Recent publications

Reports and guides

Controlling emissions of particles, vapour and noise on construction sites. Part 1: Pre-project planning and effective management (PCGI/T1)
First in a series of five pollution control guides. Construction sites can be a major source of pollution. Construction personnel need to follow good environmental practice to control emissions, comply with environmental legislation and prevent problems. Each of the five titles is £19.50 (£15 for Connect members). The set of five is £85 (£40 for Connect members)

Best practice in concrete frame construction: practical application at St George Wharf (BR 462)
Describes a demonstration of the practical benefits of adopting many of the innovative features and techniques used in the design and construction of the European Concrete Building Project’s in-situ concrete frame building at Cardington, for which a series of best practice guides and companion reports are available. £30

Digests

Digest 479 Timber piles and foundations
Timber foundations can be particularly suitable for countryside structures such as bridges, forest structures and activity centres, as well as post and beam timber buildings in waterfront or flood prone locations.

Good Building Guides

Practical guidance on building design and construction

GBG 59 Building on brownfield sites
Part 1: Identifying the hazards
Brownfield sites can contain a variety of hazards presenting risks to developers, designers, housebuilders, insurers and house owners. Part 1 of this guide describes commonly encountered hazards, their significance for housing developments and how they can be identified.

Information Papers

The latest BRE research information and how to apply it

IP 1/04 Design drainage for buildings with reduced water use
Summarises the types and characteristics of appliances that may be used for reducing water consumption in buildings, provides estimates of water value consumed for both the present and the future, and gives guidance for the design of drain and sewer systems.

Prices

Digests and Good Building Guides are £10.50 each, or each part. Information Papers and Good Repair Guides are £7.50 each, or each part.

Where to get them

These publications are available from:
- www.brebookshop.com
- BRE Bookshop, 151 Rosebery Avenue, London EC1R 4GB
  T/020 7505 6622, F/020 7505 6606

Diary of forthcoming events

12 February and 8 April 2004 at BRE, Watford
New Building Regulations and product standards
UK Building Regulations are changing and their relationship to new European products standards is becoming more complex. This series of one-day seminars will explore the impact of European standards and codes on UK Building Regulations. It will explain issues such as what CE marking means and how it relates to European standards, and what you should do if you want to use innovative products.

Contact: Events, 01923 664800, events@bre.co.uk, or visit www.bre.co.uk/events

19 February 2004 at BRE, Watford
Minimising construction waste and maximising profits
Contact: Events, 01923 664800, events@bre.co.uk

25 February 2004 at the Institute of Structural Engineers, London
Wind workshop (advanced)
Contact: Rosemary Humphreys, 020 7235 4335 ext 239, humphreys@istructe.org.uk or visit www.istructe.org.uk/courses

3 March 2004 at BRE, Watford
Fire safety in hospitals
Conference covering the need for fire safety strategies in hospitals and health care premises, the issues to be taken account of when putting together a strategy, and how the latest fire safety engineering thinking can help provide a safer, more secure environment.

Contact: Caroline McGUI, 01923 664532, mcgillc@bre.co.uk or visit www.bre.co.uk/events

11 March 2004 at BRE, Watford
Construction IT Conference
One-day joint BRE and CICA conference.
Contact: Events, 01923 664775, events@bre.co.uk

24 March 2004
Deconstruction and demolition – extracting value from surplus buildings and infrastructure
Contact: Events, 01923 664800, events@bre.co.uk

7-10 June 2004 at BRE, Watford
Resource04
Major four-day exhibition, conference and demonstration of renewable and energy efficient technologies for buildings. Will include large exhibits showcasing renewable and other innovative energy systems, along with a series of daily seminars. Anyone wishing to attend, exhibit at or sponsor Resource04 can email their details to resource04@bre.co.uk to be contacted with further information.

Training courses

3-4 February and 6-7 April 2004 at BRE, Watford
BREEAM for Offices assessor training course
Two-day training course to become a BREEAM assessor.
Contact: 01923 664462, breeam@bre.co.uk

12 February at BRE, Watford
Construction site fire safety
While most construction and safety professionals will be familiar with general health and safety issues, this course will give them the opportunity to focus on the specific risk of fire during construction and refurbishment works.

18 February at BRE, Watford
Smart homes need smart controls
A one-day workshop describing the benefits of the European Installation Bus (EB), focusing on applications and giving a practical insight into technical operation.

23-27 February at BRE, Watford
Building services integration with EIB
Five-day course designed to provide extensive insight into the technical operation of EIB, and the design and commissioning of EIB installations. Course content is evenly divided between developing theoretical understanding and practical skills, and prepares delegates to sit the EIBA Partner exam.

25-26 February and 4-5 May 2004 at BRE, Watford
EcoHomes assessor training course
Two-day training course to become an EcoHomes assessor.
Contact: 01923 664462, breeam@bre.co.uk

2 March 2004 at BRE, Watford
Dampness and cracking
Course focusing on the correct diagnosis of dampness and cracking.

10 March 2004 at BRE, Watford
Construction health, safety and welfare
This course allows delegates to be aware of health and safety hazards as part of their responsibilities on construction sites.

11 March 2004 at BRE, Watford
Fire safety awareness for personnel
Course aiming to provide personnel with a basic understanding of fire safety in the work environment.

11 March 2004 at BRE, Watford
Fire safety awareness for fire wardens or persons in charge
This course is a continuation of Module 1 Fire safety awareness for personnel

For information on the above training courses contact
(unless otherwise stated) BRE Training, 01923 664800
Email train@bre.co.uk or visit www.bre.co.uk/training

For £120 a year BRE Connect subscribers receive:
- all BRE Digests, Good Building Guides, Good Repair Guides and Information Papers such as those listed on this page – totalling at least 50 publications each year – all building to form an invaluable reference tool
- a CD-ROM each year containing every BRE publication from that year in pdf format
- preferential pricing on a range of BRE books and other publications – such as those listed on this page – for which subscribers pay a significantly reduced price
- discounts on a programme of BRE events. BRE Events are accredited to Continuous Professional Development (CPD).

For more information –
Alan Wakeford, 01923 664234, Email wakefords@bre.co.uk

BRE Connect is a subscription scheme that gives unrivalled access to BRE’s expertise on buildings, construction, energy, environment, fire and risk.
Making better use of materials research

The Better Buildings Summit
Brace yourself for climate change

Putting brownfield land to work
Sound regulations impact on builders
Waste – challenging the status quo

constructing the future
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Putting brownfield land to work: brownfield land development presents problems as well as solutions, p 10.
Sound regulations impact on builders: changes to ADE ‘Resistance to the passage of sound’ will have a direct impact on builders and designers involved with residential properties, p11.
Waste – challenging the status quo: The construction industry must change the way it manages waste, p13.

Successful audit of EEC schemes

The first round of auditing of the Energy Efficiency Commitment (EEC) programme was recently completed, with the audited schemes found to be generally well run.

The Energy Efficiency Commitment is a three-year Government programme administered by the Office of Gas and Electricity Markets (Ofgem), which started in April 2002. It requires suppliers of gas and electricity energy savings, but also savings in income-related benefits or tax credits.

Suppliers are accredited for not only gas and electricity energy savings, but also public sector savings. They submit schemes to Ofgem for energy saving measures in the areas of heating, insulation and lighting.

The EEC has an environmental aim, providing the first stage of action in the Government’s plans to improve the energy efficiency of housing in Great Britain. They are to target vulnerable areas, the impact of crime and community safety issues.

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Aggregates

Using recycled and secondary aggregates

A new project aims to show that recycled and secondary aggregates can perform as well as, and sometimes better than, primary aggregates when used in construction.

This project, funded through the DTI/WRAP* Aggregates Research Programme, will present the necessary knowledge on how to successfully use recycled and secondary aggregates in practical applications. It follows an earlier DTI/WRAP study that showed many clients lack the knowledge required to influence decisions on using these aggregates in construction projects.

Up to six best practice exemplar case studies reflecting a range of applications, products and processes for recycled and secondary aggregates (highlighting national and European standards) in applications across differing construction project types, from roads to buildings to landscaping.

The case studies will also be included on the AggRegain website – the sustainable aggregates information service from WRAP (www.aggregain.org.uk). The AggRegain site already includes over 50 case studies that demonstrate the parity of performance and the potential cost benefits of using recycled and secondary aggregates.

BRE would welcome any ideas and offers of case studies. Anyone aware of construction projects that are using recycled and secondary aggregates, or wanting more information on the project, should contact:

Katherine Adams 01923 664478
Email adamsk@bre.co.uk

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InTEC identifies timber knowledge gaps

Establishing timber as a mainstream construction material in the UK countryside by enhancing its aesthetic, environmental, sustainable and structural credentials, is the aim of an independent network known as InTEC (Innovative Timber Engineering in the Countryside)*.

The network has recently identified areas where increased knowledge is needed if timber is to fulfil its potential in engineering applications. It plans to persuade government and industry to fund projects that will generate this information so that the industry can modernise and expand.

InTEC will also encourage an international exchange of information, focusing on the identified knowledge gaps so that the UK can learn from other countries when appropriate.

Vahik Enjily of the BRE Centre for Timber Technology & Construction (a member of InTEC) says, “New markets are needed for the increased supply of timber coming on stream in the UK over the next few years. The challenge for specifiers and users of timber is to find ways to maximise its special qualities and overcome any difficulties that they may face”.

Topics identified as needing further information include:

- UK-grown stress laminated timber – friction test data needed
- truss bridges
- covered timber bridges
- pontoon/floatinb timber bridges
- timber signs and barriers
- steel/timber beam composites
- FRP/timber beam composites
- timber piles
- round timber connection systems
- external green gluing for timber bridges
- log retaining walls
- standard agricultural buildings
- timber crib walls
- timber decking
- new innovative structures

InTEC would like to hear from anyone with information on these subjects.

Contact Dr Vahik Enjily 01923 664392
Email enjilyv@bre.co.uk
For more information on InTEC go to www.forestry.gov.uk/intec

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New guidance on preventing hot water scalding

Every year around 20 people in the UK die as a result of scalds caused by hot bath water, and a further 570 suffer serious scald injuries that can result in long-term disability and disfigurement.

A recently published Information Paper sets out the issues regarding scalds in the UK and explains how to reduce the risks. It contains guidance on the selection, installation and maintenance of products to provide safe hot water to baths, showers and basins.

Although there is no legal requirement to limit water delivery temperatures, Defra recommends the use of thermostatic mixing valves (TMVs) for terminal fittings in schools, public buildings and other facilities used by the public. In addition, the Housing Corporation recommends thermostatically controlled supplies to bath taps in all housing – and thermostatic control of showers and all hot water taps is considered essential in housing for the elderly.

The new Information Paper Preventing hot water scalding in bathrooms: using TMVs explains how thermostatic mixing valves work. It advises on where TMVs should be used (housing, nursing homes, hospitals, schools, etc.), illustrates their application in baths, basins and showers, and gives guidance on installation, commissioning and maintenance.

The Information Paper also emphasises the need for care in selecting thermostatic mixing valves that are appropriate for their intended use and provide adequate protection. A new approval scheme for TMVs is explained.

For further information –
John Griggs 01923 664543
Email griggsj@bre.co.uk

* InTEC network members include BRE, the Forestry Commission, TTI, Forestry Civil Engineering, the UK Centre for Timber Engineering at Napier University, and the University of Technology, Sydney, Australia.
BREEAM Excellent for Newcastle University

Newcastle University’s new Devonshire Building, which will house an environment and sustainability research institute, is the first university laboratory to be awarded a BREEAM Excellent rating.

The BREEAM certificate was presented at an event marking the completion of the building, attended by Energy Minister Stephen Timms. He said he was particularly pleased to congratulate the University on the award because this is the first major building benefiting from photovoltaic panels to be completed during his term as Energy Minister.

BREEAM is widely accepted in the UK construction and property sectors as offering best practice in environmental design and management. There are BREEAM schemes for offices, retail developments, industrial buildings and homes.

As the Devonshire Building does not fall into any of these categories – it contains laboratories, cold rooms, conference and meeting facilities, and e-science and write-up areas – it was assessed under the Bespoke BREEAM scheme in which the assessment criteria are tailored to a specific building.

The assessments are carried out by an independent licensed BREEAM assessor, in this case from White Young Green. Newcastle University’s building achieved the highest ever score awarded under the Bespoke scheme. This high score reflects the wide ranging environmental, health and comfort issues successfully addressed in the building’s design and development.

These included its location, which is in the centre of Newcastle within 500m of a metro station and 50m of a bus stop. The Devonshire Building has limited car parking spaces, but has space for travel information displays and cycle facilities for 10% of the occupants – including shower and changing rooms. These features encourage the use of transport modes other than the car, and were credited in the BREEAM assessment.

In addition, the building is situated on previously developed land, has made wide use of materials with low embodied environmental impacts, and any timber used was obtained from sources certified to Forest Stewardship Council (FSC) standard.

Energy and water issues also earned BREEAM credits for the Devonshire Building. For example, 236 photovoltaic panels have been installed on the roof of the building, covering an area of 184m² and generating 25kW of electricity (peak).

Sensors monitor the level of daylighting in the building so that electric light use can be reduced to a level that complements natural light. A rainwater storage system provides free cooling to the chilled beam system, and the returned water from the cooling system is used to preheat the hot water system. Rainwater is also collected for use in sanitary flushing.

The development minimises night-time light pollution through the specification of fittings that limit the light spread to within 70° of the downward vertical.

Steps taken to enhance building users’ health and comfort can also gain BREEAM credits. This building’s design, for example, allows all work stations to have views of the outside and are within 2m of a window. It also provides good levels of daylight (at least 2% daylight factor) in the conference facilities, offices, labs, and e-science areas.

The thermal comfort of building occupants was addressed using thermal modelling studies, including sun path, shading, wind path, and daylight analyses, and a review of the mechanical services options.

Among many other features, the design of the building also minimises noise disturbance to those working in it, and provides good acoustics in the conference and meeting facilities. In addition, it minimises microbial contamination, avoids the use of ozone depleting refrigerants and includes a low NOx emitting boiler.

For more information –

Teim Bevan 01923 664645
Email bevant@bre.co.uk

BREEAM for Offices 2004

BRE has reviewed and updated the BREEAM for Offices scheme. Launched on 1 November, the 2004 version has been revised to keep the scheme up to date and in line with current best practice.

Additional rewards have been included for:

- using renewable energy sources
- seasonal commissioning
- specifying sustainably sourced timber for both structural uses and temporary site uses
- minimising waste from floor finishes
- implementing independently verified schemes promoting considerate construction.

For more information about the scheme update, or for information on training to become a BREEAM assessor, contact:

BREEAM Office 01923 664462
Email breeam@bre.co.uk

Roof design

Designing for safety

Roofing industry experts have been examining Health and Safety Executive (HSE) prosecutions data to investigate falls from heights associated with roofing.

The committee of experts found that most such falls are the result of fragile roofs, fragile rooflights and unguarded edges. It also found that a significant proportion of the prosecutions were concerned with untrained ‘roofers’ who either ignored or lacked training in matters of safety, and were working to inadequate method statements and risk assessments.

The committee met as a part of a Partners in Innovation project, partly funded by DTI, to look at design decisions that could have contributed to the underlying causes of accidents. The main findings of the project so far are being published in a BRE Information Paper Designing roofs with safety in mind which will be available early in 2004.

The findings of the next stage of the project will be published as a Best practice guidance for roofing with safety at the core in March 2005. This guidance will be based on reviews of current good practice guidance and a wide range of BRE roof condition surveys.

The project is currently surveying safety issues raised by roofing contractors belonging to the main trade organisations. The survey questionnaire can be found on the project website at www.projects.bre.co.uk/saferoof.

Roofing contractors that are not members of one of the main organisations are also invited to complete the questionnaire.

For more information –

Gerry Saunders 01923 664382
Email saundersg@bre.co.uk

Designing for climate change

A group of industry experts have concluded that green roofs are best able to cope with the expected impacts of climate change – higher wind speeds, heavier rainfall in winter and longer, hotter summers.

Green roofs are vegetated roof covers, with growing media and plants taking the place of bare membrane, gravel ballast, shingles or tiles. The number and placement of layers vary, but all generally include a waterproofing layer, drainage, growing media and plants, covering the entire roof deck surface.

A key feature of green roofs is the cover given to the waterproofing membrane, which prevents exposure to UV light and extremes of weather. Green roofs cope well with windy conditions and release rainwater slowly, so reducing the risks of flooding. Gerry Saunders of BRE warns, however, “High quality materials and methods of installation are needed to ensure that the green roof stays watertight for the lifetime of the building.”

When significant numbers are built in urban areas, the green roof can have other benefits such as improved air quality and the filtering of acid from rainwater. But as the initial construction costs are higher than other design options, some form of government incentive scheme may be needed to kick-start the use of green roofs in UK urban areas.

More information will be given in a new BRE Digest, produced as a part of a dual DTI/Industry funded project, which will be published in March. The Digest considers actions that can be taken with regard to roof design, which will mitigate the effects of climate change.

For more information –

Gerry Saunders 01923 664382
Email saundersg@bre.co.uk
Assessing large panel system blocks
A new research project could lead to multimillion pound savings in the long-term management of large panel system (LPS) buildings.

Discrepancies in the guidance now used when assessing these buildings will be addressed by a consortium of companies with funding from the DTI Partners in Innovation scheme. The two-year project will focus on the urgent need to:

- revise existing guidance on the structural assessment of large panel system multistorey blocks, and
- develop more advanced methods of assessing the robustness of LPS blocks under accidental loading.

The results of the project could lead to multimillion pound savings in the long-term asset management of LPS dwelling blocks, because unnecessary or inappropriate remedial and strengthening works will be avoided.

The current guidance was developed after the collapse of Ronan Point in 1968, but is now thought to be unduly restrictive. This is because it does not take account of the positive contribution made by certain aspects of structural and material behaviour to overall building robustness under accidental loading. The result has been inconsistent and sometimes inappropriate recommendations for building strengthening or, in extreme cases, demolition.

The project’s outputs will include the publication of a national draft guidance document. A BRE research project will be run in parallel with the consortium’s work to extend the scope and value for money of the overall research programme. It will contribute to the development of more comprehensive and efficient assessment methodologies that should reduce costs for the owners of LPS blocks.

BRE is now looking for organisations managing LPS stock that would like to become partners in the parallel BRE LPS project. The benefits to the project partners will include an:

- Owners Guide to the assessment of LPS buildings (only available to parallel project partners)
- advanced assessment methodology using both simplified and detailed approaches
- advanced probabilistic, risk-based assessment methodology.

Partner organisations will have unrestricted access to the assessment methodologies for a period of two years following completion of the project. After this time the assessment methodology will be made available for purchase.

For further information – Barry Reeves 01923 664558 Email reevesb@bre.co.uk

The Consortium of PI project partners includes:
- Alan Conisbee and Associates
- ASLEB through London Borough of Bromley
- Birmingham City Council
- BRE
- Carter Clock
- Campbell Reith Hill
- Curtins
- London Borough of Barking & Dagenham
- London Borough of Enfield
- London Borough of Greenwich
- London Borough of Lambeth
- London Borough of Sutton
- Stockport Borough Council
- Sanderfield Housing Group
- CityWest Homes (London Borough of Westminster)
- Sandwell Metropolitan Borough Council
- Northern Ireland Housing Executive
- Optima Community Association
- Wilde and Partners/TNO

New large-scale test facility for the North East
A new facility has been established by BRE Fire Division (FRS) to meet the needs of construction and associated industries in North East England for large-scale fire and other buildings-related tests.

Known as BRE North East, the new facility includes a 20m by 40m by 8m-high building and access to a 40-metre-high facility, allowing BRE to undertake large and full-scale scale testing work such as:

- fire performance tests on construction products
- fire safety tests of innovative building designs
- testing for certification schemes approval and Buildings Regulations.

The facility’s location in Middlesbrough – close to the north east coast and major transport routes – will allow FRS to provide a more local and cost-effective service to meet many of the fire-test requirements of northern clients such as construction products manufacturers, building designers and developers.

For more information – Pauline Aitchison 01923 664973 Email aitchisonp@bre.co.uk

News from BRE Certification and LPCB

Red Book Database
BRE Certification has moved all the entries in the “Red Books” to a database, which will make it easier and quicker to keep the information in the books up to date. The new database will be used to power new search facilities on www.redbooklive.com which are being launched at the beginning of 2004 to coincide with the publication of the next edition of the Red Books.

New fire resistant cable requirements
New cable requirements set out in the recently revised BS 5839-1:2002 call for ‘standard’ and ‘enhanced’ fire resistant cables. Even before the standard was published, LPCB had set up the equipment and procedures required to be able to offer independent testing and approval to the new requirements as set out in the standard.

LPCB is the only Certification Body able to offer this testing and certification in-house – the only true one-stop shop. The testing is carried out in BRE’s laboratories, the only UKAS-accredited test house able to offer this testing.

For a full list of LPCB approved cables, please visit www.redbooklive.com

Security products
More than 90% of security products evaluated by LPCB initially fail to meet the security levels identified by the manufacturers. But this does not put the manufacturers off – by working with LPCB, they are able to identify the weaknesses and ensure that their products work and their customers are satisfied.

Certification is not just about helping manufacturers to improve their products, it also helps reduce the risks faced by specifiers in the selection of products. Specifiers can be confident that LPCB’s rigorous certification processes help ensure that the products meet the standards and performance levels required, and this is reflected in the increasing number of specifiers demanding LPCB-approved products in their tenders.

For more information about standards and approved products, visit www.redbooklive.com

ISO 9001
ISO 9001:2:1994 was withdrawn by UKAS on 15 December 2003 and ISO 9001:2000 is now the current standard. The main differences are:

- a change to a process approach to quality rather than the old systems approach
- a less prescriptive approach to the requirements for documentation
- a much greater emphasis on the involvement of top management (including the provision of resources) and on the requirements to have and maintain good management (including the provision of resources)
- a much greater emphasis on the involvement of top management (including the provision of resources) and on the requirements to have and maintain good two-way communication with customers.

Scopes relating to fire and security products and services will continue to be baged by LPCB, and all other products (such as construction, environment and energy) will fall under the BRE Certification brand.

For more information on ISO 9000, contact Customer Services on 01923 664100
The Better Buildings Summit

No less than three Secretaries of State were on the platform at the Better Buildings Summit on 21 October 2003. This was testimony to the importance placed by the Government on improving the sustainability of construction and building design. David Strong reports.

“more innovation, better design, better planning, higher standards – more of the ‘wow’ factor and a more ‘can-do’ attitude”

The Better Buildings Summit, organised by ODPM, DTI and Defra, brought key industry players together to join forces with the Government and take forward the commitments set out in the Energy White Paper and the Sustainable Communities Plan.

Sir John Harman of the Environment Agency opened the proceedings and the Deputy Prime Minister, John Prescott, made the first keynote speech.

**John Prescott**

The Deputy Prime Minister identified the scope and scale of developing sustainable communities and creating a new type of urban environment. He called for, “more innovation, better design, better planning, higher standards – more of the ‘wow’ factor and a more ‘can-do’ attitude,” and said that all are critical to the success of the Sustainable Communities Plan. Mr Prescott went on to say, “It’s about working better with the people who matter most to create high quality neighbourhoods that will stand the test of time. Industry, Government, environmentalists, planners, architects and local residents must push for the highest standards, not the lowest common denominator.”

Mr Prescott unveiled plans to raise national standards for water conservation by 2005, and also to bring forward higher standards for boilers within the same time frame.

He also announced a £5 billion housing allocation to drive forward the Government’s commitment to affordable housing and decent homes, particularly for key workers, over the next two years.

**Margaret Beckett**

Margaret Beckett, Secretary of State for the Environment, identified the tremendous importance of the environmental footprints of our buildings and the lasting legacy they leave for future generations. The significant environmental impacts of buildings were identified, in particular:

- buildings contribute almost half of the UK’s carbon dioxide emissions, with homes alone contributing around 27%.
- demand for water has risen and continues to rise – more than half (56%) of water supplied is used by households.
- buildings have significant impacts in terms of the natural resources used in their construction, such as the timber and minerals, and in terms of the resulting construction and demolition waste.
- there is increasing pressure to find more land for development as demand for housing continues to grow.

Mrs Beckett also launched a new Carbon Trust initiative to find a cost-effective solution to the problem of solid wall insulation. Known as the Solid Wall Challenge, funding will be provided for research through the Carbon Trust’s Low Carbon Innovation Programme.

**Patricia Hewitt**

Patricia Hewitt, Secretary of State for Trade and Industry, said that a new partnership was required between government and the key contributors in the construction sector. She identified the following needs to be achieved in the UK:

- by 2010, energy savings of around 10 million tonnes of carbon from homes and business to meet the domestic CO₂ target.
- by 2020, a further carbon reduction of 15-25 million tonnes.
- by 2050, a fundamental change in the way buildings are designed and built and communities work, if we are going to hit the 60% target that was recommended by the Royal Commission on Environmental Pollution.

Mrs Hewitt went on to state that her objectives were “first, to create the homes and workplaces people want to live and work in. Secondly, to meet the targets for a low carbon economy that we set out in the Energy White Paper. Thirdly, to create world-class building services and industrial growth for the future, developing skills, services and products that we can export all over the world.”

Mrs Hewitt announced that by the middle of 2004 the Government would have in place minimum sustainability standards for all public sector procurement of built environment assets (including new leasehold and PFI projects). This will result in a new generation of green schools, hospitals and other public buildings – with lifetime cost being the most important consideration.

The future role of small-scale distributed (embedded) generation was also addressed by Mrs Hewitt, with simplified connection and monitoring protocols having been introduced. DTI will continue to work with Ofgem to ensure that electricity networks were capable of incorporating a higher proportion of distributed generation.

**Workshops**

Parallel Workshop Sessions at the Better Buildings Summit concentrated on the following four key issues:

- **The Building Fabric** workshop sought to develop an understanding of the barriers to industry and Government working towards more sustainable building fabric. This included an examination of how to maximise what can be achieved through the current review of Part L of the Building Regulations, and if there are different issues for commercial buildings and dwellings.
The Building Services workshop considered what Government working in partnership with the private sector could do to improve the environmental performance of building services (for example, lighting, ventilation). It covered the design, specification, installation and pre- and post-occupation commissioning of the full range of building services in both new-build and refurbished buildings.

The Design workshop debated how those with urban design skills can make greater use of new technologies, and how those who have a technical understanding could use this knowledge to create ‘sustainable communities’ in the fullest sense, rather than those with just lower energy requirements.

The Investment workshop considered, amongst other things, the ways in which we can recruit the investment community as an ally in the push for more sustainable buildings. It debated how we can change the outlook of those loaning the money so that they actively encourage those coming to them for loans for building projects, to make the projects as sustainable as possible.

Question time
The Summit ended with the three Secretaries of State returning to take questions from delegates. This resulted in a lively debate with delegate contributions ranging from the controversial to the bizarre! Conspicuously absent was any discussion, or reference by speakers, to the EU Energy Performance of Buildings Directive or to the importance of integrating active and passive renewable energy systems into buildings.

A number of delegates called for better training of planners regarding sustainability issues and for much greater enforcement of Part L Building Regulations (with real penalties for non-compliance). The importance of design team integration, optimising land use and minimising transport impacts were also identified. The significant potential offered by energy and environmental labelling of buildings was also highlighted.

In summary, the Summit successfully brought together for the first time the key Government departments responsible for developing a better built environment. Delegates hoped that the constructive dialogue established by the Summit between the Government and industry would continue.
Brace yourself for climate change

Soon we won’t need scientists to tell us the climate is changing – the impacts on us and our buildings will be obvious to all. Stephen Garvin looks into the all-too-near future, and focuses particularly on housing.

Flooding in 2002 and drought in 2003. Are these indications of climate change or just natural variability? One-off events cannot yet be attributed to climate change, but climate scientists around the world are nearly unanimous in their belief that the climate is changing. Most agree that in the near future we will not need sophisticated computer models to tell us this – we will all be feeling the effects, as will our buildings.

Climate change as a result of human activities is one of the greatest environmental challenges society faces, and it has already begun to have a discernible impact on global mean temperatures. There will be significant effects on the built environment throughout this century. This will happen even if efforts to mitigate against climate change fail. As it takes many years for some greenhouse gases to be removed from the atmosphere by natural processes.

The impacts of climate change on buildings and construction are difficult to quantify. A study published by BRE in 1998 (Impact of Climate Change on Buildings) gave a broad view of these impacts, and further work over the period to 2000 resulted in a report (Potential implications of climate change in the built environment) that attempted to quantify the issues for UK buildings. Particular challenges identified were:

- the impact on construction site activities, ie site work becoming more difficult and hazardous
- increased weather-tightness problems
- more instances of foundation instability
- greater flooding risk, especially in river plains and coastal locations
- poorer materials durability
- increased storm damage
- summer overheating becoming more common.

Climate change scenarios

The science of climate change is a complex business. To help those involved – including the construction industry – to respond to the problem, the UK Climate Change Programme (UKCIP) has published a series of climate change scenarios. These are based on the Hadley Centre (HadCM3) model of global climate patterns, and assume various levels of greenhouse gases in the atmosphere. Table 1 has some typical information from these, based in this case on the medium-high scenario of greenhouse gas emissions. A confidence level is provided for each aspect of climate change.

Building site activity

Many on-site activities are vulnerable to disruption by the weather. Climate change is likely to mean that site activity will be subject to more delays, have more health and safety problems for site management to overcome, and run the risk of having more site materials wasted. The main issues are as follows:

- Health and safety
  Increased hazards with more protection of site operatives required. Changes in winds, summer gales, temperature and rainfall will all affect the health and safety of workers.

- Materials use
  Some materials may become more difficult to use on site, for example, concrete and mortar subject to increased drying in transport or on site. Development of special additives may be required.

- Site storage
  Site storage of materials may become more difficult, and site spoilage is likely to increase (due to increased UV radiation, rainfall and wind speeds). Improved facilities and processes for the storage of materials will be required.

- Soil conditions on site
  Wetter winters and drier summers may mean that groundwork will be harder to complete effectively. Soil contaminants and ground gases could become more mobile at certain times of the year. Changes to the methods of site preparation will be required and, linked to this, buildings will need improved protection from contaminants.

- Days lost due to weather
  Wetter sites may mean that more days are lost for unprotected site works each year. However, the anticipated reduction in winter days with frosts may help to reduce the days lost in some locations.

- Off-site construction
  Off-site construction may be a potential means of overcoming the increased risks from climate change, but the vast majority of buildings are still constructed using traditional masonry work.

Housing

Table 2 summarises the key issues involved in the impacts of climate change on housing. These impacts could lead to a greater maintenance and repair burden for UK houses which is unlikely to be fully covered by insurance in the future. The insurance industry is concerned about its own exposure to changing risk and is considering, for example, the possibility of introducing limited or no insurance cover against flood in particularly vulnerable locations. Insurers could become a driving force for improved levels of building design by recognising in their premiums any positive adaptation measures that have a direct consequence for insurance risk.

Revised standards, guidance and regulations

Designers will need new performance standards to ensure that future buildings have a useful and sustainable life as the climate changes. The consequences of not changing design standards will be expensive and wasteful because domestic developments, for example, typically have at least a 60-year intended service life – significant climate changes are expected over this period. Additional or revised standards, technical guidance and Building Regulations are going to be needed, a process that is only now really being started. Current uncertainties about some of the climatic parameters (particularly wind) mean that the quality and reliability of this data would not yet be sufficient for use as the basis of rigorous design criteria. More work is needed on developing more reliable and detailed climate scenarios.

Action to take now

Despite the need for better climate data, it is possible for designers to start taking some pragmatic action to reduce the risk and severity of future impacts. In particular, the following strategy could be taken for all new and existing housing:

- estimate future exposure to climate based upon the current UKCIP scenarios
- make provision for easier reinstatement of the building fabric after flooding events, gales or materials degradation
- improve the foundations in areas susceptible to subsidence
- consider using thermal mass and natural ventilation to help control summer overheating of buildings.

Table 3 details some practical measures that can be taken to ensure that both existing and new housing do not suffer from the impacts of climate change. The economic impact of not taking some of these measures has been assessed and is included in Table 3.

For further information – Stephen Garvin 01355 576200 Email garvins@bre.co.uk
<table>
<thead>
<tr>
<th>Climate change issue</th>
<th>Change</th>
<th>Date</th>
<th>Confidence level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sea level rise</td>
<td>+37 cm increase in East Anglia +17 cm increase West of Scotland</td>
<td>2050</td>
<td>High</td>
</tr>
<tr>
<td>Mean annual temperature</td>
<td>+2.4°C in London +3.3°C in London +1.7°C in Central Scotland +2.4°C in Central Scotland</td>
<td>2050 2080 2050 2080</td>
<td>High</td>
</tr>
<tr>
<td>Hot summer probability</td>
<td>56% England probability increase from 1 in 50 to 1 in 2.5 years</td>
<td>2080</td>
<td>High</td>
</tr>
<tr>
<td>Summer rainfall</td>
<td>-20% in south and east England Probability of summer rainfall being 50% of average increases from 1 in 100 to 1 in 10</td>
<td>2080</td>
<td>Medium</td>
</tr>
<tr>
<td>Winter rainfall</td>
<td>+29% in Scotland +24% in London</td>
<td>2080 2080</td>
<td>Medium</td>
</tr>
<tr>
<td>Evapo-transpiration (soil moisture loss)</td>
<td>+33% increase in eastern England No change in Scotland</td>
<td>2080</td>
<td>Medium</td>
</tr>
<tr>
<td>Humidity</td>
<td>Vapour pressure will increase in south Humidity will decrease in south (autumn and summer)</td>
<td>Up to 2080</td>
<td>Medium low</td>
</tr>
<tr>
<td>UV radiation</td>
<td>Increase in south Decrease in north</td>
<td>Up to 2080</td>
<td>Medium low</td>
</tr>
<tr>
<td>Wind speed</td>
<td>Autumn increase +9% in Glasgow +4% in London</td>
<td>Up to 2080</td>
<td>Low</td>
</tr>
<tr>
<td>Gales</td>
<td>Increase in summer of +15% Decrease slightly in winter</td>
<td>Up to 2080</td>
<td>Low</td>
</tr>
</tbody>
</table>

**Table 1**: A Summer of climate change scenario (medium-high, UKCIP 2002)

<table>
<thead>
<tr>
<th>Issue</th>
<th>Key climatic changes</th>
<th>Consequence of no action</th>
<th>Design change possibilities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Materials durability</td>
<td>Increased temperatures. Higher rainfall. Increased UV.</td>
<td>Poorer durability of plastics and timber joinery, plus increased potential for cracking of masonry and concrete. Corrosion of metals more likely</td>
<td>Higher-quality materials, improved workmanship, detailing of movement joints</td>
</tr>
<tr>
<td>Foundation movement</td>
<td>Increased summer drying of soils.</td>
<td>Increased damage due to foundation movement (currently £200-400 million per year)</td>
<td>Increase foundation depth in susceptible locations</td>
</tr>
<tr>
<td>Flood risk</td>
<td>Increased winter rainfall events, allied with construction on flood plains.</td>
<td>Increased damage and disruption (currently greater than £200 million per year)</td>
<td>Design to accommodate water ingress in vulnerable locations, and to help buildings dry out quickly. Use of resistant materials</td>
</tr>
<tr>
<td>Overheating</td>
<td>Hotter summer temperatures.</td>
<td>Increased use of air conditioning and energy</td>
<td>Better natural ventilation and passive shading. Use of vegetation to keep houses cool in winter. Consider use of thermal mass in design</td>
</tr>
</tbody>
</table>

**Table 2**: Climate change impacts on houses

<table>
<thead>
<tr>
<th>Existing Housing</th>
<th>New housing</th>
<th>Economic impact</th>
</tr>
</thead>
<tbody>
<tr>
<td>Roofs – replace roof tiles</td>
<td>Roofs – choose fixings for 5% to 10% higher wind loads</td>
<td>Gales – £1-2 billion gales damage per year (including non-domestic) Fixings – £2.5 to £7 billion</td>
</tr>
<tr>
<td>Masonry – render if suffering from rain penetration</td>
<td>Masonry – use good building practice to avoid cracking, design for higher exposure to driving rain</td>
<td>PVC-U – £2.4 billion</td>
</tr>
<tr>
<td>Windows and glass – maintain well, use good quality replacements and insulating glass units</td>
<td>Windows and glass – choose good UV resistance and weather-tightness, good quality insulating glass units</td>
<td>Subsidence claims – £200 to £600 million</td>
</tr>
<tr>
<td>Foundations – underpin or repair subsidence damage</td>
<td>Foundations – increase foundation depth on susceptible clay soil by 0.5 m</td>
<td>Subsidence claims – £200 to £600 million</td>
</tr>
<tr>
<td>Flooding – maintain flood defences, improve resilience of the house, eg water resistant plasterwork</td>
<td>Flooding – avoid flood plains if possible, raise floor levels, avoid underfloor wiring</td>
<td>£200 million damage to buildings per year</td>
</tr>
<tr>
<td>Coastal erosion – manage retreat if possible</td>
<td>Coastal erosion – do not build on vulnerable areas</td>
<td>Total stock at risk £10 billion</td>
</tr>
<tr>
<td>Water – collect rainwater from roofs for gardens</td>
<td>Water – consider water resources as an integral part of new developments, sustainable drainage and grey water collection for example</td>
<td></td>
</tr>
<tr>
<td>Ventilation – take temperatures to dispel damp in winter</td>
<td>Ventilation – plan for good ventilation of houses</td>
<td></td>
</tr>
<tr>
<td>Cooling – allow mechanical ventilation only as a last resort</td>
<td>Cooling – use thermal mass or increase insulation levels to avoid overheating in summer</td>
<td></td>
</tr>
<tr>
<td>Heating – a reduction in heating is possible, or damp problems could be reduced and comfort increased in warmer winters</td>
<td>Heating – use more efficient heating</td>
<td></td>
</tr>
</tbody>
</table>

**Table 3**: Housing impacts and adaptations – existing and new
In the face of declining investment by UK government and industry in research on construction materials, it is becoming ever more critical to ensure that the benefits from this investment are maximised. Keith Quillin describes a project aiming to make sure that this happens, and reports on a workshop that recently looked at the current situation and our future materials information needs.

Establishing a strategy
After wide consultation with all housing stakeholders, the project partners are currently developing a housing-sector strategy document, to be published in Spring 2004. Its goals include identifying exactly what clients and the construction industry actually need from materials research. It will also review and collate existing information on using materials in the housing sector, and 'map' previous research in this field — establishing its impact, highlighting developments that have not yet been exploited by industry and finding the reasons why this has happened.

In compiling the strategy document, information is being sought that allows clients to exploit a full range of material types, and deal with the issues of interfacing and interaction between different materials. In addition, the barriers between sources/providers of construction material information are being identified with a view to breaking these down, and producing an alternative, integrated information source for all materials. Finally, the strategy document will propose prioritised activities and actions to address the needs of clients and the construction industry.

The housing sector strategy is being developed through close consultation with key client groups, including architects, engineers, specifiers and major users of construction products (eg house builders, developers, local authorities, and housing associations). This is essential to ensure that the information provided by the project is client focussed, and leads to improvements in efficiency and competitiveness.

Other programme outputs will include guidance documents on materials and their selection, case studies providing real examples of the commercial and technical feasibility of different materials solutions, workshops and industry meetings, and a website.

Project Impacts
According to the Director of the project, Dr Peter Bonfield (Managing Director of BRE’s Construction Division), ‘For the first time, this project brings together organisations from the various construction material sectors to address industry information needs in a truly collaborative fashion. By focusing on a specific sector (housing), BRE and Co-Construct have the opportunity to make real impacts over the year of the project.’

The strategy and action plan developed under the programme should lead to improvements that include:

- more efficient and reliable use of materials and products in construction
- improved interfacing and interactions between materials
- faster exploitation of new materials and techniques
- reduction in cases of inappropriate use
- improved co-operation between different materials supply sectors
- greater take-up and appreciation of research by industry
- materials information that more closely addresses industry needs.

Workshop findings
As part of the project, a workshop to gather industry views on information needs and barriers to the use of materials research, was held at BRE on 12 December 2003. Over 70 people attended the workshop representing producers, suppliers, architects, designers, lenders, insurers, building users, builders, developers and consultants. The day started with a number of excellent presentations from key stakeholder groups to set the scene. These included perspectives from:

- Elizabeth Whatmore, Head of Construction Sector Unit, DTI
- Anne Kirkham, Head of Decent Homes, Finance and Coordination Division, ODPM
- Tony Lord, Building Regulations Division, ODPM
- Judith Harrison, Project Director, Constructing Excellence, Housing Forum
- Ashley Lane, Group Technical Director, Westbury Homes
- John Tebbit, Industry Affairs Director, Construction Products Association

The presentations were followed by two discussion sessions, one looking at current information needs and the other at supply and future information needs. The discussion sessions were very lively and produced a range of findings (influenced by the stakeholder groups represented), a brief selection of which follow.

- Elizabeth Whatmore, Head of Construction Sector Unit, DTI
- Anne Kirkham, Head of Decent Homes, Finance and Coordination Division, ODPM
- John Tebbit, Industry Affairs Director, Construction Products Association
The current situation

Reliable information

There is too much information available, much of which is of poor quality. There is a need for more reliable, independent information (which has some sort of independent verification). This type of information is particularly helpful in getting new products (and consequently designs) accepted.

Information awareness

Information is currently collected from a range of sources – manufacturers’ literature, exhibitions, continuing professional development (CPD), seminars, journals and trade press and so on. But awareness is a big issue even where the appropriate information is available. A central source or portal for accessing information would be a great help. This could include environmental benefits and regular updates on innovation to improve the uptake and impact of information. Linking information to types of construction, design issues and recognised problems would be useful.

Information transfer

There are problems with the transfer of information, knowledge and the understanding of requirements throughout the supply chain. For example, some architects feel that sales representatives lack knowledge of products, while some suppliers in turn criticise architects for lacking an understanding of product suitability/limitations in specific applications. Supply chain partnering is therefore important for information exchange.

‘Risky’ innovation

Innovation is a risk and many parts of the industry are risk averse. This means there is often a lag (typically ten years) between the development of innovative technology and the development of robust test data and standards.

Standards

New standards are not well understood, so it is important that knowledge of standards reaches a wider audience. Standards have a major influence on whether or not products and the designs using them are accepted in the marketplace.

Future information needs

Information formats

Information should be simple, available from a single source and in a standard format, independent and ideally free (or cheap) to access. It should be presented in formats suitable for use in IT systems (rather than pdf versions of paper documents) and needs to be ‘networkable’. The Internet can be an ideal vehicle.

Information from publicly funded work plays a key role in meeting information needs throughout the supply chain. But if it is to be of full value, users must be made aware of what work is being done, the expected outcomes and future priorities for public funding. This should be available to them via the web. More continuity of publicly-funded research would be beneficial.

Incompatibilities between components used in a building can be caused by long lead times. The involvement of all parties at an early stage in the design process when specifications are to be changed can prevent this.

A lack of test standards for new products hinders innovation. The process of developing appropriate and acceptable test standards needs to match the pace at which new products are coming on to the market.

Knowledge, particularly that gained from the use of products, materials and assemblies is not adequately captured or disseminated. Case studies are important. Ideally these should be carried out by an independent body and should be reported ‘warts and all’. The best form of case studies for designers and specifiers allows them to see and feel the materials and products in use, rather than through a written case study.

A means of making comparisons between materials and products is needed. In particular it is important that information is presented in a standard format to facilitate such comparisons.

Building system

It is essential to think of the building system, not just the product – for example we need information on how a wall behaves rather than a brick. This requires the provision of impartial information on the performance of a range of materials types in consistent and relevant formats. Product information needs to address the whole life of the component, not just its specification – for example a product or component may be correctly specified but if not installed correctly may still fail. In addition, more information is needed on the interfaces between materials and products, and the limitations of different types of structure.

Flexibility of use will be important in future to allow housing stock to satisfy changing demographic and usage needs. The biggest impact will be on design, but this will require materials/product/assembly support.

Whole life performance

There is a real and urgent need for life cycle information on product and materials costs and performance, from an independent third party source. More information is needed on the service life of individual components and of the systems in which they are used.

While the retrofit market is considerably larger than the new build market, there is less information on retrofit products than on those for new build.

Information could be embedded into components using electronic tagging to facilitate maintenance, reuse and disposal.

Sustainability

Sustainability is a key issue for architects, designers and specifiers, and independent, centralised and cheap information is needed on a wide range of issues.

For example, information on embodied energy is increasingly being demanded but can be misleading – it may not, for instance, always factor in overseas transport. Information on where materials can be sourced locally would help to avoid transport impact. Another example is the need for information on CO₂ emissions generated during the production of materials.

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Legislation

Information needs to be produced and disseminated to counter a general lack of awareness of new policies, regulations, codes and standards, etc. For example:

- Planning policy, eg PPG3 – more flats are needed to achieve the required density
- CE marking
- European legislation – codes and standards, and the General Product Safety Directive which has requirements for traceability and recall
- Building regulations – increasingly complex and regularly changed (eg Part E and Part L)

Future activities

The full outcomes of the workshop will be combined with other work to establish a database of available materials research information, the results of a widespread survey on needs for information, a number of mini-workshops, and specific input from project partners. This information will be used as the key components of the housing sector strategy. The programme team will pick out some of the main recommendations from the strategy, and produce a number of outputs to be disseminated by the routes identified in the strategy document.

For further information on the workshop findings, and on the project – Keith Quillin 01923 664893 Email quillink@bre.co.uk

New Building Regulations

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CE marking

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25 Feb in Salford
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Putting brownfield land to work

Building on brownfield land meets the need for new housing and economic development while protecting the UK countryside. But brownfield land development presents problems as well as solutions. A new research consortium aims to tackle these, as Stephen Garvin explains.

Finding solutions to the problems of developing brownfield land is the goal of a new research consortium comprising nine research organisations concerned with regenerating brownfield land and urban environments.

Known as SUBR:IM (Sustainable Urban Brownfield Regeneration: Integrated Management) the research consortium is being funded by EPSRC under its Sustainable Urban Environments initiative. It is a four-year programme with initial funding of £1.9 million.

The consortium's aims
SUBR:IM aims to produce integrated and sustainable solutions for the development of brownfield land in urban areas, with the wider goal of improving the quality of life and economic growth for all.

The consortium will work to enhance the robustness of technical solutions and tools for restoring brownfield land and its infrastructure in urban areas. It plans to increase the knowledge base of all stakeholders involved in brownfield development (investors, developers, planning agencies, local authorities, the public, scientists, engineers, etc), to integrate their needs within a sustainable framework and encourage investment.

In addition, the programme will establish best environmental practice in the development of brownfield land in urban areas, extend existing knowledge and set international benchmarks and sustainability indicators.

Portfolio of brownfield sites
At the heart of the consortium’s work is a portfolio of brownfield sites in two regions, Greater Manchester and the Thames Gateway. Both areas include deprived communities and have substantial brownfield problems. In other respects they represent opposing pressures, for example, the Thames Gateway is a compact region in the heavily populated and expensive South East of England, while the Greater Manchester portfolio in the North of England is more spread out, has less population pressure and lower land costs.

The regeneration of these areas is important as it has the potential to improve the quality of life and economic prospects in both. In turn there should be knock on effects to wider areas. For example, if the Thames Gateway is developed, greenfield sites in the South East should be saved from development.

While the Greater Manchester area has received less media coverage, there has been significant government investment there. Greater Manchester has more than 900 brownfield sites dispersed around it, offering opportunities for greening (eg urban forests), as well as housing and industry. In the Thames Gateway the emphasis is on housing with industry/amenity – ensuring that the developments are truly sustainable will be the greatest challenge.

The portfolio, particularly in the Greater Manchester area, includes many sites that are of low value. Such sites present the most challenging brownfield land problem in the UK – they are widespread, their low value makes expensive remediation hard to justify, and they are frequently located in areas of social deprivation. These sites require cost-effective and sustainable solutions which combine the expertise of engineering and science working in concert with policy, planning and social engineering.

By focusing the core research around a common portfolio the consortium will keep its work integrated and interdisciplinary. The portfolio will also encourage work on the problems that are actually facing developers, local authorities and other stakeholders.

Consortium partners and supporters
The nine consortium partners are:
- University of Sheffield (the lead partner)
- University of Cambridge
- University of Manchester
- University of Reading
- University of Surrey
- BRE
- College of Estate Management (CEM)
- Forest Research (FR)
- Greater Manchester Geological Unit (GMGUL)

The research is supported by key stakeholders, including the following:
- Environment Agency
- Office of the Deputy Prime Minister
- ICI
- Arup
- RICS Foundation
- Forestry Commission
- British Property Federation
- English Partnerships
- SecondSite Property
- The London Borough of Barking & Dagenham
- CLAIRE
- Thames Gateway London Partnership

The projects
The first set of projects to be funded under the SUBR:IM consortium include core projects linking science, engineering and social science disciplines, which contribute directly to the programme’s aims and objectives. In addition to the core projects are plus projects, which are designed to add to the understanding of the problem and solutions, and to link to other consortia in the Sustainable Urban Environment programme of EPSRC.

The core projects are as follows:
- Portfolio and project management (Sheffield)
- The role of the UK development industry in brownfield regeneration (CEM)
- Multi-level decision making processes, expertise and sustainable urban regeneration (Sheffield)
- Metrics for sustainable development of remediation projects (Surrey)
- Robust sustainable technical solutions to contaminated brownfield sites (Cambridge)
- Integrated urban remediation and greening (FR)
- Quality in land remediation and management (BRE)

The plus projects are as follows:
- Restoration of acid tar lagoons (Sheffield)
- Impacts of climate change on pollutant linkages (Cambridge)
- The governance of brownfield regeneration in the UK (CEM)
- Novel special purpose composts for the sustainable remediation of brownfield sites (Surrey).

Each project is led by one of the partners (named in brackets in the above lists). The project on quality in land remediation and management, for example, is being led by BRE Scotland with support from the University of Manchester. This project aims to improve the remediation of contaminated land in the urban environment by developing quality protocols, measures and methods for land remediation. This should give greater confidence to those involved in procuring remediation technologies. More specifically the project objectives include reviewing the current approach to quality, undertaking studies on quality in site remediation and management, and determining the protocols for quality in future land remediation processes.

The project will produce guidance and research reports, and develop a series of publications for the whole consortium based around quality in land remediation and management. BRE, along with CLAIRE and CIRIA, will also be primarily responsible for disseminating the findings and guidance produced by other research partners in the consortium.

For further information – Stephen Garvin 01355 576200
Email garvins@bre.co.uk
Sound regulations impact on builders


Everyone involved in the development of residential accommodation in England and Wales will be affected by the major changes to Approved Document E (ADE) of the Building Regulations which came into force on 1 July 2003. New-build rooms for residential purposes and buildings converted into dwellings or residential rooms must now be designed, constructed and tested for sound insulation. Pre-completion testing for new-build developments comes into force in January 2004.

Why have the regulations changed?
The Government has introduced the new, more stringent regulations in an attempt to reduce the increasing number of complaints about noise that have risen dramatically over the past few years. Data gathered in the late 1990s showed that complaints about domestic noise had trebled in ten years, and that by 1996 over a third of households in England had experienced problems with noise in the previous year.

Noise can have effects ranging from mild annoyance and disturbed sleep to more serious psychological and physiological effects such as high blood pressure, stress and mental-health problems.

What’s new?
The new regulations explicitly include standards for ‘rooms for residential purposes’. This means rooms that are used by one or more people to live and sleep in, including rooms in hotels, hostels, boarding houses, halls of residence and residential homes. The 1996 noise data showed that neighbour-related noise problems reported by the occupants of flats was more than double those reported by people living in houses. With this in mind the new regulations place emphasis on separating walls, floors and stairs and associated flanking constructions, as well as reverberation in circulation areas such as corridors.

The second major change is the move to a performance-based specification. Constructions given in ADE as guidance can achieve the required sound insulation values in the majority of cases only if they are built correctly to a good standard of workmanship. To ensure that the required standards are met, the regulations have introduced pre-completion testing (PCT), a formalised procedure for carrying out site testing of sound insulation.

Meeting the regulations
Responsibility for ensuring that the testing is undertaken lies with ‘the person carrying out the building work’ – ie the contractor. That person is also responsible for the cost of testing. Designers and contractors have the following three options.

Build separating walls or floors and associated flanking constructions that are not described in ADE, with performance assessed through PCT. The construction guidance in ADE is intended to provide the builder with some examples of suitable designs that can be used to achieve the performance standards. However, there are many other construction designs, with more being developed every day. For tried-and-tested constructions, the onus is on manufacturers and builders to gather and disseminate field test measurement data to give designers confidence in the use of these constructions. For innovative constructions, an acoustic consultant will usually be required to advise on appropriate laboratory measurements and prediction models to predict the sound insulation performance when built on site (PCT will still be required).

Build according to a statistical understanding of the risks of failure for preferred constructions. Building to a higher specification involves increased costs. The designer/contractor may therefore decide to work out the statistical risk of failing the PCT and build accordingly. For example, if a type of separating wall construction with a particular type of associated flanking construction in a purpose-built dwelling has a mean airborne sound insulation of 50 dB DnT,w+Ctr with a standard deviation of 3 dB (which often occurs), then the failure rate would be approximately 5% with ADE’s performance standard of 45 dB DnT,w+Ctr. Any failures will have to be rectified, but designers/contractors may accept that a certain percentage will require remedial treatment and build lower-cost constructions with an allowance for the cost of remediation.

The testing process
Testing should preferably be carried out by a test body with UKAS accreditation (or a European equivalent) for field sound insulation measurements. BRE Acoustics Centre is one of four acoustics testing companies in the UK with UKAS accreditation. Where possible, testing should be carried out as the rooms are completed, rather than waiting until the whole development is finished. This way, any potential problems can be rectified at an early stage. Building control bodies should stipulate at least one set of tests for every ten dwelling houses, flats or rooms for residential purposes.

One set of tests will comprise either two, four or six individual sound insulation tests, depending on the type and layout of the building. If a room fails the sound insulation test, the appropriate remedial treatment should be carried out. However, a failed set of tests then raises questions over the sound insulation in other rooms, so the contractor will need to demonstrate to the building control body’s satisfaction that these rooms meet the performance standards.

Further information from BRE’s Acoustics Centre
01923 664300, Email acoustics@bre.co.uk
Waste – challenging the status quo

The construction industry must change the way it manages waste. James Hurley looks at the difficulties of doing this, and how they can be overcome.

Most people in the UK buy, consume and dispose of resources every day, and most would admit that there is plenty of scope for reducing and making better use of their waste. If we as individuals struggle to achieve better waste management, how can a whole industry be expected to change its working practices and the perception that it has a right to dump damaged, excess or simply unused materials?

As individuals we can choose on a whim where to buy our goods and what brands. We can easily and cost effectively segregate our comparatively small volumes of waste and put them out for collection or take them to civic amenity sites. But many construction industry businesses cannot match an individual’s flexibility when it comes to purchasing, use and disposal of resources, and there are significant problems with implementing better practices.

The barriers

Construction, simply put, is a manufacturing process. Materials and components are brought in, adapted where necessary and fitted together into saleable goods. Unlike a manufacturing plant, however, a construction site has some very specific challenges to changing its practices.

Variability. Every site is different – in design, location, materials and client – making the implementation of generalised waste management plans on a company level fraught with difficulties.

Other priorities. The construction industry still has a poor reputation for its record on health and safety, noise, dust and pollution control. Although there have been improvements, sorting waste and resource management are leaner and smarter, operating tighter sites, using less material, don’t change will start to see themselves losing out to those that are doing the ‘right thing’. Simply put, waste and resource management on site underway.

Getting started

Act early

Negotiate with waste management/logistics companies early in the process, and plan for effective material storage and skip/container placement on site. Identify the key waste products likely to arise on site, looking at the specification and build programme, and organise waste management activities accordingly. Engage all sub-contractors at tender stage and, where appropriate, contractually oblige them to comply with waste management plans on site.

Low profit margins. Many construction companies work on very low profit margins, often only 3-4%. Risks tend to be avoided and this promotes a conservative approach to innovation and change.

Contractor/sub-contractor relations. Most large sites are run by a main contractor with the individual work packages being let out to specialist sub-contractors. Main contractors are often responsible for the supply of materials and waste management, leaving sub-contractors with little or no incentive to reuse off-cuts or segregate material to save on disposal costs.

The need to change

Set against these problems are the ever-increasing costs of disposal, tightening regulations and increased pressures from shareholders, clients and government for the construction industry to be seen to be doing the ‘right thing’. Simply put, waste and resource management practices on site have to change. Companies that don’t change will start to see themselves losing out to those that are leaner and smarter, operating tighter sites, using less material, paying less for disposal, making more profit and ultimately winning more jobs.

Best value

Remember that the cheapest price per mixed skip does not automatically equate to the cheapest price for waste management on your site. Discuss all of the options – from compactors and segregated skips to mini-skips and rubbish chutes – with your waste/logistics companies. Use the most appropriate solution for your site.

Entering a fixed price waste management contract can discourage making changes to waste management practices – this is because you will get charged the same price regardless of whether you reduce the amount of waste produced. Discuss entering a fixed price contract tied to targeted waste reduction activities, implement waste segregation and ensure that the benefits of better waste and resource management practices are shared across the entire supply chain.

Get help when needed

Project management teams on site are often extremely busy and cannot afford the time to trawl through research papers and the Internet looking for advice and waste management tools. To be of practical use to design teams and senior management on site, these need to be readily available and easily implemented. The following sources of waste management tools and advice can get you on the road to more effective resource management in the construction industry.
1. Software and web-based tools

The SMARTWaste™ system includes a range of web-based tools ranging from simple recording mechanisms to more advanced management resources. These are briefly described below with more information at www.smartwaste.co.uk

SMARTStart™

The first step on the SMARTWaste ladder is a very quick and easy-to-use software tool called SMARTStart. This enables users to define their environmental performance indicators (EPBs) and key performance indicators (KPIs) for waste generation on a site, by site, and organisational basis. Using SMARTStart, contractors can keep records of waste arisings and their approximate composition, report on levels of segregation and recycling on site, and continuously update environmental performance indicators for waste generation for the project.

Several companies have committed themselves to using SMARTStart on their sites, including major contractors (eg Taylor Woodrow Construction), property managers (eg Slough Estates) and logistics companies (eg Abladale Logistics).

SMARTAudit™

The second step up the ladder is SMARTAudit, which is more detailed and time-dependent tool related to SMARTStart. SMARTAudit was developed to provide a robust and accurate mechanism of benchmarking wastes arising and categorising them by source, type, amount, cause and cost. SMARTAudits have been completed for construction, demolition, refurbishment, manufacturing and prefabrication projects.

The data gathered provide a spreadsheet to identifying and prioritising actions to reduce waste, reuse at source, and maximise recovery to extend materials' life-cycles. It includes mechanisms for analysing the data, providing instant reports and setting targets and action plans.

Both SMARTStart and SMARTAudit collect, process and display data automatically via secure web pages set up for individual construction sites. Depending on levels of access allowed, each site can monitor its own performance and compare it to others, also, environmental managers in a particular client or contracting company can now very easily monitor site size, value, materials and construction type with respect to resource efficiency.

BREMAP™

The third step up the ladder is to define the best practicable environmental option (BPEO) for your waste. Sustainable waste management often depends on the availability of recovery facilities and their location in relation to the point of waste arising. The extra transportation of bulky and heavy materials by road can negate environmental benefits associated with the reuse and recycling of materials.

BREMAP is a new geographical information system (GIS) that allows firms to reduce transport of bulky waste by locating the nearest, most suitable waste management site by the quantities of available information detailing recycled products, landfill sites, transfer stations, incinerators, recycling sites, reclamation companies, composting facilities and manufacturer take-back schemes, into a consistent and accessible format. The system has been developed by BRE and funded by Biffaward through landfill tax credits, and through a grant from the Institution of Civil Engineers' R&D Enabling Fund.

SMARTStartGL™

Central and local government (LG) procures around 60% of construction in the UK. Rethinking Construction and BRE developed SMARTStartGL in response to a local government questionnaire that identified a need to integrate resource management into their procurement processes. SMARTStartGL incorporates the measurement tool SMARTStart to provide local government with a way of measuring the performance of contractors – this is an essential requirement for achieving best value and continual improvement. Several local authorities are using the tool with preferred contractors.

2. Publications

A range of information on construction and demolition waste management and recycling/reuse of materials can be found in BRE publications (available from www.brebookshop.com or tel 020 7505 6622) and elsewhere:

- GBG57 Construction and demolition waste
- BR418 Deconstruction and reuse of construction materials
- Digest 447 Waste minimisation on a construction site
- Digest 433 Recycled aggregates
- IP 9/03 Best practice timber waste management
- IP 8/03 Construction site packaging wastes: a market position report
- IP 7/00 Reclamation and recycling of building materials
- IP 14/98 Blocks with recycled aggregate: beam and block flooring
- IP 12/97 Plastics recycling in the construction industry
- IP 3/97 Demonstration of reuse and recycling of materials
- IP 1/96 Management of construction and demolition waste
- IPS/94 The use of recycled aggregates in concrete


Snoek K, Turner A and Ridout R. Recycling waste from construction sites. CIoB, 1995

The EA Waste Handbook is freely available at: www.recycle.mcmail.com/content.htm


3. Contacts

BRE Centre for Resource Management
www.smartwaste.co.uk, 01923 664200
Email smartwaste@bre.co.uk

The Environment Agency’s Strategic Waste Management Assessments (SWMA): www.environment-agency.gov.uk/subjects/waste/147529?version=1

Materials information exchange
www.salvorie.co.uk

NetRegs is a source of information on environmental legislation and the construction industry: www.environment-agency.gov.uk/netregs

Reclamation
Salvo – have listings of reclamation sites by county.
T 01890 820333, F 01890 820499
Email salvo@scotholders.co.uk
www.salvo.co.uk

Rethinking Construction and the Construction Best Practice Programme have now joined forces under the banner of ‘constructing excellence’ to provide information through best practice clubs, cluster groups, demonstration projects, guidance and key performance indicators: www.constructingexcellence.org.uk

Waste and Resources Action Programme (WRAP)
T 0808 100 2040 (Helpline)
F 01295 819911
Email helpline@wrap.org.uk
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