Rethinking Standards in Construction

Developing the next generation of Construction Standards

Report of the six industry workshops to create the new approach to UK standardisation

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BSI

CONSTRUCTING EXCELLENCE
in the built environment

Introduction

Bob White

Chairman, National Platform High Level Group, Chief Executive Constructing Futures

This report captures the second phase of the Rethinking Standards in Construction programme. Following on from the success of the first conference and report published in 2006 a series of workshops were set up to address specific issues in the industry. As a partnership between the BSI and Constructing Excellence, with the support of DIUS (formerly DTI), consultants, practitioners and commentators were invited from right across the stakeholder group.

Six areas were analysed in detail: building processes, "building smart" (looking at interoperability), the water industry, commercial & industrial sector, infrastructure and the residential market. Thank you to everyone involved (full details are at the end of the document).

Standards can help the construction industry perform better. But they need to be applied in way that is encourages, cajoles and motivates the various stakeholders. There has to be a subtle balance of carrot and stick. The six workshops covered very broad areas, but all shared common ground. A theme running throughout the discussions was a general perceived lack of information up and down the supply chain. Fundamentally this is because there is a distinct lack of collaborative working and integrated teams have not been properly employed. A set of standards will help shape the right framework for projects to be managed, delivered and then maintained more effectively.

Everyone involved in the workshops agreed that processes have to change. To encourage this, the industry has to share more information. This does not just mean talking to the various teams up and down the supply chain, it means making the best use of the systems available. The concept of interoperability was accepted by everyone. It was agreed that Building Information Modelling (BIM) exists at the centre of the building process framework, but to work effectively it was going to be necessary to create a database of information for use in modelling.

In fact, interoperability was one of the consistent themes running through all of the workshops. It was acknowledged that across industry and around the world, a range of organisations are developing interoperability systems and therefore the UK has to address the concept in order to be able to compete in business globally. Using open systems, such as Building Information Modelling (BIM), to share data and information throughout the project life cycle are crucial to the long-term success of the industry. The principle of BIM is to connect islands of information with each other, rather than repeating and re-learning knowledge each time a project is begun. A free flow of information will help avoid common complaints about the lack of appropriate information available to inform the cost/

value debate. The lack of detail leads to a short sighted view of projects and an aversion to whole life costing models – for example, design only accounts for approximately 3% of building costs despite the fact that everyone is agreed that quality and value is rooted in the strength and consistency of the design process.

Another major area where standards can be of huge benefit is in planning. The difference in the way the planning system is applied across the UK causes everyone involved major headaches. It would be helpful to have some form of standardisation of the planning application and building control process. But, to improve the quality of housing and ensure long term value there had to be a consistent quality of construction. One idea was to set up durability standards for Modern Methods Construction (MMC) where existing tests are simply not applicable.

Fundamentally, planners and designers need to connect with the communities and understand the market and end users' requirements. This was a move towards an inclusive design standard that will help to build homes that meet the needs of the whole community. But, underpinning such a move is the availability of information.

Throughout the discussions, it was consistent that up and down the supply chain different stakeholders, but specifically the clients, need to be better informed and educated about the way the industry operates and the potential benefits of improving the way it works.

RECOMMENDATIONS

The main recommendations are as follows:

- The concept of interoperability was accepted by everyone. A standard database of information for use in modelling and an executive management guide are being created
- Introduction of an over-arching standard to act as a framework to encompass behaviours throughout the construction supply process
- Develop a new standard on construction procurement using the OGC process as a baseline – any new standard would operate one level below the OGC process.
- Create two new standards for the housing market – for Housing Design incorporating MMC; and for Improving Housing Planning and Procurement Processes
- Standards need to be used to help educate consumers (domestic and commercial) about water efficiency

1. Building Processes

Background

Although standards are valued, they are not seen as a driver for improved performance, or as relevant as they should be to user requirements.

However, used properly and linked effectively to KPIs they can address and support key problem areas the industry has to deal with:

- Taking a whole-life approach to evaluating risks, costs and benefits
- Sustainability
- Tracking measurable performance
- Integrating supply chains
- Changing procurement practices
- Minimising accidents

To encourage this, the industry has to share more information. Indeed, using open systems, such as Building Information Modelling (BIM), to share data and information throughout the project life cycle are crucial to the long-term success of the industry. The principle of BIM is to connect islands of information with each other, rather than repeating and re-learning knowledge each time a project is begun. Figure 1 illustrates how building information modelling can unify activity throughout the construction life cycle.

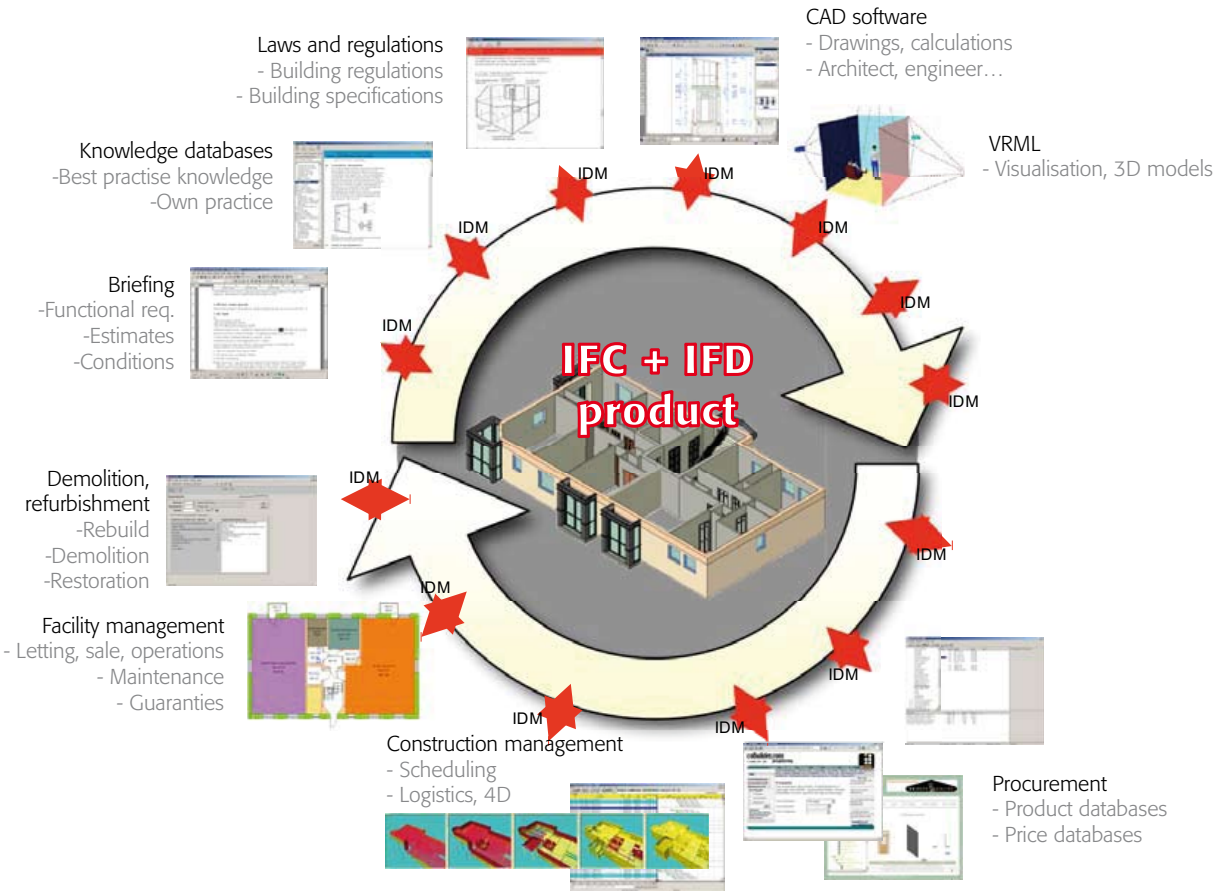

Figure 1

The issues

Interoperability represents a major opportunity to improve performance for the building processes sector. The group picked out design, the supply & construction process and facilities management as key areas and then identified the following issues to be addressed:

- Coordination of design process and construction methods
- Planning application system
- Design seen as a cost and not adding value
- Clients do not know what they want
- Reluctance to take ownership of integrated teams
- Fragmented delivery structure
- Low skills base and lack of knowledge & training
- Too much focus on short term costs and not enough on delivering long-term value
- Efficiency rarely monitored so level of waste not known
- Lack of accountability by contractors once they had delivered
- Lack of input from end-users of buildings and structures

Ideas and suggestions

The group agreed ten suggestions for how standards and standardisation might help improve building process performance.

- Encourage government to instigate a standard for whole-life costing embedding sustainability into construction activity
- Standardise planning process speed up delivery
- Standardise electronic procurement processes needed to ensure a level playing field for tendering
- Standards for risks such as health, safety, environment - and thus legal compliance
- Minimum levels of good practice for professional and trades persons
- Standards for ensuring consistency of handover and early involvement of maintainers and operators.
- Reduce misunderstanding at each stage of the build process by using standards to identify the significant factors
- Standards which support more off-site manufacture
- Require BIM/IFC models for PFI projects such as a seeding process for rest of the industry; develop IDM standards for each step in the process, defining what is in the model and what its purpose is.
- Standards to ensure compatibility of components and reduce maintenance/replacement costs

Agreed actions

The concept of interoperability was accepted by everyone. It was agreed that Building Information Modelling (BIM) exists at the centre of the building process framework, but to work effectively it was going to be necessary to create a database of information for use in modelling.

Such a library has to be standardised, maintained and audited if it is to be a credible system. From a users point of view, what criteria will be used to select products to go in to the database? It was recommended that joined up thinking within BSI is needed and maybe a link BSI with BSRIA, BRE, CIRIA or a similar body to move this forward.

In terms of design, it was noted that there are a myriad of standards – Design Quality Indicators, Housing Quality, CABE Design for Life, Part M, EcoHomes, HomeZone, and Lifetime Homes. All conflict and overlap, and are frequently changed, so what use are they? One single standardised approach would make life very simple.

In the FM area some standards already exist in the form of 'building files' which is handed over on completion of a building which typically address health and safety issues. BSRIA has issued guidelines in this area, but there was a call for the standardisation of handover/sign off procedures – almost like an MOT for a building.

The group identified gaps in available standards and suggested some action to remedy this:

- The link between various UK standards and international standards was thought to be weak – the relationship needs to be strengthened.
- Standards need to address refurbishment of buildings. Although existing standards covered all aspects of work on buildings, there was no overall process standard available to ensure that people followed proper processes in carrying out refurbishment, including demolition.
- Existing standards did not reference construction industry KPIs and they should.
- The concept of creating a building 'manual', full of data about the design and management of the structure might become very important for sales of land and structures – an enhanced version of the current HIPS idea for sale of domestic housing. The manual would enable new owners to check compliance and maintenance records more easily.

The group concluded that there needed to be a more standardised approach to the whole topic of business risk assessment in construction running through design, specification, procurement, build, FM and refurbishment. The core issue behind such a standard would be how you checked compliance to specifications, and this would need to be supported by a transaction status model. It was agreed that the interoperability concept would be core to making this work.

"a more standardised approach to the whole topic of business risk assessment"

2. BuildingSMART & construction products

Background

What is buildingSMART all about? Well, most processes and activities in the construction supply chain are now based on some form of electronic data exchange. BuildingSMART aims to enable all these electronic data systems to communicate with each other seamlessly and efficiently in order to reduce costs and improve efficiency throughout the supply chain.

Industry Foundation Classes (IFC) are the basic building blocks or alphabet of the system, which breaks data down into elements that can be understood throughout the world by any data exchange process or information classification system (including JClass, Omniclass etc).

To achieve interoperability, it is necessary to define all the properties of an item eg colour, height, length etc, and everyone has to agree what these properties mean. These decisions need to be recorded in a dictionary, just as with any language. Building Information Modelling (BIM) is what you do with the IFCs, dictionaries and property sets.

Interoperability is a step-change improvement on the use of CAD/CAM to reduce risk and cost in construction projects. It enables far more effective visualisation and costing of designs, not just at concept stage but throughout the design and build process.

The issues

Interoperability is a major opportunity to improve performance for the construction products sector. To better understand its potential impact, the group decided on eight broad issue definitions that needed to be addressed.:

- Rate of Change
- Common Language
- Fear of Change
- Lack of Understanding
- Unclear Benefits
- Process
- Technology

Ideas and suggestions

Whilst it was agreed that no one had to adopt interoperability, nevertheless a large number of major players and countries were working very hard on the concept and it is likely that it would only be a matter of time before the concept began to be a reality for UK suppliers trying to do business globally. It would be better to be in the vanguard rather than the tail of what was happening worldwide.

After detailed discussion, the group was encouraged to consider two or three new major products such as books/ PASs/Standards which would be welcomed by the industry in this subject area, and to set a time frame and a practical scheme for producing them.

Agreed actions

The group recommended three main areas of action to take advantage of the benefits of interoperability.

1. The Interoperability Dictionary

It was agreed that the IFCs had to be set down in some form of dictionary aimed primarily at manufacturers; it will explain:

- what it is that they can do using interoperability
- how to achieve it
- how much it will help them

It will include information on competitors in the form of case studies. It was acknowledged that some large organisations will want facility to create their own dictionaries. It was agreed that BSI would develop a business plan for producing a 'Scope' and a 'Guide' to distribute to the interested parties.

2. The Interoperability Data Container

The 'data container' creates the structure in which data is shipped. Data containers are the subject matter of ISO PAS 16739 which has already been published and could be developed into a BS, with additional case studies and other supporting information. It answers the question of what a manufacturer has to do to show interoperability: basically, comply with this PAS.

3. The Bluffers' Guide to Interoperability

Considered essential, an executive management guide should be written for the non-technical person (board director) by non-technical people and should indicate what interoperability can do for a user and the costs associated with not doing it.

Further discussion identified other publications such as a book /video/booklet to educate the industry generally, possibly fine tuned to aim at different sectors.

"an executive management guide should be written for the non-technical person"

3. Commercial & Industrial workshop

Background

Whole Life Costing (WLC) is what it says on the tin – it's about taking a longer-term view of the total costs of a building or structure over its lifetime, rather than focusing exclusively on the initial design and build cost. It is widely acknowledged throughout the construction industry that two to three times more money is spent on the operation and maintenance of a building during its lifetime than is ever invested in the design and build phase.

Predicting whole life costs is a minefield. One of the major obstacles in calculating whole life cost is agreeing what represents whole life value, and to whom. Be Valuable (the Richard Saxon report commissioned by CE) defines value as the difference between what you get (functions, impact, quality) over and above the resources you put in. However, the calculation will remain subjective, until it is taken a stage further and break down the type of things that a stakeholder might have to sacrifice in order to get what they want.

This makes things very complex and in 2005 a National Audit Office report identified the following problems:

- Lack of clarity as to what WLV is amongst both clients and contractors;
- Lack of information on running costs and the process of life cycle costing;
- No simple tool available to help all stakeholders understand the relationship between cost, time, quality and functionality;
- No incentive to undertake WLC such as a carbon tax.

The issues

A lack of investment in design, particularly by clients was seen as a major problem. Design only accounts for approximately 3% of building costs despite the fact that everyone is agreed that quality and value is rooted in the strength and consistency of the design process.

Communication is a problem. There is a lack of appropriate information available to inform the cost/value debate and secondly, there is a need for better communication systems. Even where information is available it has to be able to pass quickly up and down the supply chain. Interoperability is likely to be a very effective method of doing this.

More information will help educate the client. They will then begin to understand the importance of considering the long term use of the buildings and appreciate that investing in innovation at the design and planning stage can generate savings and does not necessarily imply risk and extra cost.

The differences in the way the planning system was applied across the UK caused developers major headaches. It would be helpful to have some form of standardisation of the planning application and building control process.

Ideas and suggestions

A high level process procurement standard was discussed, which ensured technical connectivity between product performance standards and overall objectives such as aiming for increased whole life value. Interoperability would be at the core of this initiative.

A lot of the problems in the construction industry were perceived to be behavioural in origin, where bad practice had become the norm. This needed to be challenged, with poor players marginalised and best practice processes brought in from other industry sectors.

Agreed actions

It was agreed that the heart of the problem lies at the beginning of a project and stems from a lack of knowledge and awareness on the client side. It was essential that risk was seen as an opportunity as much as a threat and those players in the supply chain should try to share risk creatively. On most projects, the risk profile is pre-determined by the client before any contractors come on board. It was agreed that a new way of communicating options was needed with a common language understood by different audiences.

The group did not recommend new standards per se, but instead outlined a series of key points that together, work as a route map for progress.

- **1. Design/concept stage** – Research indicates that possibly 80% of new buildings destroy value rather than create it for their clients, through being inappropriate for their needs. The focus must be the end-use of the structure to be delivered. If the brief is right, then the desired outcomes will end up being incorporated. It was agreed that the business objectives for a project needed to be challenged much more rigorously – perhaps by setting up some form of standardised process.
- **2. Pre-planning stage** – the process itself must ensure there is no disconnect between planning and on-site delivery. It was noted that the British Council of Offices (BCO) has existing standards and guidelines in place for this and the group agreed that these needed to be examined more closely and recommended working closely with the BCO.

It was agreed that any over-arching procurement standard needed to act as a framework to encompass behaviours throughout the construction supply process. Traditionally, standards have been viewed as more of a support for regulation, rather than business drivers in their own right. So therefore, it was crucial for any new standard to be seen as something to aspire towards rather than mandatory.

"a route map for progress"

The OGC gateway process was cited as a good basis to work from, as it enabled different stages to completed, and prevented going back once a stage gate decision had been taken. Reliable costing information would lie at the heart of such a process.

The marketing and communication of the benefits of such a standard were seen as crucial to real progress. BSI was perceived to have a major role to play as an educational body to promote standards as a means to improve process – not just as a means to benchmark and/or standardise. A useful way of conveying these benefits will be case studies which explain the thinking and outline the benefits of eg whole life costing, or the rationale behind intelligent buildings.

It recommended that BSI, Government and CE work together on this initiative to ensure that industry does fully understand the messages and embraces the requirement for positive change. An example of a successful campaign of this type was 'Get more for your Monergy', where seed corn investment by the government helped people to understand energy use in buildings.

"case studies explain the thinking and outline the benefits"

4. Infrastructure workshop

Background

As society changes in its requirements, infrastructure provision must adapt to suit. The concept of whole life costing, which can encompass the several lives of a structure is particularly relevant here. Information networks will drive changes of provision to users, especially in road pricing, but also in areas such as micro-generation and the provision of local power networks.

Standards have a big role to play in this changing climate. Standards provide confidence in repeatability; guaranteed minimum performance levels and increased delivery of value.

However, the emphasis should be on standardization of interfaces to ensure that technology is interoperable. Standards should not be about specifying individual components. Standards should instead provide vision and challenges for a research agenda, a framework that encourages innovation. Durability is also an important issue. There is no real need to design structures for 150 years if they are to be demolished in 30 years.

Standards could lead and encourage in these areas, but only if there is an effective communication plan in place.

The issues

Money and the financing of infrastructure work are critical to its success. The 'Bible' on the topic was the Treasury Green Book, and much interest was shown in the line to be taken on whole life costing. There is also a great deal of inconsistency around the contractual process. Overall the main issues were:

- Lack of funding to support long term strategic planning
- Tender processes overly complex
- Inconsistent procurement methods
- Fragmented responsibilities
- No long term strategic planning or vision
- No joined up thinking by government and local authorities
- Lack of integration of the supply chain in decision making
- Resource availability within the supply market
- People and skill shortages
- Too much waste
- Lack of knowledge in local authorities

Ideas and suggestions

The group was asked to consider where greater use of standards and or standardisation could help improve performance. They put forward the following ideas:

- Enable systems integration
- Standardize procurement contracts
- Set performance output specifications rather than inputs
- Establish cost data
- Standardise assembly (of components) level
- Set training requirements
- Improve overall project coordination
- Set future performance benchmarks
- Establish standards for client capability
- Provide basis for consistent use of gateway process for project review
- Reduce time, cost and effort
- Enable planning regulation
- Provide basis for standard detailing
- Improve risk management

Agreed actions

The workshop looked at scoping the kind of standard that might be required to improve performance in the procurement process for infrastructure. It recognised immediately that the OGC guidelines and the Treasury's Green Book would be a useful starting point.

It also acknowledged that it was important not to reinvent the wheel, and follow the OGC Gateway Review process, which to all intents and purposes is mandatory in the public sector, even though it only defines procurement by central government and does not have to be used by local authorities.

The procurement standard itself needs to build in its own innovation mechanism, so that it keeps up with developments in procurement. The most effective KPIs to attach to it would be output-related.

The group decided:

- There was definite potential for a new standard on procurement, provided it used the OGC process as a baseline. Any new standard would operate one level below the OGC process.
- Ultimately, it may be necessary to have different procurement processes for different areas of infrastructure, but initially what was required was an 'overarching' procurement standard (high level) similar to ISO 9000 type – common for all.

"a new standard on procurement"

- A systems map would be a good next stage.
- If the Gateway process is used, it would be important to neutralise the terminology in it which tends to be central government jargon and likely to be off putting to LA and private sector clients.
- Constructing Excellence KPIs and Design Quality Indicators would be useful output measures, as most performance measures used in infrastructure tended to be methods of specification, and not focused on outputs.

5. Residential workshop

Background

With economists estimating that at least 250,000 new homes are needed every year to support the expected growth in households over the next 25 years in the UK the pressure is on the industry to perform.

But pressure cannot be allowed to affect the quality of the end product. Poor quality housing design leads to expensive maintenance, and exacerbates public health, crime and deprivation issues for many communities as the housing stock deteriorates. CABE recently undertook a survey which found that 94% of all development was poor/average in north, and 87% poor/average in south. How can design be improved? Would templates help?

The government wants to create environmentally efficient housing stock and equal attention needs to be paid to creating appropriate physical and social infrastructure to support local communities and economies that are to be built.

New homes need to be affordable. Currently, some 50/60% of the UK population cannot afford their own home. The government cannot afford to solve a problem of this scale using tax payers' money.

The issues

Used effectively, applied intelligently and with freedom for flexible interpretation and adaptability – standards and standardisation within the housing and overall residential sector could play a central role in improving production, quality and delivering overall value to the end-user. There are three key areas to address:

1. **Planning** – there is constant conflict at the local level because politicians need to be re-elected, so they won't vote through unpopular schemes that central government say they should have in their area. Standards can be used to establish a uniform UK process; consistent thinking and policy; consistent decision-making and speed up the whole process.
2. **Design** – standards can be used to guarantee quality across the board and provide a framework for innovation.
3. **Gap between policy and reality** – standards can work towards bringing the policy makers and practitioners closer together; bring the various stakeholder groups closer together – i.e. tie in planning for house building into health, education and transport decision-making.

Ideas and suggestions

Planners and designers need to connect with the communities and understand the market and end users' requirements. This was a move towards an inclusive design standard that will help to build homes that meet the needs of the whole community. The group also recommended that standards for the layout and design of communities (design codes) were needed as well as for urban design and provision of essential services, linked to scale and local communities.

It was also important to integrate the planning process. It was agreed that there should be a standardisation of the planning application process as well as establish standards for planning applications themselves. It also suggested a rationalisation of planning, building control and building regulation processes across the country.

Thirdly, to improve the quality of housing and ensure long term value there had to be a consistent quality of construction. One idea was to set up durability standards for Modern Methods of Construction (MMC) where existing tests are simply not applicable. Another proposal was to have improved space standards which would result in more desirable homes.

The group agreed two areas to focus on: standards to improve housing design, incorporating MMC; and standards to improve the planning process.

Agreed actions

Part one: Standards for Housing Design incorporating MMC

It was suggested that the starting point for any standards on housing design must be a consensus on what represented minimum acceptable quality. This needed to be defined both in terms of the minimum inside and outside space acceptable to individuals/ households, and in terms of the minimum level of facilities to be provided at an individual and community level.

"a need for a performance-based approach"

There is a need for a performance-based approach. This would enable maximum design flexibility in achieving sustainability objectives using MMC or any other approach. One of the main drivers for new housing standards has to be the poor technical quality of much of the new housing, above and beyond any considerations of minimum space requirements. Poor quality results from pressure on budgets and time constraints, which are always likely to be a constant factor going forward. MMC has been widely discussed as a partial answer to some of these problems.

New housing standards would need the support of other complementary urban design standards and codes of practice for refurbishment. Houses do not exist in isolation; to create 'sustainable' communities urban design standards are required to specify minimum infrastructure needed to support different densities of housing. The infrastructure needs will be different for low rise than high rise. For new developments, infrastructure must include not just highways and utilities but schools, shops, healthcare, entertainment, green space etc. Over 50% of UK housing construction activity is refurbishment and it is essential to have standards for this as well as for new build. A code of practice for refurbishment, repair, maintenance and renewal (RRMR) is also required.

The introduction of any new standards in this area would require a new approach to UK housing policy and probably legislation to ensure mandatory compliance. A larger issue beyond the scope of standardisation is that in the UK home ownership is the most dominant housing model. There is a need to review housing policy in order to try and de-stigmatise renting, as this would introduce far greater flexibility into the market. However, it was acknowledged that this would represent a major cultural shift in Britain.

Part two: Standards for Improving Housing Planning and Procurement Processes

A significant amount of land is potentially available for development but the amount freed up each year for housing is governed primarily by commercial market forces rather than consumer needs. The planning process is a significant factor in getting land released. If commercial land owners had more clarity about whether and when they would receive planning permission for schemes, then regional development could be planned with more certainty, for the overall benefit of communities. To be more effective the planning system needs to have a high level stage gate process that is agreed to by all of its stakeholders. Once a scheme had got through a stage, it would not have to go back through that stage again.

" the planning system needs to have a high level stage gate process"

The advantage of this system is that all parties would know exactly where they were and it would reduce uncertainty throughout the planning process.

6. Water Industry Workshop

Background

Standards have a key role to play within the water industry. Water is a highly regulated sector, with significant strategic and political importance, not least as a major investor in capital projects – over £80bn will be spent in the 20 years between 1990 and 2010 to improve water supply. A good standards base is fundamental to its successful operation on behalf of its customers and stakeholders.

The water industry needs every member of the public to become aware of sustainability issues. Society needs to have some idea of what sustainable development means, and to contribute to long term decisions on: how to deal with climate change; who will take responsibility; and who will pay for essential environmental investment?

Water-related standards are likely to play an important part in implementing the dual principles of good governance and sound science. It would be interesting to see how the current standards base matches the current definition of 'sustainable development'.

The water industry is the most tightly regulated of all sectors, but what makes for effective regulation? OFWAT has defined this as 'proportionate, transparent, consistent and measurable', but the day to day reality depends on the implementation of agreed standards.

The issues

The group highlighted a number of key issues – but the main area was of educating the consumer about the use of water and the danger of water shortages in light of the changing climate of the UK. Time and again the group returned to this theme, sometimes indirectly linking it via concepts such as metering or the general lack of understanding about leak management in the water industry. The second major area of concern was the sheer number of bodies involved in the water industry. This had led to a confusing number of standards and a lack of enforcement.

The main issues were:

Consumers & Education

- Lack of public understanding
- Consumer apprehension that water efficient products will have poorer performance
- There is only interest in saving water when there is a drought
- Seen as regional problem not affecting whole of UK
- There is a reticence to use recycled water
- Water is regarded as a universal right; i.e. why should individuals take any responsibility
- Water supply is a hidden service
- Consumer perception of leakage management

CONT...

Bodies & Regulation

- Lack of representation at essential standards making bodies
- Insufficient support for new technologies
- Disconnection between specifier and buyer
- Too many organisations pulling in different directions
- Different standards requirements for each water company
- Long time taken to change standards and regulations; out of step with 5 year price reviews
- Standards required for alternative water supplies
- Government reluctance to impose tight standards
- A regulatory framework which is too focused on consumer "ability to pay"
- Water paid for in a way unrelated to the volume taken – devalues product
- Metering technology/ reluctance to invest in intelligent metering
- Lack of metering in water stressed areas

Ideas and suggestions

The following ten ideas were put forward as ways that standards and or standardisation could help improve performance in the water sector.

- Whole life assessment of water fitting including energy use
- Standards for installers and maintainers of water products and appliances
- Linkage of water efficiency standards to planning permission
- Quality standards for rainwater harvesting
- Develop a water efficiency classification system
- Product performance standards
- Improving the minimum water efficiency of domestic products
- SMART metering
- Regulate efficient products at point of sale
- An agreed national, if not international, standard methodology for determining water consumption, like the urban cycle consumption figure for motor vehicles

Agreed actions

Based on the issues and ideas put forward, the group recommended two broad areas of action, as follows:

1. Consumer awareness – using standards to help educate consumers about water efficiency

The key targets groups which need to be addressed to improve consumer awareness are:

- Retailers
- Designers
- Regulators
- End users
- Institutions
- Specifiers
- Educators/Trainers

The purpose would be to educate people about water efficiency performance options in order to help them compare and contrast products so that they can make educated purchasing decisions.

This objective could be achieved through a suite of water-related guidance standards for design, installation and maintenance. This would be useful as part of the Design for Sustainable Homes initiative, to integrate all the latest developments going on within the water industry.

The guidance standards would incorporate comparative performance data, and present it in an informative way, perhaps through an easy to understand rating system, which would show how different products and systems score in terms of water efficiency. The guidance would reflect the requirements of both UK and European standards. It would also clarify guidance that derived from withdrawn standards, which are still widely used in the industry.

"a significant publicity and an ongoing awareness campaign is required to achieve widespread consumer buy-in"

The guidance would need significant publicity and an ongoing awareness campaign to achieve widespread consumer buy-in. It would also need to be regularly updated.

2. Integration of water bodies and their standards – the best way of achieving organisational alignment

Most bodies have similar objectives, but each has their own way of doing things, which leads to fragmented, duplicated and incomplete information available to end users, reinventing the wheel and lack of joined up thinking.

There are two different types of organisation involved in the water industry, water supply companies and water construction companies. They tend to have somewhat different objectives. There is also a high staff turnover in most bodies which makes continuity of strategy and policy problematic.

Historically, the water industry wrote many of their own standards; this is now much less common. There is now no resource or time to do the work. The industry is currently working more independently on standards because end users trusted the British Standards brand, but the delivery time to create them was problematic, not least because of the proliferation of other water saving schemes, and the distraction that meant in terms of time and attention from the bodies that needed to be involved in the new BS. Standards were too expensive, restricting their use in the marketplace.

What are the solutions? The group recommended that the energy supply industry may be a useful model; Ofgem thought to be a better example than Ofwat. A good practice register could be established, specifying expected levels of performance at all stages in the water supply chain.

It was essential that a neutral organisation, such as BSI, should take the lead, but that all relevant industry bodies should be involved in the development of any over-arching standard. Currently, industry felt BSI was failing to provide a suitable forum for dialogue, albeit that the current workshop was felt to be a good start.

"all relevant industry bodies should be involved in the development of any over-arching standard"

7. Conclusion

Next steps

The format for each of the six industry-led workshops followed the same format to ensure that there was a consistent approach and response from industry to the content being presented and then created during the workshops. Key issues were developed and discussed in each of the sessions. These were then prioritised in the development of ideas and suggestions for the project team to address on behalf of the built environment sector. Finally a select number of critical actions were identified for immediate attention.

Priority Actions

- Development of an overarching procurement standard for clients and supply chain partners
- Housing design with specific regard to MMC
- Improving housing planning and procurement processes
- Several actions regarding making Interoperability easier to understand and use
- Creating a standard framework for the use of Building Information Modelling

It was widely agreed that where appropriate that these key principles should also be engaged through the whole life of the built asset rather than only at the design and construction phases.

Continued Industry Engagement

It was agreed that a critical strength to the approach of the Rethinking Standards in Construction initiative has been the engagement of industry in the continued development of the Action Plan. It was emphasised through the workshops that continued industry engagement would be critical to the ongoing future success of the programme in the development of a portfolio of standard for industry by industry.

Challenge the Status Quo

One of the final key overall messages from the workshops was to challenge the way that standards have been developed and published historically.

- Workshop attendees broadly welcomed the concept of associating future standards with performance measurement and benchmarking.
- The overwhelming challenge from the workshops was to assess the current paper-based format of publishing standards. Any new form of publishing standards should be focused on making standards easier to use and implement in organisations.
- Where appropriate alternative forms of publication such as web-based technologies should be explored.