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SCOTLAND



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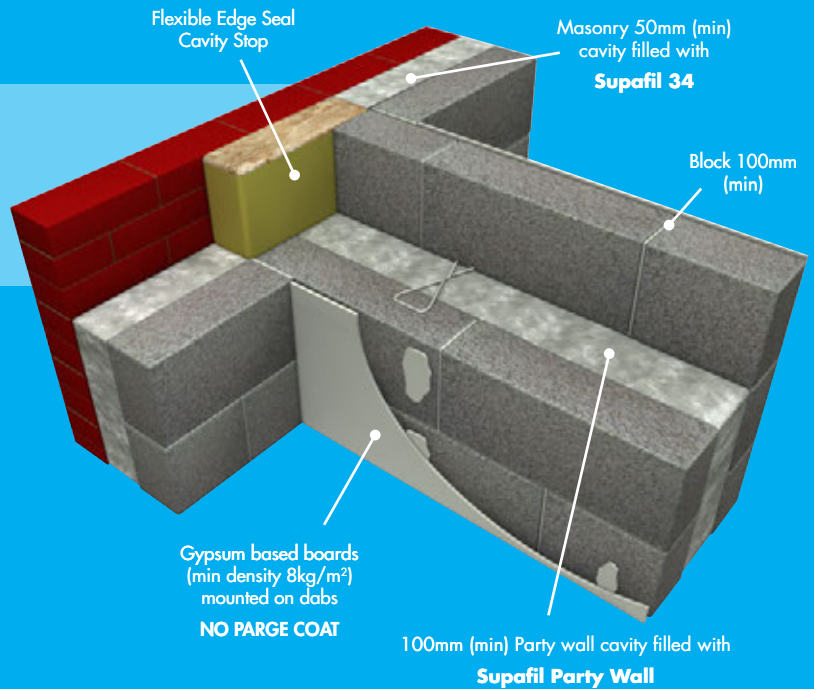
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Introduction

Welcome to the 2nd Edition of Planning and Building Control Today Scotland.

The housing crisis is still causing much political wrangling with shadow housing minister Mary Fee claiming in October that Scotland was at risk of the worst housing shortages since 1945 and the housing minister Margaret Burgess claiming the SNP government had “outperformed the record of previous Scottish administrations” in delivering new house building programmes.

Regardless of claim and counter-claim, the fact remains that housing is a key priority and more affordable housing is desperately needed. In November, the Scottish government announced that it is providing £200m in additional funding to stimulate the housing industry and safeguard construction jobs. This increase in funding is expected to deliver thousands of new affordable homes. So, some good news there for those “languishing on housing waiting lists” as Mary Fee describes them, but extra housing is only part of the solution. Any development should provide places where people want to live and engage the community in recognising the benefits.

PAS (formerly Planning Aid Scotland) encourages community engagement in creating positive places for people and they are opening this edition highlighting how they have assisted in developing a vision, and importantly a practical plan of action, for two areas in Scotland. But PAS are also about

educating the young, so they also explain what their role is to encourage them in the planning system.

Local authorities and developers should also be interested in an article from Noel Farrer of the Landscape Institute who argues that by considering effective landscaping within developments, not only are good places delivered, but they are valued and maintained, making them sustainable as well as profitable for all.

David Philp of the UK BIM Task Group also makes a welcome return with an article outlining how BIM can help industry to collaborate and deliver better outcomes, and Steve Thompson, Chair of BIM4M2 addresses the challenges faced by manufacturers in the BIM process, and the requirements of the digital product information that can be exchanged with supply chain partners.

This edition also turns its attention to the subject of energy efficiency with articles from the Energy Saving Trust discussing the benefits of solid wall insulation, Richard Sharpe of Exeter University warning of the dangers of poor ventilation, and Nick Ralph of MIMA on how to close the performance gap. All quite timely pieces considering we are now in the winter months.

As ever, comments and suggestions for future editions are always welcome, so please get in touch with the editorial team if you have anything to say.

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Children from the IMBY programme looking through a viewfinder at different view-points to think about the different elements of the built environment and land use that they see

Communities leading on Place

When the Community Empowerment Bill has passed through the Scottish Parliament, it is hoped that more communities will engage in improving their area. Here, PAS outline how they can assist...

Over the last few months, PAS (formerly Planning Aid Scotland) has been working with two communities to help them develop a vision, and importantly a practical plan of action, for their area. These projects with communities on the Isle of Rum and in Dunblane have been initiated and owned by the communities themselves, with PAS acting as facilitator of the visioning process.

It is encouraging to see communities coming forward with ideas and aspirations to improve their local area for the benefit of all and it is hoped that more communities will follow suit when the Community Empowerment Bill has passed through the Scottish Parliament. However, it is important that all sections of the community are engaged in this process, particularly young people.

The following is an overview of the two community-led projects and PAS youth engagement programmes.

Isle of Rum

PAS assisted the Isle of Rum Community Trust with preparation of their Community Land Use Plan at the Community Land Scotland conference in 2013. PAS and The Isle of Rum Community Trust (IRCT) came together to discuss collaborating on a community-led land use plan for the 100 hectares of land which in 2009 was transferred from the Scottish Natural Heritage to the Trust.

One of IRCT's key aims is to increase the island's population, which is currently around 30 people. In order to do this, more houses, and the right kind of houses are needed on the island. However, the desire of IRCT and the residents of Rum to do things for themselves needs to be balanced with the necessity of protecting the island's unique landscape.

PAS, in collaboration with IRCT and supported by The Highland Council, has undertaken two visits to

Rum to undertake landscape analysis and detailed engagement with the local community. This has involved speaking to residents of the island and also stakeholders such as Scottish Natural Heritage, as well as on-going discussions with The Highland Council. This engagement forms the basis of the draft plan which has now been prepared and will undergo further consultation.

The Highland Council has supported the aims of the project and believes that this kind of community-led plan could be a model for other communities in its area. IRCT intends to submit the Community Land Use Plan to the West Highlands and Islands Local Development Plan with the aim that it will be adopted as supplementary guidance within the plan, thereby giving more certainty about gaining planning permission for new houses in appropriate locations on the island. IRCT secured funding for this project from the Big Lottery's Awards for All programme.

Dunblane Community

The Dunblane Community Council and Dunblane Development Trust approached PAS to help take forward a community visioning project (based on PAS's Charretteplus model) to focus on creating a community-owned vision for Dunblane town centre. The project started in November 2014 and will run throughout the winter, culminating in a series of public workshops in spring 2015.

The project will involve local groups and businesses, but importantly also young people living in Dunblane – those who will live with today's decisions the longest. Through a range of education programmes, PAS encourages young people to take an interest in their local environment and think about how they can play an active part in the decisions that are made in their community.

The output from the project is intended to be a community land-use and community plan with a ready to implement action plan. The project has the support of Stirling Council, particularly the land-use planning and community planning teams. The project steering group secured funding from the Scottish Government's charrette mainstreaming programme, Stirling Council and the Big Lottery's Awards for All programme.

Inclusive communities

Young people are often not heard within the planning system and within decision-making structures in their local area. Recognising this, PAS has developed and delivered a series of educational programmes for young people aged 8-25 called IMBY™, YEP! and Young Placemakers. Workshop sessions have taken place in primary and secondary schools in both urban and rural areas across Scotland, to engage young people in the local decision making process of shaping their places. PAS has been working closely with Education Scotland to align the programmes with Curriculum for Excellence learning outcomes.

IMBY™ 'In My Back Yard' helps young children understand the importance of active citizenship in their local community and makes them consider the different ways in which land can be used and the impacts it may have on people now and in the future. PAS's use of IMBY™ in Edinburgh has been highlighted as good practice by Education Scotland.

YEP! 'Youth Engagement in Planning' educates teenagers about land use in the context of their local communities. It introduces them to the role of community councils and other civic groups while giving them the knowledge, skills and confidence necessary to get more involved in local civic engagement and help make their voice heard.

The Young Placemakers programme recognises that young people must be allowed to become more engaged with the decisions which help shape Scotland's future places. The programme gives young people the opportunity to have a central role in the planning system and to represent their local community to help build a more sustainable Scotland. ■



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Image: © Terence O'Rourke

A landscape for investment

Good quality landscape design is the key to long-term profitable development as Noel Farrer, President, Landscape Institute explains...

We need 230,000 new homes every year to cope with predicted population growth in the UK. That's more homes than at any time since the post-war building boom. Or to put it another way: by 2050, the population is likely to reach 77 million – meaning to house that number, we need to build for the equivalent of another 11 areas the size of Bristol. With the government putting more pressure on housebuilders than ever to hit the numbers, will it be business-as-usual or will these schemes endure as successful, popular and valuable places to live? We cannot afford for them not to be.

People don't want to live in any old housing. They want to live in housing that offers them a better quality of life, one that makes them feel safe walking to and from work and creates a sense of pride and ownership. This was well understood by those housebuilders behind landmark developments such as Munstead Wood, Letchworth, Span estates, Milton Keynes and Greenwich Millenium Village. All of them are a combination of good-quality housing in verdant, well-designed and constructed landscapes,

because it is the so-called 'spaces between the buildings' that make housing work.

Today, we have other notable examples, but whether they are reverential to these landmark developments or new typologies in themselves, they all aspire to the same maxim: landscape thinking delivers good places – and good places are valued and maintained, which makes them sustainable, as well as profitable for all. We've collected together five of these recent housing projects in a new guide – Profitable Places: Why housebuilders invest in landscape – that aims to show public and private developers how landscape can help them deliver their business goals.

Developed by the Landscape Institute Policy Committee Working Group on Housing, the guide offers housebuilders five ways in which landscape professionals can add value to their developments. These are:

- Investment in a high-quality landscape pays dividends, as customers are willing to pay more for it;

- Good landscape planning helps to make the best use of land, identifying the most sustainable sites for development;
- Well-planned and well-designed green infrastructure creates spaces that deliver more efficient land use;
- Landscape is a cost-effective way to meet the regulations and standards that guide sustainable development, such as Building for Life 12 – all but one of these national standards require a landscape-led approach to achieve a green light;
- Considering landscape from the outset can ensure that new development is more acceptable to existing communities, and will speed up the planning process.

But rather than just have our members tell house-builders how to do it, we started by putting the question to them. We asked senior executives at Berkeley Group, Barratt Developments, Countryside Properties, Homes and Communities Agency, Crest Nicholson, and the Greater London Authority to tell us how landscape adds value to what they do.

The guide includes comment from each of these developers, but one consistent message is that creating sustainable housing developments that pays dividends is not just about creating energy efficient homes. As Chris Tinker, Board Director and Regeneration Chairman at Crest Nicholson says, “We have learnt that to create places where people wish to live, and to add value for the new community, our shareholders and wider society alike, we should invest in the public realm and the natural environment from the outset.”

It will come as no surprise that the most popular developments are frequently the greenest, leafiest ones, with mature trees and well-designed streets. Moreover, leading developers obviously use this to differentiate themselves by featuring these images prominently in their marketing materials. But is this message being understood and acted on all the way down the supply chain and all over the country? No it isn't.

That's why we believe this guide is necessary. As the Farrell Review of Architecture and the Built Environment 2014 pointed out: “Landscape architecture and urban design are often the most valued by the public, yet contradictorily the least valued in terms of fees and frequently where the first savings are made on any given project.”

There is a growing evidence base, of which we highlight a number of key statistics and sources in the guide, that suggest this trend could be hurting rather than helping developers' bottom lines. In its ‘The value of placemaking’ report last year, property consultants Savills showed how investment in the public realm can potentially double average values of flats in parts of London. Defra and Natural England's 2013 report ‘Green infrastructure's contribution to economic growth’ suggests developers already know this, with many of them prepared to pay at least 3% more for land in close proximity to open space, and some putting that premium as high as 15-20%.

But that's if you get to build. The fact is that the public don't like housing developments that detract from, rather than add to, their neighbourhoods. A recent Local Government Association survey found that 61% of councillors in England and Wales said that public opposition is the most significant barrier to housing development. That same survey also provided the solution: asked what would make it more acceptable to the public, 81% of councillors said benefits for the community, such as schools, health services and green spaces.

It is worth mentioning some of the case studies from the guide to illustrate this point. Accordia housing scheme in Cambridge master-planned by landscape architects Grant Associates and architects FCBS incorporates more than three times the amount of green space of other housing developments in the area. Each home was designed to overlook one of these green spaces and each space is linked to the next via a network of footpaths and cycleways, pedestrian-friendly streets and subtle traffic-calming measures that create a safe, 20mph zone. It is a community landscape – and in 2008 it became the first residential scheme to win the RIBA Stirling Prize.



Accordia, Cambridge, Brooklands Avenue, a forest Garden, Grant Associates

Or how about Trumpington Meadows? Landscape architects Terence O'Rourke reconfigured the existing plans for this site to deliver almost twice as many homes as had been previously planned while improving the urban edge and green infrastructure framework. And because the developer was prepared to invest early in a country park, this has ensured that the species-rich meadow, native hedgerow planting, wetland areas and large parkland trees that have been established are likely to increase the value of adjacent housing parcels when they go on the market. Savills currently estimates an average increase of 10% has been achieved.

Existing residents in cities, towns and villages need to believe that new housing will enhance, not diminish, their quality of life and the value of their homes. Meaningful landscapes can increase property prices,



Image: © Robert Taylor

Noel Farrer
President, Landscape Institute, and
Director, Farrer Huxley Associates

but they also add capital and community value by creating socially dynamic spaces. And more often than not, this is the difference between those that endure and those that have to be knocked down and started again.

Profitable places: Why housebuilders invest in landscape is available to download at:

<http://www.landscapeinstitute.org/policy/Housing.php>

Profitable Places will be complemented by a guide on housing and landscape for local authority planners and planning committee members.

**Landscape
 Institute**
 Inspiring great places

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A New Model for Affordable Housing



How has a collaborative student-designed project become one of the first of its kind designed to some of the world's most stringent design codes? Stacey Temprell, New Build Sector Director for Saint-Gobain, tells us how the world leader in sustainable habitat paired up with The University of Nottingham on the project.

Stacey Temprell
Residential Sector Director

"The project is the result of an extraordinary journey that provides an exemplar 'zero carbon' solution that is a viable, repeatable family home suitable for the UK housing market of the future."



The University of
Nottingham

UNITED KINGDOM • CHINA • MALAYSIA

Nottingham H.O.U.S.E (Home Optimising the Use of Solar Energy) is a full-scale, fully functioning family home that complies with the future Fabric Energy Efficiency Standard (FEES), likely to be the requirement for the 2016 Zero Carbon Homes performance requirement.

The house has been designed to perform at a very low level of energy usage by optimizing both the building's fabric and services to meet the Zero Carbon Hub's FEES and the Government's agenda for reduction of impacts on climate change and fuel poverty.

FEES is the proposed maximum space heating and cooling energy demand for zero carbon homes.

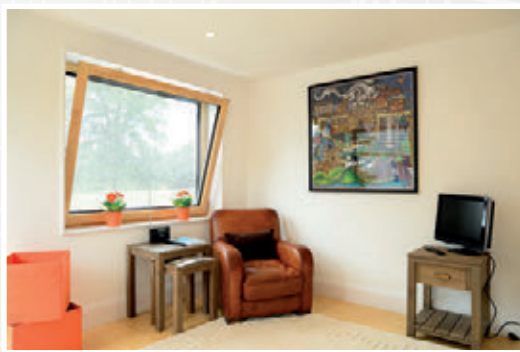
This is the amount of energy which would normally be needed to maintain comfortable internal temperatures. In a dwelling, this can be influenced by a number of factors, including building fabric U-values, thermal bridging, air permeability, thermal mass, external heat gain (solar) and internal heat gains such as metabolic activity or as a by-product of services.

FEES should ensure that a good minimum standard of building fabric (the longest-lasting part of a home) will be embedded in all new homes. It is measured in kWh/m²/year and is therefore not affected by carbon emission factors for different fuel types. For the majority of homes, levels of 39 and 46kWh/m²/year are proposed. Nottingham H.O.U.S.E achieves 36kWh/m²/year on the fabric alone, exceeding fabric standards required under FEES for even an apartment block. With an EPC rating of B, this represents a 46% reduction in CO₂ emissions compared with Part L 2010 Building Regulation requirements.

Saint-Gobain contributed a range of products and systems selected for their appeal of minimizing total energy consumptions and maintaining an inexpensive structural scheme, as well as assisting the students with the specification of the house and providing technical support.

Find out more about the Nottingham H.O.U.S.E project by visiting:

<http://www.saint-gobain.co.uk/university-students-zero-carbon-house.aspx>



Local links for the statutory Register of Architects

ARB's Interim Registrar and Chief Executive, Karen Holmes, explains how they are working with local authorities to raise awareness of the statutory Register of Architects...

The Architects Registration Board (ARB) is the UK's statutory regulator of architects; its responsibilities are set out under the 1997 Architects Act. It is an independent public interest body and its work in regulating architects ensures that good standards within the profession are consistently maintained for the benefit of the public and professionals alike. ARB's responsibilities cover the following areas:

- Keeping the UK Register of Architects;
- Prescribing, or 'recognising' qualifications needed to become an architect;
- Ensuring that architects meet our standards for conduct and practice;
- Investigating complaints about an architect's conduct or competence;
- Making sure that only people on the Register offer their services as an architect; and
- Acting as the UK's Competent Authority for architects.

How can we work together?

ARB is currently working with a number of stakeholders to raise awareness that architects are regulated. 'Architect' is a protected title under UK law and for an individual to call themselves an architect, they must be registered with ARB. Architects have to undertake recognised qualifications to ensure they meet the criteria to be registered. The message for consumers is – individuals who say that they provide architectural



services or architectural consultancy may not be registered and may therefore not have the same level of skills and experience. The quickest and easiest thing to do is check the register of architects – www.architects-register.org.uk .

Local authorities are becoming increasingly important partners in our work to raise awareness of the Register. Councils are committed to supporting their residents, and by working with us to raise awareness of the Register, local authorities can assist in facilitating the public in making an informed choice. A recent project has seen a number of local planning offices adding links to the Register on their websites. This project has proved particularly successful, generating 3500 hits to ARB's website.

Brent Council and Peterborough City Council have both designed these links especially well:

<http://www.brent.gov.uk/services-for-residents/planning-and-building-control/>

http://www.peterborough.gov.uk/planning_and_building/planning_permission/apply_for_planning_permission/choosing_a_construction_profes.aspx

If you would like to add the ARB link to your website, please feel free to get in touch:
<http://www.arb.org.uk/contact-us>

How does ARB support the consumer?

Those of you working in planning and building control are on occasion asked by consumers for information about how to locate trusted service providers. We recognise that many local authorities have policies not to recommend individual traders. In cases where members of the public are looking for an architect, these enquiries can be referred to ARB. ARB maintains the statutory Register of Architects, which is a public Register. Members of the public can use the online Register to check whether someone is registered, or search for an architect in their area. Similarly, if local authorities become aware that someone is using the title ‘architect’ when they are not on the Register, ARBs Professional Standards team can investigate and take the appropriate steps.

The online Register can be viewed at the following link www.architects-register.org.uk

What are the benefits of using an architect from ARB’s Register?

For a member of the public, there are three principle benefits of using an architect from ARB’s Register:

- **Education and training** – Architects must undertake recognised qualifications, covering all building stages from conception to completion;
- **Professional indemnity insurance** – Practising architects are expected to hold adequate and appropriate insurance to cover any claims against them;
- **Professional conduct and competence** – Architects are required to act in accordance with the Architects Code which sets out standards of professional conduct and practice. The ARB



Karen Holmes, Interim Registrar and Chief Executive

provides a mechanism for dealing with allegations of unacceptable professional conduct and serious professional incompetence against architects.

We are very keen to support those working in the planning and construction sectors, and are delighted that PBC Today are taking this proactive step to inform their readers about the role of the Architects Registration Board and how we can help. ■



.....
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The Energy Centre at Kings Yard on the Olympic site is a District Energy scheme



The district energy renaissance

As the uptake of district energy rises, more urban areas can future-proof their energy systems. However, challenges do remain as explained by Simon Woodward, Chairman at The UK District Energy Association...

District Energy is in renaissance, if you recall the many dozens of networks that used to exist in the 1960's/70's, or if you do not remember those old schemes you will see it as a new solution which is currently bursting onto the UK heating and cooling market as the golden bullet to solve low carbon heat supplies in dense urban areas. Either way, it is a method of delivering low carbon energy which is clearly seeing a considerable increase in uptake in the last two to three years.

However, there are still barriers to implementation which include high initial capital costs, lack of understanding of how to design networks, apart from a few specialists, and almost no fiscal support for the implementation phase.

Fortunately, the situation is changing. As the uptake of district energy (district heating and/or cooling) rises, the market expects installation prices to fall as new entrants move into the industry and increase competition.

There are steps being taken to introduce codes of practice and training and considerable attention is now being drawn to the issue of secondary network losses in new build residential developments. This is particularly a problem where a lack of thought has been put into the design of the heating network from the point it enters the apartment block, up to each dwelling. With unit dwelling annual heating and hot water consumptions in the region of 4,000 kWh or less, the amount of energy lost in transmission of



A relatively simple installation of district heating network in the highway. The pipes have been laid in place and are yet to be jointed

that heat to the dwelling is becoming proportionally higher and a major issue. Consultants are solving this by ventilating risers and even in some cases I have heard of air conditioning being added to overcome the overheating problems resulting from these heat gains. However, in reality sensible network design including routing, levels of insulation and operating temperatures can do much to reduce these losses to acceptable levels, removing these rather cumbersome engineering solutions to a problem which should not exist.

What is certainly true is that once an urban area has a district energy network, it has essentially future proofed its energy system. When the initial source has reached the end of its useful life, e.g. gas fired CHP, then other energy systems such as localised energy from waste, waste heat recovery or other LZC emerging technologies can then be bolted into

this network to effect an “energy generation heart transplant”.

However, the industry still needs support to deliver this expected level of growth. Detailed analysis of every urban area in the UK carried out by the UK District Energy Association demonstrated that it would be realistic to take the percentage of homes connected to a network from 2% to 14% by 2050. This analysis however assumes the implementation of a low carbon heat network incentive sitting alongside the RHI. The government is currently considering a RHI Network Uplift – which is fantastic news – but as many schemes currently being delivered are using gas fired CHP as their initial source, this will not apply, requiring further work.

There has been an impressive number of over 80 local authorities taking up DECC’s Heat Network Delivery Unit (HNDU) funding, to explore the feasibility of a network in their area. However, as the former Head of the HNDU commented at the 2014 UKDEA AGM, the success of the HNDU will not truly be judged by the feasibility funding it has awarded, but by the pipes which are being installed as a result of that funding in four years’ time.

Coupling this HNDU funding with the GLA’s push for heat networks in all new developments across London means that it is clear that the district energy landscape will be very different in 2018 from where it is today, the question is just how different. ■



.....
Simon Woodward
Chairman

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www.twitter.com/TheUKDEA



A Sustainable Future Begins With Retrofit

It is estimated that 22 million houses in the UK need to be thermally upgraded in order to achieve a worthwhile level of energy saving, with 8.5 million homes over 60 years old and considered hard to treat. But how are we tackling this and how has the past 12 months shaped up to meeting the UK's long-term targets? Mark Weaver, Project Director for Retrofit for Saint-Gobain in the UK, explains the importance of retrofitting to reduce the energy consumption of the UK's older, inefficient housing stock.

It is recognised that the UK has probably the oldest and least energy efficient housing stock in the western world. Residents in such properties feel the effects of this in the form of high energy bills, leading to unacceptable levels of fuel poverty. In order to meet the UK's 2050 CO₂ commitments, the existing housing stock needs to be a high priority amongst Government policies.

Upgrading the thermal performance of the building envelope will reduce the

energy required to maintain a comfortable environment. Insulation solutions and low emissive glazing are solutions at the core of Saint-Gobain's construction products sector. They can tackle all house types and elements of the building – walls, floors, roofs, windows and doors. Individually, treating these areas of the house can offer significant energy and savings on bills.

However, as demonstrated by Saint-Gobain's unique Energy House

project, carried out in conjunction with leading academics from Leeds Metropolitan University, the University of Salford and Saint-Gobain Recherche, taking a whole-house fabric first approach to retrofitting a house can prove hugely beneficial for thermal improvement, air tightness and comfort for the habitants of the building.

During the three-month project, we identified that, with the installation of multiple measures, energy savings of up to

63% can be easily achieved, especially on poor performing properties, with a 50% reduction in unwanted air leakage.

Representing 21% of the UK's hard-to-treat housing stock, the Energy House is a full-scale typical 1919 end-of-terrace house. Built in an environmentally controlled chamber, tests can be accurately monitored, varied and repeated while maintaining exactly the same conditions – something that most whole-house testing cannot achieve when done outdoors.

There has, and continues to be, much publicity about energy efficiency in the domestic retrofit sector in both the industry and national press. Much of it started late last year with the political debate around so-called 'green levies'. This ultimately led to significant changes and the dilution of the original Energy Company Obligation (ECO), and, most recently, the sudden closure of the Green Deal Home Improvement Fund (GDHIF). The GDHIF initiative offered up to £7,600

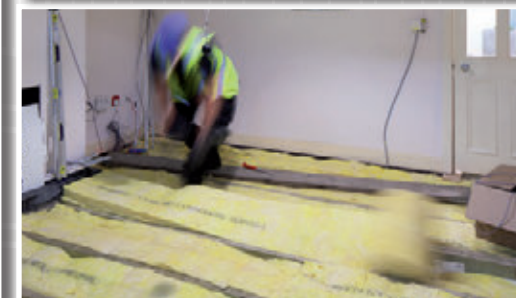
for home improvements such as solid wall insulation, cavity and loft insulation and heating measures. This series of events has resulted in an increased number of energy efficiency schemes being operated, but industry is reporting that fewer installations are actually being carried out.

I'm confident that things will improve, but 2014 is unfortunately shaping up to be a year of missed opportunities for the market. Perhaps this illustrates the need for more structural fiscal incentives such as discounts from council tax rates for homeowners installing energy efficiency products in their homes. Saint-Gobain is supportive of such measures to create sustainable growth in this sector.

However, we need to look to the positive elements and celebrate the retrofit projects that are happening across the country, many of which Saint-Gobain businesses such as Weber, Isover and Celotex are supplying to. These include social housing projects still funded by

the smaller and newly defined ECO, the Green Homes initiative in Scotland, where interest has been high, the 24 Green Deal Communities schemes for street-wide solid wall insulation and the one-off homeowner retrofits through the first wave of GDHIF vouchers. We are beginning to see genuine 'blending' of finance streams to deliver affordable retrofit for public and private properties – exactly how the Green Deal structure was envisaged. These are encouraging examples; we'd like to see the volumes reach a healthy level for industry investment, alongside a consistent policy framework for greater industry confidence.

In the meantime, Saint-Gobain will continue to develop retrofit solutions to meet the needs of the existing housing stock, and train and educate installers and contractors through the nationwide network of Saint-Gobain Technical Academies, leading the industry in providing a competent workforce to tackle the significant retrofit challenge.



Mindful BIM collaboration

Collaboration is a key element in the successful execution of a BIM project and can help to share information across teams. David Philp, Head of BIM at Mace and the UK BIM Task Group details how BIM can aid collaboration...

Building Information Modelling (BIM) is purported to aid collaborative working. Every conference or symposium marries these two themes together without really unpacking what this relationship looks like. Like BIM, collaboration has different meanings depending on your perspective and what lens you are looking through, indeed the Collins Dictionary defines collaboration as either:

1. The act of working with another or others on a joint project;
2. Something created by working jointly with another or others;
3. The act of cooperating as a traitor.

Most would say that one and two are the most commonly related meanings in the context of our industry, though some I am sure would recognize the third definition as a reality on some projects.

Hopefully we all identify collaboration as a key element in the successful delivery and execution of a project programme and as a lever to help break down silos and successfully share information across teams. The reality, as the author Morten Hansen points out is that “bad collaboration is worse than no collaboration” and that “the goal of collaboration is not collaboration itself, but results.” So how can BIM really help us collaborate and deliver better outcomes?

In this author’s opinion, the main pedal to ensure successful collaboration in a BIM environment is a clear ‘purpose’. High-performing teams are driven by a well-defined purpose (do not confuse this with a

vision statement) and if BIM (Level 2) is good at anything it is; a) lots of new acronyms, but also b) defining clear information requirements at all stages of the asset life-cycle.

Level 2 maturity begins with clearly defining the purposes of the model(s) and their uses. These are referred to as the organisational and asset information requirements and are articulated to the supply chain through an Employer’s Information Requirement (EIR).

Defined information requirements, defined processes (PAS1192-2 and 3) for information delivery and agreed data exchange standards (BS1192-4 COBie) create a strong foundation for collaboration, and when properly worked through with the entire project team, help create unifying goals. The wise client would also do well to additionally invest in BS 11000 Collaborative Business Relationships which defines roles and responsibilities and supports collaborative decision-making.

Level 2 BIM also ensures that collaboration extends beyond delivery, with the requirement for ‘Soft landings’ and the requisite for an operational champion to be involved throughout the plan of work for that project – starting with the end in mind and using the model as a basis to visualise and test the lifecycle solution at pre-construction stage. This is a great win in an industry where there is normally a large chasm between the delivery and operational lifecycles.

BIM is data rich in the context of both geometric and alphanumeric data which can be visualized in a 3D, or indeed an immersive environment. In terms of low hanging fruit, BIM allows all stakeholders in a project



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Head of BIM at Mace and
Head of UK BIM Task Group**

to clearly understand and explore the project life-cycle – often now assisted by ‘gamification’ methods and augmented reality (AR) techniques. It is essential however that organisations avoid ‘lonely BIM’, where one solitary party sits staring at their exquisite model. Models need to be shared and used as a backdrop for decision making; if you like the modern virtual day camp fire but without marshmallows and bad singing. Projects using BIM should always consider as part of their strategy the creation of physical spaces where collaboration workshops can be undertaken, models reviewed and decisions made with screens such as short throw projectors. These are often referred to as ‘big rooms’ or Computer Assisted Virtual Environments (CAVEs).

It is also critical that rigor be given to managing information flow between the project stakeholders within the context of a common data environment (CDE) as set out in BS 1192:2007. In addition, the collaborative production of architectural, engineering and construction information Code of Practice, which establishes the outline methodologies for setting up the BIM project cannot be ignored. To exploit collaborative working processes, a common methodology for managing the data produced by, and between all parties, must be used. This should include the naming of data as well as a process for exchanging data. This common data environment is a key component of both level 1 and 2 BIM maturity.

Forms of procurement should also be considered as a lever to encourage collaboration. The Government Construction Strategy trialled the use of procurement routes which sought early contractor engagement. The value of this timely appointment should not be underestimated, however, it is essential that this

same strategy be considered in the early engagement of specialist contractors and manufacturers who are key to a joined up data hierarchy. This is as much a cultural change as it is a process change.

Open data standards which allow the transportation of information and support interoperability are also really important to the collaborative investment we need to ensure that everyone can play on a level field, especially SMEs. This is why the development of COBie and IFC are crucial to ensuring the uptake of BIM across the construction community.

We must also consider the danger of information overload in a collaborative network; it is therefore essential that the right amount of information, to the right level of maturity, at the right time, is established. It is crucial therefore that a well thought out Master Information Delivery Plan (MIDP) is established through a collaborative process before the information exchange process begins.

What we must always remember is that construction is a human endeavour and technology is there to support collaboration and not replace it. Indeed, the biggest danger is that we get bogged down in a technical discussion when BIM is a behavioural change programme more than anything else. ■

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Lloyd's Register

BIM accreditation Scheme

Lloyd's Register (LR) is a global risk management and safety assurance organisation with over 9,000 employees operating in over 120 countries.

LR is historically known for classifying ships and indeed it still classifies approximately 20% of the world fleet. It is less well known for its certification of other safety critical assets, such as offshore oil rigs and platforms, as well as the UK nuclear programme certifications of Chapel Cross and Calder Hall in the 1950s, and the current build programme at Hinkley 'C'. More recently it has successfully facilitated deregulation within the utilities sector; by working with the respective regulators to develop an accreditation scheme, standards within the utilities contracting sector have been significantly raised. Within the asset management sector LR partly sponsored and project-managed the development of the PAS 55 standard, which has a feed in to Building Information Modelling (BIM). LR has globally certified more organisations against the PAS 55 standard than any other body.

Within the construction sector LR has worked over a number of years with its partners Buildoffsite, Building Life Plans (BLP) and The Royal Institute of Chartered Surveyors (RICS) in conjunction with the Council of Mortgage Lenders to facilitate the greater use of energy-efficient systems within the UK property market. To that end LR has developed the process accreditation element of the Buildoffsite Property Assurance Scheme (BOPAS), a scheme developed to address the perceived risks

associated with offsite construction stakeholders. Building Information Modelling is aligned to the application of offsite construction systems and therefore the development of a BIM accreditation scheme was a natural extension of LR's involvement within the sector. Furthermore our track record of successful accreditation schemes enabled us to introduce business best practices from other sectors into our evaluation process. This added rigour supplements the BIM assessment criteria defined in BS 1192:2007, PAS 1192-2 and PAS 91.

We carefully chose the organisation with which we piloted the BIM accreditation process because it would serve as a test bed and learning process for both parties involved. With its extensive experience of national and international BIM projects, AEC3 UK Ltd served as the ideal organisation with which to perform the pilot. Furthermore the Director, Nicholas Nisbet, is a recognised authority in his field, having been involved with the development and implementation of BIM since 1977, during which time he has contributed to the UK construction strategy and the industry response, and served as co-author of COBie, BS 1192:2007, and the BS 8541 series on construction product data.

The assessment of AEC3 UK Ltd culminated in the accreditation of their BIM Business Systems for the following scopes of work:

- BIM Object Provider/Originator
- BIM Project collaboration software Systems Service Provider



The presentation of the Lloyd's Register BIM Accreditation Certificate by Terry Mundy, Business Development Manager, Lloyd's Register EMEA, to Nicholas Nisbet, Director of AEC3, at the BSI BIM Conference in London

Nick said of the accreditation process:

“We are delighted to be the first company to gain LR accreditation in BIM, both for AEC3 and for our customers who benefit from competently developed, efficient, repeatable and checkable project and product information.”

“Everyone from manufacturers through to clients need to move away from informal and error-prone craft methods. Accreditation shows AEC3 is leading the way”.



Lloyd's Register is progressing a number of BIM accreditation assessments and for information on the scheme please access our website page via the link below:

<http://www.lloydsregister.co.uk/schemes/building-information-modelling/>

Or contact:

Terry Mundy
Business Development Manager
Tel: 07712 787 851
Email: terry.mundy@lr.org

BIM – where will the product information come from?

The potential impact of BIM on all stages of construction is undeniable. Expectations on the part of clients and other stakeholders are great and growing all the time as experience accumulates and as case studies based on successful projects emerge.

Part of the reason for this is that BIM can best be seen as belonging to a suite of related technologies and new ways of working – such as off-site manufacturing, smart buildings, data management, higher performing buildings – which collectively have been called digital engineering. The impact on how the built environment is designed, constructed, maintained, operated and dismantled or rebuilt will be profound.

Such statements are becoming commonplace and almost taken for granted. Indeed, to illustrate this, the Construction 2025 strategy launched last year is to a large extent formed around the idea that properly implemented, digital engineering will be capable of supporting the industry's need and desire for transformation, to perform at an altogether higher level (33% lower cost, 50% faster delivery, 50% lower impact).

It is becoming clear that as an industry either we already have the necessary tools, or that tools will be developed in the foreseeable future. BIM itself will continue to evolve and we can expect the flow of innovation to continue, but it is also clear that we face a step

Products manufacturers, like Saint-Gobain, carry out extensive testing on their products, both in laboratory conditions and on-site. With access to all this test data, who is best placed to provide high quality BIM datasets?

change, or a discontinuity, initially as more of the industry gets on the first rungs of the ladder of this new way of working. It is easy to see BIM level 2, namely forming and using the digital libraries of core information, as representing these first steps. Having addressed level 2 we will need to embrace BIM level 3 and all that that might bring with it, which many observers are expecting to enable the real transformation of the industry which is ultimately sought.

However good and efficient the software tools are, it is easy to overlook the other elements which need to be in place to make the whole design and build process work to actually deliver the quality and benefits expected by stakeholders, supply chain and clients. Some of these elements, such as collaborative working and sharing of information, are touched on in the other articles in this supplement. One specific area, of interest to manufacturers and suppliers like Saint-Gobain, is to do with the data, especially that to do with products, materials and assemblies, which form one aspect of the information input into the building or construction model.

A moment's reflection enables one to realise that the library of product information being used by the BIM design tool needs to be appropriate, accurate and up to date, or errors will be hidden only to emerge at a later date in say the build or assembly process, or during operation, which will potentially be very costly to resolve.

As the use of BIM progresses from level 2 to level 3 it is clear that the depth and range of product information required by the designer will continually grow – from dimensional data, to include performance (thermal, structural properties, acoustics, embodied carbon, recyclability etc). Since BIM is not just about working in a different way but it also includes the idea that ultimately the client expects it to contribute to higher performance at a lower cost, then competitive commercial pressures will be brought to bear and will help to shape how

BIM is used. To win work the designer will need to have confidence that the optimum design is being offered, in all senses, and that this design can be delivered in reality. This means that the task is not just about the elimination of errors and uncertainty in the raw data, but that the right products are being used and those products have the precise properties (and associated data) sought and assumed by the designer in assembling the solution to be offered to the client. As additional dimensions of data start to be integrated into the BIM model this challenge will only grow.

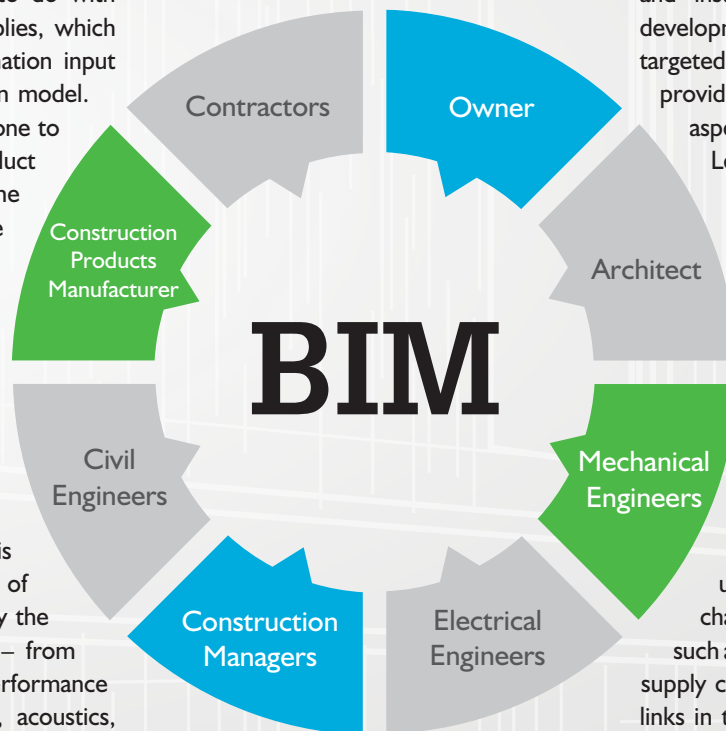
One solution offered is to use a library of generic product data – using average or typical data taken from across the market of a number of different versions of similar products (insulation, glass, wall linings, structural components, cladding etc). At first sight this solution may appear to offer a way through: a third party takes on the task of collating, interpreting and analysing the

data to form a set of typical numbers which the BIM model can then simply connect with and extract. But what are the disadvantages and is there a better way?

In any industry, manufacturers will vie with each other to develop and bring to market more competitive products and solutions. Construction is no exception. In the information-rich age of BIM, an integral part of this improvement process is the dataset associated with each product which will enable competent modelling and design optimisation. The use of generic or average data, of ill-defined ownership, would increase the risk of inaccurate data as well as resulting, in all probability, a sub-optimal design with the consequent risk of it also being less competitive commercially than one resulting from the use of better quality data relating to the actual physical solution being proposed.

Where does this higher quality, more useful, data come from? Manufacturers are in the best position to be able to offer this: they own the raw data for their particular product portfolio; they understand how to use their products in terms of design and installation; they invest in product development to bring to market solutions targeted to address specific needs; they provide technical support services on all aspects of their product or solution. Leading manufacturers, such as Saint-Gobain, are developing the delivery of this information in an on-line format for BIM so that the data is 'live'.

In the digital engineering age – where a building is built twice, once virtually in the BIM model and once on the construction site – product characteristics need to be captured in the form of electronic datasets which can be utilised and relied on by the supply chain. If a product feature is not in such a format its value is reduced. For the supply chain as a whole, and for individual links in the chain, to operate at maximum effectiveness and competitiveness the best quality data, namely the latest live data from the manufacturer, should be used. As digital engineering evolves, and demand for richer information grows, it will become even more critical to use manufacturers' live data.



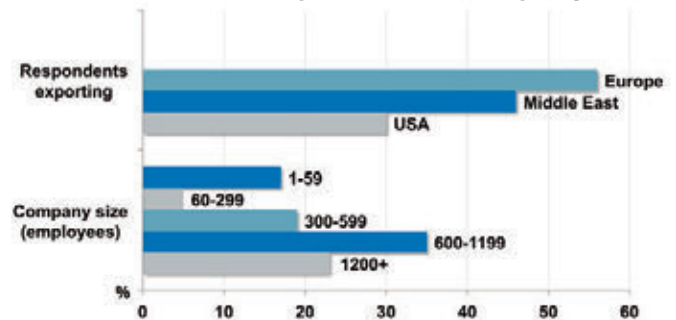
Manufacturing for BIM

Addressing the challenges faced by manufacturers in the BIM process requires that digital product information can be exchanged with supply chain partners. Steve Thompson, Chair of BIM4M2 discusses the support and advice available...

Even before the UK Government announced its intention to require collaborative 3D BIM on its projects by 2016, the construction industry had been busy readying itself for the change to a digital world. Whilst it is clear that the creation, exchange and use of product data is crucial to the BIM process, a common understanding of the type of information that product manufacturers should provide to support BIM has been missing. In March of this year BIM4M2 was formed, with the purpose to support product manufacturers through the transition to a BIM-ready industry, and to provide a forum to share their knowledge.

For me, one of the most exciting aspects of BIM is the willingness of organisations and individuals across the industry to collaborate and work together to address the challenge. Manufacturers have been using digital information and processes for over half a century, but exchanging digital information with supply chain partners is a very different proposition, and one that the sector is eager to tackle. From the preliminary results of the survey of manufacturers that our Promotions Working Group are undertaking, 93% of those responding said they plan to invest in the process (41% already have, and 52% will have by 2016). So, for many the question is less about whether to develop their BIM capabilities, but more about how, in what format and on which platforms? This is where the real challenges lie for the manufacturer, and the answers can be different for every organisation depending on their product types, supply chain routes, markets, regions and scale. However, the basic principles remain the same, to provide structured digital product information that can be exchanged with supply chain partners.

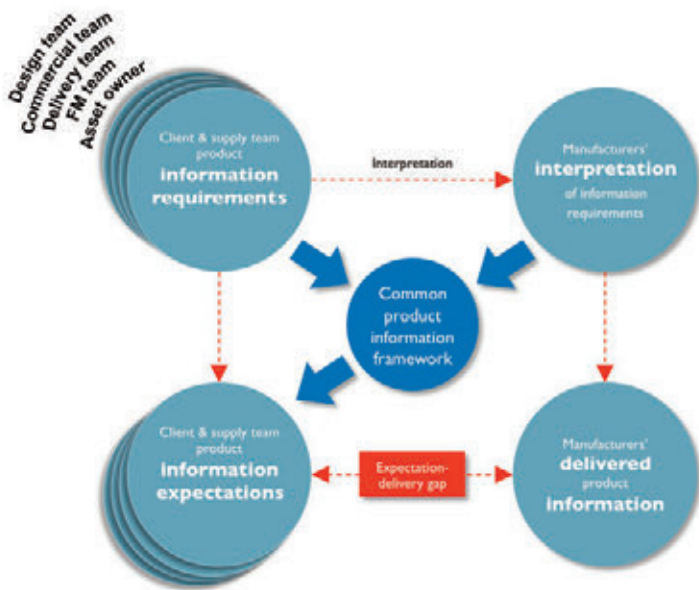
Mix of manufacturer organisation size responding to the BIM4M2 survey, and where they export to



Adding to the complexity is the different information requirements of members of the client and supply chain team on any given project. To find a way through the complexity, we need to work together as an industry and develop an agreed way of describing products and their attributes, both for the UK and internationally. Certainly BS1192:4 (COBie) forms part of the solution as the mandated exchange format for Level 2 in the UK, and the broader Industry Foundation Classes (IFC) are also crucial; but these need to be supported by further definition of what information supply chain partners need and how this can be presented consistently by product suppliers. I'll illustrate this using a customer satisfaction approach.

As we know, on any construction project the client has a set of requirements that need to be met through the delivery of the project, and to support their delivery is a set of information requirements. In the BIM process these are the Employer's Information Requirements (EIR). Added to this, members of the supply chain also need information to deliver the project effectively, and to share with others. In the BIM process these are described in the BIM Execution Plan (BEP).

The expectation-delivery gap



Steve Thompson RIBA, Chair BIM4M2

Without close engagement and accurate definition of what information is required and the level of granularity (element, system, product), there is real potential for a gap between the supply team’s expectations on what information a manufacturer provides and what will be delivered: the expectation-delivery gap. With a common framework for product information, supply teams will know what to expect, manufacturers will know what to provide as a minimum, and the gap between expectation and delivery is reduced.

With the development of COBie, the Digital Plan of Work and BS 8541 parts 1-6 in the UK, the gap will certainly begin to close where they are applied. To reduce the gap further the BIM4M2 Data Templates Working Group are working closely with other BIM4 Community groups, clients, professional institutes, trade associations and content providers to develop and refine product data templates to enable suppliers to provide information in a consistent format. There should, and will always be the potential to go further, but the templates will look to set the baseline to support the requirements of a Level 2 BIM maturity.

For those supplying products internationally, a common concern is that in developing structured information or objects for the UK, they will need to create different information for use in every region they operate in. The good news is that with the development of an ISO standard for the BIM process,

there is the potential to reduce the differences that exist, and by structuring our information in a common digital format, it makes exchange of information across regions much more straightforward.

Furthermore, the BIM4M2 Education Working Group is developing guidance for product manufacturers on the implications of BIM, and how to develop and deliver a BIM strategy that is fit for their business.

If you would like further information on the group, or to get involved please contact us through our website or on the details provided. ■



Steve Thompson RIBA
Chair

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Ensuring accurate data for BIM projects

The use of BIM is increasing rapidly across the construction sector. By 2016 it will be compulsory for fully collaborative BIM processes to be used on all government projects greater than £5 million in value. The wider industry is adopting BIM as a way to more accurately predict and ensure performance throughout the life of the building; from initial design to operation and even deconstruction. It is suggested that by 2016 over half of UK projects will use the method¹. In order to get the best out of BIM, accuracy of product and system objects is essential.

BIM can decrease waste, increase the efficiency of building operation and assist collaborative working throughout the design and construction process. The large amount of information which is compiled at the beginning of the project makes the management of the building easier after handover and improves the ability to recycle efficiently at the demolition/refurbishment stage.

Critical to the realisation of the benefits BIM can bring to the construction industry is the use of BIM objects that are current and updated in real time. To support this, British Gypsum launched the White Book System Selector in January this year, which is an online tool designed to help streamline the specification process for construction professionals. It allows specifiers to search and filter through tested British Gypsum plaster, drylining and ceiling system solutions to select the right specifications for the job. Building Information Modelling objects



(.rvt), CAD (.dwg) drawings, National Building Specification (NBS) Clauses and product and system datasheets (.pdf) are then available to download for the chosen solutions. This allows specifiers to retrieve important information in a few easy steps. Featuring simple and easy to follow search criteria, familiar to users of the White Book, this tool enables specifiers to filter by a variety of performance requirements, such as fire and acoustics, and be presented with a relevant solution for the job.

The holistic efficiency benefits that the use of BIM can bring to a construction project throughout its entire life can only be realised if accurate data is used, therefore it's vital to include high-quality product information,

and where better to get this than direct from the product manufacturer?

¹ Competitive Advantage, Adoption of BIM 2013



Paul French
Commercial Market Manager
 British Gypsum
www.british-gypsum.com



White Book System Selector

Find system solutions and BIM data quickly

Revit BIM files for all our system solutions can be downloaded from our online **White Book System Selector**. This tool works by using performance filters, such as fire integrity or acoustic insulation to search for the ideal solution to meet your project requirements.

It is vital that information contained within a building model is correct, as it will remain with the construction throughout its life; design, construction, operation and deconstruction. A key element to this approach is accurate system and product data, which is why we produce and validate this ourselves, ensuring a precise and reliable solution.

For more information, visit british-gypsum.com/wbssbim or call our Technical Advice Centre on 0844 800 1991.



NFB BIM survey reveals barriers to adoption remain

The 2014 Contractor Survey from the National Federation of Builders indicates an increase in relation to BIM readiness and use, however a number of barriers still remain which preclude full adoption...

In 2012 the NFB published its report BIM: Ready or not? The report was based on an industry wide survey which set out to assess the readiness of the contracting sector with a particular focus on SMEs. At the time, the survey confirmed that the industry had a giant leap to make if it were to achieve the government mandate of BIM level 2 by 2016. Specific barriers to adoption were identified as:

- A lack of information available for companies to make an informed decision about BIM;
- A lack of client of demand;
- A perception of prohibitively high investment costs.

The overall message of the 2012 survey findings indicated that there was a clear gap between the

appetite for BIM in terms of the commercial rationale on the one hand, and the knowledge and skills to take action on the other.

In 2013, the NFB launched a second survey to measure and assess the progress made by the sector. The interim results make comparisons with the findings of the 2012 survey.

Respondents were asked what they perceived the greatest barriers to adoption to be. The results indicated the greatest barriers to be a lack of education and training and an unwillingness of industry to collaborate. These were followed closely by the purchasing of software in not only the cost, but also confusion around compatibility across their supply chain. Client demand was still seen as a barrier, with almost half choosing this option. This was

What do you perceive the greatest barriers to adoption of BIM to be? (You can tick more than one box)	Response
Lack of industry collaboration	58%
Integrity of information	23%
Education and training	68%
Purchasing of software	49%
Forms of contract	18%
Cost	39%
Liability/ risk concerns	17%
Uncertainties regarding ownership of data	30%
Lack of clarification of roles and responsibilities	24%
Lack of expertise / experience	52%
Supply chain	48%
Client demand	44%
Lack of inter-operability between software solutions	28%
Clarity of client requirements	38%

also one of the findings from the first survey which indicates that there is still a lack of client drive towards implementation which may be reflected in the willingness of the industry to adopt BIM. Significantly, regional public procurement is not included in the central government mandate for BIM. The public sector client is very much the driver of BIM at this level but a large proportion of public sector clients simply do not understand BIM and how adoption can be achieved. The NFB's Client Readiness survey, published earlier this year, identified that over 50% of public sector clients thought that BIM should be a core competency, but this lack of understanding provided a barrier to both demand and adoption of BIM within this sector of the industry. The lack of a mandate at this level is resulting in a slow and fragmented uptake and without the demand from clients, contractors can be reluctant to make the financial commitment to training or the development of a strategic approach to BIM.

In order to gauge general understanding of BIM, respondents were asked what they perceive BIM to be, and whether they understand what it means for their projects. Respondents provided answers to more than one option for this question, with 83% of respondents indicating that they understand BIM to be a collaborative process, clearly indicating that

BIM is now perceived to be more than 3D drawings and software amongst contractors.

In the 2012 survey, 43% of respondents stated they did not perceive BIM as a core competence within their business, however in the 2014 survey this increased to 76%.

A large number of contractors indicated in the earlier survey that they were not planning to train their staff or were waiting for BIM to standardise. Over half now stated that they had or would be organising training and a third that staff will be attending free events. This is a positive finding with only the minority waiting for practices to standardise or not train at all, again highlighting that industry are progressing with the adoption of BIM.

The picture generated overall from the NFB's 2014 Contractor Survey indicates that the industry is beginning to see an increase in relation to BIM readiness and use amongst the contracting sector. Many now perceive BIM to be a core competency within their organisation. However, a number of barriers still remain which preclude full adoption of BIM and there is still much work to do if the industry is to meet the 2016 deadline. ■



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 National Federation of Builders (NFB)
 Tel: 0845 057 8160
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www.twitter.com/nfbuilders

BIM – defining better information management

BIM, despite being a small acronym, is a big word in construction. While there has been a lot of hype around BIM over the last few years we see the conversation is starting to shift toward companies asking – what’s really in it for me? However, the discussion needs to further evolve to start looking at how BIM can help define and create better business outcomes.

Models are important but they aren’t the be all and end of the information revolution – it’s the data that’s important, and for many in the industry that will still be shared in familiar 2D products like MS Word or Excel.

BIM allows clients, operators and maintenance teams to have all their data for an asset in one place. It allows for meaningful analysis across a wider selection of business information to be carried out rather than making business decisions based upon anecdotal guesses. By combining disparate data sets together – linked around a model of the asset – it becomes possible to review infrastructure data in a much more powerful way and as a result, manage assets better.

Implementing and using shared data sets with feedback of what actually works – proven by hard evidence – will improve design in the future. However, this shift of how we manage information requires more than just using software, it requires a behavioural change. This is the real change that BIM brings to businesses. It breaks down silos and enables individuals, groups and departments to share information openly and transparently. This

doesn’t mean that all information needs to be shared with everyone all the time – BIM provides the opportunity for relevant information to live in the model and only be accessed when needed.

While BIM has and is continuing to help evolve and change the construction industry the next big step will be harnessing remote sensing and telemetry. Real time feedback on the performance of structures such as bridges and tunnels will allow managers to understand how their assets are actually performing. Automating processes so that out of range figures trigger further analysis or inspections, creates the ability for pre-emptive maintenance to be carried out in a structured way rather than just having reactive or end of life strategies in place.

BIM can mean something different to everyone and that’s not a bad thing. But better data sets make for better decision making and help owners, operators, designers and installers work much more efficiently from a position of knowledge rather than ignorance.

Tekla Structures BIM software

We constantly test and develop Tekla Structures and help you to get started with it.

Models created with Tekla BIM software carry the accurate, reliable and detailed information needed for successful Building Information Modelling and construction execution. Welcome smoother workflow to your company with Tekla Structures and constructable models.

Tekla works with all materials and the most complex structures – you set the limits. Our customers have used Tekla Structures to model stadiums, offshore structures, plants and factories, residential buildings, bridges and skyscrapers.

Help with implementation

Tekla staff and our resellers help with implementation of the software. We work closely with our customers and offer local support, training and consultation.

Open approach to Building Information Modelling

Although Tekla is ready to use, the software is also highly customisable. As Tekla has an open approach to BIM, you can run other providers’ solutions and fabrication machinery and still interface with Tekla. Extending and enhancing Tekla Structures is easy with Tekla Open API, the application interface.

Duncan Reed, Digital Construction Process Manager, Tekla



Duncan Reed

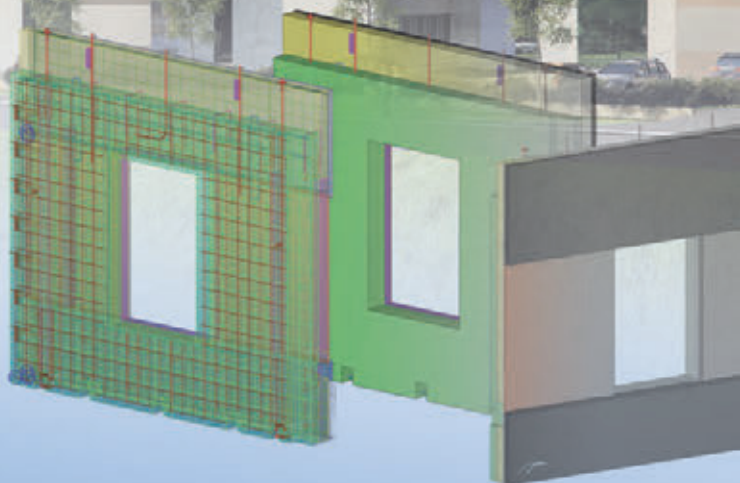
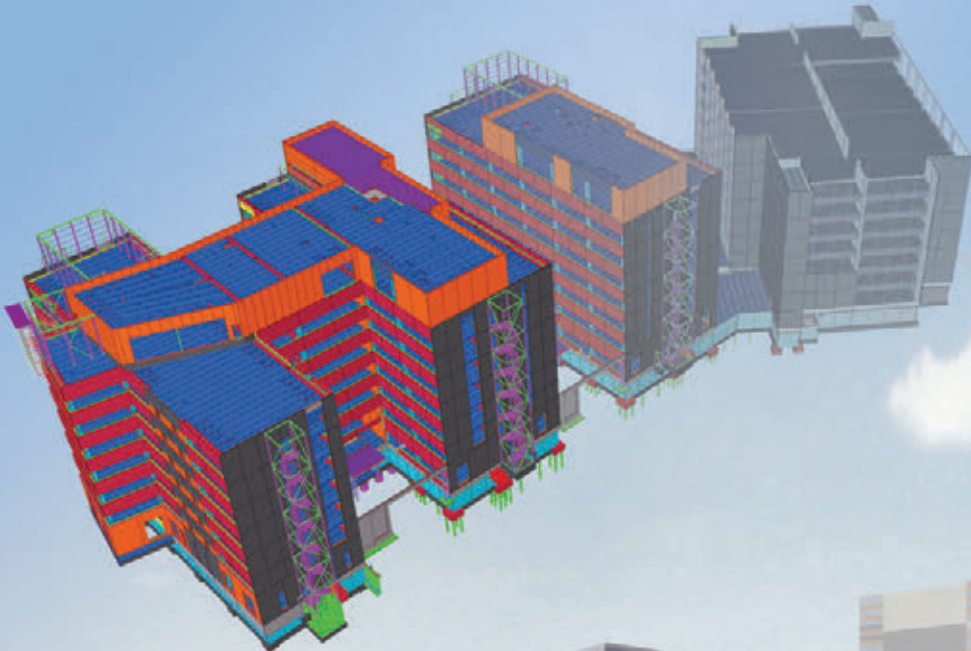
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With the almost daily BIM announcements by clients, contractors and suppliers identifying their increased efficiencies and greater value by adopting BIM, not to mention the Government drive towards adoption by 2016, Tekla recognise that forming a BIM strategy alongside responding to CE Marking and ISO requirements can seem a daunting task.

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COBie in the UK

Nicholas Nisbet, Lead Technical Author of the latest BIM standard developed by BSI, and director of AEC3 UK Ltd, talks about the standard's impact on COBie...

COBie (Construction Operations Building information exchange) is a standard format for sharing facilities information. It is designed to ensure that the client gets all the information needed to own and operate the facility in a reliable form.

Informally one can think of COBie as a well-appointed suitcase that allows us to move information from the project team across to the client team. The sides of our suitcase are transparent: anyone can see what is and what isn't yet included: we see slots for all our essentials and lots of free space for our loose items.

So what are the essentials? It's the project, site and the facility itself, the list of visit-able spaces and locations (forget the cupboards), and a list of the manageable components (forget the reinforcement bars). These spaces are grouped into floors and locations, and into zones such as occupancy and activities. The components are organised by their specification (type) and by their functions (systems). Each of these needs a name, description and classification, and a note of by whom and when they were added.

These can then be supplemented with additional loose items such as attributes, document references, contact details, maintenance instructions, and cost and carbon impacts.

The "COBie for all" working group has run through a series of infrastructure scenarios, from simple stations through detailed track and motorway handover, right up to progressive handover of a whole new line. We have found that COBie can do

the job: in fact COBie helped resolve some of the casual ambiguities that creep into conventional practice. Some specifics such as the use of Linear Referencing Methods turned out to be not so different to building practice, such as the use of grids in large spaces.

But the importance of COBie lies in its efficiency: neither the client nor the designers/contractors need waste time designing suitcases, but instead can focus packing the correct information. If you want a packing list, then the Employers Information Requirements (EIR) and the forthcoming digital Plan of Work (dPoW) will give the detail. But given the base asset register, the content of COBie is driven by real purposes such as using or maintaining, or operating or monitoring, or repurposing the facility.

Like any good suitcase, you don't always have to fill it all at once: COBie has proved invaluable for client briefing and schedules of accommodation. Later it can contain the Room (and Zone) Data Sheets (RDS). As a progress report, COBie can be used to convey to and from the client, the state of his facility. Product manufacturers often offer COBie in preference over proprietary 3D objects, especially if their products are less likely to be modelled or selected in early stages. So although COBie's primary purpose is to deliver handover information, it can offer the whole UK facilities industry a step into a world of containerised information transport.

It is a required deliverable by 2016 in central government projects where information must flow into portfolio, asset planning and facility maintenance tools. Private clients are already seeing the same

value. Applications such as Revit, Xbim, Solibri and AEC3 are offering tools that help the supply side. Suggestions for generating, comparing and checking COBie are openly available (www.bimtaskgroup.org/labs). On the receiving side, UK CAFM tools are now catching up with US applications and offering COBie support.

Is COBie too difficult (like “long-division” as one critic claimed)? Hopefully not for a mature and accurate industry moving into a data-rich era. Our advice is to use a calculator! Is it too simple (“IFC-lite”)? COBie is 100% convertible with IFC and is entirely usable on every computer and smart device, so it is likely to be around for a while yet.

“...although COBie’s primary purpose is to deliver handover information, it can offer the whole UK facilities industry a step into a world of containerised information transport.”

Where can one learn to speak COBie? There are a number of 10-minute movies on YouTube (search “COBie east”). There are lots of free examples on the buildingSMART Alliance and BIM Task Group websites (search “COBie-UK-2012”) and shortly there will be the full British Standard.

In November 2013, a working group of the BSI construction information committee B555 began collaborating on a standard description of the UK use of COBie. The outcome is named “BS 1192-4 – Collaborative production of information – Part 4: Fulfilling employers information exchange requirements using COBie – Code of practice” with the draft for public comment completed at the end of July, when the group reconvened to assess the feedback and make any final adjustments.

Anyone familiar with the earlier “COBie-UK-2012”, and the training material available on YouTube will recognise the core content. It takes a holistic view of

the built environment, suggesting how facilities including infrastructure, environmental areas and buildings can use the COBie 2.4 schema. It addresses both new-build and refurbishment and so complements both PAS 1192 part 2 and PAS 1192 part 3. The standard offers a clear ‘lean’ approach to delivering information: first identifying the purposes for which the information is needed, then following through with the implications in terms of which objects, and which attributes. It expects the employer’s information requirements (EIR) to at least specify these purposes and allows for the nomination of a detailed digital Plan of Work (dPoW) which should become the acid test for completeness.

At the heart of the UK Government Construction strategy is substantial improvements in the efficiency of the industry. Comparability is at the heart and COBie offers a formal way of transmitting the costs and carbon effects (along with other environmental measures) for the whole facility and for the individual functional systems and occupancy zones. This moves asset data into the heart of strategic asset management and decision making. ■



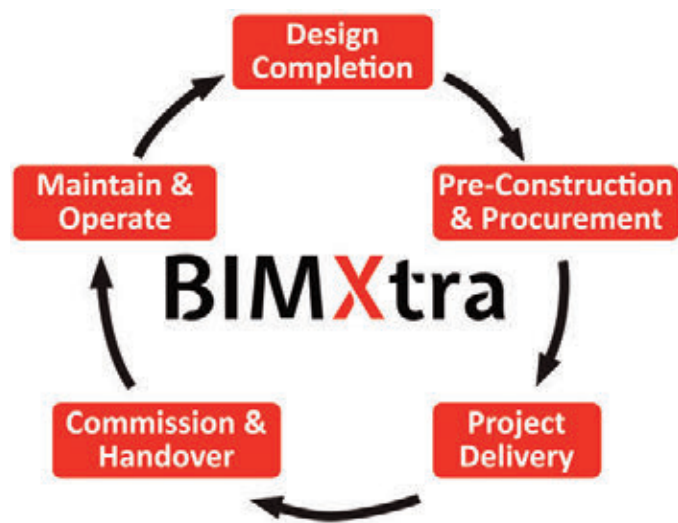
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Bringing the simplicity and opportunity of BIM to all

BIM means lots of things to many people and risks being one of the most misused words in construction, however BIM represents the enabler to a transformation that is engulfing not only the UK but also the global design, engineering & construction market; and why, because BIM enables us to work together more easily, in a modern digital environment. Using BIM we are encouraged to share information bringing efficiency and visibility, to ultimately, reduce the risk and cost of our projects. In addition we influence and improve the ongoing operation of our assets, delivering a better more intelligent output for our clients and in doing so providing them with more value in their portfolio of assets.

BIM enables people to interact with their projects in a visual environment, but is increasingly focussing on “the I in BIM”, the INFORMATION, which is held within the modelled objects as data. With modern BIM tools, information previously held in separate and disconnected documents, can be created and held within the modelled objects as the central repository for core project information.

Like the automotive industry before us, the efficiency and simplicity of a managed information process contributed to the renewed success of manufacturing. The effect has been that we buy more cars, appreciate the fact that they are more reliable, last longer and cost less to use and maintain – vehicle manufacturing is in new health.



The expectation is the same for the construction industry, allowing us to define and communicate our requirements better, iron out issues before arrival on site, remove unnecessary waste in the process and provide, for the Client, a better service and an intelligent model that can help better manage the clients asset through its operational lifecycle.

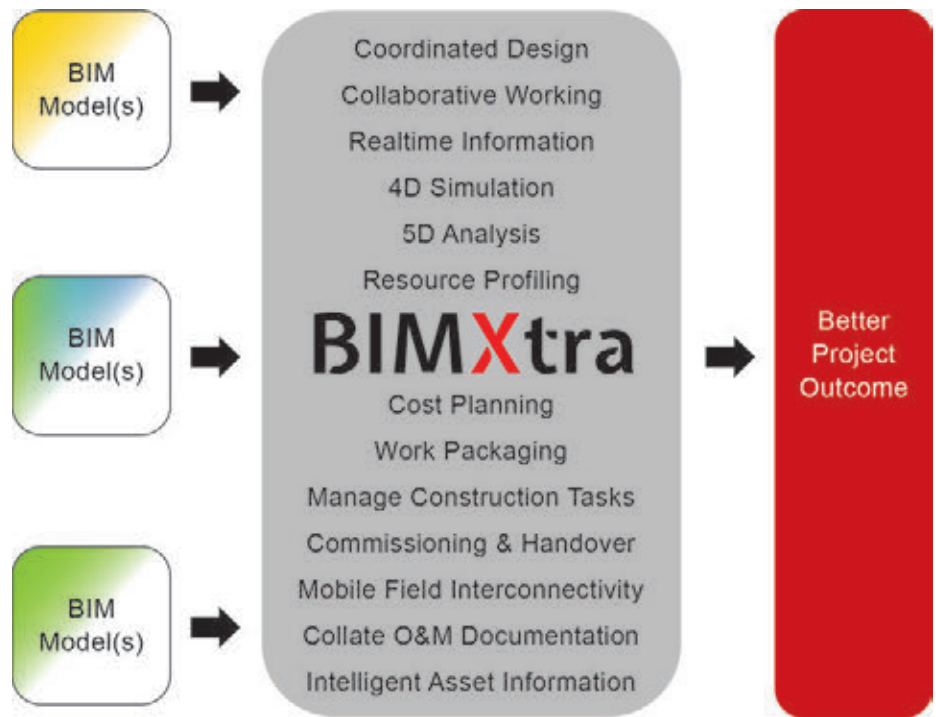
Not surprisingly achieving the utopia from this transformation, like all transformations has it's challenges, however, much has been done to address the needs of industry through new technology, and the guidance for the new BIM enabled project delivery process is established in the British Standard and PAS 1192 series, but to maximise the benefits of these new tools we need to consider the working practice changes that are also needed in many environments.

Driven by a focus on low cost procurement that can result in uncertain end out cost and, subject to your position in the supply chain, insufficient consideration of whole life operational cost, together with margins driven ever lower in a highly competitive market we are often faced with risk aversion rather than more proactive risk management.

However, in some parts of our industry suppliers and manufacturers are fully integrated with 3D CAD-CAM tools either direct to manufacture or through the creation of fully coordinated pre-assembled or pre-manufactured modules that dramatically reduce the onsite work and risks in installation and in doing so provide a higher quality product, manufactured and tested in a controlled environment.

The vision of BIM is that all parties in the supply chain collaborate across the same source of information, and make informed decisions based on better information with an improved awareness of the repercussions on others.

BIM delivers the maximum benefit when all parties take part, the leadership of key



Clients like Government, who acknowledge the benefits in project delivery and on-going asset management has been instrumental in establishing BIM as a modern working practice.

The prize for all of us is a better, more efficient, higher quality, world leading industry.

Providing a simple solution to the technology and workflow issues of BIM is where Clearbox can support the process.

Clearbox

Clearbox are a technology provider looking to bring the opportunity of BIM to all through their digital information hub BIMXtra which enables simple access to the information based around a true common data environment. BIMXtra addresses many of the issues of BIM by bridging the gap between the complexity of the BIM authoring tools and the plethora of project tools that characterise the current construction market. BIMXtra not only supports project delivery during the design and construction phase but delivers out the

intelligent asset information at handover to provide a new level of opportunity for Facility Management and Asset Management.

BIMXtra takes information from BIM and makes it available to all in the simplest of approaches. Each user has access to the information they need in the right format at the right time, allowing the influence of BIM to be shared out from the design through the entire project delivery phase. BIM in BIMXtra not only enables interrogation and exploitation of the visuals but also extends and enables the full digital information management of the project.

Developed by individuals with years of experience of delivering design and build projects, and who use BIMXtra tools themselves on their own projects, BIMXtra will help enable consultants, contractors, and SMEs alike to enjoy and benefit from BIM.

So if you are starting your journey or have uncovered some of the complexities of BIM then we can support you to meet the

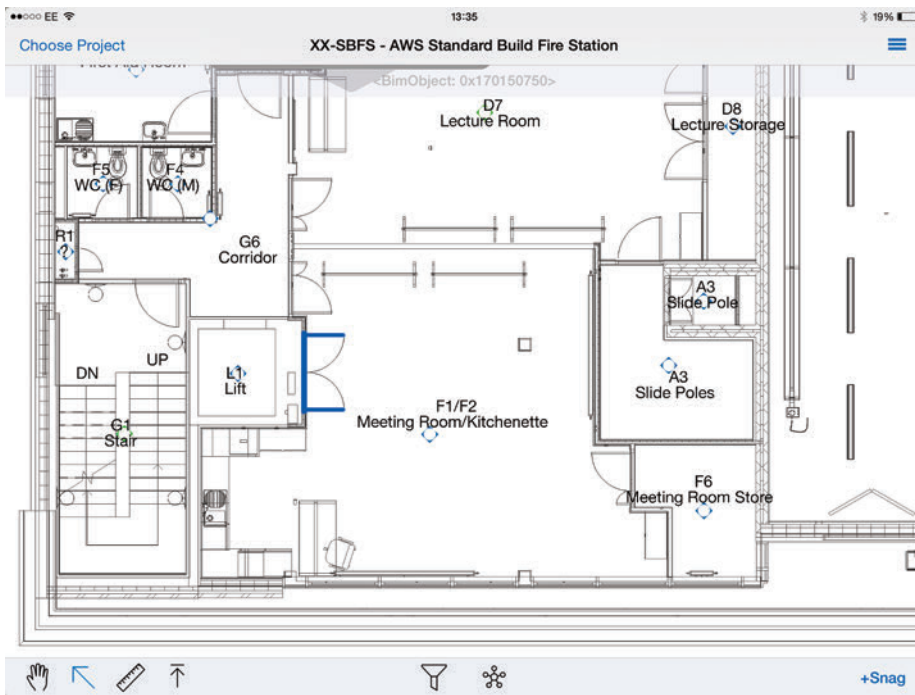
requirements of Level 2 BIM and beyond as a hosted solution. As 2016 approaches and the gap between the haves and have not's of the BIM world grows there is no better time to jump on board and benefit from the lessons learnt from some of the early adopters.

In this, the first of four articles leading to the 2016 deadline we aim to take you on a journey of the simple functionality that is now readily available, as well as reassure individuals of the benefits of BIM that can be realised in case studies. In the next papers

we will address the solutions and some case studies to allow users to appreciate the scale of the benefits and the simplicity and ease with which this can be achieved starting with the interface to programme.

Graeme Forbes

Graeme Forbes is the Managing Director of Clearbox a technology and consulting business that brings years of experience in the BIM space through new collaborative tools that help to bring simplicity to the delivery of BIM based projects.



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Performance standards to rely on

Paul Wilkins, Chair of the ACAI outlines what standards apply to organisations delivering building control and how these can help the customer...

The Association of Consultant Approved Inspectors for the private sector (ACAI), along with Local Authority Building Control for the public sector (LABC), are working together to explain the performance standards expected of all building control bodies in England & Wales.

As Chair of the ACAI, it is part of our remit to raise the profile of building control as a service that is valued, and will continue to support objectives and initiatives that encourage best practice and cooperation across both the public and private sectors.

Building control bodies work with the Building Regulations which provide a flexible set of national standards for building work covering all projects from major new commercial developments and new homes, to extensions and home alterations. At their best, building control bodies provide a proactive and valued solution to help designers and developers demonstrate compliance with the Building Regulations.

However, because a competitive dual system of building control exists in England and Wales (public and private sectors), successive government ministers in both countries have maintained an advisory group to measure performance. The Building Control Performance Standards Advisory Group (BCPSAG) sets and measures the standard of service provided by these building control bodies each year. This is now a sub-function of BRAC – Building Regulations Advisory Committee – which is a non-departmental, industry-based, advisory group sponsored by the English and Welsh governments.

A new article describing the performance standards applied to building control organisations, and explaining how these affect customers is now available

on the website of the representative body for ACAI, LABC, the RICS, CABE and CIOB – the Building Control Alliance (BCA). The article is also available on our website and explains how customers can use these standards as a way of evaluating, short-listing and comparing building control bodies for their own work.

Market feedback shows that building control rates are very competitive without a wide range of pricing. But, quality, competencies, delivery and management vary much more widely. Customers can use the standards to understand how best practice should be delivered, but more importantly, the standards exist to help evaluate the existing or proposed relationship with a building control partner or used to compare services.

There are nine key BCPSAG standards.

1. Policy, performance and management system

This means every building control body should create and publish a business policy covering the promised support and service levels to customers. This includes legal obligations in achieving compliance. In addition, the organisation should have a Quality Management System for recording and measuring delivery that is available to customers to analyse.

2. Resources

Having promised support and service levels, building control bodies should demonstrate that they possess the resources and competencies to deliver these promises on all categories of work undertaken. It's important to check if the building control provider has the experience or professional knowledge to work on all categories of building work, with sufficient surveyors possessing the right competencies to support a new project.

3. Consultation

Building control bodies should set out how they will undertake all statutory consultations in a timely manner and how the observations of consultees (eg fire services) should be communicated in writing to the customer. Ensuring a robust process is in place that will complete these consultations is a key requirement.

4. Pre-application contact and provision of advice

This enables building control bodies to explain how they will work with customers during the early design process to provide feedback on plans, compliance, innovation and affordable solutions. It includes the provision of a named 'account manager' to ensure continuity of thinking throughout a project. Pre-application design advice on compliance is a vital area of cooperative feedback and innovation, and again raises the profile of the industry.

5. Assessment of plans

Building control bodies have to demonstrate how, when assessment of plans is undertaken, they will communicate feedback on compliance issues and the views of statutory consultees including any conditions pertaining to the approval or passing of plans. As 'plan checking' is a vital area of feedback that can save money and time during construction, it's advisable to ask how much feedback will be received from whom and what experience they have.

6. Site inspection

Building control providers must state how they will determine and agree a project service plan with customers, what will be covered, when, and inspected. Additionally, they should explain how notes will be made and recorded together with an explanation of how contraventions will be communicated and resolved. Customers should understand what level and frequency of site visits will be received from the service plan quote (tender/proposal) provided by a building control body. For example, what happens if site issues are found or problems occur during construction requiring more inspections?

7. Communications and records

This covers the provision of notices, written records,

documentation and certificates plus their storage in a retrievable way for at least 15 years. Local authorities and approved inspectors operate under different regimes so customers should understand the policy of the building control body appointed.

8. Business and professional ethics

This is a commitment from building control bodies to respect the codes of professional practice governing individual professionals. Customers should understand that professional codes do apply and that conflicts of interest or matters of principle can arise even though it's rare. The ACAI, BCA, LABC, and the professional bodies (RICS, CIOB, and CABE) all support arbitration and mediation.

9. Complaints procedure

Finally, building control bodies must have an easy-to-find and user-friendly complaints process, including onward access to industry mediation. Any complaints made should be recorded and resolved pro-actively.

The ACAI fully supports the BCPSAG standards in our continued push toward higher service delivery, and would urge potential customers to utilise those standards in their projects. In this way, wider industry can be assured that the building control profession delivers the best possible services. ■

Useful links

<https://www.gov.uk/search?q=BCPSAG>

<http://wales.gov.uk/topics/planning/buildingregs/bracw/building-control-performance-standards-advisory-group/?lang=en>

<http://www.buildingcontrolalliance.org/>

<http://www.labc.uk.com/>

<http://approvedinspectors.org.uk/>

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CDM2015: The art of selective interpretation

Although reservations remain about the HSE's proposals for CDM2015, it looks like the role of Principal Designer is here to stay. James Ritchie of The Association for Project Safety outlines what steps industry should now take...

At the Health and Safety Executive Board meeting on 13th August, the HSE Construction Division presented their Report on the Outcome of the Consultation Document – their take on the industry's response to the consultation document. Some people might say that former cabinet secretary Robert Armstrong would have been proud of the way the report was written, but their analysis was not unexpected given how carefully worded were the consultation questions.

CDM co-ordinators can however feel justifiably hurt by the somewhat disingenuous comment that all of their responses should be viewed as a 'Campaign' and that therefore the HSE Board should view the percentage of positive or negative responses accordingly. Had the Association for Project Safety actually run a campaign advising their members to respond in a particular manner, the HSE's comments would have been understandable. Of course, if all of the CDM co-ordinators' responses had been in favour of the HSE's proposals, one wonders if such a 'Campaign' suggestion would have been made.

Having seen most of the construction and health and safety institutes' responses it would appear that APS were not alone in their reservations about the HSE's proposals for CDM2015. Both IIRSM and IOSH were dismissive of many aspects of the proposed regulations, and consultation respondents found potential legal problems with the draft statutory instrument, all which will have to be sorted out quickly if they wish to bring the regulations into force in April 2015.

Whilst the HSE have bowed to industry demands for an Approved Code of Practice to run alongside the industry prepared guidance, the one thing the HSE still have not addressed properly is the cost of these changes to construction in terms of re-training and the issues surrounding a potential drop in construction health and safety standards whilst the industry gets used to the new regime.

The removal of the CDM co-ordinator role was always going to happen, even if the industry had voted substantially against it. It has been the failure of the HSE since 2007 to enforce the early appointment of CDM co-ordinators and subsequently, the failure of industry to ensure the integration of the CDM-C into the project team that has led to the HSE's proposals for CDM2015. Removal of the CDM-C role should be no problem to construction health and safety provided that those people appointed as Principal Designers have the skills, knowledge and experience to coordinate pre-construction health and safety adequately, and understand exactly what they are supposed to do. To this end, the design institutes need to come together and agree exactly what skill set Principal Designers need to discharge their duties effectively and then work hard to ensure their memberships are suitably skilled.

For all but the simplest of projects, those taking on the role of Principal Designer or Principal Contractor will want to make sure they have access to good construction health and safety advice, and the industry needs to determine what they are looking for in terms of construction health and safety risk

management consultants i.e. someone who is professionally qualified to Chartered level in a relevant construction related institution, has validated CPD in this field, and a typical additional qualification – for example the NEBOSH Construction Certificate, member of the health and safety register administered by the ICE, membership of the Association for Project Safety, membership of the Institution of Construction Safety and of course, most important of all, evidence of significant work on similar projects with comparable hazards, complexity and procurement route.

“Removal of the CDM-C role should be no problem to construction health and safety provided that those people appointed as Principal Designers have the skills, knowledge and experience to coordinate pre-construction health and safety adequately, and understand exactly what they are supposed to do.”

This is an approach that many of the construction industry’s leading commercial clients are now advocating through the use of experienced, knowledgeable CDMCs as construction health and safety consultants having discovered the tangible benefits they bring to their projects for remarkably modest costs – and it is not only the clients that have been benefitting from this service but also the designers and contractors. So, if clients are wanting to employ advisers with demonstrable skills, knowledge and experience in design, construction and health and safety, and many designers are apprehensive of taking on health and safety responsibilities being suggested in the HSE’s proposed Principal Designer role, then the answer is surely for project teams to equip themselves with a competent and capable CDM consultant, with a capability proportionate to the complexity of the project involved. The top end professional clients in our industry know exactly why they employ capable people to advise them on health and safety – it is good for business – and that looks set to continue irrespective of the Principal Designer.

The HSE’s CDM2015 proposals provide an opportunity for the construction industry to reduce bureaucracy, streamline the pre-qualification process through greater use of SSIP and PAS9, and try to introduce

construction health and safety in a proportionate manner to those smaller projects where the majority of accidents are occurring. For the very smallest projects, probably in the domestic market, health and safety coordination should be simple enough for the lead designer to manage without the need for a CDM consultant, but it will need a concentrated effort by both the HSE, based around un-announced inspections of smaller sites, and greater education of both designers and contractors by their professional bodies if the change is to be successful. The ‘elephant in the room’ will be whether or not the HSE have the resources, ability and stomach to enforce their proposed new CDM Regulations during the pre-construction phase, or will they again just ignore it and concentrate on the soft target option of prosecuting contractors for failings on site.

We can only hope that, whatever the outcome, the construction industry, especially the SME sector, takes a sensible, pragmatic and proportionate approach to health and safety and that clients, designers and contractors all realise their limitations and understand when they need to employ a specialist CDM consultant to advise and assist them. We also need to hope that the industry written guidance to the new CDM Regulations is clear and effective, especially as the Approved Code of Practice will not appear until well after the CDM2015 regulations come into force. ■



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The business of fire safety partnerships

Graham Ellicott, CEO of the Fire Industry Association (FIA) sheds light on how businesses can now access Primary Authority Schemes for fire...

In 2009 RAFKAP Schemes were launched by the British Retail Consortium and the Chief Fire Officers Association (CFOA). RAFKAP stands for Retail and Fire Key Authority Partnerships and these schemes were designed to deliver consistency in fire inspection and enforcement, enabling fire and rescue services to target resources on high-risk businesses. These schemes were an early forerunner of Primary Authority Schemes.

Lead Fire Authority Schemes have also existed for some time, for example in 2012 Derbyshire Fire and Rescue (DFRS) entered into such a scheme with South Yorkshire Housing Association (SYA). In this scheme DFRS provided a Liaison Officer from within the Fire Protection Department who acted as a single point of contact for both parties. Plus, DFRS offered advice to SYHA in relation to all new build projects and were available for consultation for projects that fell outside of the Derbyshire area.

Looking further back in 2005 the then Labour Government commissioned a report from Sir Phillip Hampton entitled 'Reducing Administrative Burdens: Effective Inspection and Enforcement'. This report then became known as 'The Hampton Report' and it looked at the impact that regulators were having on the ability of business to compete and contribute to the recovery of the economy. The report concluded that across the regulatory gamut there were a number of factors that impacted on a business, such as inconsistent advice, excessive enforcement and inspection. The Hampton Report published a number of recommendations and all of these were accepted by the Government.

Following on from the Hampton Report, the Government, via The Regulatory Enforcement and Sanctions Act introduced the Primary Authority Scheme (PAS). PAS was developed as a partnership scheme based in law with statutory guidelines.

These were designed to create business investment in growth by developing confidence that regulators in different local authority areas would not place competing demands on a business which in turn could impose extra financial burdens on it. PAS includes a variety of 'strands' including:

- Assured Advice which would be provided by the regulator to a business and this would be accepted by enforcers of the same regulations;
- Inspection Plans would be agreed between the regulator and business so as to co-ordinate inspection activity under an agreed local inspection programme that was risk based;
- Enforcement Referral whereby the partner regulator has the ability to stop proposed Enforcement Action that is not consistent with the Assured Advice.

PAS was to be available to any business that operated across more than one local authority area, and it was to be applied to the majority of local authority regulatory services including the Fire Safety Order.

However CFOA opposed PAS for the Fire Safety Order and argued that its implementation would be contrary to the implementation of local Integrated Risk Management Plans. Thus, the Fire Safety Order was not included at this time in PAS.

In 2012, via the Enterprise and Regulatory Reform Bill, the Government proposed a number of changes to PAS which included it being available to trade associations and franchises. In order to see if the 'new' PAS was suitable for fire safety law, two six-month pilot schemes were run from January 2013. These were:

- A Statutory Scheme managed by the Better Regulation Delivery Office (BRDO) of The Department for Business, Innovation and Skills (BIS);
- A non-Statutory Fire Authority Partnership Scheme managed by CFOA.

These pilots were independently evaluated and it was decided that the Statutory Scheme was the most appropriate option.

In April 2014, PAS was finally extended to the Fire Safety Order and to date there are 91 partnerships listed with Hampshire Fire and Rescue Service and London Fire Brigade, being responsible for approximately two thirds of them.

The FIA welcomes the extension of PAS to the Fire Safety Order as the provision of consistent assured advice is a step forward for all concerned. However, the trade does have one area of concern and that is where the Fire and Rescue Service involved in a Partnership has an arms-length company that provides fire related services to the other party. This could lead to the accusation of conflict of interest when enforcement issues are concerned, plus, there will always be the suspicion that the work was obtained because the business partner feels that it will make life easier in general for itself if it uses the arms-length company. ■



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Don't gamble with your fire risk assessment!...

If you are responsible for a business premises, the law requires that you have a fire risk assessment. To find competent providers, you need BAFE.

Under the provisions of the Regulatory Reform (Fire Safety) Order 2005, the Duty Holder or Responsible Person for a building is required to make a Fire Risk assessment to clarify the fire precautions necessary to ensure the safety of staff, customers and property.

At present there are no adequate means to ensure the competence and reliability of a company commissioned to carry this out.

BAFE scheme SP205 has been developed specifically to address this situation, and will provide reassurance to the Responsible Person that they are doing everything possible to meet their obligations.

So don't leave everything to chance. Make sure that your suppliers are registered with BAFE.



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Promoting Quality in Fire Safety

Energy saving insulation

The Energy Saving Trust examine solid wall insulation and what opportunities it has for UK homes along with what households should consider...

It goes without saying that more expensive measures will provide the greatest savings and warmest homes. Unsurprisingly, millions of households have installed cavity wall installation which offers a very good energy saving payback, while practically every home in the UK now has some form of loft insulation installed.

This is good news for the UK but there are still millions of homes with solid walls that could still benefit from wall insulation. Only three per cent of solid wall properties have solid wall insulation, despite solid walls letting through twice as much heat as cavity walls do. There is an opportunity here to dramatically improve the UK's housing stock through solid wall insulation either on the inside (internal wall insulation) or outside (external wall insulation) of properties.

With many homes that could still benefit, but limited government funds to support solid wall insulation, there is a need to target those homes that could benefit the most. Finding these households most in need is not always simple. Luckily more and more data is available about the UK's housing stock, such as the Energy Saving Trust's Home Analytics, which can be used to focus insulation activity on the coldest and most expensive to heat homes, along with the most vulnerable households, to make the most of any government support on offer.

The energy savings associated with solid wall insulation is high – around £270 a year in the average three-bed semi-detached home or even £460 a year in a detached home, with carbon savings between 1,000 and 2,000 kg. However, the up-front costs are high and vary significantly depending on the level of work

required in the home. External wall insulation could cost anywhere between £9,000 and £26,000 while internal wall insulation is between £4,000 and £16,000. Another barrier is the hassle associated with the works, with households not wanting the disruption to the home that comes with solid wall insulation.

Luckily, there are ways to remove these barriers. If households are looking for cheaper rates, fitting the insulation work in line with other home improvements will save money on the job and spread the cost of the insulation, while also removing the hassle and disruption barriers. For example, if households are planning a new kitchen or bathroom, then it might be a great time to also explore internal wall insulation.

Households are three times as likely to consider energy efficiency upgrades alongside other home improvements, works and renovation projects, while 85 per cent of UK households would stretch their budget on home improvements to pay for energy efficiency measures and upgrades. This should be seen as an opportunity for installers who could sell energy efficiency measures alongside wider home retrofits.

Another important consideration with solid wall insulation is making sure it complies with Building Regulations. Normally the installer will ensure that the insulation is up to standard and will arrange approval from the local Building Control Office. However, if they are not going to do this, then the Building Control Office should be contacted at an early stage to make sure the proposed works comply.

“The energy savings associated with solid wall insulation is high – around £270 a year in the average three-bed semi-detached home or even £460 a year in a detached home, with carbon savings between 1,000 and 2,000 kg.”

For solid wall insulation the homeowner will need to employ a professional installer, with external wall insulation required to be fitted by a specialist installer trained by an approved system designer. Homeowners can search for companies that specialise in solid wall insulation through the National Insulation Association (NIA) and Insulated Render & Cladding Association (INCA) websites. If the internal wall insulation works coincides with other building work then the homeowner might want to ask the same builder to do the insulation, but it's important to check that they have experience in fitting internal insulation. ■

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Rising damp: rising allergies

Richard Sharpe, PhD Researcher at the University of Exeter Medical School addresses the concerning rise of allergies caused by damp...

The modern energy efficiency mantra dictates that we build new homes to increasingly stringent regulations and retrofit old housing stock to match. We insulate our houses with new materials and seal every last crack. With undeniable benefits for heating bills and CO₂ emissions, what about the impact on the indoor environment?

Internal housing conditions provide an important contribution to good health and wellbeing, and the state of our indoor environments is influenced by a number of factors. Heating, insulation, ventilation and people's behaviours, along with the type, orientation and geographic location of a property, all work to affect indoor air quality.

Over recent years we've witnessed a rise in allergic diseases that can't be explained by factors such as genetic changes alone. With one in three people suffering from allergies in industrialised countries, there has been an increasing focus on indoor air quality to explain this rise - and a robust body of evidence now suggests that rates of allergic and respiratory disease are linked to poor indoor housing conditions.

Based at the University of Exeter Medical School's European Centre for Environment & Human Health, we've just published findings that show damp and specific types of mould can pose a significant health risk to people with asthma.



Increased household energy efficiency can lead to a number of health benefits and help make a property more affordable to heat. However, efforts to prevent heat loss by reducing ventilation have led to undesired consequences for indoor air quality – increasing indoor dampness and the risk of fungal contamination, which currently affects around 16% of European dwellings.

The extent to which a home is heated and ventilated is also largely controlled by the habits of its occupants, and the way people live in their homes varies hugely. For example, some people dry their washing on indoor racks, some shower with the window closed, and many keep their windows and doors closed as much as possible in winter. All of these behaviours can increase the humidity and dampness in a home, with poorer families in particular less likely to maintain adequate ventilation through the winter months – often failing to heat the whole building.

Crucially, we know little about how these behavioural factors contribute to damp and mould in homes that have been retrofitted to make them more energy efficient – an increasingly important issue as huge swathes of old housing stock is revamped.

Our research has highlighted the need for housing providers, residents and healthcare professionals to work together to assess the impact of changes in housing quality and occupant behaviour, and we're working closely with two Cornish companies to try and find some answers.

In collaboration with social housing provider Coast-line Housing, we're aiming to understand how new building practices, intended to reduce energy use and fuel poverty – such as improved insulation and energy efficiency – can affect occupant health.

Collecting data through questionnaires with residents and the detailed sampling of homes, we're

We critically reviewed the findings from 17 studies in eight different countries and found that the presence of several types of mould – among them *Aspergillus* and the antibiotic-producing *Penicillium* – can lead to breathing problems in asthma sufferers, worsening their symptoms significantly. It also looks as though mould may actually help to trigger the development of asthma – but research in this area is still in its infancy.

With over 10 varieties found in a typical home, most people may not be aware that moulds are absolutely abundant in our outdoor and indoor environments. If you have a house or flat that suffers from damp, you're more likely to have more mould.

So what about the causes of damp? The structural integrity and architectural design of a (typically old) building can often lead to water making its way inside. A lack of ventilation and heating can then increase the indoor humidity, with this moisture ultimately condensing on cold surfaces and promoting the growth of mould.



hoping to shed light on the complex mix of factors that affect indoor dampness, and communicate best practice to reduce the presence of mould. This award winning enterprise-research partnership is at the cutting edge of built environment research and has been expanded to include the innovative technology of a second Cornish company, Carnego Systems.

Carnego are helping the team by using their digital monitoring tools to collect real time data (such as temperature and humidity) on the indoor environment. As we attempt to broaden the study's applications further, we're also working with several other partners including Community Energy Plus and the Met Office – who will be providing historical weather data to determine how external weather can affect indoor air conditions.

There's no doubt that energy efficient homes have been an incredibly positive step in the evolution of the country's housing stock. But the implications for dampness, mould, house dust mites and allergic conditions have been overlooked. We're ultimately hoping that our findings will go on to inform housing policies and health intervention work aimed at reducing the costs associated with maintaining the

built environment, as well as the health and wellbeing of residents throughout the UK. ■

You can read more on this research by following the links below:
www.ecehh.org/research-projects/health-and-housing/
www.onlinelibrary.wiley.com/doi/10.1111/cea.12281/abstract
www.sciencedirect.com/science/article/pii/S009167491400952X

This research has been supported by the European Regional Development Fund Programme 2007 to 2013 and European Social Fund Convergence Programme for Cornwall and the Isles of Scilly.



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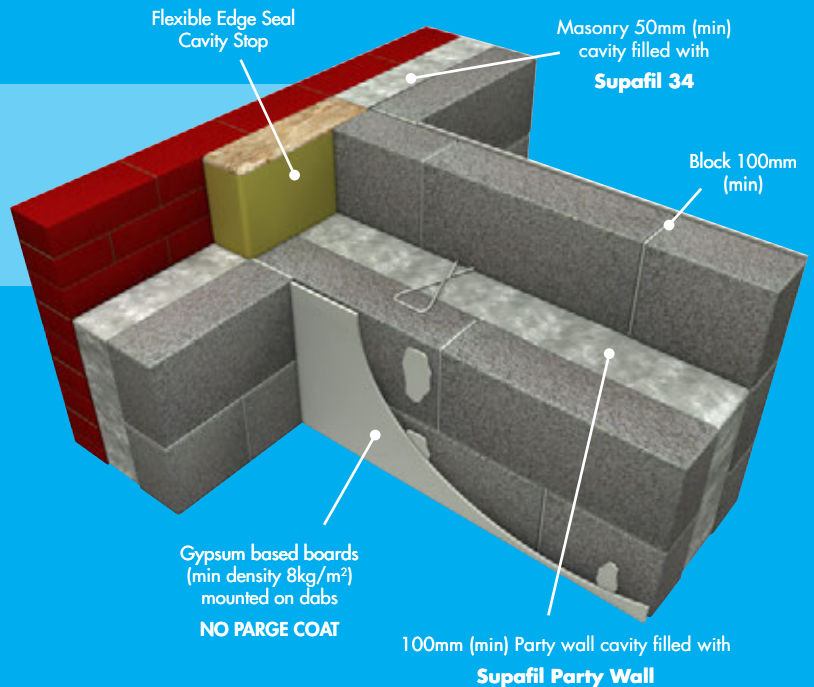
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Full Fill for the perfect fit

How fully filling with a mineral wool insulation can be the most practical and cost effective solution

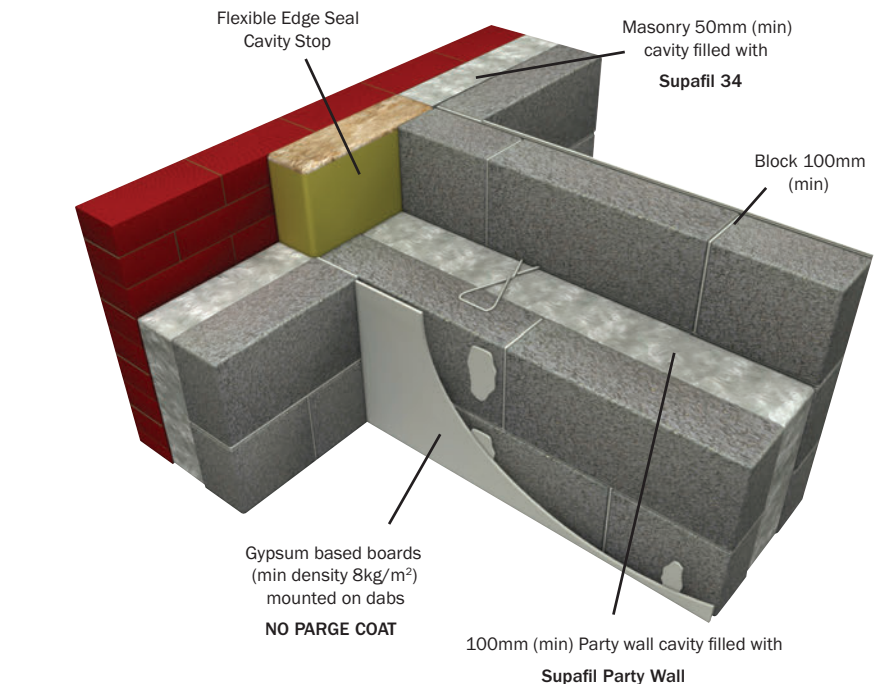
When it comes to installing any form of insulation, the performance characteristics of a product must always be considered. Indeed, when approaching a masonry cavity wall application, the fire and thermal performance of the insulation, in addition to the prevention of water penetration are vital issues that must be addressed – the selection of appropriate materials and jointing methods for the outer leaf are therefore crucial.

Alongside these factors, another key consideration can be cost. Fundamentally, housebuilders and developers require high performing products that can save them time and money. With this in mind, there is a solution that ticks every box. The recommended masonry cavity wall solution is full-fill mineral wool insulation, either injected (such as Supafil) or built in slabs (such as Earthwool DriTherm Cavity Slabs).

These systems not only provide U-values that comply with Building Regulations, but they are also the lowest in cost. Even with dense concrete blocks it is possible to achieve very high thermal performance in a manageable wall width; and a full-fill solution is suitable for all types of buildings.

Full-fill solutions are the most commonly used in the market with approximately 55% of new build cavity walls incorporating them, and 85% of all residential cavity walls when including refurbishment.¹

Housebuilders using full-fill solutions will make significant savings, whilst still achieving the thermal performance required to meet compliance with Building Regulations. In fact, compared to partial fill solutions, specifiers



can save up to 50 per cent of the cost, which can equate to up to £535 per plot – a substantial cost saving for housebuilders when they are building multiple plots.

Meanwhile, mineral wool insulation products are non-combustible and classified as Euro-class A1 to BS EN ISO 13501-1 – the highest possible “Reaction to Fire” classification – compared to a D or E typically achieved by foam plastic insulation materials.

Furthermore, there is a common misconception that water can bridge the cavity and a full-fill solution cannot be used in severe exposure zones. In reality, there are mineral wool insulation products available on the market that contain a water-repellent silicone additive to ensure that no liquid water is able to pass through and reach the inner leaf of masonry. Specifiers should only choose those products that are BBA certified for all exposure zones

– even when a site is being insured by the NHBC².

Undeniably, a full-fill mineral wool insulation to cavity walls offers the most practical, high performing and cost effective solution. This all helps in contributing to keeping properties warmer and for the homeowner, saving money on their energy bills in the long run.

For more information please visit www.knaufinsulation.co.uk

¹ Building Insulation Market, Construction Markets 2011

² Consult NHBC Standards for guidance regarding wall construction in each exposure zone

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Designing out the performance gap

The Zero Carbon Hub has recently recommended priority actions for the industry to close the 'performance gap'. Here, Nick Ralph from MIMA welcomes the report and draws upon some of MIMA's own work to illustrate its importance...

In its July 2014 report 'Closing the gap between design and as-built performance' the Zero Carbon Hub highlighted a number of key issues facing the industry if we are to tackle the performance gap – but two areas in particular are close to MIMA's heart.

The report highlighted concerns regarding the appropriateness of standard test methods for manufacturer performance declarations surrounding thermal conductivity, heat recovery and efficiency etc. This is because products and materials are generally tested in isolation, not in-situ on site. Whilst testing materials in isolation provides a logical and level comparison between products, it does not allow for issues such as air movement within a wall

element, or build tolerances when different products are fixed together. The Zero Carbon Hub therefore questioned the validity when results are used as an input into energy modelling tools such as SAP and then related to as-built performance.

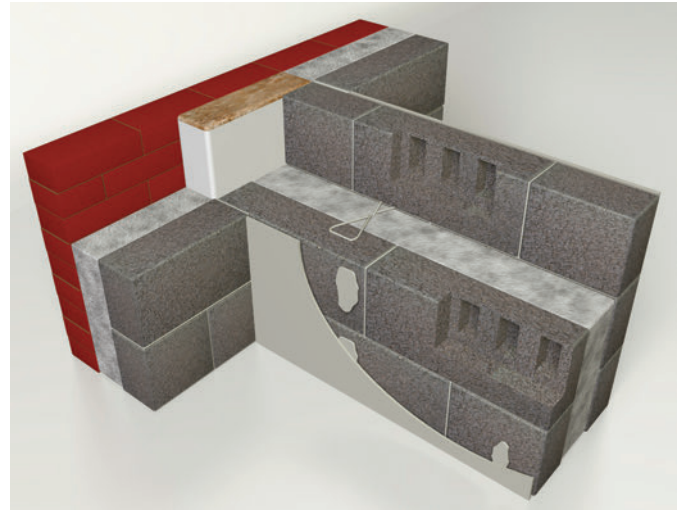
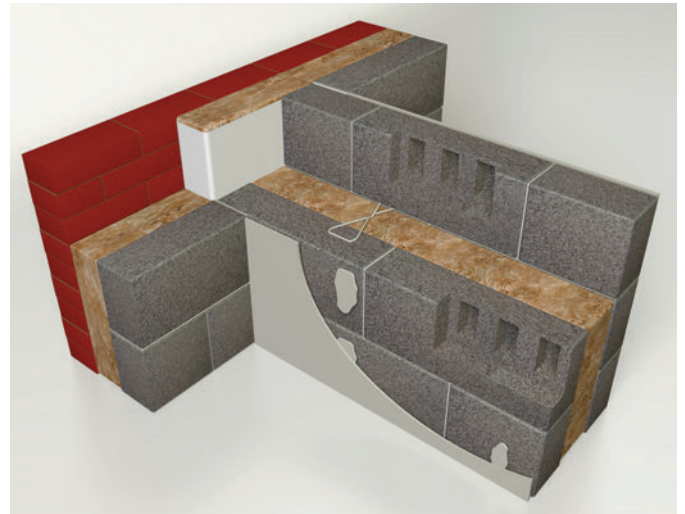
Real performance testing is an area MIMA has been heavily involved in over recent years, particularly in relation to researching the effects of the party wall bypass. Previously, there was an assumption that cavity party walls were an area of thermal equilibrium between two heated spaces and not a source of heat loss. However, studies by the Buildings and Sustainability Group of the School of the Built Environment at Leeds Metropolitan University (LMU)

between 2005 and 2007 showed that, for example, in a mid-terrace dwelling the heat lost through untreated party cavity walls could be greater than that which is lost through all of the other external elements combined.

A series of field trials were conducted on the party wall cavities of terraced and semi-detached masonry houses. The research combined a number of methodologies to achieve robust results:

- Coheating tests were undertaken of dwellings either side of the party wall both heated to the same temperature. Internal measurements included mean internal temperature, humidity and energy consumption;
- Airtightness pressure tests were taken at the start and end of the coheating test period, including the identification of air leakage pathways;
- Heat flow into the party cavity wall was measured directly using heat flux sensors attached to the surface of the internal faces of the party wall;
- A local weather station was attached to the test dwellings, to measure external temperature, external humidity, wind speed, wind direction and solar insolation;
- Air temperatures were taken inside the party wall cavity;
- Observations and measurements of the dwellings as constructed were recorded, to include borescope investigations of cavities and junctions;
- Infra-red thermal images were taken from both inside and outside the dwelling and under a range of external conditions.

The test results were two-fold. Firstly they proved that the magnitude of the party cavity wall thermal bypass was equivalent to the party wall having an effective U-Value of the order 0.5 to 0.7 W/m²K. As a result, there was an inclusion in the amended



Examples of party wall insulation

Domestic Building Regulations in 2010 (Part L1A) that party walls would need to be fully filled with suitable insulation and effectively sealed at the edges in order to achieve an effective zero-value.

The tests also demonstrated that full-fill mineral wool insulation is particularly suited to meeting the regulations, as together with effective edge sealing, it has been proven to comply with the requirements for a zero U-value without compromising acoustic performance.

MIMA welcomes the Zero Carbon Hub's recommendation for a range of approaches to diagnostic testing that can be consistently carried out at scale and available for a reasonable cost – and the call for



Nick Ralph
Mineral Wool Insulation Manufacturers
Association (MIMA)

significant investment in R&D from government, developers, manufacturers, and research programmes.

“Real performance testing is an area MIMA has been heavily involved in over recent years, particularly in relation to researching the effects of the party wall bypass.”

The importance of good workmanship was also highlighted. Ultimately, manufacturers' products are only as good as the installation – and skills and knowledge training is also a priority action recommended in the report, with an emphasis on how crucial it is that installation instructions are adhered to.

The recent changes to the new Part L regulations go some way to tackling this. Tougher rules looking at thermal bridging and air permeability are widely expected to lead to better quality workmanship on building sites - with leakage allowances down to

five cubic meters per square metre per hour – and penalties being applied to any dwelling not physically tested. This drive towards real performance, which MIMA is very active in, is going to be a clear way of identifying shortfalls in building materials and techniques.

Product choice also has a role to play. For example, the research undertaken by LMU into the thermal performance of party walls also required the performance of the external elements of the building envelope to be measured. During this aspect of the investigation, the full-fill mineral wool insulation slabs installed in the external wall cavities were shown to provide robust in-use performance. In particular, the close fit provided by mineral wool at insulation joints and at building interfaces played an important part in ensuring there wasn't an appreciable 'performance gap'. Quite simply, good performance demands good fit, and using materials that are easy to fit without gaps proved to be an important design step.

MIMA has long championed the use of Building Regulations to drive change in building practices, to improve delivered thermal performance and measure real, in-situ performance. The Zero Carbon Hub's latest report and the recent changes to Part L are therefore seen as greatly encouraging and will hopefully bring the industry another step closer to closing the performance gap.



.....
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Meeting thermal and acoustic performance in party walls

Since the revision to Approved Document L in 2010, party walls have a thermal as well as acoustic purpose. Tom Foster, senior product manager at Saint-Gobain Isover, discusses the importance of meeting thermal bypass requirements without jeopardising the original purpose of the party wall – acoustics.

Introduction

Over the past ten years, the construction industry's focus for party walls has been on improving acoustic performance, cost of installation and ease of compliance. However, since the revision of Approved Document L in 2010, focus has switched towards meeting thermal regulatory requirements by removing thermal bypass from the party wall. Despite this added complexity, it is important for the industry to remain focused on achieving good all-round performance, including acoustics.

Meeting regulatory requirements

For anyone building to 2010 or 2013 thermal regulations, serious penalties will be incurred in the SAP calculation tool if party wall thermal bypass is not addressed. The penalty is a default U-value of 0.5 W/m²k for the party wall unless measures are taken to address the issue. This can be achieved in two ways: effectively edge sealing the cavity; and/or restricting air movement by filling the cavity with mineral wool. If both measures are taken, a zero U-value can be assigned to the wall in the SAP calculation tool.

The full-fill mineral wool insulation used to restrict thermal bypass also plays a big part in the acoustic performance of the wall.

Whereas the thermal requirement for the product is generic and non-brand specific, often the acoustic requirement is much more precise and moving away from the product or brand specification could negatively impact the acoustic performance of the wall.

When applying measures to address thermal bypass, care must be taken not to create a detrimental effect on the acoustic performance of the wall. The easiest and often most financially viable way to ensure compliance with acoustic and thermal regulation is through the Robust Details scheme.

The solution

Over the past five years, Isover has gone to great lengths to support the industry with robust solutions for masonry party walls. Isover's range of three proprietary Robust Details; E-WM-17, E-WM-20 and E-WM-24 all incorporate Isover RD Party Wall Roll, a full-fill mineral wool roll designed to meet the requirement for a fully-filled cavity to eliminate thermal bypass, and to maintain high levels of acoustics. In addition, all three details remove the requirement for pre-completion sound testing and a parge-coat prior to dry lining.

By registering and building to one of these three Robust Details, house builders can claim a zero U-value party wall in their SAP calculation whilst continuing to achieve high levels of acoustic performance. Care should be taken to ensure the exact specification of the Robust Detail is followed, including insulation, wall ties, block type and plasterboard, to ensure the designed acoustic performance is achieved on-site.



Summary

The introduction of thermal requirements for party walls in 2010 may have created more complexity for the industry, but by building to the specification laid out in Isover's three proprietary Robust Details, construction professionals can have peace of mind that they will meet the new thermal regulatory requirements and maintain the consistently high acoustic performance of party walls that has been developed over the last decade.

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Senior Product Manager

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Scotland

Building Regulations

The Technical Handbooks provide guidance on achieving the standards set in the Building (Scotland) Regulations 2004 and are available in two volumes, Domestic buildings and Non-domestic buildings.

The 2013 Edition of the Technical Handbooks are now available to view or download. These handbooks provide revised guidance and support the Building (Miscellaneous Amendments) (Scotland) Regulations 2013 which were laid before Parliament on 13 May 2013. The amended regulations and technical guidance came into force on 1 October 2013. Through the same amendment regulations, changes are also made to the Building (Procedure) (Scotland) Regulations 2004 and the Building (Forms) (Scotland) Regulations 2005.

All handbooks can be found here:

<http://www.scotland.gov.uk/Topics/Built-Environment/Building/Building-standards/techbooks/techhandbooks>

STRUCTURE:

Technical Handbooks 2013 Domestic: Structure

<http://www.scotland.gov.uk/Topics/Built-Environment/Building/Building-standards/publications/pubtech/th2013dom1>

Technical Handbooks 2013 Non- Domestic: Structure

<http://www.scotland.gov.uk/Topics/Built-Environment/Building/Building-standards/publications/pubtech/th2013ndom1>

The structure of a building is fundamental to ensuring the safety of people in or around new and existing buildings and can be affected by a number of factors inside and outside the building including environmental factors. These factors should be considered to prevent the collapse, excessive deformation or the disproportionate collapse of buildings.

To achieve a structure with adequate structural resistance, serviceability and durability the following should be taken into account:

- a. the loadings (actions) on the building;
- b. nature of the ground;
- c. collapse or deformations;
- d. stability of the building and other buildings;
- e. climatic conditions;
- f. materials;
- g. structural analysis; and
- h. details of construction.

FIRE:

Technical Handbooks 2013 Domestic: Fire

<http://www.scotland.gov.uk/Topics/Built-Environment/Building/Building-standards/publications/pubtech/th2013dom2>

Technical Handbooks 2013 Non- Domestic: Fire

<http://www.scotland.gov.uk/Topics/Built-Environment/Building/Building-standards/publications/pubtech/th2013ndom2>

Life safety is the paramount objective of fire safety. Domestic buildings should be designed and constructed in such a way that the risk of fire is reduced and, if a fire does occur, there are measures in place to restrict the growth of fire and smoke to enable the occupants to escape safely and fire-fighters to deal with fire safely and effectively.

The purpose of the guidance is to achieve the following objectives in the case of an outbreak of fire within the building:

- to protect life;
- to assist the fire and rescue services; and
- to further the achievement of sustainable development.

ENVIRONMENT:

Technical Handbooks 2013 Domestic: Environment

<http://www.scotland.gov.uk/Topics/Built-Environment/Building/Building-standards/publications/pubtech/th2013dom3>

Technical Handbooks 2013 Non- Domestic: Environment

<http://www.scotland.gov.uk/Topics/Built-Environment/Building/Building-standards/publications/pubtech/th2013ndom3>

Water, air and soil are intricately linked and all can be affected by various forms of pollution that affect our environment. Other issues such as condensation have been a constant threat to people and buildings for many years. The Scottish Government encourages the use of previously developed land (brownfield) and local authorities may wish to promote brownfield land in preference to greenfield land. Some of this land will be contaminated and will need to be made safe.

The intention is to ensure that, as far as is reasonably practicable, buildings do not pose a threat to the environment and dwellings, and people in or around buildings, are not placed at risk as a result of:

- a. site conditions;
- b. hazardous and dangerous substances;
- c. the effects of moisture in various forms;
- d. an inadequate supply of air for human occupation of a building;
- e. inadequate drainage from a building and from paved surfaces around a building;
- f. inadequate and unsuitable sanitary facilities;
- g. inadequate accommodation and facilities in a dwelling;
- h. inadequately constructed and installed combustion appliances;
- i. inadequately constructed and installed oil storage tanks;
- j. inadequate facilities for the storage and removal of solid waste from a dwelling.

SAFETY:

Technical Handbooks 2013 Domestic: Safety

<http://www.scotland.gov.uk/Topics/Built-Environment/Building/Building-standards/publications/pubtech/th2013dom4>

Technical Handbooks 2013 Non- Domestic: Safety

<http://www.scotland.gov.uk/Topics/Built-Environment/Building/Building-standards/publications/pubtech/th2013ndom4>

Safety has been defined by the International Standards Organisation as 'a state of freedom from unacceptable risks of personal harm'. This recognises that no activity is absolutely safe or free from risk. No building can be absolutely safe and some risk of harm to users may exist in every building. Building standards seek to limit risk to an acceptable level by identifying hazards in and around buildings that can be addressed through the Building (Scotland) Regulations.

The intention is to give recommendations for the design of buildings that will ensure access and usability, reduce the risk of accident and unlawful entry. The standards within this section:

- ensure accessibility to and within buildings and that areas presenting risk through access are correctly guarded;
- reduce the incidence of slips, trips and falls, particularly for those users most at risk;
- ensure that electrical installations are safe in terms of the hazards likely to arise from defective installations, namely fire and loss of life or injury from electric shock or burns;
- prevent the creation of dangerous obstructions, ensure that glazing can be cleaned and operated safely and to reduce the risk of injury caused by collision with glazing;
- safely locate hot water and steam vent pipe outlets, and minimise the risk of explosion through malfunction of unvented hot water storage systems prevent scalding by hot water from sanitary fittings;
- ensure the appropriate location and construction of storage tanks for liquefied petroleum gas; and
- ensure that windows and doors vulnerable to unlawful entry are designed and installed to deter house breaking.

NOISE:

Technical Handbooks 2013 Domestic: Noise

<http://www.scotland.gov.uk/Topics/Built-Environment/Building/Building-standards/publications/pubtech/th2013dom5>

Technical Handbooks 2013 Non- Domestic: Noise

<http://www.scotland.gov.uk/Topics/Built-Environment/Building/Building-standards/publications/pubtech/th2013ndom>

Noise is unwanted sound. In order to limit the effects of unwanted sound the standards intend to improve the resistance of building elements to sound transmission. Research has presented clear evidence that noise can indirectly contribute to a range of health issues such as stress and anxiety.

Inadequate sound insulation can impair health by allowing noise from other people to disrupt normal life. A number of people in attached homes complain of neighbour noise.

The 2010 edition of Section 5 has been completely rewritten to include:

- an increase in the sound insulation performance of separating walls and separating floors;
- a robust post-completion testing regime;
- guidance for carrying out work to existing buildings;
- guidance to reduce sound passing between rooms in dwellings; and
- section has been updated to reflect then updating of Planning Advice Notes.

Including residential buildings (Non-domestic):

- separating walls and separating floors forming rooms intended for sleeping (Non- domestic)

ENERGY:

Technical Handbooks 2013 Domestic – Energy

<http://www.scotland.gov.uk/Topics/Built-Environment/Building/Building-standards/publications/pubtech/th2013dom6>

Technical Handbooks 2013 Non- Domestic – Energy

<http://www.scotland.gov.uk/Topics/Built-Environment/Building/Building-standards/publications/pubtech/th2013ndom6>

Within Scottish building regulations, improvements in energy standards have been made over many years, culminating in 2007 with the move to a carbon dioxide emission based methodology for assessing carbon and energy performance in new buildings.

In 2007, Scottish Ministers convened an expert panel to advise on the development of a low carbon building standards strategy to increase energy efficiency and reduce carbon emissions. This resulted in The Sullivan Report – ‘A Low Carbon Building Standards Strategy for Scotland’. A key recommendation of this Report is staged improvements in energy standards in 2010 and 2013, with the aim of net zero carbon buildings (emissions for space heating, hot water, lighting and ventilation) in 2016/17, if practical.

Domestic: Section 6.0.3 addresses the carbon dioxide emissions and energy performance of all domestic buildings (houses, flats and maisonettes) and ancillary buildings. In respect of dwellings, all parts of a building intended to form part of the dwelling should be within an insulation envelope.

This section should be read in conjunction with all the guidance to the Building (Scotland) Regulations 2004 but in particular Section 3 Environment has a close affiliation with energy efficiency, regarding:

- a. heating of dwellings;
- b. ventilation of domestic buildings;
- c. condensation;
- d. natural lighting;
- e. combustion air and cooling air for combustion appliances;
- f. drying facilities; and
- g. storage of woody biomass.

Non- Domestic: This section covers the energy efficiency for non-domestic buildings. Such buildings include: factories, offices, shops, warehousing, hotels, hospitals, hostels and also buildings used for assembly and entertainment.

- ventilation
- condensation
- combustion appliances and
- biomass fuel storage.

SUSTAINABILITY:

Technical Handbooks 2013 Domestic: Sustainability

<http://www.scotland.gov.uk/Topics/Built-Environment/Building/Building-standards/publications/pubtech/th2013dom7>

Technical Handbooks 2013 Non-Domestic: Sustainability

<http://www.scotland.gov.uk/Topics/Built-Environment/Building/Building-standards/publications/pubtech/th2013ndom7>

Sustainable development has been defined as meeting “the needs of the present without compromising the ability of future generations to meet their own needs” by the Brundtland Commission of the United Nations in 1983. It follows that the process of sustainable development and the quality of ‘sustainability’ to aspire to within the built environment should account for:

- social, economic and environmental factors;
- the potential for long-term maintenance of human well-being in and around buildings;
- the well-being of the natural world and the responsible use of natural resources, without destroying the ecological balance of the area where these resources originate or are processed; and
- the ability for the built environment to be maintained.

The intention of this standard is to:

- recognise the level of sustainability already achieved by the building regulations. By setting the 2010 Standards as the benchmark level, credit is given to meeting the standards within Sections 1-6 of the building regulations. This will emphasise that a degree of sustainable design and construction is not a niche market but must be achieved in all new buildings;
- encourage more demanding sustainability standards through enhanced upper levels;
- encourage consistency between planning authorities that use supplementary guidance to promote higher measures of sustainable construction in their geographical areas. By making reference to this standard, local aspirations can be met by selection of clear national benchmarks. Levels of sustainability have been defined that must include a low or zero carbon generating technology, with reference to Section 72 of the Climate Change (Scotland) Act 2009.



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