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I INFRASTRUCTURE Intelligence

Produced for the industry by the Association for Consultancy and Engineering



Talent champion

Institute of Directors' chair and ACE advisory board member *Lady Barbara Judge* on why UK engineering must invest in the best talent

page 30



INFRASTRUCTURE
Intelligence

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MESSAGE FROM
THE EDITOR

Four months into the new Tory government’s five year administration and there is a clear sense that for the infrastructure sector there is opportunity ahead.

But equally there is a realisation that this government is not the same, rebadged version of the last coalition.

With a clear majority David Cameron and George Osborne have the mandate they want to drive the UK towards their goal of economic growth and business prosperity.

Interviewed in Infrastructure Intelligence this month, Institute of Directors chair and ACE advisory board member Lady Barbara Judge makes clear that it is an opportunity that they must not blow. The business agenda must, she says, “be at the forefront of policy”.

Few business leaders in infrastructure would disagree. Nor would they argue with her insistence that for this government policy to succeed, the entire supply chain must be engaged and incentivised. In particular with direct encouragement and support given to the vital smaller companies underpinning the economy across the UK.

As she puts it: “Government spends so much money on infrastructure it has to make sure that the benefits go to small businesses”. And that means creating new incentives through tax breaks and other SME focused activities but it also means educating and guiding businesses towards those that already exist.

Negotiating the next five years of austerity will be tough for all as government ramps up its demand for greater productivity and the global competition bites into profits. SMEs in particular will need all the help they can get to find the resources to invest in the talent, innovation and new business practices that will deliver the required productivity increases.

And as Judge points out, it starts with employing the right brain power - there is no substitute for a talented workforce. “My advice is to hire women,” she says. “Open the door to the smartest and most dedicated people you can find notwithstanding their gender.”



Antony Oliver,
editor, Infrastructure Intelligence

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News roundup

ENERGY

Balfour Beatty and NG Bailey’s joint venture has been appointed as preferred bidder for the £460M Hinkley Point C power station electrical package, for EDF Energy.

Government has been urged by independent think tank Policy Exchange to continue support for onshore wind farms as a route to decarbonisation but only for cost-effective projects in Scotland and Wales.

The Oil & Gas Authority has announced that 27 onshore fracking blocks from the 14th Onshore Oil & Gas Licensing Round will be formally offered to companies. Another 132 blocks have been subjected to detailed assessment under the Conservation of Habitats and Species Regulations 2010, the findings of which are now out for consultation.

Government has stepped in to accelerate the planning process for shale gas exploration by introducing new measures to ensure councils make planning decisions within 16 weeks. New powers will be given to the Communities Secretary to call in planning applications and recover appeals. The government will also be able to take decision away from councils which fail to make decisions within the timescale.

Dogger Bank offshore wind farm in the North Sea – the biggest offshore wind project in the world - has gained planning consent. Dogger Bank Teesside A&B will have an installed capacity of up to 2.4GW - enough to power the annual electricity needs of 2M homes.

PEOPLE AND CAREERS

Large infrastructure businesses could be asked to



After three years of major building work, Nottingham’s £570M newly expanded tram network has opened. Phase Two extends Nottingham Express Transit’s service to the south and southwest of the city, reaching Chilwell, Beeston and Clifton. The extension more than doubles the size of the city’s tram network, adding 17.5km of new track and 28 new tram stops to the existing network that travels to the north of the city. Construction work was undertaken by Taylor Woodrow and Alstom on behalf of Tramlink Nottingham; the NET concession holder appointed by Nottingham City Council. It was eight months late and contributed to contractor Taylor Woodrow’s civil engineering losses of £165M last year, but it is being welcomed enthusiastically by the city.

pay 0.5% of UK payroll into the Government’s planned new apprenticeship levy, according to the CBI. “This reflects comparable schemes elsewhere and would generate the sorts of sums needed to fund the expansion of the apprenticeship programme,” it said in a briefing note. More than 30,000 of Government’s target 3M apprenticeships are to be created in the road and rail industry, it was announced. Crossrail and National College for High Speed Rail chairman Terry Morgan is to develop a transport and infrastructure skills strategy to help the transport industry ensure a continuous pipeline of skilled workers.

The All Party Parliamentary Group on Infrastructure has reformed, with new officers. Former Transport Minister and current member of the Treasury Select Committee, Stephen Hammond MP, is chair of the group. Others members are Neil Carmichael MP (chair of the Education Select Committee), Alan Brown MP (a civil engineer), Mark Prisk MP, Dr Alan

Whitehead MP, Kelvin Hopkins MP, Lord Berkeley and Lord Chidgey.

A fresh All-Party Parliamentary Group for Housing and Planning has been formed to address the national housing emergency. Royal Institution of Chartered Surveyors (RICS) will take the lead role in supporting this new APPG. Chair is James Cartledge, Conservative MP for South Suffolk supported by vice-chairs Mark Prisk (former Housing Minister), Helen Hayes (former town planner), Lord Richard Best (president of the Local Government Association) and Stephen Pound.

DIGITAL
INFRASTRUCTURE

Contractor Skanska has been awarded £200,000 funding as part of a £1M project to research real-time tracking of infrastructure asset components. The so-called ‘tag and track’ systems use Radio Frequency Identification (RFID) tags and barcodes to digitally identify

individual components and so help to boost efficiency across the entire lifecycle of infrastructure assets. The two-year research programme is being co-funded by a grant from Innovate UK for over £500,000. Skanska will work alongside partners BRE, Multiple Access Communications Limited and Leaderflush Shapland to develop the research.

PROPERTY

The 2015 property slowdown will quickly be replaced with a rush for skyscrapers and renewed focus on large scale regeneration projects, Skanska managing director Paul Heather has said. Increased foreign investment, a greater willingness of banks to lend and the desire of tenants to move into new premises or expand their businesses will return the capital’s property market to a boom he said.

HOUSING

Central and local government should work with the private sector to stimulate the construction of new, good quality retirement housing, according to new research by the International Longevity Centre. One solution, says the report, is the delivery of so-called “extra care housing”, where care services are provided on an as-needed basis to residents living in their own homes sited within dedicated retirement villages.

Building on green belt could add 7.5M car journeys a week to roads say town planners. According to Royal Town Planning Institute analysis, adding one million homes near railway stations in the Metropolitan London green belt area could see 3.9-7.5 million car journeys each week added to roads which are already struggling with congestion and delays.

WATER

Construction of London’s new £4.2bn ‘super sewer’ will start next year following the confirmation of independent investors to finance and deliver the scheme. Contractors will begin mobilisation in September. Bazalgette Tunnel Limited, a new special purpose company appointed to take the project forward, received its licence from Ofwat as a new regulated utilities business, separate from Thames Water. At the same time, Thames Water announced a much lower than predicted cost of the project to customers of £20 to £25 a year.

RAIL

Network Rail is to start the hunt for design and engineering consultants for its Crossrail 2 activity in September. Work on offer will be worth up to £110M.

Balfour Beatty has pulled out of a £75M contract to electrify the rail line between Preston and Blackpool. The move came after a review said work was unlikely to be on time and budget. Network Rail said work was still due to finish by spring 2017 and that it would retain Balfour Beatty’s design services, with a new contractor appointed shortly.

Transport for London has confirmed the award of the £760M Subsurface Tube line signalling upgrade to Thales. Thales were revealed as being in the frame in March.

Network Rail has been fined £2M by regulator the Office of Rail and Road (ORR) for failing to meet performance targets during 2014-2015. An investigation by ORR in relation to Southern, Govia Thameslink (GTR) and in Scotland in 2014-15 concluded that Network Rail breached its licence and did not do everything reasonably



Costain boss Andrew Wyllie has completed a £36M deal to buy professional services consultancy Rhead Group. The deal is intended to enhance the contractor’s programme management and advisory capability and enhance its integrated service offer as part of Costain’s Power sector, reporting into the Natural Resources division. Rhead Group was established in 1985 and with over 550 staff, provides a range of services across the infrastructure lifecycle, primarily in the UK for customers including National Grid, Wales & West Utilities and BAE Systems. In the year ended 31 July 2014, Rhead Group generated revenues of £63.5M and profits of £5.2M before exceptional administrative expenses of £0.7M. The contractor reported pretax profits up 72% to £10M in its half year figures. Turnover rose 17% to £621M largely from its highways, rail and power market contracts which delivered £475M.

practicable to deliver the reliability and punctuality to support train services.

BUSINESS

Royal BAM Group’s UK operations have reported first half profits, reversing the losses of last year. The UK civil engineering, building and property businesses had a £2.9M profit during the first six months after a £2.7M loss in the first six months of 2014. Turnover rose 18% to £776M.

Black & Veatch marked 100 years of providing critical infrastructure for clients around the world on Wednesday 12 August. The firm was founded in 1915 by Ernest Bateman Black and Nathan Thomas Veatch with 12 employees; it now provides energy, telecommunications and water solutions in more than 100 countries.

Infrastructure contracts worth £2bn were awarded in July according to the latest Economic & Construction

Market Review from Barbour ABI. The two largest were a £250M extension to the Burbo Bank offshore wind farm and a Beddington based ‘energy from waste’ facility worth £200M. From a regional perspective, it was the North West that dominated infrastructure for the month, with 32% of all contract values and an increase of almost 25% in activity when compared to July 2014.

Balfour Beatty reported half year results showing a loss of £150M on revenues of £4,085M. This compares to a £43M profit on turnover of £4,072M at the same time last year, although that was before the firm carried out reviews into project performance uncovered a new raft of problems that led to a series of profit warnings. Full year figures in March showed a £304M loss on turnover of £8.75bn. The half year results revealed a loss for the UK Construction Services division – from where most of Balfour Beatty’s recent problems have stemmed - of £145M.

The combined business of Tarmac and Blue Circle has relaunched as Tarmac, following the acquisition of Tarmac by materials giant CRH from Lafarge and Anglo American. The newly combined business can now say it is the market leader in aggregates, asphalt, contracting services, lime and powders and is a leading player nationwide in cement, concrete and other building products.

HS2

Britain’s new £50bn HS2 railway should consider the needs of customers beyond simply providing a connection from A to B, new research from Transport Focus has revealed. Customers expect HS2 to design world-class stations which are modern and tasteful with more effort to include local businesses in retail opportunities and other events. Panelists pointed to stations with great architecture such as Grand Central Station, St Pancras and Blackfriars and also praised airports such as Schipol and Singapore.

Two joint ventures are reported to be neck and neck in the race to win the job of HS2’s £350M engineering delivery partner. They are Atkins and CH2M, and Bechtel and Jacobs. Invitations to tender will be issued in September.

HS2’s plans to revamp London’s Euston Station have been revised in a bid to minimise disruption to the existing train services and maximise the efficiency of the station capacity throughout construction. The new plan will see the station developed in two phases rather than one, with six new HS2 phase 1 platforms constructed to the west of the existing station by 2026 with the remaining five open in 2032.

ROADS

Future road spending to eclipse current plans is possible but only if Highways England and its supply chain are clearly seen to be delivering the current £15bn Road Investment Strategy. And that evidence has to be visible by year three of the programme in 2017/8, effectively just two years away, says new Highways England boss Jim O’Sullivan in his first interview (see p38).

STRUCTURES

Preston’s historic grade II listed bus station and 22,500 m² site is to be redeveloped under a new multi-million pound investment plan revealed this week by Lancashire County Council. The £13M plan will preserve the bus station’s unique BDP-designed 1960s brutalist architecture and pioneering precast concrete, revamp the public space and create a home for the new Preston Youth Zone Plus. The redevelopment plan is by New York-based architect John Puttick Associates.

The British Library has been listed Grade I by Heritage Minister Tracey Crouch on the advice of Historic England. Originally designed by architect Sir Colin St John Wilson and his partner MJ Long, the Library was built between 1982 and 1999 by contractor John Laing, it was the largest UK public building constructed in the 20th century.

The competition for a new bridge at Tintagel Castle in Cornwall has attracted 137 submissions from 26 countries. The competition has been organised by Malcolm Reading Consultants for English Heritage. Graham Morrison of Allies and Morrison is chairing a jury that will draw up a shortlist of six entries with a winner announced in early 2016.

NORTHERN POWERHOUSE

Publication of a £13bn transport blueprint for the Northern Powerhouse has been criticised as a missed opportunity to progress long term schemes. The document outlines work underway in road and rail throughout northern regions but fails to mention any of the long term plans identified in the Northern Transport Strategy published in March. “Badging it as a blueprint is a missed opportunity,” said Marc Davies, chair of the ACE Northern Region and a director at WYG in Leeds. “The document earlier in the year had strategic ideas around road and rail and options for TransPennine routes. Progressing those ideas would have been very positive and shown proper commitment to the Northern Powerhouse.”

ENVIRONMENT

The majority of the UK public remains worried about global warming according to an IMechE / ICM Unlimited poll. The survey of over 2,000 members of the public found that 57% are worried about global warming, with 14% saying they were ‘very worried’. The poll also found that 64% of people think global warming is already a problem now, while 70% said they think global warming will be a problem in 20 years’ time.

AIRPORTS

Global Infrastructure Partners, the private equity owner of London City Airport, has put the airport reported to be worth up to £2bn, up for sale. It bought the east London airport from Irish businessman Dermot Desmond for £750M in 2006 and has decided to sell its 75% stake. City is GIP’s longest-held asset.

INTERVIEW: HS2 development director Rupert Walker on Euston’s new plan



As HS2 prepares to lodge an Additional Provision to the Hybrid Bill now going through Parliament, HS2’s Rupert Walker explains the drivers behind the revised two stage Euston Station scheme and the challenges that remain.

You have revealed new plans for redeveloping Euston. Why? It’s important in developing plans for HS2 that we meet the needs of everybody – passengers and the local community – and our plans are for a station that will be a place for everyone. That is why we need to make this change to the existing Hybrid Bill.

What are the key benefits? Our new scheme will cause less disruption to rail passengers, will enable us to manage the disruption to the local community in a much easier way and means we can plan for regeneration of the Euston area and Camden.

What big risks remain? It is a big construction project and in any construction project there are risks. But we are confident now that we understand Euston Station pretty much inside out – we understand how it works and what our plans are for it. The

work that we have put in over the last year has enabled us to better understand the risks.

Is your focus more towards minimising the impact on train passengers or the local community? Delivering any major infrastructure project will cause disruption and there is a balance between the disruption that gets caused to the people that live and work around the station and the people who use the station. That is why we are working to understand how passenger impacts are managed and also with the community to understand what their issues.

What is the impact on cost of these changes? There is a relatively minor impact on the cost of the scheme but the overall cost of HS2 phase One is still within its original budget and isn’t affected by this.

Have you ever considered the option of just stopping at Old Oak Common? That is a really good question but you just can’t do it. You need both Old Oak Common and Euston because we are talking about a massive number of people that will be using HS2 and will be coming to London. They go together – it is not a choice of one or the other.

So what happens now? There is some process in Parliament. It is really important the Hybrid bill is passed and we expect that to happen at the end of next year. Then we can get on and build it. We have got to work really closely with Network Rail and with TfL and with the local council to make sure that we develop the very best solution for Euston as a whole. HS2 is just a part of that.



Huub den Rooijen, Head of Offshore Wind at The Crown Estate

Offshore wind - one of the UK’s best infrastructure stories

This year it has felt like energy - and especially its cost - has rarely been out of the headlines, fuelled by a General Election and change of Government, fluctuations in oil prices, and the need to set out a vision for a secure, affordable and low carbon energy mix for the UK.

At the same time, much emphasis has been put on the importance of supporting the UK’s broader infrastructure future – from stimulating economic growth and jobs as well as ensuring the UK remains one of the most successful economies in the world.

I may be biased, but this seems a good moment to reflect on what might be one of the UK’s lesser known infrastructure success stories: offshore wind. This sector has gone from zero a little over a decade ago, to meeting around 5 per cent of the UK’s electricity demand today and is on course to meet about 10 per cent by 2020.

To date, investment in wind farm generating stations and offshore transmission links totals over £15 billion, a market set to double over the next five years. The UK has been acknowledged as the most attractive country globally to invest in offshore wind by consultants EY.

As the technology has matured,

the risk profile of the construction and operating phases of these long-term assets has become increasingly attractive to institutional investors. Crucially, the industry has also had major validation earlier this year that costs have come down significantly, due in large part to the breathtaking scale and pace of development in the UK.

Following reform of the Electricity Market, revenue streams are now underwritten by 15-year Government support contracts (‘Contracts for Difference’) allocated on a competitive basis. Following the bid prices from two offshore wind farms earlier this year, Neart na Gaoithe and East Anglia One, the sector can hold its head high in the knowledge that it will be cost competitive with other forms of low carbon energy by 2020.

As a result, the sector has a meaningful contribution to make to a reliable, affordable and low carbon energy mix alongside new nuclear and gas.

The upshot is that while industry must continue to work hard to reduce costs, it has never been in a stronger position to play its part in the UK’s long-term energy future.



Sue Percy, Chief Executive, CIHT

Industry must take action on diversity and inclusion

We increasingly hear from all quarters that the skills shortages in engineering and related professions are creating huge problems. In the highways and transportation industry, there is general agreement that we don’t have enough skilled people to work on all the new transport infrastructure projects or maintain our existing infrastructure. In addition, we have an ageing workforce with those retiring not being replaced in sufficient numbers by new entrants to the sector. So, what’s the answer? Unfortunately, there is no ‘quick fix’, or single solution but, if the industry is prepared to respond to these challenges and work together, there are things that can be done to improve the situation.

One of these is recognising the need for greater diversity in the workplace.

As a priority, we need to make highways and transportation an attractive career option for people from a diverse range of backgrounds enabling employers to recruit from the widest talent pool, rather than casting their nets only on traditional waters. There is also a need to create an inclusive culture within companies and across the industry so that all those who join us, whatever their background, feel welcome and encouraged to stay.

The business case for diversity and

inclusion (D and I) has been highlighted a number of times in the media recently, however implementing the changes necessary to take advantage of these business benefits does not appear to be a priority for some employers. Often, this is simply a case of not being sure where to start and this is where CIHT’s with its D and I employer toolkit can help.

The Royal Academy of Engineering awarded a grant to CIHT to conduct research into D and I in the highways and transportation industry and produce a toolkit to provide practical help and guidance to employers.

CIHT’s research found that the skills shortage is the main motivator for employers to take action on D and I issues. A number of employers have already started to think about how to do this and examples of good practice are provided in the toolkit. However, to make a real and sustained difference, CIHT believes there needs to be a step change in the way that the industry engages with issues around D and I as part of a long term skills strategy. To achieve this step change there will need to be strong leadership, culture change and sustained commitment in how the industry recruits, retains and develops its workforce.



Paul Jackson, CEO, EngineeringUK

Tomorrow’s Engineers Week needs you

Two years on from the Perkins review of engineering skills and as we all pull together plans for the third Tomorrow’s Engineers Week, something rather exciting is happening. The public is starting to appreciate engineers.

Findings from our annual perceptions survey, to be published later this month, show that 27% more 11-14 year olds believe a career in engineering is desirable than five years ago. The proportion of 15 and 16 year olds who would consider a career in engineering has increased from 37% to 49% in the same period.

And for 17-19s the number that have considered engineering careers has risen from 23% to 37%, with the proportion of girls rising from 12% to 28%.

This year’s survey shows a massive jump in the proportion of teachers who see engineering careers as desirable for students, at 79% compared to 57% in 2014 and the number of teachers saying engineering is undesirable for their students has halved since last year.

The Perkins review called for a coordinated approach to inspiring the next generation. Why bother? Because we need to attract new talent to the 1.82M engineering roles we will need

before 2022. That’s where you come in.

During Tomorrow’s Engineers Week, 2-6 November, we want schools and employers across the UK to work together on events and activities to inspire future engineers. We need you to tell young people about your amazing job, either by attending or hosting events/activities for young people. While we will lead on the public relations for the week, its success depends on your active input.

To support this year’s campaign we’ve also recruited two young vloggers (video bloggers), who will feature on the Tomorrow’s Engineers YouTube channel to help dispel myths around engineering.

If you’re new to Tomorrow’s Engineers Week, we can help. You can get inspiration from the website or contact one of the Tomorrow’s Engineers team, currently headed up by Chris Binnie on secondment from BAE Systems.

That active engagement at local and regional level feeds into a national picture that will continue to improve as employers across the country join the network. This coordinated approach will see the programme reach a million young people with positive messages about engineering each year. That’s an inspiring thought.



Andrew Crudgington, Director of External Affairs and Strategy, ICE

What if the Spending Review really was strategic?

The Spending Review is fast approaching and all areas of Government spending on infrastructure are under scrutiny. While areas such as Highways England’s funding settlement look safe, departments have been asked to consider how they might shave their budgets by 25% or 40%. Some heavy cuts look inevitable.

Paradoxically, this could be an opportunity. The sheer scale of the deficit reduction targets mean that we must think creatively.

The National Infrastructure Plan (NIP) - despite accusations that it’s just a list of projects - does a reasonable job of explaining what Government is trying to achieve. Investment is to be prioritised in areas that drive productivity. Infrastructure is given a central role in dealing with long term challenges including population growth and climate change.

A fairer criticism is that it’s not always easy to see the link between the projects in the NIP, and delivering on these strategic objectives. This is exacerbated by the lack of a view on what level of capacity or performance is actually being sought in order to meet our objectives.

So instead of conducting a department by department cheese-paring of budgets, what if Ministers stepped back and made strategic decisions?

The planned investment in the Strategic Road Network may help us achieve a “mile a minute” network; unlocking connectivity, growth and jobs. But nearly every journey begins and ends on a local road, where maintenance backlogs are growing. We also know that flooding incidents can take parts of the network out of action for days, if not weeks. Funding for these areas is spread across three Government departments. Capital and maintenance budgets remain siloed.

Now is surely the time to secure value by focusing on the big network-level objectives and taking a multi-year, whole life approach to meeting those objectives. We should be ready for this to result in some decisions not to build at all, for instance where deployment of technology to manage demand or optimise performance is a better option.

This in turn will help accelerate a transformation in the industry - creating a demand for new business models, more innovation and meaningful collaboration across the supply chain.



Jennifer Richards,
Managing Director,
Hydrock NMCL

The case for nuclear safety

With a 20-year gap since the last active new build in nuclear power in the UK, the knowledge, innovation and investment in civil nuclear reactor design is now led from countries such as France, the US, Canada, Japan and the fast-emerging Chinese market.

Investing in the UK nuclear market presents challenges to overseas companies, not least the need to comply with our well-established safety standards. Although detailed guidance exists on UK expectations, much ‘custom and practice’ has been developed which is often difficult for new investors and developers from outside the UK to understand and apply.

This situation presents a challenge. On the one hand, in view of the changing global landscape, is it right for the UK to stick to its current approach to nuclear safety regulation which was developed when our nuclear industry had a very different structure? Some argue that these standards are holding back much needed investment in new nuclear power. However, on the other hand, our ‘gold standard’ and high level safety principles are respected and offer the UK a means to rediscover the skills to develop nuclear technology. Through detailed safety assessment of new foreign-backed designs, British nuclear engineers can

learn from others and the UK can become an ‘intelligent customer’ for the latest nuclear reactor technologies.

First and foremost, the public, regulators and government rightly expect rigour and substantiation of nuclear industry plant and processes. Our approach to nuclear safety standards has served us well.

However, given our reliance on foreign investment and ownership, international developers find it challenging to navigate our specific requirements. Our safety standards are absolutely appropriate, and we should not adopt some ‘give and take’ to hasten through this much needed foreign-investment.

In this new global market, arguably we need to offer more clarity to international developers on how to become compliant and how to work in a UK context.

Enabling the transfer of new technology to invigorate a safe UK programme of nuclear new build allows the UK to gain experience of what best practice design looks like which will inspire our own contribution to the future of nuclear new build.

The case for nuclear safety is as important today as it has ever been, especially for its role in enabling the development of critical, future low-carbon power generation.



Jerry England, Group
Director, Digital Railway,
Network Rail

Getting ready for the next billion journeys

They say that if you ask three economists a question, you’ll get five different answers. But if there’s one thing they agree on, it’s that taking the right choices about infrastructure is one of the most powerful ways a country can secure its economic future.

In fact, one of the most important questions we face as a country is about how the railway can help our great cities in the midlands and the north complement London and the south east by becoming powerful engines of national growth.

The network is serving more passengers than ever at lower cost – but there’s no doubt about the challenges that lie ahead.

Firstly, Britain’s dynamic economy is powered by city regions that need to connect more people to more places, more directly, than the railway was originally designed to do. Put simply, their success requires scope for more train paths that cut end-to-end journey times through better connections.

Secondly, our busy railway will have to serve an additional 1bn journeys a year by 2030. So we need to act now to prevent passengers facing longer waits for trains that are more crowded, with fewer choices and where on when they stop.

Thirdly, we need to keep closing the gap between the convenient, personalised experience the public increasingly find in other areas of their lives and what they often encounter when they use the railway.

Traditional construction-based enhancements will continue to be vital in places, but the challenge to support jobs and growth in the 21st century simply cannot be met with a strategy from a pre-digital age.

One of the world’s digitally advanced railways – the London Underground – is achieving substantial capacity, flexibility and performance benefits using a family of digital technologies that is being adopted increasingly around the world.

This summer, the first new train arrived for service on the Thameslink route as part of a digitally-enabled upgrade which will let trains flow into central London at Tube-like frequency from 2018.

This autumn, analysis will be completed on the case for a faster digital roll-out on key routes.

The question for Britain isn’t whether our railway should harness digital innovation to deliver more trains, better connections and greater convenience – it’s should we choose to act in this generation or the next.



Dr Mark Dittmer-Odell,
CBI Head of Infrastructure

Look further to the future – with a strategic integrated approach

This summer saw a victory of sorts for UK infrastructure decision-making. Whatever your views on airport expansion in the South East, the fact that the Airports Commission was able to independently weigh up the evidence and offer such a decisive final report was a ray of light in an often opaque world of infrastructure decision-making.

And yet, it underlines something we all know – the UK is not good at taking an evidence-based approach to long-term infrastructure decision-making, and all too often, we wait until crunch time to take action.

The most obvious impact of this is that we end up planning individual projects in isolation, which results in a domino effect of lost opportunities. We miss the chance to make complementary investments. Cost-benefit analyses fail to capture the transformative effects of infrastructure. Political and public support wavers, reducing investor confidence and pushing up the cost of capital. Failure to sequence projects pushes up the cost of construction. Then once again, public support takes a hit.

What we should be aiming for is infrastructure that is more than the

sum of its individual parts. That will only come with a more integrated and strategic approach to the way we make decisions.

The starting point must be a clearer sense of what the UK needs – something that explains why Sir John Armitt’s proposals for a national needs assessment enjoys strong support from businesses.

But a forward look alone is not enough – it’s what you do with that information that counts. This means getting better at planning, and then delivering ‘packages’ of complementary upgrades across sectors and geographies, over longer time periods. It also means clearer articulation of a vision for how we tackle our infrastructure challenges over decades, rather than over a single parliament. These are factors that should be at the forefront of this Government’s mind as it puts together a National Infrastructure Plan for the new parliament and beyond.

And yes, finally, it means our politicians being brave enough to tackle the hard decisions head-on when faced with the evidence – a challenge that awaits the Prime Minister later this year.



Sheena Sood, Partner,
Beale and Company

Network Rail: a pull on the purse strings

In 2014, Network Rail promised a £38.5bn five year infrastructure spending plan. But only a year later, the programme is facing criticism due to a catalogue of “unacceptable problems”, spiralling costs and missed targets.

The underlying issues will have a knock-on effect across the industry, not just in relation to the “paused” projects and participants interested in these, but in relation to those projects which are live and during the delivery phase.

One view is that Network Rail will get more ruthless in the operation of its contracts. This does not necessarily mean acting outside the contractual framework but could mean following it more vigorously. The supply chain will need to be aware of this.

Those currently participating in live projects with Network Rail, or as part of its supply chain, must operate their contracts correctly. Do not leave the contract in the drawer! To avoid any arguments regarding payment entitlements, ensure that payment applications and notices are submitted on time, with appropriate detail and supporting documentation, pursuant to the contract terms. The latter is particularly important for time charge

or target cost contracts. If payment is late, manage this accordingly. Was a pay less notice issued? If not, you can push for payment.

Variation provisions will need to be followed also – do not leave claims for additional time and money to the end of the project. Again comply with the contract provisions, which should include, for example, complying with notice provisions in relation to additional time and money and not proceeding with the work where the contract requires you to provide notice and/or agree a revised fee beforehand.

Suppliers further down the contractual chain should look out for their clients operating “pay-when-paid” or “pay-when-certified”, which is prohibited under the Housing Grants, Construction and Regeneration Act 1996 (as amended).

Network Rail’s supply chain will need to be more diligent in the operation of its contracts moving forward, resulting in further resource to administer and operate these contracts – more than anticipated and more than was priced. Nevertheless investment in proper and effective administration now will pay dividends in the long term.

Great Expectations



Infrastructure is clearly in a good place right now. The fact that nearly three quarters of respondents to the latest Infrastructure Intelligence Pulse survey said they are confident or very confident about future business prospects underlines this.

It is a confidence which stems from the continued upturn in the UK economy and the positive noises coming out of government around the need to keep investing in our infrastructure as a means to boost productivity.

Yet while this latest survey certainly paints a positive picture, it also makes clear that businesses across the infrastructure sector – big and small – recognise that the next five years of Tory government will be tough.

Boosting productivity is at the heart of the government’s economic agenda. If we are to deliver the ambition stated aim of cutting up to 40% from the budgets of unprotected public departments, driving up the nation’s productivity is now key.

However, what is clear from the Pulse respondents is that this drive towards efficiency is still too firmly rooted in a drive towards lower cost rather than greater value. For many, particularly as business consolidation continues and global competition bites, the outcome is too often still just a race to the bottom.

That is bad news. Because as the survey respondents also point out, low fees and wafer thin margins severely impact the ability of businesses to invest in the new and innovative ideas, techniques and skills that will be vital to turn grown into sustainable profitable growth.

And that is just where the sector does not want to be. Growth is critical and is certainly achievable across the infrastructure market. Profitable growth remains harder.

One key challenge coming out of

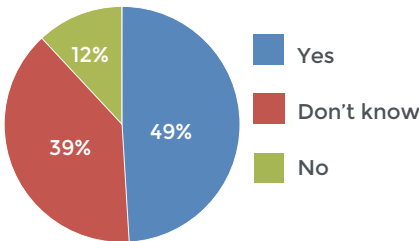
Confidence is high but looming cuts and rising costs are challenging the industry our latest Pulse survey discovered

this survey is, therefore, finding ways to use this current confidence raise profit margins so as to allow firms to invest in the training and skills needed to secure the future.

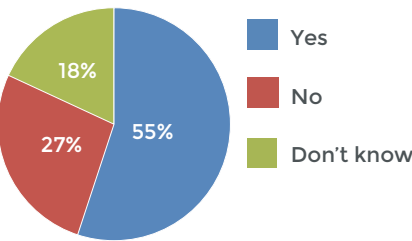
One solution, it seems, will require more focus on delivering greater whole life value from assets rather than just lower project delivery costs. Only then will we see greater, more sustainable returns down the supply chain.

As the survey points out, the next few years look like being very exciting for the sector. But they also look set to be hugely challenging. The message from business leaders is clear – boosting productivity will require new thinking - and new business models. A0

Will allocating Vehicle Excise Duty to roads by 2020 improve the country’s road network?



Will a third runway be built at Heathrow?



Business confidence

The latest survey of 164 business leaders finds 59% of respondents are confident about the sector post election and a further 10% are very confident. Only 7% said they were worried.

“Post election the Government has recommitted to its previous pro-infrastructure policies, avoiding any hiatus for projects, and furthermore has made a series of announcements which will drive even more infrastructure spend,” said the CEO of a consultant pointing to the productivity plan, Northern Powerhouse and the willingness to embrace fiscal devolution as positive signs. “With business sentiment at a high, and UK economic performance well ahead of the rest of Europe, private money is pouring into the industry too,” he said.

Economic stability was also boosting confidence. “The stability and likely longevity of a Tory government has undoubtedly bolstered financial markets and investor confidence. This is already translating into more confidence in the private sector development arena, which is a catalyst for strong and sustained investment in infrastructure,” said another consulting CEO.

“With business sentiment at a high, and UK economic performance well ahead of the rest of Europe, private money is pouring into the industry too,”

Respondents pointed to schemes such as HS2, smart motorways, the Thames Tideway and Hinkley Point C nuclear power plant as examples of major infrastructure schemes that were moving ahead, but they expressed concern over potential spending cuts, cancelled rail plans and uncertainty over energy projects, particularly renewables.

“I have strong concerns about the new government position on renewables. This creates considerable uncertainty for the industry with implications for UK energy provision. This is the opposite of what is needed to

maintain energy security and transition to a low carbon economy; the industry (and UK) needs policy stability and certainty for energy investment,” said one consultant.

Such fears left 24% of respondents unsure about the future for UK infrastructure under the new Government. “Whilst there is strong commitment to investing in Infrastructure, government bodies are being asked to review significant cuts between 25-40%,” said the CEO of an engineering company. The impact of this had yet to manifest itself in the future workload pipeline, said respondents noting that when it did the position for the industry will become clearer.

Fee issues

As the cost cutting challenge rolls out firms will need to be more innovative and find new ways to do things. However, innovation is suffering due to low fees, which have not recovered to the peaks prior to the global credit crisis. Only 24% of the 164 business

leaders that participated in the survey have experienced fee recovery to pre recession levels and 48% said they remained lower. Over 50% said that consultants needed to charge more. “We need to increase profit margins to properly invest in growing our businesses and paying higher salaries to attract and retain talent,” said the CEO of a consultancy. “We are an undervalued profession and there is now a talent shortage so we need to charge more to pay more and retain skills within the sector,” said another consulting CEO.

Respondents noted that fees had risen in the private sector but said that for public sector clients there was renewed pressure. “We have had to reduce fees by 9% this year due to pressure from a public sector client,” said the CEO. Others pointed to competition from growing firms.

“Large acquisitive consultancies are seeking turnover keeping fees low,” said one director. “The problem is suicide bidding to buy a position, especially from the very largest multi-

disciplinary; it has a very bad effect on more specialist tier 2 companies,” said another consultancy director.

Firms said that low fees meant no time to innovate with thinking time being a luxury that clients don’t want to pay for, pointing out that for every new idea that brings innovation there are several more that do not. This makes it easy for innovation to be seen as not productive they said. “Innovation requires time and time is money. Consultancy is a service industry all we are doing is selling our time. Low fees equal the poor quality of service too often provided and has resulted in overseas constructors being more innovative than UK operations,” said a business director.

“We need to increase profit margins to properly invest in growing our businesses and paying higher salaries to attract and retain talent,”

Career progression

Being productive means keeping staff churn low. Pulse respondents demonstrated a high level of loyalty to their employers with 64% serving more than 5 years with their companies and only 36% moving more frequently than this. This is in contrast to the Retention Gap report of July 2015 which found that 73% of staff serve less than 5 years with an employer.

Among the most commonly cited reasons for employer loyalty were the opportunities provided for career progression as well as a high level of job satisfaction. Working for supportive managers and good colleagues were also important to respondents along with a variety of work and good training and development. Flexibility and achieving a good work life balance were important too, ranking above pay or benefits.

The survey also revealed that 61 per cent of senior infrastructure professionals have had a pay rise this year. For 53% of respondents this was 1- 3%, but a further 33% reported a rise of 4-7%. For 15% it was higher than 7% and 4% reported pay rises through other mechanisms such as bonuses or shares.

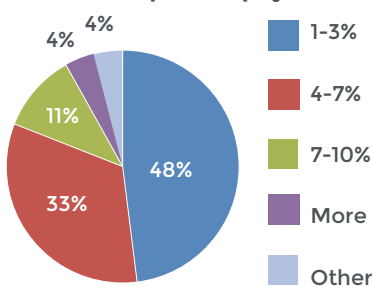
Employers were also found to have a high level of adoption of policies to encourage diversity and inclusion with 88% of companies reporting such measures were in place. “This is critically important if we are to tackle the skills gap in any meaningful way,” said a consultancy CEO. “EDI [equality, diversity and inclusion] are no longer just nice to haves. Clients are demanding that compliance is clearly evidenced in bids,” said another consulting CEO.

Discrimination had been experienced

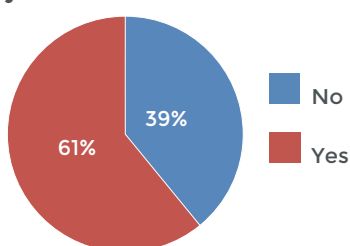
by 18% of respondents. “As a female engineer I have seen discrimination both conscious and unconscious, macho working practices, aggressive behaviours and ruthless self promotion by males,” said a director level respondent. “Being a woman I was put in situations which were not equitable, were unpleasant and where I was forced to make a choice between my job (when the hard times come) and my 3 yr old son.”

Of the 18% that had suffered discrimination 52% were female. “I was particularly discriminated against when returning to work full time from maternity leave. I was refused a bid for further education on the basis that I have a young family and I have also been overlooked for more important or exciting pieces of work in favour of older male colleagues.”

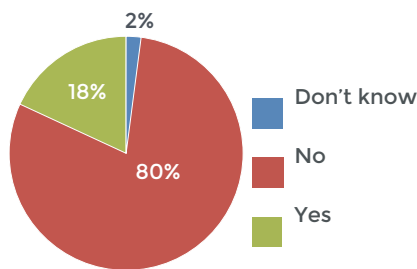
Actual or expected pay rise



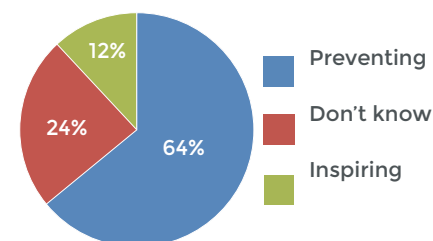
Have you had a pay rise this year?



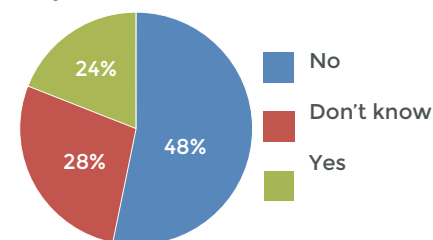
Have you experienced discrimination?



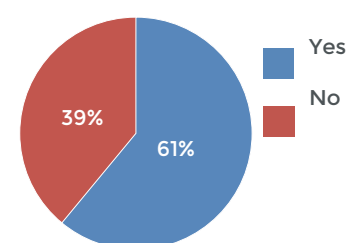
Are low fees preventing or inspiring innovation?



Have consultancy fees returned to pre-recession levels?

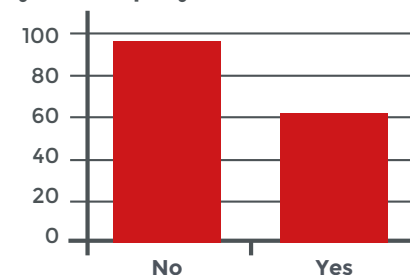


Is your firm having to invest more in business development to win contracts?



“Increasing productivity is top of our agenda,” said the director of a consultancy. Others agreed that more needs to be done. “We are unable to drive our overhead down - but we are still operating processes which date back to the way we did things years and years ago,” said the director of a contractor. “We await the digitisation of the majority of our processes - the computing power of the cloud will change the industry in the coming

Is low productivity affecting your company?



years, we are just slow adopters.”

Policy changes

From a policy perspective respondents pointed to Government announcements on rail, energy, devolution, and roads as being significant to their businesses this year. In the first budget following the general election chancellor George Osborne announced that vehicle excise duty (VED) would be channelled into road spending by 2020. Such a move was considered by 49% of senior professionals to be one that would lead to improvements in the road network. “It creates a consistent stream of revenue allowing better programming of investment in roads,” said the CEO of a trade organisation.

A further 39% said that they did not know if it would improve the road network pointing to a lack of detail about how the money would be allocated. Just 12% said that it would not improve the network fearing that central Government funding would be cut by the same amount or more.

But other sectors such as rail and energy were mentioned more frequently by firms. “Most critical has been the pause in the Network Rail spend, resulting from an under-spend in the first 6 months and the escalating price they are paying for electrification and signalling,” said the director of a contractor.

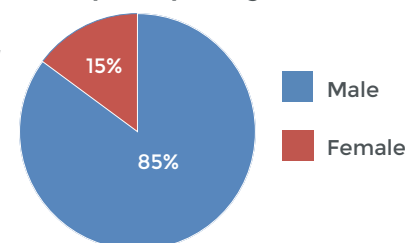
Government has also announced cuts to renewable energy incentives, affecting biomass, small scale solar energy and onshore wind energy,

moves which were described by respondents as “backwards thinking”. Not only is this setting the UK on a path towards missing its 2020 renewable generation targets of 15% of total, but it is also limiting future markets and opportunities for companies in the sector.

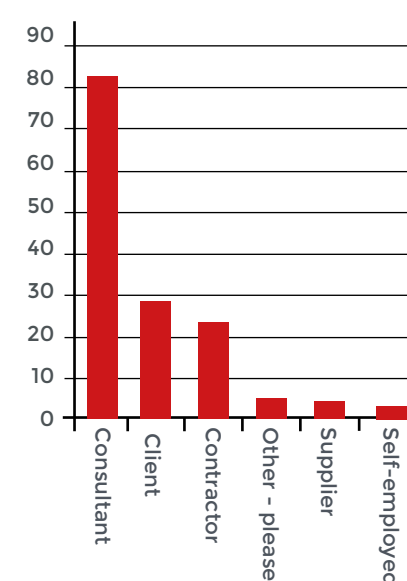
Aviation policy was mentioned too with firms welcoming a decision from the Davies Commission that additional aviation capacity should be provided through a third runway at Heathrow but they questioned when Government would act on the findings. Over half (55%) of respondents said they thought that the third runway would be built. “It will be very difficult not to endorse the commission’s report given how strongly it came down on the need to progress the third runway at Heathrow,” said a director at a consultancy. Just 27% said that it would not be built and 17% were not sure.

Director	80
CEO	30
Manager	30
Other professional	19
Employee	3
Not answered	2

Pulse participants gender



Pulse participant employers



“Increasing productivity is top of our agenda,”

Innovation and productivity

To encourage innovation some respondents called on firms to change their business models and drop the fee based structure in favour of more value based calculations. “Selling hours is unlikely to result in the ability to charge more. It is vital that consultants sell value and communicate that value,” said a consulting director.

For 40% of firms productivity is also an issue and they are not alone. The UK government has identified low productivity as being a barrier to growth. “Low growth in productivity is a recent feature of the UK economy but a long-standing feature of the UK construction industry,” said the director of an infrastructure company. “Productivity has not improved for more than twenty years. The impact of this is costs that are 10-40% more than in comparable European economies and investments that are shelved because they are too expensive,” he said.

Is your firm prepared for growth?

The number of consulting engineering companies grew by 12.3% over the last year*. The market is changing – and there are strong growth opportunities for firms with the right focus.

Do you have the right focus?

Find out more in “The Snapshot of the UK Consulting Engineering Industry 2015”
deltek.co.uk/snapshot





High speed rail - on time, en France

A Vinci-led consortium is in the final stages of constructing France's new 302km Tours-Bordeaux high-speed link ahead of a 50 year concession to operate and maintain the line. *Antony Oliver* hears why this is the model for the future.

When the new 302km French high-speed link between Tours and Bordeaux opens in 2017, it will have been, by any modern European standard, a remarkably swift rail infrastructure delivery.

After all, the Vinci-led consortium only submitted its first bid to finance, design, construct, operate and maintain the new rail link in 2009. At that point the scheme, while perhaps more than just a line on a map, still had a lot of hurdles to overcome.

A Spring 2010 appointment of the consortium by client Réseau Ferré de France (RFF), saw the project step towards reality and when financing was finalised in the first half of 2011 to create LISEA, the special purpose company responsible for financing and managing the concession, the real green light came on.

LISEA, made up of Vinci (33.4%), CDC Infrastructure (25.4%), SOJAS (22%) and AXA Private Equity (19.2%), then let the design-build contract for the project to COSEA, a consortium led by VINCI Construction with Eurovia, VINCI Energies, NGE, Fayat, Cofely-Ineo, Systra, Arcadis and Egis Rail to kick start the work.

But as technical director for LISEA, Alexis de Pommerol points out, 84% of the land still had to be acquired after the concession was agreed and many other critical, time consuming and risky matters such as environmental licensing and utilities diversions along the route still had to be designed and carried out.

Nevertheless, despite difficulties and delays at the start, the project, including around 40km of connecting lines to the existing rail network along the corridor, is now heading rapidly towards the all-important train service delivery phase.

"We are totally on schedule – in fact we are a little bit ahead of the schedule," de Pommerol says, "And that is not so common! But the risks have been well managed with short and efficient decision making processes."

It is this effective risk management – which sits with the concession company not with the government owned RFF – and ability of the consortium to "manage its own destiny" which has kept the 7.8bn euro project on track.

"We invested a lot in the bidding process on risk management and we structured the design and build process to be efficient during the construction process," de Pommerol points out.

Of course, as the UK presses forward with its 50bn euro, 550km High Speed 2 scheme, due to open completely in 2032, comparisons are easy to make and

question marks raised over a perceived difference in approach to high speed rail by the French.

But of course it is not that simple. And the critical advantage of the scheme is that it doesn't have any underground sections or any stations to construct. And with just ten interfaces with or connections into the existing rail network, explains de Pommerol, the project has been able to plough on largely unhindered by outside influences.

"It was a very critical issue at the start of the project to manage those interfaces because these were the locations at which we were not alone to manage our own destiny," he says.

"We have no other issues other than finishing on time so we are able to organise ourselves in the right way according to capacity," he adds.

The new 320km/hr line will reduce the journey time between Paris and Bordeaux by approximately one hour by providing a new dedicated high speed track to bypass the cities of Châtelleraut, Poitiers and Angoulême. New connecting lines will link to cities but other than these, construction is largely on a green field site.

This freedom to be totally focused on getting the job built has been critical for construction joint venture company COSEA, says director Gilles Godard, highlighting that finishing late was never an option.

"There are strong incentives for us to be on schedule – not least as the penalties we would pay for not opening on time are very high," he explains.

"As a result we have put in place financial incentives for early delivery – positive incentives for performance rather than negative. It creates an internal dynamic which is very strong," he adds. "We have also created a collaborative spirit across the project and a number of sub joint ventures each with a clear area of responsibility for delivery and interface with each other."

But this pressure on programme has also meant that COSEA, as designer and constructor, has had to be very flexible and collaborative so as to enable work to start on site before the design had been completely finalised.

"High speed rail is a system and projects rely on really strong integration between each part of that system. If it is not properly managed then there is a problem," he explains.

"At the start the civils team is always very keen to get going as early as possible so it was important to deliver a design that enabled the civils work

to start but that also enabled flexibility to make any changes as the project developed," he says. "In a traditionally procured model such changes would not have been possible."

It is a lesson that Gilles Godard feels could be learnt in the UK where he fears the relationship between contractors and consultants "needs to be rebalanced".

"The critical thing is for the design process to be joined up with the construction process. In the UK the split between the contractor and consultant is very big," he explains. "If the contractor doesn't benefit from the ideas that they bring to the table then they will not be incentivised to come forward."

The final part of the jigsaw in terms of driving towards a positive outcome is the fact that the consortium has a robust internal no claims agreement across all parties, which means that if there are problems – and like any project they do have them – there is a mechanism for getting to a solution.

Yet while meeting the construction objectives is critical, setting the project up to enable the line to be operated efficiently and profitably for the next 50

years is critical to the business plan.

"We have had very early engagement with the maintenance teams – through planning design and construction – not only to help plan its work but it has been involved very early explaining its specific needs for access and for vehicles," he says.

"We are able to purchase equipment specifically suited for this contract," he adds. "Historically the maintenance operator has had to use older equipment not necessarily dedicated or suited to that track. Here we have set up an organisation dedicated to maintaining that 302km section of track."

The next challenge is running the railway at a profit and, with revenue coming from track access charges but with no guarantee on how many it's a tough issue. But the key controllable factor for LISEA is providing a safe, fast, reliable track on which to run high speed trains and, for de Pommerol, that remains the route to success over the next 50 years.

"We have a contract and will suffer penalties for missing reliability and availability targets," he says. "So there is a strong incentive for us to provide a great line with no failures."



Construction joint venture COSEA has financial incentives for early delivery



Right: Trying out the HR Wallingford ship simulator, Left: On site in Wales at Project Riverside

Eyes wide open

Thirty two students and apprentices have just enjoyed student week at Tony Gee and Partners which involved an 850 mile tour of Britain to experience all that civil engineering has to offer. *Jackie Whitelaw* reports.

“An assault on the senses” is how Tony Gee and Partners HR manager Gareth Drought describes the experience of witnessing steel making at Tata Steel in Scunthorpe. Drought was taking 32 second, third and fourth year sponsored students and apprentices on a learning trip of a lifetime as part of their summer placement education with the company. And the memory of the bright bursts of energy, heat and taste of the process that creates the material many of them have been designing with will stay with them for a long time.

Scunthorpe and Tata Steel was the third stop on a journey that started for the group at the consultant's head office in Esher, Surrey. Tony Gee and Partners has a long history of sponsoring students and is building its crop of apprentices. But the firm likes to introduce them to the realities of the civil engineering world to help them make sure they are making the right career choices.

“We want our students and apprentices to fully understand what they are designing when they are working with us in the office. And to understand the type of work we do,” Drought says. “We are slightly different from many consultancies in that much of our work is with contractors on design and build so we need our

students to understand what this means, to see what contractors do and put some substance to what working with us full time will be like.”

Tony Gee has a big workload in road and rail but it is also highly sought after for its marine designs. So first thing after the Esher induction to the business was to pile everyone into two mini buses, one driven by Drought, the other by the firm's executive managing director Graham Nicholson, and set off for HR Wallingford, there to understand the mysteries of the marine world.

Care and close attention to student development has been fundamental to the Tony Gee business and the student weeks have been running for around 15 years. Nicholson is passionate about investment in students and a week of his time with his protégées is worth a lot to them and to the company.

“We get to know them, they get to know each other and we end up with people who are engaged with us as a company and who understand our business,” Drought explains. “Our experience has been that we get graduates who stay with us and charter with us.”

HR Wallingford introduced the group to its coastal models, wave machines and flumes, and, great fun this, the ship simulator. Next, after a night's

sleep in Esher, off they all went to Laing O'Rourke's off site construction Explore facility in Worksop. Cue “eyes wide open” for the students as Drought describes it, as they witnessed the future of the industry they are joining first hand, and saw how automated prefabrication in factory conditions works and is revolutionising construction.

Then it was off to Scunthorpe and another pitstop at The Travel Lodge before experiencing the primeval process that is the creation of steel. If their senses were on fire then, it was the emotions that were affected next.

The group journeyed to Wales to the Project Riverside scheme near Cardiff where Tony Gee is engineer for a road and bridge scheme. Some of the students were working on the job in the office so it was good for them to see it live. But the scheme is also close to the site of the 1966 Aberfan disaster where a colliery spoil tip fell on to a school and killed 116 primary level children. “It brought home to everyone why they wanted to be engineers – to stop that sort of thing happening,” Drought says. “It was very moving.”

Everyone got back to Esher and another night's sleep emotionally and physically wrung out. The last day was London and trips to two extraordinary



The trip gave students and bosses a chance to get to know one another.

sites – Crossrail and London Bridge.

“Crossrail showed us round the Durward Street and Cambridge Heath shafts which we were involved with and a lucky few got to go down inside – chosen on the basis of first to put your hand up, was it your birthday, and had you worked on it.”

Then everyone walked in full PPE – as supplied to everyone by Tony Gee at the start of the trip – for a 40 minute walk in full capital heat to London Bridge where they were shown round the whole development.

It was quite a week, for the students and the bosses. “We all got to know each other very well – those buses can only go at 60mph,” Drought says. The enthusiasm from the students from the week has been extraordinary, he says. “They are all properly fired up about how wonderful engineering is and how exciting their career can be,” Drought says.

“As a company we want to say a huge thank you to all our hosts who were universally marvellous and really put themselves out.

“Now I'm off round the universities and colleges to recruit the next batch of students and to start the planning for next year's student week.”



Top: The group at Tata Steel, Scunthorpe where they saw steel being made
Above: Seeing a bridge design created in the office become reality on the project.

What did the students think?

“In the office when designing structural elements to support specific loads we don't often think about the origins or behaviour of the specific element, we just carry out the written procedure. But it's essential to understand its behaviour and why it behaves this way. Visiting Tata Steel was great for this as we could see and appreciate the huge process associated with the creation of each steel section, and the properties associated with the material once completed.” *Louiza, Surrey University.*

“As an Apprentice, I found student week a brilliant experience overall. I have certainly benefited masses from visiting site as it helps to grasp some of the real engineering concepts that take place and actually see them as they happen. It was also fascinating to see how sites operate.” *Craig, South Thames College.*

“Meeting fellow students who were in similar situations to me and hearing

what positive experiences they have had whilst at the company was a great confidence boost for me.” *Eunan, Surrey.*

“From my own perspective it was an eye-opener into just how large the scope of work that not only civil engineers are involved in but Tony Gee and Partners as a company which made me proud to be a part of it all - *Craig, Bridgewater College.*

“Being on site allows you to experience the constraints and challenges that contractors face. I've found it really useful to exchange experiences and tips and have also had some really interesting discussions with other students.” *Jess, Loughborough.*

“The diversity of destinations visited over the week - test facilities, fabricators and construction sites – enriches the industrial experience which a student receives as part of their placement at Tony Gee and Partners.” *Jo, Surrey.*

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...the better we can make tomorrow

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When it comes to roads our aim is to be our customers' preferred choice for
effective and sustainable construction solutions. Not just a reliable supplier but a
visionary partner. A business that can add value at every stage - of any project.



Pushing the boundaries

The Louis Armstrong New Orleans International Airport is getting a new 30 gate terminal to accommodate increasing demand

Development of airport infrastructure that can support growth, accommodate technology change and meet tight environmental criteria is vital if the industry is going to meet soaring demand forecasts. By *Bernadette Ballantyne*.

For decades the global aviation industry has enjoyed sustained growth, with economic development, globalisation and liberalisation fuelling a demand for greater capacity and connectivity. New technologies, far from replacing the need to travel, encourage greater international connectivity between people and business – providing new reasons to travel. “Aviation is a sector that has continued to grow for at least the past 40 years, and all forecasts indicate that it will continue to expand at a healthy rate across all regions for the foreseeable future,” says Graham Bolton, aviation director at Atkins.

In fact the International Air Transport Association (IATA) predicts that demand will more than double by 2034, resulting in some 7.3 billion global air passenger journeys made every year, compared to 3.3 billion today. “History shows good correlation between growth in aviation and GDP, so as people and economies become more successful, aviation expands,” says Bolton. Through enabling the effective movement of goods and people, aviation itself is seen as a significant enabler of growth, with the US Federal Aviation Authority in 2014

“Airports have a lot of information that they are not currently using. The more sophisticated are looking at that to improve asset management, enhance energy efficiency and reduce operational expenditure.”

Justin Jones

identifying that aviation contributed 5.4 per cent to US GDP.

Although events such as the outbreak of SARS and the terrorist events of 9/11 have interrupted growth, the industry has always rebounded. “We see occasional blips from political or environmental events, but what is really interesting is that every time there has been a blip passenger numbers have recovered quickly,” says Bolton.

Developing infrastructure in response to this increasing demand involves a complex balancing act

between the needs of airlines, airport owners, passengers and local communities. Changes in airframe and engine technology, which significantly reduce noise and fuel burn, help to reduce the impact of aviation, but need to be accompanied by improvements in surface access, operational efficiency and environmental performance of facilities.

With differences in local context and user needs between individual airports, there is rarely an off-the-shelf solution to infrastructure provision. “There are different solutions that reflect the mix of passengers, airlines and travel patterns,” says Bolton, pointing to the difference between Atlanta, where Atkins undertook design and construction management for a fifth runway, and London Heathrow. “Atlanta has high levels of domestic traffic, whereas the majority of traffic at Heathrow is international. Both are hub airports but they have very different operations,” he says.

Expansion of Heathrow Airport is currently being considered by the UK Government following the publication of a long awaited review of UK airport capacity on 1st July. The UK Airports

Commission concluded that there was a strong economic argument for expansion of airports capacity in the South East, and unanimously recommended the development of a new runway at Heathrow.

However it said that this would need to be combined with a significant package of measures to address its environmental and community impacts covering noise issues, air quality and community engagement.

This is something that Hong Kong International Airport is very familiar with. The airport, which handled over 63 million passengers in 2014, had an environmental permit granted for construction of a third runway and terminal facilities in November 2014. Atkins is now designing the land formation for the new runway with associated facilities consisting of about 650 hectares of new land in the sea to the north of the existing airport platform. This means balancing the urgent need for new infrastructure with the environmental issues that marine work inevitably creates. “The addition of a third runway was proposed in the 2030 master plan, published in 2011, and the Airport Authority then had to begin the statutory consultative processes,” explains Damian Creally, Atkins’ project director. “The Airport Authority had to do an extensive Environmental Impact Assessment

What makes a good airport?

- Balances needs of airlines, airport owners and passengers alike
- Passenger journey is quick, easy and stress free
- Airport operation is safe, secure and efficient
- Baggage operation is fast and reliable
- Environmental performance includes efficiency of surface access and optimise public transport potential
- Food & Beverage and retail offerings enhance both passenger experience and airport commercial performance
- Facilities are contemporary, providing a sense of place and provide spaces for different groups of travellers
- Flexibility to adapt to future needs
- Technology enabled



Clockwise from top: Atlanta is a domestic hub airport in the US; Hong Kong International Airport in 2014; a third runway will be added to HK International to cope with demand

(EIA) and there were several issues to be considered including the impact that the land formation would have on the Chinese white dolphins; and the potential aircraft noise, air quality and social impacts associated with increasing numbers of flights.”

Having supported the Airport Authority in the development and subsequent expansion of the airport since the early 1990s, Atkins was well placed to work on the preparation of the EIA in association with other consultants. An environmental permit was subsequently granted and ensuring that the construction meets with the conditions and recommendations in the permit will lead to some innovative construction techniques being used, which will ensure preservation of ocean habitats and the protection of the environment. “There are a lot of techniques that will be used for construction that have not been used at this scale anywhere in the world. One of the environmental constraints is that there can be no dredging of the soft deposits of the sea bed,” says Creally. Therefore the use of non-dredge methods such as deep cement mixing to create grout columns that will stabilise the sea bed has been specified. Horizontal directional drilling will be used for the diversion of two existing aviation fuel supply pipes that are located below the land formation. This method sees installation carried out from the surface effectively pushing the diversion pipes deep into the bedrock without needing to disturb the marine environment of the sea bed. With an overall length of about 5km this will be a record breaking distance for the use of this method.

Construction of the three-runway system is a vital step for Hong Kong, which has seen passenger demand rise by over 120 per cent since it opened in 1998. In the first year 28.6 million passengers used the airport, but by 2014 it had risen to 63.3 million, placing it firmly in the world’s top ten. By 2030 the Airport Authority expects to see demand for 100 million passengers, which could only be met with a third runway. Based on these traffic projections, the expanded airport is expected to contribute HK\$184 billion (in 2012 dollars) to local GDP every year, almost twice the 2012 contribution of HK\$94 billion at the existing facility.

Such traffic growth is not unusual for Asian markets, with data from IATA indicating that passenger traffic



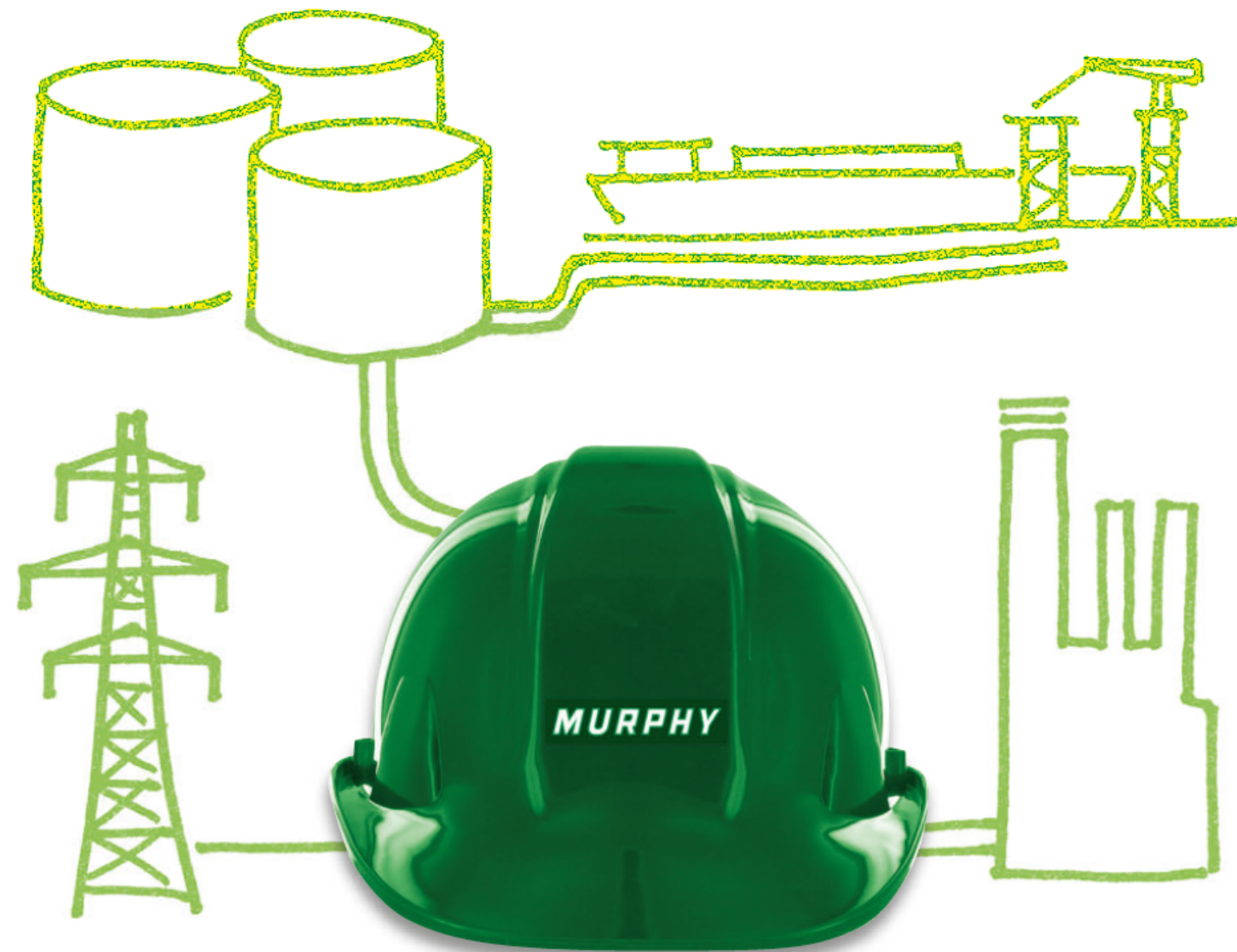
Top: Atkins project director for Hong Kong International, Damian Creally
Middle: Senior vice president, Atkins Aviation North America, Justin Jones
Bottom: Atkins aviation director Graham Bolton

in China alone will grow at 5.5 per cent per annum, a rate likely to be at least matched by other developing economies. Even in more mature markets, the impact of growth will be significant, with annual traffic in the US expected to have increased by over 500 million passengers by 2034. In anticipation of this major growth, airports across the country are reviewing their facilities and discussions are ongoing at government level regarding the funding of expansion projects. One of the methods under consideration is the removal of a cap on passenger facility charges, currently a maximum of \$4.50 per passenger.

However some airports are moving ahead with their investment plans. In the south of the country Atkins is designing a new 30 gate international terminal at the Louis Armstrong New Orleans International Airport. “We assessed the existing facilities, looked at anticipated usage and needs of the airlines, and in coordination with the airport and other consulting teams we established the business case for a solution that would best suit the airport’s development,” explains Justin Jones, senior vice president of Atkins’ aviation business in North America. “We determined that a new terminal would be far better from an operational and capital cost expenditure basis than upgrading existing facilities - and having done the planning and the site selection we are now designing the new terminal,” he continues. Construction of the project is due for completion in 2018.

As well as expansion schemes, airports in the US are also looking to improve return on investment and performance of their facilities. “Airports have a lot of information that they are not currently using, so the more sophisticated airports are looking at that to improve asset management, enhance energy efficiency and reduce operational expenditure,” says Jones, explaining that Atkins’ experience on airports all over the world means that the firm can share international best practice in these areas with its clients. At the same time demand for new services like this is seeing the firm grow and diversify its work in the sector.

Sharing best practice also means embracing new technologies and ensuring that new facilities are future-proofed. “Technology changes the way we use the infrastructure, but it changes at a pace and in ways that we can’t always exactly predict,” says Bolton pointing to the use of smartphones for online check in, radio frequency identification tags for baggage, and aps such as Uber that are changing the way that passengers are travelling to airports. “The important thing is that infrastructure has to have the flexibility to accommodate technology, process and regulatory change – without increasing up-front investment. We may not have terminal buildings that look radically different in next five years, but what will certainly change is the ease and security with which people process through, and that will be a continuing evolution.”



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David Hancock is head of construction at the Cabinet Office

Let's just do it!

Government has moved from a phase of consultation in the last administration on how to make the infrastructure industry more efficient, to expecting the sector to deliver on its promises, explained head of construction at the Cabinet Office *David Hancock* at the latest Griffiths & Armour round table meeting organised with Infrastructure Intelligence.

The forward visibility of work that the industry has always said it needed to make fundamental improvements is there, he said. The onus is now on the sector to collaborate not just at Tier 1 level but throughout the supply chain in order to innovate, helped by the requirement for use of BIM 2 on all Government contracts from next year. The result should be the 10 to 15% efficiencies that Government as a client needs in order to deliver its manifesto commitments on infrastructure.

Attendees at the round table threw Hancock a series of questions as they sought to understand how Government wanted them to work and what Government itself was doing as a client to contribute to the change in behaviour required of the industry.

How is this Government different to the last one?

DH Without doubt the administration is new; there is more focus on what it wants to achieve as you would expect from having one political party in power. In the past decisions would have to be made in negotiation, now what is

required is quite clear.

There are 150 manifesto commitments that Government is determined to deliver. There is a continuation of the desire to be a reforming government and under civil service chief executive John Manzoni government is being upskilled via the Major Projects Leadership Academy and the Project Leadership Programme so it can be closer to industry and is able to directly take the lead as a client.

Industry is talking about collaboration and asking for direction. What you are seeing develop is what you asked for as an industry – maybe not in the way that you'd always want but the outcomes will be the same.

Should we expect a more draconian five years but one where we will get decisions?

DH They won't be more draconian and you will get more decisions as this is a majority government not a coalition. Industry may not like all the decisions. But the Government is set on its course as set out in the manifesto and we are there to help them deliver it.

How important in this are the leadership programmes for Government's development as a client?

DH Very. We are trying to upskill people not just to understand the contract, but to contract manage the contract and to understand that that is about managing people not process. We understand that change is driven by the client. And what we have to become – and I don't like using the words intelligent client – is a client that understands what it is buying, why it is buying and what outcomes it is hoping to get from the investment.

Why has the role of chief construction adviser been abandoned and the Construction Leadership Council (CLC) trimmed from 30 to 10?

DH This Government is all about more focus. We have spent five years doing the exploratory phase, now is the time to start delivering.

We needed a Chief Construction Adviser in the past for instance as we didn't have the capability in government. But as we upskill we will have that capability. And we do have Infrastructure UK and the Infrastructure Client Group (ICG) to help us too.

The Government Construction Board is where the government clients meet. The idea is we try to sort the issues out ourselves and get the task groups in the CLC and ICG to support us.

My team in the Cabinet Office is still running the trials for new models of procurement – open book, cost led procurement and integrated project insurance, alongside early contractor involvement and the push for collaboration.

I am one for doing a few things well rather than a scattergun approach. Peter Hansford (Chief Construction Adviser) and I have always worked closely. Now he is leaving I have to get out to industry and be more visible.

Government wants 33% of its work to be done through SMEs. Is that one issue that Government clients will be focused on?

DH One of the things we are looking at as we become an informed client is when do we need to involve a big company and when not. We want to choose to work with companies of the right scale; it shouldn't always be the Tier One's. But no one should see that as a threat. By being an informed client it will enable us to ask the right questions such as when do we involve the supply

chain early and which parts of it.

Should the Government's recent productivity report be seen as a major new call to arms?

DH The report (produced at the same time as the Spring Budget) might have been a new report but in terms of the issue of productivity, that is something that we keep harping back to. There is a lot of waste in the industry; it clearly could be more efficient. When we benchmark ourselves with Europe, we find we are not quite as good. But now we have a chance, because of the long pipeline of work, to do something about it. When all the budgets were annual you could only worry about the day to day things. But if you have a five year plan you can start to plan for improvement. We do have productivity issues but if we can get better at this our industry has a very rosy future.

What can Government as a client learn from what is going on at Network Rail where a couple of jobs have been paused because they can't be funded from the current five year allocation?

DH It's interesting. Network Rail was asked to try to understand five years ago what it wanted in five years' time. That's a very difficult thing to do and things will change. Now they need to move things around but they still have the outcomes in mind, and they will maybe do them in a different way. Their ambition is good. As a client you

need to push and see how far you get, and regroup. Stopping a project is not a failure; in my eyes it's learning. To plan for 10 years and expect no changes is a bit naïve. We should be expecting changes. And that should be seen as people understanding their business; instead it is almost seen as a weakness and that is wrong.

Is the mandatory requirement for use of BIM 2 on Government projects from 2016 forcing change on the industry to good effect?

DH Yes, I believe so. BIM 2 is a massive change and there is a lot of work to do to embed BIM level 2 throughout the industry which will take years. But whether we like it or not BIM is forcing a new way of working. Along with early contractor involvement it is obliging collaboration; that leads you to standard products and offsite manufacture. Long term industry structural change has to follow.

What is the key benefit of BIM for clients?

DH It's understanding the supply chain right down to manufacturing, particularly what it costs to bespoke something. BIM will help us. It will really help educate clients so they understand every time they ask for something, they can quantify the on-costs and whether there is a better solution to fit the demands without having to go to bespoke.



The latest Griffiths & Armour round table organised by Infrastructure Intelligence

Message received

David Hancock's clarification of the developing new relationship Government has with the infrastructure industry was welcomed by participants at the round table event.

All were encouraged to know that Government was continuing on the path to deliver £100bn of infrastructure investment and that Government itself was going through a process of improvement as a client. And they were interested to understand that Government had moved from a process of consultation with industry to what was described as a dialogue whereby Government says what it wants and expects industry to respond.

ACE's Policy Manager Peter Campbell said the organisation had quickly understood that the relationship with Government had changed from one of partnership to dialogue "although it is worrying that it has been pushed through with a minimum of consultation. However, the Election result was a good one for industry in terms of continuity and stability," he said. "The Conservatives ran on their reputation in Government and the promise of maintaining investment – in roads, energy and so on. We are moving into a different phase from policy development to delivery; Government has to get on and deliver and it is

"We are already seeing overheating and capacity is fully absorbed,"

empowering industry to do it."

Representing the views of the consultants around the table, Mott MacDonald director Ian Galbraith said: We are proudly apolitical at Mott MacDonald but we are pleased that there is clarity in terms of investment and that we have five years of stable government.

“However, we are also aware of problems hanging over the construction industry from the recent recession. Consequently some companies might be more vulnerable than others and this might cause problems with, in particular the push for increased collaboration to increase efficiency.”

It was a point picked up by Buro Happold regional and divisional managing director Neil Squibbs who was keen to see how the push for efficiency would play out in a market that is growing rapidly. “We are already seeing overheating and capacity is fully absorbed,” he said. “We are seeing contractors wanting to be paid to tender in fact. People are licking their lips at the thought of a long pipeline of work, but how much work is too much work And when does a boom become a potential bust?”

Main contractors are seeking to protect themselves from future problems and recover old losses by imposing onerous terms on their supply chains, including consultants, said BLM partner Guy Lane. “There is concern about the onerous terms being imposed on suppliers in that these terms go beyond the reasonable skill and care obligations of consultants. There have been a number of judgments already where the court has been trying to disentangle those.”

So are main contractors really signed up to the idea of collaboration and change?

“Yes there is change but it is reluctant change and there is inertia,” said Tony Gee & Partners director Richard Prosser. “There is a little bit of filtering from the client through the contractor to us. But what you see is contractors trying to pass down strict obligations even though they are not appropriate for consultants. Contractors see that as us being collaborative with them, but it takes us beyond what we are obliged to perform in law and can reasonably get insurance for in law.”

RSA construction director Nick Newlove said that evidence from the water industry was that contractors are committed to fair collaboration.

“We have recently gone through the insurance cycle for AMP 6 and whilst there are new alliances and jv’s it is interesting to see how many arrangements have perpetuated from AMP 5 and even before that. There is real recognition from contractors that how they collaborate affects their success at developing sustainable relationships with government and private sector clients that fund



From the top: Actively engaged in discussion: Ian Galbraith, Paul Berg, Michael Walters, Steven Trehwella and Richard Prosser

“Only by removing attritional confrontation will you unlock the potential of collaboration.”

opportunities over the long term.”

Director of architect AHR Michael Walters had some sympathy for why contractors could be acting as they are at the moment. “There is still a cautionary feel among business at every level,” he said. “When you come to contractors they are picking and choosing jobs now. They have got to sort out their bottom line and put money back in the bank and that means

prices going up and them picking and dictating terms. More granularity on what is coming up in the spending pipeline and when would help.”

News that Government was intent on improving its performance as a client was welcomed by Royal HaskoningDHV director Steven Trehwella. But he made a plea for the training to include an understanding of the difference between buying a design and procuring services. “The whole risk of delivering a service tends to be pushed down to the supply chain which means transaction costs go up because of the risk embedded in it.”

For Ramboll director Peter Curran the issue was not the willingness to embrace new procurement models like Integrated Project Insurance or to collaborate more but whether processes in place would allow such change.

“The industry is definitely moving to more collaborative behaviour and clients and contractors are engaging more with the whole supply chain but are the systems and processes in place to support this? It is clients that drive the systems and the capability of client organisations has decreased through successive Governments. This trend needs to be reversed.”

Griffiths & Armour partner Paul Berg agreed with Curran on the point about processes. “People do want to work together but typical contracts mean that as soon as there is a hint of a problem, defensive behaviour is hard to change because the lawyers acting on behalf of insurers say to all the parties ‘consider your contractual position’ and everyone reverts to being adversarial. There is huge cost embedded in that, not just in the claim itself but the cost of resolving the project problems. Behaviour and approach are all driven by the contract which is why the Integrated Project Insurance procurement model which covers the whole project with no blame for any party involved is being promoted. Only by removing attritional confrontation will you unlock the potential of true collaboration.”

Curran is absolutely right, there needs to be structural change to achieve the behaviour change that will drive collaboration,” said Griffiths & Armour partner Carl Evans. “The narrative of collaboration has been with us for years but we are constantly defeated by the practicalities – the law and the insurance. The collaboration aspiration encouraged by the mandatory use of BIM from next year will be frustrated unless there is structural change which requires a complementary contracting, risk and insurance strategy.”

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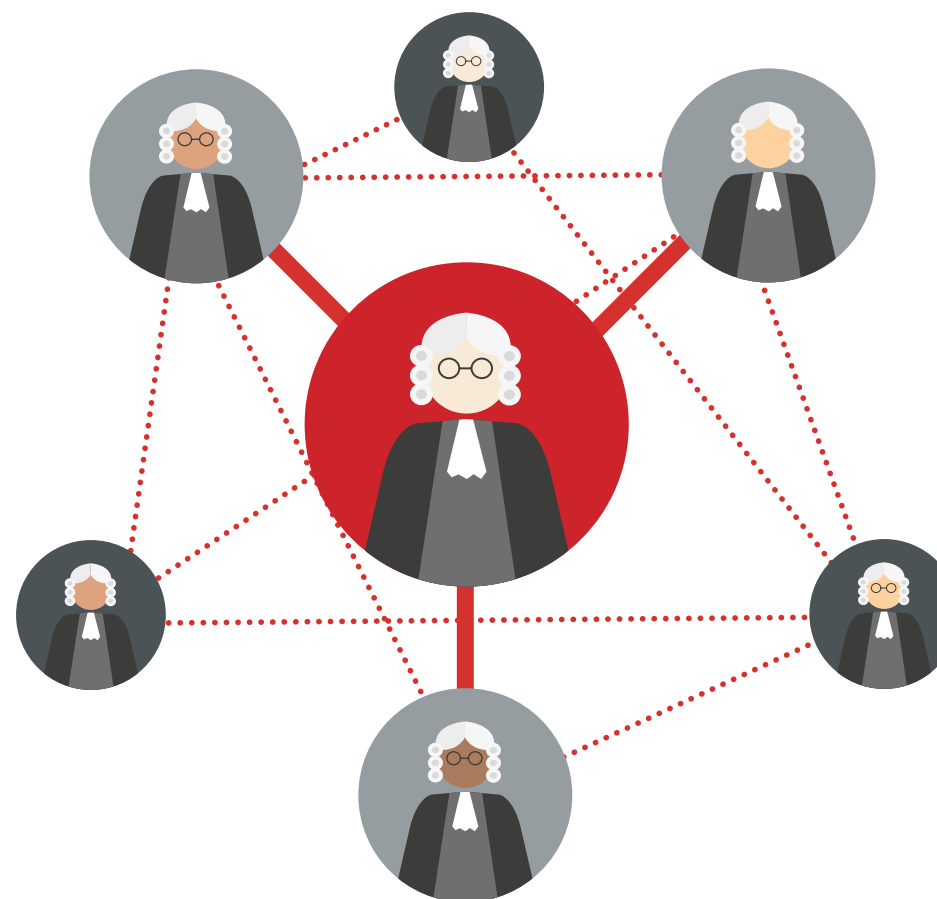
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Set up by lawyer Beale & Company (Beales), which specialises in advising the construction industry, GHN provides its members with know-how and resources via online discussion platforms, networking events and regular legal insight provided by Beales.

Helping to solve issues of common concern

This online community was started more than five years ago when Michael Archer, Partner at Beales, saw a need for an online community for construction professionals. "We wanted to create a unique network that would enable dialogue amongst in-house legal advisers in the construction industry.

Now with a membership of over 200 which continues to grow, it has proven itself to be a valuable tool to the construction community", says Archer.

Members of the network range from qualified lawyers through to those who have no formal legal training but have a responsibility for handling legal issues internally. All, however, are experiencing issues of common concern which the GHN network can help with.

Bringing people together

GHN holds two events per year plus a number of webinars which are open to all members and their colleagues to introduce them to the network. Events focus on current legal topics covered by lawyers at Beales but also include an external viewpoint too. For example, the last event held by the network was on the CDM Regulations 2015 with a guest speaker from the HSE who is head

of the CDM Unit for the Construction Sector.

All events are followed by a networking reception giving members the perfect social and work-orientated forum for questions and experiences to be shared with peers.

Legal updates, news and discussions are also published on the site within knowledge centres which reflect different services – for example, Contracts, Disputes, Health & Safety. Members can download these, comment on them and print them to share with colleagues.

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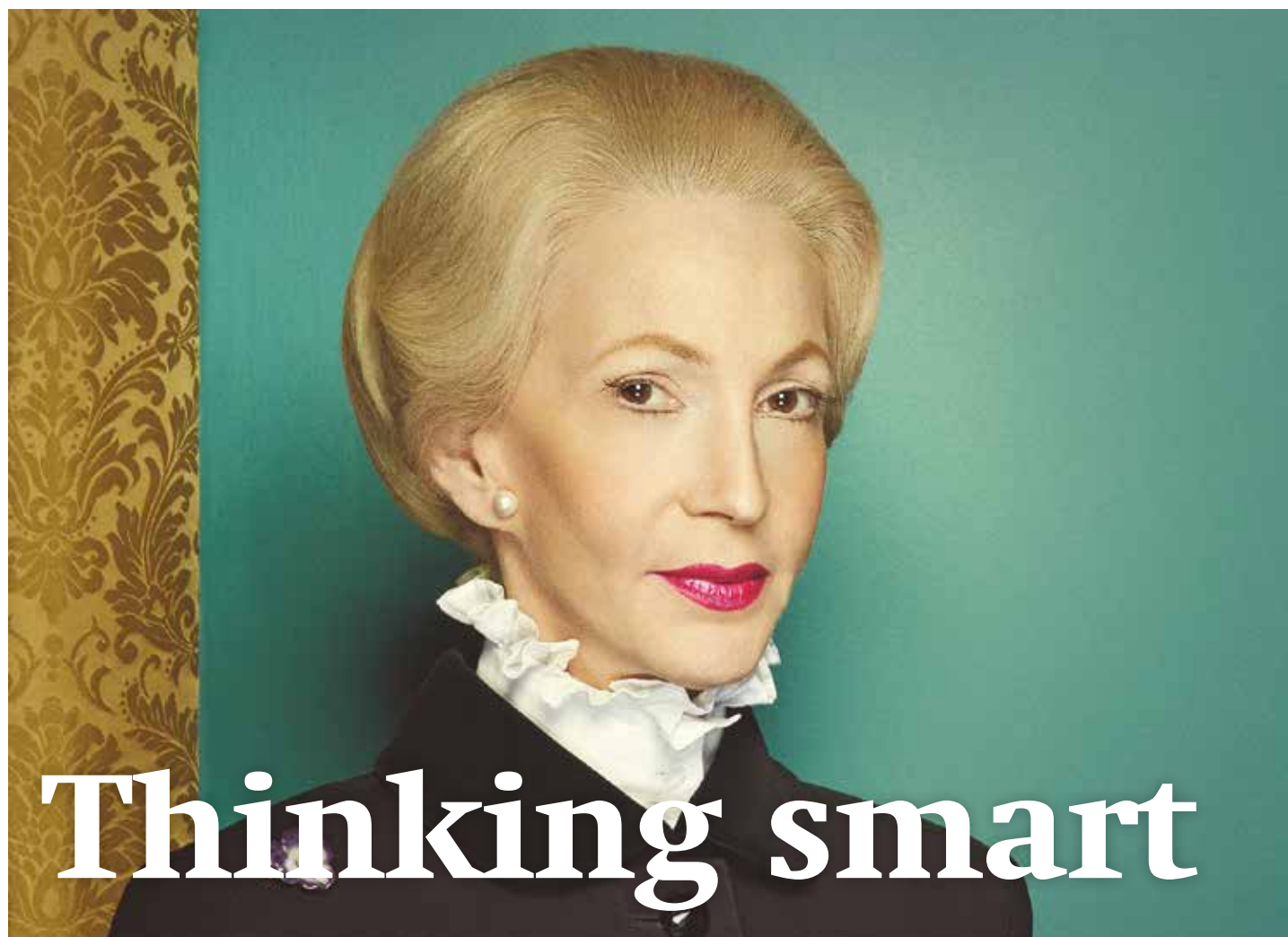
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Events

Wednesday 16th September at 12.30pm
WEBINAR – Taking stock of the practical and legal implications of Building Information Modelling

Wednesday 7th October at 13.00pm
WEBINAR – Construction law update: Payment – getting notices right and getting paid



Lady Barbara Judge is chair of the Institute of Directors and a member of the ACE's advisory board. Antony Oliver spoke to her about talent and the need to employ more women in engineering, the SME role in infrastructure investment and the challenge for new nuclear.

The first question when looking at Lady Barbara Judge's resume, is what could possibly have led her to become involved with the Association for Consultancy and Engineering.

As a top commercial lawyer from New York, former US Securities and Exchange Commission commissioner - the youngest ever - chairman of the Pension Protection Fund and first woman to lead the UK Institute of Directors, engineering would seem far from her focus.

However, it is fair to say that as a member of the ACE advisory board she is, in fact, fiercely enthusiastic about engineering, the value of infrastructure investment and the role of businesses in the sector.

And she is clear about the needs of the future. Asked how engineering and consultancy businesses can

remain successful in a competitive and changing future, Judge is forthright:

"My advice is to hire women. What is really going to drive businesses is brain power - there is no substitute for it and for a talented workforce," she says. "Women are getting more and more skilled in engineering and maths so we should recruit them into engineering jobs then set up career paths and fast track the best.

"It is only going to happen if the leadership wants it to happen and they should hire a cohort of women not just one or two. My advice is open the door to the smartest and most dedicated people you can find, not withstanding their gender."

Her passion for engineering came relatively late in her career and was prompted, she explains, by an increasing respect for nuclear power.

It started in 2002 when Judge was immersed in the nuclear industry after being appointed as a non-executive director of UK Atomic Energy Authority (UKAEA). In 2004 she became chair and held the position for two terms until 2010 after UKAEA sold its decommissioning business to Babcock International Group in 2009.

Today she remains a consultant to a number of countries and companies on nuclear new build and decommissioning. And perhaps through her role at IOD championing a vast number of small businesses, she is also passionate about the engineering skills that exist down the supply chain.

"Since I have been in the nuclear industry I have met many construction firms - tier 1, tier 2 and tier 3 suppliers - and I have been on many government missions. For somebody that doesn't

have an engineering degree I am very interested in the subject," she explains. "Today I am still surrounded by engineers as they are building nuclear power plants all around the world."

Right now her nuclear expertise is underpinned through on going work with the Japanese nuclear industry where she is deputy chair of the Tokyo Electric Power Company (TEPCO) Nuclear Reform Monitoring Committee, set up to oversee the decommissioning of the Fukushima power plant, damaged in the 2011 tsunami. She also chairs TEPCO's Nuclear Safety Task Force, established in the wake of the disaster.

And as chair of the IOD, which like the ACE has a majority of member firms in the small to medium sized business (SME) range, Judge understands the way that investment in decent modern infrastructure enables businesses to operate efficiently. Without reliable and affordable energy supplies, high speed broadband and robust transport links the nation's productivity will suffer.

Of course, her nuclear experience means that she has pretty strong and clear views on the UK's track record of investing in and developing nuclear power, not least on the need to turn around the moratorium on new build that has dogged the UK since the last new reactor opened at Sizewell in 1994.

"I was one of the people around government when we realised that we were importing more North Sea gas than we were exporting," Judge explains. She reflects on her time as UKAEA chair, when, deeply engaged in the decommissioning programme, it was clear that there was nothing being built to replace the aged assets.

"I said 'why are we not thinking about building new nuclear power plants?' - we were one of the first countries to build civil nuclear, have the expertise here and this is clean baseload generation," she adds. "So I went on a mission to Number 10 at the time with our advisers and were amongst the people that convinced the Government to put nuclear back on the agenda."

That campaign led to the well reported 2006 CBI speech by then prime minister Tony Blair to abandon Labour's long standing opposition to nuclear power and kick-start a programme to create a new generation of nuclear power stations for the UK.

Multiple converging challenges of energy security, climate change and increasing cost, she recalls, prompted Blair to call for a change in strategy.

Today the direction of travel is clear, she says, with public opinion now right

behind nuclear, referring to a recent IOD survey highlighting that 81% of members were in favour of nuclear new build to deliver vital energy security for the UK.

"Our members are looking less at cost and more at not losing it," she explains. "Business needs reliable energy to continue to grow - that means making sure the nation always has baseload power."

So why, given the political momentum that has built behind new nuclear since 2006, and around investment in infrastructure in general as the key to economic growth, have we not yet managed to turn this ambition into UK reality? Three main issues, she says, have held up progress.

"First the then Government, unfortunately, said that they weren't going to pay for it and that the private sector would - and the French were there but they struck a hard bargain and a bargain that has got tougher all the time," she explains.

"Second, Fukushima happened," she adds. "And while it has nothing really to do with UK - there are no tsunamis here - we all knew that there would be additional safety enhancements that would be expensive. As a result it all took time and the price went up."

Then, she says, came the Coalition government and the need to convince the Liberal Democrat partners that nuclear was a deliverable solution.

"We are now in a situation where we have said the first power plant will be French but we have the Japanese desperate to build. Meanwhile the French are trying to build a plant that has never been built before and a price was struck that is very high. And additionally the price of oil has fallen," she explains.

"My opinion is that it may be that Hinkley Point is not the first [new nuclear plant to be built in the UK]," she adds pointing out that both Toshiba and Hitachi have proven technology and a desire to build. Government, she adds, might think about striking an early deal with the Japanese.

"So far the French have been late and over budget with their projects in both Finland and France. Now the only way that they will build a nuclear plant is with Chinese investment. It is possible we could have faster, cheaper power delivered by Japan, a country with which we have good relations - why not at least rethink it."

The new Tory Government is, she says, much better placed than the last coalition administration to actually

drive forward with such difficult decisions to make investments in new nuclear but also in other vital infrastructure assets.

"There was so much time spent in the last government negotiating what the policy would be. Now we have a majority and a very clear thinking Government," she explains, reiterating that the investment is at the heart of driving business productivity.

"They have an opportunity and they mustn't blow it," she adds. "While you have a majority you need to be business focused. This country will only grow if the policies of Government are focused on the business agenda - all businesses - and this agenda should be at the forefront of policy."

And, she adds, business understands the next five years of austerity will be tough, requiring firms of all size to really understand client needs and adopt the most efficient practices.

However, she is also clear that Government has an important role to support and encourage the SME sector.

"Government spends so much money on infrastructure it has to make sure that the benefits go to small businesses," she says.

She highlights the Government's Contract Finder service, which allows firms to search for information about contracts worth over £10,000, as an excellent tool to assist small firms to take advantage of the opportunities on offer.

"A small company cannot perhaps deliver a £20M contract but they could deliver a £2M or £500,000 contract," she says. "But they don't always know about them. What small businesses need is more education on how to utilise the tools that they are being given by Government."

Encouraging investment in training is, she says, also vital and the recently announced programme to focus on apprenticeships should be a great way to help business to invest in young people and a great way for people to get permanent jobs.

However, whether the apprenticeship levy is the right way to drive action remains to be seen, she says, highlighting that it appeared to be quite a complex mechanism.

"In my view all Government needs to do is give companies a small tax break for every apprentice," she says. "If small business can get a tax incentive for taking on apprentices it makes it fiscally worthwhile and I think that you would get their attention. Simple is always better."

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ACE news

Mergers: still the way of the world

Nelson Ogunshakin has been at the FIDIC conference in Dubai and it has set him thinking about the shape of international business in the future.

We, as an industry, have reached a time when we must question if our current industry business model possesses the finesse and agility in order to respond, as well as succeed within global markets. Much as earthly pressures turn coal into a diamond the hope is always that domestic and international market pressures will force business models to become refined, and better able to cut through future political, economic, social, technological and environmental challenges to ensure continued sector growth and success.

Within these increasing challenges, adaptation and business model flexibility is key. If a business does not adapt to the changing circumstances under which it operates, that business will be crushed beneath market pressures.

Mergers and acquisitions (M&A) are one form of potential growth options open to major management; however, this is not the only means of generating sustainable growth and adaptation for the industry. I was speaking on the benefits of the ACE European Benchmarking programme and M&A at the FIDIC conference in Dubai earlier in September and as I prepared for that it became apparent that in order to move forward the industry must understand the implications for globally minded business needs.

Evidence from 2015 activity levels confirms mergers and acquisitions will continue to occur in the consultancy and engineering sector, not just horizontally but also vertically within the sector, as well as across continents. Most of the M&As are being driven by the need to increase scope of service and footprint, whether creating a one point solution for multiple services, diversification or increasing the local reach of an international company. This stresses the need for the industry to think global and act local, in order to ensure client needs are met around the world.

UK based consultancy and engineering companies are often sought after as M&A targets by major international players. This is because there is a growing domestic project pipeline, London is the leading centre



"Essential to the success of any international consultancy and engineering company is the acceptance of cultural ownership conditions as well as the increased need for cultural understanding."

ACE chief executive Dr Nelson Ogunshakin, OBE

for project finance deals, British expertise travels very well and it is able to deliver major projects. In addition, the UK is a stable economy that has business friendly regulations, strategic centres of excellence, respected skillsets, as well as renowned international engagement.

Essential to the success of any international consultancy and engineering company is the acceptance of cultural ownership conditions as well as the increased need for cultural understanding. Naturally, if engaged in a project abroad, local and cultural knowledge is essential for project success. Often, this results in the

merger, acquisition or collaboration of any large international company with a local firm to provide the increasingly demanded local content by clients.

The 2015 location of the FIDIC conference, Dubai, witnessed a tipping point in 2007-2008 after developing greater understanding of its institutional capacity. This led Dubai to the successful involvement of international companies within the infrastructure sector. Key to this success is those international companies enabling local content, whether through M&A or collaboration with knowledgeable local service providers. This local as well as cultural knowledge better enables international companies to succeed in the unique needs of an international project.

International mergers, acquisitions and collaborations often occur with those countries facing domestic pressures, with a need to export their expertise internationally. Japan is a classic example of this. In domestic recession for the last 20 years, Japan maintains the third largest economy, positioning itself internationally through the acquisition of companies around the world as well as increased investments in international collaborations.

This push towards M&A will continue until it reaches a point of optimum consolidation and manager fatigue, when large scale businesses will break into smaller entities. Without knowing when such a tipping point will occur, the industry going forward needs to embrace beneficial pressure points for adaptation to global demands.

In conclusion, M&A, as well as other business growth strategies, such as an alliance, joint venture and organic development have changed the industry landscape in order to meet client needs. Adoption of any of these growth strategies enables major companies to address both domestic and international opportunities and no longer limits consultancy and engineering companies. However, there is a clear and justifiable business case for both large and small to medium sized consultancy businesses to co-exist in the future as we respond to increasing domestic, international and global challenges.

Progress Network anticipates the challenge of Heathrow's third runway

With the Davies Commission's recommendation now in, joint ACE Progress Network chairs Megan Radcliffe and Joseph Roberts have captured some thoughts from members, asking what the construction of the third runway at Heathrow could mean for young consultants.

What challenges and what opportunities does the Airports Commission recommendation in favour of a Heathrow third runway option bring for young professionals?

Heathrow will bring a unique challenge for the best and the brightest to produce world class design to deliver the project in this tight urban space. Those involved in the construction will no doubt be valuable assets during the operational phase, producing a generation of "as-built" brains to serve Heathrow in the future or to act as global exports for other major infrastructure projects. As arguably the most climate aware generation this expansion brings major ethical concerns, with aviation looking likely to be one of the last sectors to displace fossil fuels. However, the shift in approach to deliver a sustainable airport is something that our network members felt they were well placed to provide.

What, if anything, should our industry do to encourage further political and public support for an additional runway at Heathrow?

An encouraging aspect of the debate is that the UK's ability to deliver such complex projects is no longer in question by either the Commission or the public. The confidence in the industry, thanks to projects such as the Olympics and Crossrail, is testament to the talents of built environment professionals. In order to advocate development of this kind, professionals will need to continue to champion the capabilities of the industry and prove that we can produce a sustainable development in this dense urban environment.

What impact will a third runway have on the next generation?



Year 7 STEM students impressed the judges

Year 7s show off their STEM skills

The first cohort of year 7 students at an academy focused on Science, Technology, Engineering and Maths education showcased their determination to conquer the difficulties of engineering at a special event organised by ACE member Capita. At the 'Structures for Superbrands' event at the University Academy of Engineering South Bank school students were tasked with the design and construction of iconic, as well as environmentally friendly buildings for London. And they strongly impressed the seasoned judging panel of Capita representatives, as well as ACE's Chief Operating Officer Anil Iyer.

"Conveying the virtues of a career in engineering has always been a challenge in the UK due to the widespread mis-use and lack of understanding of the term amongst not only the general public but by schoolteachers and careers advisers.

"It is therefore absolutely refreshing that we have, through the University Academy of Engineering, a unique environment where engineering and other STEM subjects form the core of the curriculum, with engineering concepts woven into non-engineering subjects," Iyer said. "By doing this, I hope that the next generation is able to change the perception of engineering, making it an even more attractive and inclusive career option."

There is clearly excitement from the industry, which is keen to address the challenges and opportunities of providing tomorrow's infrastructure. However, this view is cautioned by the need to make aviation more sustainable and its impact less contentious. Heathrow has the recommendation it wanted. We now wait to see whether the Government will endorse the recommendation or propose an alternative. If the recommendation is implemented Heathrow will need to rely on the full breadth and depth of the world's professional services capability to deliver the project within the parameters set by the Commission.

Progress Network update

Over the last year ACE's community for young professional consultants and engineers has enjoyed reinvigorated interest and engagement across the

UK. In addition to the thriving Progress Network group for London and South East, regional groups have blossomed in Scotland, North West and Midlands together with an international group in the Middle East. Discussions are under way to set up groups in Wales, South West, North and East England.

Thanks to the support of ACE member AECOM together with sponsors at local level, ACE is able to make all Progress Network evening events free to attend.

The success of all events lies with the dedicated volunteers who co-ordinate activities through the regional committees and their passion and drive for their profession has seen the groups thrive and increase membership. If you are interested in attending our events or getting involved with the committees ACE would like to hear from you.

Please contact Reema Patel, Senior Membership Executive on rpatel@acenet.co.uk or 020 7222 6557.

Air quality: the battle begins in earnest



September will see campaigns to resolve Britain's air quality issues ramp up. Time for business to speak up, writes *Matthew Farrow*.

Over the next few months air quality will complete its move from being a relatively low key topic, of interest only to technical experts and single issue campaigners, to being a mainstream political issue capable of generating front page headlines.

In September we will see the Government consult on how the UK can achieve compliance with EU air pollution law – the Supreme Court has demanded Ministers publish a credible plan by year end. This will spur plenty of debate and EIC will shortly publish evidence on the effectiveness of different air pollution controls.

Heavyweight think tanks such as Policy Exchange are also due to weigh into the debate, with media such as the Evening Standard and Sunday Times with their air quality campaigns a willing audience.

At the same time I think we will continue to see air quality concerns become the weapon of choice of the anti-Heathrow expansion lobby, while the London Mayor is about to launch a new initiative to restrict emissions from machinery on London construction sites. Added to that, the emergence of Zac Goldsmith as a frontrunner in the race to succeed Boris Johnson as London Mayor will mean that green issues in general, and air quality in particular, will have a real prominence in the campaign leading up to the Mayoral election next May.

So far though, while there has been a welcome increase in mainstream media coverage of air quality, the voices being heard are those with a very direct professional or commercial interest in the debate. So a typical news story about the often appalling levels of NOx or particulates in our urban areas will contain a quote from a body

Environmental Industries Commission annual conference

Date: 19 November 2015

Venue: The Willis Building, London
To book: www.eic-conference.co.uk

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like EIC many of whose members manufacture air pollution control technology.

Or there will be opinion from a campaigner such as the estimable Simon Birkett or Alan Andrews of Client Earth, and then one from a vehicle manufacturer or the Society of Motor Manufacturers and Traders pointing out the progress car manufacturers have made in cutting CO2 emissions, the complexities of recalibrating the vehicle testing cycle to ensure real world improvements in vehicle emissions etc.

This is all well and good, what is missing here is the voice of the more general business community, the silent majority as it were.

Back in the mid-2000's, when I ran the CBI energy and environment team, a tipping point was reached in 2006/7 when it was noticeable how CEOs of major companies in retail, finance, manufacturing and other general sectors wanted to emphasise the importance to the general business community of tackling climate change.

I remember the surprise from senior Government officials when I explained to them that CBI supported strengthening the UK 2050 carbon target from a 60% cut to 80%. They may have been initially surprised, but also welcomed the cover this gave ministers to be more ambitious in climate policy.

We need a similar mainstream business voice on air quality. I can't believe that retailers want shoppers having to negotiate streets choked with air pollution. Or that Britain's tourism industry – generating over £24bn – is happy with tourists gazing at the UK's world famous tourist attractions through a haze of NOx and particulate matter. If those views were heard loud and clear, it might give ministers the political will to think more radically about what needs to be done to clean up Britain's dirty air.

Matthew Farrow is director general of the Environmental Industries Commission, the leading trade body for environmental firms.

www.eic-uk.co.uk

Highways England sets out the challenge, Tideway green light, vision for rail, the digital future and northern transport

All articles can be read in full at www.infrastructure-intelligence.com

TOP STORY: Roads: industry has two years to to prove it can deliver

Future road spending to eclipse current £15bn plans is possible but Highways England and its supply chain have just two years to show they can do it, says Highways England boss *Jim O'Sullivan*.



Jim O'Sullivan is the new chief executive of Highways England

"We are working on the biggest road capacity programme since the 1970s with Road Investment Strategy 1. If the economy continues to grow RIS 2 will be bigger. But that will depend on the successful delivery of RIS 1," O'Sullivan said.

The Road Investment Strategy sets out plans to spend over £15bn in the six years to 2020/21. It is the first ever long term plan for developing the nation's highways network and the Department for Transport has set out what it describes as a "deliberately ambitious" and demanding vision for Highways England to deliver.

"Year 3 is the critical year (2017/18). That is when the workload really ramps up and when we will be starting to negotiate RIS 2 with Government," O'Sullivan said.

"By year three, we'll have to have had a track record of delivery behind us. But we need an organisation and a supply chain that is credible and looks like it can do the last two years of RIS 1. We have to be on programme and able to show that we are surrounded by an industry that is up for years four and five. Everything hinges on the

people, equipment and organisational capability."

Year 3 is when workload which has been settled at between £1bn and £1.5bn a year increases dramatically to £4bn a year, a huge step change for Highways England and its supply chain to manage.

"Delivering the Road Investment Strategy is absolutely vital. Especially when you consider the pressure on other sectors like Network Rail," O'Sullivan said. "After six weeks in the job, however, I am confident it is deliverable but there are a number of organisations yet to be persuaded."

Keys to future success are having the right skills in Highways England and to develop effective collaboration with the supply chain, O'Sullivan said.

He is aware of the enthusiasm for long term contracts in the supply chain but has some words of caution.

"Long term contracts are a good thing but can lead to complacency. Our suppliers need to take a long term view of the market and upskill accordingly. They may lose out if they only upskill to the limit of the long term contracts allocated."

Thames Tideway to start next year



Once in a generation opportunity said project boss *Andy Mitchell*.

Construction of London's new £4.2bn 'super sewer' will start next year following the confirmation of independent investors to finance and deliver the scheme. Contractors will begin mobilisation in September.

Bazalgette Tunnel Limited, a new special-purpose company appointed to take the project forward, received its licence from Ofwat as a new regulated utilities business, separate from Thames Water.

At the same time, Thames Water announced a much lower than predicted cost of the project to customers of £20 - £25 a year, way below the predicted £80 level. And the three preferred bidder contracting consortia had their contracts confirmed.

"It's no exaggeration to say this is a truly momentous day for London and the River Thames" said Thames Water CEO Martin Baggs.

The news means that Andy Mitchell, CEO at 'Tideway', the delivery organisation for the Thames Tideway Tunnel, now owned by Bazalgette Tunnel Limited, can get on and build the scheme.

"It's not just about cleaning up the river, important though that is. Nor is it just about building a tunnel. It's about making sure we transform the River Thames, making it central to the capital's wider social and economic well-being. This is a once in a generation opportunity."

Time to set rail on a different track?



Government's review of Network Rail offers an opportunity said Arup director *Alexander Jan*.

Despite stable funding and independent regulation, the Network Rail model is now being challenged.

So what should happen next? Some parts of the system – such as the intercity routes – should be cut loose from state control. The tracks and trains could be hived off under thirty or forty year concessions. That would allow long term investment decisions to be made to the benefit of passengers.

Competition from road, air and other rail providers would keep long distance operators on their toes. Light touch regulation could ensure proper access arrangements.

Scotland and Wales should be handed full responsibility for their parts of the rail network – as is largely already the case north of the border.

For London and other major city regions of England, the Government should be equally ambitious. A policy of supercharged rail devolution could see the Mayor of London along with leaders of the counties take responsibility for running trains and the infrastructure that serve their areas.

Rail devolution would create an industry structure and range of incentives to drive efficiency and innovation. Crucially it would support more housebuilding and growth on railway land. And it would answer the decades old question of what the state should do with Britain's railways.

The North's missed opportunity



A £13bn transport blueprint for the Northern Powerhouse is missing long term vision.

The document outlines work underway in road and rail projects throughout northern regions but fails to mention any of the long term plans identified in the Northern Transport Strategy published in March.

"Badging it as a blueprint is a missed opportunity," said Marc Davies, chair of the ACE Northern Region and a director at WYG in Leeds. "The document earlier in the year had strategic ideas around road and rail and options for TransPennine routes. Progressing those ideas would have been very positive and shown proper commitment to the Northern Powerhouse."

The blueprint was published as Transport Secretary Patrick McLoughlin visited projects in the north of England. He said that Government was determined to keep the momentum going.

Other experts agreed that the plans need to be part of a wider strategy. "To achieve their full potential, the latest plans must form part of a broader Northern integrated transport strategy, which could include HS2, a high speed east to west rail link and other peripheral projects. These bring with them separate challenges, such as finding the funding and generating public support over the medium term – but these are areas that leaders are already focusing on," said Malcolm Bairstow, partner and head of infrastructure at professional services firm EY.

Bridging the digital gap



Neil Farmer of Tony Gee explained how digital engineering could revolutionise bridges.

Experts from consultant Tony Gee, contractor Laing O'Rourke and academics from the University of Cambridge have started on a research project entitled "Digitally enabling the design for manufacture, assembly and maintenance of bridges."

Costing £1.2million and co-funded by Innovate UK, the research aims to rationalise and automate bridge design processes through digital engineering. This in turn will allow the standardisation of some of the most common bridge types and elements, enabling offsite fabrication using advanced manufacturing techniques.

Working for Laing O'Rourke on the creation of a dual carriageway, Tony Gee helped support the use of design for manufacture and assembly (DFMA) by designing seven bridges in a way that promoted this method.

There are seven work phases to the new research before we move on to analysis of the design process, engineering DFMA processes and linking this to BIM.

- Quantify, classify typologies and requirements
- Capture, analyse design decision making process
- Research design and Engineer DFMA components
- Integrated set of digital tools
- BIM linked quality management system
- Data dictionary, data schema and translators
- Benchmark and demonstration.

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Careers

Career Path: Lavinia Melilla

Lavinia Melilla is a port and marine technical expert with Bechtel, and has recently been awarded a fellowship by the Institution of Civil Engineers. Aged 35, she is the ICE's youngest fellow.

Why did you decide to go into engineering?

I knew that I wanted to be an engineer right from when I was a small child. My father was a civil engineer in Italy, where I was raised, and he was always passionate about his career. He told me that you can design and build whatever you wish if you are an engineer. It was always the career for me.

What did you study? How did that lead to this career?

I studied civil engineering and then gained a Masters in marine structures at the University of Rome La Sapienza. After that, I obtained a PhD in hydraulics. Throughout my studies I gained experience in design and construction and I naturally progressed into the port and marine industry.

CV highlights since

Travelling all over the world and coming up with new formulae and equations for sedimentation and flood dynamics



(I enjoy maths!), and developing a new method to identify vortex structures in turbulence. Other highlights include being on the ICE's Maritime Expert Panel. But most recently, I am delighted to have been awarded a fellowship by the ICE.

Describe your job

I provide input to assist technical decisions about port and marine activities that Bechtel's involved with around the world. Innovation, sustainability and value engineering

are a constant focus of my work. No port and marine project is ever the same because there's always a unique combination of environmental conditions and customer requirements. So my work is never boring!

What advice would you give your younger self?

Give plenty of attention to value engineering exercises to minimise costs – it will be important in the future. And take the time to get to know and learn from colleagues.

What kind of career do you believe engineering offers women?

There are just as many opportunities for women as there are for men. Everyone – regardless of gender – gets out of their career what they put into it. There are no limits for women engineers and I have personally found that I am listened to and treated as an equal to male engineers in all of the countries in which I've worked.

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