

JOURNAL CIBSE



The official magazine of the Chartered Institution of Building Services Engineers

June 2009

ENERGY STAR

Olympics training centre given an 'A'

OFFICE MOVES

The new Guide to Specification

MASTER PLAN

Hospitals to get green treatment

Design visionary

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Renewable energy

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*compared to traditional boiler-led systems

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From the editor



Improvement or paper exercise?

As the property slump bites, don't be surprised if the person coming to assess the energy rating of your building is an out-of-work junior estate agent. Yes, by all accounts, any old Tom, Dick or Harriet has been filling the ranks of the nation's energy assessors – those professionals charged with the important task of awarding energy performance certificates to properties.

I borrow this dig against estates agents – bless 'em – from Professor David Fisk, whose mirthful speech was one of the highlights of the recent CIBSE national conference (see page 18). But his very serious point was that there has been strong evidence of unqualified people being employed to conduct building assessments – with the accredited energy assessor (EA) signing this off without ever visiting the property.

The *Journal* itself highlighted this problem in March, when we quoted some EAs who had complained about this practice, likening it to driving a car using someone else's licence. Policymakers, however, have not been turning a blind eye. As we reveal (pages 8 and 16), the Department for Communities and Local Government last month issued a guidance note that, in effect, bans this practice from the end of this month (June).

This is all well and good. Those applying any rating system on the ground need to have full credibility for the process to have any value. Whether this guidance will have the impact required remains to be seen: there will always be some EA-accreditation firms that will want to cut corners and provide a quick-and-dirty

service. So, as well as guidance, perhaps we also need a robust register of accreditors with a licensing regime of inspections.

But, as we approach the first full year of the energy performance certificate regime this autumn, a more fundamental question is whether the system is in danger of becoming another box-ticking exercise in which clients are 'satisfied' and can forget energy efficiency for another year. As such, the DEC system will become a sticking plaster for the lack of day-to-day attention to the performance of living, changing buildings.

Hopefully the round of assessments this year will provide more incentives to clients to improve their ratings. But if a DEC is used simply as a badge of rectitude – “this is all we need to do” – and ratings don't improve noticeably overall, then the system is clearly failing to work. The truth we must face, though, is that a snapshot of a building's

energy performance, converted into a carbon-emissions rating, is never going to be a substitute for the proper running, maintenance and usage of a building. And this is where facilities management services could play a greater role in making sure that DEC's are more than just a paper exercise. DEC's and EPC's are welcome, and they're here to stay. But, as with BREEAM, LEED and other ratings systems, we must ensure that clients are persuaded to see them as just one stage in the overall, difficult and ongoing process of reducing the carbon footprints of their building stock.

Bob Cervi, Editor
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Perhaps we also need a robust register of accreditors with a licensing regime.

Research lays out path to decarbonising buildings

Researchers say they will soon be able to map out exactly what steps need to be taken to meet carbon reduction targets for non-domestic buildings, and at what cost.

The Carbon Trust, an independent advisory body, has used a computer model named DeCODE (Determining Carbon Opportunities in the Developed Environment) to create a report which will recommend to government the "optimum" path to help meet the target of at least an 80 per cent cut in emissions from non-domestic buildings by 2050. According to the trust, for the first time the model will help to provide the evidence to show that everything from energy efficiency, micro-renewables and decarbonising the grid will have to be done to reach the target, while emissions could increase significantly if nothing is done.

DeCODE consolidates all the Carbon Trust's knowledge developed to date into one tool, enabling the organisation to analyse all its data.

It works by showing how much carbon can be reduced when certain energy saving measures are chosen, and how much this is likely to cost.

Information included in the scenarios can range from building demolition and new-build rates to the use of energy efficiency measures and renewable technologies.

Stuart Farmer, head of buildings strategy at the trust, said: "It's not a question of whether we should be focusing on energy supply decarbonisation or building energy demand reduction; it's not a choice between energy efficiency measures or renewables, new or existing buildings. The challenge is so great that we need to do all of these. The Carbon Trust report will concentrate the national policy position."

The report is expected to be ready in early autumn.

Schools are failing to record high energy performance

The majority of new school buildings are not performing to a high level, according to their energy performance certificate (EPC) ratings.

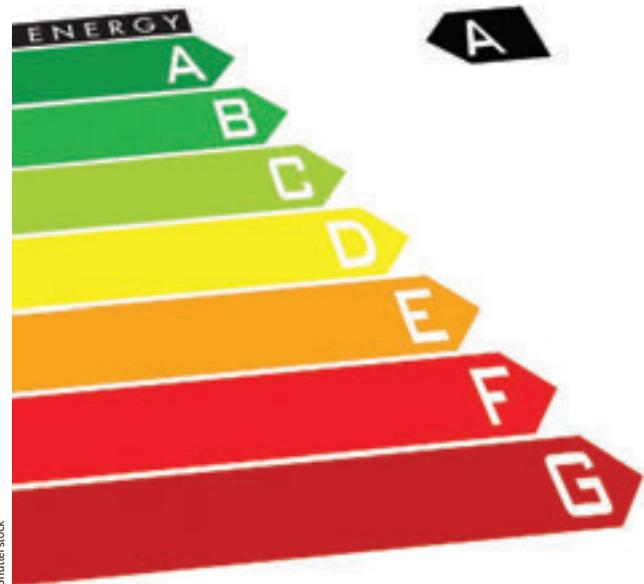
By the end of 2008, 28 secondary schools and 64 primary schools had had EPCs but, of these, only 43 were graded between bands A to C. The rest fell into the lower D to G efficiency bands. The average non-domestic EPC rating is currently a C.

The results also show only one per cent of primary schools and two per cent of secondary schools scored an A.

The largest percentage of primary schools (15 per cent) received a D, whilst the largest percentage of secondary schools (14 per cent) fared better, scoring a B.

The findings were revealed by a parliamentary question asked by shadow climate change minister Gregory Barker to schools minister Jim Knight.

But when Barker asked how many schools had been penalised for failing to display a DEC, Knight was unable to answer because no record of any penalties or issues of non-compliance are kept. He was also unable to answer how many



schools were actually displaying their DECs.

New schools with a floor area greater than 1,000 sq m are required to have an EPC. Existing schools that are being refurbished only require a display energy certificate (DEC).

Both are legal requirements, with local trading standards offices responsible for enforcement.

Both DECs and EPCs are recorded on a national register (www.ndepcregister.com) but, to gain access to an individual school's certificate, its unique reference number must be known. This means schools can access their own data, but members of the public cannot. Knight added that there are no plans at present to publish individual school energy data.

Plan for smart meters in all homes in 10 years

Smart meters are to be installed in every British home by 2020 – making the UK the first nation to attempt an overhaul of electricity and gas meters on this scale.

The Department of Energy and Climate Change (DECC) estimates that it will cost between £7bn and £9bn, or an average of £269 to £346 per household, to implement the plan.

But it says the change should help make homes more energy-efficient and reduce utility bills.

However, consultancy Ernst and Young believes the government could have underestimated the cost by as much as £6.4bn. The company believes the true figure to be as high as £13.4bn, or £515 per household.

A DECC spokesperson rejected the claim: "The figures that we have published in our impact assessment are a result of a lot of analysis and independent expert advice as well as input from stakeholders. We believe we've got our stats right."

Furthermore, the government's own consultation impact assessment found that rolling out smart meters to all households will deliver net benefits of between £2.5bn and £3.6bn over the next 20 years, which would "fall to suppliers, to customers and to the country as a whole", DECC said.

Smart meters would enable meter readings to be taken remotely and give householders real-time information, helping consumers see

what energy they are using.

They are seen as a key step towards future smart grids, making it easier for renewable generation to feed into the grid – including micro and community level generation – and will support the decarbonisation of heat and transport through the greater use of electric and plug-in hybrid vehicles. Suppliers will also be able to offer more tariffs and services aimed at encouraging more efficient and economical energy use, according to DECC.

A consultation has now been launched at www.decc.gov.uk/en/content/cms/consultations/smart_metering/smart_metering.aspx

The deadline for comments is 24 July 2009.

New design standard for schools set to spread across public sector



A UK government advisory body has been given the power to veto new school designs using a new minimum design standard.

The Commission for Architecture and the Built Environment (CABE) has been pressing for such a standard for the past three years.

Schools minister Jim Knight announced the standard's introduction for the Building Schools for the Future (BSF) programme in an attempt to prevent more unfit-for-purpose schools being built. It is envisaged this will eventually lead to all public sector buildings having a minimum design standard in the future.

Designs for BSF schools are already assessed by the CABE

schools design panel, but now only those graded as 'very good' or 'pass' will proceed to procurement and construction. Designs graded 'unsatisfactory' or 'poor' at their third and final review will not be built.

Knight said: "This is the first time ever that independently-assessed, clear, objective and robust design standards have been laid down for a public sector building construction programme. It adds real teeth to the design process. It will make the design process faster and more efficient by promoting best practice and thinking in school design."

Features of the new minimum design standard include:

- A new, simpler four-point grading system;

- The inclusion of educationalists, sustainability and landscape specialists on the peer review panel;
- Teachers and students' views;
- Random checks on non-sample scheme schools; and
- CABE will provide more in-depth feedback reports, education and informational support.

CABE believes the standard will have a longer-term impact on the quality of schools than almost any other educational reform.

● CABE and the Homes and Communities Agency have completed the first national survey on the design quality of affordable housing, which found just 18 per cent of schemes were judged to be either good or very good.

www.cabe.org.uk/news

We need more community heating, says DECC official

The UK government wants to set up a forum to encourage the use of waste heat in buildings to help the industry meet its 80 per cent carbon emissions target.

Hergen Hays, an official at the Department of Energy and Climate Change, said setting up something like a "heat-markets forum" would enable industry, the energy regulator Ofgem and the government to collectively create a set of codes and conducts for community heating. Speaking at a recent conference organised by the Renewable Energy Association, he said: "If we don't tackle heat we have no chance of meeting our target for 2050."

He said that district heating needed to be installed at a local level, and a large-scale heat and combined heat and power policy framework was needed to drive energy efficiency in large businesses.

On the domestic front, just two per cent of homes in the UK currently receive heat from district heating systems. It is estimated that 5.5m homes could be benefiting from these.

He believes feed-in tariffs, which should come into force in April 2010, and the renewable heat incentive, will be key to meeting the government's renewable energy target of 15 per cent by 2020. A consultation on renewable heat incentives is scheduled to begin this summer.




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News in brief

New rules to ban blacklisting

The government is to introduce new regulations to prevent blacklisting in the construction sector. In March the Information Commissioner reported that 40 construction companies had subscribed to a database to vet construction workers. That database has now been closed. A consultation will be launched in early summer on the revised regulations.

Projects rewarded by ACE

The winners of the second ACE Engineering Excellence Awards 2009 have been announced by the Association of Consultancy and Engineering. For full details of the winners, the commended and highly commended projects, visit www.acenet.co.uk

Award for Arup scheme

A project in Hong Kong has won one of the province's most prestigious architectural prizes. The St Andrew's Church and Kindergarten project won a Merit Award at the Hong Kong Institute of Architects Annual Awards. Arup provided structural and geotechnical engineering design and supervision services for the two-storey, reinforced-concrete structure.

Employers consider cuts

One third of employers are considering slashing costs by changing staff bonuses, making redundancies and cutting pensions, according to Tough Choices: The Hays Talent Management Survey. More than eight out of 10 employers and employees think voluntary redundancy is the best method of cutting costs, and three quarters think it is fair to cut discretionary bonuses. Only one in four would opt to cut their pension.

3,000 extra apprentices

Nearly 3,000 extra apprenticeship places are being created by the government at a cost of £11m. Businesses with a proven track record in offering high-quality apprenticeships will receive the cash to train the extra apprentices over the next two years.

Poor energy audits of buildings to be weeded out in government ban

The government has responded to concerns over the awarding of energy certificates by banning some practices regarded as potentially leading to poor-quality building assessments.

Energy assessors of buildings will no longer be able to award a performance certificate via a 'data gatherer' without visiting the site themselves, under rules being introduced at the end of this month.

The Department of Communities and Local Government (DCLG) is prohibiting this practice, known as 'remote lodgements', which appears to have undermined the integrity of energy performance certificates (EPCs).

The issue was highlighted in the *Journal* in March, when a number of energy assessors claimed that unqualified people were visiting a building and passing the information to an accredited assessor to consider.

Concerns about the use of data gatherers centred on suggestions that some accreditation firms were allowing unqualified people to collect data and then look for an energy assessor to grant the certificate.

"You cannot use someone else's driving licence to drive a car, therefore you should not be permitted to provide an EPC for another individual or company that has just put together the information," one complainant said.

The DCLG has issued a guidance note for energy assessor accreditation schemes which states that, from the end of June, "remote lodgement business models ... are not acceptable. The fact is, in such



Energy assessors are being required to visit properties, says new guidance

circumstances, that the accredited [energy assessor] is unable to fully supervise the assistant and verify the data and how it is collected".

When it comes to awarding domestic EPCs, the guidance strictly bars the use of data gatherers, insisting that this is "not permitted".

With non-domestic buildings, a data gatherer can work under the supervision of an energy assessor. But the guidance insists that an energy assessor "must inspect all

properties for which they issue an EPC to ensure they can verify any data provided".

The DCLG is conducting an audit of energy assessor accreditation schemes to identify the sources of poor-quality certificates.

However, it is not clear how the department will deal with those schemes found to be operating in an unacceptable fashion.

See News Analysis Page 16

New guidance on sustainability for the engineering industry is launched by professional regulator

The regulator for the engineering profession has launched new guidance on sustainability for building services engineers.

The Engineering Council UK's (ECUK) Guidance on Sustainability for the Engineering Profession

describes engineers' leadership role in creating sustainable development and lists six principles to guide and motivate. The principles are interdependent and of equal importance, with social, economic and environmental aspects

included, according to the ECUK.

The guidance is designed to complement information on aspects of sustainability already published by other professional engineering institutions, and replaces the ECUK's code of practice published in 1993.

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News in brief

Scheme for sustainability leadership created

Engineering consultancy Arup has joined forces with Cambridge University to create the new Cambridge Programme for Sustainability Leadership, which aims to develop and spread best practice in combating climate change by creating jobs and improving quality of life in cities.

R&D centre to be built

Consultancy Mott MacDonald has been appointed to work on the construction of a new four-storey research and development (R&D) centre in Cheshire, UK, by pharmaceutical group AstraZeneca. Mott MacDonald will provide structural, civil and architectural design, as well as overall design co-ordination and construction support.

WYG to design new prison

Multi-disciplinary consultant WYG has won a three-year contract to manage the design and build of a new 800-cell prison in Londonderry for the Northern Ireland Prison Service on an existing prison site.

Free pipe-joining training

CIBSE members can get free training in pipe-joining methods from Victaulic. The CIBSE-accredited presentation introduces the technology, explains how it works and its benefits in welding, flanging and threading. To arrange a presentation call Andy Carter, product engineer, on 01438 310690.

South London schools refurb

A £200m partnership to rebuild seven schools, put up two new ones and complete four building refurbishments, has been signed by Balfour Beatty, Southwark Council, Partnerships for Schools and Building Schools for the Future. All construction and facilities management will be carried out by Balfour Beatty, an engineering, construction, investment and services group.

Urban wind turbines deliver poor results, says new research

Most wind turbines deliver very disappointing results if they are installed in an urban setting, according to new research produced by London South Bank University (LSBU).

Professor Tony Day told a recent meeting of the CIBSE/ASHRAE group that "manufacturers tell us how marvellous they are", but proper statistical analysis tells a different story.

LSBU studied a 6kW horizontal axis turbine installed 42 metres above street level on an 11-storey south London residential apartment block for a year. It delivered less than nine per cent of its total maximum capacity of between 8 and 9 MW/h. As the turbine cost £32,000 to install, Day said that equated to about £1,200 per tonne of carbon saved.

He added that a 36 per cent discrepancy between the manufacturer's claimed performance and the data his team gathered should be taken into account when local authority planners are considering whether a wind installation meets carbon-saving criteria set down by initiatives like the London Plan.

"Turbines need to be more intelligently sited," said fellow researcher Dr Steve Dance, who studied the noise and vibration impacts of the installation. "In this kind of location it will effectively deliver nothing for eight months of the year as the wind speeds [averaging 3.8m/s over the year] are too low."

However, he pointed out that



Wind turbines need to be more 'intelligently sited'

an identical turbine in a more sensible location had generated 50 per cent more electricity; and both presenters agreed there was hope for the future of the technology.

"Wind technology is where cars were about 100 years ago," said Day. "People laughed at the Model T Ford and it could well be that future versions of turbines will make a more meaningful contribution to carbon saving."

In a separate development, Britain's only wind turbine manufacturing plant, on the Isle of Wight, faces closure because of a lack of demand in the UK.

The plant's owner, Danish firm Vestas, partly blamed "a lack of political initiatives" in Britain for the situation.

But the company's comments came as plans for the world's biggest off-shore wind farm, in the Thames estuary, were given the go-ahead by the UK government – with the aim of supplying electricity for the London Olympics in 2012.

In addition, Europe's largest on-shore wind farm in East Renfrewshire, Scotland, has been completed with a total of 140 turbines. The installation aims to provide power for 180,000 homes.

Nominations open for the WES Karen Burt Awards

Nominations are now being accepted for the 10th Karen Burt Awards.

The awards, by the Women's Engineering Society (WES), are open to women in engineering or a related discipline who have achieved chartered status since July 2008.

WES asks professional bodies affiliated to the Engineering Council to nominate their

highest-calibre, newly-chartered female engineer, applied scientist or IT professional, who has demonstrated a commitment to the promotion of her profession.

The award commemorates the late Dr Karen Burt, an eminent physicist. The closing date for nominations is 1 July. For more information call WES on 01438 765506, email info@wes.org.uk, or visit www.wes.org.uk

£60m for uni builds

Building works worth £60m have been approved on a further 47 new projects at 26 universities.

The funding was authorised by the Higher Education Funding Council for England (HEFCE) as part of the government's second round of the accelerated capital projects spending programme to help stimulate Britain's economic recovery.

The programme was announced in December 2008, with the first round of projects approved in February.

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Follow the code or face the consequences

CIBSE would like to remind members of the Code of Conduct they sign up to on joining.

With money tight, an increasingly litigious society and more building services engineers doing domestic work, you may be more likely to be under scrutiny from your client and members of the design team looking for scapegoats.

We would like to stress that CIBSE does not receive many complaints about its members; however a recent case serves as a timely reminder that you are bound by the code.

Recently a CIBSE member was formally reprimanded by the institution and warned as to his future conduct as the result of a complaint made against him. The case centered on communication and was complicated by the intricacies of being on a design team in a large domestic project. From the evidence provided, other

members of the design team were also felt by the Disciplinary Committee to be at fault but it was the CIBSE member that the client complained about. This demonstrates the need to keep communication open and to be timely with your contributions to the process. If you are held up by others, then say so – keep the client and others in the design team informed. And maintain written communication so that you have evidence of the facts, should anything go wrong.

If a complaint is made against you it will be considered by the Professional Practice Committee, which is delegated by the Board to the Disciplinary Committee. Cases are examined to ensure they are not merely malicious and that they are genuinely centered on members conduct. CIBSE does not become involved in contractual matters or dispute resolution.

In recent years a number of

complaints were not pursued because they were primarily disputes over fees or failure to deliver under the contract. One or two cases have revealed that there was no contract to begin with, and CIBSE would encourage members always to have a contract or a letter of appointment, and to maintain written communication before a contract or appointment is formalised.

If you are found to be in breach of the Code of Conduct after a disciplinary hearing, you will be subject to one of four sanctions: a warning as to future conduct; a reprimand; suspension for a period up to a maximum of two years; or expulsion from the institution.

Suspension and expulsion will be published in the CIBSE Journal as a matter of public record. Members have the right to appeal. For full information on the code and the disciplinary rules, visit www.cibse.org and go to 'About CIBSE'.



Cooper gets award

David Cooper, managing director of consulting engineers LECS (UK) Ltd and Fellow of CIBSE, becomes a Liveryman of the Worshipful Company of Engineers from the master of the company, Tony Roche. The company's members are required to be chartered engineers, a Fellow of a recognised engineering institution, and also to hold the Freedom of the City of London.

New group forms in Qatar

A new CIBSE group has been formed in Qatar.

Qatar, one of the wealthiest states in the Gulf region, is currently experiencing a boom in its construction industry. This has led to the requirement for international expertise to complement the construction industry. A small number of these specialists are UK BS engineers.

The founder members are John Makaronas, David Baker, Michael Daly, Philip Dyer, Joseph Smith, Ramzi Qumsieh, Tony Boothman and Peter Carew. Daly has now been appointed as Qatar's representative.

The members have a wealth of experience in design and management and are currently working on prestigious projects in Doha, including: the New Doha International Airport; Qatar



Members of the new Qatar group

National Convention Centre; and the International World Class Medical Research Hospital for the Qatar Foundation.

The group will provide best practice advice in Qatar to any interested parties. It intends to organise site visits and technical seminars, and to liaise with other engineering groups in Qatar.

To join or contact the group email Michael.Daly@ConsultMaunsell.com or jmakaronas@hotmail.com

News in brief

Moss's outstanding contribution

Brian Moss, chairman of CIBSE Services Board and past CIBSE president, has been awarded a Tercentenary Medal by the Worshipful Company of Fan Makers for his outstanding contribution to fan engineering and the BS industry.



Walking in London

The Society of Façade Engineering is holding its annual City Walk – Buildings in the Euston Area – on Thursday 25 June. The event will start at 4.30pm at Arup, 8 Fitzroy Street, London W1T 4BQ with a talk by guest speaker Henk De Bleecker from Permasteelisa on Dynamic Facades. The walk starts at 6.30pm. To register visit www.facadeengineeringsociety.org

Honorary Fellowship

CIBSE has awarded Professor Deian Hopkins, retiring vice-chancellor and chief executive officer at London South Bank University (LSBU), an Honorary Fellowship. The award recognises his commitment to and enthusiastic support of BS courses and research, and his support for the university's association with CIBSE.

Join CIBSE

Competent BS professionals with CEng/IEng qualifications who are registered with other engineering institutions can become a CIBSE member at Associate, Member or Fellow grade. A CV, competence statement, development action plan and details of one sponsor are required.

Contact Bobby Wright on 020 8772 3639 or bwright@cibse.org

Training and Development

Training and development submissions

The closing dates for annual submissions to be considered at the July and October 2009 Training and Development Panel meetings are 20 June and 8 September respectively.

For training submissions and queries, employers' enquiries and applications for approved company training schemes, contact Olwen Williams, training and development administrator, on 020 8772 3605 or at owilliams@cibse.org

CPD Directory update

CPD course providers who would like to apply for an entry into the Directory of CPD Course Providers should contact Olwen Williams, training and development administrator, on 020 8772 3605 or email owilliams@cibse.org

We also accept applications for online courses. We will welcome more e-learning applications.

The following organisation has recently been added to the directory:

The Institution of Engineering and Technology (IET).

A concessionary rate is available for entries into some categories.



CIBSE assessor presents DEC to London Marriott

Gordon Ormond, London cluster director of engineering at The London Marriott Hotel – Marble Arch, accepts the hotel's first DEC (display energy certificate) from Andrew Gardner, CIBSE Low Carbon Energy Assessor of CCL Consulting Limited. The Marriott is one of the first branded hotels in the UK to complete a DEC.

New Part L is arriving soon – and we need your views

The long-awaited consultation on the new Part L should be arriving in your inbox any day now. And with it the challenge for the institution to understand and respond to this major piece of regulation.

As building services engineers, you are the people who know best about how Part L works and where changes need to be made. It is therefore essential that we find a way of tapping into this expertise and utilising the knowledge and experience that is already out there. We will be organising events to discuss the consultation, and to get the views of practising engineers to ensure that we are feeding your comments and ideas back to DCLG (Department of Communities and Local Government). But let's also remember that, in order to make a difference to the energy demand and carbon emissions

of our buildings, we need to take the sort of action set out in the consultation. It will largely be down to CIBSE members to meet the proposed target to cut aggregate carbon emissions in new buildings by 25 per cent. The knowledge and experience to deliver low-carbon buildings sits largely within CIBSE: CIBSE low-carbon consultants and low-carbon energy assessors lead in terms of delivering accredited competence in low-carbon design and operation of buildings.

It is not enough to achieve low-carbon design – we need to achieve low-carbon buildings, where the operational performance matches the design intent. In short, we need to achieve compliance of the as built (or refurbished) project with the goals of Part L. Only by working together and pooling the knowledge and experience of designers, builders, clients and regulators can

we meet the targets and ensure compliance with the legislation. In particular, we need a regime in which building services engineers work closely with building control, to ensure targets are really met – not just on the CAD screen, but onsite.

Through this greater team working, those with the right skills to assess and certify compliance are able to do that, freeing building control officers to focus on higher risk projects where their enforcement skills are needed.

This close working, open communication and shared problem-solving will ensure latest Part L targets can be met. And, as experts in low carbon design, it is our responsibility to take the opportunity to make this work. I encourage you all to make sure you have your say. For more information visit www.cibse.org/partl
Stephen Matthews

REHVA and CIBSE in talks on cooperation

CIBSE and the Federation of European HVAC Associations (REHVA) have met to explore how we can work together more closely. As an umbrella body, REHVA is an important conduit to the European Commission. There are currently two principal areas of influence for REHVA in Europe – the EPBD (now being recast) and also the Energy Using Products Directive. The group discussed opportunities to promote CIBSE publications, training, the flexible learning scheme and website access. The free REHVA Dictionary is now available at www.rehvadictionary.org to translate building services related terms

between 15 languages. More will be added when the translations are prepared.

Consultation responses

CIBSE has recently responded to the following consultations:

- CLG and DECC Heat and Energy Saving Strategy (HESS);
- DECC consultation on the term 'carbon neutral'; and
- CLG Carbon Reduction Commitment

In the HESS response we particularly emphasised the importance of using trained and accredited professionals to deliver advice on improving the energy performance of existing buildings.

For details visit www.cibse.org and look up "Consultations" under "Knowledge Bank".

Building information modelling

Following CIBSE's adoption of the industry-wide BIM definition, we are now stepping up our activity in this area.

If you are doing BIM now or using any of the currently available enabling software please let us know and we will keep you informed. We also want to learn from you so please send an email to Samantha McDonough: smcdonough@cibse.org, stating your interest and views on what the issues are for practitioners.

Undergraduate award entries invited

CIBSE is inviting final-year building services students to enter the CIBSE Undergraduate Award.

Does your final-year project demonstrate engineering excellence? Do you have an original idea that deserves recognition? And can you show a strong understanding of engineering science and design? Simply send us a 2,000-word synopsis of your

final-year project. Judges will be looking for clear, easy-to-read submissions with a strong idea, understanding of engineering science and design, originality, and good visual quality with high-quality drawings.

The award is open to final-year BS engineering BSc, BEng and MEng students in the UK and internationally. The first prize is

£500, plus one year's free CIBSE graduate membership, and two places at the CIBSE president's dinner. There are also two highly commended prizes of £100.

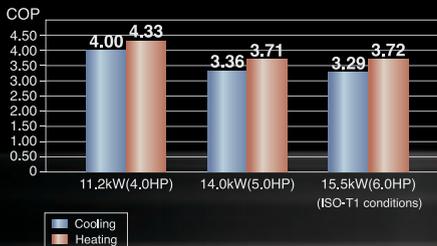
The closing date is 31 July 2009. Download the application form from the CIBSE Young Members Blog at www.cibseyoungmembers.co.uk and send all your entries to clacey@cibse.org

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iStock/LisaFX Photographic Designs

Energy assessors will be required to visit a site to award a certificate



When the system of certifying a building's energy performance was introduced last autumn, the move was widely welcomed as a significant step towards cutting the carbon footprint of the UK's building stock. But, while attention was focused on the ratings applied to properties via the new energy performance and display energy certificates (EPCs and DECs), underlying problems with the certification process were threatening to undermine the whole structure.

One key problem that emerged was so-called remote lodgement, which was highlighted in the March issue of the *Journal*. A number of energy assessors – those responsible for providing certificates – complained about practice of awarding a certificate via third-party 'data gatherers', likening this to driving a car using someone else's licence.

The Department of Communities and Local Government (DCLG) is now, in effect, banning this practice for DECs and EPCs, which are applied to public-sector buildings. According to a DCLG guidance document sent to accrediting bodies in May, the practice of "remote lodgements" of DECs will be regarded as "unacceptable" from the end of this month.

During a CIBSE seminar last month on EPCs, an official from DCLG, Peter Matthew, disclosed that departments in Whitehall had become increasingly "wobbly" about the quality of EPCs. "Is it really worth basing our policies on this if a lot of messages we're hearing is that there are

All present and correct?

Earlier this year the practice of providing energy performance certificates for buildings without ever visiting a site caused a furore. Now the government is responding by tightening the rules. **Carina Bailey** reports



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It's really important that we build confidence in EPCs. – DCLG official

quality issues?" he asked. "If our departments are getting wobbly then I need to actually turn them around, I need to give them the confidence that EPCs and DEC's are a brilliant starting point. I believe it's really important that we build confidence in EPCs."

Matthew added that an audit of accreditation schemes should soon provide the DCLG with an idea of the poorer-quality schemes, which the department can then monitor more closely. He has also mooted the idea of commissioning an audit looking at the value and quality of EPCs – to be assessed by DCLG itself.

But Matthew also stressed that the guidance DCLG provides is the bare minimum that assessors should be striving for, and that he would like to discuss ways with the industry about how to "raise the bar on quality". It is hoped this would lead to a range of good-practice guides.

Jacqueline Balian, managing director of CIBSE Services Ltd, agrees that quality is a serious issue, especially as some training courses claim to be able to teach delegates with no previous experience to become energy assessors in as little as three days.

Currently there are a number of accrediting bodies for energy assessors – one of which is CIBSE Certification – and some bodies are allegedly advising

assessors not to remove any of the recommendations routinely included by the software to improve a building's EPC rating, regardless of how inappropriate some of these might be, says Balian.

The economic recession has also impacted on the certification process. When EPCs were first introduced it was expected that 140,000 would be produced over a year. The real figure lodged to date is about 80,000. DEC's have fared worse, with an estimated 42,000 expected, but just 25,000 lodged by mid-May 2009. But, despite the obvious problems of quality voiced by Matthew and Balian, industry leaders and developers seem to share the view that EPCs and DEC's are a step in the right direction.

Paul Edwards, head of sustainability at Hammerson, has come round to the idea of EPCs after initially branding them a "disaster". He argues there was confusion over what buildings needed to be included and says

he still doesn't understand why an EPC is needed on an empty shell that just has a cable running to it but no actual services. He is also critical of why a second survey needs to be done to complete a DEC when a survey was already completed to do an EPC.

But he adds: "I see great opportunities for benchmarking and understanding where we sit against other people in the business and also in the industry. Once we get benchmarking then we can start to value these things."

John Field, director of Power Efficiency Ltd, insists EPCs and DEC's have raised the profile of energy efficiency and carbon reduction, but believes that their introduction has created a segmented market: high quality versus minimum compliance.

Richard Hipkiss, sales and marketing director at i-Prophets Energy Services, believes there is also a third market – the "voluntary" market, where people actually take an interest in their

EPC and recognise its value. "The EPC and DEC are very powerful together. The DEC is an annual statement of performance. It's a very, very powerful tool because of its simplicity."

But Ant Wilson, a director of consultancy AECOM (formerly Faber Maunsell), argues that an EPC has nothing to do with energy or performance, because it is based on expected CO₂ emissions – while the reality of a building's energy usage is that it can end up being more heavily occupied than was intended, for example, and so appears to be less energy-efficient.

In the longer term, the DCLG is aiming to build EPCs and the European Performance of Buildings Directive – under which EPCs fall – into the UK government's Heat and Energy Saving Strategy, according to Matthew. In order to do this, discussions surrounding how EPCs should be regulated also need to be resolved, with an arm's-length body to police it a possible option. ●

Displaying energy performance

EPCs:

An EPC is an Energy Performance Certificate that all non-public sector properties must have when they are sold, built or rented. They took effect fully last October.

The EPC records how energy efficient a building is by rating it from 'A' (most efficient) to 'G' (least efficient). It also includes a report giving recommendations for improvement. Each improvement includes the indicative payback period and carbon impact.

The rating is based on the performance of the building and its services, for example heating, rather than the appliances within it. This is known as an asset rating.

DECs:

A DEC, or Display Energy Certificate, shows the actual energy consumption, or energy performance, of a building in terms of the carbon dioxide produced. It uses a rating score between A and G to show how

well a building is performing based on gas and electricity meter readings. A supplementary report is also supplied with the certificate suggesting ways in which the energy performance of building could be improved. Currently DEC's are only required in public buildings over 1,000 sq m and need to be publicly displayed.

The certificate is valid for one year, while the accompanying report is valid for seven.

Source: www.businesslink.gov.uk



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Engineering a more sustainable future

The realities of cutting carbon emissions, the future for renewables, ensuring schools are properly ventilated, and involving clients and users in the design process were among the cutting-edge issues discussed at the CIBSE national conference 2009. Reports by Carina Bailey and Bob Cervi

Engineers can help with cutting water waste

How do we ensure a “water-saver friendly building”, asked Charlotte Parkes of AECOM, who pointed out that 89 per cent of carbon emissions arising from water systems relate to usage in the home.

Savings can be made through a change in people’s behaviour and the use of better technology, she said, arguing: “As building services engineers we hope to influence the second and third aspects in this list.”

It is down to the individual to decide what is necessary usage of water in the home, but some of the seemingly unnecessary consumption can be blamed on the technology used in showers, toilet flushing, and so on.

Industry would have to meet revisions to Part G of the Building Regulations, a consultation document which proposed applying a calculator to water appliances to determine usage, Parkes said. The final revisions were still awaited.

But she added that such measures should not push the boundaries of user acceptability and should meet the practical aspects of a building, such as drainage and plumbing.

Chris Northey, of public health engineering group BDSP Partnership, said that, with government subsidy and tax relief, the costs of installing waste-water recycling systems could be recouped within a year.

Climate change a great opportunity for engineers but cut out the box-ticking

Building services engineers hold the keys to some of the biggest solutions in cutting carbon emissions in Britain, said Professor Julia King, a member of the Committee on Climate Change (CCC), an independent advisory body to government.

The need to increase energy efficiency in residential and commercial buildings presents an exciting opportunity for engineers, she added – although, amid an economic recession, it was a testing time too. King said current policy on increasing energy efficiency in residential buildings would produce a reduction of 9m tonnes of carbon dioxide (9 MtCO₂). But the “technical potential” in the sector meant a possible cut of 43 MtCO₂.

She pointed out that the

government has pledged to offer 7m homes in the UK “whole-house” carbon-reduction packages by 2020 – estimated to be worth £42bn.

In the meantime, she reported, the CCC is soon to issue an assessment of the impact of the recession. A second report to government on carbon-reduction progress would be issued at the end of this year, she added.

Professor David Fisk, of Imperial College, London, was critical of the UK’s display energy performance certificates (DEC) regime, describing it as one of the “sloppiest” in the world, adding jokingly: “We’re now getting out-of-work estate agents to get your DEC ... by telephone!”

He said this was part of the process of “tick-box engineering”



King says BS engineers hold the key

– getting an environmental brief by a client and sending this off to get a green rating. So the question being asked is not, “how can we get a building that’s great for the environment?”, but “how can we get a BREEAM Excellent rating?” He added: “That’s where tick-box engineering becomes dangerous.”

In search of a definition of zero-carbon

What does ‘zero-carbon buildings’ mean and how can they be delivered? This difficult question was posed by Stephen Ward, a sustainability director at AECOM.

He said he believed that the most significant “evolution” to come out of the UK government’s consultation document on defining zero carbon was not having to meet the zero-carbon target purely on-site: “We’re talking about zero carbon on a net zero basis, so we’re not saying buildings have to be zero carbon every minute of the day, so as long as [they are] net zero over the year.”



Ward: zero carbon can be on- and off-site

The Department for Communities and Local Government (DCLG) had introduced the idea of carbon compliance, which is the target that the industry has to meet, whether it be done using on-site

generated energy or physically linking the development to a nearby energy centre. The consultation set out three options for what that on-site compliance target should be, ranging from 44 to 100 per cent below current 2006 TER. But DCLG is expected to discourage developments being connected to off-site renewables by a private wire, which previously counted towards achieving the Code for Sustainable Homes. And, according to Ward, an open question still hangs over whether unregulated energy use will be included in the definition for non-domestic buildings.

Natural ventilation row prompts call from delegates for resolution

The question of which ventilation strategy to use in new school buildings – in particular, natural or mechanical – dominated a number of speaker sessions.

Terry Wyatt, a consultant to Hoare Lea, insisted that schools should have demand and control systems to ensure they are used efficiently: "If left to the teacher, faced with one switch, she'll turn it on and leave it on. Anything set by hand must have a default control." Wyatt also pointed to a lack of use of variable speed drives on motors: "We are designing systems for maximum capability, which is rarely used – using variable speed means saving energy."

John Palmer, a regional director at AECOM, argued that natural ventilation should be considered as a first design option in schools, believing that pupils and teachers could be relied upon to open windows and turn off switches: "We have to think about the knock-on effects of mechanical ventilation... It means lots of kit, and where are the POEs [post occupancy evaluations] of this in schools?"



School debate: Martin Liddament, left, with John Palmer

Martin Liddament, of VEETECH Ltd, said that, according to the Carbon Trust, mechanical ventilation systems and air conditioning require continuing maintenance to ensure safety and correct performance.

Edward Murphy, technical director of Mott MacDonald, presented a study of his consultancy work on naturally ventilated schools in Sheffield, UK. But, in a Q&A session, Terry Wyatt described the picture presented by the preceding speakers

as "real fairy land", adding: "How many schools are built in beautiful settings? How can you switch off acoustic noise [from outside the school]? New schools are nowhere near the performance that you are referring to." One young delegate said he was "staggered by the amount of conflict", adding that CIBSE should help to resolve such issues, "so we can go forward". Another delegate said: "We have been discussing this for 20 years."

CHP energy saving benefits 'are over-hyped'

The ability of tri- and co-generation systems to save energy has been over-hyped, suggested Dr James Thonger, an associate director of Arup.

Some uses of these systems, such as combined heat and power (CHP) fuelled by natural gas, could be less efficient than fossil fuel-powered boilers, he argued.

Pointing to figures from Dukes 2008 showing that 71 per cent of CHPs are powered by natural gas, he queried why this should be so, and suggested that energy savings from such systems had been overestimated.

Thonger argued that various "tricks" had been used to elevate energy savings from CHPs. For example, while CHP could be shown to be 18 per cent more efficient than conventional heating, this saving is halved to nine per cent if heat loss is included in the calculation. In analysing whether a co-generation system is more energy-efficient than a conventional one using the same fuel supply, the industry should use the government's CHPQA Standard, Thonger said.

Debate highlights perils for renewables

Relying on renewables alone to slash carbon emissions is not enough: nuclear needs to be considered to meet stringent government targets, insisted young engineer Rick Wheel of Arup during the CIBSE Young Engineers debate: Is the recession killing the market for renewable technologies?

Wheel and three other young engineers – Mary Ann Clarke and Nigel Banks from AECOM, and Becci Taylor from Arup – were grilled for more than an hour by

delegates at the YEN dinner and debate.

Wheel added: "I don't believe nuclear is sustainable by any definition of the word. However, it's a very, very low-carbon solution. If climate change is going to be taken seriously, then nuclear has a very real place over the next 50 years."

Banks stressed his concerns about unearthing future sources of oil and gas: "If oil reserves are low and declining I'm sure gas prices and electrical prices will



Two of the young-engineer speakers, Mary Ann Clarke, left, and Becci Taylor

rise as a result. The really worrying thing is that the next best available source of oil is the tar sands from Canada and other places, which are horrendously unstable and carbon polluting. If you don't stop that, then you've got no chance of stopping climate change."

The idea of capturing carbon from burning fossil fuels isn't a strategy that Taylor advocates either: "Investing money in carbon capture would be better spent on renewables."

Taylor believes that clients don't have a choice on renewables: "Legislation requires that those buildings contribute to a low-carbon

economy. They won't necessarily be on-site renewables. An off-site obligation can cater for that as well.

"It's particularly interesting in the context of the recession – a recession makes things more efficient, companies have to be more streamlined.

"We shouldn't be putting renewables where they don't work anymore."

Clarke agreed that the issue now should be to put the right renewables in the right place and make sure that the location and building demand actually match the renewables that engineers propose.

She added: "Perhaps we should consider, if we can't put small renewables on buildings, whether we should be looking at having a levy where maybe we actually contribute to having a larger renewable strategy."

A vote at the end revealed the majority of delegates disagree that the recession will kill off the renewables market.



CIBSE members grilled the young engineers for more than an hour

Give the standards for energy efficient products

Greater harmonisation of standards across Europe is key to getting consumers to buy more energy efficient products, said Paul Wendon, engineering director of air solutions manufacturer Flåkt Woods.

He insisted that legislation such as the Energy Using Products Directive, which aims to reduce the consumption by energy-using products, is essential in meeting environmental and political targets and helping manufacturers survive the recession.

"We see harmonisation of standards as key and standardisation of products as key so we can optimise the cost to the customer.

"If we continue to develop three standards – one for the UK, one for the EU and one for the further-afield markets – we'll start to see that we will have a bit of a mess as manufacturers will start to introduce complexity where it shouldn't be necessary."

Currently manufacturers are dealing with different regulations for the UK, Europe and the wider world.

Added to this problem are dwindling budgets and the customer's desire for the cheapest solution possible – regardless of energy efficiency.

"We are being asked to innovate and develop products with budgets that are declining and markets that are disappearing," Wenden said.

"Without legislation and regulation, very few of the investments that we make to offer you better-performing, more efficient products will come to fruition because the market does not phone us every day and ask for the most efficient solution. Today, most of our customers phone us and ask for the cheapest solution."

For manufacturers to continue to export their products, they need to be able to produce a standard product that can be supplied to the widest possible market, he argued.



Delegates learn about the European laws affecting building services, new client-led strategies and how to master controls

Clients and users of buildings locked out of design process

An insight into a new draft framework to keep clients involved in the decision-making process during building design has been provided by building services research group BSRIA, delegates heard.

Soft Landings is a framework of activities for all key members of a project team to work to, explained Roderic Bunn from the group.

One of its aims is to give the project team more information about client needs and what they require from the building to try to combat some of the problems consistently discovered in post-occupancy evaluations (POEs).

Users often consider the control systems to be dysfunctional, "operating illogically as far as the occupants are concerned", said Bunn, because information about how systems should be operated have not been passed on adequately.

He added: "Rarely do automated systems give proper feedback to the occupants on why they're operating and what they're doing.

"So users find themselves locked out of the decision-making process. It alienates them and it's always a strong sign that they're seriously alienated when they start breaking them. There's an increasing unmanageable complexity in buildings. We see this time and time again with teachers and school administrators, who are given control systems they simply don't understand."

This can leave buildings suffering chronic under-performance that never gets resolved. Value engineering can be another source for problems, as can the positioning of the school itself, in terms of sunlight and solar gain, and poor facade engineering.

But it is hoped this new framework will help resolve some of the



Roderic Bunn, right, with Bill Bordass (see report below)

operating problems. Crucially, it requires a Soft Landings team to be on site when a building is first opened; the design team to remain involved up to three years after the building becomes operational; and for the process to be client-led.

The draft framework is a partnership between BSRIA, the Usable Buildings Trust and the Darwin Consultancy.

www.softlandings.org.uk

Key to control systems is: keep them simple

Designing building controls that work first time isn't as commonplace as one might think, said Bill Bordass of the Useable Buildings Trust.

He confessed to being highly critical of current controls systems. "We sell dreams and install nightmares. Designers don't follow through into operation and they don't pass their knowledge on. We have very little feedback so we do not learn fast from emerging issues and unintended consequences."

The simple things are the ones that the industry generally hasn't got right, he said – like using photovoltaics but being unable to

turn the lights off.

Issues like this lead to offices and new schools using far greater amounts of energy than was predicted, resulting in much higher CO₂ emissions. But solutions do exist, Bordass said, advising engineers to improve the transparency between design estimates and the actual energy consumed; design controls which users can understand, in terms of what they are and how they were designed to be used; find out how the systems and controls are working once the building is in use; and, most of all, keep it simple.

Stewart Langdown, business development manager at TridonicAtco, agreed that simplicity is the key: "Robust [design] doesn't necessarily mean something that has been heavily engineered. It means that someone's thought about how the technology goes together."

Technology today is advancing at such a rate that one of the major problems facing the industry is how to get end-users to control complicated systems easily, he added. Technology education is key to combating the problem, he suggested.

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Letters

Serving the powers that be

The thermodynamic garbage that constitutes the UK Energy Bill grates a little. I refer of course to the proposed feed-in tariffs for small-scale, renewable energy.

It is self-evident (or should be if you subscribe to this eminent publication) that both the efficiency and the financial viability of renewable technology increases with scale. Our elected representatives are now proposing feed-in tariffs for domestic generation, subsidising the least-efficient form of renewable energy.

Am I overly cynical in thinking that lobbying by major power generation companies may be behind this, ensuring that whatever meagre funds are available are squandered on the least-effective technology, helping to ensure a continuing monopoly of vested interests?

Surely our political masters cannot be that corruptible?

Peter Hill, *CEng, MCIBSE*

Misleading figures on heat pumps

I note with concern figures and information quoted in the CPD module on 'Heat pump technology' (*Journal*, May, page 59). Figure 3 of the module quotes comparative heating methods and operating costs. From the figures quoted, it would appear that electricity is purchased at 6p/kWh and oil at 78p/litre. Both of these figures are far from reality and present a very biased and unrealistic comparison, very much in favour of the electric heat pump systems proposed. Current electricity prices available to most of the general public would put a totally different spin on the comparative benefits of air-source heat pumps against other fuels.

I am also concerned that the text below the graphs on page 61 state that with a COP between 3.0 and 3.6, heat pumps outperform all other types of heating shown. I would suggest that, with true electricity and oil prices, heat pumps perform slightly poorer than most fossil fuels, especially when seasonal variations in COP are considered. In addition, no mention is made of the cost of biomass systems, which offer lower figures than all of those quoted using wood chip at current commercial figures, and provide better carbon savings.

Michael Cade, *CEng, FCIBSE*

What is the true cost of renewables?

After reading the 'Under Achievers' article in the March edition (page 26) and the item



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referring to "throwing renewables at buildings to reduce the carbon footprints", I sometimes wonder whether we have been hijacked by the green lobbyist and our governments have been ill advised.

I do not want to appear to be a sceptic on renewable energies, as some I'm sure are effective, but I would like to see a data case on the carbon offsets and the production costs in terms of carbon emissions to manufacture the renewable energy equipment, taking into account the sourcing and treatment of the raw materials, production costs and life-cycles of the equipment.

I bet that the carbon savings provided by the renewable equipment in no way covers the carbon emissions in the whole production, shipping and installation process!

D Horridge, *UK*

Consensus ignores arguments on carbon emissions

Nick Cullen is a brave man to question the causes of climate change, but his point is very valid (March, page 20). The consensus on the causes of global warming looks and feels like a bureaucratic convenience, needed by politicians as a policy, and reinforced by "scientists" wary of their promotion prospects or simply wanting to be on the bandwagon.

As Cullen says, the fractional increase in CO₂ concentration is not large. But even this does not give a realistic idea of the increase in absorption by CO₂. The overlap of the CO₂ absorption bands with the water vapour absorption bands halves the net effect of any increase and reduces it further in humid conditions.

The 'consensus' arguments also seem to ignore those CO₂ absorption bands where there is already saturation absorption. Those pointing to increased solar activity present this point obliquely by pointing out that the percentage increase in solar output is comparable to the most simplistic overestimate of the effects of CO₂.

They also point out that the intensity of incoming radiation in the 'greenhouse bands' is orders of magnitude greater than the intensity of reradiation from the Earth's surface in the same bands, so that an increase in solar intensity is doubly important.

I am not saying anybody is 'wrong', but I am questioning their overdeveloped sense of rectitude and their shortness of (presented) detail.

However, there is every reason to reduce our energy consumption as soon as possible and to live more efficiently – fuel shortages acting as they do on everything from food supply to forestry – and every reason for being much more careful about the way we abuse our over-populated planet.

John Moss *MCIBSE (retired)*

CIBSE Journal welcomes article proposals from any reader, wherever you are – whether it be letters, longer opinion pieces, news stories, people or events listings, humorous items, or any ideas for possible articles.

Please send all letters and any other items for possible publication to: bcervi@cibsejournal.com, or write to Bob Cervi, Editor, *CIBSE Journal*, Cambridge Publishers Ltd, 275 Newmarket Road, Cambridge, CB5 8JE, UK. We reserve the right to edit all letters. Please indicate how you wish your letter to be attributed, and whether you wish to have your contact details included.

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Team effort

We must accept that good design alone will not deliver sustainable buildings. It is the practitioners and operators who hold the keys, says young engineer **Morwenna Wilson**



Why is it that so many of our buildings are disappointing? Every project team comes together with the best of intentions, but too often the outcome is a letdown. I believe much of this is due to the way that projects are delivered.

A recent report produced by the Specialist Engineering Alliance (SEA) and launched at the House of Lords highlighted the fact that the inability of the industry to work in integrated teams was making it almost impossible for us to deliver sustainable buildings.

Often, from the day our teams are put together, we face an uphill struggle because the design process is not adequately inclusive. Every profession in the chain has a critical role to play and, unless we are all working together from day one, the implementation will not match the design intent.

However, most young engineers attracted to the building services profession seem to be inspired by design work. They are excited by the opportunity of working towards sustainable solutions and see the 'front end', where the decisions are made, as the best place to be. This has led to a traditional 'front loading' of the industry, with installation and commissioning skills given secondary billing. However, the sustainability agenda has actually increased the opportunity for engineers working on the later stages of projects to make their mark.

We at the design end must keep our feet on the ground and make sure the building systems we design are easy to install, commission, operate and maintain – and the best way to make sure that happens is to work in close collaboration with the contracting teams, which have to implement our designs, and the facilities managers who must keep them going for years to come.

To meet our goals, we will have to engage the technical knowledge and practical application skills of FMs much earlier in the design process, which should make this profession more attractive to potential recruits.

We also need to dramatically improve our understanding of what happens to our designs once

we hand them over – and that means an increased role for the post-occupancy evaluation engineer, whether an FM or independent consultant. Post-occupancy evaluation has the potential to inform not only the maintenance, but the delivery of a building. It is only through monitoring the performance of a building when it is in use that we can determine whether it is truly performing as intended and meeting sustainability targets. And, perhaps more importantly, post-occupancy data can help engineers establish whether their design assumptions were correct and inform future design choices.

We must also look even further back into the process. Japan, for example, has long had a tradition of building services design engineers working for manufacturers – if you are aiming for long-term sustainability, that makes perfect sense. Without the recruitment of intelligent young engineers into the building services manufacturing sector, the future innovation and development of new and existing technologies will decline. We should be aiming for passive design wherever possible, but our ability to source and apply efficient plant and renewable technologies will be central to achieving our sustainability aspirations.

I understand there used to be an air of the old English 'class system' about the structure of engineering teams and everyone was expected to 'know their place'. In today's context, that is nonsense. The new membership grades within CIBSE reflect how our profession is becoming more inclusive and our goal now must be to use this to broaden our appeal to potential recruits. ●

Most young engineers are excited by the opportunity of working towards sustainable solutions and see the 'front end', where the decisions are made, as the best place to be.

Morwenna Wilson works for Arup and chairs the CIBSE Young Engineers' Network London Centre

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It's a wind-up

Roderick Pettigrew urges the UK government not to carry on wasting any more taxpayers' money on wind power when the money could be better spent elsewhere



The British government is forever telling us that climate change is the biggest issue we face, but of the £175bn the Chancellor is borrowing this year to prop up the public finances, only a fraction will be spent on really getting to grips with carbon emissions.

There is no coherent strategy for tackling our energy problems. The government has approved 11 sites for new nuclear power stations at an eye-watering cost of £4.5bn each, but the first of these will not be on stream for at least 15 years – assuming they are built at all.

The British Wind Energy Association also wants the government to bail out off-shore wind farms to the tune of £2bn. Nine major projects are already in the pipeline at a total cost of £12bn, but investors say they will not be completed without this extra money. The government has put a lot of faith in wind energy and the London Array in the Thames Estuary, set to be the world's largest offshore wind farm, has now been given the go-ahead. The first phase alone will cost £2.2bn to build.

We are being held to ransom because taxpayer support will not end with these huge construction costs. Off-shore wind farms will also need generous public subsidies for the next 25 years at least, if they are to make "economic sense"; this is according to the energy firms themselves, who will be raking in the profits.

Wind farms are simply not economically viable; moreover, their carbon credentials are questionable. Each new wind farm has to be backed up by a conventional power station for those days when the wind inconveniently refuses to blow. So, not only does wind come with no guarantees, the electricity it generates is far more expensive than our existing supplies and could actually increase our carbon footprint. Look at Denmark, where wind turbines cover the countryside. Their carbon emissions, like ours, are still rising.

If the giant energy firms holding out the begging bowl to the British taxpayer want to pull the plug – let them! We have much better things to spend the money on.

Our most pressing problem is reducing energy consumption in existing buildings. Homes account for 27 per cent of our total energy bill, and the building services industry already has a whole range of cost-effective solutions to tackle that problem. Think how much could be achieved with wind's £12bn if it were spent on upgrading ageing heating systems; fitting loft and cavity wall insulation; double glazing; better heating controls; variable speed pumps, and so on.

We could even look at a comprehensive programme to fit whole house ventilation systems that reclaim heat while simultaneously reducing the condensation and airborne bacteria problems that blight so many homes in deprived areas.

That money could also help to tackle fuel poverty, which is on the rise again after more than a decade of falling numbers.

A fraction of those billions could also significantly boost the modest £45m announced in the Budget for small-scale renewables and micro-generation technologies. The Renewable Energy Association estimates that £625m would provide a meaningful boost to the solar thermal market and other carbon-reducing building projects, while also delivering much quicker and more impressive results.

It would also help to stimulate the market for 'traditional' building services engineering and give employers the confidence to retain and retrain both experienced and apprentice engineers, so preserving and creating thousands of jobs. ●

Roderick Pettigrew is deputy chief executive of the Heating and Ventilating Contractors' Association. www.hvca.org.uk

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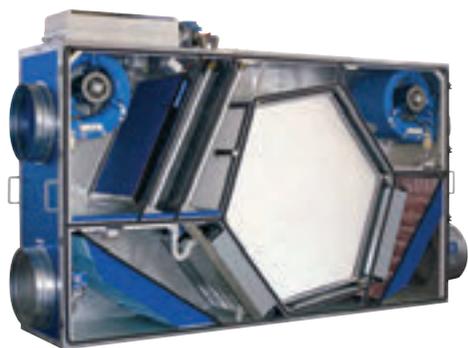
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Fit for purpose

Now that CORGI is no longer with us, how can specifiers of gas appliances ensure that these are being fitted safely? Hywel Davies explains the new accreditation scheme



On 1 April 2009 the Gas Safe Register replaced CORGI as the approved scheme for gas installers in Great Britain and the Isle of Man under the 'Gas Safety (Installation and Use) Regulations 1998'. These state that "no person shall carry out any work in relation to a gas fitting or gas storage vessel unless he is competent to do so". That competence is based on belonging to a scheme approved by the Health and Safety Executive (HSE). Gas Safe is now the only approved scheme for gas technicians.

While most gas work is in domestic premises, this change affects anyone procuring gas work. Consultants and contractors need to understand the new rules, as they have duties under the Health and Safety at Work etc Act when appointing anyone to undertake gas work. It is also particularly relevant to residential landlords who must, by law, have gas appliances in flats and lodgings inspected.

With some 40 people a year killed or injured in gas explosions, and 14 people dying from carbon monoxide (CO) poisoning in 2008 due to badly installed, repaired and maintained gas appliances, this is a matter of life and death.

The regulations require that anyone employed to work on any gas fitting be a Gas Safe-registered technician. The term 'gas fitting' covers gas pipework, valves, regulators and meters, and any other fittings, apparatus and appliances designed for use by consumers of gas for heating, including portable heaters, lighting, cooking or other non-industrial purposes.

All Gas Safe-registered technicians have ID cards confirming their registration and show which fittings and appliances they are qualified to work on.

The Gas Safe Register has routine monitoring procedures for those registered, and for investigating complaints over gas work. Anyone can nominate work done for them for inspection via the Gas Safe website.

It is not an offence for a householder to engage an unregistered technician to work on their own appliances, although they may be putting themselves

and their family at risk; and they may also be liable in a civil court if there is an accident and others suffer loss. In addition, a gas safety check must be carried out annually.

Landlords must issue a gas safety certificate to each of their tenants within 28 days of the check being completed and to any new tenants before they move in. Records must be kept for at least two years. Landlords must also show tenants how to turn off the gas supply in the event of a gas leak.

Employers or the self-employed have duties under health and safety law when engaging someone to work on gas fittings. In the event of a gas-related incident, the HSE will look at the checks made by the employer to ensure that the work was being carried out by someone legally competent to do so.

Everyone engaged in the procurement of gas-related work needs to be familiar with the rules, ready to use the new facilities for checking technician qualifications and, if need be, use the facility on the Gas Safe Register website to report anyone working illegally.

In addition, the HSE strongly recommends the use of carbon monoxide alarms to detect the presence of the highly toxic gas, which can be produced by gas appliances. On average 25 people a year die from carbon monoxide (CO) poisoning, and many more suffer health problems from CO exposure directly related to gas.

Alarms should comply with BS EN 50291 and carry a British or European approval mark. But such alarms are not a substitute for regular maintenance and safety checks. ●

Hywel Davies is technical director of CIBSE
technical@cibse.com

Consultants and contractors need to understand the new rules, as they have duties under the health and safety legislation.

To check that a Gas Safe fitter's ID card is genuine, and the holder competent in the areas claimed, go to www.gassaferegister.co.uk/help/check_an_engineer.aspx and enter the ID card number, or call 0800 408 5500 for a check.

The Gas Safety (Installation and Use) Regulations 1998, Statutory Instrument (or SI) No. 2451, can be downloaded from www.opsi.gov.uk/si/si1998/19982451.htm

Visit the Gas Safe Register website at www.gassaferegister.co.uk. There is a separate site for technicians, <https://engineers.gassaferegister.co.uk>

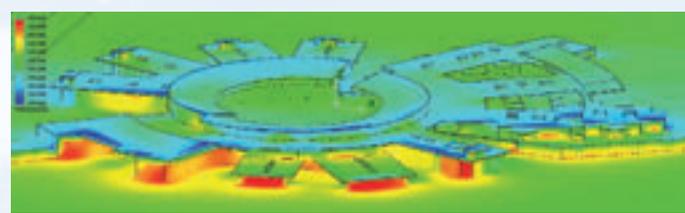
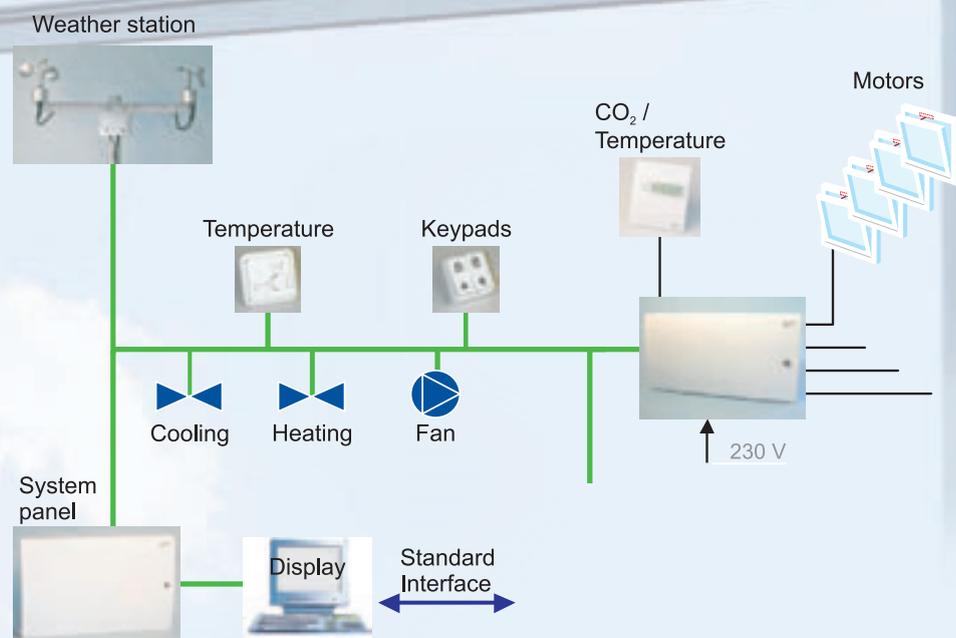
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Team builder

The head of a multinational company might seem an unlikely evangelist for slashing carbon in the building industry. But Bob Cervi finds that **Keith Clarke** is on a mission to save the planet – with the help of frontline building services professionals

Keith Clarke knows first-hand the potential hardships of green living. When we meet in a sun-drenched office at the top of a skyscraper overlooking large swaths of central London, the most noticeable thing about the grey-suited executive is the prominent bandage on one of his fingers.

“I dropped a log on it,” he confesses. Clarke, one of the building sector’s siren voices on the impact of climate change, is trying to make a difference in his private life with plans to create a carbon-neutral property on a piece of forested land – which requires shifting logs. He is also trying to install green technology, including a heat pump, at his home in London.

Clarke, however, is reluctant to talk about himself, instead wanting to focus on environmental issues. Perhaps unusually for the chief executive of a multinational corporation, he is also more than willing to focus on industry issues ahead of promoting his employer, WS Atkins, a £1.3bn-turnover plc that claims to be the largest multidisciplinary engineering consultancy in Europe.

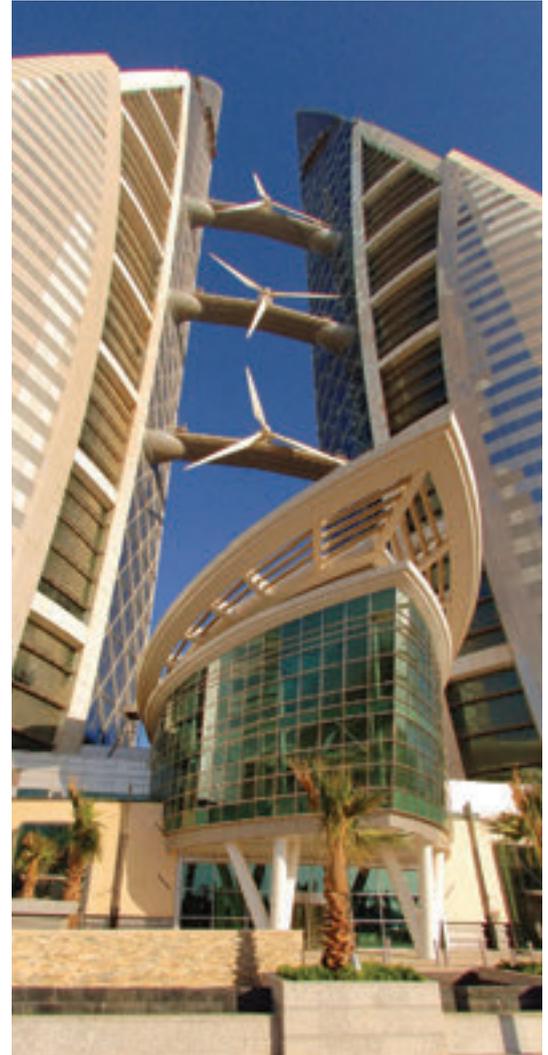
Atkins has, in the past, promoted its attempts to bring its green vision to its own projects, resulting in some notable examples of sustainable new buildings such as the award-winning, Atkins-designed World Trade Centre in Bahrain. For Clarke, though, the threat of climate change is so incontrovertibly real and urgent that the building sector needs to go back to fundamentals to really make a difference. Current policies and initiatives for greening the built environment are, he insists, necessary but far from sufficient.

“Continual improvements to what we do already – Part L [of the Building Regulations], or how much water we use, or the recycling of materials – are all absolutely valid. Houses are warmer, dryer, more efficient, and buildings perform better,” concedes Clarke.

But, he argues, this won’t be enough. He believes that a key solution is to embed carbon reduction into the earliest stages of a building’s conception – an idea that has been dubbed carbon-critical design (CCD). The Construction Industry Council, which Clarke chairs, has been working on developing this idea – work that is now being developed jointly by the council and a group >

“The traditional design team brings in M&E engineers far too late in the process.”

Atkins



Atkins says it promotes sustainable building through its own projects, such as the Bahrain World Trade Centre, far top and right, and the company's own Bristol, UK, office, above

“Carbon-critical design is about introducing a difficult process of accounting.”

> of other industry bodies including CIBSE, which is working with BIFM on developing tools and guidance for operational carbon management of buildings as part of the CCD initiative. Clarke admits that a great deal more needs to be done to develop the idea. But he believes that it requires the introduction of a process of carbon accountancy, under which the client is allocated a carbon budget that they have to stick to.

“CCD is about saying, we’re introducing a professionally difficult rationing of a new currency,” he argues. “It’s not just a case of, ‘I want the property to be more efficient, I want better lighting, etc, etc’. We still want all that, we still want a good social agenda [in building].”

“But we must also say that the client not only has X amount of money and Y weeks of time, he also has only Z tonnes of carbon – the client can ‘spend’ all this carbon allocation on making the building, while spending nothing over its life, or spend none of it on the building but all of it over the lifespan.” However, concedes Clarke, this raises complex questions of definition and boundaries when it comes to a building’s carbon footprint: “What is the building’s life, where do you draw the parameters for calculating the budget, and where is the edge of that piece of carbon accountancy?”

Accounting for a project’s carbon footprint, however, seems to be just one side of the CCD coin. The other is the fundamental change that is needed in the design process.

Says Clarke: “The traditional design team brings in M&E [mechanical and electrical] engineers far too late in the process. If we’re serious about carbon reduction, the whole mechanics of the building need to be conceptualised with real knowledge, which means bringing in M&E expertise at the beginning.”

“Good integrated design teams have traditionally done a bit of this. What I’m talking about is doing this but with knobs on, doing it aggressively. This means a lot more technical input before you know the answer [to design questions].”

Will carbon usage become rationed in this way? Clarke believes that it will eventually, although it might take another decade. But he’s adamant that the building services profession must not sit and wait for rationing to be introduced – it needs to work now on putting truly integrated design teams in place.

This means getting more technical people who can deal with conceptual issues involved in influencing the design at an earlier stage. Overall, says Clarke, a lot more work needs to be done at the beginning of the project, and less in the middle and at the end. This >

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Clarke: engaging with clients > "on a carbon agenda"

includes involving manufacturers and products early on, rather than leaving it to the contractor to find, for example, a boiler that ends up being different from the one planned.

"To get to where we need to be on the carbon footprint of a project is really quite complex," Clarke concedes. "We need engineers designing things out, rather than putting in more mechanicals, more plumbing, more wiring."

But, I ask, will architects, famed for their loftiness, permit such an intrusion of engineers into the early stages of design? Clarke, himself a chartered architect, agrees that the building services engineer needs a bigger voice within the building team, but he insists that carbon-critical design depends on its acceptance by every member of the team, whether they are the architect, the structural engineer, cost consultant or M&E engineer.

"Unless all members understand CCD as a fundamental part of their question, you're not going to get it integrated into the team. CCD is part of making the normal business deal with this design question. We're not going to get there in one step, but CCD has to be the ultimate goal."

And Clarke is certainly not in favour of a team having a green champion: "This again means the M&E engineer turning up later, to be told what to do – that's not right." Introducing integrated design cannot be about following the client either, Clarke insists. It's about taking the initiative as a profession.

"The idea that professionals wait for the client to say what it wants is never going to get you where you want to be. If we [as professionals] can't help clients, shame on us," he says.

But Clarke is quick to add that he has seen a huge change in professional bodies in recent years, with institutions "stepping up to the plate in a way that's deeply encouraging". But what messages should institutions send out?

Clarke is certain about what he doesn't want to hear: "Don't tell me it's about people insulating their homes; don't tell me it's about China not building coal-fired power stations; don't tell me it's about other people."

His own message to the institutions is: "You guys are designing and building the built environment for the future – are you going to tell me that's going to fail as well? No you're not, because you're good enough to be part of that solution."

"But do you know how to get there? If you say you do know, then you're wrong. If you say you're part of the solution and are going to find out, then you're a player. And the government is asking you to solve that problem. It's your bit of the pie."

Clarke believes that not all members of the institutions are sufficiently taking forward the green agenda. "Not all my staff in Atkins are there yet either," he adds. "But where we are today is significantly more forward than a year ago."

But can building services professionals make a difference if politicians and policymakers aren't moving fast enough to cut emissions? Clarke argues that the world still lacks a "coherent roadmap" to get us to the goal of an 80 per cent cut in emissions by 2050, but he believes that there is a "deep intent" among governments that there will be such a roadmap.

At present, one key hindrance to progress is technology – we do not know which technology will

"The idea that professionals wait for the client to say what it wants is never going to get you where you want to be. If professionals can't help clients, then shame on us."

be most effective in helping to cut carbon. However, he adds: "Today we don't need to know what works. The solutions might all fail, and then get reinvented. What matters is someone saying, 'I'm building X, and this is my carbon budget'."

Right now for Atkins this means that, for everything it designs, it engages with the client on a carbon agenda, says Clarke. As an evangelist for change, he can't be accused of not trying to put his own back yard in order. But he has a great deal more hard graft ahead of him to help turn the concept of carbon-critical design into a reality. And he's clearly not afraid of hard graft – he has the bandage to prove it. ●



Atkins is Europe's largest multidisciplinary consultancy

Keith Clarke

CV

Career: CEO of Atkins since 2003. Joined from Skanska where he was executive vice-president responsible for its activities in the UK, Poland, Czech Republic, India and China. Prior to Skanska, held various management roles for Kvaerner, Trafalgar House and Olympia & York. Has worked in Asia, India and Europe, and spent 10 years in the US as an architect with the New York City Public Development Corporation.

Activities: Chairman of the UK Construction Industry Council (CIC). Advisory board member of the Built Environment Innovation Centre at Imperial College, London. A member of the Supporters at Large Group for Open House. Patron of the Environmental Industries Commission.

Education: The 57-year-old was born in Brixton, south London, and educated at Brighton Polytechnic and the Pratt Institute, Brooklyn, New York, becoming a chartered architect.

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Close comfort

The office building services landscape has shifted under the weight of economic recession and growing pressure for sustainability. The new version of the *BCO Guide to Specification* seeks to reflect these changes, writes **Neil Pennell**

Four years on from the last edition of British Council of Offices (BCO) *Guide to Specification*, much has changed in the office marketplace. Perhaps the most significant change has been the growing importance of sustainability. Additionally, in the current recession, occupiers are seeking to optimise their use of space. BCO wanted to investigate different products and ways of working in anticipation of future changing conditions.

The needs of occupiers, and the relationship between cost and value, have been key to the link between supply and demand. A generation of highly sophisticated buildings have been delivered on the back of historically high capital values. As occupiers seek to optimise their

use of space, and the sustainability agenda takes hold, the guide evaluates the steps that need to be taken to ensure viability.

New research was commissioned to inform the 2009 guide, covering subjects ranging from internal office temperatures and occupier densities to small power consumption. All the key design parameters have been revisited and, where needed, updated and amended to reflect best practice. There is additional coverage on envelope design, acoustics, vertical transportation, building refurbishment, handover and taxation.

The guide reflects the recognition that the 'one size fits all' approach of the past is too restrictive a medium to define what is best in office design. It considers two building typologies: an intensively used and serviced deep plan urban city centre office; and a shallow plan geometry, much more suited to passive solutions.

The internal design of office spaces is all about the people that use them. While external climate and imposed load drive many of the design parameters of a building structure and envelope, most of the internal design requirements are defined by the use of the building.

Fundamental to ensuring appropriate levels of specification is identifying the number of people

likely to be in a given floor space area at a particular point in time. This is measured by 'occupancy density' calculations.

New research

Between May and August 2008, the BCO commissioned research by Pringle Brandon into the current occupancy density of commercial offices in the UK. The study covered 249 UK properties comprising more than two million sq m of net internal office area (NIA). The results from the study showed that over 75 per cent of the sampled properties have an occupancy density of between eight sq m and 13 sq m per workspace NIA.

This shows a higher density than the 12 to 17 sq m range used in the past two editions of the guide. This range arose from research conducted for BCO in the 1990s.

In other words, the comparative workspace density figures clearly indicate an increase in density of use (desk space for a given area) and intensification of use (the amount of time a desk is in use over a given period of time). The former has been a result of a shift away from prescribed space standards in the public sector and the change from predominately cellular offices to open-plan desk space.

The move from hierarchical to flat organisational structures, and from transactional and individual working to knowledge-based interactive and team working styles, have underpinned this. Rising space costs have also been a factor, as has technology – more computer-based work and less paper allows for smaller work spaces.

Effective density

It is important to note that the consideration of workplace density alone as the basis for design may overstate the demands placed on building services systems and result in over-provision of these. Effective density, expressed as NIA per person, is a better guide to the actual demands on building infrastructure.

This is analogous to the use of diversity in the design of building services systems. The new guide uses both workplace density and effective density to define occupancy-related design parameters. Services such as air conditioning terminal loads, small power requirements and outdoor air allowances need to be considered in relation to workplace density. Services related to actual diversified occupancy across a floor plate area, such as lift performance, main plant loads and toilet provision, should be based on effective density.

When actual workplace densities of the intended user of the space are not known – as in the case of speculative developments – the guide offers best practice advice to ensure an adequate level of provision is made to suit most potential occupier uses.

Small power

BCO commissioned building services research body BSRIA to carry out an investigation into the small power use profile in 16 office buildings across



Land Securities/Paul Grundy

New Street Square, London.

The new BCO guide seeks to reflect recent and current trends in office development

The guide Helping to set the client's brief

The BCO guide has been adopted by professionals as the definition of an industry standard for office design – from the performance of the envelope to the strength of the structure, from service provision to space comfort, and from floor plate efficiency to floor space effectiveness.



Many of the parameters included in the guide relate to building services design and the indoor environment. The guide is not a substitute for the detailed advice and information contained within CIBSE publications, but it does identify the key parameters that impact upon value and effectively 'set the client's brief'.

The 2005 edition of the guide, for the first time, included a series of papers from leading industry thinkers on the subjects of sustainability, cost and value, business performance and mixed use, and how these would impact on the future design of offices at that time. Since then, there has been huge change in the industry, with the growing importance of the climate change agenda, environmental legislation, changing planning requirements, economic gyrations and intensification of use. The new guide seeks to take these issues on board.

The *BCO Guide to Specification 2009* is available at www.BCO.org.uk or ring 020 7283 0125.

■ **Fundamental to ensuring appropriate levels of specification is identifying the number of people likely to be in a given floor space area at a particular point in time.** ■



Dashwood House, London.
The guide contains new
advice on lift systems

> the UK. While carrying out retrospective electrical load measurements in occupied office buildings is challenging and expensive to do, the research found no evidence that small power loads are falling from the levels specified in previous guides. Although desktop equipment has become more efficient in recent times, the combination of increasing occupier density and a growing number of devices per workspace have, it seems, effectively cancelled each other out.

Therefore, after long debate in the services working group, the recommended design allowance of 25W per sq m has been retained in the new guide.

More work is required in this area. Hopefully the improved metering in buildings driven by Part L of the Building Regulations, as well as the need to report on energy performance driven by the European Energy Performance of Buildings Directive, will generate much more data in this area on which to base our design advice.

24-degree debate

The 24-degree debate is an industry challenge to review its guidance on summertime internal design temperatures in comfort-cooled and air-conditioned buildings. The 2005 edition of the guide reflected the conventional wisdom of the time and recommended internal design temperatures in a comfort-controlled office space be maintained at 22 deg C. However, in a world of global warming, maintaining this temperature internally, with increasing external temperatures, requires higher energy use.

BCO has worked jointly with CoreNet and the Royal Institute of British Architects to review the implications on workplace productivity and comfort of a more relaxed

Highlights Some key additions to the guide

Lifts:

The new guide provides comparable performance parameters for both conventional and destination control lift systems, based on the quality of service as measured by average waiting times. BCO believes this has not been done before, because each manufacturer had been creating its own performance standards for destination control systems.

Most of the major lift suppliers active in the UK were consulted on the approach taken to normalise the definition of performance standards, and agreed that they would be able to comply with the benchmark standards for both passenger handling performance and ride quality standards.

The guide specifies, also for the first time, ride quality standards. It also offers advice on lift planning, goods lift provision and firefighting requirements.

Lighting:

The guide provides advice on both daylighting and artificial lighting in the office environment.

For artificial lighting, the previous recommended range of acceptable lighting design levels has been retained, but the impact of adopting different levels within the range on the occupiers fit out of the space is fully explained.

Also provided is more detail on what should be achieved in a Cat A design and what level of enhancement should be left to the occupier Cat B works. More emphasis has been placed on lighting control, and for the first time an annual target energy use parameter has been included.

Internal air quality:

Poor air quality leads to poor performance in the workplace due to distraction by odour, sensory irritation, allergic reaction or direct toxicological effects. The guide recommends standards of outdoor air above the statutory minimum of 10 L/s/sq m. It includes a table to track the impact of occupier densities on outdoor air allowances, and on the flexibility provided to the space through the provision of good outdoor air allowances.

internal design temperature standard for climate-controlled office space. After considering some of the latest academic research and conducting field trials at a major occupier's offices during the summer of 2008, it was concluded that 24 deg C provides good comfort and productivity conditions for office occupiers and allows a reduction in energy use because of reduced cooling. ●

Neil Pennell is a director of the BCO board of management, chairman of its technical affairs committee and head of sustainability and engineering at Land Securities Group plc

“ The guide reflects the recognition that the ‘one size fits all’ approach of the past is too restrictive. ”

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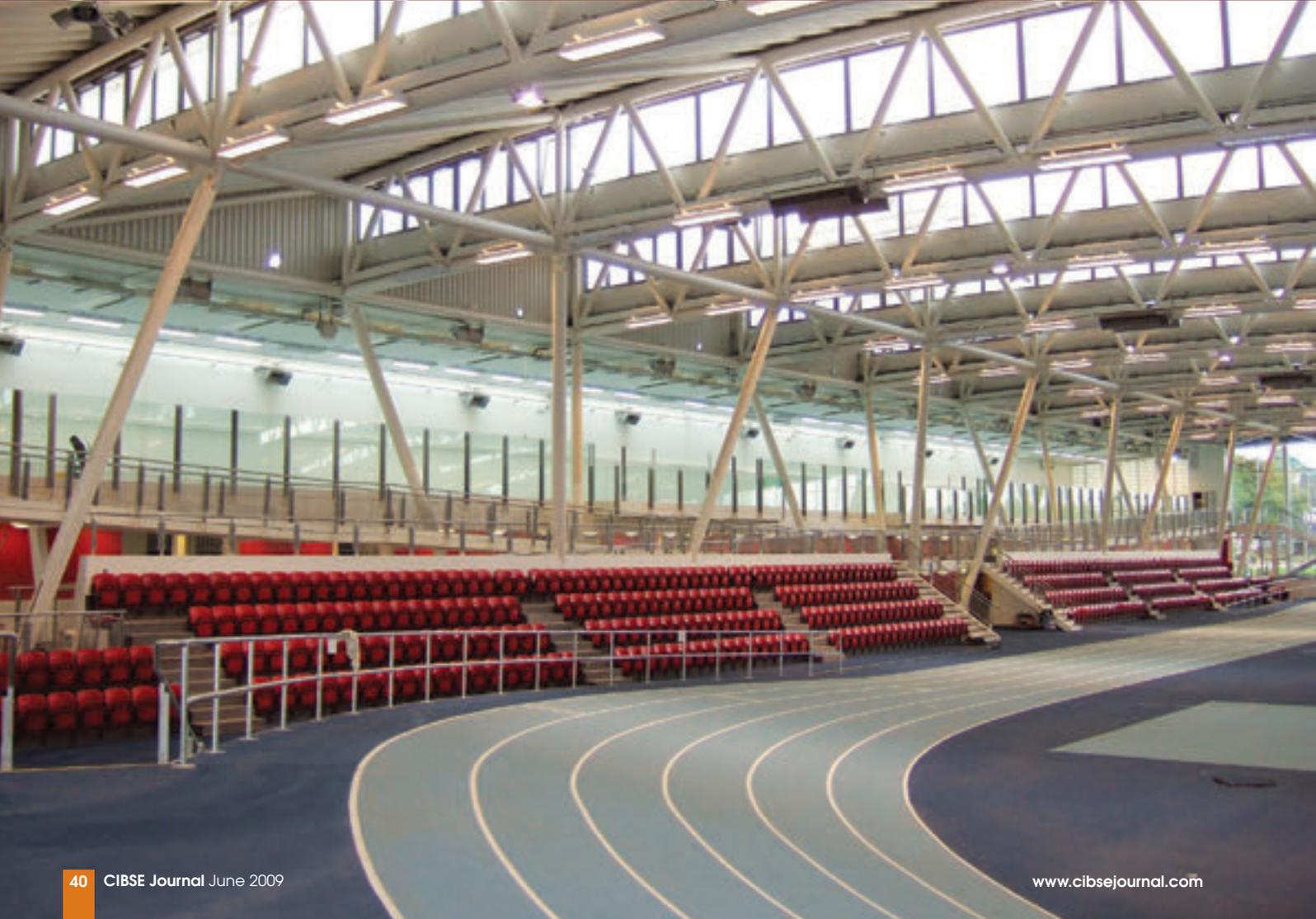
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Staying the course

Creating a huge indoor arena for Olympic athletes was a challenging prospect. But the use of passive engineering at Lee Valley athletics centre has proved to be a success with its users while also gaining the highest rating for energy efficiency, writes **Simon Ellery**

British Olympic medal hoppers are hard at work in preparation for the London games in 2012 – and, for some of them, the arrival of a naturally ventilated, state-of-the-art indoor stadium couldn't have come sooner. Since it opened in 2007 the Lee Valley athletics centre in east London has been used as a training base for a number of leading athletes. But the indoor centre is not just renowned for its air movement – its approach to environmental engineering through integrated design has earned the facility a rare grade 'A' energy performance rating.

Max Fordham Consulting Engineers worked with David Morley Architects with the aim of producing an exemplar of environmental responsibility. Despite having to maintain high air quality for athletes training and competing in different zones in the centre, the facility produces very low levels of CO₂ and is highly energy efficient. This is achieved by innovative 'passive' engineering and comes despite using existing building services technology.

Max Fordham's Dr Neil Smith says: "Our task was to provide [athletes] with the required environmental conditions to train to their peak performance."

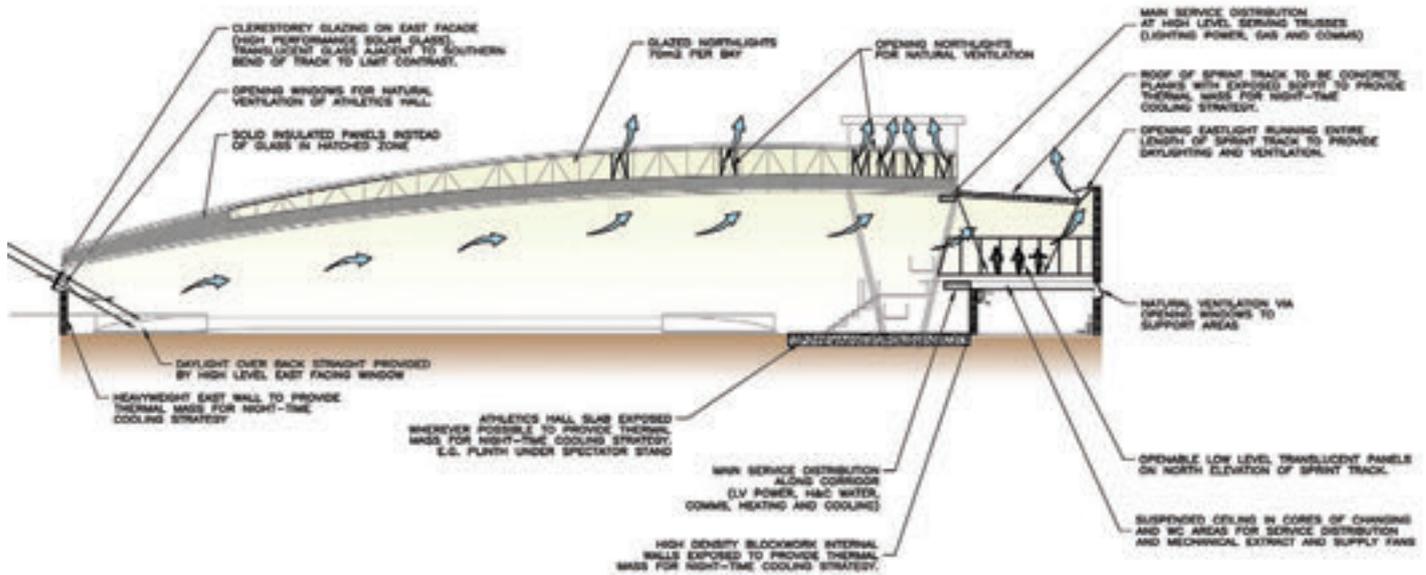
However, the size of building needed to accommodate a wide range of facilities – including the only 200-metre, six-lane track in the south of England – combined with very low occupancy when not used for competitions, meant the project posed a serious energy efficiency challenge.

"This had the potential to give it a large environmental 'footprint' in terms of the resources and energy used in >



The Lee Valley indoor athletics centre in east London (pictured here and opposite) has been designed for use all year round. There is also an adjacent outdoor track (top of facing page)

Lee Valley athletics centre - ventilation strategy



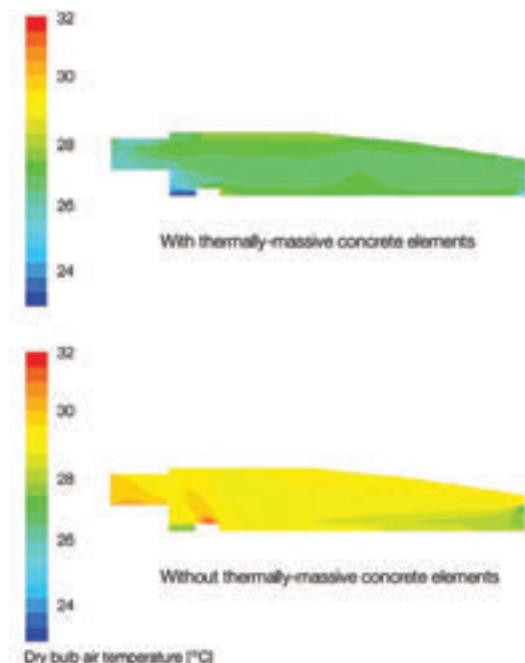
“An important aim of the building design was to provide the best possible training venue with the lowest possible carbon footprint.”
 – Neil Smith

both the construction and operation of the building. So an important aim of the building design was to provide the best possible training venue, with the lowest possible carbon footprint,” says Smith.

The indoor centre includes 130 metre sprint straights, specialist facilities such as weights, a conditioning gym, full indoor ‘jumps and throws’, as well as permanent seating for 500 spectators.

“It is a huge building,” says Max Fordham’s design physics specialist Tom Bentham. “Different people use different parts of it at different times.”

Effect of thermal mass or temperatures on a section through the athletics hall and sprint track on a hot day. (external air temp 27°C)



Bentham sought ways to exploit the building’s extensive passive energy saving potential through daylight, natural ventilation and thermal mass for cooling. This advice on the building’s ‘form’ – including factors such as orientation of the building and its mass – was fed through to designers David Morley Architects.

All the building’s controls are zoned so that different areas with different systems can work independently – and this is key for controlling the amount of energy used.

“If people are running in the sprint track and not the rest of the building, then the lights may need to be on there, along with ventilation and heating. But you don’t want to heat or light the rest of the space,” Bentham says.

Extensive exposed thermal mass – consisting of two flanking concrete walls, a concrete slab that is the sprint track ceiling and the spectator stand, which is again a huge concrete slab – act as a large heat sink that limits temperature swings.

These concrete blocks absorb heat, particularly in the height of summer, including solar heating from the two glass end walls as well as heating from occupants and electrical equipment. This is then radiated on cool nights to warm the building and boosted by night-time natural ventilation, which helps cool the thermal mass and eliminates the need for mechanical cooling.

The building fabric itself is air-tight and well insulated, and the ratio of solid to glazed areas is optimised to keep solar gain to a minimum. The fixed external shading to the south façade minimizes solar gain in summer but maximises this in winter for passive solar heating.

Mechanical intervention is targeted and minimal. The main athletics hall, sprint track and the majority of the ancillary spaces are naturally ventilated. This is achieved through 240 WindowMaster motors that open and close windows so that the correct amount of ventilation satisfies both air quality – in terms of reducing CO₂ – and temperature.

Says Bentham: “The alternative to naturally ventilating a building this size, in terms of the fans required, would consume much more energy because they would be running all the time.” The windows open at the most every quarter of an hour and the amount of energy consumed by the motors is “so small as to be negligible”, he adds.

Having good natural air ventilation also tackles stuffy or hot conditions, while both indoor and outdoor CO₂ sensors check for air quality.

To fine-tune the temperature in each zoned space, radiant gas plaque heaters are used to provide instantaneous heating. Boasting a much higher efficiency than more traditional radiant tube system, they have a faster heat-up rate and supply short bursts of heat.

As with the other building control mechanisms, the heaters are arranged in zones to limit their use only to where needed.

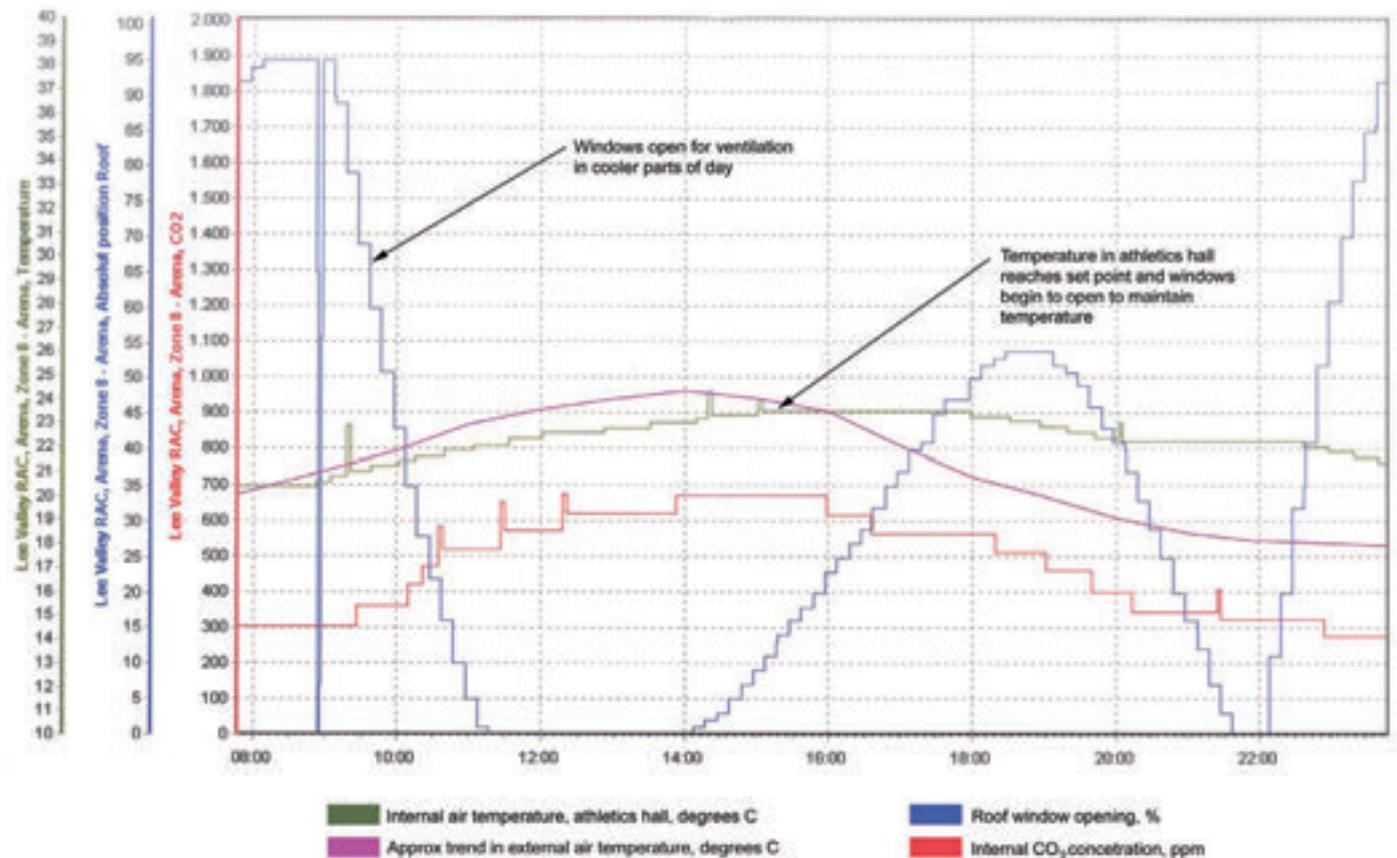
“None of the systems are new or revolutionary,” says Bentham. “What’s worked amazingly well in this building is that each system has been designed very carefully to suit the use of the building.”

He says that in many projects, the control systems can end up being “hugely complicated”, so that if something does not work “it’s incredibly difficult to find out why”. “And that’s often why things are left to run not working as they should be, which means a building consumes much more energy than the designer’s calculations showed it should.”



Heating and lighting has been designed to respond to the changing occupation and use of the building

Data from natural ventilation control system, summer day





External shading minimises solar gain in summer and maximises it in winter for passive heating

> Max Fordham says it put in place a series of robust strategies over the zoning and the timings of when different elements would be on or off, so that the building is simple to build, and writing the control software is also straightforward.

“A big part of it is thinking in advance, having a clear idea of what you want to achieve and the simplest way of achieving that. This makes it much less likely that you will have problems in practice.”

Operational monitoring of the building found that, in summertime, it met the good air quality needed for athletes but kept the temperature down. In winter it was found to maintain good temperature and a fresh atmosphere.

Smith says that, barring some minor commissioning issues relating to the set-up of the radiant panel heaters and some seasonal refinement of the window controls, there has not been any significant system failure to date: “The passive solutions and zoning strategies actually reduce the maintenance burden compared with a standard approach.” ●

Integrated design

Energy-saving measures to reduce dependence on M&E systems

Natural ventilation: The main athletics hall, sprint track, and the majority of the ancillary spaces are naturally ventilated. An automatic natural ventilation control system ensures optimal user comfort and that the correct amount of ventilation is supplied to spaces at all time to satisfy both air quality and temperature.

Thermally heavyweight materials: Extensive exposed thermal mass within the building attenuates temperature swings within the spaces and, when coupled with night-time natural ventilation, eliminates the need for mechanical cooling.

Daylighting: The main athletics hall is well lit during the day using north light ridges at each truss position and clerestories at each end of the hall to provide very uniform lighting of the space. The sprint rack has a roof light running its entire length and also uses borrowed light from the main hall. Most of the ancillary spaces have high-performance solar-control glazing at high level, which ensures optimal daylight levels without high solar gains. The daylight strategy allows the artificial lighting to be dimmed or switched off when daylight levels are sufficient.

Well insulated building fabric: The design of the building fabric uses best practice in insulating standards and an optimised ratio of solid to glazed areas to keep fabric heat loss and solar gain to a minimum.

Air-tightness: The detailing of the envelope and its construction has been made as airtight as possible to minimise infiltration losses.

External shading: The fixed external shading to the south façade of the main hall has been designed to minimise the solar gains in summer but maximise the solar gains in winter for passive solar heating.

Minimising general power consumption

Energy efficient lighting: Wherever possible light fittings with high-efficiency lamps, such as compact fluorescent or discharge lamps, have been used. The normal lighting in the main athletics hall for everyday operations uses fluorescent lights.

Lighting controls: Lighting is automatically controlled by light level and presence detectors to switch lighting off when not required, and to dim it down or turn it off when supplemented by natural light. Lighting in the main athletics hall is zoned to allow switching off of zones when not in use.

Minimising plant energy consumption

Radiant gas plaque heaters: These are used in the athletics hall and sprint track to provide instantaneous radiant heating. They have much higher efficiency than more traditionally used radiant tube systems and heat up fast, allowing shorter heating periods. The heaters are arranged in zones to ensure that only the areas being used are heated.

Efficient boilers: High-efficiency low-NOx condensing gas-fired boilers are used to heat ancillary spaces. Water flow temperatures are weather compensated to maximise condensation and latent heat extraction from the flue gases.

Good controls: A comprehensive building control system constantly monitors all of the spaces. The BMS monitors energy consumption. Pumps are variable speed. PIR-controlled ventilation to toilets and showers.

Renewables

Infrastructure has been installed for the future provision of a large-scale wind turbine adjacent to the building, and the aerofoil profiles above the roof have been design to take photovoltaic panels.

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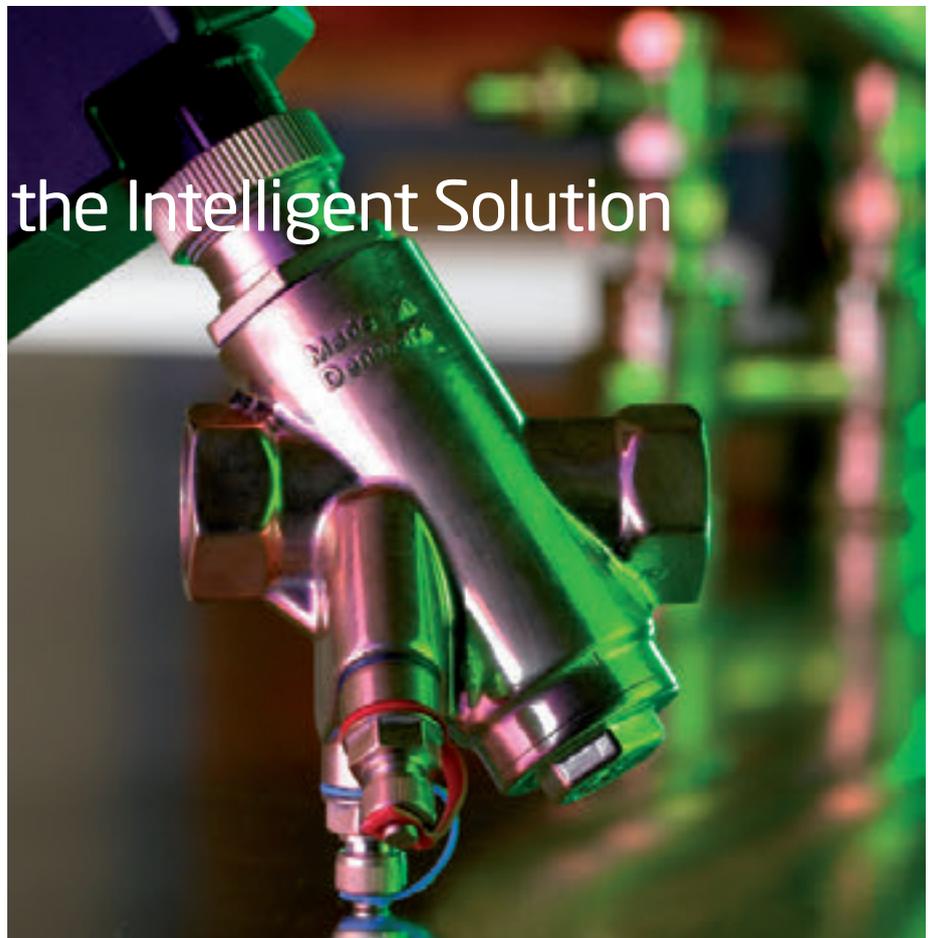


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Green growth

A master plan aimed at doubling the size of an English teaching hospital points to the need for a radical shift in energy sourcing and usage. **Paul Haddlesey** looks at the challenges and options ahead



Addenbrooke's Hospital in Cambridge is to almost double in size in the next decade as part of a development plan dubbed the 2020 Vision. The aim is to develop the site as an international centre of excellence, bringing together clinical care, teaching and research to form the Cambridge Biomedical Campus on the site.

The development plan has a strong focus on sustainability, according to Cambridge University Hospitals Trust, which runs Addenbrooke's and other healthcare facilities on the site. Faced with firm targets for cutting carbon emissions, the trust regards sustainable development as a must, particularly for the new buildings.

AECOM (formerly Faber Maunsell) is providing engineering consultancy services for the master plan. Its director of building engineering, Carl McKenzie, says the plan provides an ideal opportunity to set an overall framework for the trust's continuing sustainability initiatives – in line with the NHS carbon reduction strategy as well as national, regional and local sustainability requirements.

The vision for 2020 relates to the projected date for controlled development of facilities on the site. Full development is expected to take until 2040.

Carbon reduction

Carbon dioxide emissions per unit of floor area at the trust have fluctuated over the previous five years. In 2008, at 151 kg per sq m, emissions were close to typical practice for a teaching hospital within the health service. However, targets set within the NHS carbon reduction strategy relate to gross emissions, and these have risen over the past five years, principally due to increases in floor area.

In light of this, as the 2020 Vision strategy envisages an increase in clinical floor area from 190,000 sq m to around 275,000 sq m, unit emissions (kg per sq m) would have to be reduced substantially further than the 26 per cent gross reduction on 1990 levels required by the carbon reduction strategy.

The overall energy efficiency of the estate would therefore have to increase by 50 per cent by 2020 – implying a drop from 151 kg per sq m to 77 kg per sq m. Given that it will be difficult to substantially reduce consumption in existing parts of the estate, new buildings will have to be designed to emit very little carbon dioxide. "Achieving this target will require a radical change in the way that the trust uses and procures energy," McKenzie says.

"With priority given to passive means of heating, cooling and lighting, new and refurbished buildings can be as intrinsically energy-efficient as possible, with energy use not exceeding 35 to 55 GJ/100m³ in new buildings and 55 to 65 GJ/100m³ in existing buildings. This may mean redevelopment of the most energy-inefficient parts of the campus," he adds.

Consequently, the intention is that the entire campus may be supplied with low-carbon forms of heat, cooling and electricity such as combined heat and power (CHP), and that all new buildings will make use of district energy, eventually leading to the entire site being served by low carbon energy. While all technologies will be evaluated – including wind power, ground source heat pumps and biomass heating – large-scale renewable forms of energy such as solar thermal and photovoltaics may be introduced to the site in phases.

It is also recognised that the trust's carbon emissions are not restricted to the operation of its buildings –

“Achieving this target will require a radical change in the way that the trust uses and procures energy.” – Carl McKenzie



Partnership

Preparing for the 2020 Vision

Addenbrooke's Hospital, along with the Rosie Maternity Hospital on the same site, is operated by Cambridge University Hospitals, an NHS Foundation Trust with a mix of clinical, biomedical and research functions. It currently has more than 1,000 beds and around 7,000 staff.

As part of its '2020 Vision', the trust intends to extend the site on the southern fringe of the hospital – the South Campus Hospital Renewal Programme – while also including other significant developments in the master plan.

This plan needs to consider the impact of any extension work on the existing services and utility infrastructure as well as potential for the ongoing site development.

Consulting engineers AECOM (formerly Faber Maunsell) was engaged to provide overarching engineering strategies that support the master planning proposals, as part of a master planning group led by a combined architect team of Devereux and Allies & Morrison.

AECOM's input includes environmental, energy and sustainability issues, engineering services infrastructure, and estates strategy. Consultancy WSP is providing transportation planning.

indeed, 78 per cent of carbon emissions within the NHS come from ancillary services such as transport and procurement. The redevelopment of the hospital, therefore, will facilitate reductions in ancillary carbon emissions, the trust says.

Heat and power

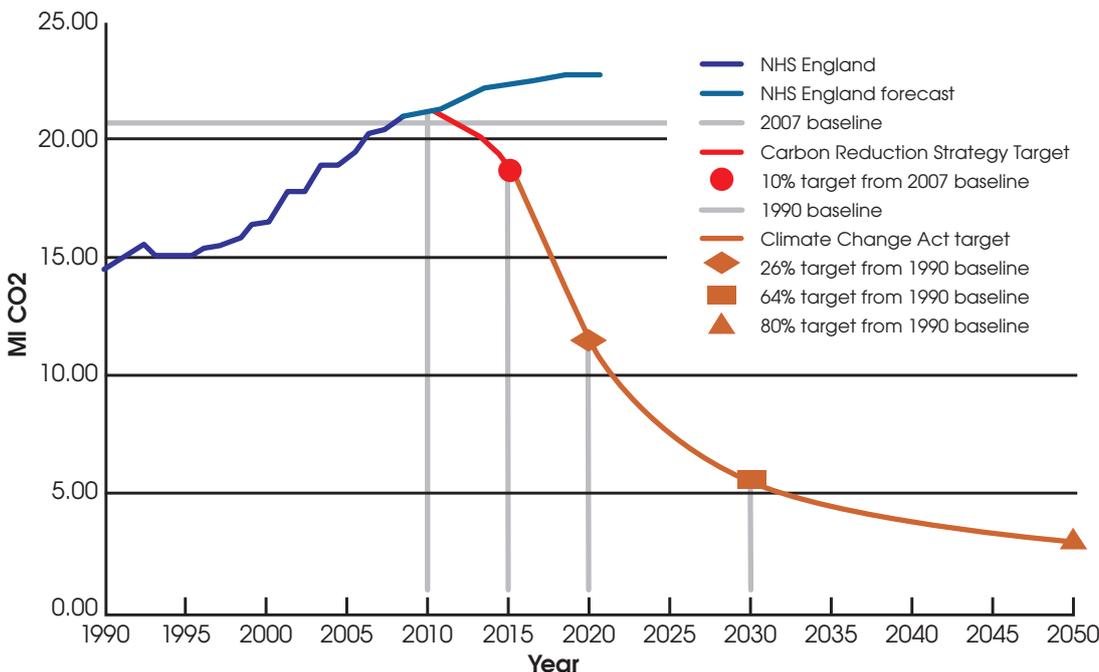
The complexity of the master plan is exemplified by the considerations that need to be given to the heating and power generation aspects of the site. Given the extensive heating networks operated by the majority

of hospitals, this is something that will impinge upon other hospital expansion plans.

The existing Addenbrooke's site currently uses a steam distribution system, dating back to the 1960s, with some more recent modifications, to provide heating, humidification, hot water and sterilisation functions. Steam is raised in a central energy centre comprising four levels with a gross floor area of circa 2,000 sq m containing gas boilers, a gas CHP unit, and two incinerators.

The waste incineration plant is central to the trust's

NHS carbon emissions and reduction targets (in million tonnes) in England



> waste management and energy strategy, and consists of two incinerators each rated at 4,000 lbs/hr steam each at 9 bar pressure (equivalent to 1.4 MWth each). They are capable of processing 500 kg/hr of clinical waste each, though typically process 300 kg/hr. The waste comes from within Addenbrooke's (around 2,000 tonnes a year, thus saving on clinical waste disposal) and from other organisations (a further 2,000 tonnes annually).

There are also two steam-raising gas-fired boilers rated at 36,000 lbs/hr steam each at 8 bar (equating to approximately 12.5 MWth) installed in 1996. In addition, a 4.2 MW gas turbine CHP system generates 17,000 lbs/hr steam at 8 bar (circa 6 MWth), with an efficiency of around 60 per cent.

The CHP system was installed in 1991, and with continued maintenance and refurbishment is expected to have a relatively long lifespan. The unit can be operated economically, producing electricity at 6p/kWh (based on the trust's current gas price of 2p/kWh). This compares favourably with the current purchase price for grid electricity of 9p/kWh.

Steam main

The site steam main is constructed from eight-inch insulated piping located within basement and ground-floor service corridors and typically operates at up to 8 bar, although this is reduced in the summer period. During the winter months the load is dominated by heating – whereas, in the summer months, hot water is the main load, with around 20 to 30 per cent of the load utilised for sterilisation.

As a result of reductions in thermal loads over the years, through efficiency improvements, higher



Cambridge University Hospitals Trust

The overall energy efficiency of the expanded site will need to improve by 50 per cent to meet carbon-reduction targets in the NHS

internal heat gains and removal of the laundry, the ring main has some capacity to accommodate additional thermal load. Peak steam demand is around 21MWh and the total capacity from CHP, incinerators and boilers is around 25MWh, so there is spare capacity for some of the year. The incinerators are used to meet the base load throughout the year and the CHP operates next in the hierarchy.

Energy from waste may form an important component of meeting future low and zero-carbon building targets. Alongside the environmental benefits, there are the existing advantages of waste management and the associated economic considerations. Incineration on site is a criterion that needs to be firmly within the 2020 vision, says the trust.

While there are many other considerations that need to be included in any master plan for expanding a hospital, heating often represents a particular challenge. Not only is the heating vital to key activities within any health estate, it is also a major contributor to carbon emissions. Achieving the best balance that will satisfy all requirements, therefore, depends heavily on the expertise and innovation of the building services engineer. ●

Master plan Path to creating long-term solutions

Outline stages for the plan:

- Reviewing the Trust data on the existing site;
- Developing an information pack document;
- Reviewing potential master plan options;
- Selecting a preferred master plan to address the long-term development of the campus; and
- Developing an estates strategy that considers the master plan's findings.

The plan incorporates:

- Children's hospital;
- Comprehensive cancer centre;
- Neurosciences centre;
- Re-provision of the emergency department;
- Critical care, additional theatre capacity;
- Perinatal services; and
- Infectious disease facilities.

The proposed development will include:

- The Forum, a mixed-use hotel, conference centre and educational development;

- The relocation of Papworth hospital to the site;
- Further development of staff residences on the north of the existing hospital site; and
- The planned development of a bio-incubator on the site.

Current site conditions:

Understanding the existing site conditions is critical to determining the best way forward in the master plan. In particular, it was necessary to establish a clear picture of the following:

- Determining loads for proposed schemes;
- Likely impact on infrastructure of future predicted loads;
- Determining relationship with infrastructure details and economic life of the systems;
- Establishing constraints imposed by existing buildings;
- Assessing suitability of existing site for future healthcare and research;

- Establishing phasing of potential developments and any necessary enabling works and alterations; and
- Predicting required investment levels per annum.

Long-term development plan:

In creating a long range development plan, the master planning team needed to include the following key considerations:

- Engineering services routes;
- Expansion capabilities;
- Flexibility provision;
- Maintaining existing services;
- ICT (tele-medicine);
- Foul and surface drainage;
- Phased development;
- Structural philosophy;
- Environmental impact at all levels;
- Material assets; and
- Cultural heritage.



BSRIA PUTS MONODRAUGHT SOLA-BOOST TO THE TEST

Monodraught has installed a 1200mm Sola-boost Windcatcher system in the busy entrance foyer and atrium of the Building Services Research and Information Association (BSRIA) offices in Bracknell, to enable BSRIA to carry out long-term monitoring and testing over a 12-month period. As Monodraught's Professor Terry Payne, explains, there are many benefits to this exercise. BSRIA is immediately benefiting from energy-free natural ventilation to counter previous overheating it has experienced in previous years – up to 40°C in summer – due to solar gain, and Monodraught will benefit from the validation of its Sola-boost Windcatcher. BSRIA has a fully glazed, two-storey entrance. However, in addition, BSRIA has the opportunity to carry out extensive, ongoing monitoring.

Early indications from the report compiled after the first six months are extremely encouraging, in terms of reductions in both temperature and CO₂ levels.

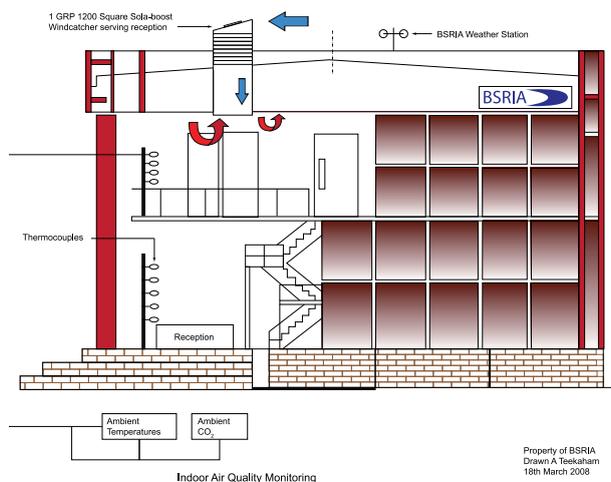
Dr Arnold Teekaram, a principal research engineer with BSRIA who was responsible for compiling the report, noted: "The ventilation unit clearly had a marked effect on reducing the levels of CO₂ within the reception area, as well as temperature levels."

A weather station was set up on the entrance foyer roof to measure wind speed and direction, external temperature, and other environmental factors. Inside, permanent monitoring equipment is recording readings at five-minute intervals, 24 hours a day. Data is downloaded regularly to enable BSRIA staff to analyse performance.

Since monitoring only commenced in September, it was not possible to monitor the very high temperatures that had resulted in overheating that had occurred in the previous years, since average external daytime temperatures were approximately 17°C, somewhat lower than a typical British summer! The average temperature during the nights dropped to approximately 12°C but the average wind speed was approximately 3m/s during this period. The report states that this is reassuring, in that the design wind speed chosen by Monodraught in sizing the Windcatcher system is based on 2m/s. The weather data over the period 1 September 2008 – 4 January 2009

was measured and it could be seen that there was a decrease in external temperature as expected, where the temperature dropped to as low as -5°C.

In monitoring the internal temperatures, it was seen with the damper fully closed that the internal temperatures rose to a maximum value of 31.2°C, measured at a level of 5.32m from ground floor approximately 1.5m below ceiling level. This was



followed by a decrease as the external temperature began to drop. The peak internal temperature of 31.2°C corresponded to a peak ambient external temperature of 19°C. The external temperature began to drop at approximately 17:00 hours, this trend was consistent for successive days.

The effect of fully opening the damper resulted in an immediate drop from 31.2°C to 29.5°C, again measured at approximately 1.5m below ceiling level. With the dampers still open, the rate of the internal temperature was continually reduced, compared to when the damper was fully closed. The results, monitored by BSRIA, also show that there was a marked temperature gradient between ground floor and first floor. The maximum temperature recorded on first floor was approximately 31°C whereas, on the ground floor, the maximum temperature measured was approximately 26°C. The

data also shows that, during the night-time period, the damper was activated to provide night-time cooling resulting in internal temperatures decreasing to a minimum value of 14°C on 28 September 2008.

The effect on the average CO₂ levels within the reception area was also observed. With the damper fully closed during the day, the maximum CO₂ concentration reached was in the region of 1000ppm. With the dampers fully open, this was reduced to 508ppm. This result again underlined the basic design parameters of a Monodraught Windcatcher system in having a fairly dramatic effect on CO₂ levels by removing the build up of CO₂ at high level and introducing fresh air, also from roof level, which resulted in this marked reduction in CO₂.

Prior to the installation, calculations from a Monodraught survey indicated that an air change rate of 13.5 air changes an hour would be required. To achieve this target ventilation rate one of Monodraught's GRP 1200mm square Sola-boost systems was selected. At an external wind speed of 2m/s this target is achieved, 12.2 air changes per hour is provided by wind pressure and buoyancy, a further 2 air changes per hour provided by the Sola-boost fan. During the daytime, control is maintained by the Sola-boost's internal dampers, with the solar-powered fan providing additional air movement. Another significant benefit for BSRIA is the Sola-boost's night cooling facility, which is an important part of Monodraught's temperature-control strategy for the space.

Professor Terry Payne says he is delighted with the results and welcomed the opportunity for long-term monitoring to be carried out in a real situation by a highly professional team. He now looks forward to the full BSRIA report at the end of summer 2009 and adds that the results are sure to be of great interest to both parties as well as the wider HVAC community.

Full copies of the BSRIA report are available from Monodraught Limited.



Squeeze on the breeze

Specifying air movement systems can be a real challenge, not least because of the competitive tendering process typically used to acquire them. However, **Ian Vallely** detects a wind of change blowing through the fan procurement process

There is a real danger that the process of 'better buying' employed by some contractors could result in a switch of emphasis in large ventilation projects – from energy efficiency to lowest price – as the project moves into the procurement and construction phases.

This, some argue, is because 'better buying' is nothing more than a euphemism to describe the process of squeezing bigger discounts from suppliers.

Stuart Long, technical director of consulting engineers RPS Gregory, says that – unless there is a specific client brief requiring adherence to particular criteria – it is usually difficult for the consultant to insist on high-performance fans, high-efficiency motors, and the like: "Left to their own devices, it is my opinion that most mechanical contractors will almost without question opt for cheapest first cost."

However, he says: "Thankfully, end-user clients and those in the public eye are now much more receptive to a life-cycle cost approach, which facilitates new technologies and clearly illustrates their long-term impact."

George Reilly, senior building services engineer at Buro Happold, believes that "better buying" implemented solely for commercial gain has a detrimental effect on efficiency and quality.

"We are responsible for specifying the correct product for each project and defining the key design criteria for it. We should always make our clients aware of any additional running and/or maintenance costs of implementing 'better buying', in order to give an indication of increased life-cycle costs to reflect true savings."

However, Mike Rhead, a partner in Armstrong Rhead, does not see life-cycle costs as a realistic performance measure. He says: "If we looked at the lowest life-cycle cost for every element of design, we would never get a design finished – this is a naive way of thinking of how consultants design projects."

Engagement

Buro Happold says it tries to engage manufacturers at the early stages of a project to ensure the right solution is found for the scheme, and to avoid over-specifying systems and unnecessarily adding control complications and costs.

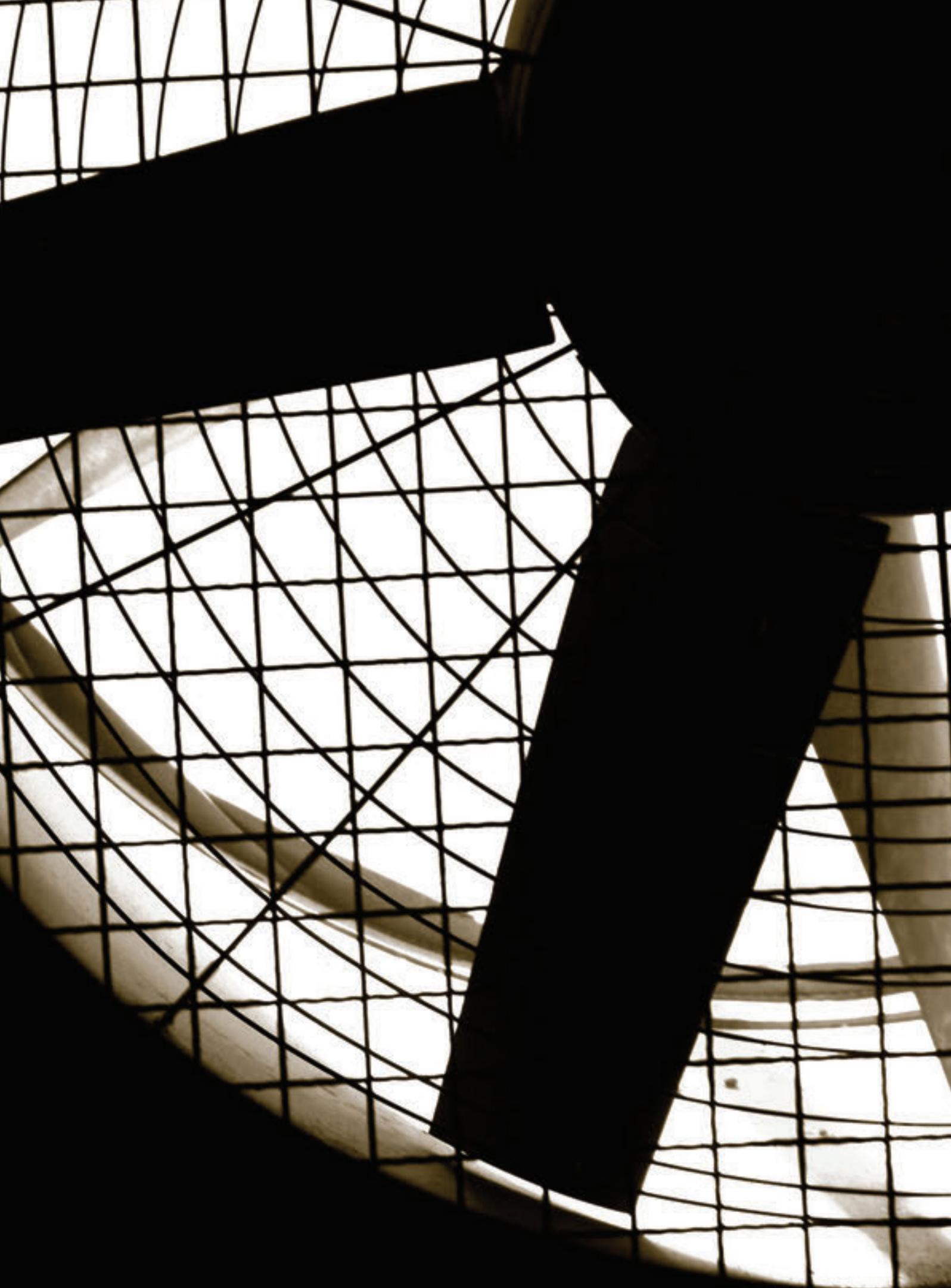
Says Reilly: "If the project is tendered in the correct fashion and adequate cost is built into the cost plan, the retention of high-efficiency plant/controls has a much higher success rate. This puts the responsibility on us, as designers, to ensure that our specifications are detailed and robust enough to survive any 'better buying' measures."

He adds: "Given the recent changes in government legislation on energy consumption, this process is becoming easier and we find that clients, developers and contractors are more aware of the importance of conserving energy."

Hurleypalmerflatt works with air-movement manufacturers to develop energy efficient ventilation solutions with low life-cycle costs. Jim Harrison, a director at the company, explains: "A current case in point is the use of efficient fans in high-density IT cabinet cooling systems. I believe that, if consultants stress that fan selection is based upon achieving improved energy performance ratings in relation to both LEED and BREEAM, and any changes could affect the ratings, then both contractors and clients will sit up and listen."

Nonetheless, with the limited time available to them, isn't there a temptation for consultants to focus on defending their selection of big items such as air-handling units and chillers rather than spending time fighting for better controls or the most energy efficient versions of component products such as fans? >

Within budgetary constraints we should be aspiring for the best possible performance and pursuing excellence in all that we do.
– Ant Wilson



> Says Rhead: “Saving 10 per cent of energy by carefully selecting a chiller will usually save far more energy than spending time saving 10 per cent on a fan. Having said that, in the time available, I would expect our practice to do both.”

This ‘more bang for your buck’ argument may be persuasive. However, the specification of high-quality ventilation equipment also depends upon the method of procurement. And the building services industry currently seems far more comfortable with competitive tendering than with partnership-style relationships.

Tendering

Rhead, who has seen the good and bad of both types of relationship, says: “With both, you need the right contractors. It is easier for less ethically-minded contractors to screw the client – even if the client gets what he wants.

“A properly specified competitive tender should give the client the same project if the consultant does his job properly – but this is a big ‘if’. I have seen few contractors whose input into a partnered project justifies their increased profit from it.”

However, says Reilly: “Competitive tendering can put pressure on the successfully appointed team to deliver on the project within a tight budget. We

“If consultants stress that fan selection is based upon achieving improved energy performance and any changes could affect the ratings, then contractors and clients will listen.” – Jim Harrison

generally focus on working with the contracting team after appointment to form a good working relationship. We find having specific procurement and coordination workshops essential to ensure that the team stays focused.”

Reilly believes that consultants can smooth the procurement process by engaging the tendering parties at the earliest possible stage in order to define and clarify the design philosophy.

“Manufacturers are aware of our desire to reduce energy consumption and they will always strive to improve the quality of their product as it is the natural engineering evolution.

“We should be thoughtful in what we specify and about the budget we are working within. We should be aware of emerging technologies via CPD and to what ends they can benefit our project and clients, and not just specify the latest new trends.”

Harrison adds: “Consultants can help the procurement process by emphasising the need to achieve the requirements of Part L, to meet energy performance targets, and provide the client with greater feedback on cost in use. Manufacturers also



The method of procurement can have a big impact on the specification of a ventilation system

need to engage more with consultants on developing their products and getting them on side.”

Ant Wilson, director of sustainability at AECOM (formerly Faber Maunsell), goes further. He believes that too many consultants are happy to go to minimum acceptable standards because anything more can be perceived as over-design.

“We shouldn’t be looking at it this way,” he insists. “We should be aspiring for the best possible performance. Within budgetary constraints, we should be pursuing excellence in all we do.”

Supply chain

According to one fan maker, consultants are pivotal in setting up progressive supply chain arrangements because they can ensure that the correct product selections and the correct supply chain partner appointments are made.

Neil Yule, European sales director of Flakt Woods, says: “The technical review of the products has to be the most important part of the selection process. Consultants can work with client groups to help them structure the supply chain to pull together the best selection of products that are required for a typical HVAC system.

“Once that is in place, it is much easier from a consultant’s point of view because he hasn’t got to constantly recalibrate the design, since the suppliers at the beginning of the project will be there throughout.”

He adds: “If you look at a typical specification at the moment, I think rather too much of the description is about how the fan will be these dimensions and that pitch angle, etc, rather than going into the performance that comes from the product. Consultants should be much more prescriptive in terms of the real performance the product will provide – and, in some cases, that should include full life-cycle costs.” ●



Above, Jim Harrison of Hurleypalmerflatt; below, Ant Wilson of AECOM





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Renewable energy targets easily achieved with Dimplex ground source heat pumps

A business park on the south Cornish coast with a high level of energy efficient features to provide cost savings for occupiers has included Dimplex ground source heat pumps in its specification – and quickly achieved its renewable energy targets.

The Falmouth Business Park, a development from Priority Sites – a joint venture between Royal Bank of Scotland and English Partnerships – consists of 10 one- and two-storey units, giving 24,000ft² of self contained offices.

Robert Churchill, Priority Sites senior project manager, says: "Installing the Dimplex pumps was a really cost-effective way for us to achieve the renewable energy targets set as part of the planning consent for the site. We are introducing features that are more usually associated with larger scale commercial developments, but which will be important in helping lower the carbon footprint of these premises.

● Call 01489 773336, email: marketing@dimplex.co.uk or visit www.dimplex.co.uk

Hitachi launches air source heat pump

Hitachi Europe has launched Yutaki, an air source heat pump for the domestic heating market. Cheaper and easier to install than a ground source heat pump, Yutaki converts 1KW of consumption into 4KW of output. Likewise, CO₂ emissions can be reduced by up to 40 per cent compared to boiler-led systems.



Yutaki works with traditional radiators, under-floor heating and domestic hot water storage systems. It features built-in frost protection, Auto Summer Switch-Off and a one-touch Holiday button. It also has a screed drying function making it ideal for new builds. It comes with a five-year warranty from Hitachi.

● For more information, please call 01628 585394



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● Visit www.aircraftairhandling.com

LG slips in a new cassette

LG has added a handy new mini model to its comprehensive range of ceiling cassettes – a 1.6kw mini version. The company's established range of ceiling models are available from 2.5 to 15kw and are connectable; not only as single split systems in both inverter and non inverter configuration but also as twin, triple and double twin configuration.

The LG range has the shallowest cassettes on the market: at only eight inches deep these units can fit into the tightest of spaces and have completely independent louvre control



making drafts a thing of the past as blocking the airflow is a simple function operated from the remote control.

To aid with meeting health and safety objectives, there is now a remote control filter panel allowing the regular filter clean to be completed without any access equipment being required. Simply press a button and the filter drops down for cleaning; press the button and up the filter goes again.

● Visit www.lge.co.uk or call 01753 876772 to find out more

Thinking buildings? Think Grundfos

Enter the Grundfos' new web portal, www.grundfos.com/commercialbuilding, and see the all-new web window that will help to simplify pump selection by making available to you for the first time a 'one-stop shop' for commercial building services professionals that offers:

- **Product information:** find out more about specific Grundfos pump families and their areas of application;
- **Quick pump selection:** in just a few clicks you can select the pump(s) that best meets the needs of your particular application;

- **Downloads:** being able to find and download all the information you need when you need it is something that is now available to all visitors to the site; and
 - **Lexicon:** provides a quick reference guide to familiar and sometimes not-so-familiar industry terms.
- Call 01525 850000 or email: uk-sales@grundfos.com



Enjoy an energy saving silent night with the new M Series

The new energy-saving, AA-rated M Series models from Mitsubishi Electric offer a combination of cutting-edge inverter technologies with highly efficient heat exchangers to deliver remarkable energy efficiency at the quietest operation possible.

Mitsubishi Electric heat pump systems have always been among the quietest on the market and with its super-quiet 'Silent Mode' of operation at just 19dB, the MSZ-GE Series is now the quietest heat pump available.

The inverter-driven heat pump air conditioning units in the MSZ-GE range deliver exceptionally efficient heating or cooling. With a choice of 4 new indoor units that can be used in a single split system or as part of an MXZ Multi system, the line-up offers complete flexibility for smaller multi-room applications.

The heat exchanger capacities of the indoor and outdoor units have been increased to enhance overall heat exchange efficiency levels.

● Call 01707 282880 or email: air.conditioning@meuk.mee.com





MHIE gets top ratings for new wall mount split series

Substantial technical improvements place the new wall mounted SRK-ZIX inverter heat pump single splits from Mitsubishi Heavy Industries Europe (MHIE) among the top performers in air conditioning efficiency. Advanced technologies and remodelled indoor and outdoor units produce markedly better performance than earlier models – in both Energy Efficiency Rating (EER) for cooling and Coefficient of Performance (COP) for heating, with the industry's highest ratings in the range at 5.71 and 5.56 respectively.

● Call: 020 7842 8100 or visit www.mitsubishi-aircon.co.uk

Lochinvar fashions high efficiency solution with George

Leading boiler and water heater manufacturer Lochinvar has supplied high efficiency gas-fired equipment to top fashion brand, George, the clothing division of Asda.

Five Lochinvar CP-M high efficiency gas-fired condensing boilers, three 150kW and two 180kW plus two EcoKnight 115kW water heaters, have been installed at George House, the newly opened headquarters of the popular fashion label at Magna Park in Lutterworth, Leicestershire.

Selected for their high efficiency and low NOx



emissions, the products are providing space heating and hot water for the purpose-built 84,440 sq ft offices which include special fashion concept and development areas, a café, a shop and shower facilities for the comfort and convenience of the 521 employees based at the site.

David Pepper, managing director of Lochinvar, said:

"We've worked with a long list of UK retailers in the past, including Morrisons, Tesco, Marks & Spencer and House of Fraser, and are pleased to have our products selected for the new HQ of such a high profile fashion range as George."

● Call: +44 (0) 121 711 5000 or email: sarah@bright-consultancy.co.uk

New room thermostats have unique energy saving features

The new Honeywell DT90 range of wired and wireless digital room thermostats is a breakthrough in home heating control, with unique energy saving features.

Their TPI (Time Proportional and Integral) advanced energy saving control provides more accurate temperature control than traditional home



thermostats using a simple on/off control, and uniquely matches boiler firing to system load for more efficient boiler operation.

An ECO button gives timed setback to reduce energy demand when the user's lifestyle varies from the heating program.

A self-learning facility recognises how the heating system responds to its demand signals, then adjusts accordingly to give better control.

● Call: 01344 656511 or visit:

www.honeywelluk.com



Advanced Wolf AHUs from Walter Meier

As part of its exclusive distribution agreement with Wolf GmbH, Walter Meier (Climate UK) is offering Wolf's innovative KG Top range of air handling units (AHUs).

Across its 16 sizes, ranging from 2,100 m³/h to 100,000 m³/h, Wolf KG/KGW units

combine high-performance and low-energy consumption with sensible pricing and low cost of ownership. As such, they go far beyond the need to comply with standards and directives to encompass every detail of a project, from maximising design flexibility and optimising component size.

The KG Top range incorporates modular construction for greater flexibility, along with several other innovative features. For example, the company has used the filter dimensions of a standard 610mm x 610mm filter as the basis for all dimensions, so the cross-section of the unit can be fully utilised.

● Call: 01707 665088, email: paul@market-force.co.uk or visit: www.market-force.co.uk



Thermo-Floor turns up the heat at the Roundhouse

Thermo-Floor, the supplier of next-generation, energy-efficient underfloor heating and cooling solutions, has been working on the iconic new Roundhouse campus at Derby College. Neil Evans, general manager of Thermo-Floor, explains: "The transformation work taking place is an ambitious project to restore and revitalise the once-derelict grade II listed buildings on the site. We were brought on board to design, supply and install underfloor heating within the engine repair room. Thermo-Floor's system gives the Roundhouse the benefit of reduced energy bills and a healthier environment."

● Call 01455 203205 or visit www.thermo-floor.co.uk

Timoleon launches new fast and flexible system for underfloor heating pipes

The new ClipPlates now available from Timoleon have been purpose designed to speed the installation of high-efficiency underfloor heating systems.

For years, underfloor heating companies have sought to devise an effective means of holding the pipework firmly in place in whatever configuration may be required. The early method of tying the pipes to a wire mesh required intensive backbreaking labour, but attempts to improve on it by



developing clip plates often brought their own problems with the plates distorting under the tension caused by the looped pipes.

● Call: 01392 363605 or email: projects@timoleon.ltd.uk

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New Powerplus from Seaward sets new standards in 17th edition testing

Seaward's PowerPlus 1557 is the electrical industry's first fully-integrated, 17th edition test-and-inspection unit.

This unique tester incorporates electronic versions of all main test certificates so that test data is automatically entered into the correct certificate fields as testing is undertaken.

This unique solution eliminates the need for separate manual recording of results on a dummy certificate with a pencil and paper – and means that PDA recording devices are not required.

The lightweight PowerPlus 1557 multifunction tester has been designed for maximum portability and ease-of-use. Unique onboard electronic certificate software enables test data to be recorded directly by the tester using a replica of the inspection and test certificate.

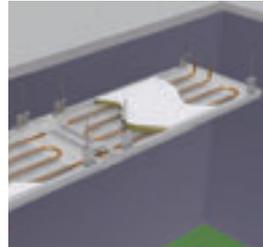
The certificate assistance also holds many of the commonly used tabulated values, such as earth loop impedance tables.

● Call +44 (0) 191 586 3511, email: sales@seaward.co.uk or visit www.seaward.co.uk

New CIBSE-recognised Radiant Heating CPD

SAS International has developed a new CIBSE-recognised CPD presentation on the theme of radiant heating. Ceiling-mounted radiant heating panels (RHPs) are produced by HCP, the specialist heating division of SAS International.

Designed to inform both engineers and architects, the presentation provides an introduction and overview of energy-efficient radiant heating panels (RHPs). It includes how RHPs work, performance and applications, technical specifications, and design considerations when specifying.



Radiant Heating solutions are increasingly specified in the healthcare and educational sectors, where the benefits of freeing up floor and wall space, and integration with natural ventilation strategies are well recognised. Additionally RHPs can contribute towards reduced cleaning regimes and help meet infection control targets by reducing the cross infection risks associated with other systems.

You can book a radiant heating CPD by emailing cpd@sasint.co.uk or calling 0118 929 0900.

● For further information on radiant heating panels visit: www.hcp-sasint.co.uk/radiant-heating.htm



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Torin-Sifan launches innovative EC technology Fandeck range

Air movement specialist, Torin-Sifan, has launched the next generation of EC technology double and single shafted Fandeck solutions. Designed for a variety of applications including fan coils, air curtains and air handlers, the 230v EC Fandeck range

boasts the lowest specific fan powers as well as providing the lowest noise levels in its class. This is combined with fully integrated EMC filtering and optional PFC within the onboard electronics package, which avoids the cost of additional harmonic filtering and is supported by extremely versatile 0-10v speed control capabilities.

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● Call +44 (0) 1793 524291 or visit: www.torin-sifan.com

Pracht and Sill show true grit

Ervin Amasteel, one of the largest international manufacturers of steel abrasives, has recently specified Sill Lighting to provide high quality, robust luminaires to its UK plant in Tipton.

Aggressive conditions in the plant meant a lighting system was needed to endure temperatures of up to 50°C as well as withstand the damp and dusty environment and vibrations caused by machinery.

Imola luminaires from Pracht, supported in the UK by Sill Lighting, were specified for their easy maintenance and IP65 protection rating

making them dust-proof and jet-proof. Instead of three-metre long gaskets, always the weak point of conventional fittings, the Pracht system has two small 45mm o-rings making them much better sealed against the rigours of heavy industry.

● Call 01844 260006, email: sales@sill-uk.com, or visit: www.sill-uk.com



Consulting engineering practice specifies Raychem HWAT for its own building

When consulting engineering practice Henderson Green was fitting out the company's own new offices at Carlton Crescent, Southampton, it was obvious that it would be using its expert knowledge to specify high-performance building services.

This was evident in its choice of Raychem HWAT hot water temperature maintenance for delivering instant hot water throughout the building, using a heat-traced single pipe system.

Manufactured by Tyco Thermal Controls, the Raychem HWAT self-regulating heat-tracing system is a simple, intelligent and energy-efficient means of delivering instant hot water at every hot tap, including those on 'dead legs'.

● Call: 0800 969013 or email: salesUK@tycothermal.com

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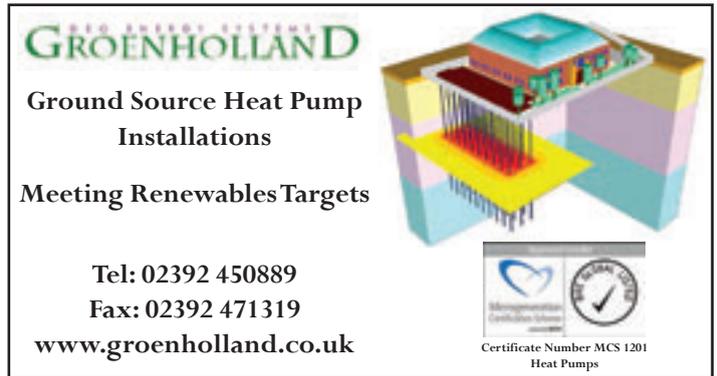
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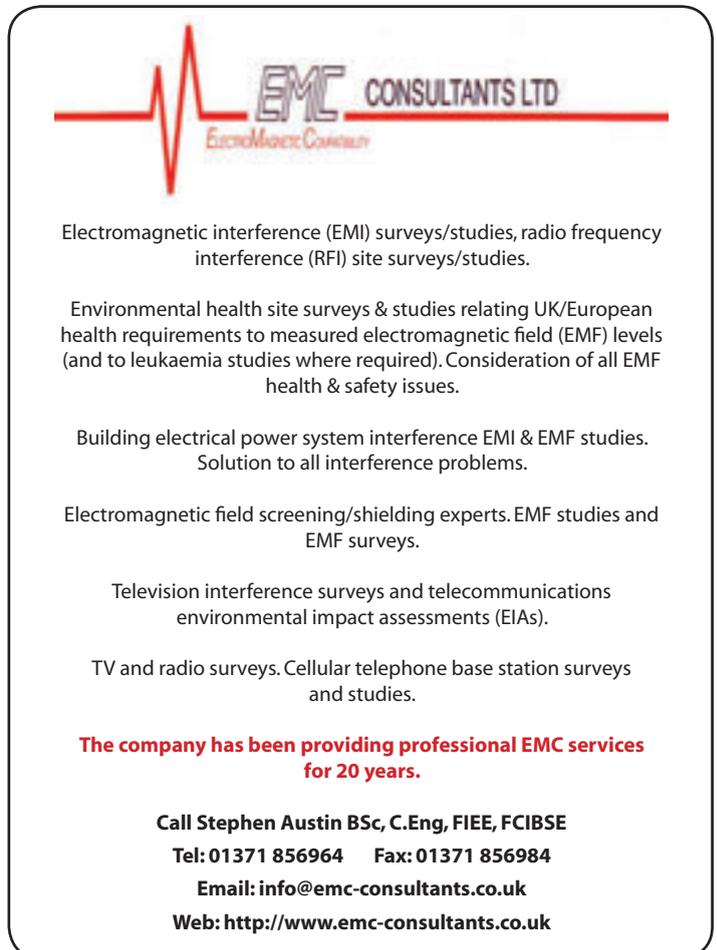


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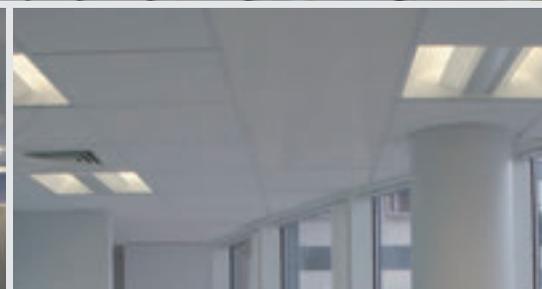


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Radiant heating panels

This CPD article considers the attributes and applications of low-temperature radiant heating panels as an aid to cutting the carbon dioxide emissions of buildings

The use of radiant heating panels in buildings can provide an energy-efficient and space saving solution, contributing to reduced energy in a building, helping to meet the TER (Target CO₂ Emission Rate) as well as lowering its operational energy use.

Radiant heating was traditionally associated with gas-fired or steam-supplied high-temperature, high-roofed industrial applications; however, ceiling-based low-temperature radiant heating is now regularly applied to the healthcare, educational and secure facility sectors.

Reducing the building heat loss

To determine the predicted heat loss using the CIBSE Simple Method^[1] the following relationship is used:

$$\Phi_t = [F_{1cu} \Sigma(AU) + F_{2cu} C_v] (\theta_c - \theta_{ao})$$

where Φ_t is the total heat loss (W), F_{1cu} and F_{2cu} are factors that are related to the type of heat source, $\Sigma(AU)$ is the sum of the products of the surface area and corresponding U value for each surface where there is a heat flow (W · K⁻¹), C_v is the ventilation coefficient (W · K⁻¹), θ_c is the operative temperature in

the centre of the room (°C) and θ_{ao} is the outside air temperature (°C).

The factors F_{1cu} and F_{2cu} may be obtained from:

$$F_{1cu} = \frac{3(C_v + 6\Sigma A)}{\Sigma(AU) + 18\Sigma A + 1.5R[3C_v + \Sigma(AU)]}$$

and

$$F_{2cu} = \frac{\Sigma(AU) + 18\Sigma A}{\Sigma(AU) + 18\Sigma A + 1.5R[3C_v + \Sigma(AU)]}$$

and where $\Sigma(A)$ is the total area through which heat flows (m²), and R is the radiant fraction of the heat source; this will have a high value for radiant heat sources (with a maximum value of 1 for a pure radiant source) and a low value for predominantly convective sources (right down to of zero for forced air heaters).

In many cases when undertaking building heat loss calculations the two factors F_{1cu} and F_{2cu} practically have a value of 1 and so the heat loss expression reverts to the time honoured simplification of:

$$\Phi_t = [\Sigma(AU) + C_v] (\theta_c - \theta_{ao})$$

However, when examining the equations for F_{1cu} and F_{2cu} it can be seen that, as the value of R increases, both factors will get smaller. Similarly, a combination of a high

radiant fraction, R, with high ventilation coefficient, C_v (i.e. high air change rate), will reduce the value of the factors F_{1cu} and F_{2cu} . When high values of R and C_v are combined in large volume spaces and particularly for those with relatively small values of $\Sigma(AU)$ (i.e. low U values and/or relatively small external envelopes compared with the room volume) – there will significantly lower calculated heat losses due to the higher emitter radiant fraction.

Typical wall mounted emitters (erroneously called 'radiators') will emit 80 to 90 per cent of the heat convectively and just 10 to 20 per cent by radiant heat transfer – i.e. a low radiant fraction of 0.2. In comparison, flat plate radiant heating panels (typically ceiling mounted) will emit predominantly infrared radiation (radiant heat) – likely to be at least 67 per cent radiant – i.e. have a high radiant factor, R, of 0.67.

This radiation will travel in all directions from the panel's surface and passes through the air with virtually no absorption of heat. The radiation is then absorbed by any non-reflective surfaces; any reflected heat will be subsequently absorbed when striking >

> another surface. So the predominant (radiant) heat transfer will be transferred directly to the room occupants, contents and surfaces.

Thermal comfort

The standard index of thermal comfort for moderate environments is the operative temperature, θ_c , (formerly known as dry resultant temperature). Operative temperature (at room air velocities of below $0.1 \text{ m} \cdot \text{s}^{-1}$) is given as $\theta_c = (\theta_{ai} + \theta_r)/2$, where θ_r is the mean radiant temperature in the room (degrees C).

Using the CIBSE simple model for heat losses, the predicted internal air temperature, θ_{ai} , and mean radiant temperature, θ_r , may be evaluated for rooms using:

$$\theta_{ai} = \frac{\Phi_t(1-1.5R) + C_v\theta_{ao} + 6\sum A\theta_c}{C_v + 6\sum A}$$

and $\theta_r = 2\theta_c - \theta_{ai}$

Where $\sum(A)$ is the area of the room surfaces through which heat flow (m^2). Hence rooms can be examined to determine the effect of the emitter type on all the key parameters that make up the thermal environment when heating the space. As the radiant fraction of an emitter increases (for example if a convector type heater is replaced by a radiant type), and the operative temperature is controlled, the value of mean radiant temperature θ_r will rise, the air temperature θ_{ai} will fall. As a result of the increase in the radiant temperature, the air within a space θ_{ai} will not need heating to the same temperature as would be required with a more convective type of heating system to maintain the same comfort temperature θ_c . This is likely to be reflected in reduced energy use.

Particularly when there is sedentary occupation (for example people sitting in offices) the radiant temperature asymmetry (the difference in the perceived radiant temperature from different directions) is recommended to be below 10K to ensure reasonable comfort. Appropriate positioning of the radiant panels (for example mounted at high level around the perimeter of the space) can significantly reduce potential problems from temperature asymmetry^[2]. However care needs to be taken to ensure that they are not mounted too low. If mounted too low, occupants may complain of excessive temperatures above their head; if mounted too high, occupants may not feel the full heating benefit. For example, in a typical office or hospital environment, where occupants remain reasonably static, a manufacturer^[3] recommends a minimum mounting height of 2.7m.

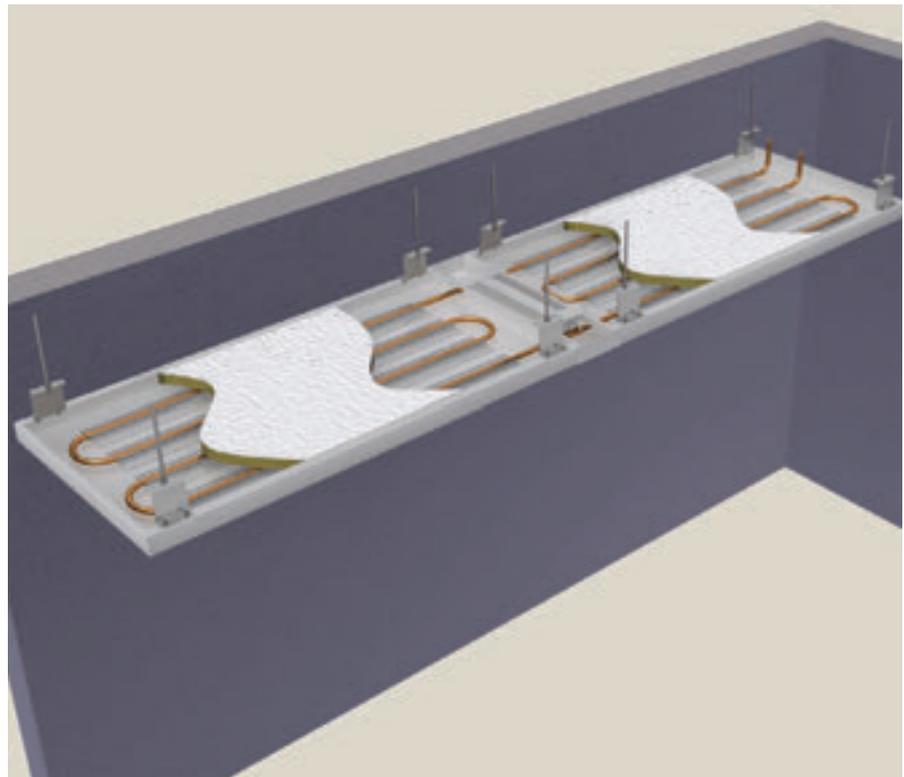


Figure 1 Typical radiant heating panel construction

The make-up and selection of radiant heating panels

Radiant heating panels are most frequently heated by low-pressure/temperature hot water (LPHW) and are manufactured from steel or aluminium panels that may normally be factory finished to suit the building's décor. A typical radiant heating panel consists of a serpentine copper tube intimately fixed to the rear of a metal panel (see Figure 1).

This construction ensures effective contact between the heating element and the radiating surface, and maximises the thermal transfer to the face of the panel. A foil faced insulation pad above the serpentine pipe reduces the convected and radiated heat from the upper surface of the panel.

Panels are available in a variety of shapes and sizes, typically ranging from widths of 300mm to lengths of 9,000mm.

The output from a radiant panel will be predominantly radiant, but there will also be some convective heat output from the panel's surface due to air movement in the room. Radiant heat transfer is determined by the panel emissivity (this is the ability of the panel to radiate heat compared with that of a radiant 'black body'), which would typically exceed 0.9, and the difference between the panel mean surface temperature and the mean radiant temperature, and emissivity of the surfaces in the room below. It has been shown that altering the emissivities of the room surfaces practically has a relatively

small effect on the heat output of the panel.^[4]

The convective heat transfer is rather more difficult to evaluate, and will be related to a number of variables including: the surface convective heat transfer coefficient; the adjacent air temperature and speed; and the direction of heat flow. CIBSE Guide B^[5] provides tables of both the radiant and convective heat transfer from flat panels. Potentially surface mounted radiant panels will emit between 400 and 600 $\text{W} \cdot \text{m}^{-2}$ at typical office temperatures.

Manufacturers' data will typically quote a mean water temperature and a 'room temperature' to enable their equipment to be sized. From the preceding discussion it is clear that it is challenging to provide a predictable value of output. However, empirical data presented by reputable manufacturers should provide a reasonably simple selection method using values obtained from standardised laboratory tests. The relatively fast thermal response of the panels will mean that they can be quickly controlled to satisfy and match changing conditions in the space, so reducing the detrimental consequences of oversized panels.

It is important to note that, when panels are installed vertically, e.g. as wall panels, or freely suspended from the soffit, the heat output is likely to increase over that for those installed in a suspended ceilings, since air movement across the face of the panels increases the convective output.



Figure 2: Suspended module including radiant heating, lighting and acoustic absorption material

Application of radiant heating panels

Radiant heating panels can be surface-mounted, freely suspended or integrated within a suspended ceiling, and can be linked to each other with pipework joined by push-fit flexible hoses. Panels may be grouped to provide zone control (for energy efficiency and comfort); directly controlled by thermostatic valves; or linked into a central control system.

The arrangement of the panels affects the water flow resistance; the actual pressure drop will be similar to that for an equivalent length of plain tube – hence it is preferable to arrange panels in parallel (as opposed to series) to minimise operational pressure drop and pumping costs.

The panels, which may be curved and profiled to satisfy aesthetic requirements, weigh approximately 15kg per sq m (depending on manufacturer), and can be suspended using drop rods, grip wire or chain. The exact method of suspension will be determined by their application.

By mounting the heating system at high level, the flexibility of the use of the occupied space is improved, whilst at the same time reducing potential damage and tampering – hence reducing maintenance requirements and associated costs. The removal of heating surfaces from the reach of occupants also reduces potential for injury.

Since the heat transfer mode is predominantly radiant, there are fewer parasitic draughts reducing unwanted air movement in the space, for example in controlled environments, such as laboratories and clean rooms, where air and dust movement must be kept to a minimum, and also where there are specific air movement regimes required for infection control.

As with other LPHW systems, radiant panels create almost no noise; this can be advantageous in areas such as sound studios, theatrical, educational and healthcare establishments.

Radiant panels are suitable for both new build and refurbishment projects. By increasing the amount of floor area available (by, for example, removing a traditional low level perimeter heating system) net lettable area can be increased, and space flexibility may also improve.

Radiant panels can be particularly suitable for the healthcare sector. Anti-bacterial paint finishes are available, which inhibit the growth of micro-organisms. Wards are hence easier to clean, requiring no removal of guards (as would be present in low level systems), and aiding infection control by reducing the cross-infection risks that may be associated with other systems. Anti-ligature panels may be used in secure facilities, such as mental health units, and prisons, to minimise the risks of self-harm.

Naturally ventilated buildings can successfully employ high-level radiant panels particularly when combined with acoustic lighting rafts (see Figure 2). Services are kept at high level, and rafts allow air to circulate, leaving concrete soffits exposed.

Conclusion

Radiant heating panels are suitable for a wide range of applications, particularly in the healthcare and educational sectors, and can help to reduce energy consumption and hence carbon emissions. As a result they can help meet TERs to satisfy building regulation requirements while ensuring performance and comfort levels are maintained.

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With thanks to John Staunton of HCP, a division of SAS International

References

- [1] *CIBSE Guide A – Environmental Design*. CIBSE, 2006.
- [2] A, Day, Ratcliffe M, and Shepherd K, *Heating Systems, Plant and Control*. WileyBlackwell, 2003.
- [3] HCP, *HCP Technical Guidance*, 2009.
- [4] Kirby, Watson, *Radiant heating and cooling handbook*. McGraw-Hill Inc, 2000.
- [5] *CIBSE Guide B – Heating, ventilating, air conditioning and refrigeration*, CIBSE. 2005.



1. Which of these is unlikely to be true when using the CIBSE simple method to calculate a room heat loss?

- A A more radiant heat source (higher R value) will have a lower calculated heat loss.
- B In many cases factors F_{1cu} and F_{2cu} are close to a value of 1
- C A more convective heat source (lower R value) will have a lower calculated heat loss.
- D As ventilation coefficient, CV rises calculated heat loss will rise
- E As $\Sigma(AU)$ rises the heat loss will increase

2. When considering the heat transfer associated with room heating equipment, which of these is unlikely to be true?

- A Radiant heat passes through the air with little absorption of heat
- B Traditional wall mounted or floor standing 'Column radiators' are likely to have a high radiant fraction
- C Radiant heat will be absorbed directly by solid surfaces
- D Some radiant heat will be reflected before finally being absorbed
- E Flat plate radiant heaters will emit infrared radiation

3. A top floor room (20m x 10m x 3m with one outside wall) heated by a radiant heater with R of 0.9 has the following characteristics and a calculated heat loss of 4855 W. What is the room air temperature likely to be (to the nearest whole number)?

$\Sigma(A) = 245m^2$, $C_v = 120 W \cdot K^{-1}$, $\Sigma(AU) = 84.5 W \cdot K^{-1}$, $\theta_{ao} = -4^\circ C$, $\theta_c = 21^\circ C$

- A $-4^\circ C$ D $21^\circ C$
- B $14^\circ C$ E $24^\circ C$
- C $18^\circ C$

4. Which of these is unlikely to be a feature of a radiant panel?

- A Can be decoratively finished to suit décor
- B Likely to be steel or aluminium panel
- C Uses pipe attached intimately with the rear of the panel to supply heat from the LPHW distribution system
- D Does not have any convective heat output
- E Typically has a slow thermal response

5. The benefits of using high level radiant panels are likely to include of all these except one – which one?

- A They directly promote significant air movement
- B Relatively easy to clean
- C Kept out of reach of occupants reducing risks of injury and damage
- D Can be used in conjunction with exposed thermal mass of concrete soffits
- E Potential to increase net lettable area compared with other floor/wall mounted systems

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Burton Hospitals NHS Foundation Trust is committed to safeguarding and promoting the welfare of children, young people and vulnerable adults and expects all staff and volunteers to share this commitment. As part of our safe recruitment practice the Trust will apply for a criminal records disclosure from the CRB for all posts with patient contact.

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Our established architectural design department includes a mechanical and electrical design capability. As a chartered mechanical building services engineer, you will assist the Principal Services Engineer in taking forward the ethos and design capability of this section, and planning and delivering the services works programme.

The remit involves designing new and refurbishing/ replacing existing installations, and providing guidance and advice on maintenance of mechanical systems. Building types involved are educational, leisure, sport, cultural, community etc.

You will have, or be working toward, chartered status, and be capable of designing a wide variety of mechanical services installations, including those of a more specialised nature such as ice rink or swimming pool plant. You must also have extensive experience in site inspections during services works and an ability to trouble-shoot and diagnose system malfunctions.

You should have an interest in sustainable energy solutions and a good grounding in design solutions that minimise carbon emissions in line with EU directives, in order to assist the department in developing a council-wide energy use strategy.

Good communication skills and the ability to prioritise your workload and work under pressure are essential.

A relocation package up to £5,000 may be available.

A current driving licence is essential.

For an informal discussion, please contact Sue Best on 01387 731000.

Closing date: 29 June 2009.

Application forms available from Jobcentre Plus or Staffing Section, Combined Services, Marchmount House, Marchmount, Dumfries on (01387) 731000, email: commercialpersonnel@dumgal.gov.uk to whom they should be returned or apply online.

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ESTATES MAINTENANCE SERVICES

SENIOR BUILDING SERVICES ENGINEER

REF: 6141

£34,435 - £43,622 pa

With responsibility for a Building Services maintenance section, you will ensure a co-ordinated, customer-focused approach and the operational estate is maintained within budgetary limits, service standard requirements and with due regard to the University safety policy.

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For informal enquiries please contact Mr. Richard Thomas, Head of Estates Maintenance Services on (0116) 250 6426.

For this vacancy please use the application for support posts.

Application forms and further details are available from our website: www.jobs-dmu.co.uk Alternatively telephone (0116) 250 6433 (24 hour answerphone). Please quote the reference number.

Closing date: 21 June 2009.

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Head of Mechanical & Electrical Services

This is an excellent opportunity for an ambitious Engineer to join a National professional multidisciplinary business.

The position is a key appointment that demands a highly ambitious, self motivated individual capable of managing and developing a leading Mechanical & Electrical department. Current fee income of the department is circa £1 million per annum and the new Head of Department will be tasked with significantly developing this.

Working from the Nottingham office the challenge will be to continue to raise and develop the profile of the department, particularly through the Practice's large Client portfolio, and to introduce new clients, whilst maintaining the very high standard of service currently delivered by the department.

Since the formation of the department in 2000 it has been staffed predominantly with Engineers from Design & Build Contracting organisations, ensuring a unique approach and understanding of not only design and installation but also of cost, programme and project delivery. It is the Practice's desire to maintain this theme through the next stage of its development.

The candidate should preferably therefore have experience and an understanding of the design & build contracting environment in terms of design, installation and estimating functions. In addition the role will require familiarity with IT packages such as Hevacomp, Microsoft Office, AutoCAD.

The remuneration package is commensurate with the seniority of this role and there are excellent future career opportunities within the Practice.

All applicants should telephone Gary Carey (0121 454 3515) in the first instance for an initial discussion or write enclosing a full CV to: Edmond Shipway, 16 Greenfield Crescent, Edgbaston, Birmingham B15 3AU

E-mail: gary.carey@shipway.co.uk

Web: www.edmondshipway.co.uk

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Applicants should be competent in the use of AutoCAD® as well as HVAC design, spreadsheet and word processing software. We are looking for an ambitious engineer who is able to demonstrate personal drive and commitment to build on our success.

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Or fax to: (441) 292 3784
email: rmason@wal.bm
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If you are looking for a new role or have been struggling to find a new position call us for a free appraisal of your CV and update information about the M&E Market today. A well written and well presented CV can make all the difference. With an increasingly competitive candidate market you need to give yourself the best opportunity!

Mechanical Associate | Manchester | to £55k | ref: 1880

Our client, a leading multi-disciplinary consultancy is looking for an experienced mechanical design engineer to lead a project team. You will have experience with education and healthcare projects and also have a hands on approach to design. Chartered status essential! An excellent opportunity!

Electrical Design Engineer | London | to £55k | ref: 3665

A multi-disciplinary consultancy, our client is looking for candidates experienced in the design of power systems. You will support the team to develop conceptual designs for electrical distribution systems from EHV, HV, MV to Low Voltage, incorporating high voltage equipment, generation equipment, UPS plant, low voltage switchgear and power control and monitoring systems.

Mechanical or Electrical Design Engineers | South Coast | £NEG! | ref: 1660

Our client is a leading consultancy specialising in healthcare and education projects. They are currently looking for senior level mechanical and electrical engineers to join their busy team. Chartered status is desirable but not essential.

Security Cleared M&E Candidates | Surrey & Berks | £High! | ref: 1568

We have a number of projects requiring candidates with recent or current security clearance. We are looking for candidates with Mechanical or Electrical backgrounds in all disciplines including; design engineers, cad technicians, surveyors and project managers. Long term projects and competitive packages available.

For more information or a confidential discussion please contact Mark Butter

T: 02392 603030

E: mark.butter@blueprintrecruit.com www.blueprintrecruit.com

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OR Consulting is a small London based building services practise specialising in the engineering of low carbon buildings. Our team combines a passion for engineering with a practical, pragmatic approach, to deliver high quality and efficient solutions.

OR Consulting is involved in a varied range of projects and are currently seeking dynamic engineers who can contribute to our team. The candidates must be customer focussed, creative, resourceful, and be able to work both independently and as part of a close knit team.

The following opportunities exist:

Part Time Electrical Engineer

This vacancy is suited to an experienced electrical engineer, who is seeking to balance their professional role with other commitments. The candidate shall have both a knowledge of all current legislation and a flair for working within a design team to create fully integrated design solutions.

Intermediate Mechanical Engineer

This vacancy is suited to an engineering graduate with experience in building services, sustainability or a related subject, who is seeking an opportunity to develop within a young practise. The candidate shall be able to independently interrogate design challenges and present proposals for their solution.

For more details of each opportunity, please forward your CV and cover letter to: info@orconsult.co.uk

www.orconsult.co.uk

OR Consulting Engineers
Alternative solutions for the built environment



We are pleased to announce that Paul Bartlett MREC who has over 20 years recruitment experience within the Building Services sector has joined Oracle Global.

Electrical Building Services Design Engineer
£30,000 - £40,000

West Sussex

You will be fully conversant with detailed electrical design along with lighting and cable calculations using Amtech, and Dialux software. Working on an Education project, the ideal candidate will be chartered and have experience with attending site meetings, undertaking site surveys and involved in the design, selection and sizing of electrical aspects of building services such as lighting, small power systems, emergency lighting and power distribution systems.

Contact: Jamie Argyle 020 7033 1046/07920 801767

Principal Acoustic Engineer / Head of Acoustic Engineering
£45,000 - £52,000

London or Surrey

As a proven Acoustic Engineer, ideally MIOA, with previous exposure of carrying out noise surveys, i.e. external - environmental noise, plant noise, etc., internal room criteria, reverberations time, wall sound reduction index, good working knowledge of current acoustic standards, HTM 1801, BB93 (schools), BS 4142, etc. and to be able to apply these to design work, liaise with manufacturers, suppliers and contractors, represent the firm at site meetings, undertake site inspections, valuations and commissioning.

Contact: Jamie Argyle 020 7033 1046/07920 801767

Intermediate & Senior M&E Design Engineers
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Middlesex/NW London

An established Building Services Consultant is looking to recruit M&E Design Engineers who have an interest and can demonstrate previous experience within Sustainable and Low Energy issues. They have been associated with a diverse range of Projects throughout the UK, Europe and the Far East including Retail, Commercial, Healthcare, Transportation and Education.

Contact: Paul Bartlett 01483 654469/07947 246262

Sustainable/Environmental Engineers/Building Physicists
£28,000 - £45,000 & benefits

London & HC

Ensuring Buildings are kept up to latest legislations consuming less energy and producing minimal emissions, we have been retained by various Consultants to recruit individuals with knowledge of traditional Design principals combined with an interest on providing a greener environment. Areas of interest include EcoHomes, Thermal Modelling, Part L Regulations, BREEAM, SAP Assessments, CFD, Low Carbon Designs and Renewable Energy.

Contact: Paul Bartlett 01483 654469/07947 246262

For more information on the above positions or other opportunities within Design please contact:

Jamie Argyle MREC on 0207 033 1046/07920 801767 jamie.argyle@oracleglobal.com

Paul Bartlett MREC on 01483 654469/07947 246262 paul.bartlett@oracleglobal.com

For current positions and opportunities within Building Services Contracting please contact:

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20 years on

Continuing our new 'day in the life of' series, **David Atkinson** describes what it's like to be a principal engineer at international building services consultancy, AECOM



Family man David Atkinson has worked at Aecom (formerly Faber Maunsell) all his working life.

He joined in 1989 as a 'skinny, spotty, 16-year-old', working at Oscar Faber in Altrincham. Now he is a principal engineer, I Eng, and ACIBSE, working on projects such as Media City in Salford – the new home to the BBC, involving the relocation of 2,500 key staff and anticipated to be one of the largest media cities in Europe.

AECOM's involvement includes the full design of three BBC buildings, totalling an area of 44,000m², containing offices and radio studios, a 24,000m² studio block and a multi-storey car park containing 2,300 car spaces over 11 floors.

As one of the lead mechanical engineers on the BBC buildings, Atkinson's involvement has included designing a number of services, including heating, water services, active beam systems, ventilation, and the broadcast-critical areas including radio studios, presentation areas and IT rooms.

Atkinson says his working week changes to suit the stage of a project. During the early design stage he is 100-per-cent office bound but, as time progresses, he may attend meetings with the architect, structural engineer or possibly at another AECOM office.

Once a project is in the construction stage, his time can then be split between the office and the site.

As the BBC buildings reach commissioning stage, a typical day for Atkinson includes answering queries from the sub-contractor installing the plant. But, prior to commissioning, he says the queries are generally on the finer elements of the services design, such as minor modifications to ease co-ordination, checking the contractors proposed installation drawings, and reviewing air and water flow-rates ready for the commissioning process. This is ongoing and will carry on until project completion in 2010.

The end result will enable the contractors to complete full installation and commission the systems based on Aecom's design flow-rates. He says: "Projects can be so different, and have such a broad range of service requirements. I consider all projects that I work on to be a challenge.

"The most enjoyable part of my job is attending site and seeing my designs actually being installed. From the initial design stage to construction, and then commenting on a contractor's proposed installation drawings – it's great to be in a position to see a project through, from scheme design to commissioned installation."

Movers & Shakers



Keith Armstrong has been appointed as the new CIBSE north east regional chairman.

Armstrong, a regional director with AECOM, has been a CIBSE member since 1992. Taking up the reigns from outgoing chairman, Sam Collard, Armstrong will hold the position for a year, not only chairing the regional committee meetings but also representing the interests of CIBSE's north east membership at a national level.



Stuart Lington has joined NG Bailey as managing director of its maintenance division.

He has more than 20 years' experience in the maintenance industry. Now Lington will play a key role in growing and moving the maintenance division of NG Bailey, a building services business, forward.



Jay Doo has joined AECOM as associate director and mechanical services leader. He will be based in the

Auckland branch and will help raise the profile of the international engineering consultancy's New Zealand health engineering group.

Professor Deian Hopkin is retiring as vice chancellor and chief executive of London South Bank University.

Having held the position since 2001, he has now accepted an Honorary Fellowship from CIBSE.

Past CIBSE president David Hughes said: "We at CIBSE regard Deian as a friend and colleague and congratulate him in crossing the boundary from arts to engineering and for accepting an Honorary Fellowship of our institution."



Stuart Parker has been appointed by design and engineering specialist Morgan Professional Services (MPS) as business development executive in

Scotland. Parker joins MPS from Odin Consulting Engineers, where he was associate director. He will now be responsible for developing new business opportunities for MPS in Scotland, where the company provides design and engineering services for major construction projects.



Engineering and environmental consultant Gifford has appointed **Tim Stidwill** as technical director of its

structural engineering team in Birmingham.

Stidwill, a qualified and experienced chartered engineer, joins Gifford from Ramboll Whitbybird. He was director of the firm's Birmingham office, which he set up and managed.

In his new post he will work alongside the structural design team.



Ken Dalton is the new chief executive for AECOM Europe after engineering consultants Faber Maunsell rebranded to share its parent company's name last month.

Dalton will now be responsible for the European division.



Stephen Lisk has been inaugurated as the new president of the Society of Light and Lighting (SLL).

This year is the SLL's centenary and during his presidential address Lisk said it was an honour to be at the helm, outlining the group's history, present tasks and the future challenges ahead.

International engineering consultants AECOM has appointed **Graham Fairley** to head its Façade Engineering Group. Fairley has experience in the technical, management and procurement aspects of projects, having worked at a number of consultancies. Being an architect by trade, Fairley will now be able to fuse together the technical and design aspirations in AECOM's (formerly Faber Maunsell) future projects.

Email your latest people appointments and role profiles to cbailey@cibsejournal.com



THE CIBSE LOW CARBON PERFORMANCE AWARDS | 2010

CALL FOR ENTRIES

The CIBSE Low Carbon Performance Awards recognise and reward proven achievements in delivering carbon savings in buildings. Showcasing innovative and inspirational low carbon solutions the awards highlight carbon reduction in both the design and management of buildings.

Categories include:

- New build of the year
- Refurbishment of the year
- Design/ technical innovation of the year
- Product of the year
- Low Carbon Consultant of the year (only open to CIBSE LCCs)
- Low Carbon Energy Assessor of the year – EPC (only open to CIBSE LCEAs)
- Low Carbon Energy Assessor of the year – DEC (only open to CIBSE LCEAs)
- Client of the year – Energy performance
- Client of the year – Low carbon operation
- Low Carbon Manager of the year

Ensure your projects get the attention they deserve and join your fellow professionals at the forefront of the industry: deadline for entries is 30th October 2009 and awards will be presented in February 2010 at a high profile ceremony at London's Grosvenor House Hotel.

For more information on entry criteria or to enter visit

www.cibse.org/awards2010



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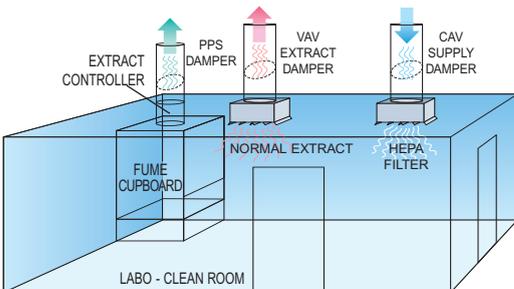


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