BOOKS

Subsidence damage to domestic buildings: a guide to good technical practice (FB13)

Provides authoritative guidance to best practice in the technical and engineering aspects of subsidence damage to domestic buildings, and covers investigation, diagnosis, repair, prevention and mitigation of building cracking and deformation. It reviews current information and provides a clear, logically baseline of technical guidance for investigators (see page 04). £27.50 (£20 for Connect members).

DIGESTS

Concise reviews of building technology.

External timber structures – preservative treatment and durability (Digest 503)

Provides guidance on appropriate and enhanced specifications of timber preservatives, with additional measures for maximising the service life of timber. It takes account of new types of preservative now available, and guidance in recent BRE publications, British Standards and other industry publications. It will help with specifying durable timber structures for external use, and understanding the key issues in ensuring durability. £15 (£10 for Connect members).

GOOD BUILDING GUIDES

Practical guidance on building design and construction.

Basement construction and waterproofing (GG72)

This Guide discusses one of the main challenges when designing a basement: preventing water or water vapour ingress. The focus is on dampness due to penetration of groundwater, sometimes complicated by rising damp. Part 1 outlines the principles of constructing a waterproof basement. Part 2 describes the main methods for perimeter construction with advice on safety, insulation and services. £15. (£10 for Connect members).

INFORMATION PAPERS

The latest BRE research information and how to apply it.

Modern methods of construction (MMC) in housing (IP3/07)

This 4-part set of Information Papers looks at four critical aspects of MMC:

- Drivers and barriers to use
- Planning for manufactured homes
- Designing for manufacture
- Successful development and manufacture of MMC products

See page 03 for details. £25 (£20 for Connect members).

Performance-based intervention for durable concrete repairs (IP9/07)

Introduces the concept of performance-based intervention for durable concrete repairs. Summarises one of the main outputs of CONREPNET, the EC thematic network on the performance-based remediation of reinforced concrete structures. The network facilitated the transfer of information from research to practice, promoted a performance-based approach to remediation of concrete structures, and established research and development needs. £9 (£7 for Connect members).

GUIDANCE COMPILATIONS

Compilations of BRE advice on wide ranging topics, for example (among many others):

- Sustainability and green issues (AP247).
- Air quality, radon and ventilation (AP250).
- Condensation and dampness (AP255).
- Electrical, lighting, acoustics and control systems (AP257).
- Energy, insulation and air conditioning (AP258).
- Fire (AP259).
- Soils, ground investigation and foundations (AP264).
- Timber (AP265).
- Water supply, drainage and sanitation (AP266).
- Wind, floods and climate (AP267).

TO OBTAIN ANY OF THE PUBLICATIONS LISTED OR TO SUBSCRIBE TO BRE CONNECT:

www.BREBookshop.com
Phone 01344 328038
Fax 01344 328005
email brepress@ihsatp.com

EVENTS AND TRAINING

13 SEPTEMBER IN LONDON

The use of lime mortars and renders

Public open one -day seminar on the specification of lime at The Old Royal Naval College, Greenwich (University of Greenwich) – in association with BRE and sponsored by English Heritage – aimed at professionals in London.

MORE: details at: www.buildinglimesforum.org.uk

18 SEPTEMBER AT EXETER UNIVERSITY

Building with Wood

An event on the role of timber in improving the sustainability of the built environment. Speakers include representatives from BRE, TRADA, RIBA and Exeter University.

MORE: www.woodfairsouthwest.co.uk

21 SEPTEMBER 2007 AT BRE, WATFORD

RdSAP and EPC Refresher Training for Domestic Energy Assessors and Home Inspectors

A new one day course for Domestic Energy Assessors and Home Inspectors.

24–28 SEPTEMBER AND 19–23 NOVEMBER 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.

25 SEPTEMBER IN CARDIFF

External Timber Cladding in Wales

Event at the Welsh School of Architecture, University of Wales, in association with BRE

MORE: www.woodknowledgewales.co.uk

27 SEPTEMBER AT BRE WATFORD AND 8 NOVEMBER IN PORT TALBOT

Fire safety management course for hospitals

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

3 OCTOBER IN LONDON

Donovan Purcell Lecture

The Donovan Purcell Lecture promotes the greater understanding of the use of natural stone. This year's lecture is by Hank Dittmar from the Prince's Foundation, and Ptolemy Dean, the architect who is historic buildings adviser to the BBC's Restoration series. President of the Stone Federation, Dave Richardson of BRE, will chair the event.

MORE: Contact: admin@stone-federationgb.org.uk

4 OCTOBER 2007 AT BRE WATFORD

Emergency use of lifts or escalators for evacuation from buildings

Half-day seminar

17 OCTOBER IN PORT TALBOT AND 21 NOVEMBER AT BRE WATFORD

Fire safety design course for hospitals

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

17 OCTOBER IN LONDON

Sustainable Building 2007

This conference on will bring together experts that can help turn costly compliance to balanced sustainable property development. Fully covering the Code for Sustainable Homes and Green Building Standards, it will look at the practical implications, provide advice on the financial and tax realities, and discuss how to deliver to the new needs and demands of consumers and occupiers.

MORE: www.newzeye.com

28 OCTOBER – 1 NOVEMBER AT THE NEC IN BIRMINGHAM

Interbuild

At this year's Interbuild BRE will be running a series of low carbon building seminars in a specially designated seminar facility, focussing on:

- Low carbon building technologies
- Passivhaus – a pathway to zero carbon housing
- The Green Guide to Specification
- Designing and complying with Part L and the EPBD
- Low carbon buildings with 'Climate Lite'
- Site Waste Management Plans and the BeAware project
- Green Certification – are the products you use really green?
- BREEAM EcoHomes and the Code for Sustainable Homes

MORE: www.interbuild.com

6–9 NOVEMBER AT BRE WATFORD

Fire Risk Assessment training

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

8 NOVEMBER IN LONDON

Talking water

This year's Talking Water event will focus on water pressure – concentrating on water supply pressure, the water requirements for the Code for Sustainable Homes, and product supply and training.

13 NOVEMBER 2007 IN LONDON

Technologies Conference and Exhibition

National Centre for Excellence in Housing conference at Wembley Stadium, to explore the technological advances and changes in technologies that will support UK home builders in achieving and delivering low and zero carbon housing.

FROM 13 NOVEMBER AT BRE WATFORD

Low carbon technologies explained

A series of low carbon technology briefings provide an insight into the available technologies and their benefits, the outputs that can be expected from them, and the means of incorporating them into developments. The dates for the next series of briefings are:

- Biomass – 13 November 2007 (full day)
- PV – 12 February 2008 (morning)
- Solar thermal – 12 February (afternoon)
- Micro CHP – 13 February (morning)
- Heat pumps –13 February (afternoon)
- Small scale wind – 18 March (full day)

21–22 NOVEMBER AT BRE WATFORD

Code for Sustainable Homes Assessor Training Course

Two-day training course plus additional examination day.

4 DECEMBER IN LONDON

future homes '07

The 'future homes 07' conference at the QE II Centre is being supported by the BRE Trust. Speakers will include BRE Trust chairman Sir Neville Sims who will address the topic of sustainable communities.

MORE: www.govnet.co.uk/futurehomes/programme.php

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 or visit www.bre.co.uk/events

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CONSTRUCTING THE FUTURE

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Issue 33

Safer communities with effective security

Revolution in housing

Unlocking the potential of refurbishment

Smart homes

Biomimetics

AUTUMN 2007 ISSUE 33

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SECURITY PRODUCTS MUST CONFORM TO NATIONALLY ACCEPTED STANDARDS

The old saying 'prevention is better than cure', is particularly suited to today's security market. Rather than catching and prosecuting thieves once they've offended, the objective should be to keep them out in the first place. Stringent testing, accreditation and certification of security products plays a key role in ensuring commercial and domestic premises enjoy a realistic level of criminal resistance.

Nationally accepted security standards that have traditionally been applied to products such as doors, windows and locks, also include a range of physical protection for buildings, asset recovery systems and computer security – providing specifiers and consumers with an easy-to-understand reference for product performance.

The Secured by Design initiative from the Association of Chief Police Officers Crime Prevention Initiatives (ACPO CPI), takes this concept one step further. It licenses its widely recognised logo to products that have been certified to the security standards accepted by ACPO, such as LPCB's Loss Prevention Standards (see page 6), providing purchasers with absolute peace of mind.

The benefits of product certification are not restricted to consumers, they extend to the industry itself. By having their products certified, manufacturers can identify and address any problems relating to under-performance.

With security remaining one of today's biggest issues, demand for high-quality products that work and stand the test of time is set to increase. Manufacturers must make sure their products perform to nationally accepted standards in order to remain competitive in today's consumer savvy market.

Alan McInnes
Association of Chief Police Officers (ACPO)
Crime Prevention Initiatives General Manager

VISITORS EXPLORING THE INNOVATION PARK DURING OFFSITE2007

INNOVATION PARK OPENS FOR VISITORS

The Innovation Park at BRE's Garston site near Watford features several demonstration buildings showcasing modern methods of construction (MMC), including more than 200 different innovative and emerging technologies. Organisations and individuals wanting to view and use the Park as part of their education and training programmes for research and development purposes are welcome to visit.

Five of the demonstration buildings were launched by Yvette Cooper, the Minister for Housing and Planning, during the OFFSITE2007 event in June (see page 08). World leading in sustainable design and construction, and making use of some of the very latest innovations in construction technologies and materials, these buildings all address the 'zero carbon' challenge and are amongst the most sustainable buildings in the world.

Further demonstration buildings planned for the Innovation Park include a prototype of 'Green House'– voted the winner of the Home for the Future competition, by Mail on Sunday readers and viewers of Real Estate TV – which will be built on the Park by Barratt (see page 02).

A visitor centre is also now being constructed at the Innovation Park. The East of England Development Agency (EEDA) is providing £423k of funding for the new centre, the design and construction of which began in July (see page 09).

MORE: 0845 22 32 966, email innovationpark@bre.co.uk

GREEN PRODUCTS AND SERVICES

The recently launched website, www.GreenBookLive.com, provides a new and reliable source of information on green products and services that can help to deliver reduced environmental impacts (when compared with typical products /practice). Green Book Live brings together lists of certified people, products, and services, including:

– manufacturers with certified environmental profiles for their construction products
– competent persons for delivering CO_2 calculations for building regulations,
Code for Sustainable Homes and BREEAM assessments.

Also listed are products tested by other organisations, such as energy saving products from the Energy Saving Trust. This free online service represents a step forward in cutting through 'greenwash' as many of the products referenced have been approved to rigorous environmental requirements.

The content of GreenBookLive.com will be continually developed until its profile matches that of the Red Books, the internationally recognised references for fire and security products and services.

MORE: Companies wishing to be considered for a listing should contact by email enquiries@brecertification.co.uk

APPROVED CERTIFIERS OF DESIGN IN SCOTLAND

Building professionals in Scotland are being invited to register their interest in becoming Approved Certifiers under new schemes being developed for the Energy Certification of Buildings.

The Building (Scotland) Act 2003 introduced the option of certifying the design or construction of a building as complying with the Building (Scotland) Regulations 2004. The system is based on the principle that qualified and experienced building professionals and tradesmen can be responsible for ensuring compliance with building regulations – without the need for detailed scrutiny by local authorities – provided they are employed by reputable companies that operate a system of careful checking.

BRE Certification is applying to act as Scheme Provider for the Energy Certification of Domestic Buildings, and for the Energy Certification of Non-Domestic Buildings.

Approved Certifiers must be employed by an Approved Body – ie a member of the Scheme – and adopt suitable practices to provide a certification service, including procedures to check compliance with the Building (Scotland) Regulations 2004. An Approved Body can be a firm, public body or other organisation.

BRE Certification is supplying training and assessment of competency for construction professionals related to energy design and the Building Standards system in Scotland, which will allow them to become Approved Certifiers. Any building professionals – architects, M&E engineers, building engineers, consultant engineers, energy auditors and others – may apply to become Approved Certifiers, provided they meet minimum entrance requirements and can (continues page 2)

FALSE CLAIMS OF APPROVAL

Approval of products and services is important to everyone in the supply chain, from the manufacturer to the end user, because it gives peace of mind that the product or service meets and continues to meet a recognised standard.

All products or services approved by BRE Certification / LPCB are issued with a certificate. In many cases LPCB certificates are accepted at face value because of our reputation for applying robust certification practices and for being the major organisation in the UK responsible for the approval of fire safety protection products.

Regrettably, some manufacturers have recently been fraudulently claiming BRE Certification / LPCB approval for their products, with forged certificates in circulation. Regardless of the circumstances, BRE Certification / LPCB takes action as appropriate in these cases.

In order to help specifiers and users avoid choosing products and services that do not have BRE Certification / LPCB approval, guidance has recently been produced on how to check the validity of certificates. This is available at www.RedBookLive.com/validity and makes use of an online database, updated daily with the details of all approvals. Reliable services such as these are becoming increasingly important in the fight against fraud.

MORE: Should you at any stage encounter difficulties in establishing the validity of a certificate, or if you still have concerns, contact LPCB on 01923 664100 or email lpcb@bre.co.uk

LPCB GOES ON SHOW

LPCB exhibited at International Fire Expo and IFSEC, held at the NEC in Birmingham from 21 – 24 May. The exhibitions covered fire related issues and innovation in security products. The shows gave LPCB an ideal opportunity to talk to a wide range of professionals about its Loss Prevention Standards and Red Book Listed products. This year saw a very high number of international attendees, including specifiers, insurers and manufacturers.

LPCB also exhibited at the NFPA World Safety conference and exposition in Boston, held from 3 – 6 June. VdS were guests on the stand and visitors were enthusiastic about two such internationally renowned Certification Bodies promoting their approved products and services together.

MORE: Angela Richards, richardsa@bre.co.uk

OFFSITE2007

BRE Certification exhibited at the OFFSITE2007 event in June at BRE Watford. Almost 6000 people attended the event (see page 09), which showcased how modern construction and advanced technologies are coming together to deliver high performing, more sustainable and smarter buildings. Dr Sarah Colwell presented a paper on, 'The role of certification in OFFSITE systems', and Professor David Charters presented, 'What are the implications of healthcare fire safety for modern methods of construction?'

MORE: Angela Richards, richardsa@bre.co.uk

A PROTOTYPE OF THE AWARD WINING 'GREEN HOUSE' BY GAUNT FRANCIS ARCHITECTS WILL BE BUILT AT THE BRE INNOVATION PARK

NEW MMC GUIDANCE HAS RECENTLY BEEN PUBLISHED (PHOTO COURTESY OF ADVANCED PANEL SYSTEMS)

demonstrate competency by examination. Sole practitioners can also apply to be Approved Certifiers – they would act as Approved Certifier and Approved Body.

The Certification Scheme offers the benefits of a potential 10% reduction on warrant fees charged by the Verifier and a much smoother process towards Verification of the building design.

MORE: To register your interest – www.bre.co.uk/acod/registernd.jsp

HOMING IN ON THE FUTURE OF HOUSING

'Green House' by Gaunt Francis Architects was announced as the winner of the Home for the Future Design Award, run by the Mail on Sunday and sponsored by the National Centre for Excellence in Housing earlier this year. By inviting the public to vote for their favourite design from a shortlist of sustainable and technologically sound options, the competition generated awareness of excellence in design and, through Green House, identified a desirable home for the future.

The National Centre is now playing a major role in ensuring that the Home for the Future competition leaves a lasting legacy.

Initially a prototype of the winning design will be built by Barratt on BRE's Innovation Park, where it will be available for educational and promotional visits. Construction work will commence this autumn. Negotiations are now underway to secure the adoption of Green House on a number of key developments in England. A guidebook will be published (also in autumn) on Green House and the other Home for the Future competition entries – and details of the other entries and an update on Green House will feature in issue 34 of *Constructing the future.*

'Home for the Future was a truly collaborative event with contributors and sponsors working closely to secure its success, whether through judging, promotion, technical evaluation or administrative support,' says National Centre Director Anna Scothern. 'That ethos will continue – ensuring that Green House provides feedback that contributes to our bank of evidence and hard fact on successful housing design and innovation.'

'This will be the pattern for all National Centre projects and activities,' says Scothern, 'the National Centre works to collaborate with industry, evaluating joint dissemination channels and ensuring that our information and advice is supported by a strong evidence base.'

The National Centre's activities are aligned with four interlinked themes:
– Sustainability – building homes that safeguard the future
– Design Quality – designing homes that inspire and excel
– Efficiency – creating homes that are affordable
– Land Use and Planning – supporting community cohesion.

It will continue to support the Code for Sustainable Homes through the coordination role recently announced by the Government's 2016 Task Force. In partnership with the Housing Forum, the National Centre will also facilitate debate on the new Planning White Paper and the wider planning issues raised by the Barker Report on land-use planning and the Housing Green Paper. It will also work to raise awareness of improved design standards for new homes and developments and ensure, through efficiencies and imaginative resource use, that the UK can satisfy the demand for affordable homes. These issues are equally relevant to existing stock and the National Centre will work to ensure that refurbished homes fully contribute to tomorrow's sustainable communities.

MORE: www.homein.org or call 01923 664775

ONLINE ACCESS TO THE LATEST PUBLICATIONS

IHS BRE Press has launched an online version of BRE Connect, the monthly subscription package of BRE books and reports, Digests, Information Papers, Good Building Guides and Good Repair Guides.

Subscribers to BRE Connect Online can not only view online, save, download and print new publications as they are published each month, but also retrieve and download the entire back catalogue of more than 1500 BRE publications. The paper-based monthly subscription will continue for people who prefer to receive printed copies.

The new service is based on The Construction Information Service – a fully searchable and intelligently classified source of information for the construction industry – and subscribers will be able to view the abstracts of 26,000 other documents from more than 475 construction publishers (including BSI, TRL, CIBSE and CIRIA). In addition, personalised browse and search facilities are built in.

Subscribers to BRE Connect Online are also entitled to:
– Discounts of 30% on IHS BRE Press publications in hard copy
– Discounts of 20% on British Standards
– Access to a database of more than 90,000 construction product catalogues from 9000 suppliers and over 80,000 CAD drawings from over 80 manufacturers
– Access to other databases of companies, products, trade names etc.

MORE: www.ihsbrepress.com, call 01344 328038

MMC IN HOUSING

Modern Methods of Construction (MMC) – or offsite systems – continue to be of great interest to all those involved in the construction of new housing. This trend is expected to continue through the encouragement of the Housing Corporation and English Partnerships, and the introduction of the Code for Sustainable Homes.

With this in mind a new set of Information Papers (IP 3/07 parts 1-4) looking at four critical aspects of MMC has been produced. The four parts are as follows:

Part 1 Drivers and barriers to use

MMC are increasingly being used to meet housing needs because of the savings in time and materials, and the potential for higher quality they offer. But there are significant barriers to their widespread use, most notably concerns about higher costs. Part 1 looks at these issues head-on and helps to introduce the other Papers in the series.

Part 2 Planning for manufactured homes

Taking full advantage of the benefits of MMC at the lowest possible costs requires some advanced planning. Part 2 looks at this issue primarily from the point of view of Registered Social Landlords, and considers:
– preparing the brief
– developing the concept design
– obtaining planning approval, and
– achieving efficient construction.

Part 3 Designing for manufacture

Part 3 looks at the role of flexible systems and mass customisation, and in particular at how the standardisation of some components – when combined with modern CAD – can produce flexible housing that cost effectively meets clients' needs. The Paper also looks at the specific issues faced by volumetric, pod and panelised construction, which help to show where they can be most appropriately applied.

Part 4 Successful development and manufacture of MMC products

This paper considers why some MMC products and producers are more successful than others. It looks at the importance of making high value-added products and of avoiding waste. Part 4 will not only help those developing and producing MMC products, but will also help clients to understand the issues that they need to be aware of as they manage their MMC supply chains.

MORE: *Modern methods of construction (MMC) in housing,* published by IHS BRE Press, is available from www.BREBookshop.com, or call 01344 328 038

MARK'S AND SPENCER – SUSTAINABLE RETAILING

Marks and Spencer has entered into a five-year partnership – the first of its kind in the retail sector – in which it will work with BRE on ways of helping M&S achieve its Plan A* targets to become carbon neutral, send no waste to landfill and extend the use of sustainable raw materials by 2012.

M&S is increasing its store space by up to 20 per cent over the next five years and, in the biggest programme in the UK, is continuing to refurbish all of its stores. BRE will provide advice on ensuring these programmes are as sustainable as possible and will develop a set of 'Sustainable Retail Construction' guidelines for new and existing M&S stores.

These guidelines will cover everything from the analysis of initial store designs and the selection of construction materials, to auditing and working with key suppliers to deliver sustainable construction methods.

'With Plan A we have set ourselves some deliberately ambitious targets and we know that we don't have all the answers,' said M&S Chief Executive, Stuart Rose. 'Whilst we have made some progress, such as switching all the flooring we use in our stores to materials that have a top Green Guide A rating, there is much more we need to do. (continues page 4)

DR. COLM CRYAN, COMMERCIAL DIRECTOR OF BRE IRELAND

'This partnership will give us full access to BRE's expertise and leading-edge capability,' said Rose, 'to help us create sustainable solutions that we can use in the building or refurbishment of all our stores.'

MORE: Simon Guy, 01923 664305, email guys@bre.co.uk

* In January Marks & Spencer announced Plan A, a business-wide £200 million 'eco-plan' that will impact on every part of the M&S business over the next five years.

SUBSIDENCE AND WHAT TO DO ABOUT IT

Authoritative guidance on best practice in the technical and engineering aspects of subsidence has been published in a new BRE Trust commissioned guide *Subsidence damage to domestic buildings: a guide to good technical practice*. It covers investigation, diagnosis, repair, prevention and mitigation of building cracking and deformation.

Subsidence is a persistent problem in some parts of the UK. Around 35,000 often complex and protracted domestic insurance claims are made each year, costing up to £550 million. The new book (published by IHS BRE Press) reviews current information and provides a clear and logically structured baseline of technical guidance for investigators.

Written by Richard Driscoll and Hilary Skinner – who have worked on subsidence, soil and foundation problems for many years – the book provides guidance that can be used for training, or as an aide-mémoire, to ensure that decisions are based on practices and information that are the best available to the industry.

MORE: www.BREBookshop.com, call 01344 328038

SCOTTISH CONSTRUCTION ADVICE

The Scottish Construction Centre (SCC), set up to meet the particular needs of the Scottish construction industry, has developed a new website to provide a 'one-stop shop' for advice and guidance on sustainable, innovative construction for all in the industry.

Planners, developers, designers, builders, contractors, manufacturers, suppliers researchers and others are invited to view and register on www.scocon.org to gain access to its resources which include:

A Web Forum that allows access to a wealth of easily searched and navigated information. Registered users are able to post queries and responses.

Frequently asked questions, plus responses, which are regularly updated to reflect important changes as they happen.

If users are unable to find information they need in the Web Forum, FAQ's or via the website's links, they can contact the SCC Helpline on 0845 863 0026 and be directed to a local expert, or email enquiries@scocon.org

MORE: www.scocon.org

FIRST DIRECTOR OF BRE IRELAND

Dr. Colm Cryan, formally of Sycamore Networks and MIT's Lincoln Laboratory, has joined the recently launched BRE Ireland as its Commercial Director.

In Dr Cryan's previous roles he led teams that were building and operating advanced communication systems for terrestrial and free space networks.

BRE Ireland is a joint venture between BRE, the University of Limerick and the Limerick Institute of Technology. The aim is to create a new, independent, authoritative Irish body that will help set the standard for sustainability, innovation and enterprise in Irish construction.

BRE Ireland will offer the full range of BRE services, tailored as appropriate to meet the needs of the Irish market. It will also provide a vehicle to support BRE Certification in Ireland.

The business is based in the Enterprise Incubator Centre at the Limerick Institute of Technology.

MORE: +353 (0)61 208 821, email cryanc@bre.co.uk

MAKING MONEY WHILE YOU SLEEP

Making innovative ideas profitable is the focus of this year's BRE Annual Conference on the 20th of September.

'Innovation is often regarded as the preserve of boffins in research centres, and can appear to be more like witchcraft or alchemy than a source of practical solutions,' says Andrew Williams, Director of BRE Ventures at BRE. 'In fact, successful innovative ideas are usually a lot more day-to-day and tangible than many people think.'

RICHARD HOWITT MEP (RIGHT) WAS AMONGST THOSE WELCOMING THE FIRST RESIDENTS OF THE SMARTLIFE HOUSING DEMONSTRATION PROJECT

The popular view of innovation is that of 'big bang' step-change initiatives. 'It's actually more often the accumulation of a series of smaller incremental developments that are each valuable to the business,' say Williams, 'and together provide a platform for the big initiative'.

Profitable innovations depend on the generation of ideas and their uptake by the market. On the generation side, for example, inventors will have novel ideas in need of applications, and manufacturers may have ideas and IP (intellectual property) that are not key to the existing business, but could be highly valuable in non-competing sectors or territories.

On the market side manufacturers that have an innovative approach will know what technologies, processes and market characteristics are key to their businesses, and to maintaining a competitive edge, while designers and users need to be aware of developing technologies and processes so they can differentiate the designs or services they are offering.

'Commercialising ideas through licensing or other mechanisms can generate new revenue streams and have a value on the books,' says Andrew Williams. BRE's annual conference this year 'Innovation - the driver for success' deals with the practical aspects of making money from ideas. It will look at what BRE is doing through its Innovation Den initiative to help realise the value of innovation for the whole of the built environment.

'The conference will focus on the do's and don'ts of innovation and its value beyond the big bang', says Williams. 'It's not going to be a theoretical review, but rather will cover what needs to be done in terms of technology, processes and markets to stay ahead. It aims to show that many ideas, often around us all in our everyday life, can make money while you sleep!'

MORE: Andrew Williams, 01923 664563, email williamsa@bre.co.uk

FIRST SMARTLIFE RESIDENT MOVES IN

The SmartLIFE Housing Demonstration Project reached a major milestone last month when the keys to the first completed home were handed to the first resident by Richard Howitt MEP for the South East of England.

The house, along with 105 others at three sites in March and Chatteris, Cambridgeshire, has been built by a revolutionary not-for-profit partnership between BRE and Cambridgeshire County Council known as SmartLIFE.

The pioneering project puts four building techniques under the microscope to demonstrate how modern methods of construction can alleviate housing shortages in growth areas and lessen the impact the home-building industry has upon the planet.

The work led by SmartLIFE has been funded by the Housing Corporation, English Partnerships, Fenland District Council, Cambridgeshire County Council, and Communities and Local Government. Home Group, one of the largest housing providers in the UK, is project managing the developments.

Other partners involved include integrated construction consultancy Avebury and architects, Churchill-Hui, and Proctor and Matthews as well as Willmott Dixon (Inspace Partnerships) and Calfordseaden.

MORE: Linda McKeown, 01923 664569, email mckeownl@bre.co.uk

DONOVAN PURCELL LECTURE

This year's Donovan Purcell Lecture, which aims to promote a greater understanding of the use of natural stone, will be given by Hank Dittmar from the Prince's Foundation and architect Ptolemy Dean, the historic buildings adviser to the BBC's Restoration series. The President of the Stone Federation, Dave Richardson of BRE (the main sponsor of this year's lecture), will chair the event.

The Lecture commemorates Donovan Purcell, the founder Chairman of the Standing Joint Committee on Natural Stones. The SJCNS was set up in 1974 to provide a forum to increase the awareness of natural stone at all levels and to work for a wider knowledge and use of stone. Its members range from the RIBA and ICE to SPAB and English Heritage.

The lecture is on 3 October, at One Whitehall Place in London, starting at 6.30 pm.

MORE: Email admin@stone-federationgb.org.uk

PUBLIC BUILDINGS AND SPACES, SUCH AS SCHOOLS, NEED TO BE MADE SECURE WITHOUT TURNING THEM INTO INHOSPITABLE FORTRESSES. REG GRIGG EXPLAINS HOW THIS CAN BE ACHIEVED IN THESE AND OTHER BUILDINGS.

Government policy requires that the Home Office, Ministry of Justice and other Government departments strive to make our communities safe places in which to live and work. In response, initiatives intended to bring about changes to our communities have led to a massive growth in opportunities across the security market, as new methods of crime prevention, detection, observation and physical protection are developed.

EFFECTIVE NOT FORTRESS

The multitude of building security solutions now available make it easy to provide protection against unauthorised access and intrusion, but at the risk of turning public buildings and spaces into inhospitable fortresses. It is effective methods of physical security re-enforced with reliable detection and alarm systems that will provide the best defence from unwanted visitors for most types of premises, from residential and commercial buildings to facilities and components of the national infrastructure.

When considering community project designs, the specifier must remember that it is not fortress security that is required but 'effective' security. There are means available for specifiers to find out what is effective – the Loss Prevention Certification Board (LPCB), for example, specialises in the testing and approval of products and systems for their effectiveness.

LPCB's testing is often performed in accordance with proven national or international standards, but where no applicable standard exists LPCB will consult with key stakeholders to produce a Loss Prevention Standard (LPS). These provide architects and system designers with benchmarks against which to specify new technologies whilst at the same time allowing the market to develop.

On-going audits of the approved products and of the associated manufacturing facilities help ensure the products continue to remain compliant and that changes and modifications to the products are controlled. Similar methods are used to assess installers since correct installation is equally important.

SECURED BY DESIGN

Loss Prevention Standards have the support of ACPO CPI (Association of Chief Police Officers Crime Prevention Initiative), known in the community as Secured by Design (SBD). Secured by Design is the UK Police's flagship initiative supporting the principles of 'designing out crime' by using effective crime prevention and security standards.

Secured by Design's experts provide local authorities and others with advice and information relating to effective design, working through a network of police architectural liaison officers and crime reduction officers. Building developments that meet SBD requirements are awarded 'Secured By Design' approval in recognition of achieving an effective level of security. In many community developments, such as housing, sheltered and student accommodation, hospitals, shops and schools, the SBD design recommendations call for systems and components that are approved to Loss Prevention Standards.

This is a particularly timely initiative for schools because the number of them suffering break-ins has dramatically increased and the cost of this crime is soaring. In 2004 over 80,000 data projectors and interactive whiteboards were installed in English schools, taking the total number of installations to over 160,000. This represents an investment of nearly £600 million. But as the amount of technological equipment needed by schools has increased, so too has its theft. Between January and March 2005, there were 194 school burglaries involving data projectors in London alone according to the Metropolitan Police Authority. These projectors are particularly desirable because of their high value and the ease by which they can be passed on – the LPCB is currently trialling a new standard, LPS 1650, to combat this theft.

Secure physical protection backed up with reliable detection and alarm systems will deter most opportunist criminals and delay those that are really determined, thus increasing their risk of being caught. In schools and other public buildings the most effective have been those where the security solutions were considered early in the design and planning stages of the buildings and adjacent landscaping. This sort of forward planning and design forms a fundamental part of the Secured By Design concept. Providing effective lighting at the perimeter and within the grounds, and installing CCTV equipment that can capture clear, accurate images, will greatly deter a criminal and can, if required, help the police to secure a successful prosecution.

Installation of effective fencing will delay unauthorised entry and complicate the removal of stolen goods making the premises a much less attractive target. Should the criminal persist with an attack and reach the building it must also offer a similar level of security protection. Doors (including fire escape doors) can be specified to provide a high level of security without compromising safety. Windows too can incorporate adequate security measures. LPCB's standard LPS 1175 [*Requirements and testing procedures for the LPCB approval and listing of intruder resistant building components, strongpoints, security enclosures and free-standing barriers*] can be applied to assess security performance for most applications.

The materials used to construct the façade and roof need the same consideration because it is often quicker to gain entry here. It is good to use thermally and acoustically efficient materials that also suit fast-track installation and off-site 'green' methods of construction, but they should also be resistant to attack.

CRAVED EQUIPMENT

ICT equipment (information & communication technologies), such as desktop computers, laptops and projectors need effective protection as these items are often the target of the break-in. They are considered by the police to be 'CRAVED' (concealable, removable, available, valuable, enjoyable and disposable). Protection can be achieved in a number of ways, such as by fitting them with effective secure mounting systems and/or by using denial of service technologies.

Effective denial of service technologies can include PIN code access, removable fascia panels and the use of electronically coded keys. LPCB is about to publish a Loss Prevention Standard (LPS 1650) enabling the effectiveness of the denial of service technologies to be assessed.

SECURE PHYSICAL PROTECTION BACKED UP WITH RELIABLE DETECTION AND ALARM SYSTEMS WILL DETER MOST OPPORTUNIST CRIMINALS AND DELAY THOSE THAT ARE REALLY DETERMINED, THUS INCREASING THEIR RISK OF BEING CAUGHT. IN SCHOOLS AND OTHER PUBLIC BUILDINGS THE MOST EFFECTIVE HAVE BEEN THOSE WHERE THE SECURITY SOLUTIONS WERE CONSIDERED EARLY IN THE DESIGN AND PLANNING STAGES OF THE BUILDINGS AND ADJACENT LANDSCAPING

Alternatively, 'spoiling' the equipment's appearance with extremes of colour can make items less desirable.

A means of tracking the item can also be applied, such as asset-marking identification approved to LPS 1225 [*Requirements for the LPCB Approval and Listing of Asset Marking System*], and linked to a secure database such as those approved to LPS 1224 [*Requirements for Secure Database Registers*]. Removal of this identification will cause damage to the item, thus lowering the re-sale value.

Thieves that have to spend time and money making stolen items reusable, perhaps needing the assistance of others, are more likely to be deterred because the items cannot be disposed of quickly. Raising the awareness of the measures taken to protect the ICT equipment and the building itself will also help to reduce the number of attacks.

The theft of projectors or other ICT equipment leads to more than the direct losses associated with replacing the stolen items, and the repair of any associated damage. In schools, for example, teachers will be unable to conduct lessons using ICT media and may have to spend additional time preparing alternative lessons. Students and teachers can also suffer from the psychological effects associated with being victims of crime, especially the younger children. And, of course, criminals may return as soon as the replacement equipment is in place!

ARSON RISK IN SCHOOLS

Theft of equipment is not the only threat from criminal activity. Defending against arson with sprinklers should also be seriously considered as, for instance, the criminal may set fire to the building to cover up the crime.

Local authorities now carry out thorough risk assessments to determine the requirements for sprinkler systems in schools. To lose a school to fire has an affect and a cost much greater than the cost of rebuilding. Pupils and teachers may need to travel further, prohibiting walking or cycling and causing delivery and collection problems for parents. School projects can be lost, the pupils' states of mind can be affected, stress-related illnesses may occur and qualifications that involve ongoing assessment of everyday work may be impossible to judge fairly – all affecting education and results.

Catering and maintenance staff, teaching assistants and others associated with the school's day to day operation are also affected. Current levels of school related arson imacts on thousands of children and staff in some way every year.

The local community can also be affected, for example if evening classes and sports clubs have to be cancelled and the local shopkeeper's customers take their custom to the vicinity of the replacement temporary school. Additionally, valuable time will be spent by local authorities and associated organisations as the decision to rebuild or not is discussed. The cost and disruption of theft and arson can be avoided by deterring the criminal, causing him to give up the attempt, or ideally, to never start.

CHOOSING THE RIGHT PRODUCT

Variations of the 'onion skin' approach to security can be used to secure all kinds of facilities – the level of protection being commensurate with the risk – but the only way to ensure the performance of the security protection will be effective is to choose products that have been independently tested and approved.

The Loss Prevention Standards (LPS) developed by LPCB are intended to reduce risk, and new standards are being developed continuously. The standards can be downloaded for free from www.redbooklive.com; LPCB approved installers, and fire and security systems are also listed here. MORE: Details of the specific LPS standards in use to protect the community can be found in SBD publications at www.securedbydesign.com or by calling LPCB at 01923 664100

Reg Grigg is an expert in the field of fire and security system approvals at BRE Certification.

HOUSING AND PLANNING MINISTER YVETTE COOPER BELIEVES A REVOLUTION IS NEEDED IN THE WAY WE DESIGN AND BUILD HOMES. AT OFFSITE2007, SHE OUTLINED THE CHALLENGE TO BUILD MORE AFFORDABLE, BETTER DESIGNED HOMES THAT HELP TO TACKLE CLIMATE CHANGE.

YVETTE COOPER MP, MINISTER FOR HOUSING AND PLANNING

DEMONSTRATING THE FUTURE

ALMOST 6000 VISITORS ATTENDED THE OFFSITE2007 EVENT TO EXPLORE DEMONSTRATION BUILDINGS THAT REPRESENT MANY ASPECTS OF THE FUTURE OF BUILDINGS IN THE UK.

Many of those involved in providing housing share a vision of a future in which we not only protect and enhance the environment for this generation and those to come, but we also give families access to homes they can afford, and create and sustain safe and successful communities.

To achieve this vision we must increase the rate at which we build affordable homes, raise the quality of their design and improve their environmental performance.

MORE AFFORDABLE HOMES

To meet the needs of our growing and changing population we must build more homes, a goal that some say has been hindered by a creaky and outdated planning system, insufficient money for new social housing, a lack of skills in construction and in local authorities' planning departments, and a housebuilding industry that wouldn't play ball.

The Government has responded by reforming the planning system – reducing the number of tiers in the development plans system and updating our policy on housing in Planning Policy Statement 3 (PPS3). PPS3 now gives local authorities the tools to deliver high quality housing by providing more flexibility in how they plan for housing. It puts greater emphasis on the importance of good design in providing homes where families with children, young people and the elderly want to live.

We have also provided more resources to local authorities' planning departments and they have responded by speeding up decisions. Three quarters of councils are now meeting the targets for processing planning applications on time, compared with one in ten five years ago.

The response from the housebuilding and construction industries has also been positive, with the level of housing supply increasing from around 130,000 a year in 2001/02 to over 180,000 in 2005/06. And we are on course to deliver the target of 30,000 social rented homes a year by 2008. But building more social housing will not solve the problem alone. Many of the young families joining social waiting lists would rather buy a home, but have seen house prices rise beyond their means. We need to build more affordable housing – it's as simple as that.

Every region in the country now faces affordability pressures and demand is increasing faster than supply. So what we have done so far isn't enough, especially as the most recent household projections indicate even greater rates of household formation – to around 220,000 new households per year.

To help meet this challenge we have asked John Calcutt (the Chief Executive of English Partnerships) to undertake a 'Review of Housebuilding Delivery'. He will examine how new home delivery is influenced by such factors as the nature and structure of the housebuilding industry, along with its supply chain of land, materials and skills. The review will also look at household growth and at how homebuyers' needs and aspirations can be met. We look forward to receiving its recommendations this autumn.

THE ROLE OF DESIGN

There are excellent examples up and down the country of refurbished and new developments that have created successful mixed tenure communities, with comfortable homes that are light and airy with good quality private outdoor areas as well as surrounding public space.

The Coalfield Communities programme, for example, has transformed places with refurbished homes and new jobs. There are now more jobs on the site of the colliery in Castleford than there were below ground. The Housing Market Renewal Pathfinders have also succeeded in turning around some of our most deprived communities – by renovating housing and improving the design of the local environment. And you only have to look at the increasingly high standards of the projects coming through our Housing Design Awards each year to see how standards are improving.

But progress is still too patchy. CABE's recently completed audit of new housing built between 2003 and 2006 shows that all too often we are accepting poor quality schemes. Fewer than one in five schemes were classed as good, while nearly a third were considered to be poor – so poor that CABE felt that they shouldn't have received planning consent. We must improve the design of both individual homes and the places that surround them.

CLIMATE CHANGE

Amongst the scientific community and in Government there is no longer any real doubt that the climate is changing because of our actions. We cannot be certain what the catastrophic consequences will be if we don't act, but the risks are high. It has been estimated that the economic impacts, for example, could be greater than the two world wars and the Great Depression put together.

Nearly half of our carbon emissions come from buildings and a quarter from our homes. We need substantial changes in the way we heat and power our buildings, and a new approach to designing places and buildings that are environmentally sustainable – whether, for example, by using lighter coloured finishes to help combat the urban heat island effect, or careful use of materials that have lower embodied energy.

Last year I went to Scandinavia with Stewart Baseley (Executive Chairman of the Home Builders Federation), Paul King (now Chief Executive of the UK Green Building Council), and John Calcutt. We saw inspiring examples of low carbon homes and community infrastructure – proof that high quality of life and sustainable living can be achieved together – and were convinced of the need for a step change in the way new homes are built in the UK. In December last year the Government announced that we want all new homes built to a zero carbon standard by 2016. This shift towards zero carbon homes will be supported by a long-term strategy, which combines changes to the regulations with fiscal incentives, and demonstrates how it can be done.

Gordon Brown's announcement that zero carbon homes will be exempt from stamp duty will give a significant boost to take up. We've seen before how incentives like this can create and reinforce new markets. Six years ago, low sulphur petrol went from being almost unknown to dominating the market in a matter of months, because duty was cut by two pence. I believe we will see something similar with zero carbon homes over the next decade.

Zero carbon homes is not a Government whim – a taskforce will make sure we work towards tackling the barriers to achieving the zero carbon homes target, and the adoption of the Code for Sustainable Homes will help. All new Housing Corporation funded homes and those supported by English Partnerships will achieve Code level 3 standards as minimum – that's a 25 per cent improvement on the current building regulation standard. Already some places are able to go further – the Millennium Communities that we initiated in 1997 are delivering Code Level 4.

Here again the housebuilding and construction industries, far from 'not playing ball' have responded positively, and even taken a lead. At the OFFSITE2007 event in June, I launched five demonstration buildings on the BRE Innovation Park that are world leading in sustainable design and construction. Using some of the very latest innovations in construction technologies and materials, these buildings address the zero carbon challenge, making them amongst the most sustainable buildings in the world.

Four of these houses, built by Stewart Milne Group, Kingspan, ecoTECH and Hanson, have been built to the Code for Sustainable Homes. They are the first houses to have been assessed under the Code, and I was pleased to be able to present the first Code For Sustainable Homes certificates to them.

We need nothing short of a complete revolution in the way we design and build our homes if we are to achieve our vision of a better future. Many of the technologies exist already as the demonstration homes on the BRE Innovation Park show. Now we need more work to test them and deliver economies of scale.

MORE: Further detail on the Government's policy on green housing and sustainable communities is at www.communities.gsi.gov.uk

This article is based on speeches given by Yvette Cooper at OFFSITE2007 and at this year's Home Builders Federation Annual General Meeting.

The buildings shown above are, left to right, back row: Re-thinking's school of the future, Hanson's Eco-House, Stewart Milne's Sigma Homes. Front row: Hanson House 1, built for OFFSITE2005, which will house the Park's Visitor Centre, ecoTECH's Organics Home, Kingspan Off-site's Lighthouse and the Osborne House which was completed in June 2006.

For those who couldn't attend the OFFSITE2007 event there is still plenty of time to see the buildings as all but one of them – including six houses and a section of a school – will be kept on the Park for at least two years.

The Innovation Park showcases modern methods of construction (MMC), including more than 200 different innovative and emerging technologies. Organisations and individuals wanting to view and use the Park as part of their education and training programmes for research and development purposes are welcome to visit. In addition, a number of open days for the public are being organised.

At the OFFSITE2007 launch event, the East Of England Development Agency (EEDA) – BRE's partners in organising the event – announced that it would provide £423k of funding for a visitor centre on the Innovation Park. The Centre will be based in the Hanson House 1, which was originally built for OFFSITE2005. It will use a range of innovative/smart technology to transfer the technical, product and design information showcased on the Park to a diverse range of visitor groups from primary school pupils to architects. Work on the design and construction of the new facility began in July with completion expected by the end of the year.

While OFFSITE2007 has come and gone, the development of the Innovation Park goes on. The next demonstration building to be built is the 'Green House', which was voted the winner of the Home for the Future competition, by Mail on Sunday readers and viewers of Real Estate TV (see page 02 for more details).

MORE: For information on visiting the Innovation Park, email innovationpark@bre.co.uk or phone 0845 22 32 966

TOP LEFT KEVIN MCCLOUD OF GRAND DESIGNS WITH BRE'S CHIEF EXECUTIVE, PETER BONFIELD AT OFFSITE2007
BOTTOM LEFT STEWART MILNE AND NATASHA KAPLINSKY OPEN THE STEWART MILNE DEMONSTRATION HOMES AT OFFSITE2007

IT IS TIME TO RECOGNISE THAT REFURBISHMENT IS KEY TO MEETING UK HOUSING NEEDS AND CUTTING CARBON EMISSIONS FROM HOMES.

A major new initiative will move refurbishment to centre stage by demonstrating the options it offers for dealing with this country's millions of single-skin, energy leaking older homes.

Refurbishment must be moved up the housing agenda if the UK's housing shortage is to be eased. At present we don't generally choose refurbishment – despite having one of the oldest housing stocks in the developed world – preferring to gobble up land for new housing, or to wastefully demolish and replace existing homes.

But this is an unsustainably short-sighted approach, given that half of the housing stock is more than 50 years old, around a quarter of homes are categorised as 'non-decent', and – in the midst of this housing shortage – around 800,000 are vacant. Most older homes need renovation to bring them into line with today's energy efficiency and other standards. Demolishing and replacing them is neither possible (60% of UK homes that will exist in 45 year's time have already been built), nor desirable – knocking down swathes of older housing is wasteful and destroys communities and architectural heritage.

Refurbishment can bring thousands of homes back onto the market without that waste or loss of urban character. It can also play a vital role in reducing carbon emissions – refurbishment offers as many, if not more, opportunities for delivering low carbon homes as new build.

This is not to say that refurbishment is always an easy option. Bringing older, single-skin buildings up to 21st century standards of comfort and energy efficiency incurs costs that are not associated with new build, and requires specialist knowledge and skills. The problem is that we lack much of the information and expertise needed, and what there is tends to be dispersed and not readily available from a single source. The upshot is that new build appears to be a more straightforward choice – and where refurbishment is attempted, it is often wastefully focused on the wrong areas.

The £2.7 million BRE Stable Block project will demonstrate on a real building just what high standards of refurbishment can be achieved cost effectively. It will gather together the very latest examples of best practice and generate important new material including a cost model of the various refurbishment/new build options, and before and after performance data.

DEMONSTRATING SUCCESSFUL REFURBISHMENT

A disused Victorian stable block will be turned into four exemplar refurbished dwellings that demonstrate the options and logic for different levels of refurbishment. The building will also incorporate a sympathetic extension, an education facility that showcases the latest refurbishment technologies and techniques, and a training centre that will provide top-up courses for traditional construction skills and crafts.

The stable block, which is sited next to BRE's Innovation Park at Watford, poses all of the problems associated with pre-1919 housing. These include solid brick walls, sash windows, a clay tile roof, dampness, disrepair, poor thermal performance and even resident bats – now a protected species. As well as demonstrating best practice in energy efficient refurbishment, the specification will take care to retain the original character of the building whilst catering for modern lifestyle needs.

The homes will incorporate intelligent products and digital communication infrastructure that will monitor building performance and enable the provision of tele-assisted care, home education and home working.

A key goal is to ensure that all of the information gathered is passed onto and used by the industry. 'The measurements from detailed before and after monitoring will be fully documented to prove the case for housing refurbishment,' says BRE's Chief Executive Peter Bonfield, 'and an extensive communications programme will aim to reach everyone who needs to know – the housing sector, the construction industry and the man in the street.'

Above all, the project aims to demonstrate what can be replicated nationally on different types of buildings and in different locations. The work will be extended to link with ten live refurbishment schemes being undertaken by the Housing Market Renewal Pathfinders (HMRPs)*. Hardial Bhogal, Chair of the nine HMRPs, was keen to be involved with the project. 'The options available for estates don't always just involve clearance. We are eager to learn and improve our efforts at refurbishing the stock, using the information that will emanate from this project.'

THE EAST OF ENGLAND DEVELOPMENT AGENCY VIEWS THE PROJECT AS AN IMPORTANT OPPORTUNITY TO DRIVE FORWARD ITS ASPIRATION FOR A NATURAL AND BUILT ENVIRONMENT THAT WILL SUPPORT ECONOMIC VITALITY AND RENAISSANCE. THE AGENCY IS PLAYING AN ACTIVE ROLE IN THE PROJECT AND HAS CONTRIBUTED NEARLY HALF A MILLION POUNDS OF FUNDING TO IT.

CLIENT AND DELIVERY SIDE SUPPORT

Of vital importance to its success is the fact that the project has attracted partners from influential organisations across the housing sector, including experts from both the client and supply side of the industry. As well as the HMRPs, these include the East of England Development Agency (EEDA), the Housing Corporation, Wates Living Space, PRP Architects, E C Harris, RSK and The Prince's Foundation for the Built Environment.

HRH The Prince of Wales visited the BRE stable block last year to mark his Foundation's commitment to finding the optimum ways of refurbishing historic building stock. 'We are delighted to be supporting and advising on this initiative to reduce carbon emissions from older buildings and make them a viable part of our built inheritance.' says Hank Dittmar, Chief Executive of The Prince's Foundation. 'These homes have been soundly constructed and are often in neighbourhoods whose central location affords car-free access to shops, services and public transport provision.'

WORK UNDERWAY

Work on the project is already underway – the specification standards for the stable block have been drawn up, advice has been sought from planners, and bat surveys have been completed. Work on the fabric of the building is scheduled to start on site in late September 2007 and end in Autumn 2009.

Final reports from the two-year study will be available in late 2009, but interim findings will be released along the way.

MORE: Contact Kate Symons on 01923 664552, email symonsk@bre.co.uk

*The nine Housing Market Renewal Pathfinders were established by the Government in 2002 to revitalise weak and failing housing markets in their areas so that housing could play its part in the creation of sustainable cities and towns.

TOP AND CENTRE A STABLE BLOCK WILL BE TURNED INTO FOUR EXEMPLAR REFURBISHED DWELLINGS.
BOTTOM THE DISUSED VICTORIAN STABLE BLOCK WITH ALL OF THE PROBLEMS ASSOCIATED WITH PRE-1919 HOUSING.

SUMMARY OF PROJECT DETAILS

The Stable Block Refurbishment project will demonstrate how to
- achieve best practice in energy efficient and sustainable refurbishment
- meet modern needs whilst preserving the original character of older buildings
- incorporate intelligent products
- design and install digital communication infrastructure to monitor building performance and enable the provision of tele-assisted care, work stations, education and home entertainment
- deliver commercially viable affordable housing.

It will incorporate:
- four refurbished housing units
- an education facility to showcase the latest refurbishment technol ogies and techniques
- a training centre for top-up courses and knowledge promotion in construction skills and crafts
- an exhibition centre.

Linking with ten refurbishment projects across the country, the project will also demonstrate how to apply the principles of sustainable refurbishment to a variety of building types in different locations.

On a detailed level, work will focus on:
- refurbishment standards
- structural repairs
- regular maintenance
- insulation and energy efficiency
- updating services, kitchens and bathrooms
- adaption for changing needs (flexibility): disability / home working / tele-assisted care / leisure / space / security
- sustainability issues energy efficiency / renewable energy / sourcing materials / recycling / new technologies.

LEARNING FROM NATURE IS NOT SOMETHING GENERALLY ASSOCIATED WITH THE CONSTRUCTION INDUSTRY, BUT BIOMIMETICS HAS A HUGE POTENTIAL FOR INSPIRING INNOVATIONS AS THE INVENTOR OF VELCRO COULD TESTIFY. ANDREW DUNSTER REPORTS.

BIOMIMETICS HAS THE POTENTIAL TO HELP THE CONSTRUCTION INDUSTRY AND ITS CLIENTS WITH THE DEMANDS FOR:
– Reduced embodied energy (CO_2) in construction products
– Reduced materials use, better resource efficiency and lower cost
– Reduced weight and complexity (lighter structures, response to manual handling regulations, etc)
– Novel designs
– Reduced maintenance burdens (intervals and costs)

THE LOTUS EFFECT: BARRIER POINT: AN EXAMPLE OF BIOMIMETICS FROM CONSTRUCTION
The lotus leaf has a highly water repellant surface microstructure. When it rains, water droplets cannot maintain contact with the surface and immediately run off, picking up dirt particles to leave a clean trace in their wake.
A special façade paint (Lotusan) has been developed from a detailed study of the lotus leaf, and sheds dirt and water by a mechanism similar to the lotus effect. Its advantages have been illustrated in the case study of a white building, the 18-storey Barrier Point in London's Docklands, where repainting due to surface soiling was required within five years of construction. The building has since been repainted with the new paint and the manufacturers claim that the façade will remain clean, maintaining the building's original appearance and reducing the need for maintenance. The paint is 10-20% more expensive than standard paint and has a market of approximately £7m per annum.

PHOTO: PETER WHITE

Biomimetics is a novel approach to developing designs and products or solving human problems by taking inspiration from nature. A well known everyday example of a biomimetic-inspired product is Velcro®, which drew inspiration from sticky seeds clinging to a dog's fur. A very different example of biomimetics is the use of computer tools, based on how ant colonies interact, to optimise the routes for deliveries from fuel and food processing plants to customers[1].

Multi-national companies such as Mercedes Benz and Gillette are actively exploiting biomimetic concepts to develop low drag vehicles[2] and to create new product concepts for personal care.

Biomimetics can be regarded as a mindset – abstracting processes from nature, identifying the business opportunites for these processes and applying them[3]. This sounds simple but the 'intellectual leap' from an idea to the natural analogue (or vice-versa), is not trivial. It is also important to appreciate that biomimetics is not about copying nature, but about learning from nature. Current areas where biomimetics are being applied globally include energy and resource efficiency, added functionality in materials and structures, robotics, lightweight structures, architecture and design.

Globally, there are four key centres of biomimetics research and innovation – the UK, the Netherlands, Germany and the USA. The outcomes of a DTI industry mission to continental Europe[4] showed that much of UK industry (not just construction) is unaware of the potential for biomimetics, but that the field is better developed in Germany where a well supported network of competence, known as BIOKON[5], has been established.

BIOMIMETICS IN CONSTRUCTION

Biomimetic approaches can be used to find novel solutions to problems, and many already well known and familiar solutions are consistent with – if not inspired by – biomimetics. A fundamental biological principle is that of minimising the use of materials in non-critical areas. For products and structures this can reduce weight and cost. One example already exploited in construction is adopting lightweight 'honeycomb' structures; another is introducing large empty channels or voids into the core of concrete slab elements[6]. The biome structures at the Eden Project (shown above), for instance, provide the required structural performance with the minimum of structural frame material by using hexagonal cell structures. The cells in wasp nests are created in a similar pattern.

Although most industrial interest in biomimetics is found in the aerospace, textiles, computing, artificial intelligence and sensor sectors – with a limited track record in construction (mainly in materials and design) – there have been some commercially exploited construction sector examples, including:
– self-cleaning paints (eg, Lotusan, see above), glasses and concretes
– honeycomb structures (eg, the Eden Project biomes, and light weight stone veneer cladding products[7])
– interesting architectural approaches (eg, branching tree-like roof supports at Stuttgart airport)
– passive ventilation in whole systems (eg, the Eastgate building in Harare, which uses ventilation principles based on those of termite mounds[8,9].

Biomimetic ideas and approaches have the potential to provide construction with tools to apply inventive problem solving ('thinking outside the box'). Biomimetics can also offer novel ways of reducing maintenance and maintenance intervals, and of using materials more efficiently.

BIOMIMETICS AS A ROUTE TO NEW PRODUCTS

There are three processes for integrating biomimetic into product development and commercialisation:

Entrepreneurial: derived from an individual's lateral thinking (eg a plant burr led an entrepreneur to develop Velcro®).

Research-led (bottom up): the main steps are to analyse and understand a biological principle, abstract the biological model, identify an industry challenge and develop a product through prototyping and testing (eg Lotusan paint was derived from a detailed study of the lotus leaf structure).

Industry-led (top down): the approach is to formulate a technical problem, seek analogies from nature ('How would nature do it?'), abstract the biological model and develop a product through prototyping and testing (eg strong, light structures based on hexagonal cells).

Virtually all commercially exploited biomimetic innovations are bottom-up rather than top down, which is an inefficient way of getting innovations to market. The difficulties in exploiting biomimetics arise from a lack of awareness in industry – biomimetics is not an approach that most engineers would normally consider. The complexity of mapping the principles onto engineering problems can also be a factor.

It is clear from the findings of the DTI biomimetics mission that:
– biomimetic products can generate significant business, eg the £7 million a year market for Lotusan paint
– biomimetic products developed to solve specific industry problems (eg the need for a dry adhesive) appear to be easier to market than a particular technology without an obvious end use.

MORE: For further information contact Andrew Dunster, BRE Building Technology Group, dunstera@bre.co.uk

Dr Andrew Dunster is a Principal Consultant in BRE's Building Technology Group. He has an interest and expertise in the application of sustainable and innovative construction products and technologies. He is also an expert on concrete performance and is currently leading a project on biomimetics in construction, supported by the BRE Trust.

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THE COMMUNICATIONS TECHNOLOGY OPERATING THE INTERNET CAN BE USED TO PROVIDE MANY WIDE RANGING AND OFTEN LIFE–ENHANCING HOME SERVICES. THANKS TO THIS TECHNOLOGY, THE ERA OF SMART HOME SOLUTIONS IS ALMOST UPON US.

Community services
An increasing proportion of UK healthcare delivery is going to take place in the community rather than through acute hospitals. The factors driving this policy shift include the growing number of people aged 60 or over, which is set to reach almost 20 million between 2020 and 2030.

Secure, reliable broadband connectivity and internal communications networks can support the remote delivery of health and social services, and help reduce the costs of caring for an increasingly elderly population. This communications infrastructure can also support the delivery of education in the community – providing 24/7 access to educational material, and secure access for parents to their children's records and other educational support services.

Wired-up communities
Linking a home's internal communications systems with the external internet in a local area allows for a wired-up community. These networks provide the means of broadcasting information of importance to the local area, and can be used to reduce social exclusion in areas of economic regeneration.

Typically these services are delivered through a set top box – avoiding the need for a computer – that provides free to air TV, internet access and a virtual PC. Other services can include video-on-demand, CCTV and shopping services.

Community communications networks can deliver local area information and news services, allow for education and healthcare in the community, and provide the means for local employment opportunities, events and sports to be advertised. This all helps to engage people and support the regeneration of local communities.

Commercial services
One of the primary drivers for installing a broadband infrastructure has been the market demand for commercial services, including downloadable music, voice over Internet Protocol (VoIP) and, more recently, video and TV on-demand. The market uptake of these and other commercial services will increase with the widespread implementation of a universal, domestic communications network.

The Internet Protocol (IP) communications systems, which operate the 'world wide web', potentially offer a range of services to the home that could have as great an impact on our lives as the internet itself.

The wider use of IP could completely revolutionise the monitoring and management of homes, and the delivery of community services such as healthcare and education. It could also help to reduce social exclusion by improving communication, and allow for flexible work patterns through the 'small office at home'.

WHAT IS A SMART HOME?

A smart home has an internal communications network with access to external broadband connectivity. While many homes have broadband access through a single-point internet connection to a PC, few have the required internal network for distribution of voice, data and video signals throughout the house. To gain the full advantages of a connected society, all houses must be internally 'wired' with a distributed communications network.

Currently only about 1000–2000 new homes a year rank as smart homes, usually at the upper end of the market and mostly driven by lifestyle and entertainment considerations. This is just 1% of new housing stock and represents a missed opportunity for improving UK housing.

THE BENEFITS

Monitoring and management of energy use, water and the environment
The means of delivering and consuming energy and water in the home hasn't substantially changed for many years. They allow for little of the smart interaction with the user – either for monitoring use or controlling consumption and waste – that smart home systems offer.

Smart home systems can also be used for remote home monitoring and management that could, for example, facilitate the delivery of telecare and the monitoring of homes susceptible to fuel poverty in winter. In addition they can monitor and control security and access to the home.

THE BARRIERS

While there is awareness of IP communications and the potential benefits to home owners, occupiers and society as a whole, current levels of smart home installation (of an integrated suite of services, not just a single access point) remain very low. There are a variety of reasons for this, including:

Perceived risk
IP technologies are less than ten years old and regarded by house developers and builders as innovative and so inherently risky. The perceived risks include uncertainty about the technology involved, its cost, installation, commissioning requirements and ongoing liabilities.

Cost implications
The time will come when installing connected home systems will be as common and obligatory as installing gas, water and electricity services. But until connectivity is accepted as the fourth utility it will be regarded as a cost burden.

The capital and installation costs of a basic communications infrastructure with one master point and six additional connection points in a three or four bedroom property, was typically £800 in 2006 – with costs falling as demand increases. A connectivity faceplate (about the same size as a double electricity socket) in each room typically allows for a computer connection, a phone connection, two satellite TV connections, a terrestrial TV connection and a radio connection.

Lack of regulations and guidance
There are no regulatory requirements for installing connectivity technology in homes, largely because of the difficulties presented by the differing timescales of technology and regulatory development. But the Government has produced a draft guidance document, *Data Services – Connecting to Homes*, that will be better able to keep pace with technological developments.

Skills shortage – design, installation and commissioning
Communications cables need careful handling, and have more precise termination requirements than electrical light and power cables. Poor installation will reduce bandwidth and quality of service. Basic training in cable handling and termination is not overly complex, but essential if the communications system is to operate to its maximum capacity.

Existing homes
The retrofitting of cable media into existing homes is expensive, messy and disruptive, and stands a good chance of resulting in a communications system of lower quality than that in a new build or major refurbishment project. This presents a major challenge to the national roll-out of the connected home, and is possibly the most significant barrier to developing integrated connectivity.

SMART HOME DEMONSTRATION

A project by BRE and partners OpenHub is showcasing a full-scale new build smart home by construction products provider Hanson, at BRE's Innovation Park in Watford. By showing the benefits for home owners and society in general, the project hopes to be a catalyst for a change in attitudes towards integrated smart technology in the home. To visit the Innovation Park, phone 0845 22 32 966
or email innovationpark@bre.co.uk
MORE: www.bre.co.uk/innovationpark

The article is based on information provided by Mike Perry of BRE.

ABOVE THE HANSON HOUSE AT THE BRE INNOVATION PARK – A FULL–SCALE, NEW BUILD DEMONSTRATION SMART HOME. PHOTOS BY PETER WHITE