. Those involved in design and construction aren’t happy to allow ‘warts and all’ exposure of poor delivery and operation. CarbonBuzz allows you to post data anonymously, which should encourage more project teams to participate.

Make facilities management part of the design process

Facilities management (FM) should be integrated into project delivery or refurbishment to improve operational performance. It should be embedded into the design process, and CIBSE engineers need to communicate the benefit of early involvement of FM to clients.

Those running FM should be trained to handle the systems delivered. Complex engineering systems should not be the responsibility of people who have limited understanding of building services.

Engineers should focus on delivering building services that can be operated by the facilities manager, and designers should be encouraged to look at minimising the requirement for building services, so that buildings are simpler to operate. Some of CIBSE’s most relevant papers in the Knowledge Portal could be rewritten in a more pragmatic style for a FM audience.

"The real fruit comes by getting the operational side involved in the design and construction phases. That’s when the big wins come about."

*George Adams*
Encouraging more young people into the industry

CIBSE should encourage young people to join the industry as engineers and look at increasing the number of people who enter the industry as engineering technicians. It should be more involved in the STEMNET scheme, which encourages young people to understand the importance of science, technology, engineering and mathematics. CIBSE could help mentor more young people by making CIBSE Fellows industry ambassadors. A technician route to becoming an engineer should be given as much weight as an academic qualification – CIBSE should take inspiration from the well-established education system for training in Germany and Austria.

There should be a clearer path for young architects who are considering a career in engineering. Architect courses are oversubscribed but many applicants are potentially stronger on the technical side and should be encouraged to consider a career in building services.

Papers in the Knowledge Portal should be rewritten for students to show the many opportunities and continuing training in a building services career.

The CIBSE Young Engineer Network (YEN) is a signpost for the future and should be nurtured. CIBSE should also embrace diversity at every step, to help build the industry skills.

Building services is one of the few engineering professions that has a close connection with humanity and this should be strongly emphasised to young people.

CIBSE has a role in encouraging more people into the industry. Many of the large employers recognise they have a skills problem, but they don’t know how to solve it. As apprenticeships and sponsorship of young people are costs on the balance sheet for businesses – for them, the easiest thing to do is not engage in the issue.

I wish Lord Sugar’s ‘apprentice’ was more like a real apprenticeship. I did a technician’s apprenticeship – it’s a perfectly acceptable route through – Andy Ford

The CIBSE Journal

July 2013

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23

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British Land just can’t stop smashing its targets. The commercial property giant has been so successful in its energy-reduction initiatives that they continually get revised upwards, and the firm grabbed the top gong at this year’s CIBSE Building Performance Awards, winning the Carbon Champion of the Year accolade – alongside the Client Energy Management Award, which it bagged for the second year running.

British Land’s carbon-cutting journey goes back to 2008 when the corporate responsibility (CR) team started to set portfolio-wide targets for energy reduction. First came a desire to achieve a 20% energy reduction from landlord services by 2012, against a 2009 baseline. This was quickly exceeded, so much so that the target was doubled to 40% by 2015. Now, with its 2013 CR report showing that energy reductions across the portfolio have already hit 38%, this target looks set to be revised upwards again.

“We think that we can push towards 50% landlord-influenced energy savings across all of our buildings,” predicts Justin Snoxall, head of the business group within British Land’s CR team. “To date at York House, our head office in London, we have already achieved 60% savings.”

The team’s success is built, not on expensive retrofit equipment, but on sound energy management practices by data monitoring and matching central plant running times to the user-habits of tenants. ‘We did have metering in our buildings, but there wasn’t any real-time analysis of it. We had struggled to achieve anything more than 5% energy savings and, clearly, we needed additional support,’ said Snoxall.

That help came in the shape of EP&T Global’s Edge Mars energy monitoring, analysis and reporting tool, which allows...
15-minute metering data to be analysed and performance optimised. A pilot study at York House achieved 15% energy savings, giving the team the ammunition to propose a roll-out to occupiers in a mix of offices and shopping centres.

‘We wanted a proposition where EP&T would guarantee savings and each occupier would pay back the costs through energy savings,’ says Snoxall. ‘We were able to say to tenants that they had nothing to lose. We would put the money up-front, there would be no operational disruption and we guaranteed the savings. And, if there weren’t any savings, EP&T would make up the shortfall.’

While a sound argument for tenants, it’s fair to say that the team did have to overcome some initial resistance from its own estates department.

‘Many building engineers were apprehensive about it,’ recalls John Gentry, associate director of engineering at Broadgate Estates, the British Land subsidiary that manages some of the company’s high-profile developments. ‘There was a concern that the system’s ability to drill down into detailed data would provide ammunition with which to criticise engineers.

‘However, once the system was introduced, the engineers quickly realised that it was a tool that could help them drive real improvements in their buildings.

‘There was a light bulb moment when they saw that there were some good savings to be made by changing the way they operated the buildings, and kudos to be gained from achieving those efficiencies. This inspired an element of healthy competition.’

EP&T’s analytical data pinpointed exactly where energy was being consumed and quickly highlighted some easy wins.

‘For example, if we saw that there was very little on-floor power consumption at a time when we were still running all the plant, we could go to the occupiers and ask: “Do you need all the plant running at seven o’clock in the evening – it looks like you’ve got very little load on your floors at that time?” Their typical response was: “Well, actually no, we don’t. We’ve all gone home by six o’clock.”’

The results are impressive, with energy reductions having so far saved occupiers some £5.2m on their energy bills since 2009, cutting carbon emissions by some 40,000 tonnes in the process. Across the office portfolio, Snoxall explains that four
• 15% reductions from aligning central plant run times with occupiers’ operational requirements
• 10% reductions from eliminating heating and cooling conflicts and increasing intake of external ambient air to reduce needs for heating and cooling
• 5% reductions from adjusting set points
• 5% reductions from installing light sensors or replacing lighting in the common parts

We’ve tried to take tenants along an educational path,’ says Matthew Webster, energy executive at British Land. ‘Energy management is not simply about turning things off; it’s about optimising and running things in the most efficient way, moving away from base-build operations [the part of a multi-tenant building that directly serves and affects everyone] to recognising the way that people actually use the property.’

Some contractual changes were needed to make this shift. British Land has now enforced a core hours philosophy to move away from

Steps towards 50% energy savings
As British Land has almost hit its 40% energy reduction target from landlord services by 2015 against a 2009 baseline, how does it aim to get towards 50% savings? Justin Snoxall explains:

• Working with BMS partners to drive more functionality from the BMS; for example, where space is unoccupied, we want the BMS to turn off air-handling units and other plant automatically
• Re-commissioning central plant in each building at least every five years; buildings are designed and commissioned based on an initial set of occupational assumptions. These assumptions may change or never be realised. For example, at our head office at York House, the building was commissioned to accommodate 200 people on each floor. Today there are 100 people on each floor. There is, therefore, an opportunity to review the heating and cooling loads to the floors to ensure that we are not over-supplying conditioned air to the space
• Plant and lighting replacement opportunities; this requires effective engagement by the building management to seek approvals from all occupiers, explaining the commercial case for capital investment. At Exchange House, occupiers agreed a pilot installation of a variable speed drive on a chiller. When we found that the projected 40% energy reductions were exceeded, with 50% reductions, occupiers have subsequently been keen to install variable speed drives on all chillers
• Long-term asset replacement plans; these forecast our plant replacement up to 10 years ahead. Having already achieved significant energy reductions, in many cases we can reduce the overall capacity of the plant, further reducing overall capital costs

British Land credits success to sound energy management practices that match central plant running times to user-habits of tenants.
HOW DO YOU RATE YOUR LANDLORD?

The landlord’s role in the energy performance of a building is crucial in the lettings arena, yet there is no way for tenants to compare one landlord with another. Display Energy Certificates do indicate the energy performance of the whole building but, with the landlord responsible for approximately 50% of the energy use in a typical multi-let office, surely there is a need for an energy rating for the landlord’s element?

British Land has been working with the Better Buildings Partnership (BBP) for the past year to introduce an operational rating scheme for landlords, which it is calling the Landlord Energy Rating or LER.

‘The idea is that, just as the BRE Environmental Assessment Method (BREEAM) Excellent rating has become the market requirement for new space, a Landlord Energy Rating of five stars should become the energy efficiency requirement for new lettings in existing space,’ says Snoxall. ‘We believe that this single initiative could have a big impact on transforming the market.’

The LER specification has been drawn up and piloted, and there is currently a debate within the BBP as to what the next step should be.
The engineering industry is set to suffer a huge shortfall of skilled professionals unless more is done to attract people from a much wider range of backgrounds, according to leading engineering organisations.

In the 10 years to 2020, the UK Commission for Employment and Skills has predicted there will be a shortfall of 300,000 engineering jobs across all disciplines. For professional engineering roles, the problem is acute. Findings from EngineeringUK suggest that, every year up to 2020, an average of 87,000 posts will need to be filled by skilled engineers with a Level 4+ qualification (HNC or equivalent) – currently the UK only produces about 46,000 people qualified to this level.

The need to recruit from a broad range of backgrounds provides opportunities for businesses, says Fiona Cousins, principal at Arup. ‘A diverse workforce enriches the business environment by providing the ability to gather a number of different perspectives on a problem,’ she says. Her view has been borne out in The business case for equality and diversity, a report commissioned by the Department of Business, Innovation and Skills (BIS), which has collated studies that show evidence of firms reaping benefits from diversity and equality.

According to the Education for Engineering’s (E4E) Aspiration and Opportunity report, the engineering professions have to look beyond their traditional sources if they are to replace their dwindling workforce and expand it to cope with the expected growth required to fulfil the green agenda.

The report says the engineering workforce traditionally consists of mainly white, able-bodied men under 45 years old. However, it notes that by 2011 they only represented 20% of the workforce. It said that to maintain a skilled workforce the industry must attract engineers from different backgrounds and attract more women, ethnic minorities and people with disabilities.

The Royal Academy of Engineering has received government funding to address this problem. Bola Fatimilehin, diversity in engineering programme lead (job share) at the Royal Academy, says a diverse workforce is needed now more than ever if the engineering sector is to fill the vacancies. ‘We do actually have to encourage more people into engineering and remove the barriers that stop people from considering a career in the industry,’ she says.

So, why aren’t more young people and those from diverse backgrounds opting for a career in engineering? According to Cousins, one problem is the perception that engineering is neither creative – nor really a profession – but a ‘pale male’ club.

Cousins says the importance of a diverse workforce cannot be overstated: ‘The best performing team I have ever been in included 10 people, five of whom were women. The team as a whole included five nationalities, spread over an age range of 20 years and with university degrees in seven different
members at present, but we are nowhere near touching the surface yet. There are a lot of women doing their own thing and keeping their heads down because they are working in a male-dominated environment and don’t want to draw attention to themselves.’

To help address the issues of inequality within engineering, the institution has launched a Diversity Panel. This aims to break down the barriers to those under-represented groups in the profession, such as ethnic minorities, those with disabilities and women.

Andy Ford, chair of the Diversity Panel, is proposing that the incumbent CIBSE president should automatically become the chair of the Diversity Panel once their presidency ends.

President George Adams FCIBSE, is a keen supporter of equality and diversity, which feature in his key themes for his presidential year. ‘We’re starting to see that diverse teams can do better in creating sustainable solutions in building services. It’s all about creating working environments that nurture fresh thinking’, He sees embracing diversity in the BSE world as a big step towards de-carbonising our cities and drastically reducing the energy consumption of the built environment.

It is this top-down leadership that Ford hopes will promote a change in culture in the world of building engineering. ‘It’s a logical step,’ he said. ‘We need to engage a wider skills set within the industry and we need a bigger pool of talent.’

CIBSE was one of eight professional engineering institutions (PEIs) that signed a Diversity in Engineering concordat at engineering institutions (PEIs) that signed a Diversity in Engineering concordat at engineering institutions (PEIs) that signed a Diversity in Engineering concordat at the Royal Academy of Engineering in May. The document requires PEIs to increase diversity among professional membership, communicate commitment to equality and monitor and measure progress. The Academy says it will encourage all 36 PEIs to sign-up.

The Construction Industry Council has a similar project with its Fairness, Inclusion,

disciplines, from communications to policy to engineering to architecture. The difference in their perspectives was vital to problem-solving.’

Last year Alan Milburn MP, chairman of the Panel on Fair Access to the Professions, described the glass ceiling – faced by the least represented sections of the workforce – as being ‘scratched, but not yet broken’, and accused the professions of not doing enough to improve access for all.

Cousins might agree with Milburn’s ‘scratched glass ceiling’ analogy. By her own admission, she has been ‘the oldest woman in the room’ for the last 20 years. ‘I have also frequently been the only one, and this continues, especially in external meetings, and especially during construction,’ she says.

But, there is some heartening news – architectural firms have made the transition to include more women, more quickly, than contracting firms, so design teams are now frequently evenly mixed. And CIBSE female membership is growing – from 844 in 2008 to its current total of 1,501. (In comparison, male membership stands at 2,109). At senior level, CIBSE has only 16 female Fellows out of 979, although this compares favourably with 2008, when there were only three out of 1,039. The CIBSE women’s network, WiBSE, was created to build on this momentum and has gained more than 375 members since it launched in May this year.

However, Sarah Davis, chair of the WiBSE group, is under no illusions that the barriers have been broken down. ‘We have 375

Young Engineer of the Year Lee Tabis is a man who knows his own mind. He left school at 16 and enrolled on an apprenticeship scheme, not a popular choice with his teachers and not the route into employment that many espouse today. He started an advanced apprenticeship in building services, engineering with NG Bailey and says: ‘I soon realised how effective an apprenticeship route can be for building the foundations of a career.’

But it wasn’t always plain sailing. ‘Initially there was an underlying feeling of being perceived as young and insignificant, regardless of experience. I think as younger engineers have developed, it is proven that age does not necessarily reflect competence, and the perception of value is changing accordingly.’
SKILLS GAP DIVERSITY

Important lessons to learn

Developing a culture of inclusiveness should be a top-down process, says Farah Naz, the co-chair of the Women in Sustainable Construction and Property (WSCP) group. Naz, who trained as an architectural engineer in the USA, has worked on projects across three continents and has seen a lot of creativity and innovation across the building services disciplines. However, the sustainability and building services engineer, who now works in the UK for Ramboll, believes that the full benefit of an inclusive culture will only be seen when ‘we become more actively involved in inviting people from other disciplines, cultures and backgrounds through events, networking opportunities, and design competitions to create a platform of knowledge sharing.’

Education is integral to this, says Naz, and the message should be driven home from primary school onwards. ‘Inclusivity needs to become part of our thinking process, not an afterthought.’

Parade of nations

Dorte-Rich Jørgensen is a member of CIBSE’s new Diversity Panel. Her best experience of diversity was during the London 2012 Olympics, which saw people from all over the world – with a variety of ethnic backgrounds – working together. However, the sustainability and building services engineer, who now works in the UK for Ramboll, believes that the full benefit of an inclusive culture will only be seen when ‘we become more actively involved in inviting people from other disciplines, cultures and backgrounds through events, networking opportunities, and design competitions to create a platform of knowledge sharing.’

Education is integral to this, says Naz, and the message should be driven home from primary school onwards. ‘Inclusivity needs to become part of our thinking process, not an afterthought.’

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CIBSE Journal July 2013
Elta fans is a major supplier of axial flow fans for smoke ventilation, with the SmokeVent range developed for emergency smoke spill extract systems that may operate as part of the main system as dedicated fans for emergency clearance only, to overcome hazardous fire, smoke and fume conditions.

The SmokeVent range is specifically developed for general ventilation plus emergency smoke extract at either 200°C or 300°C for 2 hours using fans up to 2000mm in diameter or 400°C for 2 hours up to 1250mm in diameter.

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For more information contact Elta Fans on +44 (0) 1384 275800.
Building information modelling is transforming the way buildings are designed. Mott MacDonald used the Royal Welsh College of Music and Drama to set the tone for future BIM strategy. Jo Stimpson reports

PROJECT TEAM

- **Client:** Royal Welsh College of Music and Drama
- **Structural, mechanical and civil engineer:** Mott MacDonald
- **Acoustician:** Arup Acoustics
- **Main contractor:** Willmott Dixon
- **Architect:** Flanagan Lawrence
BIM capabilities are developing at an impressive rate. But sometimes ambition outstrips the technology available, as Mott MacDonald’s mechanical, electrical, and plumbing (MEP) team found when working on an extension to the award-winning Royal Welsh College of Music and Drama.

When modelling work began in 2009, the team was eager to stretch its BIM legs, but BIM packages for MEP were still in their infancy. With some resourceful thinking, the engineers made early forays into using BIM for plant-room detailing and services clash detection. The results were a revelation, launching the team on an upward trajectory toward creating the sophisticated MEP BIM models of today.

Before this £22.5m development, the college’s existing 1970s building had no concert hall, and lacked rehearsal spaces for drama students and its symphony orchestra. The extension enabled a new 450-capacity concert hall, 160-seat theatre, rehearsal rooms and a new exhibition space to be created.

The new facade wraps around the older building. It features a distinctive, wood-clad concert hall at the north end and a central atrium with glazed walls on its east and west sides. The building is topped by a ‘floating’ roof that cantilevers on the south end.

When the project started in 2006, consultants were commonly using BIM for structural design, but not for building services engineering, says Mott MacDonald buildings and infrastructure director David Eastland. MEP staff tended to have limited BIM expertise, and UK-compatible MEP-specific software wasn’t yet available.

‘Whether you’re in the UK, US or Australia, a structural element is very similar, but MEP is very component-based,’ says Eastland. ‘As it was, the software tended to draw on imperial-measured components based on US standards. We were all waiting for the Europeanisation of the software.’

**THE PATH TO MATURE BIM**

The path for building information modelling (BIM) is progressive from: maturity Level 0 to 3:

- **Level 0 – Application of 2D CAD files**
- **Level 1 – Both 2D and 3D information applied to projects, but often little connection is made with others (Lonely BIM)**
- **Level 2 – Production of 3D models by all in the team (possibly in isolation but also interoperable using BS 1192 practices) and eventually on to**
- **Level 3 – A single fully integrated/ interoperable data driven model is used by the whole ‘supply chain’ from inception to ultimate building deconstruction.**

The term ‘BIM’ is applied variously by practitioners along the path to maturity Level 3. It sometimes simply relates to their adoption of software solutions but as their understanding and application matures ‘BIM’ will represent the development, management and exploitation of the shared data resource that represents the physical and functional characteristics of the built environment. **Tim Dwyer**
With some resourceful thinking, the engineers made early forays into using BIM for plant room detailing and services clash detection. The results were a revelation.

The Mott MacDonald team, however, was keen to take advantage of BIM’s benefits – even if that required improvisation with the non-MEP software packages that were available. ‘We had seen what structural engineers were doing with AutoCad Revit. We wanted to dip our toes in the water with BIM – and then realised the power of the technology,’ says Eastland.

Revit Structure had been used on the college to build a structural model of the building. Services engineers initially used a basic 3D-modelling programme to build an indicative model showing the layout of ducts and cables. They also created simple services routes through the structural engineer’s model, using a US-based software package. Eastland says this process was a ‘great leap’ compared with anything the MEP team had done with BIM before, but the effort paid off when the new model was successfully integrated with the existing structural model.

Navisworks project review software was then used to detect clashes. ‘Suddenly, everyone could visualise and understand our challenges,’ says Eastland. The team used the model to determine whether each clash could be avoided by creating a new opening, or whether the services needed to be rerouted. It allowed the team to resolve significant problems early on. It became clear that BIM could enable more efficient coordination between architectural, structural and building services design.

The team turned to BIM later in the project, when a value engineering opportunity arose, involving a so-called ‘tower of plant’ on the south side of the building. This would house boilers, chillers and other plant, but could be eliminated, with the plant placed in the basement instead.

The plant’s new central location meant that the length of the distribution routes were reduced, and access requirements to high-level roof structures were eliminated. It also had aesthetic benefits; the building gained an elegant roof overhang in the space where the tower would have stood.

Mott MacDonald mechanical engineer Tony Koo was tasked with communicating the change to the client, opting to build a 3D model of the revised design. The client could immediately see the benefits, and the project could continue without further ado. ‘Suddenly, the penny dropped,’ says Eastland. ‘The 3D model saved a lot of time and money.’

The refurbished and extended Royal Welsh College of Music and Drama is now a landmark building in Cardiff that has been recognised with accolades, including a prestigious RIBA Award for architecture, and the ACE Engineering Excellence Award for Building Services by a large firm.

The MEP team’s experience laid stepping-stones on a path that has become well-trodden in subsequent years. Now, Eastland says, the team ‘would be unlikely to undertake a project as complex and unique as this without using BIM for building services’.

There are a number of other aspects of the project that would have benefited from BIM if today’s software and expertise had been available at the time. A prime example is the electrical distribution around the new concert hall and theatre, where a highly complex network of cables was required in an environment that was painstakingly designed for excellent acoustics.

The college building stands adjacent to a complex network of cables was required in an environment that was painstakingly designed for excellent acoustics.

The future of BIM
From tentative first steps in Cardiff to corporate giant leaps, the Mott MacDonald MEP team has seen firsthand how fast BIM proficiency and technology can improve. So how will things progress in the coming years?

‘What happened with Microsoft Excel is what will happen with BIM,’ says Eastland. ‘When they invented the Excel spreadsheet they had no idea how varied its applications could be. But just look at what they’re doing with spreadsheets now.’

Eastland believes that new graduates will play an instrumental role in discovering the full potential of BIM. ‘What we have now is a bunch of bright young things who are going to grab BIM with both hands and tell me how they’re going to use it,’ he says. ‘The graduates we are employing now will have a fresh perspective. They will not know 2D CAD – they’ll think in 3D and BIM interoperability.’

Eastland predicts that within the next few years all building projects will be modelled in 3D CAD. Clients will become more familiar with BIM and will begin to demand that they be given access to a model and the associated data, he says. He also believes that, just as MEP has caught up with structures in terms of BIM use, other sectors will follow over the next three years or so and become more interested in BIM – particularly clients, asset managers and manufacturers.

Improvements to software packages are likely to be forthcoming, Eastland imagines that BIM programmes will have better user control interfaces and that there could be a common operating platform for use with multiple software packages.

BIM could also reshape contracts, programme scheduling and payments. ‘Consultant appointment documents will change to reflect the workflow of BIM projects,’ Eastland says. ‘The documents will reflect the fact that when you use BIM the bulk of work is done up-front, rather than later in the project.’
noisy main highway, and is in constant use by a
large number of people, but it was paramount
that nothing compromised the acoustic
integrity of the concert hall. Complex acoustic
design was required to deliver a concert-
standard performance space.

The hall features a circular outer skin,
within which sits a concrete box comprising a
400 mm-thick drum and a 300 mm-thick
lid. Any penetrations between these outer and
inner walls had to be acoustically detailed to
minimise vibration and break-in noise. There
could be no rigid connections; only flexible
ones were permitted to isolate all vibrations.

However, the plant required in and around
the concert hall was extensive. In total, 75
theatrical audio and communications outlet
boxes and 75 theatrical power and lighting
boxes were sited, each with up to 16 cable
outlets. The cable interconnections differed in
origin and route. ‘Cabling doesn’t get much
difficult than this,’ says Eastland. ‘It was
like trying to bring some kind of order to a plate
of spaghetti.’

Managing this intimidating network of
cables within the controlled environment of
the concert hall was a considerable challenge, both
terms of data management and physical
co-ordination of the cables. The task fell to Mott
MacDonald senior electrical engineer Suthan
Kaneswaran, who says the BIM capabilities
available to him today would make a job like
this much easier.

For example, a 3D model of the primary
cable routes would be built, meaning the team
could easily understand where the plant was
and have a dynamic record of each cable’s
properties. BIM would mean that the cable
network could be easily adjusted and refined
remotely, without the need to go on site. ‘It’s
difficult to visualise everything in 2D, and
on this project we had to go on site to determine
restrictions in places where we wanted to trunk
cables together,’ Kaneswaran says.

These aspirations have been realised on
subsequent projects. MEP software suitable for
different international environments is now
widely available.

The MEP team sees the Royal Welsh
College of Music and Drama as the “flashbulb
moment” that started a rapid journey toward
BIM excellence. ‘We’re at the stage where we
can really do this now,’ says Eastland. ‘We’ve
come a long way in the three years since we
started modelling on the Royal Welsh College
in 2009. Experiences such as that on the
college are why Mott MacDonald is now so
committed to BIM for MEP.’

BIM proficiency requires the presence of
three elements that, historically, were not in
place, says Eastland: the software, the hardware
and the ‘liveware’ – that is, the staff proficiency.
‘Now we’ve got all three, and we have staff
efficiency that this is the future. They are
driving it forward,’ he says.

Even the ‘old guard’ of engineers – who felt
more comfortable working in 2D and drawing
by hand – have been won over, Eastland says.
‘It’s Darwinian – adaptation is essential to
survival. Anyone resistant to BIM will find
they can’t access the information and everyone
else can. They will then have to switch their
computer back on and catch up.’

We wanted to dip our toes
in the water with BIM –
and then realised the power
of the technology

David Eastland

Going underground

Mott MacDonald is now

providing architectural, civil,
building services engineering
and structural design on three
underground stations for the
new Klang Valley Metro Rail
Transit Blue Line in Kuala
Lumpur, Malaysia.

The project relies heavily
on BIM as a means of remote
international working. Revit
and Navisworks are used
in conjunction with online
collaboration tool GoToMeeting
to allow teams in different
countries to coordinate in real
time on the same model.

The complexity of the
model – which will incorporate
4D (programming) and 5D
(cost) – is ‘staggering’, says
Eastland. It has enhanced
stakeholder engagement,
enabled automatic scheduling,
and prevented clashes between
complex MEP and the building
shell.

In London, the £700m
Victoria Station Upgrade has
also been greatly enhanced by
BIM. London Underground
was one of the first clients to set
out requirements for BIM, and
Mott MacDonald’s use of BIM
on the project won Bentley’s Be
Innovated in Rail and Transit in 2010.

All project partners –
including principal contractor
Taylor Woodrow Barn Nuttall
– are working collaboratively
from a single, shared 3D model.

A common data environment
means that all participants have
controlled access to the correct
information at all times.

BIM has allowed the
modelling of complex
guardian around existing
utilities, and the automatic
positioning of drilling rigs. It
has also been used to evaluate
value engineering alternatives.

The model includes both
information from ‘as built’
records and from laser sweep
surveys, and all information
is tagged with its provenance.
Multidisciplinary inputs are
integrated into a single model,
meaning that interface issues
are identified and resolved
before construction.
Jet fans have long been the go-to technology for effective car park ventilation, but developing safe and reliable systems is often challenging. James Allen discusses the need for greater understanding of smoke control in car park design.

It is important to remember that fans selected for a car park ventilation scheme form part of a collection of fans, which interact with each other and their surroundings.

Practical, powerful and cost-effective – it’s no wonder thrust fans, which includes both jet and induction technology, are now the first choice in car park ventilation throughout the UK and worldwide. Tracing their roots to the tunnel fans pioneered in the 1960s, their adaptation for enclosed car parks over the last 20 years has elevated them above traditional ducting design.

Yet, despite their technological and practical superiority, there is often a lack of cohesion in the industry when designing new systems and using thrust fan technology effectively.

**The cut and thrust of design**

There are currently two design approaches for a thrust fan system: smoke clearance and smoke control. Firstly, smoke clearance systems meet the requirements of the Building Regulations – Part B and Part F, which define air change rates for smoke and pollution extraction, based on a set number of air changes per hour (10 and 6 ac/hr respectively). However, a smoke clearance system doesn’t take into account the potential size or location of a fire, and neither does it aid escape or firefighter access. British Standard 7346 Part 7, which was published in 2006, has gone some way to address this issue by including design parameters for smoke control systems, while ensuring the use of thrust fans does not worsen conditions for escaping occupants or firefighters.

The second option for building services engineers is a smoke control system. These are designed to manage smoke movement, while facilitating firefighter access within the necessary visibility and temperature criteria. Despite not yet being a requirement in the UK, these type of systems are fast becoming a preferred choice for new car park construction, where the parking area on a single floor is sufficiently large enough (typically floor areas greater than 4,000m²).
Car parks smaller than 4,000 m\(^2\) become less suitable for smoke control due to greater confinement of the fire, fewer options for control over the direction of airflow, and reduced plant room space. In these cases smoke clearance is usually the chosen path.

Whichever method is chosen, there are a number of factors that must be considered during the design stage to ensure building design engineers avoid future problems, as well as reduce the possibility of worsening conditions during a fire.

For more than 10 years, computational fluid dynamics (CFD) has been relied upon to design and demonstrate an effective thrust fan system. The use of CFD is considered essential because of the complexities of air movement involved. However, on some occasions, the timescales required for calculating airflow and fire conditions for a variety of scenarios can make CFD expensive. Furthermore, the outcome of a CFD simulation is only as good as the input data, with the accuracy of results varying significantly according to what information is used – ranging from the boundary conditions applied to represent walls and ceilings, to the choice of model for the fire source.

Consequently, many fan manufacturers are now using this technology to provide their own data and aid engineers in the design process, highlighting some key factors to consider when specifying a system. It is important to remember that fans selected for a car park ventilation scheme form part of a collection of fans, which interact with each other and their surroundings. So, it is essential that they are specified taking a holistic approach – encompassing the whole system – rather than treating each fan separately.

Some of the key points to take into account during the design stage include: jet fan performance; lateral spacing; the total number of fans specified; and installation effects.

**Thrust fan performance**

Jet performance can vary widely from product to product, with the effectiveness of each fan fluctuating, depending on how each is installed. So, by using the velocity profiles supplied by the manufacturer as reference data, engineers can obtain vital information about the throw length and width of a jet from the fan. Plus, it demonstrates the total quantity of air moved over a specific distance when installed. It’s this level of detail that can help system designers to incorporate such data into the early stages of system design.

In addition to the effects of building geometry, the lateral spacing – distance between neighbouring fans – has a significant effect on system performance. For example, the effect of installing a 400mm diameter fan at, say, 10m spacing instead of 15m, can have a dramatic effect on the velocity profile. With larger gaps between the thrust fans, isolated velocity profiles can form, preventing a uniform flow. This may require higher extraction rates to be employed to effectively fill the gaps, especially if the flow is expected to control smoke from a vehicle fire in all areas.

However, the potential issue here is that the extract flow is usually already fixed by the size of the shafts or openings – again highlighting the need to incorporate such data into the early stages of system design.

**Installation effects**

In car parks there are a variety of obstructions to airflow, such as pillars, down-stand beams and larger impediments, including internal rooms and stair cores. Other significant losses in airflow include the pressure developed by a fire, its location – whether the fire is in a corner or is some distance away from a wall – and large increases or decreases in floor-to-ceiling height. These factors are referred to as ‘installation effects’ and they need to be fully understood by the ventilation system designer.

Not all thrust fans will have a direct influence on the extract flow rate. Selected fans will be used for distributing air, while others accelerate air and smoke towards an extract point. If thrust fan systems operated by automated controls are not balanced – and there are too many fans – it can result in backflow of smoke or, worse still, rapid acceleration of smoke beyond zone boundaries, particularly in large multi-zoned car parks. (See figs 1 and 2.)

**Reference**

1. BS 7346-7:2006, Components for smoke and heat control systems.

**JAMES ALLEN** is senior CFD applications engineer at Fläkt Woods.
It's widely accepted that the main fire risks to life in small buildings arise during the evacuation periods as heat and toxic products spread rapidly throughout the building. Local or disproportionate failure of the structure, which may happen during the later stages of fire development, are a secondary concern, providing no sleeping risks exist, adequate warning of fire is given and sufficient exit width is provided.

It's understandable, therefore, that some fire engineers have questioned the need to protect structural steel elements in low rise buildings. This is particularly so when it appears that fire protection is being used at the expense of other safety measures, such as suppression systems, which are possibly the most effective of all.

Unfortunately, the relatively high cost of these means few, if any, detailed studies have been carried out to determine their ability to act as a trade-off for passive structural fire protection in steel-framed buildings. This is unfortunate because fire suppression systems, in attacking blazes at source, will also protect against content, infrastructure and environmental losses in a way that structural protection alone, cannot.

In 2007, a unique opportunity arose at the Beetham tower to determine if the building's fire suppression system could be used safely as a trade-off for structural protection in the four-storey steel-framed podium structure. The work was carried out using a risk-based approach similar to that used to develop new fire resistance periods in BS 9999. The opportunity only arose because the suppression system was being installed at the request of the operator (Hilton) and not as a means of satisfying any safety requirement.

**Risk-based design approach**

The risk-based approach used Monte Carlo simulations – the parametric fire in Eurocode 1 and the limiting temperature technique as set out in BS 5950-8. It was executed on the basis that all steel columns and beams in the building would have been passively fire protected to achieve two hours of resistance. The likelihood of individual steel elements being heated beyond their limiting temperatures in any one room was first calculated for the fire-protected option and then for the alternative option which relied solely on a suppression system being present in the room.

For each case, the number of steel elements heated beyond their limiting temperatures in
individual rooms was recorded and the results included into event trees. Each event tree allowed the risks to be compared relatively. The relative nature of the approach allows some of the limitations of the underlying fire and structural models to be overcome.

The methodology consisted of four main stages as illustrated in Figure 1.

**Monte Carlo analysis**

The Monte Carlo analysis (Figure 2) uses different values; these typically being those attributed to fire load density and ventilation in the room of blaze origin. Each variable is assigned a distribution of values and this controls the frequency that different values are chosen when a set number of fire simulations are run. The technique is ideally suited to problems of this nature as the calculations are based on physical theory and experimental measurement. This helps compensate for a lack of information about real-life circumstances in a manner that other risk-based methods cannot. Furthermore, all assumptions are explicit and a measure of the sensitivity of these can be made by changing the value for a variable, re-running the simulations and then comparing the new results with those originally generated.

At the end of the process, 10,000 values of maximum steel temperature [protected and unprotected] have been calculated for each room in the building. The frequency that individual limiting temperatures would be exceeded is then calculated by dividing the number of exceeds by the total number of fire simulations run in that room. The overall risk for both design options is then back calculated. The results are shown in Table 1.

The analysis assumes that if the sprinkler system operates successfully then flashover and damage does not occur.

The results of the study show that the fire suppression system is capable of providing a level of structural safety at least comparable to that achieved should all structural elements in this building be fire protected to achieve 120 minutes fire resistance and that the required reliability of the suppression system for equivalence ranges between 11% and 87.0%. The average reliability rate for precise equivalency in this case is 53%.

There is no reason to suggest that the low-pressure water mist system used on this project would not achieve this overall performance level.

When analysing the results of this work consideration should be given to the following:

- The building did not need a fire suppression system, in attacking blazes at source, will also protect against content, infrastructure and environmental losses in a way that structural fire protection alone cannot.
The podium is four-storeys high and has a composite steel frame that is structurally independent of the main tower. It is separated from the tower by a compartment wall that has 60 minutes fire resistance.

As the podium is structurally independent of the main tower, it could have been argued that a 60 minute fire resistance period was applicable for elements of structure. The fact that 120 minutes fire resistance was adopted suggests that the reported results may be conservative.

The analysis assumed all passive fire protection to be correctly installed, well maintained and, therefore, 100% reliable. This may not be the case in practice.

Had likely reductions in direct and indirect losses, as a result of using a suppression system, rather than passive fire protection only, been factored into the calculations, the cost and safety benefits of this alternative may have appeared much greater.

In 2007, the work was reviewed by BRE and approved by Manchester City Council. Then, the building was thought to be the first to be designed using the risk-based techniques outlined here and probably the only low-rise steel-framed building that has a structure protected entirely by a fire suppression system.

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**Case Study: Fire Suppression**

**Table 1:** Results of risk assessment process showing required reliability of fire suppression system for equivalency to be achieved

<table>
<thead>
<tr>
<th>Case number</th>
<th>Probability of fire starting</th>
<th>Assumed suppression success rate</th>
<th>Probability of flashover occurring</th>
<th>Number of failures based on 10,000 fires</th>
<th>Probability of failure based on 10,000 fires</th>
<th>Relative risk of failure</th>
<th>Required suppression success rate for equivalency</th>
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<td>0.027</td>
<td>87%</td>
</tr>
</tbody>
</table>

x = not applicable, fp = fire protection option, sp = steel protected by suppression system only
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- **Cylinder space not required** – More storage/usable space in dwelling
- **Rapid/accurate response through plate heat exchanger and control technology** – Energy efficient and comfortable heating and hot water temperatures achieved
- **Renewable energy implemented easier in central/communal plant room** – Solar/Biomass/Heat Pumps
- **Central Boiler House** – A single annual gas safety inspection which is restricted to the plant room
- **Central Boiler House** – Reduction in maintenance costs due to reduced boilers to service
- **Can be installed facing into landlord areas** – Less disruption to dwellings during maintenance
- **Meter reading and energy bills can be carried out remotely from a central location** – This can be very attractive to councils and those with a large portfolio of buildings

For further information or to receive a technical guide tel: 020 8783 3050 or email: info@stokvisboilers.com

www.stokvisboilers.com
Variable refrigerant temperature controls make the latest VRF heat pumps 28% more energy efficient than previous systems, claims Daikin’s Martin Passingham.

The first step for designers aiming to improve energy efficiency is to reduce actual energy demand by improving the thermal effectiveness of the building fabric. An additional benefit of these highly insulated buildings is that they are also suited to energy efficient solutions, such as air source heat pumps.

The Energy Related Products (ERP) Directive, affecting the seasonal efficiency of VRF (variable refrigerant flow) and Daikin’s VRV (variable refrigerant volume) heat pumps, is scheduled to start in 2016. Because seasonal efficiency measures energy use across the entire operating range, it is a more accurate measurement of the real-life effectiveness of systems and gives an indication of how well an air conditioning system operates over an entire cooling or heating period.

Seasonal improvements for VRV heat pumps are achieved by the incorporation of a variable refrigerant temperature control. This automatically adapts the VRV system to an individual building’s requirements, significantly reducing running costs.

The variable refrigerant operating conditions may be present to ensure that the balance between the demands of comfort and efficiency are optimised, and can deliver annual cost savings of up to 25% for heat pumps with the variable refrigerant temperature control. In traditional, less efficient systems, control will rely on varying the refrigerant flow rate while maintaining a constant refrigerant temperature set point.

The automatic variable refrigerant temperature mode works by reducing the speed of compressors and by increasing the evaporation temperature, as it cools outside. This delivers higher efficiency due to lower compression ratios (Fig 1).

So the more the refrigerant temperature, the higher the efficiency, as variable refrigerant temperature is applied to meet load.

The heat pump also has a continuous defrost cycle, which can operate alongside the heating system, making it a viable alternative to traditional heating systems. This is important as, during the heating operation, all heat pumps accumulate ice, which must be melted periodically, using the defrost operation to reverse the refrigeration cycle. This allows for continual operation and maintaining of a comfortable internal environment, even when external temperatures are severe.

To ensure that the site works most effectively, customised monitoring and control software is used for simplified commissioning, servicing, configuration and customisation. The software also allows systems to be managed across multiple sites.

Basildon hospital

Daikin variable temperature systems were installed to provide comfort air conditioning into the eight kitchens of Basildon Hospital’s Jubilee Wing.

Two heat pumps with 22.4 kW cooling capacity were installed externally on one of the hospital’s roofs. Both pumps were connected to six wall-mounted units. Maintenance can be carried out from the front of the unit, so causing little disruption to the workflow in the kitchens.

Each of the heat pump systems are controlled using a wired remote control, as well as being centrally controlled via the hospital’s building management system. This has been pre-programmed to switch on the systems at specific times (for example, when the kitchens are being used), to save energy.

The scheme has also been designed to be expanded easily, or replicated across other areas of the hospital, when refurbishment or maintenance programmes allow.

Because the installation is recent, no actual running data is available yet, but projected energy consumption modelling has been carried out, and similar monitored live installations on other projects outside the UK are showing an increase in energy efficiency of 28% over the previous high efficiency VRV units.

The heat pump also has a continuous defrost cycle, which can operate alongside the heating system, making it a viable alternative to traditional heating systems. This is important as, during the heating operation, all heat pumps accumulate ice, which must be melted periodically, using the defrost operation to reverse the refrigeration cycle. This allows for continual operation and maintaining of a comfortable internal environment, even when external temperatures are severe.

To ensure that the site works most effectively, customised monitoring and control software is used for simplified commissioning, servicing, configuration and customisation. The software also allows systems to be managed across multiple sites.
The terminology and concepts used to determine the magnitude and direction of incident solar radiation

There are many stunning examples of significantly glazed buildings that, through thoughtful design, can also have moderate cooling loads. To achieve effective designs requires a good understanding of how the building responds to changes in the external environment. Some of the aspects of thermal mass (and admittance) have been covered in earlier articles (January 2013 and May 2011). This article will consider the solar geometry and the effect of climatic attenuation on incident solar radiation that may then be applied to evaluate the effectiveness of shading devices and calculate solar heat gain through fenestration.

Solar gain through glazing will be primarily dependent on the intensity of the incident solar radiation and the relative position of the sun to the surface of the translucent material. There are standard methods and algorithms that have been developed to synthesise solar data – these are given in detail in CIBSE Guide J. However, the terminology used and the assumed background knowledge may be unfamiliar to many building professionals.

The intensity of the sun
At the outer reaches of the earth’s atmosphere, the incident sun’s energy has an intensity of about 1,367 W·m⁻² and, since the sun is large and 149,600,000 km from the earth, the sun’s rays are assumed as practically parallel on entering the atmosphere. As the electromagnetic radiation passes through the atmosphere, it is attenuated by gases, aerosols and particulate matter. The attenuation (that, apart from ultraviolet, principally takes place in the troposphere) and the scattering (known as ‘Rayleigh scattering’) of the solar radiation will relate to the depth of atmosphere through which the radiation passes.

The effective atmospheric depth will be affected by the apparent angle of the sun’s rays with the ground (the relative solar position is illustrated in Figure 1). The actual path length (Figure 2) through the atmosphere is described using the term ‘relative air mass’, AM. This value will depend on the height of the site above sea level and the solar altitude – at higher values of relative air mass, less solar radiation will reach the earth’s surface and the higher frequencies (blue/green light) are increasingly scattered, so leading to light dominated by lower frequency red/orange.

An AM value of 2 (relating to a solar altitude angle of 30°) is typically used in standard data for solar irradiance.

To account for the effect of the climate (including permanent pollution) at a particular location, the ‘Linke turbidity factor’, $T_L$, represents the multiple of clean dry atmospheres that would produce the equivalent solar attenuation to the actual atmospheric conditions at a particular location. This ranges from a value of 2 for very clean, cold air to 3 for very warm, and above 6 for a location with heavily polluted air.

Figure 1: The relative position of the sun to a point on the earth’s surface
Figure 2: The effect of solar altitude on atmospheric depth
5.3.2.4 Clear sky global irradiance

The clear sky global irradiance on a horizontal surface is simply obtained from beam normal irradiance, the solar altitude and the diffuse horizontal irradiance:

$$ G_{h} = G_{b} + G_{d} $$

where:

- $G_{h}$ is the clear sky global irradiance on a horizontal surface.
- $G_{b}$ is the beam normal irradiance.
- $G_{d}$ is the diffuse horizontal irradiance.

5.3.2.3 Clear sky diffuse irradiance on horizontal surfaces

The diffuse horizontal irradiance of the clear sky, $G_{d}$, is a component that plays a significant role in determining the total incident solar radiation on horizontal surfaces. It is defined as the portion of the clear sky irradiance that is not blocked by the earth's atmosphere or the surface being considered. The diffuse component is affected by various factors, including the atmospheric conditions, the elevation of the surface, and the reflectivity of the ground. The diffuse irradiance at a given solar altitude is a function of the Linke turbidity factor, $T_{L}$, and the solar altitude, $\beta$.

$$ G_{d} = G_{d0} \cdot T_{L} $$

where:

- $G_{d0}$ is the diffuse irradiance at sea level, which is a function of the solar altitude.
- $T_{L}$ is the Linke turbidity factor, which is a measure of the atmospheric turbidity.

A Linke turbidity factor of 6 is about 180 W·m$^{-2}$ at mean solar distance. Correcting to mean solar distance for Aug 4, with a Linke turbidity factor of 3.5, the diffuse irradiance is 113 W·m$^{-2}$.

5.3.6 Site elevation can be considered by using the effective Linke turbidity factor, $T_{EL}$:

$$ T_{EL} = T_{L} \cdot (1 + k) $$

where:

- $k$ is the elevation correction factor, which is determined by the site's elevation and the elevation correction factor for the surface.

When the solar radiation reaches the earth's surface, the direct component of solar energy, known as the 'beam irradiance' (measured perpendicular to the direction of the sun), will be affected by the site elevation. Locations such as Denver, Colorado – which is 1.6 km above sea level – have a significantly shorter atmospheric path (with a troposphere depth of around 17 km above Denver) than a location at the same latitude but at sea level. By comparison, in the UK the highest town is 500 m above sea level. To account for this, an altitude correction factor is applied to the basic beam irradiance that will also be dependent on the sky clarity. This correction factor is shown in Figure 3 for a Linke turbidity factor of 3.5.

![Figure 3: Effect of site elevation in metres on the predicted beam irradiance expressed as a ratio to the sea level beam irradiance at different solar altitude angles (Source: CIBSE Guide J)](image)

After passing through the atmosphere, the normal beam irradiance has a maximum value of approximately 950 W·m$^{-2}$. In addition to the direct irradiance, there is a diffuse component that – as the name suggests – is non-directional and will depend on the atmospheric (notably climatic) conditions, as well as the surrounding surfaces. As the Linke turbidity factor increases, the diffuse irradiance at a given solar altitude rises (as indicated in Figure 4), since there is greater scattering of light. The diffuse irradiance typically ranges from 100 W·m$^{-2}$ for a 'clear' sky, up to 450 W·m$^{-2}$ for a 'cloudy' sky.

The colour and reflectivity of adjacent constructions, ground and vegetation will affect the reflected component of solar radiation – this is considered as diffuse radiation, and its magnitude is directly related to the surface 'albedo' (the fraction of sun's radiation reflected from a surface).

The albedo of different common materials ranges from about 0.14 for tarmacadam to 0.23 for aged concrete. A recent report on a project indicates that surrounding surface finishes should play a significant part of the design analysis when considering the environmental performance of buildings, as they may significantly affect heating and cooling loads.

It is normally assumed that, of the reflected diffuse radiation, 50% will strike the adjacent vertical surface, while for sloping surfaces, CIBSE provides a simple relationship in terms of the slope angle, $\beta$.

The ground reflected irradiance is given by:

$$ R_{g} = p_{g} \cdot G_{c} \cdot (W·m^{-2}) $$

where:

- $p_{g}$ is the ground albedo, $r_{g}$ is the ground slope factor and $G_{c}$ the clear sky global irradiance on a horizontal surface (W·m$^{-2}$).

The ground slope factor is given by:

$$ r_{g} = \left(1 - \cos(\beta)\right) / 2 $$

and so for vertical surfaces $r_{g} = 0.5$.

If there is mirror-like ‘specular’ reflection (such as from highly reflective polished metal cladding), the reflected component would need to be specifically modelled for the application.

In common with other sources, CIBSE-published solar data applies a ground albedo of 0.2 and a Linke turbidity factor of 3.5, with various correction factors, $k$, being applied to the data to account for localised site conditions.

The 'global irradiance', $G_{c}$, at a particular surface is the sum of the beam and diffuse components.

### The relative position of the sun

The relative position of the sun may be practically determined for any time during the year with simple trigonometry plus some empirical data relating to the earth’s orbit around the sun and the axial tilt (of 23.4°) of the earth that drives the seasonal variation in incident solar radiation.

As shown in Figure 5, the value of solar declination, $\delta$, is independent of location but related to the time of year (varying from +23.5° around 20 June to 0° at the vernal and spring equinox, and -23.5° around 22 December, due to the relative tilt of the earth’s axis as the earth revolves...
Figure 5: Solar geometry at a point on the earth’s surface relative to the tangential visual horizon

Figure 6: The wall-solar azimuth, \( \alpha_w \)

around the sun, and may be determined by a simple sinusoidal functions. Only locations in the ‘tropics’ (latitudes between 23.5°N and 23.5°S) can have the sun vertically above (at a solar altitude of 90°, zenith of 0°). When considering a particular location, the angular height of the sun above the horizon, the solar altitude, \( \gamma \), and its angular position in the horizontal plane, the solar azimuth, \( \alpha_s \), may be calculated.

So:

\[
\sin(\gamma) = \sin(\delta) \cdot \sin(\phi) + \cos(\delta) \cdot \cos(\phi) \cdot \cos(\omega)
\]

\[
\cos(\alpha_s) = \frac{\sin(\gamma) \cdot \sin(\phi) - \sin(\delta)}{\cos(\phi) \cdot \cos(\gamma)}
\]

with the \( \sin(\alpha_s) \) calculation being required to establish the quadrant where \( \alpha_s \) resides.

\( \omega \) = absolute value of the hour angle (e.g., noon = 0°, 2pm = 30°, 9am = 45°, etc.)

\( \phi \) = latitude

If \( \sin(\alpha_s) < 0 \), then \( \alpha_s = -\cos^{-1}(\cos(\alpha_s)) \);
if \( \sin(\alpha_s) > 0 \), then \( \alpha_s = +\cos^{-1}(\cos(\alpha_s)) \).

CIBSE Guide J provides a full set of formulae that may readily be applied to spreadsheets to provide the relative position of the sun at any particular time. The purpose of establishing the solar position and the irradiance is to be able to apply it to the surfaces of a building, and so the relative position must be established. As indicated in Figure 6, the angle that the surface faces (in the horizontal plane) is known as wall azimuth angle, \( \alpha_w \), measured relative to south (in the northern hemisphere). The difference between the wall azimuth angle and the solar azimuth, \( \alpha_s \), is known as the wall-solar azimuth, \( \alpha_w \), with values to the east of the north-south meridian negative and values to the west being positive.

So \( \alpha_w = \alpha_s - \alpha \).

The basic solar data having been determined, the intensity of beam irradiance, \( B \) (W·m\(^{-2}\)) falling on a horizontal plane may be established from

\[
B = B_n \cdot \sin(\gamma) \cdot \cos(\alpha_s)
\]

and for a vertical plane (taking account of both the altitude of the sun and the orientation of the surface)

\[
B = B_n \cdot \cos(\gamma) \cdot \cos(\alpha_s)
\]

where \( \alpha_s \) is the wall-solar azimuth.

For a sloping surface, it requires a rather more complex set of trigonometric equations, so it is convenient to separately establish the angle of incidence of the solar radiation with a sloping surface

\[
v(\beta, \alpha) = \cos^{-1}(\cos(\gamma) \cdot \cos(\alpha_s) \cdot \sin(\beta) + \sin(\gamma) \cdot \cos(\beta))
\]

And so for a sloping surface with a slope \( \beta \) and wall azimuth \( \alpha_w \),

when \( \cos(v(\beta, \alpha)) > 0 \) \( \Rightarrow B(\beta, \alpha) = B_n \cdot \cos(v(\beta, \alpha)) \)

otherwise \( B(\beta, \alpha) = 0, \) as the surface will not be exposed to direct sun.

The positional data for the sun is shown conveniently using a sun-path diagram (Figure 7). This cylindrical projection has the azimuth plotted along the horizontal axis, with the altitude plotted vertically. Each of the curves represents the path of the sun throughout a day for each month of the year. As with the preceding solar calculations, the sun-path is represented using local apparent time – this is the sun time (that is, for the northern hemisphere, midday is when sun is due south). Similar data is available in a tabulated form for all global locations, based on the basic formulae from a number of sources including that on the NOAA Earth System Research Laboratory website at http://1.usa.gov/141WG7W

The terminology and basic techniques in this article may be applied when determining the potential impact of solar radiation on the external faces of a building. Practically, the most effective way to undertake this is by employing the formulae (together with other underlying calculations from Guide J) using a spreadsheet, or with one of the industry standard modelling packages.

A future follow-up to this CPD will apply this knowledge to building fenestration, and then examine the effect of the material from this and the earlier CPD articles on moderating cooling loads in buildings. © Tim Diwyer, 2013.

References

Module 54
July 2013

1. What is the approximate intensity of solar radiation on the outer limits of the earth’s atmosphere?
   □ A 970 W·m⁻²
   □ B 1,070 W·m⁻²
   □ C 1,170 W·m⁻²
   □ D 1,270 W·m⁻²
   □ E 1,370 W·m⁻²

2. When the zenith angle is 60°, what is the approximate basic value of the relative air mass for solar radiation passing through the atmosphere?
   □ A 0
   □ B 1
   □ C 1.5
   □ D 2
   □ E 2.5

3. When the solar altitude is 20° in Denver, Colorado, what value of site elevation correction factor would be applied to solar data that is based on a Linke turbidity factor of 3.5?
   □ A 1.00
   □ B 1.05
   □ C 1.10
   □ D 1.15
   □ E 1.20

4. The large car park around a single storey office has its old concrete surface covered with tarmac. What will be the effect on the reflected solar radiation striking the office windows?
   □ A It will reduce by about a third
   □ B It will reduce by about a sixth
   □ C It will increase by about a half
   □ D It will double
   □ E It will stay virtually the same

5. What date and local apparent time will the solar altitude be 20° and the azimuth –40° for a site in France at 52° N?
   □ A 11am, 21 January
   □ B 9.30am, 23 February
   □ C 2.30pm, 20 October
   □ D 11am, 21 March
   □ E Noon, 22 June

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Elta announces launch of new SCC fan
Elta Fans has added another product to its ‘Elta Select’ range. The newly launched Viper SCC (UK patent application number 1211017.7) is a new duct-mounted, centrifugal fan which produces high pressure even with low volumes. The fan is designed as ideally suited for installation in sports and leisure facilities, schools, colleges, retail centres, factories and similar duct-mounted installations.

New guide to PICVs
Marflow Hydronics, the specialist solution providers for the balancing, controlling and metering of water distribution systems in the HVAC industry, has launched a brand new ‘Definitive Guide to Pressure Independent Control Valves’. The aim of the guide is to provide understanding and knowledge to help anyone using the products, ensuring that systems are designed to optimise the best performance levels.

Aquatech Pressmain and Autron racing ahead
Sponsors of this year’s Ginetta Junior Championship car, Aquatech Pressmain & Autron have been watching closely from the track side as their blue car has been driven hard by the youngest, and only, female in the championship, 14-year-old Jamie Chadwick. Now mid-way through the season, tension is high by the youngest, and only, female in the championship, 14-year-old Jamie Chadwick. Now mid-way through the season, tension is hard by the youngest, and only, female in the championship, 14-year-old Jamie Chadwick.

Air curtain collaboration at Drapers Garden
Air curtain specialist, JS Air Curtains, and entrance specialist, Blue Chyp, have recently supplied and installed four revolving door air curtains at Drapers Garden office complex in the City of London. JS Air Curtains’ Rotowind range was designed to meet the specific conditions of a revolving door, which can act as a low-speed fan, forcing a mass of cold air into a room with each rotation. By combining a Rotowind with a revolving door system, cold air is prevented from entering.

Mitsubishi Electric has produced a new brochure designed to highlight the financial and performance benefits from taking full control of a building’s energy use. The 16-page brochure seeks to help building operators optimise the performance of their air conditioning system to reduce running costs and minimise carbon emissions. Sebastien Desmottes, product marketing manager and controls expert for Mitsubishi Electric, said: ‘Good controls will benefit any application, large or small and this brochure is designed to help our customers find the best solution for their situation.’

Titan Products launches TPZ-Net Zigbee wireless range
The TPZ-Net is a new range of wireless environmental products from Titan Products. Incorporating Zigbee wireless technology, the range creates extremely stable, self-healing mesh networking capabilities. The TPZ-Net range is designed to monitor temperature, CO₂, humidity, light and occupancy levels wirelessly and transfer this information back to the Titan Products coordinator, where the information can be transferred onto a BACnet network or to other Titan product controllers, or I/O (input/output) devices.

Why humidity? HygroMatik CPD offers the answers
HygroMatik provides humidification answers in its in-depth CIBSE-approved CPD. The CPD provides details on the relative humidity requirements and different systems including, isothermal and adiabatic, for a range of environments to answer sector specific demands. This updated presentation, from one of the leading suppliers of commercial air humidifier systems, discusses the following areas, which can be addressed to provide optimum humidification, including comfort and health, prevention of static electricity, materials storage, process control, historical restoration, and protection and prevention.

Brochure shows how controls can reduce running costs
Marflow Hydronics, the specialist solution providers for the balancing, controlling and metering of water distribution systems in the HVAC industry, has launched a brand new ‘Definitive Guide to Pressure Independent Control Valves’. The aim of the guide is to provide understanding and knowledge to help anyone using the products, ensuring that systems are designed to optimise the best performance levels.

The guide describes the design and operation of Pressure Independent Control Valves (PICVs), explaining how they work, their operational limits and the control options available.

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Two decades of CableCalc Level P marked with a free version of new twin and earth calculations
To mark 20 years of CableCalc, Castline Systems has released a free version of its popular CableCalc program, which will calculate single-phase radial and ring circuits wired in twin and earth cable. It includes free technical support by email. CableCalc Level P is a fully working, unlimited-use version and provides far more than just simple volt drop calculations. CableCalc Level P can be downloaded from www.castlinesystems.com free of charge.
● Call 01293 871751 or visit www.castlinesystems.com

CableCalc Level P

CO₂ monitoring in workplaces and schools
Tinytag carbon dioxide data loggers are being used by leading Danish environmental monitoring company, ArbejdsmiljoeCentret (‘works health centre’), to help ensure optimum conditions are maintained in workplaces and schools. CO₂ is recorded to check whether ventilation is sufficient for the room compared to the number of people that are using it, preventing a CO₂ build-up, maintaining air quality and ensuring the wellbeing of occupants. The loggers are small, discreet and wall mountable. Made in the UK, prices from £325.
● Call 01243 813008, email info@tinytag.info or visit www.tinytag.info

Lochinvar extends indirect options to meet changing demand
The increased use of renewable energy sources in combination with traditional gas-fired systems is driving demand for more flexible commercial heating and hot water solutions. As a result, boiler and water heater manufacturer Lochinvar has expanded its wide range of indirect storage vessels. These products are capable of capturing energy from a variety of renewable sources, including solar thermal systems.
● Visit www.lochinvar.ltd.uk

Myson’s new ULOW-E2 – technology in motion
Against a climate of rising energy prices and a revolution in better property insulation, Myson unveils its new heating solution, the ULOW-E2; the UK’s first ultra-efficient radiator, driven by E2-Technology. Specifically designed to work with lower system temperatures, and to produce high heat outputs from smaller sizes, the ULOW-E2 uses innovative E2-Technology to automatically switch between static and dynamic operation in a single heat emitter. Static operation allows the ULOW-E2 to operate as a traditional radiator; while dynamic operation will activate in-built fans, significantly enhancing the heat output.
● Visit www.myson.co.uk

ActiMass supports design teams on thermal mass projects
Thermal mass heating, cooling and ventilation specialist ActiMass offers design advice, thermal modelling and project support on innovative building schemes. The firm supports feasibility, design and installation stages for passive, air, water or new patented combined systems. Experience includes commercial offices, universities, schools, utilities and retail. For innovative feasibility or design proposals, contact the firm by email for an informal and confidential discussion regarding your project or building.
● Email enquiries@actilmass.co.uk or visit www.actilmass.co.uk

Grave launches new range of TCVs
Valve manufacturer Crane Fluid Systems has launched a new range of thermal circulation valves (TCVs), designed for use in domestic hot water systems to help kill Legionella bacteria, which causes the deadly Legionnaires’ disease. The Crane Fluid Systems’ TCV range is WRAS approved and available in sizes DN15 low flow and DN15 and DN20 standard flow. The valve is compact and includes an isolation valve, thermometer access point and a settable temperature sensing cartridge which is pre-set at a standard 57°C. The installation of a TCV into hot water systems ensures that the water is maintained at a temperature that Legionella cannot survive in. Crane Fluid Systems’ new TCV range aids self-balancing and thermostatically controlled regulation of water flow and thermal disinfection. This type of thermal circulation also reduces commissioning time and therefore cost too. Sizing and selection of TCVs is very important and Crane Fluid Systems offer a 92% double panel.
● Visit www.cranefs.com or www.cranefs.com
Grundfos Hydro MPC booster sets win WRAS approval
Grundfos Pumps has recently attained WRAS (Water Regulations Advisory Scheme) full product approval status for its range of Hydro MPC E/F/S booster sets. This approval is only granted following rigorous mechanical testing and ensures that these complete booster sets comply with the various strict byelaw regulations and requirements as they currently exist in the UK. The scope of this recent approval covers Grundfos Hydro booster families that comprise of between two to six pumps, are up to a 16 bar PN rating and pump models up to CR(E)90. Over the years, Grundfos has built up a great reputation in supplying booster sets to the highest standards. With all the elements relating to the design, engineering and build combining to deliver to the most exacting standards, these sturdy, yet compact sets are perfect for a wide range of applications from hotels to education establishments, high rise developments to industrial demands as well as within the water utility industry itself.

- Email grundfosuk@grundfos.com, call 01525 850000 or visit www.grundfos.co.uk

Carbon monoxide – the latest guidance
Kidde Fyrnetics has launched its guide to carbon monoxide safety in housing – updated with details of new models to the TenYCO range of 10-year guaranteed CO alarms – at the 2013 Gas Safety Management Conference. This CORGI organised event is the inaugural Conference for the Association of Gas Safety Managers (AGSM) and the first National Inter Authority Gas Forum. Kidde Fyrnetics – a sponsor of the Conference – launched its guide to carbon monoxide at the event.

- Email kiddefyr@ukgateway.net

Remeha helps Luton school cut energy use by more than half
Three Remeha Quinta Pro 115 condensing boilers on a cascade system have more than halved Farley Junior School’s energy usage and carbon emissions. VSRW specified Remeha’s market-leading Quinta Pros to replace ageing atmospheric boilers two years ago, with low temperature radiators and fan heaters added last year to maximise energy savings. Gas consumption has plummeted from 660,995kWh to 273,148kWh with carbon savings in the region of 53 tonnes a year, enabling Farley to reduce its carbon footprint by a further 15 per cent this year. The financial savings will be used for the direct benefit of the school’s pupils.

- Visit www.remeha.co.uk, call 0118 978 3434 or email boilers@remeha.co.uk

Circuit protection and control solution for 19 Dumfries photovoltaic installations
Dumfries contractor JB McCormick has used Hager circuit protection and control for the installation of photovoltaic (PV) panels on 19 public buildings. Dumfries and Galloway Council’s investment in solar PV is to reduce its carbon footprint and energy costs in line with the Scottish Government targets set out in the climate change (Scotland) 2009 Act. The contract covers primary schools, secondary schools, ice rinks, swimming pools and other buildings. To date the council has saved about 500,000kWh of power and generated 600,000 kWhr.

- Call 0870 240 2400, email info@hager.co.uk or visit www.hager.co.uk

Wandsworth launches ‘spec-your-own’ accessories
Wandsworth Group has launched a new range of grid mounting outlets, offering specifiers a flexible selection of combined electrical sockets, USB charge points and multimedia outlets to coordinate with switches and sockets for a tidy and aesthetically cohesive look in any environment. Compatible with any plate finish in Wandsworth’s Series 2, Series 3, Penthouse and Decorative ranges, the new grid mounting outlets include conventional sockets and television aerial points, along with USB charge points and a range of multimedia outlets, including HDMI, ADSL, SVGA, satellite TV and speakers.

- Call 01483 713400, email info@wandsworthgroup.com or visit www.wandsworthgroup.com

CP’s controls reduce running costs for West Dorset District Council
CP Electronic’s Vitesse Plus and Vitesse Modular lighting control systems have been installed to great effect in the impressive new offices of West Dorset District Council. The council has moved from its previous location of Stratton House to smaller and more energy efficient offices called South Walks House in Dorchester, Dorset. The new building has helped the council immediate reduce its running costs and its impact on the environment.

- Email enquiry@cpelectronics.co.uk

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Kidde Fyrnetics has launched its guide to carbon monoxide safety in housing – updated with details of new models to the TenYCO range of 10-year guaranteed CO alarms – at the 2013 Gas Safety Management Conference. This CORGI organised event is the inaugural Conference for the Association of Gas Safety Managers (AGSM) and the first National Inter Authority Gas Forum. Kidde Fyrnetics – a sponsor of the Conference – launched its guide to carbon monoxide at the event.

- Email kiddefyr@ukgateway.net

Remeha helps Luton school cut energy use by more than half
Three Remeha Quinta Pro 115 condensing boilers on a cascade system have more than halved Farley Junior School’s energy usage and carbon emissions. VSRW specified Remeha’s market-leading Quinta Pros to replace ageing atmospheric boilers two years ago, with low temperature radiators and fan heaters added last year to maximise energy savings. Gas consumption has plummeted from 660,995kWh to 273,148kWh with carbon savings in the region of 53 tonnes a year, enabling Farley to reduce its carbon footprint by a further 15 per cent this year. The financial savings will be used for the direct benefit of the school’s pupils.

- Visit www.remeha.co.uk, call 0118 978 3434 or email boilers@remeha.co.uk

Circuit protection and control solution for 19 Dumfries photovoltaic installations
Dumfries contractor JB McCormick has used Hager circuit protection and control for the installation of photovoltaic (PV) panels on 19 public buildings. Dumfries and Galloway Council’s investment in solar PV is to reduce its carbon footprint and energy costs in line with the Scottish Government targets set out in the climate change (Scotland) 2009 Act. The contract covers primary schools, secondary schools, ice rinks, swimming pools and other buildings. To date the council has saved about 500,000kWh of power and generated 600,000 kWhr.

- Call 0870 240 2400, email info@hager.co.uk or visit www.hager.co.uk

Wandsworth launches ‘spec-your-own’ accessories
Wandsworth Group has launched a new range of grid mounting outlets, offering specifiers a flexible selection of combined electrical sockets, USB charge points and multimedia outlets to coordinate with switches and sockets for a tidy and aesthetically cohesive look in any environment. Compatible with any plate finish in Wandsworth’s Series 2, Series 3, Penthouse and Decorative ranges, the new grid mounting outlets include conventional sockets and television aerial points, along with USB charge points and a range of multimedia outlets, including HDMI, ADSL, SVGA, satellite TV and speakers.

- Call 01483 713400, email info@wandsworthgroup.com or visit www.wandsworthgroup.com

CP’s controls reduce running costs for West Dorset District Council
CP Electronic’s Vitesse Plus and Vitesse Modular lighting control systems have been installed to great effect in the impressive new offices of West Dorset District Council. The council has moved from its previous location of Stratton House to smaller and more energy efficient offices called South Walks House in Dorchester, Dorset. The new building has helped the council immediate reduce its running costs and its impact on the environment.

- Email enquiry@cpelectronics.co.uk

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Greenbuild shows no north/south divide over heat pumps

Mitsubishi Electric has hailed the success of Manchester’s Greenbuild Expo as proof that interest in low carbon heating is just as strong in the north as it is in the south of the UK. The heat pump manufacturer had already reported increased interest from both commercial and residential sectors at London’s Ecobuild in March and saw a similar level at Greenbuild. ‘We were particularly impressed by the quality of the enquiries over the two days of Greenbuild, disproving any notion that the sluggish economy is dampening down interest in renewable heating,’ explained John Kellett, general manager of the heating division.

CIBSE approval for Pentair

Pentair Thermal management has recently been awarded CIBSE approval for its latest continuing personal development (CPD) seminar: ‘Innovation for single pipe hot water services.’ The seminar looks at how to deliver energy efficiency, comfort and safety as well as carbon reductions and how an ‘act now’ policy results in benefits now and in the future.

European product manager Jonathan Jones said: ‘Given the need for carbon reduction in the built environment, it is essential that access to this information is free and easy to reach.’

Hager launches Type 1 + 2 surge protection devices

Hager has launched type 1 + 2 surge protection devices (SPDs) that are designed to optimise arc extinction for both direct lightning strikes and for type 2 8/20 waveforms. The device uses Spark Gap technology that has been further developed to limit follow current to a 500A peak to help minimise the problem of upstream MCBs or fuses tripping. It is also encapsulated to avoid any leakage current. Hager’s type 1 + 2 surge protection devices have good energy co-ordination to help prevent damage to sensitive electronic equipment.

Remeha Commercial launches Gas Absorption Heat Pump range

The new Remeha Gas Absorption Heat Pump (GAHP) range offers a high efficiency, low-carbon, low-NOx alternative to low grade heating and hot water generation in commercial new build developments. The proven technology delivers continuous heating at exceptionally high fuel efficiencies of around 144% (GCV), reducing energy usage, operating costs and carbon emissions. Suitable for use in conjunction with commercial condensing boilers or in cascade operations, it is available as a single unit or in cascades of up to 48 units. The Remeha GAHP meets all legislative requirements including the E&P Directive. It is suitable for natural gas and LPG operation.

A1 Flue Systems appoints new directors

Commercial Chimney and flue manufacturer, A1 Flue Systems has announced the promotion of senior managers TJ (Tracy-Jane) Moir and John Hamnett to directors. They will join the board with immediate effect. TJ 41, is the daughter of founder Colin Moir and, since joining the company in 1988, has worked her way up to director having held management roles in purchasing, estimating, finance, HR, administration and marketing. Both TJ and John have recently gained their qualifications with the Institute of Leadership and Management for Director Development, accredited to Coventry University.

Cyber security

Contractor Carel has appointed Bob Cowlard as its new UK managing director with effect from 3 June 2013. Bob joins Carel from Sanyo, where he covered various managerial roles, including vice-president of Sanyo Air conditioners Europe and, more recently, the position of managing director of Sanyo sales and marketing GmbH. Well known in the air conditioning industry, Cowlard brings extensive technical and commercial knowledge of the air conditioning market.

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SE Controls enhances fire safety and comfort at flagship apartment development

Berkeley Homes’ flagship Woodberry Park apartment development in North London is using an advanced smoke and natural ventilation system from SE Controls to not only provide protection for residents in the event of a fire, but to also create a better environment by actively managing any excessive heat build up in corridors. SE Controls was commissioned to design and install a SHEVTEC mechanical extraction smoke ventilation systems within two separate low rise private residential blocks within Woodberry Park, which provide a total of 117 luxury apartments.

A key part of SE Controls’ project specification and design brief was that the smoke ventilation system should also incorporate an ‘environmental ventilation’ mode, enabling it to monitor heat build up in communal corridors and lobbies while also managing the operation of automatic vents to reduce the temperature and introduce fresh, cooler air into the building.

● Visit www.secontrols.com or call 01543 443 060

Rada chosen as Asda supplier

Rada, the experts in commercial showering and washroom controls, has become a preferred supplier for Asda. Rada’s T4 120 timed flow mixer tap has been installed at a number of Asda superstores across the UK due to the product’s reliability, durability and safety. Combining a stylish yet contemporary finish, the T4 range enhances the appearance of any washroom, and its easily adjustable flow and time settings allow for significant water and energy savings.

● www.radatimedflowcontrols.com/pdf/timeflowprod.pdf

Rural Energy unveils biomass management system

UK biomass boiler technology expert Rural Energy has unveiled a new management system on all its small and medium sized boilers as part of its partnership with leading European manufacturer Herz. The new Herz T-Control provides an interactive way of managing the functionality of biomass boilers with a touch of the user-friendly screen. The biomass system can also be monitored from anywhere, using an app for remote PCs, tablets and mobiles and clients’ Building Management System (BMS) can plug in directly and interrogate all the data.

● Visit www.myriadceg.com/biomass or call 0203 189 0654

Ecoflam chips in to project and drives energy-efficient installation

Ecoflam has supplied two BLU 700kW LPG burners as part of a refurbishment of the heating and hot water system at Woodbury Park Hotel and Golf Club, near Exeter in Devon. The low NOx BLU burners were fitted on the existing boilers – which supply the hotel and leisure facilities – to upgrade the ageing system from oil to LPG. The M&E contractor was Exeter-based M.A.T. Electrics Ltd.

● Call 01386 556092

Free online energy management training now available

The first module of a new e-learning course on energy management, which is currently being developed by the Energy Institute (EI), is now available free of charge. The full course will be released in July. E-learning has surged in popularity over the last few years and the EI has developed this course to offer a flexible approach to the training needs of anyone working in this sector. The course is interactive and provides a series of practical questions and scenarios for learners to engage with.

● www.energyinst.org/energy-management/e-learning

Energy Saving Home Show

Industry expert Dan Caesar is determined to unite industry in tackling the energy crisis: ‘While Government is working to stimulate demand, the energy saving industry continues to wait for consumer initiatives to succeed. Now is the time then, for industry to stop waiting and start selling the financial benefits of energy saving to the millions of homeowners actively looking to lower bills.’ Dan and his team are taking two exciting concepts to market – the Energy Saving Alliance & the Energy Saving Home Show.

● Email team@energiseevents.co.uk
GIP ducting, now available from Greenwood
Greenwood Airvac, a Zehnder Group company and supplier of innovative ventilation solutions, adds a new product to its Guaranteed Installed Performance range with the introduction of ComfoTube ducting. A major part of whole house ventilation systems, ducting plays a key and crucial role in the delivery of Guaranteed Installed Performance (GIP) as it can impact the performance of ventilation by up to 50%, and it is especially important in whole-house systems where the ducting is installed within the building fabric.
Visit www.gip-ducting.co.uk

Riegens extends LED range
Riegens has extended its range of LED solutions to include the Cirrus LED suspended lighting luminaire. Specifically designed for office and commercial interiors, Cirrus LED has a sleek, slim profile and an eye-catching appearance provided by a matt anodised aluminium border. Cirrus LED uses an innovative optical system with anti-glare micro prism panels, the latest diffuser technology and a dedicated back reflector. These features combine to ensure the optimum distribution of direct/indirect light. Offering low energy consumption, energy efficiency is achieved by the optics high output ratio >83 lm/W.
Email riegens-lighting@riegens-lighting.com

Mikrofill arrives at Marylebone
The Marylebone Project is a partnership between Church Army (founded in 1882) and the Portman House Trust, and is a Registered Social Landlord. Although the building itself had been updated over the years, changes to the heating system were long overdue. The five x 100 kw boilers were replaced with three Mikrofill Ethos 130 kW condensing boilers reducing output to the heating system and adding a welcome boost to the hot water system with two new Extreme 500 hot water loading systems. A Mikrofill EFD (Electronic Filling Device) and a 1000L expansion vessel were also included as the system had originally been open-vented.
Call 0845 260 6020.
With 360 ingenuity, we have helped transform BBC Broadcasting House into the world’s most advanced, energy efficient media hub, taking it from heritage to high-tech.

AECOM works to deliver the right solutions in the right settings, sustainably.

Interested in becoming part of this visionary team, and helping our clients to see further and go further? We’re looking for sustainability consultants and REVIT designers, along with mechanical, structural, electrical and public health engineers for our offices in Bristol, Cambridge, Cardiff, Leeds, London, Manchester and St Albans. For more on these and our current graduate opportunities, visit: www.aecom.com/careers.

We are an Equal Opportunity Employer.

No agencies please.

Saving an icon

What do you do with ageing landmark buildings: reinvent for future generations or consign to history?

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Desco (Design & Consultancy) Ltd is an award-winning building services engineering consultancy with offices in the UK, Middle East and Far East.

The practice has continued to develop an excellent reputation for delivering a professional quality service, much of which can be attributed to the talented people who work in the business.

We are currently expanding and seeking to recruit enthusiastic, talented individuals to fill the following design engineering vacancies:

**UK Offices: Sunderland and Epsom**
- Senior Mechanical, Electrical & Public Health Engineers
- Mechanical, Electrical & Public Health Engineers
- Revit MEP Operators

**Middle East Office: Doha, Qatar**
- Mechanical Director
- Associate Mechanical Director
- Senior Mechanical, Electrical & Public Health Engineers
- Mechanical, Electrical & Public Health Engineers

**Far East Office: Manila, Philippines**
- Engineering Office Manager
- Engineering staff at all grades
- CAD staff at all grades
- Revit MEP Operators

If you are interested in joining our team and have the relevant experience and qualifications, please email your application with a full CV, indicating which vacancy you are applying for, to: jobs@desco.uk.com

We are an equal opportunities employer.

Direct applications only please; recruitment agency applications will not be considered.

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Principal Electrical Design Engineer – Associate Director Potential | Southwark
£50,000 Plus Generous Package

Our client is a well renowned medium sized building services consultancy. This is a superb opportunity to join an employer that offers significant potential for career progression and personal development as well as some excellent benefits. This consultancy, which has sold routes within the London consultancy market, is looking to expand their team due to continuous project wins over a sustained period. Ideally candidates will have at least 8 years’ experience, and preferably be chartered. You will be take a lead role in the design and implementation of electrical building services, to ensure they fully meet the client's requirements and that projects are delivered within budget and on programme.

Electrical Building Services Design Engineer | Southampton
£30,000 - £40,000 Plus Generous package

A small building services consultancy require an Electrical Design Engineer to work at their office in Southampton. The ideal candidate will have experience within residential and commercial developments, and have at least 6 years' experience within a building services consultancy. Candidates should ideally be a Chartered or Incorporated Electrical Design Engineer, with minimum HNC / HND qualification. You will work on high-end residential and healthcare projects which are at the cutting edge of design.

Associate Director of Mechanical | Nottingham
£55,000 - £60,000 Plus Benefits

Our Client is a multi-discipline international consultancy providing design services to their clients in a uniquely focused, integrated and cost-effective manner. As part of their strategy they are now looking to grow their design activities further into the private sector market, and to assist in this they are seeking an Associate Director who will manage the Mechanical Design team and help grow the business in Nottingham and surrounding counties. The company's objectives are to achieve a professional integrated building services engineering consultancy with maximum profitability, focusing directly on client needs whilst providing the best technical and cost effective solutions.

Contact: george@conradconsulting.co.uk | 0203 159 5387
Find more jobs online at www.conradconsulting.co.uk

Senior Mechanical Design Engineer | London/Herts | to £35K LTD | ref: 3687

Our client is a leading International multi-disciplined engineering consultancy. Candidates will ideally have a strong background working on large scale commercial offices. 3-6 month contract.

Int Mechanical Design Engineer | London | to £35-£40K | ref: 3631

A busy, growing M&E consultant is looking for a degree qualified mechanical engineer. Ideal candidates will be IES proficient with a strong consultancy background. Leisure and rail sector experience is desirable.

CAD/BIM Manager | London | to £40-£50K | ref: 3664

Our client is a large M&E Contractor who has a full order book running into 2014. Candidates will have a track record of managing their own internal cad team or external cad bureaus. This is a fantastic opportunity to build your own team.

Senior Electrical Design Engineer | London/Herts | to £35K LTD | ref: 3688

Our client needs 3 senior engineers to work on large prestigious projects based in the UK and overseas. Candidates will be expected to complete detailed designs at stage E-F and have a track record within the commercial sector.

Senior Electrical Design Engineer | London | £40-£50K | ref: 3682

An International blue-chip consultant with a newly formed London office requires experienced electrical engineers with major new build and refurbishment data centre experience. Long term opportunity.

Senior Mechanical Design Engineer | Hampshire | £45K+ | ref: 3615

Candidates will ideally be degree qualified and Chartered. Our client, a large multi-disciplined consultant, works on operational facilities and office refurbishments up to £10m in value. Experience of budgeting, leading a team and client facing would be beneficial.

t: 02392 603030

e: cv@blueprintrecruit.com

www.blueprintrecruit.com

Budding anderson recruitment

Senior Electrical Design Engineer
London, £40 – £55K + benefits

We have a unique opportunity for a senior electrical engineer to join a fast growing sustainability and building services consultancy in Central London. The opportunity presents a platform to lead a team, have a real input in shaping the direction of the business, and gain fantastic exposure to UK and international projects. Our client is looking for a well-rounded engineer that is technically excellent, can communicate effectively with clients, and can manage and build the electrical side of the business. BAR1231/IA

Senior Mechanical Design Engineer
West Sussex, £42K + benefits

An expanding specialist Building Services and Sustainable design consultancy with a reputation, forged over the past 20 years, of delivering low energy sustainable solutions, are currently seeking to enhance their team of environmentally focussed engineers. They require a Senior Mechanical to take a client facing lead role on multiple projects spanning the Residential, Commercial, Leisure, Local Authority & Healthcare sectors. BAR1231/TA

Mechanical Thermo Modeller
Dubai, 32000 AED PCM + Flights

Our client is a well established and respected International Building Services consultancy. As a result of continued growth in the Middle East they have a requirement for a Mechanical thermo modeller to work on their team of specialists in Dubai. If you are a degree qualified, client facing senior engineer that possesses experience of IES and ASHRAE 90.1 this is an excellent opportunity to dramatically change your lifestyle. BAR1232/TA

For further information and to apply, please call us on +44 (0)203 176 2666 or email cv@b-a-r.com

Thinking of your future www.b-a-r.com

The University of the West of England is entering an exciting stage of capital development with a master plan and projects ranging from £50k up to £40m including new Student Accommodation, Laboratories, Data Centres, Lecture Theatres and Library facilities. Working within the Estates Department the job holder will provide professional Mechanical Building Services Design and Project Management to support the on-going development of the University estate. Working as part of a multi-disciplinary team the post holder will provide mechanical engineering advice from initial feasibility right through to post project evaluation on a range of refurbishment and new build schemes for the University. The post offers the opportunity to follow a project from concept to final handover being based in the office with regular site visits. An appreciation of sustainable design would be advantageous.

Closing date: 17 July 2013
Ref: 1341650

UWE is committed to equality and values diversity; to work for an employer that aspires to achieve excellence through inclusion, please visit: uwe.ac.uk/jobs

www.blueprintrecruit.com

www.b-a-r.com

Thinking of your future
Electrical Design Engineer

You are required to be degree qualified with a minimum of three years post qualification design experience in the construction industry, which includes design experience in power distribution, lighting, fire and security and other alarm systems, lightning protection and other associated electrical engineering systems. Experience with dialux lighting design software and daylight calculation would be advantageous.

The successful applicant will have a balanced role split between electrical design and site monitoring work on a variety of different projects.

Experience and the ability to plan, organise, direct, undertake and control the technical, financial and commercial aspects of projects from beginning to end is essential. The successful applicant will be required to demonstrate the ability to carry out design, co-ordination, management and construction supervision on a number of projects running concurrently. Candidates should be able to demonstrate project management experience, and the ability to promote good personal and team working relationships.

If you are interested in the above vacancy, please reply by email with a clear statement identifying why you think you would be suited to the position.

Please enclose full CV including all education, qualification and experience details.

Email: paula.newman@esdp.com

To find out more about esdp, please visit our website www.esdp.com
Bright ideas needed for a site that never sleeps.

Associate Director of Estates – Ipswich Hospital

£65,922 - £81,618

Open 24 hours a day, 365 days a year, Ipswich Hospital covers 46 acres and is visited by around 8,000 people a day. The future of this complex and important public site could be yours to shape. Taking an innovative approach to rationalisation and improvement, you’ll build on investments such as our new £5m state-of-the-art sterilisation unit, and our new £5m cardiology centre, which opens in autumn 2013.

You’ll bring a track-record in strategic estate management that includes first-class project management skills and experience of managing complex capital projects.

As well as the ability to nurture productive relationships with the local authority and colleagues across the Trust, you’ll be equipped to negotiate complex commercial contracts. All of which means you’re ready to be a shining light in the future of this forward-looking Trust.

Closing date: 9 July 2013.

To find out more and to apply, please visit www.ipswichhospital.nhs.uk

You’re not just looking after buildings.
You’re looking after the interests of our nation.

It’s not just looking after buildings. It’s looking after the interests of our nation. Our business is to make sure offices around the world function efficiently. This is a responsibility we take very seriously. That’s where you come in. Whether you’re in the field inspecting the property and monitoring any health and safety issues, giving technical advice, managing the team of contractors carrying out the works; or back in the UK designing and managing the project and ensuring that it’s cost effective – it’ll ultimately be up to you to help keep overseas offices running efficiently. The nation relies on our foreign offices to protect our interests. We want to rely on you.

Building Services Engineer – UK Based
Technical Works Officer – Initially UK based with potential for overseas locations
M&E AutoCAD Technician and Drawing Manager – UK Based

To apply, please visit www.fcoscareers.co.uk
Events & training

CIBSE Building Performance Awards 2014
Launch 3 July, London
The official launch of the CIBSE Building Performance Awards 2014 – recognising the business, teams, projects and products that demonstrate engineering excellence in the built environment. Find out how to enter and discover what the judges are looking for. Attendance is free but places are limited. www.cibseawards.org

Breathing Buildings seminar
25 July, Manchester
The Priority Schools Building Programme Output Specification Regulations and how designers need to consider these for ventilation strategies. Led by Dr Shaun Fitzgerald. Robert.ferry@bdp.com

Annual general meeting...
Continued from page 14
three-year programme of development approved by the board would cost around £4m in total; and while this was a substantial commitment for the Institution, the board was convinced that it was necessary to maintain CIBSE as a premier institution.

Regarding the reasons for not offering free subscriptions for part-time – as well as full-time – students, it was explained that the majority of part-time students were in employment and supported by their employers. Arrangements for part-time students might be reviewed in future, but the intention of free membership for full-time students was to expand the Institution’s reach into a diverse range of engineering courses. It was suggested that part-time students were more likely to be retained in membership for the future, and that many of the benefits of membership were already provided to part-time students by their employers, thus potentially reducing the incentive to join. It was also noted that many employers did not cover the cost of membership. It was reported that analysis had been undertaken on the impact across different grades, and the benefits of each grade continued to be reviewed.

Stephen Matthews noted that CIBSE had secured the biggest percentage increase in engineering council registration for any of the significant institutions, and pointed out that the scheme for free student membership was very much a trial stage. The loss of part-time student income would be significant, and CIBSE was in line with many other institutions in offering free membership for full-time students. Detailed figures were considered in depth by the board, and the success of the strategy would be reviewed, with the points raised at the AGM about part-time students being taken into account.

It was noted that the basic increase proposed was 3%. It was suggested that the reasons given at the meeting should be explained to members so that the need for the increase was appreciated. The possibility of using gift aid was suggested, so that the need for the increase was appreciated. The resolution was approved unanimously.

BIM and Soft Landings
2 July, London
An evening event from the Home Counties North East region. andrew.saville@armville.com

Young Engineers Network (NW committee) social – comedy night
9 July, Manchester
An evening of laughter at top comedy club XS Malarky. An entry fee is payable. www.cibse.org/events

Young Engineers Network (NW committee) meeting
11 July, Manchester
CIBSE YEN NW continue the monthly evening meeting in interesting pubs around Manchester to discuss ideas and planning. Meetings are informal and all ideas encouraged and welcomed. www.cibse.org/events

Screening of Home – a film by Yann Arthus-Bertrand
11 July, London
An exclusive screening of the film Home, which delivers its environmental and sustainability message through aerial photography. A free event (online registration essential) organised by Home Counties North West region. www.cibse.org/events

SoPHE – drinking water ring main
17 July, Manchester
An evening event organised by the North West region, looking at the importance of putting water into the forefront of design. Attendance is free by registration. www.cibse.org/sophe

Bristol social event
18 July, London
www.cibse.org/events

CIBSE Home Counties North West Regional membership workshop
18 July, Berks andshire
An advice workshop and networking evening offering practical advice on applying for Engineering Council registration and CIBSE membership, as well as a chance for informal mentoring. Registration is essential. www.cibse.org/events

CIBSE Homes for the Future Group Debate
18 July, London
groups@cibse.org

CIBSE Golf Outing
1 August, Belfast
An afternoon golf outing at the Knock Golf Club organised by the Northern Ireland region. d.willis@biggroup.co.uk

CPD TRAINING
For more information, visit www.cibsetraining.co.uk or call the events team on 020 8772 3660

Earthing and bonding systems
2 July, London

Building drainage explained
2 July, London

Introduction to facilities management
3 July, London

Fire resisting and smoke control doorsets
3 July, London

Practical controls for HVAC systems
4 July, London

Building regulations section 6 (energy)
4 July, Inverness

Introduction to legionella control
9 July, London

Preparing FM and maintenance contracts
9 July, London

Low carbon buildings for local authorities
10 July, London

The carbon reduction commitment
10 July, London

Energy monitoring and targeting
11 July, Newcastle

Air Can 4: automatic controls & refrigeration
11 July, London

Mechanical services explained (3 days)
16 July, Birmingham

Electrical services explained (3 days)
16 July, Manchester

Lighting and energy efficiency
17 July, London

Display energy certificate training
23 July, Birmingham

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