

# CONSTRUCTING THE FUTURE

bre

## Issue 30

**Low carbon buildings**

**SmartLIFE affordable housing project**

Fire performance of external cladding

Welsh construction – working for Wales

Innovation application

The Eurocodes revolution

Sustainability through planning – BREEAM Developments

AUTUMN 2006 ISSUE 30

# Contents

<b>Comment</b>	<b>1</b>
<b>News</b>	<b>2</b>
<b>Welsh construction – working for Wales</b>	<b>5</b>
While worth an estimated £2 billion a year to the Welsh economy, the construction industry has the potential to contribute far more.	
<b>Innovation application</b>	<b>6</b>
Improved awareness and understanding of new and emerging technologies could enhance the quality of the UK's built environment.	
<b>Low carbon buildings: programmed to succeed</b>	<b>7</b>
The DTI's Low Carbon Buildings Programme will provide millions of pounds for the installation of energy microgeneration technologies in buildings. Kirk Archibald, Low Carbon Buildings Programme manager, explains how the scheme works.	
<b>Fire performance of external cladding</b>	<b>9</b>
While fires in multi-storey buildings are rare, they can be very hazardous – particularly when able to spread via the external cladding system.	
<b>SmartLIFE affordable housing project</b>	<b>11</b>
A pioneering new housing project in Fenland could usher in an approach to affordable house building that emphasises sustainability and environmental performance, as well as comfortable community living.	
<b>Sustainability through planning – BREEAM Developments</b>	<b>13</b>
The enormous breadth of issues involved in sustainable development, presents problems for local authorities and developers alike.	
<b>The Eurocode revolution</b>	<b>14</b>
Eurocodes will soon revolutionise how most of the world designs its buildings and civil engineering structures	

## Free subscriptions

Subscribe to free quarterly issues of *Constructing the future*, and/or a monthly E-newsletter service giving concise news of built environment developments, events, training and publications. Simply register at [www.bre.co.uk/register.jsp](http://www.bre.co.uk/register.jsp)

*Constructing the future* is published by BRE, the UK's leading centre of expertise on the built environment, construction, energy use in buildings, fire prevention and control, and risk management. BRE is owned by the BRE Trust, a registered charity with a mission to champion excellence and innovation in the built environment for the benefit of all.  
ISSN 1465-3788

Editor: Tom Harvey, [E.harveyt@bre.co.uk](mailto:E.harveyt@bre.co.uk)  
BRE: [www.bre.co.uk](http://www.bre.co.uk)  
Design: OPX, London, T 020 7729 6295, [www.opx.co.uk](http://www.opx.co.uk)  
Printing: Croxsons Sheetfed, T 01494 777900, [E.info@croxsons.co.uk](mailto:E.info@croxsons.co.uk)

# Comment

## Green is a good investment

Ten years ago it would have been inconceivable that we would discuss eco-innovation with the financial services and investment sector. It was seen as an exclusively 'green' subject for niche manufacturers and well-meaning greens, definitely not for mainstream consideration.

But eco-technologies are now recognised as the technologies of the future, and it is clear that solutions that make us greener and leaner is a growth market.

I believe that in ten years' time eco-technologies will be taken for granted in mainstream business models, the way that information technologies are now. The parallels with the early days of the IT industry are remarkable, because the core developments in world-changing technology are not being driven by global multi-nationals with huge research budgets, but by entrepreneurs and SMEs working out of university technology parks and light industrial units.

Great efforts are being made by national, regional and local level government, in conjunction with the whole range of private sector organisations, to promote SME-sector growth. Meanwhile venture capital firms are actively supporting eco-innovation, and funds are available for businesses demonstrating commercial viability and clear growth strategies.

In fact the success of specialist funds is generating a lot of attention. In the UK, as in the US, clean-tech is already the fifth largest 'sector' for investment.

The City of London Corporation believes the City has a vital role in supporting this new and burgeoning sector, and we will continue to work with our partners in business, in government and in NGOs, to realise its potential. One of our most visible commitments to this is the Sustainable City Awards, established in 2001 and run in partnership with 16 organisations, including livery companies, trade bodies, voluntary sector organisations and businesses.

Representatives from these join the judging panel to select award category winners and runners-up, who will be announced at a prestigious ceremony at Mansion House in February 2007. This year we have a Sustainable Buildings category, working with BRE, which rewards excellence in sustainable design for new build and refurbishment.

More than 100 organisations, from household names to small family businesses, have so far received recognition through the Awards.

Further information on the Sustainable City Awards, Email [sca@corpoflondon.gov.uk](mailto:sca@corpoflondon.gov.uk) or go to [www.cityoflondon.gov.uk/sca](http://www.cityoflondon.gov.uk/sca)  
The closing date for entries is 2nd December 2006.

Simon Mills  
Head of Sustainable Development,  
City of London Corporation



## Sustainable Assessment Framework

The Forestry Commission Wales (FCW) recently commissioned BRE to develop a Sustainable Assessment Framework to set standards for housing to be built on land it is releasing. The housing should be affordable as well as sustainable, and the targets and criteria in the Framework should serve as a guide to developers tendering for the work.

'Experience has shown us that flexibility is the key to success with this sort of project,' says Nick Tune of BRE's Welsh Office. 'You have to set goals and show how these can be achieved, but you can't be too prescriptive. No two sites are the same and each community will have its own priorities which it must attend to. A one-size-fits-all approach would help no-one.'

With this in mind, BRE developed a Framework that encourages developers to do the maximum for the finance available. It addresses five main issues, setting out criteria for each: Organisation (8 potential criteria), Design (24 potential criteria), Specification (5 potential criteria), Construction (9 potential criteria), Performance in use (3 potential criteria). It is up to each developer to decide at the tendering stage how far they can go overall. This approach therefore tests the market to produce the best possible sustainable, affordable housing for the site.

The Framework is straightforward to use, breaking the target setting, tendering and assessment process down into seven separate stages. The first step is to enrol some local help and know how by engaging as Project Partners, organisations who have experience of sustainable development and who understand local planning requirements. Working together with the FCW, the team selects from the Framework a list of sustainability criteria appropriate to the site under consideration. These are ranked and weighted with a weighting multiplier (Show stopper – 1, Important – 0.75, Desirable – 0.5, Not important – 0), then written into the Invitation to Tender to indicate to developers which issues are the most significant.

The closer the developers are to the higher target for each criteria the more they score. The Project Partners and the Forestry Commission then score and assess the proposals and the tender with the highest score is deemed the most sustainable.

'We are delighted with the Framework,' says Chris Edwards of the FCW. 'It's helping us meet our mandate to promote the use of certified timber through sustainable development and it links directly with other areas of work BRE is helping us with. The Framework is also relevant to European partnership projects we are involved in. Working together has been of real value – we have gained insight into the complexities of sustainable development, while BRE better understands the needs of the forestry sector, and both parties are able to share their knowledge in the UK and abroad.'

**For more information** – Nick Tune, 01639 864760, Email [tunen@bre.co.uk](mailto:tunen@bre.co.uk)

## Launch of lean construction qualification

The first trainees are currently being signed up to a new, nationally recognised qualification that is open to individuals implementing lean improvements in construction businesses.

The new BTEC Level 3 Advanced Award in Construction Lean Improvement Techniques will be awarded by the Construction Lean Improvement Programme (CLIP) and has been established by CLIP in partnership with RDI and the national awarding body Edexcel.

'In establishing this qualification we have responded to the wishes of companies to recognise individuals' skills and input into company improvement,' says CLIP Director Martin Watson. 'In addition, having lean qualified employees will provide real evidence to customers and suppliers that a company is serious about doing things better.'

Those eligible for the qualification will be active participants in a CLIP improvement activity being undertaken by their employers – normally this would be a CLIP Masterclass of a minimum of 15 days. They will be assessed in terms of attendance (a minimum of 30 guided learning hours are required), and an Assessor's Report based on observation of participation during the CLIP activity and written responses to questions posed by the assessor. The Assessor's Report will be independently verified by Edexcel/RDI. A small amount of time, probably less than four hours, will be needed for more formal training to cover aspects of the syllabus not covered in the CLIP activity.

'By having the training alongside a company-based improvement programme, additional costs are minimised,' says Martin Watson, 'to basically just the administration costs and fees for each person registering.'

'The BTEC will give individuals confidence they have sufficient understanding of lean tools and techniques to use them on future projects, and it can provide credit towards, for example, institution membership.'

**For more information** – 01923 664638, Email [watsonm@bre.co.uk](mailto:watsonm@bre.co.uk) or go to [www.bre.co.uk/clip](http://www.bre.co.uk/clip)

## Adding value to small diameter hardwoods

The successful development a novel 'star' sawing technique to process small diameter hardwoods then bond them 'inside-out' to create square beams, has prompted the Forestry Commission and Scottish Enterprise to press ahead with developing the process.

The project is investigating ways of refining the engineering process and constructing beams that are longer than a single stem. In addition, the BRE team carrying out the work will produce indicative working stresses and identify key markets for the new product.

Small dimension hardwood thinnings have traditionally been destined for the firewood or pulping markets. Successful development of inside-out beams could provide an opportunity to add value to a fairly low-value resource.

The project is focusing primarily on oak, although alternative hardwoods have been and will continue to be assessed. Using 'green' gluing technology – or bonding wood while it is wet – makes it possible to convert small diameter stems into usable sections of various dimensions by cutting them into four equal quarters, turning them inside out, then bonding and drying them.

One of the most interesting results to emerge from the first stage of the project is that re-engineered inside-out sections develop few if any checks or splits when dried. The incidence of distortion (twist, bow and spring) after drying is also significantly reduced in re-engineered oak beams when compared to solid beams processed from the same material.

Re-engineered beams are also both stronger and stiffer than solid oak beams processed from similar dimension material and are comparable in strength and stiffness to solid beams processed from large diameter material.

**For more information** – Geoff Cooper, 01923 664806, Email [cooperg@bre.co.uk](mailto:cooperg@bre.co.uk)

## Rapid provision of disabled facilities at home

An important new application for off-site construction systems is their use in the provision of disabled facilities at home. These take the form of relocatable factory-made modules such as those currently being trialed by Salford, Leeds and other city councils.

The modules are typically manufactured in timber frame or light gauge galvanised steel frame with a render brick slip outer skin, and fully finished internally. They generally comprise a bedroom area and level access 'wet' room with toilet, level access shower and washing facilities – are fully serviced and have radiators connected to the central heating system of the main dwelling.

Installation is straight forward, with the module being manufactured in the factory while a team of workers makes the house ready to accept the adaptation.

Foundations are prepared and any modifications required to the dwelling are undertaken – such as creating an opening to enter the module from the dwelling and alterations to services to allow easy connection to the module. This preparatory work usually takes around one week to carry out. When the dwelling is ready the module is craned into place – an operation that takes less than a day. A further day is taken making good the decorations, etc. internally and the module is ready for use. In total, disruption to the occupants is reduced from a few months to around seven days.

The result is that facilities can be quickly provided to people who may urgently need them and, unlike conventionally-constructed adaptations, can be installed without the need to move the occupants out while the work is being undertaken. Another important advantage that a factory-made unit has over one built by conventional means, is that it can be quickly and easily re-located should it no longer be needed.

'From a technical view the modules perform extremely well,' says Keith Ross, BRE's Technical Housing Director. 'They are robust, well insulated and can be designed for any need. The roof structure can be strengthened to take a hoist and door widths and heights tailored to the needs of tenants.'

**For more information** – Keith Ross, 01752 248149, Email [rossk@bre.co.uk](mailto:rossk@bre.co.uk)

A Forestry Commission and Scottish Enterprise funded project aims to add value to small diameter hardwoods



Relocatable factory-made modules offer a rapid means of providing disabled facilities at home



## News from BRE Certification

### SBEM success

The 2006 revision to Part L means that all new buildings must meet a target rate of CO<sub>2</sub> emissions. BRE Certification recently received a licence from DCLG to operate a Competent Person Scheme for companies with individuals wishing to be certified for their ability to use the tools for calculating CO<sub>2</sub> emission rates.

More than 20 building designers, consultants and others have achieved Competent Person status under the BRE Certification scheme – which is currently limited to the interface for the Simplified Building Energy Model (iSBEM) for non-domestic buildings. A list of Competent Persons who have met the scheme requirements can now be found in the Red Book and at [www.redbooklive.com](http://www.redbooklive.com)

For more information about iSBEM – [www.bre.co.uk/energyrating](http://www.bre.co.uk/energyrating)

### New fire extinguisher punches above its weight

Soda-Club Ltd has recently obtained a Technical Approval from LPCB for its innovative 1kg fire extinguisher. Tested by LPCB to EN-3, the 1kg extinguishers achieved a 34B fire rating – the rating achieved by the majority of larger 2kg CO<sub>2</sub> extinguishers, but not usually by those of 1kg.

### Curbing false alarms

To help curb false alarms the CFOA (Chief Fire Officers Association) recently developed a 'Model Agreement' between the Fire and Rescue Services and Alarm Receiving Centres. The agreement calls for third party certification of both the installer and the Alarm Receiving Centre (ARC).

Multifire Ltd has recently gained approval to LPS 1014 Issue 5: Requirements for certificated fire detection and alarm system firms, which satisfies this requirement. LPS 1014 also requires one Certificate of Conformity for each project completed, ie single point responsibility, which benefits all parties concerned such as the insurer, fire brigade, building owner, etc. In addition LPS 1014 requires, where possible, the use of third party approved products.

### Environmental Profiles

BRE Certification's Environmental Profiles are proving popular with flooring manufacturers with four new products being listed:

- Burmatex Ltd – needlepunch and tufted carpeting
- Interface Europe Ltd – palette and tufted carpets
- Freudenberg Building Systems UK Ltd – Noraplan floor covering
- Tarkett-Marley Floors Ltd – Elite PUR/ Eclipse PUR vinyl flooring.

Two window manufacturers recently became the first companies to receive an Environmental Profile for PVC window systems:

- Rehau Ltd
- Aspen Windows Ltd

Certificates have also been awarded to:

- Lafarge Roofing Ltd – Redland Cambrian Slate
- Boise Building Products Ltd – BCI wooden joist

Environmental Profiles are calculated environmental impacts throughout a product's life – not only during manufacture (which also includes impacts from virgin and recycled inputs) but also in a building taken over a typical building life, including maintenance, replacement and demolition.

For further information – Tel 01923 664100 or visit [www.redbooklive.com](http://www.redbooklive.com)

## Ground breaking buildings at OFFSITE2007

A range of pioneering, full-scale demonstration buildings will feature at the OFFSITE2007 exhibition and conference on 11-14 June 2007. The aim of the event is to showcase the latest developments in modern methods of construction (MMC).

The demonstration buildings include a school of the future by Re-Thinking, part of Willmott Dixon Construction, and three innovative houses from sponsors Hanson, Spaceover and Osborne.

Re-Thinking are newcomers to the event and aim to demonstrate how inspirational school design can meet the needs of students and teachers, while being energy efficient, intelligent and quick to build.

'The recent CABE report on schools built between 2000-2005 showed that 50% of them were poorly built and badly designed', says Charles Tincknell, Head of Re-Thinking. 'With so much at stake in the Building Schools for the Future programme, we aim to build an exemplary non-traditional school that demonstrates innovative and adaptable design. Crucially the design will focus not only on the classroom environment but also on the safety and well being of students – corridor and toilet facilities where bullying and drug taking can take place will be key considerations.'

Hanson exhibited an innovative house at OFFSITE2005, and returns with a house that particularly addresses climate change issues. 'Our OFFSITE2007 house will focus on occupant comfort in the changing UK climate,' says Gerry Feenan of Hanson. 'We'll be addressing issues such as overheating and solar gain and how best to mitigate against them with a concrete and masonry structure. The house will have excellent sustainability credentials and will exhibit features such as a smart ventilation system and enhanced thermal mass.'

Volumetric manufacturer Spaceover will demonstrate modules from a live housing project, South Chase New Hall, in Harlow. 'Our new volumetric system has taken into account some of the major drivers in the housing sector,' says Director Steven Barrett, 'in particular the need for much higher levels of energy efficiency and the benefits of renewable energy sources'.

Sponsors Osborne recently completed their demonstration house on the BRE Innovation Park (see page 4, right), which has pushed the boundaries of sustainable, affordable housing. The house, constructed from the Jabhouse SIPs (Structural Insulated Panel system) in just one and a half days, exceeds current Part L requirements on carbon emissions by 40%, and requires only one third of the energy for heating and cooling of a house constructed to 2006 Building Regulations. It also demonstrates a range of smart technology.

Other sponsors of OFFSITE2007 include the Concrete Centre, the central development organisation for the UK cement and concrete industry. Its aim is to assist all those involved in design and construction to realise the full potential of concrete. It achieves this by offering a programme of awareness seminars, training courses and publications.

SmartLIFE, the innovative EU project that has involved the construction of an MMC Training and Business Centre and an affordable housing project in Cambridgeshire, is also sponsoring OFFSITE2007. A range of speakers from the SmartLIFE initiative will give presentations at the conference on the findings from their affordable housing project, which involves performance measurement of three different MMC housing systems as well as traditional build (see page 11).

David Marlow, Chief Executive of EEDA – the East of England Development Agency – which is partnering BRE on the event says, 'The East of England faces many challenges in delivering the housing needs of the region that are both of high standard and affordable. We are fortunate to have so many innovative companies based here that can ensure housing is built to the highest possible environmental and design quality. EEDA is particularly pleased to support OFFSITE2007 because it provides an opportunity for the built environment industry to come together to show how growth can be delivered in a manner that protects the high quality natural and built environment in the East of England.'

For more information – [www.offsite2007.com](http://www.offsite2007.com) or Email [events@bre.co.uk](mailto:events@bre.co.uk)



Construction of Hanson demonstration house for OFFSITE2007 – Hanson's OFFSITE2007 house will address climate change issues

## Housing Minister opens Osborne house

Housing and Planning Minister, Yvette Cooper MP officially opened The Osborne demonstration house at the BRE Innovation Park in Watford on 21 September.

The Osborne house is the latest of four full-scale houses to be constructed at the Innovation Park. It builds on the successful performance of the Jabhouse Whole House System design, which uses Structural Insulated Panels (SIPs) technology to minimise air leakage and enable off-site construction.

The Jabhouse System is supplied and constructed by Innovare Systems, using SIPs to create a structural shell that includes the internal leaf of external walls and party walls, first and second floors and roof system.

On the first floor of the demonstration house, visitors learn about the innovative technologies used in exhibitions from supply chain partners working with Innovare Systems. The second floor contains a bedroom with en-suite facilities and a study area. There is also the opportunity to view the room in the roof, enabled through use of a SIPs roof cassette system.

The energy strategy for the house was to reduce demand, maximise renewable energy and use fossil fuel as efficiently as possible. The house design was considered on a holistic approach – thermal insulation, ventilation, cold bridging and heating systems – whilst demonstrating family living with a typically conventional layout.

'The homes we build today will house our children and grandchildren for decades to come which means they need to be sustainable,' said Yvette Cooper. 'We want UK developers to match and beat Scandinavian standards within ten years, so it is encouraging to see the Osborne demonstration house leading the way both in energy efficiency and in creating well designed homes that are beautiful to live in.'

Osborne Director Paul Ensich says, 'We are delighted that the construction of the house was a success, and that it has been so well received by the first visitors to the Innovation Park. With an enviable life span, thermal efficiency and low running costs, the Jabhouse system will deliver sustainable solutions providing overall long-term benefits. Together with our supply chain partners we are confident that the Jabhouse demonstrates sustainable living for the future.'

**For more information** on the BRE Innovation Park – Jaya Skandamoorthy, 01923 664582, Email [skandamoorthyj@bre.co.uk](mailto:skandamoorthyj@bre.co.uk)

## 'Fire Grid' emergency response system

A £2.3 million project aims to develop a prototype emergency response system that will provide fire fighters with information concerning the likely sequence of events during a fire before they actually unfold.

The project is being carried out by a BRE-led consortium that includes the University of Edinburgh, Arup, ABAQUS UK Ltd, ANSYS Europe Limited, Vision Systems (Europe) Limited, the London Fire and Emergency Planning Authority and the Institute of High Performance Computing, A\*STAR (Singapore). The three-year 'Fire Grid' project is supported by the DTI-Led Technology Programme.

The information supplied will include details of how the fire is expected to spread, how the structural integrity of the building will be affected, and how the building occupants are likely to react in response to the fire. This intelligence, previously only available in hindsight, should allow the emergency services to execute a more effective response to a fire incident.

Although initially focussing on fire, the methodologies developed by 'Fire Grid' may also be extended to other hazards such as environmental incidents, natural disasters and acts of terrorism.

There are five elements to the system:

- **Sensing:** Data collection from the emergency location with instantaneous and continuous relay to the emergency response system.
- **Modelling:** Simulation tools running in a predictive mode to model the evolution of the fire, establish its impact on the structure (and therefore predict the collapse), while also analysing the intervention alternatives and evacuation strategies.
- **Forecast:** All simulations, analyses and communications to be achieved faster than the evolution of the emergency in real time.
- **Feedback:** Processing of the continuously updated sensor and simulation data relayed back to the active response systems at the emergency location and to the emergency services to assist their intervention.
- **Response:** Effective co-ordination of all intervention by a command and control system using an intelligent execution support aid.

**For more information** – [www.firegrid.org](http://www.firegrid.org)

Yvette Cooper MP, Minister for Housing and Planning, at the Osborne demonstration house



## In brief

### Construction helpline in the West Midlands

A new BRE-run helpline has been launched by the West Midlands Centre for Constructing Excellence (WMCCE), for small-to-medium sized businesses in the West Midlands. It will advise on construction-related issues and how to obtain information and advice.

With funding from Advantage West Midlands and the European Regional Development Fund, WMCCE supports business improvement programmes and helps implement best practice and innovation. It can offer subsidised services to eligible companies in the West Midlands region – helpline callers will be advised on whether their companies are eligible for WMCCE support.

'WMCCE, in conjunction with partners, runs product, process, people and systems improvement programmes, which have been demonstrated to achieve benefits such as savings of up to 10% on capital building costs, fewer accidents, increased productivity, and lower staff turnover,' says Dave Richardson, Director of BRE's Construction Consultancy. 'Via the helpline, we will sift out the companies that could benefit and advise them how to take their application forward to WMCCE.'

The number for the helpline is 0870 787 5683.

### Green property profit

An event for those wishing to achieve legislative and environmental goals without losing commercial viability is being held in London on 28 and 29 November. It will include the impacts of Directives, achieving sustainability targets for construction project without harming profitability, and new technologies and energy developments.

**For more information** – [www.newzeye.com](http://www.newzeye.com), Email [conference@newzeye.com](mailto:conference@newzeye.com)

### New report on refurbishing Victorian Housing

The newly published *Sustainable refurbishment of Victorian housing* presents a method of assessing the refurbishment of traditionally built houses dating from the period 1840–1919, which is similar to that used in BREEAM EcoHomes. It looks specifically at competing requirements for modern energy and acoustic standards, whole building performance and the effects of durability, reliability and maintainability of the building fabric. It is designed to be of value to construction professionals responsible for the refurbishment of Victorian housing – housing managers, surveyors, architects, developers and planners, local authorities and owners.

The report also examines the economic, environmental and social costs and benefits of retaining this part of the building stock and develops a methodology that can be used in the assessment process. It includes case studies that illustrate the practical application of this approach to individual houses and to larger areas of housing.

*Sustainable refurbishment of Victorian housing* is published by IHS BRE Press and is available from [www.brebookshop.com](http://www.brebookshop.com)

Last year BRE set up an office in Port Talbot to make its expertise and facilities more readily accessible in Wales. The aim was to help foster the sort of innovation in products and processes that will increase the international competitiveness of businesses operating in the timber, construction, environment and heritage building industries, particularly small to medium sized enterprises (SMEs).

### **Welsh timber**

The number and range of projects in which BRE Wales has become involved during this short time is testament to the strength and potential of the industry. One of these has been the development of the Welsh Timber 'Knowledge Hub'. Timber is a major built environment material and a valuable Welsh industry, but it has long been acknowledged that the industry is fragmented and in need of a centre – or Knowledge Hub – of information and guidance to support timber businesses.

To prosper, the timber industry needs to have more of its businesses producing high quality niche products that set them apart from competitors. This requires a step up in technology through research and development, financial investment and 'know how', all of which will be encouraged and facilitated by the Knowledge Hub. It will also work to bridge the gap between foresters and sawmills, and manufacturers and consumers, so what is grown in Welsh forests is of maximum use to the timber sector.

A subdivision of the Welsh Forest Business Partnership (WFBP), the Hub will initially comprise two project officers located at the University of Wales, School of Agriculture and Forest Sciences in Bangor, and at BRE Wales, Port Talbot. This will give them access to the support and expertise in the timber industry that each organisation possesses, as well as ensuring that both North and South Wales are well served.

### **The work will fall into three main areas:**

#### **1. Information gateway and knowledge transfer**

Innovation depends on the smooth and rapid transfer of knowledge. This will be the primary role of the Knowledge Hub and will be achieved through:

- A website – not only packed with information but also interactive so that knowledge can flow freely between users.
- Information Bulletins will be sent to companies that request them, with news on legislation, research, events, etc.
- A Helpline for technical enquiries.
- Events and workshops – two events in the south and two in the north of Wales a year are planned.

#### **2. Product development and prototype testing**

The Hub's Project Officers will act as links between individual timber businesses and research organisations, and will help businesses to raise the funds required to cover product development and testing costs via grant funding programmes.

#### **3. Research and development**

As well as encouraging R&D by individual businesses, Project Officers will facilitate joint R&D projects. Large-scale R&D is required for the timber sector in Wales to flourish – to bring know-how, technical advances, funds and international recognition to the sector.

### **Affordable housing**

In common with many parts of the UK, Wales has an urgent need for high quality, sustainable housing that is affordable for local people. The challenge for the Welsh construction industry is to cost effectively meet this need using the local supply chain. Modern methods of construction (MMC), which often involve a high degree of off-site manufacture, may offer solutions to this problem.

A project funded by the Welsh Assembly Government's Knowledge Exploitation Fund (an EU Objective One funded scheme for Wales which promotes the more effective commercial use of knowledge) is examining the use of MMC to deliver sustainable, affordable homes through the Welsh supply chain. Led by the Welsh School of Architecture's Centre for Research into the Built Environment, the project involves a comparative study of MMC and traditional-build housing projects in Wales.

Three construction projects are being studied – one using a timber MMC system on a Gwalia Housing Association project in west Wales, one using a steel volumetric system for the Severn Housing Consortium in south-east Wales, and a third in Cardiff using traditional brick and block for the Wales and West Housing Association.

BRE is a partner in this project and BRE Wales, along with BRE's Housing Innovation Team, will be monitoring the construction works and providing technical support to the project. This will include the use of the Calibre tool for measuring productivity and SMARTaudit for measuring and managing waste.

### **Sustainable Welsh development**

The wide range of other projects with which BRE Wales has been involved include several in which sustainability is a key theme, for example:

- An appraisal guide and tool developed for The Forestry Commission (a significant land owner in Wales) to evaluate developers against quality, price and sustainability issues when choosing developers to deliver affordable, sustainable housing (see page 2).
- Guidance for local planning authorities developed for the Welsh Local Government Association to increase planners' awareness of the key sustainability issues relating to new developments. The aim is to put sustainable development at the heart of the statutory planning system for Wales.
- Sustainable design guidance for all future developments commissioned by the Snowdonia and Pembrokeshire Coast National Park Authorities
- Training in sustainable construction for site managers, foremen etc.

**For more information** – Nick Tune, 01639 864760, Email [tunen@bre.co.uk](mailto:tunen@bre.co.uk)

# WELSH CONSTRUCTION – WORKING FOR WALES

**While worth an estimated £2 billion a year to the Welsh economy, the construction industry has the potential to contribute far more, not only financially, but also in the provision of more high quality, sustainable, affordable homes and other buildings and infrastructure. Nick Tune reports.**

# INNOVATION APPLICATION

Many would agree that improved awareness and understanding of new and emerging technologies could enhance the quality of the UK's Built Environment. The challenge is how this improved access can be achieved.

The key is in creating an effective means for businesses working in the built environment, to connect and communicate with organisations and individuals that are developing and supplying innovative technologies and processes – which have application to the UK built environment.

This may not be an entirely new idea but now action is being taken to make it happen far more routinely, through the actions of a consortium – established by DTI; comprising BRE, BSRIA, CIRIA and ARUP – to develop and implement an industry-led Knowledge Transfer Network for the Modern Built Environment (KTN-MBE). The KTN-MBE will lead a wide range of activities to facilitate the exchange of knowledge and stimulate innovation across the built environment.

These activities will bring together the suppliers of technological innovations and processes, including universities and research organisations, with those directly involved in making use of innovation, such as clients, suppliers, contractors or component manufacturers involved in the provision and use of the built estate.

## Want does industry want?

The first step is to identify what knowledge and technologies the built environment industries need in order to improve levels of quality, productivity, value and performance. This will be done through the network groups making up the KTN-MBE, which include the:

- **Industry Leadership Group (ILG)**. The KTN-MBE will be coordinated through the ILG under the chairmanship of Bob White of MACE.
- **KTN-MBE Delivery Team** comprising BRE, BSRIA, CIRIA and Arup.
- **Sector Groups** of key stakeholders for each of the priority sectors
- **Engagement Groups**, through which a wide range of existing networks, membership based organisations and interest groups can participate in, and benefit from, the KTN's activities.

Initially the Network will focus on three key industry sectors – offices, healthcare and infrastructure. The KTN-MBE will employ Sector Managers who will engage directly with the key players in these chosen sectors, with the guidance and support of Sector Boards consisting of influential industry stakeholders.

The challenge will be to identify those priority topics that have the most potential to deliver a step-change in industry performance and client value in these sectors. Whilst the KTN focus is on knowledge transfer related to innovative technologies and processes, it is recognised that, for the most part, the built environment is not a high-tech industry and at most levels is instinctively risk averse. Decisions on what technologies and processes to investigate and the dissemination routes chosen, will be made with this in mind. The KTN-MBE is also open to investigating other areas of innovation, for example different delivery/maintenance processes or changes to regulatory controls.

'The KTN is not looking for futuristic, pie-in-the-sky solutions with no track record of success,' says Rufus Logan of BRE, the KTN-MBE Director. 'It aims to gather knowledge that we know is already delivering significant improvements to industry performance and productivity – wherever in the world this may be found – and to make sure those who can benefit from this knowledge, know about it.'

'Similarly, we aim to investigate and capture those technologies and processes that are benefiting other sectors but may also have considerable potential for application by UK's built environment industries.'

## Finding the solutions

Having identified the needs of industry, the next step is to find the knowledge and technology that meets these needs. Appropriate and applicable technological innovation and processes will be identified through UK and worldwide searches, using a pool of 'technology hunters'.

These 'technology hunts', commissioned by KTN-MBE will be intensive knowledge gathering processes, short in duration, and focussed on finding solutions to issues or opportunities identified by industry.

The solutions will then be fed back to industry via the network. Negotiations to adapt and adopt specific innovations will be brokered through the KTN. The findings will also be disseminated more widely through the KTN's own web-based, electronic and other media channels. In addition, practical support will be provided to existing communications channels, such as sponsoring conferences and seminars organised by groups engaged in the KTN.

## Leadership and delivery roles

'The Industry Leadership Group will play a key part in ensuring the KTN's success,' says ILG Chairman Bob White of Mace, 'by providing both advice on its development and direction, and supporting the communication of its results to industry and government.'

The Delivery Team members will each have specific roles in the KTN-MBE:

- **BRE** will be responsible for overall project management of the KTN, involving the financial management and coordination of the development and delivery of the project. BRE will also lead the Knowledge Transfer Network activities relating to the healthcare sector.
- **BSRIA** will take the lead with regard to the offices sector.
- **CIRIA** will take the lead for the infrastructure sector.
- **Arup** will lead the development and delivery of the web-based knowledge transfer strategy.

A University Gateway Officer will be seconded to the team to establish close working links with UK universities and university-led research programmes, industry networks and collaborative projects.

'It's important to note that we are not trying to muscle in on and threaten existing knowledge disseminating networks and organisations,' says Bob White. 'On the contrary, we aim to add value to other groups wherever possible.'

## Project duration

The initial funding from DTI for the KTN-MBE is for three years. 'But from the outset we will be working to develop and grow the KTN in such a way as to attract additional resources to support further development and to sustain the Network over the long-term,' says Rufus Logan.

**For further information** or to take part in the KTN, contact Rufus Logan – 01923 664357, Email [loganr@bre.co.uk](mailto:loganr@bre.co.uk)

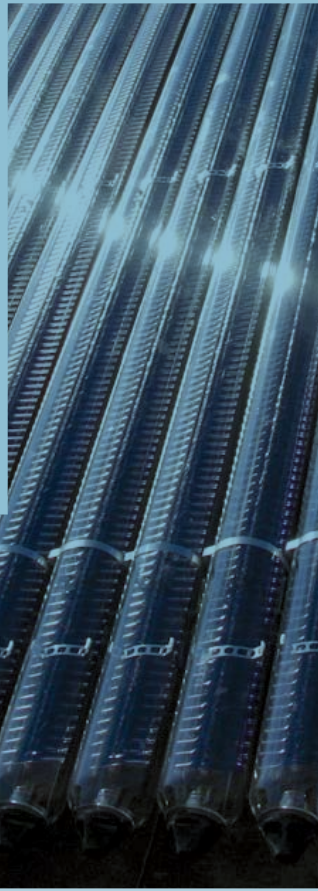
## Modern Built Environment Knowledge Transfer Network

Connecting developers of innovative technologies and processes with those applying them in built environment businesses.

Tel 01923 664357, Email [loganr@bre.co.uk](mailto:loganr@bre.co.uk)

Modern Built  
Environment

Knowledge Transfer Network



## LOW CARBON BUILDINGS: PROGRAMMED TO SUCCEED

The DTI's Low Carbon Buildings Programme will provide millions of pounds for the installation of energy microgeneration technologies in buildings. Kirk Archibald, Low Carbon Buildings Programme manager, explains how the scheme works.



Phase one\* of the DTI's Low Carbon Buildings Programme, managed by the Energy Saving Trust with technical support from BRE, was launched on 1 April 2006. It will run over three years and replaces the previous DTI Clear Skies and Solar PV grant programmes.

The grants are open to householders, public, not-for-profit and commercial organisations across the UK. The aim of the programme is to demonstrate how energy efficiency and microgeneration can work hand-in-hand to create low carbon buildings and provide innovative working examples. Two streams of grants are available under phase one of the programme. Stream one is for householders and community organisations (visit [www.lowcarbonbuildings.org.uk](http://www.lowcarbonbuildings.org.uk) for more information on stream one grants).

Under stream two commercial, public sector and not-for-profit organisations can apply for grants, up to a maximum of £1m from a £16.6m fund, towards the cost of microgeneration technologies installed as part of larger scale projects. The programme aims to encourage exemplar low carbon buildings, which are, none-the-less, replicable.

Grants towards the costs of installing microgeneration technology will be managed by the Energy Saving Trust, via a competitive bidding process, and will be divided into two categories: Category 2A will enable organisations to apply for up to £100k or 40-50% on refurbishment or retrofit projects, from a total grant fund of £5.6m; category 2B will enable organisations to apply for up to £1m or 40-50% on new build or major refurbishment projects, from a total grant fund of £11m. The Carbon Trust will be providing a package of low carbon design support for successful applicants under category 2B, at key stages throughout the design, construction, commissioning and occupancy phases of the project.

Experience of developing other low carbon buildings has shown that there are a number of points within the construction process where low carbon principles can be lost, or if operated incorrectly, produce more carbon than intended. Stream two of the low carbon buildings programme aims to provide funding to support the cost of zero or low carbon technologies; coupled with ongoing technical support throughout the development to ensure optimum carbon benefits can be realised from these buildings. In this way, it is hoped that the commercial viability of low carbon buildings can be explored in full, providing a business case for future best practice standards.

At present, both installers and products must be accredited under the DTI's Major PV demonstration and Clear Skies programmes in order to be eligible for funding under the Low Carbon Buildings programme. The Low Carbon Building programme is also committed to supporting new and emerging renewable energy technologies. BRE Certification will be taking over the accreditation process of new technologies from spring 2007, under a new accreditation scheme that is being developed (see 'Microgeneration scheme' article on the right).

To find out more about the DTI's low carbon buildings programme visit [www.lowcarbonbuildings.org.uk](http://www.lowcarbonbuildings.org.uk)

\* Phase two of The DTI's Low Carbon Buildings Programme has just been announced and will be covered in the next issue of *Constructing the future*.

## Technology currently accredited under the Clear Skies Programme:

### Small scale hydro

A micro hydro plant is below 100kW. Improvements in small turbine and generator technology mean that micro hydro schemes are an attractive means of producing electricity. Useful power may be produced from even a small stream. The likely range is from a few hundred watts (possibly for use with batteries) for domestic schemes, to a minimum 25kW for commercial schemes.

### Solar PV

Photovoltaic (PV) systems use cells to convert solar radiation into electricity. The PV cell consists of one or two layers of a semi conducting material, usually silicon. When light shines on the cell it creates an electric field across the layers, causing electricity to flow.

PV systems generate no greenhouse gases, saving approximately 325kg of carbon dioxide emissions per year – adding up to about 8 tonnes over a system's lifetime – for each kilowatt peak (kWp – PV cells are referred to in terms of the amount of energy they generate in full sunlight).

### Biomass

Biomass is organic matter of recent origin. The CO<sub>2</sub> released when energy is generated from biomass is balanced by that absorbed during the fuel's production. This is called a carbon neutral process.

There are two main ways of using biomass to heat a domestic property:

1. Stand-alone stoves providing space heating for a room. These can be fuelled by logs or pellets but only pellets are suitable for automatic feed. Generally they are 6-12 kW in output, and some models can be fitted with a back boiler to provide water heating.
2. Boilers connected to central heating and hot water systems. These are suitable for pellets, logs or chips, and are generally larger than 15 kW.

### Small scale wind turbines

Modern wind turbines use the wind's lift forces to turn aerodynamic blades that turn a rotor which creates electricity.

### Solar thermal

Solar water heating systems use heat from the sun to work alongside a conventional water heater. Panels collect heat from the sun's radiation and transfer it via a heat exchange to water. The technology is well developed with a large choice of equipment to suit many applications.

### Ground source heat pumps

Ground source heat pumps (GSHP) transfer heat from the ground into a building to provide space heating and, in some cases, to pre-heat domestic hot water. For every unit of electricity used to pump the heat, 3-4 units of heat are produced.

## Technology awaiting accreditation under BRE Certification:

Air source heat pumps

Water source heat pumps

Renewable CHP (Combined heat and power)

MicroCHP

Fuel cells

## LCBP checks and balances

The DTI's Low Carbon Buildings Programme will provide millions of pounds to help deliver a wide range of inspirational energy efficiency and microgeneration projects throughout the UK. To ensure that the Programme delivers the maximum benefits there are mechanisms for assessing and certifying elements of the scheme.

### Application assessment

Grant applications for commercial and large-scale developments, for example, will be assessed by BRE.

'We are primarily looking for two things,' says the technical assessment scheme manager, Chris Roberts. 'Firstly some evidence that the applicant has taken all reasonable steps to reduce their energy demand through energy efficiency measures beyond – in the case of new build and major refurbishment projects – the minimum legal requirements, and secondly that the proposed microgeneration installation is appropriately specified and is a technically robust solution.'

The length of an assessment varies depending on the scale of the application, ranging from a few hours for small schemes to up to a day or more for major schemes.

'The other really interesting part of BRE's role,' says Chris Roberts, 'is that we will be carrying out random compliance checking of some of the installations. We will be visiting sites up and down the country to check that the scheme has done what it set out to do.'

This compliance checking will not only support the quality and credibility of the scheme, it will also provide excellent feedback and case study material of renewable energy systems in action.

### Microgeneration scheme

The Low Carbon Buildings Programme will provide grants towards the cost of installing microgeneration technology in buildings. But they will only be available if the applicant uses both products and installers that have been certified under the PV and Clear Skies schemes until March 2007, and then under a new microgeneration accreditation scheme that takes over from April 2007.

BRE Certification has been appointed by the DTI to develop and deliver this new microgeneration accreditation scheme, which will evaluate and certify products and installers against robust criteria for each of the microgeneration technologies. This will provide greater protection for consumers and help to ensure that the grant funding delivers maximum benefits.

BRE Certification will establish an independent project steering group, with wide stakeholder representation, to establish the required criteria. The steering group will review the existing relevant standards, identify areas where standards do not currently exist or are deficient, and develop any new standards required.

'Our work will be monitored by our recently created Sustainability Board,' says Carol Atkinson, the Managing Director of BRE Certification, 'which will independently oversee the work of the project steering group as well as the operation of the scheme.'

'We are happy to be supporting a scheme that will positively impact on the long-term energy requirements of our industries and communities for many generations, as detailed in the DTI's microgeneration strategy.'

The scheme aims to help build a rapidly growing microgeneration industry that is based on quality and reliability, and which will make a substantial contribution to cutting both the UK's dependency on fossil fuels and its carbon dioxide emissions.

'The Government is committed to increasing the amount of electricity generated at a local level as it helps us with the twin challenges of reducing carbon emissions while ensuring security of supply,' says Energy Minister Malcolm Wicks

'At a time when the sector is expanding rapidly and where you can now buy solar panels in the high street, it is essential that the public has confidence in the technology and the installers that are fitting it. The BRE Certification managed accreditation scheme aims to do just that.'

# FIRE PERFORMANCE OF EXTERNAL CLADDING

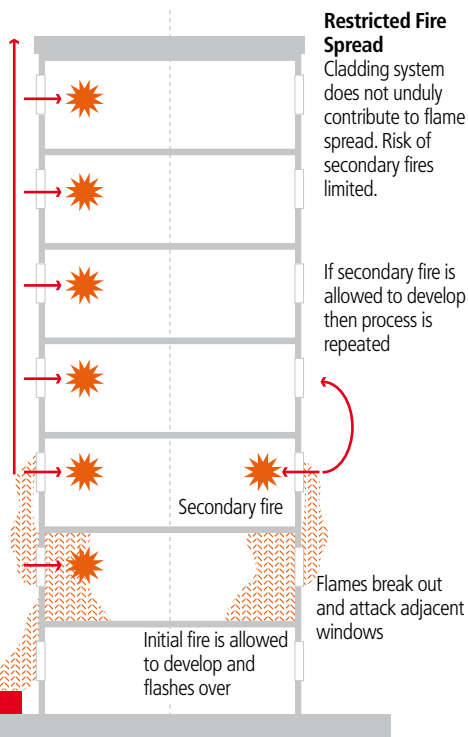
While fires in multi-storey buildings are rare, they can be very hazardous – particularly when able to spread via the external cladding system. Sarah Colwell reviews this issue and explains how cladding products can be tested and assessed to minimise the risks.

## Rapid Fire Spread

Cladding system contributes to flame spread resulting in risk of multiple simultaneous secondary fires

External cladding contributes to flame spread – Risk of secondary fires at all levels

External fire incident



## Restricted Fire Spread

Cladding system does not unduly contribute to flame spread. Risk of secondary fires limited.

If secondary fire is allowed to develop then process is repeated

Flames break out and attack adjacent windows

Principle behind BS 8414 parts 1&2 and BR 135



System under test on the BRE External Cladding Test Facility

## The issue

Fires involving multi-storey buildings are fortunately rare, but when they occur they can be very dangerous, both in terms of risk to life and property loss. They can cause major disruption to businesses, or to domestic life if dwellings are involved.

Losses from damage to commercial property can be considerable. The Basingstoke fire in 1991, in which two floors of a 14-storey office block were damaged, resulted in a £15.6M claim. A more recent example in Madrid in 2005, also led to significant property and financial losses.

It was estimated in 2001 that there were over 5,000 blocks of flats in England, representing about 300,000 homes. One of the fire issues raised with this type of building is the potential for fire to spread via the external cladding on the structure, as seen in the Knowsley Heights fire in 1991.

The Garnock Court fire in Irvine, Scotland in 1999, gave rise to a Parliamentary inquiry into the potential risk of fire spread in buildings via external cladding. One of the recommendations from the inquiry included the statement that, '... we do not believe it should take a serious fire in which people are killed before all reasonable steps are taken towards minimising the risks.' As a result of this, the Loss Prevention Certification Board (LPCB) continually develops and publishes certification schemes to protect people and their property. A full listing of these can be found at [www.redbooklive.com](http://www.redbooklive.com)

### External fire spread

Fires can occur within a property or in close proximity to the building envelope. If no intervention occurs, the fire within the building may develop to flashover and break out from the room of origin via a window opening or doorway. Flames breaking out of a building from a post flashover fire will typically extend 2m above the top of the opening irrespective of the material used to construct the outer face of the building envelope, and the potential then exists for any external cladding system to become involved in the fire.

### Testing fire performance

#### – BS 8414 : Part 1 : 2002 – Fire performance of external cladding systems.

##### Part 1. Test method for non-loadbearing external cladding systems applied to the face the building.

BS 8414 : Part 1 : 2002, based on BRE Fire Note 9, is a full-scale test designed to investigate the fire performance of non-loadbearing exterior wall systems, including external wall insulation systems and curtain walling, fitted to a masonry substrate when exposed to an external fire source at a realistic scale.

A 9.6m high test facility is used with a main face 2.8 m wide and includes a right angle internal return wall, a minimum of 1.5m deep. The fire source is designed to represent a post flashover fire exiting from an opening such as a window. The duration of the fire source is 30 minutes.

Thermocouples are placed at the mid-depth of each combustible layer, and cavity where present. They are located at two heights above the fire source; 2.5m and 5m, and the time taken for the fire to spread between these two levels is determined for each layer and cavity in the system. Any system collapse or delamination is also noted. The test method does not assess the fire resistance of the exterior wall assembly.

The second edition of the BRE Report *Performance of External Thermal Insulation for Walls of Multi-Storey Buildings* (BR135) published in 2003, provides guidance on the fire performance of external cladding systems and a classification system for the BS 8414 –1:2002 test method. The principles behind the classification system are based on fire spread away from the initial fire source and the rate of fire spread.

Additionally if fire spreads away from the initial fire source, the rate of progress of fire spread, or tendency for collapse, should not unduly hinder intervention by the emergency services.

#### – BS8414 : Part 2:2005 - Fire performance of external cladding systems.

##### Part 2. Test method for non-loadbearing external cladding systems applied to a steel frame.

The increasing use of lightweight framed systems and offsite construction techniques for these types of buildings, has resulted in the need for a second part of the test standard to allow the assessment of these systems. This part of the standard can be used to assess, at full scale, the fire performance of non-loadbearing external cladding systems supported by a building frame, such as curtain walling, glazed units, infill panels and insulated composite panels. The specimen sizes, fire exposure conditions and monitoring locations are the same as those used in Part 1 of the BS 8414 –1:2002.

As with part 1 of the test method, a classification system for this part of the test standard is currently being drafted as an annex to the BR135 document.

### Technical Approval

As part of the Construction Products Directive (CPD), an ETAG (European Technical Approval Guideline) has been produced by EOTA to enable CE marking of these types of products. ETAG 004 for *External Thermal Insulation Composite Systems with Rendering* was published in 2000 to provide a route for CE marking of these products. As part of this ETAG, the reference to fire performance includes the provision for the use of full-scale testing to evaluate the performance of fire barriers for insulated systems, if required.

### Certification

One method of ensuring that the product meets a standard is to choose one that is approved by a nationally accredited certification body, such as LPCB which has just completed a £100,000 investment in expanding its test facilities to meet the increasing market demand. Certification by LPCB is independent third-party confirmation that the product meets and continues to meet the appropriate standard.

The certification process involves rigorous assessment and testing of products, coupled with regular audits of quality procedures governing the factory production process to ensure that they meet quality standards reviewed by a team of experts – these include manufacturers, installers, designers, clients, regulators, insurers, engineers and scientists. This differs from a test, which is basically a snapshot of the product on a given day – certification, through regular audits, ensures that the product continues to comply with the standard and meet the specification.

In order to meet the demands from the market for certification schemes to cover the fire performance of composite systems, a new LPCB scheme has been launched as part of the LPS 1181 series of fire growth tests for LPCB approval of construction product systems. LPS1181 part 4 covers systems tested under BS8414 –1:2002 with a part 5 scheme in preparation to cover BS 8414 –2:2005 systems.

LPCB, together with its predecessor the Fire Offices' Committee (FOC) has been involved for over 150 years in working with specifiers, including clients, insurers, and regulators, to set the standards necessary to ensure the quality of products in the market place.

### Listing

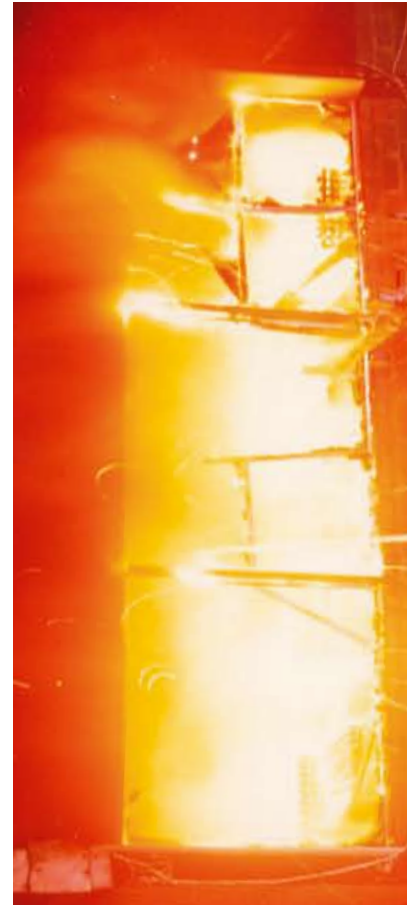
Once a product, service or company meets the required standard, a certificate is issued and listed in the relevant 'Red Book' – either under the *List of Approved Fire and Security Products and Services* or *List of Approved Companies and Construction Products*. Listing in the Red Book is a very useful marketing tool for the approved companies as thousands of specifiers and insurers around the world use it to select their suppliers. The Red Book is published in January each year and on CD ROM in January and June. A 'live' copy of the Red Book is continually updated online at [www.RedBookLive.com](http://www.RedBookLive.com).

For more information visit [www.redbooklive.com](http://www.redbooklive.com) or Tel 01923 664100

## New fire safety law – Are you covered?

The new fire safety law brings new responsibilities. If you don't comply you could be prosecuted. Don't leave the safety of your business and staff to chance.

For information and a free quotation for a fire risk assessment, call us now on 01923 664883, email [fra@bre.co.uk](mailto:fra@bre.co.uk) [www.bre.co.uk/firerisk](http://www.bre.co.uk/firerisk)



# SMARTLIFE AFFORDABLE HOUSING PROJECT

**Construction started in September 2006 on a pioneering new housing project in Fenland that could usher in an approach to affordable house building that emphasises sustainability and environmental performance, as well as comfortable community living.**



It will provide more data than the industry has ever had before on the reality of using modern methods of construction.

Each design has had to show how it reflects local and national guidance.

Every step of the construction process will go under the microscope.

It's about ensuring that the end product has true value to the consumer.



The project comprises construction of 106 new homes in the Cambridgeshire towns of March and Chatteris, which will become home to both private buyers and housing association tenants when they are completed in 2007. The process of constructing them will be a demonstration and training scheme involving some of the leading players in shaping affordable housing policy and creating sustainable communities.

English Partnerships, the Housing Corporation, Fenland District Council and the Department for Local Government and the Communities are funding the project, which is being led by SmartLIFE, a joint venture between Cambridgeshire County Council and BRE. Fenland District Council and Home Group, one of the largest housing providers in the UK, are key partners in driving forward the development.

The project has been developed to demonstrate how modern methods of construction can be used to alleviate housing shortages in growth areas. Its unique aspect is the extent to which every step of the construction process will go under the microscope to assess issues such as build speed, build quality, the sustainability of the construction process and the post-occupancy performance of the resulting houses, including energy efficiency.

Avebury, a practical construction consultancy and architects, together with architects Churchill Hui and Proctor and Matthews are working with Fusion, Pinewood Structures and Polarwall, three leading manufacturers of innovative building systems. Willmott Dixon is the main contractor and Calfordseaden are providing an extensive range of services including employer's agent, EcoHomes rating, Housing Quality Indicators, lifecycle costing and general cost advice, as well as providing advice from their extensive experience of modern methods of construction.

The project will examine a raft of issues connected with using modern methods of construction, compare and analyse different systems and identify potential improvements. 'In short, it will provide more data than the industry has ever had before on the reality of using modern methods of construction,' said Richard Harrington, East of England Area Director for English Partnerships.

Three innovative construction systems will be used – the Fusion StlF™ panelised steel frame system, the Pinewood Structures panelised timber frame system and the Polarwall Insulating Concrete Formwork (ICF) system. The systems will be used to build approximately 60% of the homes, which will be a mix of terraced, detached and semi-detached properties with two, three and four bedrooms. The other 40% will be built using traditional brick and block methods.

The number and variety of houses involved means that a wide selection of measurements will be taken and stacked up in various permutations to assess what works well and where there are opportunities for improvement.

'We are delighted that Fenland has been selected to take part in this innovative international housing project,' says Cllr. Kit Owen, Portfolio Holder for Housing for Fenland District Council. 'The scheme will provide 41 new units of affordable housing for local people in March and Chatteris, and contribute to efficient development of further housing in the future.'

Simultaneously, the new SmartLIFE construction industry training centre in nearby Cambridge will work with

organisations and individuals involved in the project to enhance the skills required to use modern methods of construction to best effect.

'This unique demonstration shows how SmartLIFE, working closely with other key delivery agencies, can highlight practical and potentially cost-effective solutions to the shortage of quality sustainable and affordable homes,' says Kevin Scobell, Chief Executive of SmartLIFE. 'The lessons learned here will help us all to improve our housing delivery effectiveness.'

Measurements will be taken using BRE's CalIBRE and SMARTWaste systems, as part of the continuous improvement process on site designed to identify areas for improvement through real-time measurement and assessment. The same set of measures will be obtained for each building system and the brick and block houses.

CalIBRE will map the construction process, identify and code packages and tasks, monitor site construction processes and produce analysis, reports and feedback for the construction team. In addition, the data collected will be used to assess the project against benchmarks using the Constructing Excellence Key Performance Indicators (KPIs). Cost, build-time and health and safety are amongst the KPIs that will be used.

A number of sustainability KPIs will also be used, including energy and water use during construction, waste produced and the bio-diversity impact. SmartWaste, BRE's web-based tool for measuring and reducing waste, will be used to evaluate the waste produced, enabling the contractor to identify how it was generated and the potential for reducing it.

The effect of the 106 new homes on the environment and locality will be assessed during and after construction. Measures will be taken of the proportion of ecologically valuable habitats created or retained in the area. Finally, the whole life performance of the finished buildings will be assessed to examine issues such as energy efficiency, based on the manufacture, installation, maintenance, repair and replacement of key components.

'SmartLIFE continues to provide practical solutions to the key blockages to sustainable growth,' says John Reynolds, Deputy Leader of Cambridgeshire County Council. 'As well as training the latest construction methods at its innovative Cambridge-based centre, SmartLIFE is helping Cambridgeshire to show a clear way forward in the speedy delivery of high-quality, sustainable affordable homes for the East of England and other key growth areas.'

The development is split across three sites, with each architect concentrating on one site and working with one of the innovative construction systems.

Each design has had to show how it reflects local and national guidance in terms of design and the creation of sustainable communities. In addition, the designs comply with Housing Corporation Scheme Development Standards (SDS). In terms of site layout, comfort and security are important. The layouts are designed to promote creative children's play and encourage residents to use their streets in ways that reduce social isolation, particularly amongst older people. Each site is aiming for Secured by Design accreditation, which focuses on issues connected with crime prevention.

'The Corporation is really pleased to be involved in this project. It gets right to the heart of sustainability,' says John Rouse, Chief Executive of the Housing Corporation. 'It is about



providing homes that maximise the technology of today, in the most cost effective and user friendly way. It's about ensuring that the end product has true value to the consumer and provides warmth, comfort and places where people want to live and stay.'

In addition, each home is designed to optimise sunlight and daylight use to minimise energy consumption. Gardens have been positioned for maximum benefit – south-facing, wherever possible – with minimal over-shading from trees and other buildings.

Energy-efficiency best practice will be adopted with wall construction U-values of at least 0.27 w/m<sup>2</sup>K. Overall, the development must achieve a minimum EcoHomes rating of 'Very Good' – EcoHomes is the homes version of BREEAM (the BRE Environmental Assessment Method) which balances environmental performance with the need for a quality standard of living. The issues assessed are grouped into seven categories: energy, water, pollution, materials, transport, ecology and land use, and health and well-being.

The development will help to tackle the current demand for housing in the Fenland area, with more than 38% of the 106 properties designated for rent or shared-ownership, and the rest for private sale.

Alan Baldwin, Assistant Director of Regional Development at the Home Group says, 'When all the design and layout elements are taken together with the detailed effort that will go into building these houses, the people who buy and occupy them can be assured that they are getting a very well thought out and carefully constructed property'.

**For more information:**

- BRE: Linda McKeown, 01923 664569  
mckeownl@bre.co.uk
- SmartLIFE: Kevin Scobell, 07800 622935  
scobellk@bre.co.uk

## Energy asset rating – the big issue

Energy rating certificates will influence property values and rental income. Find out now how your buildings perform.

Contact Matt Dickinson

Tel 01923 664658

Email [dickinsonm@bre.co.uk](mailto:dickinsonm@bre.co.uk)

The Government's Sustainable Communities Agenda is challenging local authorities, developers and designers to ensure that all new developments and regeneration schemes are designed and built sustainably, creating places where people want to live and work in ways that address environmental constraints.

Building Regulations and Planning Policy Statements set out general requirements, but it is up to local authorities to set their own policy targets and assess schemes when they come up for planning approval. Given the breadth of the issues involved, this sets a challenge for both local authorities and developers. It is impossible for either party to have in-house the necessary expertise on sustainable development, design measures and quantitative standards.

The local authority is able to agree a clear sustainability framework with measurable requirements.

A number of local authorities and developers approached BRE for help, and as a result the bespoke benchmarking system BREEAM Developments was created to guide them through development plans. Existing policy, SA/SEA outcomes and local aspirations are taken into account, and assessment schemes are drawn up to steer design.

There are very strong benefits to this approach. The local authority is able to agree a clear and authoritative sustainability framework with measurable requirements that will improve developments on the ground early in the design process. Key information can be provided to council officers and members to help them assess planning applications. Designers and developers know exactly what is required of them, so can have effective pre-application discussions and consider the right issue at the right time in the design process. Developers can demonstrate their sustainability credentials to the local planning authority and to potential purchasers.

Key information can be provided easily to council members and officers to help them assess planning applications.

The Barking Riverside development provides a good example of what can be achieved. Set in the Thames Gateway strategic growth area, Barking Riverside is the biggest brownfield site in Europe and will accommodate a flagship 10,800 home, mixed-used development to be built over the next 25 years.

BRE worked with Barking Riverside Limited (BRL) – a joint-venture company comprising English Partnerships (the land owners) and Bellway Homes – and the local planning authority and other partners to create a sustainability benchmarking framework. The Framework will assess the sustainability of

phased design proposals and score them according to good and best practice targets. Covering 12 topics, it will collectively provide a logical assessment of the quality and sustainability of the development through four stages: design and layout, materials procurement, construction, and occupation.

Designers and developers know what is required and so can have effective pre-application discussions and consider the right issue at the right time.

The framework functions as a working Excel spreadsheet, with each indicator carrying a specific weighting that is based on its relative significance to the sustainability of the site. For each indicator the developer specifies the standard of practice to be achieved (based on existing national good and best practice) and provides evidence to demonstrate this commitment (similar to the design assessment of EcoHomes). On completion of the assessment, a summary sheet illustrates the performance of the sub-framework plan as a 'radar' graph showing the scores achieved for each of the 12 sections (an example of a summary of sustainable performance is given below).

The Barking Riverside framework was based on an earlier pilot version of the South East England Development Agency Checklist. Issues relevant to the site were extracted, with new standards added to ensure compliance with the London Plan. Alongside this, new indicators were developed to enable the assessment to go beyond the remit of the planning system. This was of particular importance for this high profile site that had sustainability firmly on its agenda.

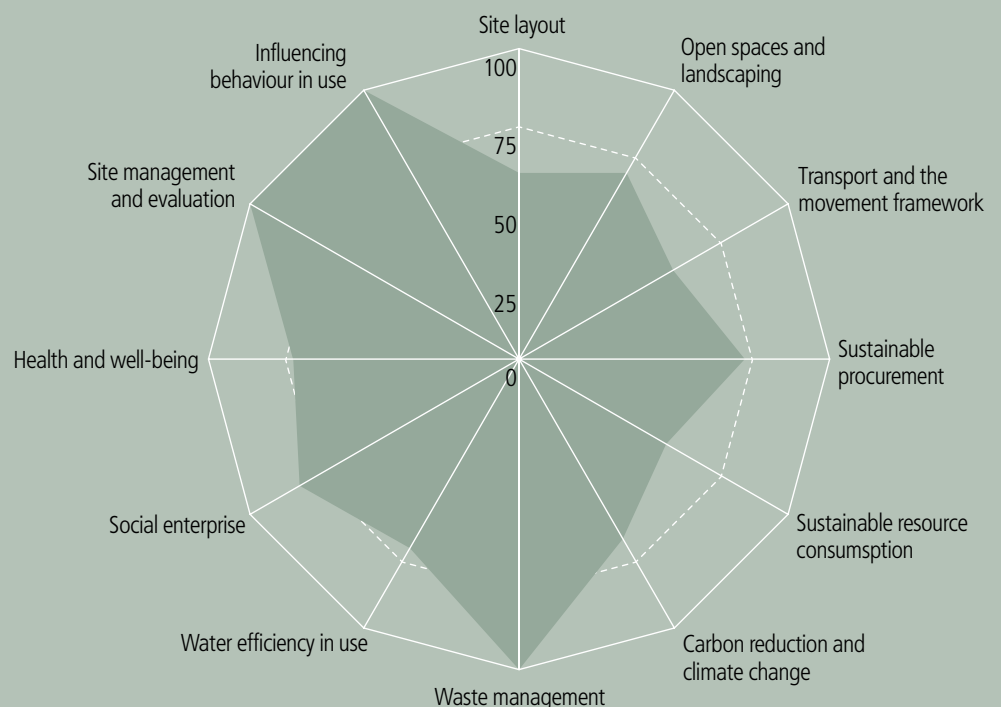
Developers can use BREEAM Developments to demonstrate their sustainability credentials to the local planning authority and to potential purchasers.

The framework is nearing completion and will be ready to assess Phase 1 of the development. On completion of each phase, the indicators will be reviewed and upgraded to ensure that each phase of development is assessed in line with current good and best practice in sustainable design and construction.

For more information on setting and measuring sustainability through the planning process, Email [sustainablecommunities@bre.co.uk](mailto:sustainablecommunities@bre.co.uk), or Tel 01923 664324

# SUSTAINABILITY THROUGH PLANNING – BREEAM DEVELOPMENTS

The enormous breadth of issues involved in sustainable development, presents problems for local authorities and developers alike. A new bespoke benchmarking service known as BREEAM Developments guides both parties through the complexities of setting appropriate sustainable development targets for a particular site.



# THE EUROCODE REVOLUTION

**Eurocodes will soon revolutionise how most of the world designs its buildings and civil engineering structures – Haig Gulvanessian, chairman of the UK's pan-industry Eurocodes Expert advisory group, explains.**

The massive development programme for the 58 new European structural design codes (Eurocodes) – the most advanced structural codes in the world – is complete. There can now be little doubt that the Eurocodes are going to become the world's new structural design standards.

The European Committee for Standardisation (CEN) Technical Committee 250 had made 43 of the 58 Eurocodes available by August 2006, with the remaining 15 parts being available by the end of 2006. The British Standard Institution (BSI) had published 39 BS EN versions of the codes by the middle of this year – including all those for concrete, steel-and-concrete composite, timber and masonry structures – and UK national annexes are being developed.

Not only are the other 'old' European Union nations progressing at a similar pace, but so also are many of the ten new member states and four accession and candidate countries. Beyond Europe, Australia, Malaysia, Singapore, South Africa and Vietnam have already decided to base their future structural design standards on the Eurocodes, and China, India, Oman, Qatar, Sri Lanka and UAE are considering this.

It is now certain that within three years, Eurocodes will be the only structural codes generally available to UK and other European building and civil engineering designers.

## **National annexes are the key**

However, the publication of national annexes in the UK and other countries remains the key to the implementation of Eurocodes. BSI had published ten national annexes by the end of October 2006 and should have published most of the remainder well inside the statutory two-year time limit.

Allowing for a period of co-existence, the latest date for withdrawal of BS and other national codes will be early 2010 – and this timetable will be comfortably met by most EU countries. It is therefore certain that within the next three years, Eurocodes will be the only structural codes generally available for European building and civil engineering designers. In fact they may well have to be used earlier for public works contracts and for obtaining CE marking for structural products, components and kits of parts.

... get maximum benefit from the huge opportunities Eurocodes will provide, both in Europe and worldwide.

## **UK support**

The UK Government fully backs the implementation of Eurocodes, and the Institution of Structural Engineers (IStructE) has set up a pan-industry implementation committee to support this.

In particular the IStructE committee worked closely with the Institution of Civil Engineers (ICE) structures and buildings board this year to develop ICE's Eurocodes Expert website at [www.eurocodes.co.uk](http://www.eurocodes.co.uk) as a pan-industry information source. This new site is now available and provides comprehensive and easy-to-access information on the codes, and all available training courses, seminars, publications, software and web resources.

The courses and guidance available in the UK – most of which are already listed on ICE's current Eurocodes Expert site – greatly surpass anything available in other European member states. UK civil and structural engineers are now urged to take full advantage of these resources to get maximum benefit from the huge opportunities Eurocodes will provide, both in Europe and worldwide.

## **Impact of Eurocodes seminar**

A seminar at BRE Watford on 7 November 2006 will fully explain the impact of Eurocodes on the UK construction industry. It will include an overview of the latest developments and their affects on construction businesses, and use case studies to highlight key calculation methods and potential barriers to implementation.

For more information about the event or to book a place go to [www.bre.co.uk/events](http://www.bre.co.uk/events), Email [events@bre.co.uk](mailto:events@bre.co.uk), or Tel 01923 664800.

## **What are Eurocodes?**

Eurocodes are a set of structural design codes for building and civil engineering works, which will replace national codes (published by the British Standards Institution in the UK) after a period of co-existence. Improving the competitiveness of the construction industry in the European Union and beyond, is their primary objective.

There is a clear distinction between design codes and national regulations / public authority requirements. Harmonising national requirements is outside the scope of Eurocode development, but the aim is that the Eurocodes should be recognised in national regulations as a route for achieving compliance.

The Eurocodes comprise 58 design codes covering 10 areas: the basis of structural design, actions, concrete, steel, composite steel and concrete, timber, masonry, geotechnics, seismic resistance, and aluminium. Publication of the Eurocodes will be completed next year.

**BREEAM Developments**  
benchmarking sustainability  
through the planning process

For more information call 01923 664324  
or email [sustainablecommunities@bre.co.uk](mailto:sustainablecommunities@bre.co.uk)

## Recent publications

### Books

#### **Sustainable refurbishment of Victorian housing (FB14)**

This new BRE Trust report establishes a methodology for applying EcoHomes assessment methods to pre-1919 housing and examines the economic, environmental and social costs and benefits of retaining Victorian houses through several case studies. £30 (£20 for Connect members) See page 4.

#### **Stabilising mine workings with pfa grouts (BR488)**

This new environmental code of practice provides guidance based on information in the literature, laboratory studies at BRE, data from the use of pfa grouts and expertise from an industry steering group. £50 (£30 for Connect members)

#### **Reuse of foundations for urban sites – Proceedings of the International Conference (EP 73)**

This volume presents papers by the RuFUS project partners and authors from Europe and further afield. (£95)

#### **Reuse of foundations for urban sites – A best practice handbook (EP 75)**

This Handbook provides: a sound understanding of the background to foundation reuse and the key issues. (£75)

### Good Building Guides

Practical guidance on building design and construction

#### **GBG 68 Installing thermal insulation: good site practice**

This Good Building Guide is in two parts:

- Part 1 covers general principles of preventing thermal bridging and air leakage, and gives detailed advice applicable to insulating ground floors, pitched roofs and rooms-in-the-roof.
- Part 2 covers the insulation of external cavity walls, windows and doors, and lists references for further reading.

The two-part set is £20 (£15 for Connect members)

### Digests

Concise reviews of building technology.

#### **Digest 500 Using UK-grown Sitka spruce for exterior cladding**

Sitka spruce is the most widely grown softwood in the UK, yet its use in cladding applications has been relatively low. This is beginning to change with increasing interest from architects and designers, as timber cladding offers an aesthetically pleasing way of enhancing the outside features of a building. £15 (£10 for Connect members)

### Information Papers

The latest BRE research information and how to apply it.

#### **IP 8/06 Non-ferrous metal wastes as aggregates in highway construction**

Explains how non-ferrous metal wastes can be used successfully as aggregates in highway construction. £9 (£7.50 for Connect members)

14 November 2006 at BRE, Watford

#### **New fire safety law**

Seminar that will help you to ensure that your business is covered.

15 November 2006 at BRE, Watford

#### **Fire safety management course for hospitals**

A one-day course covering fire safety management issues for hospitals.

16 November 2006 at BRE, Watford

#### **Fire safety design course for hospitals**

A one-day course covering fire safety design issues for hospitals.

16 November 2006 at BRE, Watford

#### **Talking water – sending the right message**

Conference on water efficiency and human consumption, which will examine how people use water and what can be done to create less wasteful habits.

20 November 2006 at BRE, Watford

#### **Achieving airtightness**

A half-day CPD workshop that explains how to comply with the airtightness requirements of Part L of the Building Regulations. Those attending will receive a copy of the BRE publication *Airtightness in Commercial & Public Buildings*.

20 November 2006 at BRE, Watford

#### **Heritage buildings**

One of a series of courses at on key issues for home inspectors and other building professionals.

21 November 2006 at BRE, Watford

#### **Inspection of non-traditional and modern methods of construction**

One of a series of courses at on key issues for home inspectors and other building professionals.

21 November 2006 at BRE, Watford

#### **Low carbon technology briefing: Ground water/air source heat pumps**

Morning workshop being held as part of the series of low carbon technology briefings.

21 November 2006 at BRE, Watford

#### **Low carbon technology briefing: Micro CHP**

Afternoon workshop being held as part of the series of low carbon technology briefings.

21–24 November 2006 at BRE, Watford

#### **Fire Risk Assessment training**

A four-day comprehensive course that includes carrying out a Fire Risk Assessment.

23–24 November and 7–8 December 2006 at BRE, Watford

#### **SBEM training**

SBEM is a computer program that provides an analysis of a building's energy consumption. This course is aimed at building designers and consultants with a basic understanding of energy use and building services, and Building Control practitioners wanting to specialise in energy calculation and Part L compliance.

27 November 2006 at BRE, Watford

#### **Low carbon technology briefing: Biomass**

A one-day workshop being held as part of the series of low carbon technology briefings.

27 November – 1 December 2006 at BRE, Watford

#### **Building services integration with KNX/EIB**

Allows delegates to effectively deliver the benefits of EIB, and provide value-added service to clients.

28–29 November 2006 in London

#### **Green property profit**

This two-day conference will address issues such as: carbon asset testing, energy performance ratings, energy certification, renewable energy directive and changing market trends (see page 4).

Contact: 0208 969 1008 or go to [www.newzeve.com](http://www.newzeve.com)

28 November 2006 at BRE

#### **Inclusive environments and access auditing**

The programme for this course may be taken over 3 consecutive days, or day 1 may be attended in isolation, with an option to attend days 2 and 3 at a later date.

29 November 2006 at BRE Scotland, East Kilbride

#### **Low carbon technology briefing: Small scale wind**

A one-day workshop being held as part of the series of low carbon technology briefings.

4 December 2006 at BRE, Watford

#### **Low carbon technology briefing: Low carbon cooling technologies**

A one-day workshop being held as part of the series of low carbon technology briefings.

7 December 2006 at BRE, Watford

#### **Building Better Schools – delivering IT provision for the future**

Workshop on how to deliver an IT strategy that meets the needs of education, the business and the building. One of a series of workshops giving guidance through the priorities of good school design.

12–15 December 2006 at BRE, Watford

#### **Fire Risk Assessment training**

A four-day comprehensive course that includes carrying out a Fire Risk Assessment.

13 December 2006 at BRE, Watford

#### **Concrete in aggressive ground**

One day seminar on applying new guidance for concrete to be used in ground that may contain aggressive chemical substances, eg sulfates.

### BREEAM

Courses at BRE, Watford covering the technical contents of BREEAM schemes and giving details of the assessment processes:

– 22–23 November 2006

#### **EcoHomes (BREEAM for homes) assessor training**

– 5–6 December 2006

#### **BREEAM Industrial assessor training**

– 5–6 December 2006

#### **BREEAM Offices assessor training**

Contact: 01923 664462, [breeam@bre.co.uk](mailto:breeam@bre.co.uk)

#### Further information

For further information on the above events and training courses, contact (unless otherwise stated) BRE Events – 01923 664800, [email.events@bre.co.uk](mailto:email.events@bre.co.uk) or visit [www.bre.co.uk/events](http://www.bre.co.uk/events)

## Events and training

14 November 2006 at BRE, Watford

#### **Building Better Schools: Fire – designing to maximise safety and minimise risk**

One of a series of workshops giving guidance through the priorities of good school design.

**breconnect**

BRE Connect gives unrivalled access to BRE's expertise on buildings, construction, energy, environment, fire and risk.

For £145 a year BRE Connect members receive:

- All BRE Digests, Good Building Guides, Good Repair Guides and Information Papers such as those listed on this page – totalling at least 50 publications each year – all building to form an invaluable reference tool
- Access to pdf copies of all BRE publications published during the year
- Preferential pricing on a range of BRE books and other publications – such as those listed on this page – for which members pay a significantly reduced price

For more information –

Tel 01344 328 038, Fax 01344 328 005, Email [brepres@ihtsp.com](mailto:brepres@ihtsp.com)

**bre**

Constructing the future is circulated in association with *Contract Journal*.