

# Sustainability in the built environment: The importance of skills, education, and recruitment

A conference exploring progress since the publication of 'Building Better' by the WSBF in January 2015

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**Attlee Suite, Portcullis House, Westminster**  
**11am – 1pm, Wednesday, 25th November 2015**

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## Event Summary

**Chair**  
**Bob Neill MP**

**Speakers**  
**Dr Roberta Blackman-Woods MP** – Shadow Minister for Housing  
**Professor Tim Broyd** – The Bartlett Faculty of the Built Environment, UCL  
**Nathan Baker** – Institution of Civil Engineers  
**Ben Pritchard** – Constructing Excellence/Generation 4 Change  
**Pauline Traetto** – BRE Academy  
**Dr David Hancock** – Cabinet Office



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## Event Background

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The Westminster Sustainable Business Forum organised a conference to follow-up with its recent essay collection *'Building Better: Recommendations for a more sustainable UK construction sector'* to explore the progress made since its publication. The publication included contributions from UK Trade & Investment, BRE, Carillion, the Construction Industry Training Board, Willmott Dixon Energy Services Limited, and the School of Construction Management & Engineering at the University of Reading. Contributors provided comments and recommendations on a range of construction-related topics, relevant within the 'Construction 2025' industrial strategy.

This follow-up conference focused specifically on the importance of and pathways to reforming skills, education, and recruitment in the construction sector in order to make it more sustainable. It drew upon some of the recommendations made in the essay collection on how to encourage the right blend of skills, training, and qualifications as well as how businesses can incorporate sustainability aspects into recruitment processes.

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## Speaker Presentations

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### Dr Roberta Blackman-Woods

Shadow Minister for Housing

*"Government needs to take advantage of the emerging sustainable construction field and invest in both apprenticeships and technology. But there is also clearly a role for industry here to invest. And this role will not only be about ensuring that apprenticeships have access to new technology-based jobs but also about making the industry attractive to young people".*

Roberta opened her address with a reference to the Housing and Planning Bill, going through the Committee stage in the House of Commons, and highlighted that while there were always disagreements between the parties, in this case a cross-party consensus about the need to increase the numbers of houses being built in the UK was very clear. She went on to point out that we can only build more houses if we have the skilled workforce that is able to translate our desire for more houses. Construction currently employs 2.3 million people in 280,000 businesses and the global construction market is expected to grow at an annual rate of 4.3% until 2025, with substantial growth opportunities, not only in the UK, but in emerging markets and across the globe. To realise these opportunities, skills and education are vital and Roberta emphasised that we need to make sure that we have the right level of training to facilitate growing productivity in our economy and the construction sector more specifically. There is also a need to ensure that the construction industry is at the forefront of innovation, using the most advanced and efficient technologies, which, again, is highly dependent on whether we have enough people in training and that the training is of a good standard. With the construction industry having lost around 400,000 workers over the course of the economic downturn, a further 40,000 workers are expected to retire from the industry in the next five to ten years – a number that only hints at the scale of the task ahead. Roberta referred to the 2015 Federation of Master Builders' (FMB) state of trade survey, according to which 50% of FMB members experienced difficulties in hiring workers such as bricklayers, carpenters or joiners.

Roberta went on to point out that employers are also concerned about Britain's relationship with the EU as a considerable number of people working in the construction industry come from the EU. She pointed out that the Chartered Institute of Building warned that tight regulation of immigration, which might come as a

consequence of leaving the EU, could damage construction activity in the UK. In this context, it is ever more important that the UK has a good level of well-trained, home-grown workers and ensures continuous training in the field, while acknowledging the implications of needing workers from outside. Roberta considered it critical to have a good number of apprentices and ensuring that their training is of a high standard. Expenditure on apprenticeships in England is around £1.5 billion, with £0.7 billion being spent on 16-18-year-olds and £0.8 billion on adult apprentices. Given the sheer scale of the shortage in the construction sector, this might not be enough. Further, Roberta emphasised the importance of making new links between education and industry and urged academia and the construction sector to support each other in replenishing a high-skilled workforce, especially in the context of the green and sustainable construction market. Roberta cited the essay authored by Gilli Hobbs and endorsed her recommendation for Government to “set long-term commitments for improving the environmental performance of all buildings, across their life cycle and beyond zero-carbon; [...] thus developing standards, products and services for the growing global market”. There is a great potential for the UK to become a leader in greening the construction sector; however, the ideas of academia, innovative technology and industry will need to be married up quickly in order to achieve this, while technology-related skills will need to be incorporated at all levels of training.

Finally, Roberta turned to talk about a multi-skilled workforce, which will need to incorporate a combination of traditional and modern skills and be consistent across the whole sector. She urged Government to take advantage of the emerging sustainable construction field and invest in both apprenticeships and technology, while making sure that industry invests and plays its part in ensuring that apprenticeships have access to new technology-based jobs and making the industry attractive to young people. Roberta proposed that National Apprenticeship Week could be used to showcase what the sector can deliver for young people in a more attractive way. Related to this topic, she also pointed out that action was needed to tackle the lack of women in the sector. Gender diversity in the construction industry is shockingly poor, with women making up just around 11% of the entire workforce. On building sites themselves it is estimated that 99% of workers are men and the UK has the lowest proportion of female engineers in Europe, with only 14% of entrants to engineering and technology-focused university courses being women. Roberta highlighted the importance of presenting the construction industry as a good, viable career option for girls and women so that the sector is diverse and well-rounded.

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## Professor Tim Broyd

The Bartlett Faculty of the Built Environment, UCL

*“The move to industrialisation is opening up new and emerging gaps in supply chain understanding and digital engineering. Many companies now act ‘digitally first’ before even thinking about developing on-site. Systems-thinking as well as lifetime-thinking are becoming ever more important in terms of greater efficiencies and reductions in carbon”.*

Tim began by highlight his own background and the fact that he himself moved from the industry to academia just over three years ago, with his previous roles in the industry already having been at the interface between industry, academia and government/policy-making for the built environment. He then set out that the built environment should really include both, buildings and infrastructure as well as both capital procurement and operational aspects and maintenance. The associated industry is highly fragmented with a relatively small number of large companies and a high volume of very small companies. Within this fragmented industry, there are many different skills and disciplines and recently, there has been an increasing trend to industrialise the built environment sector with Building Information Modelling (BIM) and Design for Manufacture and Assembly (DFMA). Tim further pointed out that this move to industrialisation is opening up new and emerging gaps in supply chain understanding and digital engineering, meaning that “systems-thinking”, that is, considering how parts of infrastructure work with each other as a whole and understanding buildings as a system, is becoming more and more important. Tim also emphasised that life-time thinking is equally important. To reflect this in cost-terms, we need to move from looking at capital expenditure and operational

expenditure separately to considering total expenditure. Tim also thought that if we can understand the holistic value of individual facilities better we might construct better performing buildings in the first place. This will need to be matched in carbon terms, that is, moving from accounting for capital carbon and operational carbon to looking at total carbon.

Tim did not think that reforms of the education system for the construction sector are currently needed. First and foremost, the image of built environment and engineering will need to improve in order to attract more people to become engineers and act to improve the vast imbalance in terms of diversity in the sector both in terms of gender diversity and ethnic diversity.

The introduction of BIM and DFMA is likely to lead to a different kind of skilling of the workforce. Tier-1 contractors are now starting to employ supply chain specialists from other industries, for example automotive and aerospace. However, Tim also pointed out that there are significant and vast differences between these industries and that a simple transfer of skills would not be possible. Specific business processes need to be adjusted and, crucially, culture and behaviour need to change. He lauded Government's leadership in the move to BIM, not by legislation or regulation but by mandating BIM level 2. At the same time, however, Tim lamented that this initiative is currently concluding in March, with nothing yet in place to replace it. Government has invested about £1-2 million per year to set up a framework for BIM, to develop a tool set and training, including that of procurers in Government departments. As a consequence, procurement costs have been 15-20% lower. This, however, only relates to central government, with nothing covering local authorities and until there is a steady pipeline of customer requirement over the long term for BIM, it will not be easy to tell how the skills systems should be best amended, if at all. Tim further highlighted that there are similar issues with DFMA. Around 10-15 years ago, a number of prefab housing manufacturers went out of business, largely before they properly got into business, because housing association were unable to provide forecasts for mass-manufactured numbers of units over a number of years. Market dynamics in the sector are very different from the rest of the manufacturing sector.

Tim also emphasised that the built environment is and always has been part of the manufacturing sector. Construction and manufacturing were never separate but have been parcelled up in different departments for administrative purposes. The approach of "design, then construct" might still be alive, but needs to be replaced by greater collaboration and cooperation across all stakeholders and disciplines at an earlier stage. For example, construction products companies are now starting to engage much earlier in the process, which is enabling them both to help improve the design and constructability as well as tailor products for particular purposes. Further, there is currently substantial engagement between industry and academia; however, this mainly happens between academia and large and/or specialist companies as small companies tend not to have the innovative capacity, including time, money and resources, to get properly engaged. There is also a significant difference in terms of time scales and the ability of academia to march in step with industry. It takes a couple of years to set up a new undergraduate or postgraduate course and at least one to three years to set up a new large research activity.

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## Nathan Baker

The Institution of Civil Engineers

*"The civil engineer of today is very much focused on wider skills. Brunel was the archetypal civil engineer; he was a one-man team. Similarly, the skills required today are no longer just about understanding bending moments or strength of concrete. They are about being able to understand the people you are working with."*

*Right people, right time, right place, right skills.* Nathan opened his address by highlighting that the civil engineer of today is very much focused on a wider skill set, which can be broken down into four categories: technical skills, people management, personal development, and business skills. Making use of Brunel as the archetypal civil engineer, Nathan went on to showcase how he had been a one-man team, raising the money, organising the projects, finding the materials, designing and then implementing the project. Today, the workforce in the construction sector is multi-disciplinary, multi-functional, and works in cross-sector teams.

The skills required now are no longer just about technical understanding but about being able to understand the people you are working with. McKinsey estimates that there is \$57 trillion to be spent on infrastructure globally to be done by 2030. The immediate problem can be solved relatively easily as contractors perceive that they technically do not have a skills issue because they buy the labour in. They rather are presented with a wage inflation issue and a very mobile workforce, which moves from project to project; a model that is highly unsustainable and which we need to address going forward.

Nathan highlighted that for his understanding the biggest issue facing the construction sector at the moment is about how we deal with change. It is change that slows us down or rather, how we deal with change can slow us down tremendously. Our world is constantly changing and with it technology, people and materials are changing. As the inhabitants of this world we have to deal with these changes, which in turn means that people will have to be even more capable of adapting. Nathan further went on to describe how the so-called millennials, that is, those under 35, think differently and use different channels for communication and knowledge creation than previous generations. Being aware of these differences, the industry will need to address the skills topics around communication and engaging people inter-generationally in order to drive what Nathan called an infrastructure revolution, distinguishing it quite clearly from the process of evolution, which he characterised as gentle and generally happening without anybody noticing.

Taking his speech back to Brunel, Nathan highlighted that Brunel understood risks and the management of risk far better than the construction industry today. There is a need for us to start to innovate and take more risks in managing effective delivery, intelligent planning, and design. Referring to the volume of concrete being put to use in the context of Crossrail, he pointed out that first pour of concrete will have fundamentally been the same to the last pour of concrete used in the project, despite the extended length of the project. By contrast, companies like Vodafone are making strategic changes to their business models almost every week because their environment is changing so fast and the technology is shifting with it. Nathan emphasised that we need more innovation in terms of materials, our way of measuring and monitoring our performance of activities, and our skill set has to change to incorporate digital engineering as a fundamental component. Nathan also emphasised the importance of attracting people into the construction industry and to subsequently develop them. He also saw diversity as a fundamental issue in our workforce, which will need to be addressed. One way to do this could be to support comeback schemes to get people back into the workplace after a period of time out due to parenting, long-term care or in the case of employees making a change from one specific industry to another as the skills people have from outside the construction sector are becoming ever more important today than they have ever been. Nathan finished by making a request to Government about integrating the supply chain. With a massively fragmented industry, supporting UK Small and Medium-Sized Enterprises and getting them integrated into the chain will be vital. Nathan concluded that from a skills perspective, we need to ensure whole-life learning; we have to have broadly skilled people and, most importantly, we need to accept the fact that change is happening and we have to deal with it now.

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## Ben Pritchard

### Constructing Excellence/Generation 4 Change

*“What we build has a fantastic social impact: With everything that is constructed, be it a new kitchen, an extension to the house, or Crossrail, you are improving someone’s home, someone’s life, someone’s commute and ultimately you are improving someone’s perspective.”*

Ben Pritchard started by emphasising the need to increase talent in the construction industry and expressed concern at the sector’s failure to create an attractive image for itself so far. He shared some of his own perspectives on working in the sector and highlighted the tremendous impact the built environment can have on people and society as a whole by shaping the environment and improving people’s lives. Drawing on his own experience in terms coming into the industry, Ben highlighted that one of its most aspects is the ability to be involved with things that change people’s lives for the better and the fantastic social impact that what we build can have. Ultimately everything that is constructed, a new kitchen, an extension to the house, or Crossrail, we are improving someone’s home, life, commute and with it their personal perspective.

Ben pointed out that this image and enthusiasm will need to be conveyed by the influencers in society as it might be hard to erode the traditionally negative reputation of the construction sector in schools alone. Further, career advisers will need to highlight better the plethora of options for careers within the sector. At the moment, less than 30% of careers advisers will actually advise that construction is a good place. The range of opportunities within the industry goes far beyond the public's perception and the digital revolution will further increase the different paths possible within the industry. This does not only relate to BIM and digital engineering, but encompasses all other innovations that are happening. The sector needs to capitalise on data and its management and use, on robotics, on 3D printing, and on offsite construction, and fundamentally change the way we build buildings.

Ben continued by emphasising that remembering the soft skills and the person behind the qualifications is vital. In his opinion there is potentially too big of an emphasis on the need more coders, people with IT background, when engineers are needed who have an oversight over the whole process. The foundations for understanding changes and how these influence the built environment is laid at a very young age and he lauded National College for High Speed Rail in Doncaster for taking a lead on these issues. However, he also pointed out that a focus on young people will not be enough, but that the industry will also need to encourage the older generation, parts of which might have taken a leave of absence from the sector and will need support to get back. Further, he hinted at a potentially massive pool of talent that the industry cannot ignore, consisting of people who are looking for a career change. Ben concluded that there is more that we can do as an industry to try and persuade people to seek out a career in the sector, for instance by going to schools and spreading the message how great the industry can be.

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## Pauline Traetto

BRE Academy

*"I urge Government to reflect on the terminology of apprenticeships. The term more and more is a hindrance to uptake. The terminology is associated with muddy boots and contributes to the perception that an apprenticeship is not as good as a degree. If we could reflect on the name of the apprenticeship I am sure we could help turn around the perception of the industry, further diversification and remain best in class."*

Pauline opened her speech by showcasing the success of the BRE academy over the past 2 years and by emphasising that the UK is in a position of leadership in terms of construction. In order to reflect changes to the construction sector and its environment, the BRE's training and education programmes have also changed. The BRE has been training for 50 years, but over the past 2 years there has been a specific focus on the skills shortage and on upskilling the industry. Pauline lauded the UK's success in effectively bridging the gap between academia and industry by having cross-sector conversations. From these conversations it has become apparent that employers more and more require workers whose qualifications combine a versatile set of skills. Hence, courses that teach employees the cutting edge, new technologies, while also making them aware of what is happening industry-wide. Pauline also pointed out that the construction industry will need to better enable career progressions and the BRE, together with institutions like the Construction Industry Training Board (CITB), academia and other organisations is working across supply chains to develop educational programmes that meet that need for the skills that are needed today but also understand which skills will be needed tomorrow. With respect to training around BIM, the BRE has basically embarked on a journey with industry to realise the full potential of BIM, training various levels across the supply chain, while also collecting information from this process.

Pauline pointed out that digital training can be one effective way to make the industry more accessible and communicate its interesting and versatile aspects. The BRE has increased its efforts in making a number of its programmes digitally available and also invests into skills programmes in cooperation with primary schools across the UK for year 6 children to come to BRE's Innovation Park, which showcases many of the technologies that are transforming the construction industry. However, school curricula can be tight and the industry needs to think about alternative routes to attract new talent. Modular approaches to learning can be one way to engage more people as they can learn on their lunch breaks and on the weekends. 43% of BRE

employees are women and there are currently 24 apprentices at the organisation. By itself this is only a tiny contribution, but Pauline made the case for industry-wide collaboration, urging industry leaders to come together to develop a framework with Key Performance Indicators and to regularly revisit to make sure it stays relevant.

In order to support the impact that change will have on society and the construction industry, Pauline presented the BRE's online tools, which help technical experts understand softer skills and the changes that these new disciplines require. She highlighted that the industry is already joined together by goodwill to change the status quo and pointed out that this will need to be formalised in order to have a lasting impact. Pauline concluded by urging Government to reflect on the terminology of apprenticeships, pointing out that the term more and more seems to become a hindrance to uptake. With the terminology being associated with a dirty work environment, public perception is still that it is not as good as a degree. Reflecting on the name of the apprenticeship could help turn around the image of the industry, support diversification and ensure UK construction remains best in class.

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## Dr David Hancock

Cabinet Office

*“Our challenge is to help people access the construction industry and make it more attractive to a wider audience. The net will need to be cast wider and the gender pay gap, which at 22.8% is wider than in any other industry, will need to be closed. Only 12% women and 3% from the Black and Minority Ethnic community are represented in construction therefore, there is a massive amount of people the industry is currently not engaging with.”*

David began by highlighting that construction is an immensely important area for the Government. He explained that for every pound spent on construction in the UK, 92p stay within the UK and that the sector accounts for about 6.5% of GDP, while employing around 2.1 million people. David then went on to point out that Government is also a major construction client, putting it in a position from which it can influence the industry. In 2011 the Government published its Construction Strategy, which set out the path for the future of the construction industry. This was aligned with the strategy for industry - Construction 2025, an industry document, published by the department for Business, Innovation and Skills (BIS). These conceptual documents aimed to increase efficiency and reduce spend by about 15-20%. One of the things Government did in order to achieve this, was that all Government contracts mandated the use of level-2 BIM. David further turned to the 'construction pipeline', within which the Cabinet Office has identified £118 billion worth of work that needs to be completed to raise the level of construction in the UK. For infrastructure this figure is almost four times as much, around £400 billion. On our way out of the recession – a time during which nobody invested in the sector and in training its workforce – we are in desperate need of new blood to come into our industry. David lamented the poor level of diversity in the sector and highlighted that the percentage of women in construction remains in the low teens, at a time when more and more women are taking on board positions. He traced this back to the oft-mentioned image problem of a career in the sector, which is that of a physically tough, dirty profession, while, in reality the industry, has moved on to smart devices, the digital revolution and BIM.

David went on to explain how Government is planning to tackle the challenges to the construction industry. For instance, the new head of civil service John Manzoni is leading an agenda to upskill government in areas such as commercial and professional capability. Further, Government has put in place the Major Projects Leadership Academy, a joint venture between Deloitte and Saïd Business School. The Academy hosts an 18-month course for all Senior Responsible Owner who are accountable to Parliament for the delivery of projects. David also pointed out that there is recognition in Government that policies need to be accompanied by a professional agenda and emphasised that delivering projects is as important as writing the policy around them. In this context, David further highlighted the merger of Infrastructure UK with the Major Projects Authority to form the Infrastructure and Projects Authority (IPA) and the development of a national infrastructure plan for skills, which analyses the skills landscape in the UK and presents key challenges facing

the industry to deliver the infrastructure pipeline. Around 100,000 additional workers are needed to deliver the infrastructure plan and David pointed out that the required skills will change over time, leaving around 250,000 existing workers to be retrained and upskilled. Workers will need to be able to move effectively between sectors, projects and regions in order to be able to deal with the increasing labour demand. For a more diverse set of people to enter the industry the net will need to be cast wider and the gender pay gap, which is with 22.8% wider than in any other industry, will need to be closed. With only 12% women and only 3% of workers from the Black and Minority Ethnic community, there is a massive amount of people that the industry is currently not engaging with. The sector urgently needs to improve career information and advise more young people to move into apprenticeships. Government is committed to apprenticeships and is using public procurement support them by introducing the apprenticeship levy on large companies. Any project over £10 million will need to include a plan for apprenticeships.

David further highlighted that one peculiarity of the construction industry is that there are around 950,000 SMEs in the construction supply chain, which amounts to around 18% of all the SMEs in the country. There is a low barrier to entry for SMEs in the construction sector and Government is aware of the importance and moral obligation of prompt payment within supply chains. The lifeblood of SMEs is cash flow and through project bank accounts and the fair payments charter agreed by the Construction Leadership Council (CLC) their future can be supported. Concluding his speech, David emphasised that construction is on a position to drive growth across the whole economy, as construction and infrastructure is the heart of any nation.

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## About the organiser

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### **The Westminster Sustainable Business Forum**

The Westminster Sustainable Business Forum (WSBF) is a high-level coalition of key UK businesses, Parliamentarians, Civil Servants and other organisations. Providing a politically neutral environment for knowledge sharing and discussion on sustainability policy, we help to inform the wider sustainability agenda in government and are a trusted source of independent information and advice for policymakers. We publish authoritative research reports; impact on government policy through our in-depth round table policy discussions and outputs; and inform the wider sustainability debate by convening Parliamentarians, senior Civil Servants, business experts and other stakeholders at our larger policy events and seminars. The WSBF works in the policy areas of sustainable construction, sustainable infrastructure, water, sustainable planning, green finance and natural capital. We are cross-party, independent and not-for-profit.

For more information, please visit <http://www.policyconnect.org.uk/wsbf>, contact Claudia Jaksch at [claudia.jaksch@policyconnect.org.uk](mailto:claudia.jaksch@policyconnect.org.uk) and follow us on Twitter [@theWSBF](https://twitter.com/theWSBF).