

CONSTRUCTING THE FUTURE

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Issue 29

Transforming Victorian housing

Fire engineering design of steel structures

Construction waste

EcoHomes for existing housing

The UK's first MMC training centre

More scientists and engineers needed

PassivHaus design arrives in the UK

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Comment

Demolish or refurbish?

The refurbishment rather than demolition of run-down Victorian buildings is an option that could offer the best route to modern, energy efficient housing in the UK.

To help avoid a serious change in global climate the UK must cut 60% of its carbon emissions by 2050, stated a report by the Royal Commission on Environmental Pollution – a target that was adopted in the Government's subsequent Energy White Paper. It's a tall order!

As homes contribute a large part (about 25%) of the country's carbon emissions, it follows that housing emissions will have to be cut by 60% if there is to be much chance of meeting the overall target. Oxford University's environmental change institute led a two-and-a-half-year project looking at whether the so-called '40% house' is achievable.

Their report concluded that it could be done, but that among the many measures needed would be the demolition of three million houses that are too costly to heat, including about a million Victorian buildings – there are currently around two million Victorian terraced house in existence, making up 10% of the total housing stock.

But there is another – and in many cases better – option to the mass demolition of Victorian houses. With effort and imagination many, perhaps most, could be cost effectively refurbished to become energy efficient 21st Century homes.

The Prince's Foundation for the Built Environment, the East of England Development Agency and the University of Hertfordshire, are starting a project that aims to demonstrate that old, run-down housing can be transformed to provide attractive, flexible accommodation for the future – details are given in the article on page 7.

Any organisations wanting to become involved in the project can contact me on 01923 664133, nicols@bre.co.uk.

Simon Nicol
Director of Housing, BRE Environment



Improving security on industrial estates

A research project to improve safety and security on a large industrial estate (in south-east England) comprising more than 200 separate business units was recently completed by the BRE Crime Risk Management Team.

Industrial estates are at increased risk of crime and disorder because they are vulnerable to opportunist, professional and organised gangs of criminals.

As there has been little research in England into crime on industrial estates there is now an overwhelming case for a programme of research and evaluation. Police efforts in tackling business crime varies widely because it is not a performance indicator used to assess police performance.

A Crime Opportunity Profile (COPS) audit of the project area was carried out to identify crime and disorder risks in public and private space. Also included was an analysis of wider social and economic issues identified through the collection of reported crime and disorder data together with social, economic, demographic and traffic management data.

In order to accurately understand how well the environment was organised and managed, the methodology included questionnaire surveys of the local community, businesses and employees in the project area together with a series of focus groups and interviews with key personnel.

Part of the study revealed that reported crime and disorder was a fraction of what was actually occurring, and fear of crime was exceptionally high despite considerable investment in a number of improvement schemes. This surprised a lot of key stakeholders who thought that crime was reducing. It also became apparent that investments made to improve security and safety in the study area was failing to impact on, or target, some of the real problems.

The research findings and recommendations will be used by the local business partnership to formulate a crime prevention plan, pool resources and take collective action to improve safety and security to transform the area into a vibrant modern business environment.

For further information –
David Loader, 01923 664876,
Email loaderd@bre.co.uk

Schools Design Forum

The Schools Design Forum (SDF) is a new initiative by the BRE Trust and the Sustainable Development Commission (SDC)*. It aims to address the need increasingly felt by many involved with schools to improve the way sustainability is delivered – both in terms of how schools are designed and constructed, and the way they engage with pupils and the community to promote truly sustainable communities of the future.

‘Through BSF (Building Schools for the Future) and the primary programme starting in 2008, we have a unique opportunity to build schools that not only improve sustainability today, but also allow future generations of pupils, teachers and the community to work together to bring about a step change in sustainability,’ says Sir Neville Simms, Chairman of the BRE Trust.

The objectives of the SDF are to:

- deliver a realistic but stretching vision of a sustainable school and its links with the community
- integrate school sustainability in a way that contributes to social regeneration and sustainable communities
- produce a ‘road map’ for LAs, schools, the industry and other stakeholders, which integrates all of the disparate demands of sustainability into a national best practice format for sustainable delivery
- work collaboratively with LAs, schools, the industry and other stakeholders in creating the road map
- identify obstacles and barriers and recommend solutions that enable the vision to be realised
- champion and advocate a users’ national agenda for sustainability alongside government
- share and promote best practice
- disseminate practical advice to reduce the disparity between those that do it well and those that do not
- stimulate and exploit research and innovation to achieve the full sustainability potential of schools.

Initial funding for the Forum has been provided by the BRE Trust, but the SDF is a national collaborative self-help programme where members’ joining fees go to fund work to meet the objectives of the Forum and its members.

Forum members will be demonstrating, through their membership, that they are committed at a national level to helping make younger generations much more aware of sustainability than we currently are. They will also be responding to the challenge of the Government’s sustainability agenda in a very visible way.

‘The case for sustainable schools is absolutely clear,’ says Jonathon Porritt, Chairman of the SDC. ‘The economics of better design are evident: schools spend almost £400 million a year on heating and lighting, and a 500-pupil school could save over £8,000 a year through additional energy efficiency measures. Above and beyond that, these school buildings are where tomorrow’s adults are forming their ideas and beliefs. If we want sustainable development to matter to our children, there’s no excuse for anything but the highest standards.’

The formation of the SDF has been welcomed by the Department of Education and Skills (DfES) and Partnership for Schools (PFS).

For further information on the Forum and on becoming a member – Andrew Williams, 01923 664563, Email williamsa@bre.co.uk or visit www.schoolsdesignforum.org.uk

* The SDC is the Government’s independent watchdog on sustainable development, reporting to the Prime Minister and the First Ministers of Scotland and Wales. www.sd-commission.org.uk

Demonstration education and healthcare buildings

Proposals have been put forward for the construction of full-scale demonstration education and healthcare buildings on the BRE Innovation Park. The plan is to complete the buildings in time for them to be launched at the four-day OFFSITE2007 exhibition and conference in June next year.

‘Tougher building regulations and the growing challenges of sustainability have encouraged the rapid development of innovative construction methods and advanced technologies for a range of buildings across the sectors,’ says Jaya Skandamoorthy, the OFFSITE2007 commercial manager. ‘Our aim is to reflect these developments at the event in both the exhibition and the conference programme.’

OFFSITE2007 will specifically focus on how these innovations are coming together to deliver higher performing, more sustainable and smarter buildings. Major features of the exhibition will include:

- off-site manufactured systems and innovative on-site construction methods
- sustainable technologies – recycled building products and sustainable building materials, new products from natural resources and the use of industrial by-products for construction
- smart technologies – control systems and sensors for monitoring, and intelligent technologies for whole building communication.

OFFSITE2007 will take place on 11-14 June 2007. Companies interested in taking part in the event by sponsoring, exhibiting, speaking or attending as a delegate, can contact Sue Rogers – rogerss@bre.co.uk

Industrial estates are at increased risk of crime and disorder



‘The case for sustainable schools is absolutely clear,’ says Jonathon Porritt



The four demonstration houses at the BRE Innovation park could soon be joined by full-scale education and healthcare buildings



News from BRE Certification

Sprinkler study report completed

A two-and-a-half year study on the benefits of sprinklers in residential accommodation has been completed by BRE for the Department for Communities and Local Government (formerly the ODPM).

The full report of the project, *Effectiveness of sprinklers in residential premises* is now available to download free of charge at www.bre.co.uk/fire

First Indian company approved to LPS 1254

A pioneering manufacturer of Polyester has become the first Indian company to gain approval to LPS 1254, Issue 1.1: *Requirements for Suction Tanks for Automatic Pumps*.

Devi Polymers Private Limited of Chennai, India, has gained approval for its FLOSTO - GRP sectional rectangular water storage tank. The compression moulded modular tank system has a variety of uses and has been certificated by LPCB for use as a pump suction tank in conjunction with the LPC Rules for Automatic Sprinkler Installations.

Devi represents a growing number of overseas companies gaining entry into the Red Book. This provides the benefits of internationally recognised third party certification, but also an invaluable route to market for exporting products and services worldwide.

Innovative manual call point

Safety Technology International (Europe) Ltd has recently gained approval to EN 54-11: 2001 through LPCB for its innovative 'ReSet' series 01 manual call point. The 'ReSet' series are unique manual call points that mimic the effect of breaking glass whilst offering the benefits of a re-settable operating element.

Polaron achieves LPS 1014 approval

Polaron Controls Ltd, a division of Polaron Group plc, recently gained approval to LPS 1014, *Requirements for Certificated fire detection and alarm system firms*.

LPCB's LPS 1014 scheme aids specifiers in selecting reliable contractors such as Polaron with a track record in designing, installing and servicing fire detection and alarm systems. It requires one Certificate of Conformity for the project, ie single point responsibility, which benefits all parties concerned – insurers, the fire brigade, the building owner, etc. The scheme also requires, where possible, the use of third party approved products.

LPS 1014 *Requirements for Certificated fire detection and alarm system firms* also helps satisfy a recent 'Model Agreement' between the fire and rescue services, and alarm receiving centres for the third party certification of installers.

NFPA annual conference

LPCB recently exhibited at the NFPA World Safety Conference and exposition at the Orange County convention centre in Orlando. Much interest was shown in the LPCB listings and CE marking capabilities.

For further information – tel 01923 664100 or visit: www.redbooklive.com

Major low carbon buildings event

Following the success of the resource05 low carbon buildings conference and exhibition last year – which was attended by nearly 1,500 visitors – there are high expectations for resource06 and full details can be viewed at www.resource06.com

'The third annual resource conference and exhibition is set to be another successful event in the series,' says David Strong, Managing Director of BRE Environment. 'Delivering low carbon buildings has become an important issue on the agenda of all the main political parties. The recent changes to Part L of the Building Regulations and the introduction of the EU Energy Performance of Buildings Directive (EPBD) provide major business threats and opportunities.

'Through keynote lectures, cutting-edge debates and workshops, resource06 provides an ideal opportunity to find out how these changes will impact on companies and organisations.'

This year's event will be held on 27-28 September and BRE's Watford headquarters. The first day's programme will focus on the domestic sector, with day two addressing issues associated with the non-domestic sector.

Speakers from across a wide range of the industry's leading low carbon projects will present their findings and offer practical examples. These include the Nottingham Eco-Home, the Award Winning Jubilee Brighton Library, Terminal 5, and the Building Better Schools for the Future, Living Rainforest and UK Green Building initiatives.

For full programme details and to book on line visit www.resource06.com



The then energy minister Stephen Timms (second from left) at resource04. This year's event will be on 27-28 September.

Centre for Energy Utilisation

The University of Strathclyde and the BRE Trust have established a new Centre of Excellence in Energy Utilisation.

Based at the University, this joint venture will develop programmes that focus on the interface between energy demand and supply. It will look particularly at the development of an integral approach to building performance modelling.

The Centre will include a new University Chair, jointly funded by the BRE Trust and the University of Strathclyde. The role will be known as the BRE Trust Research Chair in Energy Utilisation, with Board members of the new centre drawn from BRE and the University's Institute for Energy and Environment.

The Centre for Energy Utilisation initiative will result in a new direction for energy research, give rise to cross-discipline consultancy opportunities, and foster innovative training programmes at all levels.

This is one of a number of Centres of Excellence being established at some of the leading UK universities under the BRE-Universities Partnership. They are being set up to develop the new research capabilities that are key to future developments in the built environment.

The new centres include the Centre for Innovative Construction Materials at the University of Bath, where the first director, Professor Peter Walker, has now been appointed. He also holds the research Chair funded by BRE Trust and the University.

Professor Walker was appointed as a lecturer in Structural Engineering at the Department of Architecture and Civil Engineering at Bath in January 1998, being promoted to Senior Lecturer in September 2002. He has gained a reputation for research work on sustainable construction materials at Bath, including exploring traditional technologies such as earth and green timber.

For more information – Professor Farshad Alamdari, 01923 664947, Email alamdarif@bre.co.uk



Professor Peter Walker (Photograph courtesy of the Imaging & Photographic Unit, University of Bath)

Structural safety of buildings

The issue of structural safety throughout the life of a building is the focus of conference being organised by the Institution of Civil Engineers in October.

Structural defects and failures in buildings can result in substantial financial costs in terms of repair, restoration, structural remediation, disruption, loss of productivity and in litigation and compensation. Worse still they can result in loss of human life and personal injury.

Defects and failures can occur at any point in a building's life, and neglecting to plan ahead only contributes to risk. It is therefore crucial that investment is made to ensure ongoing structural safety and the efficient long-term use of buildings.

The one-day ICE conference on 4 October will explore the crucial issues that affect a building's structural safety throughout its lifespan – from design and construction, to the ongoing management of the structure, its refurbishment and beyond.

Drawing lessons from good practice and successes as well as structural failures, experts will deal with topical issues including:

- the role of risk management in long-term safety
- the designer obligations inherent in the CDM regulations, and safety regulations
- the use of recycled and reused materials
- designing for appropriate robustness and unexpected events
- the latest methods for minimising deterioration across the lifespan of buildings
- the latest techniques for appraising buildings
- refurbishing older buildings safely.

Structural safety across the lifespan of buildings, will be held on 4 October 2006 at the International Coffee Organisation, London.

For further information email conferences@ice.org.uk or go to www.iceconferences.com

Energy efficient construction products

A new research project aims to encourage the use of energy efficient construction products across Europe, and promote the use of EU labelling schemes in the building sector.

The project involves partners from around Europe, including BRE, and is funded by the EU, the UK Government (through the MTP Programme) and UK industry.

It will introduce labelled construction products to the European market through a voluntary mechanism. The aim is to motivate the EU industry to produce more energy efficient construction products, and to facilitate the implementation of new EU Directives at practice level.

To achieve these goals the project will:

- review the common construction practice in EU buildings and the use of construction products (conventional and innovative)
- assess of the most relevant energy performance indicators and benchmarks of construction products, both of common practice and best practice, as well as their contribution to the overall energy performance of buildings
- examine existing labelling schemes in the EU and world-wide, and select the most appropriate
- describe appropriate self-regulatory mechanisms to involve the industrial sector in a voluntary initiative aimed at promoting energy efficient construction products
- raise awareness and information activities, including direct involvement among key market actors and decision makers.

Product data is being collected for the production of a European database on building materials and components in the following categories:

- masonry units
- cladding
- prefabricated components
- aluminium systems
- windows
- passive components
- insulation.

Support from UK industry is being funnelled through a UK GREEN-IT Club. The club is running five dissemination events during the project, the first of which was held at BRE, Watford on 10 July 2006.

Industry members and supporters of energy efficiency in construction wanting to join GREEN-IT can contact Laura Birrell, 01355 576232, Email birrell@bre.co.uk. Information on the workshops is available at www.bre.co.uk/events

For more information on the project – Stephen Garvin, 01355 576200, Email garvins@bre.co.uk



In brief

New release of Part L software

An updated release of the Part L calculation software SBEM has been made available for designers wishing to demonstrate compliance for buildings other than dwellings.

The development team responded to feedback from the market on the previous release in January, and has incorporated a number of improvements to the calculation itself and to the way in which data is entered. The new software package, available for download from www.ncm.bre.co.uk, comprises version v1.1.a of the calculation tool SBEM and of the interface iSBEM, together with an updated User Guide and supporting databases.

The team is very grateful for the feedback from the industry, and will continue to respond to comments and questions via the website and the telephone helpline at 0870 460 8141.

Robustness of structural systems

Since the World Trade Centre disaster there has been renewed interest in the robustness of structural systems.

The Joint Committee on Structural Safety (JCSS) has established an Expert Task Group (ETG) on Robustness of Structures and appointed Dr Gerard Canisius of BRE as its Chairman. The ETG consists of eleven international experts, including Mr Geoff Harding of DCLG (formerly ODPM), Dr Fahim Sadek (of NIST, USA and of 9/11 investigation fame), Prof. Michael Baker (of ETH, Zurich) and Prof. Ton Vrouwenvelder (of TNO, The Netherlands).

The task group has a timeframe of two years to develop international guidelines for evaluating the robustness of structural systems and designing robust structures. The terms of reference includes matters such as potential hazards, structural behaviour, risks, risk mitigation measures and public perception issues. It held its first meeting on 5 July at BRE in Watford.

For more information – Gerard Canisius, 01923 664694, Email canisius@bre.co.uk

Unashamedly modern

Among speakers presenting their views on the key issues to consider when designing and regenerating urban landscapes at this year's BRE Annual Conference, was 'Grand Designs' presenter Kevin McCloud.

Mr McCloud made it clear that he is a firm believer that although modern buildings should fit well into their environment, they should not be pastiches of the past.

He took the view new buildings should be built and designed well, from locally sourced sustainable materials, and with minimal environmental impact both locally and globally. But also that they should look as though they 'belong' to where they are built.

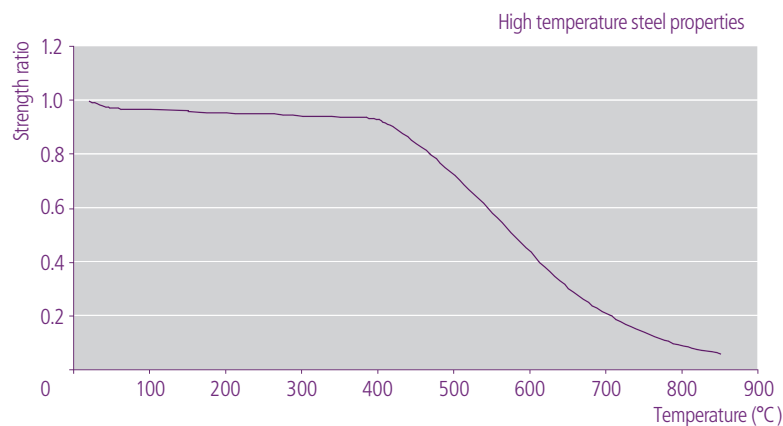
At present, he told the audience of more than 200 delegates, developments in Wales, the North East, or around London all look the same – pseudo-Victorian, mock-Tudor and Georgian revival designs, with Kentish weatherboarding, Suffolk tile-hanging, and flint-knapped features, 'rubber stamped' across the countryside from pattern-book plans.



Grand Designs presenter Kevin McCloud speaking at the BRE Annual Conference

FIRE ENGINEERING DESIGN OF STEEL STRUCTURES

Designers now have a range of options for achieving the required fire performance in steel framed structures. We look at the advantages and disadvantages of the various approaches.



Relationship between temperature and steel strength for structural steel

Steel framed structures are extensively used throughout the world, particularly in high-rise construction. To meet the fire safety requirements of UK National Building Regulations, it is normal practice to cover the steel members with proprietary fire protection materials to ensure the stability of the building for a prescribed period.

In recent years, alternative performance-based fire engineering methods have been developed, which provide the designer with a number of options for complying with the requirements.

Material behaviour

Steel loses both strength and stiffness with increasing temperature. Test data presented in the graph above shows that this reduction is relatively slow until around 400°C, but particularly significant between 400 and 700°C.

The accuracy of this data is supported by the fact that it correlates well with large-scale beam and column tests, but previous experimental work² suggested a significantly poorer performance and contributed to the perception that steel elements perform poorly in fire. For example, the more recent tests showed that at a temperature of 550°C structural steel will retain 60% of its room temperature strength, while the results of the earlier work had been closer to 40% retained strength.

Because of this perceived poor performance, the most common method of 'designing' for fire is to design the steel structure for normal conditions and then protect the steel members with proprietary fire protection materials to ensure that a specific temperature is not exceeded, or that a specified percentage of room temperature strength is retained.

A more rational approach would be to consider fire at the initial design stage rather than as an expensive afterthought once the main structural members have been chosen. Such a philosophy is consistent with new design documents produced in the UK and Europe^{3,4}.

Protection materials

Passive fire protection may be in the form of traditional construction materials such as concrete or brickwork. Until the late 1970s, concrete was the most common form of fire protection to structural steelwork. But the high cost of this form of protection together with the problem of spalling in fires led to the development of alternative methods.

More frequently, insulation is provided by spray or board fire protection or some combination of the two. Intumescent coatings may be preferred to the more traditional methods. Reactive coatings are becoming increasingly popular in the UK. Sprayed systems are popular where the steelwork is not visible, such as floor soffits hidden by a suspended ceiling.

Board protection is preferred where the protection is to be left exposed. In modern steel framed offices the most common protection is to spray the beams and to protect the columns with boards. A useful source of information on commonly used fire protection materials is the Yellow Book⁵ published by the Association of Specialist Fire Protection and the Steel Construction Institute. This document provides information on the thickness of protection for specified periods of fire resistance.

The advantages and disadvantages of applied fire protection materials are summarised in Table 1.

Partial protection and unprotected steel

A number of innovative design solutions have been developed to allow the use of unprotected or partially protected steel members in buildings. Examples include columns where the web may be blocked in, either by concrete blocks or reinforced concrete, deep deck systems such as the asymmetrical slim floor beam (ASB), and shelf angle beams.

Information on using steel without applied fire protection is available in an SCI publication⁶. In certain situations such as open sided car parks, steel profiles may be used without any form of protection. The use of fire engineering design methods can be used to justify using unprotected steel where the fire resistance requirement is low and the imposed load at the fire limit state is low.

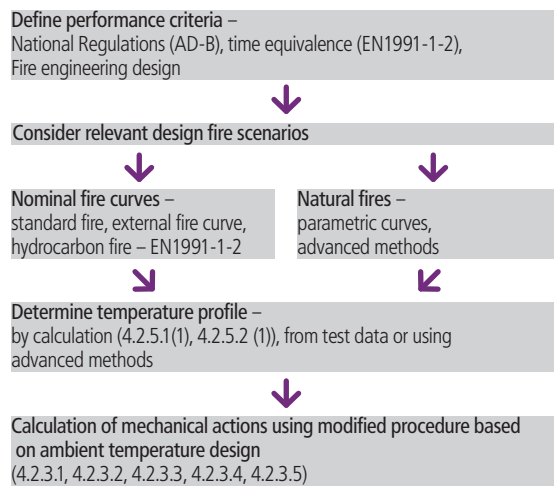
Performance based options

The development of performance based regulations and codes in the UK and Europe has done much to stimulate a more rational approach to the fire engineering design of buildings, taking account of all relevant factors through a risk-based approach to design for fire. The structural Eurocodes provide a variety of options to the designer, ranging from a simple reliance on standard test data to a consideration of global structural performance derived from advanced numerical methods. The fire design procedure is summarised in the diagram (above right).

New design methods

Following an extensive programme of full-scale fire tests, a new design method has been developed by BRE in conjunction with the UK steel industry. It is based on observed behaviour from real fires, and takes account of the enhanced load carrying capacity mobilised by composite floor slabs acting in tensile membrane action at the fire limit state. The method allows for the increasing use of unprotected steel beams, subject to the limitations set out in the design guidance produced by the industry⁷.





Design procedure from Structural Eurocodes (the clauses refer to EN1993-1-2)

Background research

The BRE design method was developed following an extensive series of full-scale fire tests carried out at BRE's Cardington large-scale-test facility over a number of years. The method has been validated against the test results and provides an excellent correlation between predicted and measured deflections. The test programme is summarised in Table 2.

The Cardington test programme, together with observations from real fires, has demonstrated that the behaviour of composite steel framed buildings is significantly better than predicted from the performance of the individual elements assessed using standard test procedures.

The enhanced performance is in part attributed to the stiffness of the beam to column connections which make a significant contribution to the overall behaviour of the structure, particularly at relatively small displacements. The tensile membrane action of the composite slab plays a significant role in maintaining the strength and stability of the structure at large slab displacements.

Renewed interest in the behaviour of complete structures in fire has followed the terrorist attacks on the World Trade Centre and in particular, on the collapse of WTC 7⁸. Issues such as robustness rules for tall buildings, redundancy, the blast resistance of passive fire protection and the performance of connections require further study.

Conclusion

A number of options are available to ensure the fire performance of steel framed structures, ranging from a reliance on tried and tested prescriptive methods to the use of advanced calculation models. Developments in the performance and type of passive fire protection materials available has been matched by improved knowledge of the performance of complete structures due to realistic fires. Recent events have stimulated a renewed interest in the performance of whole buildings in fire.

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This article is based on a paper by Tom Lennon, a Principal Consultant at BRE.

Advantages	Disadvantages
Limited design effort required	Generally conservative approach resulting in inefficient use of material
Performance in real fires shown to be adequate	Fixing of protection generally on critical path for construction
Approach easily understood by designers and regulators	Does not relate to actual behaviour in a real fire
Off-site intumescent coatings increase the speed of construction	May be subject to impact damage
	May be damaged due to maintenance and repair

Table 1
Use of applied passive fire protection

Test	Maximum steel temperature (°C)	Time to maximum temperature (mins)	Maximum vertical deflection (mm)	Residual deflection (mm)
1 Restrained beam	900	170	232	113
2 Plane frame	800	125	445	265
3 Corner compartment 1	903	114	269	160
4 Corner compartment 2	1020	75	425	325
5 Large compartment	691	70	557	481
6 Demonstration	1060	40	641	544

Table 2
Cardington fire tests on steel framed building

New fire safety law – Are you covered?

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TRANSFORMING VICTORIAN BUILDINGS INTO MODERN, ENERGY EFFICIENT HOMES

A pioneering partnership to transform Victorian buildings into energy efficient accommodation for 21st century living was launched by HRH The Prince of Wales, President of The Prince's Foundation for the Built Environment, in June 2006.

Britain has the oldest housing stock in the developed world, much of it represented by the Victorian terraced housing that characterises our urban centres. There has been a good deal of talk about the 'house of the future' and the regeneration of our older urban areas, but the reality is that at current demolition rates the average house will have to last for up to 1000 years before it is replaced.

Meeting energy targets

Oxford University's 40% House Report suggests that by 2050 more than a million Victorian terraced houses – around half of those currently in existence – will have to be demolished and replaced with more energy efficient homes if targets for reduced carbon emissions are to be met.

'The recently launched Victorian House of the Future project will show that demolition is not the only option open to us,' says David Strong, Managing Director of BRE Environment. 'There is another that allows us to upgrade existing stock whilst avoiding the waste associated with demolition, and preserving the mix of architecture that makes our urban landscape a more humane and interesting place in which to live and work.'

Hank Dittmar, Chief Executive of The Prince's Foundation agrees. 'By retrofitting these old buildings you save the embodied energy within them – rather than using more energy to make new buildings. Furthermore, these Victorian terraces were built in a more sustainable urban layout – a layout that in itself can help reduce fossil fuel consumption – than the suburban layouts produced in the post war era.'

Demonstration project

The new project is a collaboration between The Prince's Foundation, BRE, the East of England Development Agency (EEDA) and the University of Hertfordshire. It will begin with the refurbishment of a Victorian stable block at BRE's Headquarters in Watford. The project will analyse and demonstrate how older buildings with solid walls, poor insulation, draughty windows, inadequate heating and in a state of general disrepair, can be transformed to provide attractive, flexible and energy efficient accommodation for the future.

The work will be of particular benefit to the East of England region where more than 50% of ongoing construction output will be connected with existing building stock, rather than new build. 'This innovative project will help to support sustainable economic development in the East of England,' says Richard Ellis, Chair of EEDA, 'through a high quality and sustainable built form, and the introduction of innovative construction methods and materials that will help to improve the quality of life of all who live and work in the region.'

The completed scheme will incorporate a demonstration house, an adjacent refurbishment education centre, workshops and first-floor offices and meeting rooms. The layout will show the enormous versatility this type of older building can offer. The overall aim of the project is to find a route that makes the economics, technologies and environmental demands stack up into a viable blueprint for future similar refurbishment.

Companies or organisations wanting to contribute skills and expertise are invited to contact Simon Nicol, BRE Environment, 01923 664133, nicols@bre.co.uk

HRH Prince Charles in front of BRE's Victorian stable block with (left to right) Simon Nicol, BRE's Director of Housing, Richard Ellis, Chairman, East of England Development Agency and Professor Tim Wilson, Vice Chancellor and Chief Executive of the University of Hertfordshire.

Demonstrating the refurbishment option

The Victorian stable block to be refurbished as part of the demonstration project (described left), lies at the heart of BRE's 70 acre site, and was constructed in 1855.

Now in a state of some decay, it will be transformed into showpiece mixed-use housing and office accommodation with the housing component meeting the Decent Homes Standard. The finished building will retain the historical aspects of the stable block and make maximum use of the existing materials and resources.

As older, solid wall housing will have to last for many years into the future at current replacement rates, this project will demonstrate many classic problems with older solid wall properties, such as how to insulate and ventilate to best practice standards, how to deal with structural faults, identify and remove asbestos and add contemporary services – with minimum impact.

The main aim is to repair and retain the existing building to demonstrate best practice methods to achieve a building that is a safe and pleasant place to work, whilst avoiding the waste and loss of character that demolition would bring. The refurbishment process will be documented and used, along with a permanent display showing cut-away parts of the building, to demonstrate the issues and solutions employed with common work to solid walled dwellings. The building will be used for training surveyors on condition survey courses, and for demonstrations to visitors to BRE.

Choosing refurbishment or demolition

The project to refurbish a Victorian stable block complements recent BRE Trust funded research (first reported in the last issue) into the way developers tackle the renovation of Victorian and Edwardian houses.

The technical, economic, environmental and social implications of retaining homes built in the UK between 1840 and 1914 have been extensively surveyed as part of this research. The survey was designed to inform developers' decisions on whether and how to renovate Victorian and Edwardian houses. Project Director Tim Yates said, 'Renovating and refurbishing older housing stock involves complex decision-making. As well as being economically viable to restore, the resulting homes need to be energy efficient and easy to maintain. They need to be located in areas where people want to live and where there are adequate transport links and social infrastructure such as shops and schools.'

Sustainability has been the main focus of the survey, both in terms of the materials and technologies used for renovation and refurbishment, and the on-going economic and environmental effects of living in the houses after refurbishment. Heating, lighting and sanitation, for example, must meet or exceed the best modern standards.

Tim Yates gave a presentation on the project at the 'REFURB 2006' conference at BRE last month. 'A methodology can be developed to support decision making by establishing a benchmark from which the benefits of various actions can be objectively assessed,' said Yates at the conference. 'The assessment uses a scoring developed from Ecohomes XB (see page 10).

'The methodology can also show that limits for both conservation and sustainability – whether economic, environmental and social – can be defined beyond which actions become unacceptable in terms of damage to the built heritage or in purely economic terms.'

By documenting case studies in Nelson, Nottingham and London the project has shown that a range of refurbishment schemes can be successful in environmental and economic terms, but that in a market driven economy there are limits to what can be achieved. It has also highlighted the importance of considering a range of schemes for a location and proceeding with the most appropriate one, and of having an overall regeneration programme that meets the needs of the existing local community.

The *Sustainable Refurbishment of Victorian and Edwardian Houses* report will shortly be available from the BRE Trust.



The stable block in 1924

MORE SCIENTISTS AND ENGINEERS NEEDED



HRH The Princess Royal being introduced to students from Parmiter's School during her visit to BRE in May.

While science and engineering offer rewarding careers, not enough people are being attracted into these fields. Why is this and what is to be done?



Not enough teachers and students

'The growing shortage of scientists, engineers and science and maths teachers will have serious long-term consequences for the UK unless we get more young people to take the subjects at least to A-level', said Alan Wood, chief executive of Siemens plc, when discussing the research results published by the company earlier this year.

According to Siemens the UK is currently suffering Europe's worst brain drain and will fall behind the rest of the world in science and research if this continues – demand for science courses is falling whilst demand for science graduates is rising.

The fact is that students are not choosing to do physics, chemistry and maths at 'A' level in the numbers the UK needs. This is despite the finding of the Siemens survey of 500 UK students, that the vast majority (over 80%) believe that science qualifications lead to interesting and well paid jobs.

So what's the problem? The survey also revealed that 70% of students think it is harder to get an A-grade at A-level in science-based subjects than in 'softer' subjects, and that when deciding whether or not to take a science subject, the level of difficulty in getting high grades is an important factor for the majority of students.

'A-level results are at an all time high and competition for university placements is extremely competitive,' said Eric Frisk, Chairman of the National Association of Head Teachers Secondary Committee. 'Consequently, students are taking the "safe" option when picking A-levels at the expense of subjects like physics and chemistry that could potentially be more rewarding to themselves and of greater value to the economy.'

Physics seems to be a particular problem area with a reported 30% of university physics departments having merged or closed since 2001. Although overall A-level entries in all subjects have risen by 14.6% since 1990, the number of physics entries has fallen by 38%.

According to a national survey published in November 2005 by the Centre for Education and Employment Research (CEER) at the University of Buckingham, the steep decline in the numbers of students taking A-level physics can be directly linked to the shortage of expert teachers and decreasing opportunity to study the subject.

The survey of 432 schools and colleges showed that teachers' qualification in physics is the most important factor, after pupil ability, in explaining performance in both GCSE and A-level physics. It also found that only a quarter of schools have a physics teacher with a relevant degree.

And not enough women

The lack of women in science and engineering fields has been highlighted by HRH The Princess Royal. Earlier this year, while addressing an audience of MPs and scientists, The Princess Royal called for more to be done to attract women into these disciplines.

The Princess pointed to the continuing perception of science as a male domain, with children having definite views on what constitutes men's work and women's work by the time they enter schools. Pupils asked to draw a scientist usually depict a white male with facial hair in a white coat working alone in a laboratory. This is a stereotype that not only alienates girls but also contributes to other attainment gaps, such as that between white and Afro-Caribbean and between children from manual and professional families – and probably alienates boys as well.

What can be done?

'We feel it is time to consider innovations in how science is taught at GCSE level, the degree of support given during A-levels and perhaps even a different points system for science and maths subjects,' said Alan Wood. 'This is not to suggest "dumbing down" the subjects at all, but we do need to ensure that students do not feel that if they choose harder subjects they will be less likely to get a place at a good university.'

Engaging young people

According to Jonathan Kestenbaum, CEO of the National Endowment for Science, Technology and the Arts (NESTA), 'Our recent "Real Science" research showed that there's a need to make science more engaging in the classroom through practical experiments. It makes science compelling for young people'.

The Engineering Education Scheme (England) encourages school students to solve practical problems, and so inspire them to take up further education and careers in engineering or science.

For example, under the scheme the BRE Trust funded pupils at Parmiter's school in Watford to work with a BRE mentor on a project to design and build a multi-axis micro positioning system, which could be used as part of an automated tester of biometric fingerprint readers.

Their successful project was presented to the Scheme assessors, and was also independently reviewed by the British Association for the Advancement of Science (BA). The four participants received BA Platinum CREST Awards, which are only given for outstanding achievement.

Role models

The Princess Royal has emphasised the importance of inspirational female role models in getting more women into science and engineering. In May of this year she visited BRE to meet a number of the female scientists and engineers working there, and to see examples of what they are achieving.

Details of wide ranging career opportunities at BRE can be viewed at www.bre.co.uk (click on 'Job opportunities').

A new version of EcoHomes, the widely used environmental rating method for housing, has been developed to provide a rating system for existing housing stocks.

EcoHomes XB is designed to enable residential property managers and registered social landlords (RSLs) to assess the environmental efficiency of their housing, identify potential improvements, and measure the improvements when work has been carried out.

A key feature of XB is the emphasis on improvement rather than absolute scores. This is necessary because of the nature of existing housing. There is a wide range of property types and an equally wide range of potential for improvement. At the same time there is a limited number of measures that can realistically be adopted.

Areas covered

The topics covered by EcoHomes XB are:

Management Policies: energy, energy efficiency advice, environmental policy and energy labelled appliances.

Energy: fabric loss, energy efficient fittings, heating system controls, SAP rating, drying space, external lighting.

Transport: access to public transport.

Pollution: zero emission energy source.

Water: internal water use, external water use.

Health: external private space, internal private space, controlled ventilation.

Waste: reduction of material waste, domestic recycling facilities, disposal of appliances.

Designed for ease of use

Funded by the Housing Corporation and taking just over two years to complete, XB's development has involved consultation with a range of stakeholders, including housing associations, local authorities, EcoHomes assessors and other interested parties. Close liaison with the Housing Corporation during its development has ensured that EcoHomes XB is as user-friendly as possible, and number of housing associations and local authorities have participated in two pilot studies.

The result is a complete tool for RSLs that enables them judge the environmental performance of their management structure and their existing housing stock. It has been designed for use by untrained personnel with readily available information.

At the outset the RSL completes an assessment using only data and information that is to hand. For the initial appraisal the data and information can be extrapolated across all dwellings of the same build type and age group. This will give a rough idea of the stock's performance and will highlight house types that are in need of priority attention.

As more detailed data and information become available the stock can be sub-divided into more discreet groups of geographical area, village or suburb, and be further refined to consider individual streets or groups of houses. This will enable RSLs to pinpoint areas of their stock which are most in need of attention.

How it works

EcoHomes XB has a rating score of 0 to 100, subdivided into groups of 3 points. The scoring reflects changes in performance due to minor refurbishments and maintenance works, such as the replacement of boilers and installation of water efficient fittings.

EcoHomes XB has three components:

- 1 **Guidance:** sets out the criteria that need to be fulfilled for a rating score to be awarded and gives advice on what is, and what is not acceptable.
- 2 **Credit Estimator:** a quick check tool to give the RSL a rough guide to what rating score might be achieved. It can also be used to see which areas would be most practical for the RSL to consider addressing.
- 3 **Summary score sheet:** combines all the properties assessed and gives the final rating score.

The assessment starts by using information to hand to set a 'Benchmark'. The user then sets a 'Target' at a score that they would realistically expect to achieve over the next year and using more detailed data as it becomes available.

There is a final, fixed 'Goal' of a score that they should attain to achieve maximum practicable environmental performance.

Assessments under EcoHomes XB are for the guidance of RSLs only – they are not mandatory requirements. The assessments will help in highlighting areas of the stock that require attention, and will facilitate the choice of work to be undertaken for the most benefit and practicality.

For more information –

Tel 01923 664462, Email breeam@bre.co.uk, or visit www.bre.co.uk/ecohomes

There will be a workshop on EcoHomes XB at the resource06 (see page 3) low carbon buildings conference and exhibition in September – go to www.resource06.com for details.

BRE Home Inspector Assessment and Training

Join the several hundred people, both experienced practitioners and new entrants, now in the process of becoming Home Inspectors.

Tel 01923 664829

Email homeinspector@bre.co.uk

www.bre.co.uk/homeinspector

ECOHOMES XB – ECOHOMES FOR EXISTING HOUSING

EcoHomes XB will help housing managers and landlords to improve the environmental performance of their buildings, by identifying the areas in most need of attention and the actions offering the most benefit.

FOR
SALE

THE UK'S FIRST MMC TRAINING CENTRE

A new SmartLIFE centre in Cambridge aims to train 600 local students a year in modern methods of construction.

Photographs:
SmartLIFE Training and Business Centre: main contractor Bluestone, architects Annand and Mustoe, mechanical engineer WSP, Structural engineer, Whitby and Bird



One of three international SmartLIFE centres is now open for business in Cambridge, and will be used for training in modern methods of construction (MMC) as well as staging seminars, conferences, exhibitions and events.

An inspirational timber and steel structure, which itself was built using MMC, the Cambridge SmartLIFE Business/Training Centre is located on the campus of Cambridge Regional College. Its opening marks a key milestone in the delivery of the BRE-led SmartLIFE initiative in partnership with Cambridgeshire County Council. Working with Hamburg in Germany and Malmö in Sweden, the aim is to support the development of sustainable communities in EU growth regions.

At least 70,500 new homes are needed in Cambridgeshire by 2016, together with £2.2bn worth of infrastructure and associated services. It is planned that MMC will meet some of these requirements, along with traditional build techniques. The aim of the centre is to build up the skills base needed to kick start this construction programme by training 600 local students a year.

The centre comprises lecture rooms, a large conference area, a visitor centre and a large practical training space that can also be used as an event arena. It is a unique example of a fast track, sustainable, affordable building, and acts as a terrific showcase for MMC having used several different types of innovative construction in its composition including:

- a glulam sustainable timber frame system
- I-joists walling and Lenotec walling system made from multiple cross-laminated layers of spruce
- steel/canvas roof canopy and SIPS roofing panels
- untreated western red cedar external cladding
- treated timber windows with a life cycle comparable to market leading systems
- 15m electricity generating wind turbine and ground source heat pump which will collectively provide 75% of the buildings energy needs

The need for a hands-on training/demonstration area within the training centre has led to the design of a flamboyant steel framed canopied area that can accommodate two full-scale houses. The canopy – the biggest single span hyper canopy in the UK – has given the centre a very distinctive look.

MMC Training programmes have been developed in partnership with Cambridge Regional College and these begin in September 2006. There are two main types of training that the centre provides:



1. An NVQ in Industrial Building Systems

this encompasses the three main routes of building in modern methods – timber, steel and concrete construction.

2. Industry up-skilling

local and regional construction companies can use the Training Centre as a means of up-skilling staff in MMC – this is so that, as new systems reach the market, construction workers can develop their skills to meet the market requirements.

Kevin Scobell, Chief Executive of the SmartLIFE project says, 'The opening of the centre is hugely significant for the construction industry – with government targets for housing well behind plan the need for skilled MMC workers is crucial to the industry getting back on track for delivery. The great thing about it is that it provides a fantastic environment in which students can learn about MMC, and it's been constructed from those very methods'.

The next phase of the SmartLIFE project involves piloting innovative methods of construction on a demonstration project of 100 homes, where the performance of different types of innovative systems will be measured.

Fenland District Council has recently granted planning permission to SmartLIFE for the construction of these houses on two Cambridgeshire sites in Chatteris and March. They will be constructed from MMC systems in timber, steel and concrete as well as traditional build. One of the aims of the project is to measure and compare the performance of different systems and traditional build as no data currently exists. Using measurement tools Calibre and SMARTaudit, BRE's Housing Innovation team will manage this part of the project once construction starts in August.

Kevin Scobell says, 'We are working closely with our partners and other related projects to establish a strategy for the future of SmartLIFE that goes beyond the initial three-year phase. Towards the end of this phase we will be pulling together all we have learnt in a major international conference and report. We will be able to see what the transferable elements of the project are and how it can be rolled out elsewhere.'

The SmartLIFE Training and Business Centre's lecture rooms, conference area, visitor centre and huge training demonstration area, are available for hire.

For further information on the centre contact –
richard.bateman@cambridgeshire.gov.uk

SmartLIFE

The fundamental aim of SmartLIFE is to facilitate the delivery of sustainable growth. Each SmartLIFE region is facing a different growth related challenge. Cambridgeshire's recent growth pressures are partly resulting from the growth in its high-tech/biotech sector. Malmö's approach too is in part a response to economic pressure, since the opening of the Öresund Bridge which connects Sweden to Denmark an increasing number of Danes have started moving from Copenhagen to Malmö and this is expected to increase. Hamburg is proactively seeking growth policies, trying to reverse the trend of negative growth and pessimistic population forecasts.

Although there are different agendas in terms of growth, the partner countries share similarities in dealing with the issues surrounding increased growth. For example increased growth goes hand-in-hand with an increased pressure on land, resources, populations, the economy and housing. The SmartLIFE partner areas all share a deficit in affordable and suitable housing for the needs of population. Each region also has a strong desire to encourage sustainability as the way forward to manage growth.

By researching the similarities and differences between the UK, Sweden and Germany in terms of growth and sustainability we can learn what in each country helps or hinders the up take of modern methods of construction and the planning system. From this research the project can move forward and develop strategies to increase the uptake of Modern Methods of Construction (MMC) and deliver innovative solutions to growth and sustainable community issues.

resource06

For the latest on delivering low carbon buildings and the impact of recent regulation changes

27–28 September
at BRE Watford

For full programme details
and to book on line:
www.resource06.com

A C&D WASTE DIALOGUE

Szilvia Zakar reports on projects that are reaching out to the construction industry to gather information – to be fed back to government policy makers – on the C&D waste issues facing the industry.



Construction and demolition waste accounts for around 33% of controlled waste in the UK (over 100 million tonnes/ year), this makes it the single largest waste stream.

Construction companies pay around 5% of their profit for waste removal and about £200 million in Landfill Tax. When waste from the manufacture of construction products and the quarrying of mineral resources is included, this figure rises to over 50%. Changes and forthcoming regulations in waste legislation require companies to pay higher rates for waste disposal than ever before. So it is not surprising that the Industry needs to become leaner in order to remain competitive in the future.

Business needs

The Defra funded 'Strategic Approach to C&D Waste' project aims to gauge the business needs of the construction sector in terms of resource efficiency. The project will consider the activities, drivers, trends and thinking of construction related business with key industry figures and policy/programme stakeholders. Gaps, confusion and inconsistencies will be identified, with a target of developing an effective road-map for change over the next 5 to 10 years.

This will deliver an industry focused set of activities (under the Business Resource Efficiency and Waste – BREW – Programme managed by Defra), reflecting the needs of this important landfill tax paying sector. The purpose of the road-map is to have a goal agreed by all stakeholders in terms of construction resource efficiency, to identify opportunities and actions for increasing resource efficiency, and to develop targets and timescales. An overall target might be, for example, to reduce the production of waste to a given percentage of turnover by 2015. The benefits to the construction sector will be clearly laid out, along with a strategy to achieving the goal.

One of the project's first tasks is to carry out a survey of industry needs in relation to construction waste and resource efficiency, and to assess the availability and effectiveness of current sources of information and provision of support. Representatives from all industry sectors have been invited to submit a response through an on-line questionnaire.

The Strategic Approach to C&D Waste project underpins two other ongoing projects that are aiming to reach out to the Industry and gather information which can be fed back to a decision making process for the future.

National Waste Benchmarking

The Defra funded National Waste Benchmarking project addresses the fact that, without knowing the quantities and types of waste being produced by the construction, demolition and refurbishment industries, it is virtually impossible to predict waste arisings for future years. Having a better understanding of waste production at a site level will enable policy makers and the construction industry to better deal with the waste streams so that these can be transformed back into secondary resources.

The project's main aim is to get 1000 sites to report on construction, refurbishment and demolition waste in a consistent manner using in-house systems, waste managers, Site Waste Management Plans, waste brokers and SMARTWaste reporting systems. This information is then fed into a database / website that will generate benchmark figures – these will be used to predict waste on future developments and assist resource planning.

Construction Research Efficiency (CoRE)

CoRE is part of Defra's BREW programme that aims to return additional landfill tax receipts, from April 2005, to business in a way that supports companies in improving their resource efficiency and waste management. The CoRE project is set up as a regionally based pilot with Regional Development Agencies to draw together the work relating to construction resource efficiency.

This is taking place in the regions of East of England (Eastern CoRE), London (London CoRE) and South East of England (South East CoRE), due to the high levels of construction – both underway and planned – in these areas. Each region has a champion to drive forward the delivery of CoRE, which will add value to projects relating to construction resource efficiency in those regions.

It is anticipated that these projects will provide ample opportunities for the construction sector and industry to work closely to implement and transfer best practice in resource efficiency that can be implemented at site, regional and national levels.

Szilvia Zakar is a consultant in the BRE Centre for Resource Efficiency.

For more information – email zakars@bre.co.uk

PASSIVHAUS DESIGN ARRIVES IN THE UK

The term 'PassivHaus' refers to a specific construction standard for residential buildings that have excellent comfort conditions in both winter and summer.

More than 5,000 homes have so far been built – mainly in Germany and Austria – in accordance with the principles of PassivHaus design, which reduces energy use by up to 90% compared to existing building stock. The European PEP (Promotion of European Passive Houses) project aims to bring PassivHaus design to the UK.

'Ten years ago, no-one believed us that houses can manage with a tenth of the heating energy used by average old buildings', says Professor Wolfgang Feist of the PassivHaus Institut Germany. Since then, the concept of PassivHaus design has spread around Europe, with several UK projects now in the planning stages.

The well known principles of low-energy use – reduce the energy demand, then meet the remaining energy requirement as efficiently and cleanly as possible – underpin the concept of PassivHaus design. For a dwelling to qualify as a PassivHaus the energy used for space heating and cooling must be less than 15 kWh/m²/yr, and total primary energy use must be limited to 120 kWh/m²/yr (including all end-uses). If these criteria are achieved, the energy requirement can be met by specifying smaller (and therefore cheaper) building services and renewable energy sources.

In the UK the German spelling of 'PassivHaus' has been adopted for dwellings that achieve the 15 kWh/m²/yr energy target. This is needed to differentiate true PassivHaus dwellings from other super-insulated buildings that incorporate passive solar features, as they might not necessarily achieve the same level of energy performance.

Building a PassivHaus is not about specifying components elementally, it requires a holistic approach to energy efficiency and strong on-site management. The main technical differences between building regulation standards and the PassivHaus standard are broadly as follows:

- Intelligent use of passive solar gains and specifying building features that limit the risk of overheating in summer.
- Super-insulation: opaque fabric U-values must be less than 0.15 W/m²K, with U-values for windows and doors generally needing to be less than 0.8 W/m²K (for both the frame and glazing). Thermal bridges are also eliminated.
- Airtightness: 1 m³/(h.m²) at 50 Pa test pressure or less
- Whole house mechanical ventilation with heat recovery (75% efficient or better).

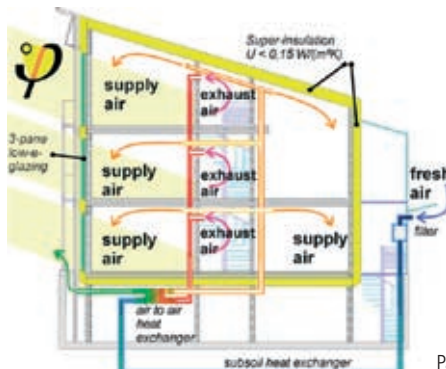
These features limit the design heat load to the load that can be transported by the minimum required ventilation air. Thus, a PassivHaus does not need a traditional heating system or active cooling to be comfortable to live in – the heating demand can be met using a small electric heater within the ventilation system (although there are a variety of alternative solutions).

Most of the necessary building components are readily available in the UK, with a variety of UK and European SMEs developing new building products suitable for use in PassivHaus dwellings.

The PassivHausUK website, www.passivhaus.org.uk, provides information on the concepts of PassivHaus design, examples of PassivHaus dwellings in Europe and the UK, practical information such as building product listings and design guides, details on certifying buildings and technologies as PassivHaus compliant, updates on national workshops and the annual international PassivHaus conference, and a forum for discussion.

PEP is a consortium of eight European partners, supported by the European Commission, Directorate General for Energy and Transport, which disseminates PassivHaus principles outside of Germany and Austria. BRE is the UK's participant offering localised research, consultancy, and information through the PassivHausUK website. BRE's involvement in PEP is sponsored by the BRE Trust and the Energy Saving Trust.

For more information – www.passivhaus.org.uk



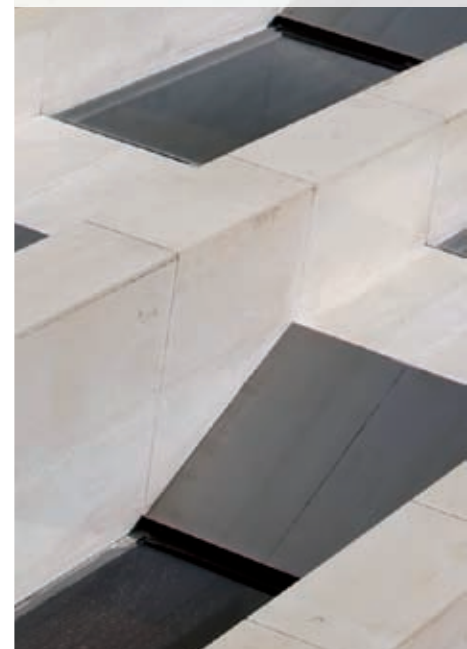
PassivHaus technical sketch

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Recent publications

Books and Special Digests

Part L explained – The BRE guide (BR 489)

Helps architects and builders understand the energy performance requirements in the 2006 edition of Part L. It explains:

- the background to the changes
- the EU Energy Performance of Buildings Directive (EPBD)
- the regulations and approved guidance that implement the changes
- designing buildings to meet the new CO₂ targets
- new standards for work in existing buildings.

£25 (£20 for BRE Connect members)

Timber frame dwellings. Conservation of fuel and power: AD L1A guidelines (SD2)

Explains how the requirements of Part L can be satisfied for a new timber frame dwelling. Provides guidance on the relevant regulations, showing various approaches to compliance, together with four worked examples. Seventeen examples of timber frame wall, roof and floor constructions show how suitable U-values can be achieved. £30 (£20 for BRE Connect members)

Digests

Concise reviews of building technology.

Digest 499 Designing roofs for climate change – Modifications to good practice guidance

Roofs being designed now will have to be able to cope with predicted climate changes and designers need to take this into account. This Digest gives recommendations, based on the views of roofing industry experts, on proposed modifications to good practice guidance for many types of roof in light of predicted weather changes.

Information Papers

The latest BRE research information and how to apply it.

IP 5/06 Modelling condensation and airflow in pitched roofs

Discusses the factors in constructing a realistic model to predict condensation risk in structures with significant airflows, and describes the sources of the data needed to run such a model and the resulting outputs.

IP 6/06 Balanced Value for sustainable procurement

Balanced Value is a tool for construction professionals who want to incorporate functional performance and 'triple bottom-line' sustainability (social, environmental and economic) into their decision-making processes.

IP 7/06 Pruning trees to reduce water use. Summaries of research; conclusions and recommendations

Describes a series of experiments to assess if soil drying by trees could be controlled by branch pruning. Two standard pruning techniques were used to reduce the crown size of mature trees. An alternative approach for newly planted trees was also investigated, using a geotextile membrane to limit the growth of the tree roots.

Prices

Digests are £12 each (£8 for Connect members) and Information Papers are £9 each (£6 for Connect members).

To obtain any of the publications listed above or to subscribe to BRE Connect:

- www.BREBookshop.com
- Phone 01344 404407
- Fax 01344 714440
- Email BREBookshop@IHSRapdoc.com

Diary of forthcoming events

Access

22-24 August 2006 at BRE, East Kilbride

19-21 September at BRE, Watford

Access auditing

Aims to train professionals in the built environment on the principles and practice of access auditing. Delegates successfully completing the course will receive a CPD certificate of attendance, and can choose to go on to take a certificate of competence in access auditing and could register as BRE associates to undertake this work.

14 August 2006 at BRE Scotland, East Kilbride

12 September 2006 at BRE, Watford

Disabled access awareness Course - The Disability Discrimination Act

The Disability Discrimination Act requires building owners to make reasonable adaptations to buildings to remove physical barriers to service access (the Building Regulations set out requirements for new buildings). This one-day course will raise the awareness of construction professionals and building managers of disabled access issues, using case study examples to demonstrate good and bad practice.

Contact: 01923 664800, email events@bre.co.uk

BREEAM

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

– 5-6 September

EcoHomes (BREEAM for homes) assessor training

– 20-21 September 2006

BREEAM Schools assessor training

– 3-4 October 2006

BREEAM Offices assessor training

14 September 2006 at The Lighthouse, Glasgow

Introduction to BREEAM and EcoHomes

Free seminar on meeting sustainability targets.

Contact: 01923 664462, breeam@bre.co.uk

Fire safety

A series of courses at BRE, Watford on the key aspects of fire risk:

– 18 September and 23 October 2006

Fire risk assessment training – module 1, Fire legislation

– 19 September and 24 October 2006

Fire risk assessment training – module 2, Premises management

– 20 September and 25 October 2006

Fire risk assessment training – module 3, Fire science and fire in buildings

– 21 September and 26 October 2006

Fire risk assessment training – module 4, Principles and practical aspects

– 22 September and 27 October 2006

Fire risk assessment training – module 5, Practical risk assessment

Contact: 01923 664883, fra@bre.co.uk

Health and safety

7 September 2006 at BRE, Watford

19 September 2006 in Middlesbrough

21 September 2006 in Port Talbot

28 September 2006 at BRE, East Kilbride

Understanding safety risk management

One-day course providing a pragmatic framework to risk management, encompassing structural risk and occupational health and safety risk, as it relates to the practising engineer.

12 September and 10 October 2006 at BRE, Watford

A – Z of health and safety

Aimed at Health & Safety Managers, the A-Z of Health and Safety Awareness identifies key issues to be addressed with an appropriate picture, key word and phrase of information.

19-20 September 2006 at BRE, Watford

11-12 October at BRE Wales, Port Talbot

24 October BRE Scotland, East Kilbride

Internal Auditor training to OHSAS 18001

Covers: the principles of OHSAS 18001, techniques and methodology, planning, reporting and closure of internal audits

Home Inspector training

Series of courses at BRE Watford on key issues for home inspectors and other building professionals:

- 11 September and 6 November 2006 – **Building Defects**
- 12 September and 7 November 2006 – **Walls and Cracking**
- 13 September and 8 November 2006 – **Roofing**
- 14 September and 9 November 2006 – **Timber defects**

– 21 September, 20 November 2006 – **Heritage buildings**

– 15 September, 10 November 2006 – **Services and utility installations**

– 20 September, 21 November 2006 – **Inspection of non-traditional and modern methods of construction**

Home Condition Report and Home Energy Report Training

Three days of training, on 21-22 August and 18 October 2006, and again on 18-19 September and 15 November 2006 to:

- survey dwellings consistently and complete Home Condition Report (HCR) to a standard format
- competently undertake energy efficiency surveys
- provide basic energy efficiency advice, and hence produce the Home Energy Report element of the HCR.

18 September and 10 October 2006

How do I become a Home Inspector?

Free seminars explaining the background to the Home Information Pack and the training and assessment options available for becoming a Home Inspector.

Contact: Monica Cross, 01923 664829, homeinspector@bre.co.uk

School design

A series of workshops at BRE, Watford, guiding attendees through the priorities of good school design:

– 12 September 2006

Designing for flexibility and educational functionality – best practice today and flexibility for the future.

– 12 October 2006

Renewable energy and the school's carbon footprint – how to include 10% renewables and reduce waste.

– 14 November 2006

Fire – designing to maximise safety and minimise risk.

– 7 December 2006

Delivering IT provision for the future –

how to deliver an IT strategy that meets the needs of education, the business and the building.

Contact Caroline McGill: 01923 664800, mcgillc@bre.co.uk

Other events and training

16-17 August, 13-14 September and 27-28 September 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.

21-25 August and 25-29 September 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.

14 September 2006 at BRE, Watford

Smart homes need smart controls

A one-day workshop describing the benefits of the European Installation Bus (EIB) – one of the market leaders in European integrated home control systems with over 100 manufacturers producing EIB compliant devices – focusing on applications and giving a practical insight into technical operation.

19 September 2006 at BRE, Watford

Planning for daylight and sunlight workshop

Presents practical advice on overshadowing and providing daylight and sunlight to buildings in built up areas.

19 September 2006 at BRE, Watford

Part L & EPBD Workshop

CPD workshop explaining the implications for non-domestic buildings of the major changes.

27-28 September 2006 at BRE, Watford

resource06

Seminars, networking events and an exhibition relating to the low carbon and sustainable building agenda (see page 3).

Further information

For further information contact BRE Events – 01923 664800, email events@bre.co.uk or visit www.bre.co.uk/events

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