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MARCH 2018



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17 APRIL 2018 - NEC, BIRMINGHAM

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INFRASTRUCTURE, HOUSING
& SUPPLY CHAIN EVENT

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INSOLVENCY TRIGGERS LIABILITY
UNDER ABI PERFORMANCE BOND

the **INFRASTRUCTURE** SHOW 2018 Constructing the Future

The UK's Leading Infrastructure, Housing & Supply Chain Event

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WELCOME

from the editor

WELCOME to the latest edition of UK Construction Excellence.

A year on from Royal Assent, ground has been broken on phase I of HS2, Britain's High Speed Rail, and in this issue we focus on the contribution transport makes to the economy.

According to the latest analysis, contractors' output in the transport sector in 2017 was valued at around £8.6Bn; we look at the 'Transport Infrastructure Construction and RMI Market Report –

UK 2017-2021' in more detail and see how the construction industry will benefit.

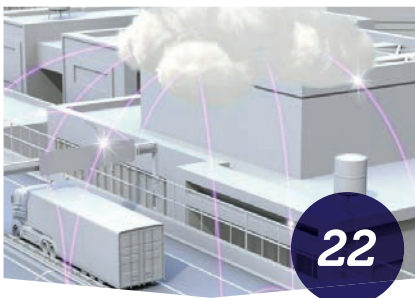
Highways England is driving much of the investment into Britain's roads, with the development of an intelligent motorway network; we examine its strategic plan and the dawn of the digital age for our roads. Cars of the future could be programmed to spot potholes on motorways and automatically transmit this information, improving both maintenance efficiency and road safety.

While the launch of Transport for the North builds on the success of the Northern Powerhouse, with the organisation looking to transform the transport system for the North of England, providing the infrastructure needed to drive economic growth. And as always, the latest in news, views and opinions from around our industry.

Victoria Maggiani

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**CONSTRUCTION
MEDIA**
ISSN 1461-1279

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UKIS 2018: GETTING INTO THE ZONE

The UK's Leading Infrastructure & Supply Event

Infrastructure is the foundation upon which our economy is built. The Government remains determined to deliver better infrastructure across the UK to help grow the economy and improve opportunities.

With a national infrastructure pipeline of over £600Bn in projects to be completed over the next ten years, the infrastructure industry represents a significant opportunity for businesses of all sizes.

The UK Infrastructure Show – Constructing the Future, taking place at NEC, Birmingham on Tuesday 17 April, is a must-attend event for those working in all areas of infrastructure. Register today for FREE!

UKIS 2018 provides participants with a unique opportunity to engage, connect and collaborate with a vast array of key projects, decision makers and influencers representing all areas throughout the supply chain.

The latest National Infrastructure Pipeline features over 720 projects and programmes across transport, housing and digital to fire up the nation's infrastructure, and UKIS is delighted to be working with HS2, Transport for London, Tideway, Horizon Nuclear, Consortium Procurement, Procurement for All, and Midlands Connect.

The 2018 show has been zoned into the three main areas of infrastructure, representing the top spending infrastructure sectors, and visitors can engage with the Supply Chain Opportunities Zones around these areas.

- **Housing Zone**
- **Moving Zone**
- **Powering Zone**

Each zone will have a series of presentations from projects, giving you more details on the supply chain opportunities available within the organisations presenting. Hear direct from representatives of some of the major UK infrastructure projects including HS2, Crossrail 2, Wylfa Newydd Power Station, Tideway, Westminster Regeneration, Birmingham Regeneration and more.

Housing

Housebuilding is a national priority, with demand for new public and private housing at its highest ever level. The Department for Communities and Local Government has committed to fixing the broken housing market with significant investment and changes to planning procedures, including the creation of a £2.3Bn Housing Infrastructure Fund to unlock new housing projects across the UK.

The Government has pledged to build 300,000 new homes, and with this comes additional requirements for supporting infrastructure – so investment into major water and waste projects continues, including the Tideway project, which is one of the largest of its kind.

Within the Housing Zone you will hear from some of the major buying consortia in the housing sector, detailing the framework opportunities available to organisations like yours. Find out more about some of the major frameworks available in sectors including compliance, property maintenance, safety and security, corporate procurement, water treatment services and more. Attend sessions in the Housing Zone and learn more about how your company can work with the major players in this sector. As a buyer you will hear more about Universal Credit and also Dynamic Purchasing Systems and the benefits they can bring to your organisation.

Official Housing Zone Partners include two of the UK's largest social housing consortia Consortium Procurement, Procurement For All as well as Westminster City Council and Delta eSourcing.

Moving Zone

The UK is a nation on the move. New roads, bridges, tunnels and public transport infrastructure – including large-scale projects such as HS2, Crossrail 2 and the Trans Pennine Route Upgrade – aim to make travel easier and faster and reduce its impact on the environment. In the next five years around £30Bn will be spent on major new rail projects and upgrades to existing lines, with a further £10Bn spent on new roads.

Sessions in this zone will cover some of the biggest transport infrastructure projects in the UK, including HS2 and Crossrail 2.

Powering Zone

Demand for the resources needed to power the UK has never been greater, so investment in delivering new sources of energy is set to rise. Over the next five years, £5Bn will be spent in Scotland alone, with a further £16Bn spent across the rest of the UK, including the Hinkley Point C nuclear power station in the South West. Energy projects are large and complex – and involve long and diverse supply chains providing services from design and engineering to IT and facilities management. Green energy projects run by cities and local authorities are also set to receive millions in Government funding, opening up further opportunities for businesses of all types to get involved; not to mention the opportunities from biomass, onshore wind and other renewable energy projects.

Sessions within the Powering Zone will focus on some of the major energy and utilities projects underway across the UK.

Skills Development Zone

Prepare for Success: The Skills Development Zone offers a range of interactive sessions designed specifically for suppliers looking to improve their knowledge and success rate during the bidding process. Whether you are a current or aspiring supplier to the infrastructure sector, this training zone provides the expert advice needed to help you find opportunities and improve your bidding techniques.

What will I learn? By attending the Skills Development Zone you will:

- Learn how to avoid the common pitfalls that litter the bidding process
- Understand how to identify and add value to your bid
- Improve your chances of achieving greater bidding success
- Hear how CompeteFor can help you find opportunities in this sector

Product Showcase

- Discover Innovation and Cutting Edge Solutions
 - The Product Showcase at the UK Infrastructure Show 2018 will bring together current and aspiring suppliers within this high-value marketplace, alongside some of the major infrastructure projects under way across the UK.
 - This area of the show will bring together construction's leading and most influential suppliers, representing a wide range of products and services, designed specifically to enhance efficiency and support the ongoing requirements of the infrastructure industry.
- Visitors will have the opportunity to:**
- Discover exciting new products, innovative services and efficient and adaptable suppliers
 - Develop new partnerships and working relationships
 - Network with cutting-edge solutions providers
 - Exhibitors and sponsors will benefit from direct contact with over 1000 delegates from across the infrastructure industry, enabling them to develop both new and existing business opportunities within this multi billion pound marketplace.

PROJECT PARTNERS

Organisers, BiP Solutions, have confirmed several major partners for the event, including the Infrastructure Projects Authority, HS2, & Thames Tideway.

THE IPA works with Government and industry to ensure infrastructure and major projects are delivered efficiently and effectively, giving it exclusive insight into the sector.

HS2, the high-speed railway, will provide high-speed connections across the country by 2033. HS2 will be a catalyst for growth across Britain, opening up local and regional markets, attracting investment and improving skills and job opportunities.

TIDEWAY is the organisation delivering the Thames Tideway Tunnel, a 25Km sewer tunnel

OPPORTUNITY AND TRAINING ZONES

Designed to educate delegates on the key issues common to large-scale infrastructure projects, these zones will take you through all you need to know in order to make the most of the supply chain opportunities available in this sector. You will also hear from representatives from some of the UK's leading projects, with details of supply chain opportunities.

COMPETEFOR SUPPLY CHAIN ADVICE HUB

The CompeteFor Supply Chain Advice Hub is the go-to place for any organisation looking to improve their procurement capability, get a complimentary profile check-up or have your questions answered.

PROJECT PARTNER PAVILIONS

Our project partners will each have a dedicated pavilion within the Product Showcase Exhibition. Come along and meet with representatives from these projects to learn more about the supply chain opportunities open to organisations like yours.

PRIME CONTRACTOR ENGAGEMENT VILLAGE

The UK Infrastructure Show Prime Contractor Engagement Village will allow visitors the opportunity to meet directly with many of the key Prime Contractors currently engaged in the delivery of live projects, providing an insight into possible opportunities for developing ongoing working relationships.

needed to prevent untreated sewage discharging into the tidal River Thames in London. The tunnel will not only improve the environment, ecology, public health, appearance and reputation of London, but it will also give a much-needed and immediate boost to the economy by offering thousands of skilled jobs and hundreds of apprenticeships.

CONSORTIUM PROCUREMENT is the national procurement service of the Northern Housing Consortium, providing a wide range of framework agreements covering compliance management, asset management, telecare and financial inclusion including insurance and electronic payments. We currently represent over 300 members who between them manage over three million social housing tenancies across the UK.

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The UK Infrastructure Show 2018 is FREE to attend for anyone working in the infrastructure sector

– SMEs, Prime Contractors and representatives from major projects across the UK. To register for your complimentary place, simply

CLICK HERE.



UK the **INFRASTRUCTURE**
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Official Project Partner :
West Midlands Combined Authority

(L-R) Huw Rhys Lewis, Managing Director of the Urban Growth Company; Cllr Bob Sleigh, Deputy Mayor of the West Midlands and leader of Solihull Council; Laura Shoaf, Managing Director of Transport for West Midlands; and Bernadette Kelly, Permanent Secretary at the Department for Transport

Major transport schemes underway in West Midlands

Top government officials have been given a tour of several major transport schemes currently underway across the West Midlands.

More than 100 senior Department for Transport (DfT) managers, including Permanent Secretary Bernadette Kelly, travelled from Whitehall to Birmingham for the regional tour. Guests were welcomed by Mayor for the West Midlands Andy Street, who chairs the West Midlands Combined Authority (WMCA) and is a keynote speaker at the UK Infrastructure Show.

Transport for West Midlands (TfWM), the transport arm of the WMCA, took the representatives around key schemes already under construction in the region and part funded by government, as well as other major project sites.

Between them, some of the schemes represent up to half a billion pounds worth of investment.

Laura Shoaf, Managing Director of TfWM, accompanied the Permanent Secretary on a tour of UK Central Hub, at the National Exhibition Centre and Birmingham Airport site. Here, they were met by Deputy Mayor of the West Midlands and leader of Solihull Council, Cllr Bob Sleigh and Huw Rhys

Lewis, Managing Director of the Urban Growth Company, who explained plans to transform Birmingham International Railway Station into a major transport hub.

The project aims to provide seamless connections to Birmingham Airport and the new HS2 Interchange Station by 2025, bringing together rail, tram and bus services, as well as private vehicles, taxis and bicycles.

Other projects visited by DfT officials were: the Midland Metro depot at Wednesbury, which was given government funding last November and where there are plans for a tram extension to Brierley Hill; and the Wolverhampton Interchange project, which involves a redevelopment of the city's railway station and an extension of the existing tram line.

Cllr Sleigh said: "The West Midlands is enjoying a renaissance right now but we need to make sure we have a transport network that can not only meet the increasing needs of passengers and businesses but also help accelerate that economic growth.

"That's why we will be spending £3Bn on new transport infrastructure over the coming decade to provide more tram

and rail lines, better roads and more cycle routes.

"I'm therefore pleased we have been able to welcome Bernadette and her staff to the region and show them how these schemes make a real difference to people's everyday lives."

Bernadette Kelly commented: "The Midlands is at the heart of the UK and its transport network. Modern, effective links are critical to driving forward the Government's commitment to make the Midlands a powerful engine for economic growth, both regionally and across the country.

"We are improving connectivity, shortening journey times, reducing congestion and transporting people, ideas and goods. We are making everyday journeys better and connecting lives, jobs and communities."

Don't forget to visit West Midlands Combined Authority at UKIS 2018 for more procurement opportunities: Book now at <http://www.ukinfrastructureshow.co.uk/>



Intelligent cat's eyes light up Switch Island

Switch Island in Merseyside is set to benefit from the introduction of intelligent cat's eyes.

Highways England is installing some 170 innovative new cat's eyes at Switch Island, which is one of England's busiest motorway junctions where the M57, M58 and three A roads converge, as part of a £3M project to improve safety.

The new LED road studs, or intelligent cat's eyes, light up in response to changing traffic lights. This will be the first time the technology has been used at a motorway junction to improve safety for the 90,000 vehicles that use the junction every day.

The new technology has already been installed at Hindhead Tunnel in Surrey, guiding drivers through the tunnel, but the Switch Island scheme will be the first time they have been linked to traffic lights at a motorway junction.

The LED road studs light up when traffic lights turn green so drivers can clearly see which lane they should follow. Cables under the road surface connect them to traffic lights through a nearby automatic controller unit.

Visible up to 1,000m away, the new studs are far greater than traditional reflective cat's eyes, and have been proven to help stop drivers drifting between lanes,

reducing the risk of collisions.

Phil Tyrrell, Project Manager at Highways England, said: "We're always looking for new ways to further improve journeys and safety for drivers, and I hope the new intelligent cat's eyes will help better guide drivers around Switch Island.

"The innovative light-up road studs along with the other improvements we're introducing will make it much easier to navigate the junction, benefiting the tens of thousands of drivers who travel through it every day."

Work to improve congestion at Switch Island is due to start in February, and is being funded by the Government's £220M congestion relief programme.

The scheme will take around a year to complete and is designed to improve the flow of traffic and enhance safety, following 49 collisions at the junction in the past two years. New traffic lights will be installed at a height of over five metres – higher than HGVs and double-decker buses – so that drivers approaching the junction can clearly see when the lights are changing.

Further improvements will see changes to the road layout and lane markings, new barriers between carriageways, coloured high-friction surfaces and better signs. A new 400m shared cycle

path will also be created through the junction, linking up with the existing cycle path alongside the A5036 Dunning's Bridge Road.

Jerry McConkey, Sefton Council's Transportation and Highway Infrastructure Service Manager, said: "We have worked closely with Highways England and Merseyside Police to look at the issues at Switch Island and develop improvement proposals.

"As a result, we are delighted that these important safety measures are about to be introduced with Highways England implementing the latest technology solutions. This will further improve safety and give drivers a much higher level of confidence when negotiating this busy junction."

The new intelligent cat's eyes which are being installed at Switch Island were designed by Oxfordshire-based company Clearview Intelligence. Managing Director Nick Lanigan commented: "The introduction of intelligent road studs, reacting to traffic light changes on a busy roundabout, is a continuation of the traditional cat's eye legacy but takes advantage of new technology available. The new studs have been proven to reduce lane transgression by over 50% in certain conditions so it's a great way to help improve the safety for all road users."

HS2 searches for contractors

HS2 Ltd is currently seeking rail systems track and mechanical and electrical contractors to deliver the track and overhead catenary system works and the tunnel and lineside M&E and tunnel ventilation works between London and Birmingham (Phase One) and Birmingham to Crewe (Phase 2a).

The contract package is worth some £1.55Bn, with the track and overhead catenary system (OCS) package overseeing HS2's construction and its dynamic testing phase. It will link the whole system and trains before handing it over to the operator for the line's trial running phase.

Aspects of the track and OCS contract include delivery of critical elements of the railway's infrastructure, covering its overhead catenary 'power' system from which high-speed trains will draw down power, and 180 miles of track along which they will travel at speeds of up to 225mph.

The contract also incorporates construction work within stations and in tunnels including the provision of engineering trains to link worksites along the route. It also covers design integration and co-ordination with other railway systems, civil engineering and station construction contractors.

The second part of the Pre-Qualification Questionnaire (PQQ) publication is for the circa £330M contract for the tunnel and lineside M&E and tunnel ventilation works. It covers the design,



installation, testing and commissioning of HS2 safety equipment including tunnel ventilation fans, lighting, handrails, fire safety equipment and tunnel alarm systems.

HS2 Ltd Chief Executive Mark Thurston said: "We're looking for the smartest, most cost-effective solutions that the industry has to offer through these contracts, which form part of the overall railway system for HS2.

"These two essential contracts are fundamental to HS2 operating safely, reliably and efficiently for the millions of people who will use and come to depend on it. Once complete, HS2 will transform rail travel in the UK, providing extra capacity and improved connectivity between our major cities and act as a catalyst for growth across the UK."

HS2 services will connect over 25 destinations and 30 million people across the UK. Trains will serve existing city centre stations in places like Glasgow and Liverpool, as well as brand-new purpose-built stations in Birmingham, Manchester, Leeds, and the East Midlands.

Don't forget to visit HS2 Ltd at UKIS 2018 to discuss more procurement opportunities: Book now at <http://www.ukinfrastructureshow.co.uk/>

Major upgrade scheme for A38

Highways England has revealed the preferred route for a major junction improvement in Derbyshire.

The A38 Derby Junctions Scheme is designed to make journeys more reliable, with long-distance journeys separated from those making local journeys.

Valued at £225M, the project will see the Kingsway, Markeaton and Little Eaton roundabouts replaced with two underpasses and a flyover, which will collectively help to reduce congestion on this busy route.

The publication of the preferred route follows public consultation held in February and March 2015.

Highways England senior project manager, Graham Littlechild, said: "Following our consultation held in 2015 we carefully considered all feedback to select the best possible options to take forward as our preferred route. This process has been detailed and time-consuming, but this has been necessary to ensure we make the correct decision.

"Once complete, this scheme will alleviate three key bottlenecks for those travelling through Derbyshire on the A38."

Further work will now progress on the design, with Highways England looking more closely at the local



area, completing surveys and investigations to help design the scheme in greater detail.

A further period of consultation will be carried out later this year, before the application for a Development Consent Order is submitted.


If planning approval is granted, construction work on the scheme could start in 2020/21.

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Artist's impression of East Midlands Hub

Midlands to maximise HS2 benefits

The Government, Midlands Connect and East Midlands Council have agreed a number of priorities which will help maximise the economic benefits HS2 will bring to the region.

These include a commitment to the partial opening of the East Midlands Hub Station in Toton, several years before HS2 arrives in 2033.

Between them, four key outcomes were agreed during a meeting between Secretary of State for Transport Chris Grayling and representatives of Midlands Connect and East Midlands Councils in Nottingham.

All parties have agreed to work towards:

- Partially opening the East Midlands Hub station at Toton in the 2020s, at least for Network Rail services, to support and stimulate the development of the planned Innovation Campus nearby, which has the potential to create 10,000 new jobs;
- Early delivery of road infrastructure around the Hub to support the early phases of the Innovation Campus;
- Relocating the Network Rail/DB Cargo depot in Toton to another site within the East Midlands to facilitate the development of the Innovation Campus; and
- Establishing an East Midlands 'delivery body' to realise the potential of the Innovation Campus and associated Garden Village housing developments.

In addition to these four priorities,

Midlands Connect and East Midlands Council will continue to press for a link between the Midland Main Line and HS2 Phase 2b. This will ensure classic compatible trains can serve the North of England from the East Midlands; while all parties have also agreed that services on the Midland Main Line need to be improved, following the decision not to electrify the line between Kettering and Sheffield.

Commenting on the progress that's been made, Midlands Connect Chairman Sir John Peace said: "We have said for a long time that more investment in transport and infrastructure in the East Midlands can have a transformative impact on its economy and the quality of life of the millions of people who live here. I'm therefore pleased that the Government is already in dialogue with the Midlands Connect team and East Midlands Council to accelerate connectivity around the HS2 Hub station at Toton.

"This is a once-in-a-generation opportunity for the region and I am looking forward to further meetings early in 2018 to keep up the momentum."

Chris Grayling, Transport Secretary, said: "HS2 will become the backbone of our national rail network – supporting growth and regeneration, bringing passengers faster journey times and delivering an estimated 74,000 jobs and adding nearly £4Bn to the East Midlands economy by 2043.

"I welcome the ambitious growth strategy put forward by the East Midlands leaders to maximise the benefits of HS2 through the development of an Innovation Campus, garden settlements and better connections at Toton. We have also invested £25M to help Midlands Connect develop a transformational transport strategy, and will work with them on their proposals."

It is hoped that by working more closely with the Government on the East Midlands Hub and Midland Main Line regional communities and businesses will receive more certainty about the future of transport and infrastructure developments, to rebalance investment across the country.

As the transport pillar of the Midlands Engine, Midlands Connect is contributing to achieving the ambition to add £54Bn to the Midlands and UK economies by 2030, powering post-Brexit growth, not just for the benefit of the Midlands but for the whole of the UK.

Don't forget to visit Midlands Connect at UKIS 2018 for more procurement opportunities: Book now.



QS & Construction Conference 2018

10 May 2018, Etc. Venues St Pauls, London

Join the discussion at the RICS QS and Construction Conference, review sector's performance and analyse current demands on the industry and its future direction.

The event will be a mixture of high-level strategic debate combined with practical sessions that will positively impact your day-to-day practice. Dedicated technical sessions will examine building contracts, whole life costing and case law updates.

The day will culminate in a debate tying together the conference topics to understand the strategies and new methods of construction needed to respond to today's, tomorrow's and the future requirements of the industry.

Highlights of the day include:

- Economic update – understand current market conditions, results from the latest RICS Construction Survey and discover where we are in the current property cycle.
- Offsite construction in action – hear a case study of a project that successfully utilised off-site manufacture and whether this new modern method of construction is the future of the industry.
- In conversation with TfL – hear from a construction client on their views and outlook for the industry.

This is the must attend event for anyone wanting to be at the forefront of the construction sector.

Visit the website for more information rics.org/qconference



Construction set for growth worldwide

A resurgence in US construction is set to support a robust run of growth for the sector worldwide, according to the latest report from Oxford Economics.

The report analyses statistics for the sector from across the world, and 2018 is set to be a strong year for construction, with several back-to-back years of robust expansion above average annual growth rates seen over the current decade also predicted.

This optimistic outlook is set to be fuelled by a sharp upturn in US construction activity after the American sector spent much of 2017 in the doldrums. US construction is expected to have registered growth for last year of just 0.2% following a Q2 contraction by 0.6% and with a further expected decline in Q3 2017.

In contrast, the forecast for 2018 is an expansion of US construction by 2.8%, to be followed by an even stronger 2019 with projected growth of 3.3%.

Expectations for US construction growth are set by strong global economic growth and a further strengthening in world trade, plus higher optimism driving additional investment in new projects. A further boost for the American sector will come from the Trump Administration's proposed infrastructure investments.

Residential building is the dominant driver in the US, although infrastructure investment may leave civil engineering as the leader. Oxford Economics predicts US civil engineering to grow by 2.2% in 2018.

Globally, the expected resurgence in US construction is a key driver of the forecast for global construction growth to accelerate to 3.2% this year and 3.3% in 2019, from an expected 2.4% in 2017, 2.5% in 2016 and an average of the preceding five years of 2.8%.

Robust growth will continue in eurozone construction and forecasts have been upgraded for the year. This continuing buoyancy in construction comes against a backdrop of widespread economic strength in the eurozone.

The German construction sector remains the major driving force, riding a wave of demand in the wake of the million-plus migrant influx from 2015. Both residential and non-residential construction have seen significant boosts.

For China, the 2018 forecast has been scaled back, although construction growth is still strong at 4.2%.

Overall, construction in China remains relatively steady, with non-residential construction the strongest component, especially commercial structures such as office buildings and shopping complexes.

In the UK, however, ongoing weakness is predicted for construction in 2018, with a contraction of 0.3% forecast for the sector. The sectoral picture is bleaker than in recent years as the outcome of uncertain Brexit negotiations impacts on investment decisions.

The full research report is available from Oxford Economics.

NHBC reports rise in UK new home registrations

The NHBC has reported an increase in new home registrations for 2017, with more than 160,000 new homes registered to be built in the UK last year. The figures show an increase of 6% on 2016, according to NHBC's latest new home statistics.

Throughout the year, some 160,606 homes were registered, up by some 8,500 homes in 2016, and the highest since the pre-recession levels of a decade ago.

The private sector showed the highest number of properties registered, at 3% (118,825 new homes) higher than 2017. The affordable sector has shown the sharpest increase, with 41,781 homes pushing the figures up 14% on 2017. This is also the highest yearly total for the sector since NHBC electronic records began 30 years ago.

Actual completion rates are also improving, increasing by 4% from 141,685 in 2016 to 147,278 last year.

Across the UK, nine out of 12 UK regions experienced an increase in registrations, with the East Midlands (+19%; 14,481), Wales (+19%; 5,470) and North West (+12%; 16,947) among the areas which saw noticeable growth.

2017 also showed the first increase in the capital since 2014, with a slight increase on 2016, with 17,850 units compared to 17,587.

Commenting on the statistics, NHBC Chief Executive Steve Wood said: "Our figures show the market has delivered strong growth resulting in the highest new home figures for a decade and growth across the majority of the UK, including London for the first time since 2014.

"Looking ahead, NHBC will continue to work with the industry to help raise the standards of new homes. With 6% growth in the quantity of new home registrations, the focus on delivering quality for consumers remains critical."

Insolvent

Building contractor insolvency triggers liability under ABI performance bond

It is common in construction contracts to use bonds as protection against non-performance by contractors. The courts have recently given guidance around the interrelation between performance bonds and contractor insolvency.

In *Ziggurat (Claremont Place) LLP v HCC International Insurance Company plc*, Ziggurat, the employer, contracted with County Contractors UK Ltd ('County') to build blocks of student accommodation. The contract was in standard JCT 2011 standard form. A performance guarantee bond was provided over County's work on the accommodation by HCC International Insurance Company plc ('HCC').

County stopped work on the site, highlighting financial difficulties as the cause. The bond, in general, provided that if there was an event of breach of contract by the contractor, it would discharge losses suffered by the employer. The bond differed slightly from a usual standard form bond where, at Clause 2, an addition was agreed by the parties which was described as a 'homemade addition' by Coulson J. Clause 2 provided that "The damages payable under this Guarantee Bond shall include (without limitation) any debt or other sum payable to the Employer under the Contract following the insolvency (as defined in the Schedule) of the Contractor."

County failed to return to site and Ziggurat proceeded to serve notice of termination, stating that others would be employed to finish the job and it would seek to recover these costs. Ziggurat identified County's failure to proceed diligently with the works and attend site as the reasons for termination. County was insolvent and duly entered into a creditors' voluntary arrangement (CVA). Ziggurat still proceeded with its demand under the bond.

County took issue with the validity of the termination, stating that Ziggurat had repudiated the contract by serving a notice two days early, prior to the insolvency event, which meant that the contract had

come to an end. Coulson J held that this was contrary to the scheme provided for under the JCT Standard Form.

The surety, HCC, heavily resisted paying under the bond, arguing that Ziggurat had to prove that County was in breach of contract and the losses stemmed from such a breach. HCC argued that it was necessary to prove both that a breach had taken place and that losses had been incurred as a result of that breach before a claim could be made under the bond.

Coulson J looked at the meaning of Clauses 1 and 2 of the bond. Clause 2 clearly stated that damages included 'any debt' payable under the Contract following the insolvency. The debt was therefore ascertained even though it was demanded after the CVA. The Clause was clear that County was still liable for sums that were not paid following insolvency and County was in breach because they failed to pay the debt, and payment was due under the bond.

Clause 2 was not deemed as a subsidiary clause to Clause 1 and was not 'stand-alone'. A breach of contract was therefore not required to trigger HCC's obligations. The contract provided two separate termination routes, the default of the contractor, or the insolvency. The bond sought to mirror these.

Coulson J rejected HCC's arguments on the point above, stating:

"In my view, that is an erroneous reading of the provisions of the bond... That interpretation would mean that clause 2 could never operate. If an insolvency event is not a breach, which is the assumption for this purpose, and the only trigger under the bond is a breach of contract by (the contractor) then clause 2 would be rendered redundant."

County's insolvency was sufficient to trigger the termination provisions of the building contract. Ziggurat did not have to prove that County was in breach of contract. Coulson J pointing out that the

insolvency in this case "is a complete answer to the breach point." HCC was attempting to defend a matter which did not have much hope of being defended.

The case shows that employers can always expect a fight from sureties before receiving any money, even if the fight seems fruitless.

Even though Ziggurat won this case, the lesson learnt for employers, contractors and surety's alike, is that parties' must always be careful when inserting homemade amendments to ABI Model Form provisions of bonds, especially when they cover insolvency proceedings. The case illustrates the danger of amending an ABI bond.

The new Clause 2 in this case was designed to protect the employer from losses resulting in the work ceasing following insolvency. Overall, the bond did not provide a sum of money for Ziggurat to spend at the end of the matter, but a right to sue once works had been complete



Article submitted by Mark James,
Partner, Coffin Mew

RECOVERING PARTY COSTS IN ADJUDICATION – THE FINAL WORD?

The costs of representing a party in adjudication can be significant. Not surprisingly parties are keen, where they can, to recover these costs and there have been a number of reported cases where, for one reason or another, a party has managed to persuade an adjudicator to award the recovery of one party's costs from its opponents.



Although Section 108 of The Housing Grants Construction & Regeneration Act 1996 ("the Act") is silent on whether this was permitted or not, in the early days it was believed by some that such power was automatically bestowed on the Adjudicator. It was argued that, because the Act provided the express power to apportion liability for the payment of his fees, there was an implied power to order the apportionment and recovery of other party costs. This notion was, however, quashed in *Northern Developments (Cumbria) Ltd v J & J Nichol* [2000] BLR 158 in which HHJ Bowsher QC concluded that an Adjudicator had no jurisdiction to decide that one party's cost of the adjudication should be paid by the other party.

As we know, the Local Democracy, Economic Development & Construction Act 2009 amended the Act and introduced a new section 108A to deal specifically with party costs. The provision says:

108A Adjudication costs: effectiveness of provision

(1) This section applies in relation to any contractual provision made between the parties to a construction contract which concerns the allocation as between those parties of cost relating to the adjudication of a dispute arising under the construction contract.

(2) The contractual provision referred to in subsection (1) is ineffective unless-

(a) It is made in writing, is contained in the construction contract and confers power on the adjudicator to allocate his fees and expenses as between the parties, or

(b) It is made in writing after the giving of notice of intention to refer the dispute to adjudication.

There has been some confusion concerning what Section 108A actually means. Did paragraph (2) (a) allow parties to lawfully include express provisions in their contracts allowing for one party to recover cost from the other or did this provision solely relate to allocation by the adjudicator of his fees and expenses? We now have an answer.

In **Enviroflow Management Limited -v- Redhill Works (Nottingham) Limited** [2017] EWHC 2159 (TCC) this very point was addressed by Mrs Justice O'Farrell DBE in which she said at paragraph 52 of the decision:

"In my judgement section 108A makes an express provision in relation to the costs of the parties relating to adjudication. It provides that such costs incurred by the parties in the adjudication process will only be recoverable where an agreement to that effect is made in writing after the giving of notice of intention to refer the dispute to adjudication (unless it is a contractual provision relating to the adjudicator's fees and expenses)" [my emphasis]

This is an important judgement because Enviroflow was relying on the implied term set out in Section 5A of the Late Payment of Commercial Debts (Interest) Act 1998 to claim its reasonable costs in recovering the debt Enviroflow considered was owed to it.

This very point was addressed in the next paragraph of the decision:

"In this case, by reason of the Late Payment Act, Enviroflow was entitled to seek its reasonable costs in recovering the sums due in respect of interim applications for payment by reason of an implied term. That implied term falls within the definition on "any contractual provision made between the parties to a construction contract which concerns the allocation between those parties of costs relating to the

adjudication of a dispute under the construction contract". Therefore, it is caught by section 108A, subsection (2), and is ineffective unless the subject of an agreement made in writing after the notice of adjudication."

So, it seems that two very clear points arise from this judgment.

Firstly, any agreement relating to the recovery of inter-party costs will only be recoverable if an agreement is put in writing after the notice has been issued.

Secondly, a party to an adjudication cannot rely on The Late Payment of Commercial Debts (Interest) Act 1998, if it applies, to seek recovery of its reasonable costs in an adjudication unless a specific agreement made in writing after the notice of intention has been issued.

Don't you just love it when we have clarity?

Peter Vinden is a practising Arbitrator, Adjudicator, Mediator and Expert. He is Managing Director of The Vinden Partnership and can be contacted by email at pvinde@vinden.co.uk. For similar articles please visit www.vinden.co.uk.



Transport set to dominate output within the UK infrastructure subsector





According to the latest analysis, contractors' output in the transport sector in 2017 was valued at around £8.6Bn.

The 'Transport Infrastructure Construction and RMI Market Report – UK 2017-2021 Analysis' has been published by AMA Research, a leading provider of market research and consultancy services with over 25 years' experience within the construction and home improvement markets.

Major transport infrastructure development programmes are largely driven by public sector funding under five-year investment programmes, with funding allocated on an annual basis. Between 2012 and 2016, contractors' output in the transport infrastructure sector was volatile, due to annual fluctuations in new road construction output and year-on-year decreases in rail construction activity levels.

The report found that roads construction and maintenance is mainly being driven by the first phase of the Highways Agency's five-year Roads Investment Strategy (RIS1), which is part of the National Infrastructure Plan (NIP). Under this, over £15Bn of funding has been allocated for capital enhancement and renewals for the period 2015-16 to 2020-21.

Other major road schemes are being delivered as part of the multi-modal Transport Strategy for the North, which sets out the strategic options for future transport investment in the north of England to boost the Government's concept of a 'Northern Powerhouse.'

As a result of these and other ongoing schemes, roads construction output is forecast to increase in 2018 and 2019 as road improvement contracts under Highways England's Collaborative Delivery

Framework (CDF) translate into increased output. In addition to new works and major upgrade programmes, Highways England also has a maintenance budget of £1.3Bn over its first fixed five-year investment period for to 2019-20.

In the rail sector, there have been significant increases in contractors output and new orders, underpinned by a combination of major projects and regional frameworks. Contractors working in the UK rail sector currently have £38Bn funds available for Network Rail for Control Period 5, covering the period between 2014 and 2019.

Rail construction output is expected to grow significantly during the period 2017-2019, underpinned by a substantial number of major schemes. These include the Bank Station redevelopment project, main tunnelling works on the Northern Line extension to Battersea and electrification of certain cross-country routes, the delayed Metropolitan Line extension project and enabling works on Phase I of the HS2 Project.

In the airports sector, proposed additional runway capacity at Heathrow should underpin future development, though major construction works are not likely to begin until 2021. Output in the airports sector is also expected to be boosted by a four-year development programme at Manchester Airport and a £1.2Bn capital investment programme over the next five years at Gatwick Airport.

Furthermore, announcements of additional capacity and investment at the UK's major airports, together with a number of smaller and medium-sized projects at both major and regional airports, should also generate additional work in the sector over the next few years.

In the UK ports sector, a number of major schemes are currently being planned or are progressing, many of which are part of key major regeneration schemes including: a significant expansion at the Port of Tilbury; the Western Docks Revival (DWDR) project at the Port of Dover; the second phase of Peel Ports Group Liverpool2 terminal expansion programme; and a major expansion of Southampton Docks.

In Scotland, Wales and Northern Ireland, each devolved administration produces its own infrastructure plan setting out spending on economic infrastructure. The Scottish investment pipeline includes 30 major programmes and over 100 individual projects. In Wales, around £2Bn is being invested in transport infrastructure projects, while in Northern Ireland, £2.6Bn is being invested, with the majority being spent on roads.

The outlook for transport infrastructure construction is positive, with the Government recently committing to providing the biggest investment in transport infrastructure in years, and as a result. Forecasts indicate increasing output and a significant pipeline of major projects under the National Infrastructure and Government Construction Pipeline (NIP). As part of the NIP, around £92Bn is to be invested in transport infrastructure over the period to 2020-21, of which more than half will be put into railways projects. A further £40Bn will be invested across the infrastructure sector at large after 2021.

The report is available now and can be ordered online at www.amaresearch.co.uk or by calling 01242 235724.



Transport for the North

Following in the footsteps of the Northern Powerhouse, Transport for the North (TfN) has been established.

Transport for the North is the organisation formed to transform the transport system across the North of England, providing the infrastructure needed to drive economic growth. This unique partnership is designed to unite elected and business leaders from all areas of Northern England to work with central government and national transport bodies. Transport for the North will not replace or replicate the work of existing local transport bodies. Its role is to add strategic value, by ensuring that funding and strategy decisions about transport in the North are informed by local knowledge and requirements. This

fits with the devolution agenda and TfN will draw powers down from central government rather than up from local government.

In January, Transport for the North revealed its vision for the future, with the release of its Strategic Transport Plan.

In the document, the organisation sets out its plan for the next 30 years. Over this period, TfN wants to transform the road, rail, sea and air connections in the North of England to help drive long-term economic growth. The Strategic Transport Plan explains the need for

investment in transport across the North and identifies the priority areas for improved connectivity.

Its vision is: "of a thriving North of England, where modern transport connections drive economic growth and support an excellent quality of life."

John Cridland, Transport for the North Chairman, said: "The North is a rich, diverse region and home to around 16 million people. We have vibrant communities, buzzing cities, five stunning national parks, an abundance of talent and a wealth of high-

performing businesses. Transport for the North's vision is of a thriving North of England, where modern transport connections drive economic growth and support an excellent quality of life.

"For the first time, civic and business leaders and transport operators are speaking with one voice on transport to make sure the North fulfils its potential. Our plan proposes a revolutionary investment programme that will make it possible to travel to high-quality jobs. This is an ambitious programme that will improve our roads and railways, and will also drive a sea change in skills development in the North, ensuring we meet that historic gap in investment."

The plan is designed to make it easier for people and goods to travel across the region, improving access to jobs, supporting businesses and improving the movement of freight and goods across the North and to ports and airports. Seven 'corridors' of opportunity are identified in the plan that are key to achieving these aims. For example, the 'Southern Pennines' corridor identifies proposed road and rail improvements from the Port of Liverpool to the Humber Ports, via Cheshire, Greater Manchester and Sheffield City Region, as well as strengthening cross-border movements into the East Midlands, whilst 'Connecting the Energy Coasts' explores ways to improve travel between some of the UK's vital non-carbon energy and research assets in Cumbria, North Lancashire, North Yorkshire, the North East and Tees Valley.

Alongside the 'corridors', Transport for the North has outlined its emerging vision for Northern Powerhouse Rail, a rapid, reliable and resilient rail network between the North's six biggest cities and other economic centres. This is accompanied by an updated Rail Strategy for investment in the North's existing lines, stations, services and franchise operations, reflecting the planned integration of Rail North into Transport for the North in April this year.

Response to the plan and TfN's creation has been mixed, with former Deputy Prime Minister John Prescott walking out of the press conference, calling the whole thing "a fraud."

However, other reactions haven't been quite so headline grabbing. Institution of Civil Engineers (ICE) Director General Nick Baveystock, said: "The Strategic Transport Plan aligns with the ICE's own recommendations, setting out a coherent case for improving connectivity across all major modes of transport. This will improve service accessibility and reliability for people in the North and help to deliver sustainable

economic growth across the region.

"We are pleased that the Plan goes beyond the here and now to consider the impact and benefits of future technologies, such as autonomous and connected vehicles. It is critically important to ensure that the North's transport networks are future proofed, signalling that the region is ready and waiting to exploit this and other similar opportunities.

"With Transport for the North preparing to become a statutory body in April, the ICE supports its strategy and looks forward to continuing work together."

David Sidebottom, Director of the independent watchdog Transport Focus, said: "Transport users across the north will be pleased to hear the commitment to keeping them at the heart of plans to develop the transport network. Transport can deliver all kinds of economic and social benefits – but it has to work for the people using it. We look forward to seeing further detail on how Transport for the North will work with transport users to best capture their needs, measure their satisfaction with services provided and then build services that best serve them in the future."

Stephen Joseph, Chief Executive of Campaign for Better Transport, said: "We welcome the Strategic Transport Plan and its emphasis on rail investment in particular. This is long overdue given the decades of underinvestment in rail in the North of England which has left passengers with slow and limited services and routes, and ageing and unsuitable trains. We also welcome the move away from the absurdly expensive and unnecessary trans-Pennine road tunnel and hope this project can be formally disposed of.

"We now need to see the inter-urban investment in the plan matched by investment in local transport across the region, both in rural as well as urban areas, so that no community is left behind.

"Our hope is that the Plan can now provide the North of England with the opportunity to move away from car dependence and towards a genuinely low carbon transport future in which there are real alternatives to the car for getting around."

While Paul Knighting, Director at Turner & Townsend and sector lead for Rail, commented: "The North has some of the most crowded rail services in the country, rail journey times are often slower than road! It's therefore great to see that TfN has set out a bold vision for

the transformation of transport in the region.

"We particularly welcome the inclusion of further updates to the Long Term Rail Strategy, which outlines priorities for investment in lines, stations, services and franchise operations.

Delivering these priorities would bring greater connectivity, capacity and cost-effectiveness to the rail network."

"Having established this much anticipated strategy, we look forward to the conclusion of the public consultation, the statutory status of TfN and the subsequent review and support of the Treasury in prioritising the Northern Powerhouse agenda.

"Addressing the priorities of the Strategic Plan, against a backdrop of limited public funds, low productivity in the construction industry and a growing skills shortage are key considerations.

"We are delighted to see that the Strategic Plan includes options for attracting private investment into infrastructure schemes which will ultimately make or break the ultimate vision of the plan.

"We look forward to working with TfN in the development and delivery of these transformational improvements to the North's transport connectivity and witnessing the tangible socio-economic benefits that this will bring to the people of the North."

Neil Carberry, CBI Managing Director for Infrastructure and People, said: "The publication of Transport for the North's Strategic Transport Plan is a significant milestone in delivering the infrastructure that is needed to boost productivity across the whole of the north. Their plans for improved connections between the towns, cities and economic centres that will drive long-term growth, reflect many of the priorities highlighted by businesses in the North.

"Reaching this stage is a testament to the hard work and collaboration of elected and business leaders, who will be looking to see progress continue at pace.

"It is now for other areas and central government to work together to ensure that no region is left behind by the regional growth agenda."

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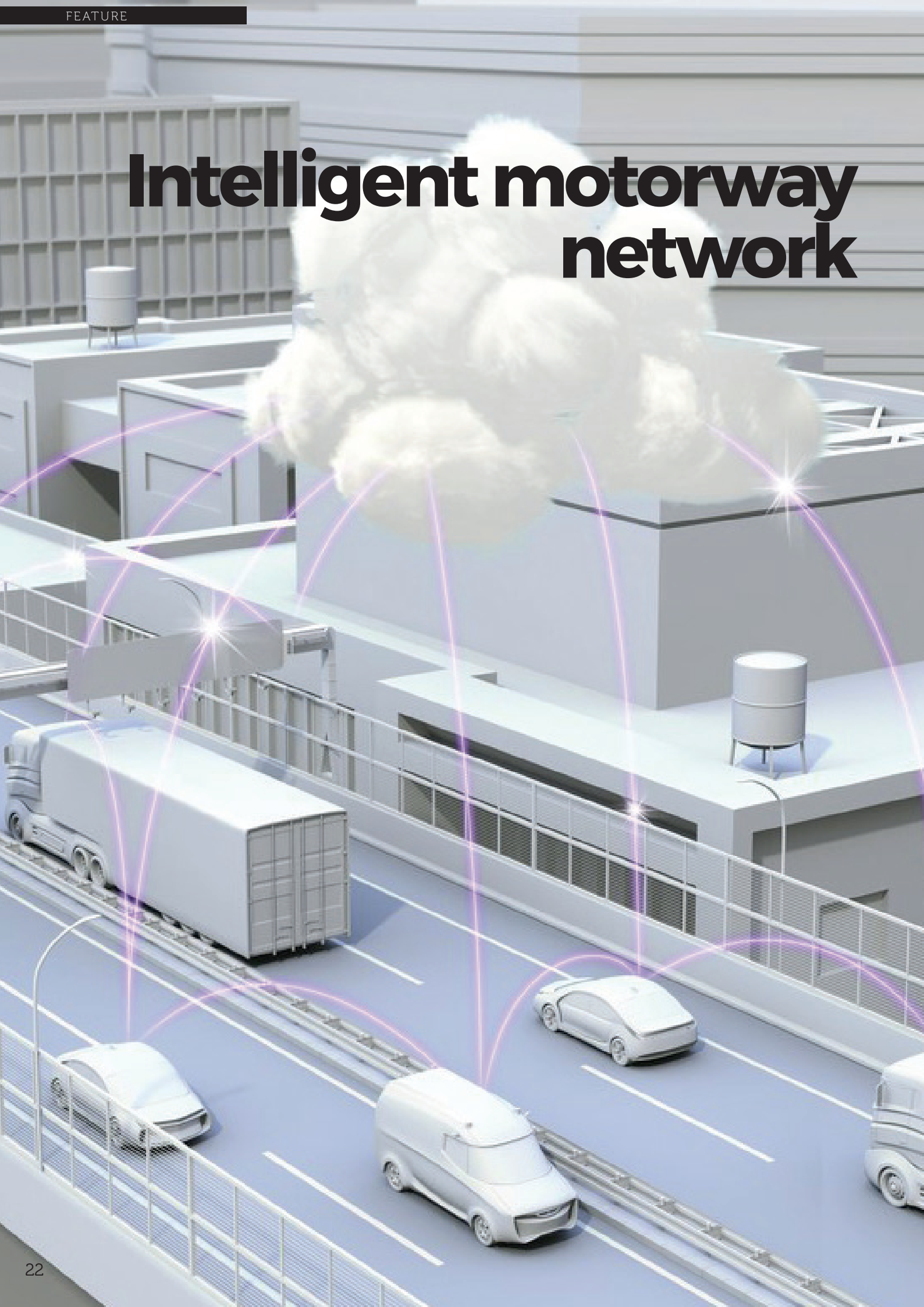


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Mixed reality in construction gets real with Trimble's HoloLens hard hat

The lines between reality and fiction are finally disappearing on construction sites. A new hard hat solution for Microsoft HoloLens is changing the way construction professionals design, build, and operate. You don't want to miss this. You've probably heard of augmented reality (AR) and virtual reality (VR), but there's another form of reality taking over construction sites. It's called mixed reality.

What is mixed reality?

Mixed reality is a technology that merges real and virtual worlds to create brand new environments where physical and digital components can interact in real time. It's "mixed" reality because it encompasses both augmented/virtual reality and the real world via immersive technology, letting you see the real environment overlaid with holographic data from a 3D model.

Mixed reality is transforming the way construction companies consume and interact with information. A recently released product combines both hardware and software to enable the education of onsite teams, so the crew knows exactly what task to perform and receives feedback instantaneously. But the benefits go beyond the real-time sharing of information.

We wanted to see the hype in action, so we went on-site and let a few guys try

the Trimble Connect app for Microsoft HoloLens mixed reality glasses for the very first time. Here is their reaction. "This is exactly what I'm seeing in the office, but you can actually get real life, which is great for a lot of remodels, especially hospitals. A lot of times, we can't even see what's already been built in a hospital, so being able to walk through with what we do vs. what they already have would be great."

How does Microsoft HoloLens mixed reality hardware and software work together?

Microsoft HoloLens is a mixed reality product that includes specialised components and a custom holographic technology processing unit, allowing people to go beyond a screen and into a part virtual, part real, world. This is transforming the way people are communicating, creating, collaborating, and even building.

Trimble's Hard Hat Solution for Microsoft HoloLens leverages the benefits of mixed reality into areas where increased safety requirements are mandated. The relationship between hardware and software is strong, as the glasses are integrated with a holographic computer, which is all fitted safely and securely on an industry-standard hard hat.

The HoloLens is fitted inside of the hard hat so that workers can begin

to experience the mixed reality environment— all while staying ANSI-compliant.

The components come together to form the Mixed Reality Hard Hat Solution.

The software, Trimble Connect for HoloLens, improves building coordination by combining models from multiple stakeholders such as structural, mechanical, and electrical trade partners. It provides for precise alignment of holographic data on a 1:1 scale on the job site, so workers can review models in the context of the physical environment.

Trimble Connect for HoloLens is available now through the Microsoft Windows App Store. A free trial option is also available, enabling integration with HoloLens. The paid subscription supports premium functionality, such as precise on-site alignment, collaboration, and measurement tools— all for less than a cup of coffee every day.

Trimble's Hard Hat Solution for HoloLens will retail for \$300 USD and is expected to be available in the first quarter of 2018. To learn more, visit mixedreality.trimble.com.



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Verifying Queen Elizabeth II Bridge

When it was first opened in October 1991, the QEII Bridge over the River Thames was Europe's largest cable-supported bridge. The 2.8km long and 130m high bridge is managed and operated by Connect Plus Services (CPS) on behalf of Connect Plus, as part of a 30-year contract awarded by Highways England.

Since its contract began in 2009, CPS had been receiving anecdotal reports highlighting incidences of vibration occurring on the pylon and stays in certain wind conditions. Due to the anecdotal and subjective nature of the information sources, CPS needed to investigate to provide a clearer understanding of the fatigue demand in critical areas of the structure. The company embarked upon a structural monitoring programme with the primary goal of ensuring that the QEII Bridge will remain in good structural condition, to minimise future maintenance costs.

In 2012 structural engineering specialists COWI performed an initial desk study and temporary monitoring exercise. This identified a potential susceptibility to vortex-induced wind excitation of the bridge pylons, which in turn seemed to cause excitation of the stays. Dry- and rain-wind galloping of the stays was also identified as a risk, due to low measured intrinsic damping.

For these mechanisms of wind-induced excitation, the magnitude of the response is known to be sensitive to the specific environmental conditions, for example the speed, direction and turbulence of the wind and the intensity of rainfall. To gain an accurate understanding of the fatigue demand on the structure, it is necessary to understand how often significant response events occur and quantify their severity. By correlating structural response against measured climatic conditions, insight is gained into the specific conditions and mechanisms that are causing the vibrations.

CPS invited Applied Industrial Systems to work together with COWI to devise a scheme that included tendering for the sensors' design and supply as part of a permanent structural health monitoring programme (SHMP). The SHMP needed to measure and simultaneously analyse five aspects of bridge behaviour, by collecting data continuously at very high speeds.

Variables to be monitored included:

- Stay responses, in order to derive deflection amplitudes and modes correlated to wind intensity, turbulence and direction, also in conjunction with rain
- Stay response as a result of pylon vibrations and to observe patterns of stored energy transfer between pylons and to understand the causal mechanism (and incidence)
- Synchronised response to the impact of corresponding wind, turbulence, rain and thermal measurements
- Deck response, which is measured because this may have a contributory role in the transfer or storage of energy
- Wind is measured at both deck and pylon-top levels for speed, direction and turbulence.

"The best way to remove speculation and subjectivity about demand on the bridge is to instrument and accurately



measure what is happening and how the bridge responds during different combinations of weather conditions," says Neil McFadyen, Technical Director at COWI, who was responsible for the performance design.

Currently in commissioning phase, the purpose of the new structural health monitoring system is to note whenever there is a response to wind by the pylons or stays, record the response and then classify it in terms of wind direction and speed.

"Once we have captured a series of response events over an extended period, we will be able to identify two things; firstly the incipient wind conditions as events take place and secondly, how often they happen. Since we also know the historical meteorological patterns for the Dartford area, we can then make reliable probabilistic predictions about the amplitude of vibrations on the pylons and stays, plus their future frequencies of occurrence. This kind of predictive power can save significant amounts of actual value when one considers the costs of stay replacement or strengthening," says Neil McFadyen.

Ordinarily this would result in vast amounts of data, which due to volumes, could not all feasibly be stored or reviewed. The structural health monitoring system designed by COWI and developed by AIS has been designed to counter these issues, by constantly examining whether data being collected is of interest.

"During the 200Hz acquisition phase, when data of interest is captured, this activates a trigger schedule for the relevant information to be stored for a set period of time, which enables wind build-up impacts to be monitored. Since this is taking place continuously, it's possible to examine historical information and compare impact during different weather conditions," says Simon Burras, Managing Director at AIS.

The system has another trick up its

sleeve. The UK predominantly receives wind from the southwest, so COWI anticipated a faster accumulation of event packets where the wind is coming from that direction. However, using historical wind data from the Crossing instrumentation, it is possible to exclude data segments from the statistical processing data set in proportion to this historical incidence and thereby adjust the data set to accumulate an unbiased account of the effects of wind from nearly all directions and velocities. As a result, it then becomes much easier to state with confidence when the experiment is sufficiently complete and avoid unnecessary engineering analysis.

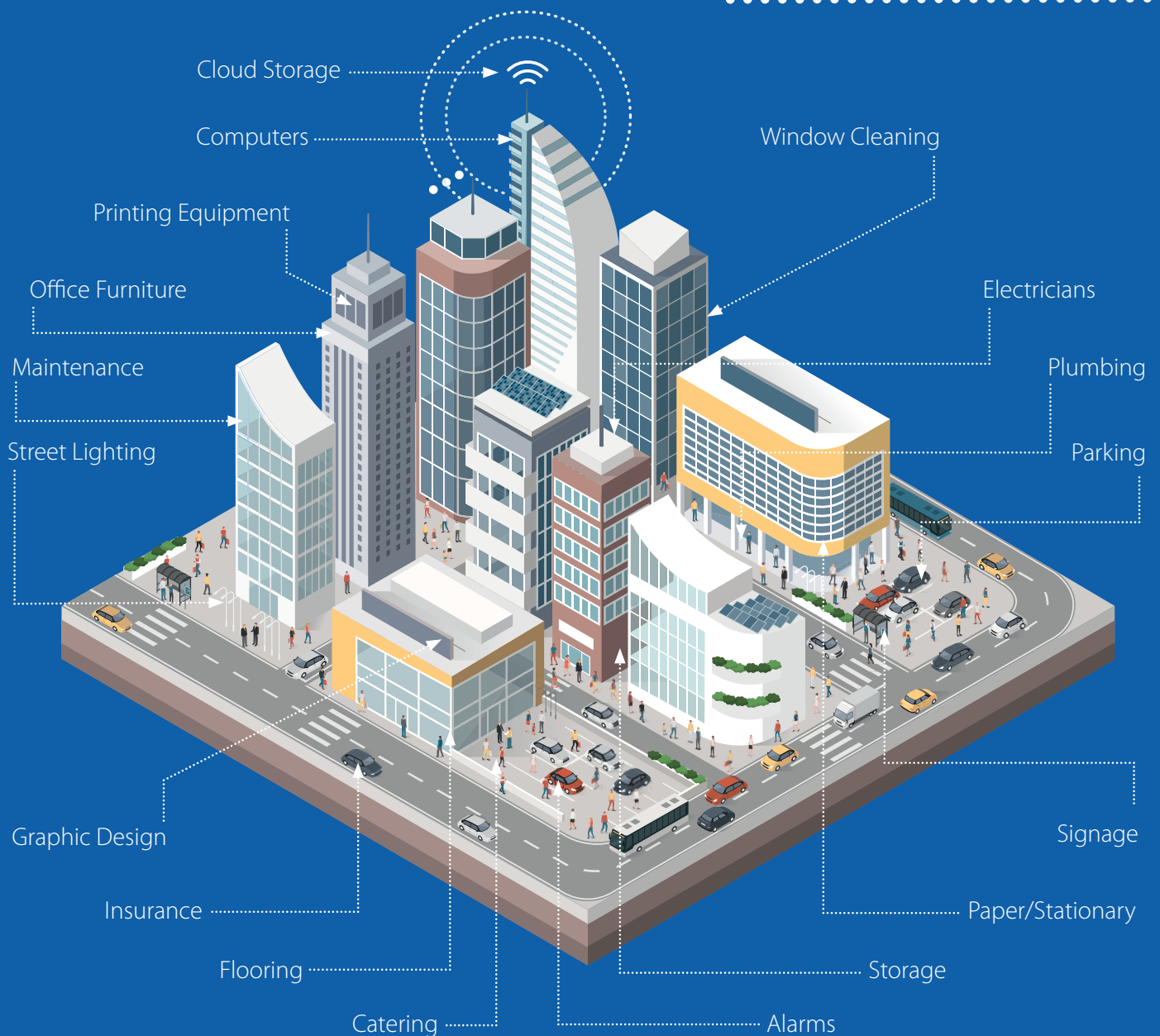
In addition, the system allows data to be synchronised, to simultaneously observe vibrations in different parts of the bridge structure – for example, monitoring aeolian vibration of the pylons forcing vibrations in the stays. The required synchronisation was achieved by using distributed Beckhoff EtherCAT I/O over fibre optic cables.

With Connect Plus making the investment in a new structural health monitoring system, CPS aims to be in a position to accurately forecast likely longer-term maintenance and operational costs in the shortest possible timeframe. Once the data capture phase has been running for a few years, CPS will be able to demonstrate with a high degree of confidence, whether the bridge will be compromised by wind demand. More significantly, if it is, CPS will have the ability to take ameliorative action whilst plenty of residual fatigue life remains.

"Ultimately, all bridges are effectively prototypes and although theoretical modelling allows us to predict impacts in the future, bridge engineers inevitably lack the advantages of trial and error afforded to other engineering disciplines. Verification and condition monitoring are essential aspects of maintenance and ensure that any service disruption, plus the cost of managing inevitable structural wear and tear, can be kept to an absolute minimum," says Simon Burras.

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Using 'simulation' to improve the test & training phases for Crossrail's new tunnel ventilation control system



by Simon Burras, Managing Director at Applied Industrial Systems (AIS)

All modern metro systems include a tunnel ventilation system and a control system (the Ventilation Control System or VCS), to ensure that the required mode of ventilation can be easily selected by a railway traffic controller.

This article outlines the requirements and complexity of Crossrail's tunnel ventilation control system, how it was tested and how the controllers who use the system are being trained.

Why do we need tunnel ventilation?

Moving trains create air pressure and 'natural' ventilation as they move through tunnels. If a train has to stop for any reason, forced ventilation is required and provided by a tunnel ventilation control system (TVCS). Necessary for safety and compliance purposes, a TVCS is designed to process a complex set of logic in order to set up the required ventilation modes for normal operations, maintenance and emergencies.

Forced ventilation – provided by fans mounted in the shafts – is required in one of four circumstances:

- Under Platform Extract (UPE) for removing heat from stationary trains during warmer weather and to help prevent heat build-up in the tunnels
- If trains are stopped in the tunnel and require cooling to maintain their air conditioning
- Fresh air and extraction for maintenance workers during engineering hours
- Fire in the tunnel leading to a

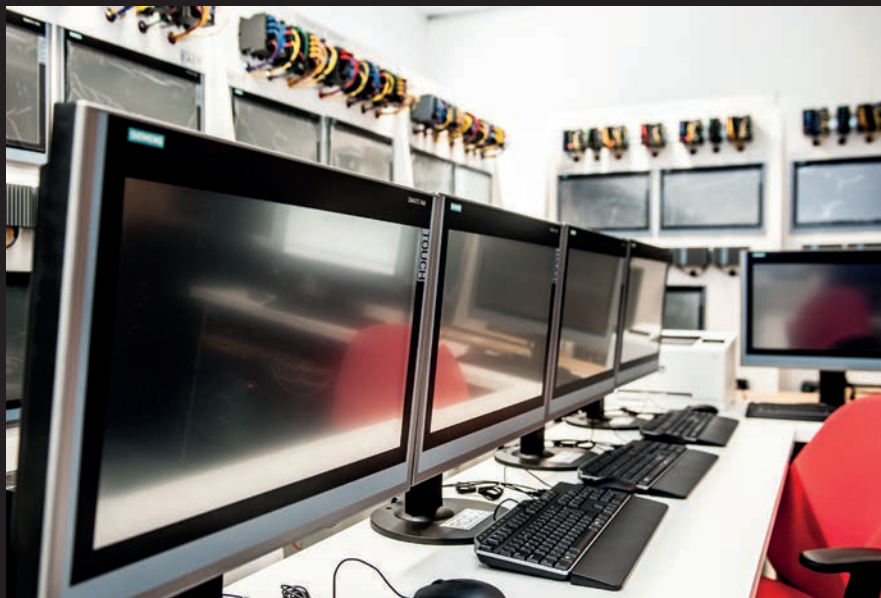
requirement to evacuate passengers and control smoke so that the escape route has a fresh air supply (i.e. smoke is extracted in one direction and passengers escape in the other).

Given the variables – including train positions, the location of a fire and the availability of ventilation equipment – the control systems are required to process a complex set of logic and yet keep the user interface to the controller as simple as possible. The objective is to ensure that during an emergency, there are no delays in activating the system – controller actions have to be simple and obvious.

Testing every possible operational permutation

Testing such a critical and complex system is one of the most important aspects of the development. This is completed by a team of control system software engineers using a dedicated tunnel ventilation control system (TVCS) test suite which is run using simulation devices to mimic live operation of the plant. Every single operational mode that could feasibly be required once the system is fully installed needs to be tested.





Built by AIS using Siemens' technology, the simulated Crossrail test system is a complete replica of the fully functional tunnel ventilation control system. But unlike the live site, the action of the 48 fans, 160 dampers and over 500 actuators that control the airflow into and out of the 18 tunnel shafts along the metro line are being simulated using Siemens' SIMBA PRO simulation devices.

The objective is to ensure that the logic controlling each of the operational sequences can be fully tested, including the back-up modes used if one or more ventilation shafts become unavailable. In fact, testing the failure and back-up modes takes a significant proportion of the project's time as there are thousands of permutations of possible field equipment failures. The system is developed to be fault tolerant and testing has to prove this as part of the overall validation and verification activities to meet the SIL2 safety requirement in accordance with EN 61508.

Using simulation hardware to accelerate development cycles

Installing Siemens' SIMBA Pro simulation hardware is a crucial part of the test system design as the equipment enables the test team to write scripts that simulate all of the different Input and Output responses. For example, when the system turns on a fan, the simulation recognises the command and is able to provide feedback that is required as part of the operational logic. Similarly, faults can be simulated (e.g. a damper failure) to test back-up modes. Although it is technically possible to test the software without simulation, it would take longer and be less accurate because each scenario would have to be manually simulated using switches and lamps.

100% Simulation – 100% Test

The philosophy adopted for Crossrail testing has one simple aim – that by

the time the system arrives on site for commissioning, no logic changes or software changes will be required. Using the simulation approach described, we are as near to 100% confident of achieving this aim as it is possible to be.

Importance of early traffic control operator involvement

Crossrail's tunnel ventilation control system has automatic and manual modes, that require an operator to initiate the appropriate ventilation mode. Since the majority of manual interventions involve emergency situations, training railway controllers to use the system competently is an important and on-going requirement.

In an emergency situation, controllers must decide how to apply tunnel ventilation within seconds and, from experience, one of the best ways to achieve this is by involving controllers in the design process from an early stage. Rail for London (the operators of the new Elizabeth line being built by Crossrail) were keen to engage operators in the design of the operational screens for the TVCS (known as the Human Machine Interface or HMI) early on in the project. Designing the user interface with the information for the operator to make a fast and correct decision is key.

Benefits of 'teach back' to identify enhancements

One effective strategy is to develop HMI control screens according to a phased approach using the 'teach back' method. This allows controllers to influence the design and development phase at each stage, giving them the opportunity to request amendments and enhancements before changes become costly. Once controllers have given their input, the next version of the prototype is developed and literally

'taught back' to the controllers.

This technique is based on the fact that people are typically better at pinpointing what's missing than specifying exactly what they want. As an iterative process, it also means that controllers become embedded within the design process and have greater ownership of the final delivered system.

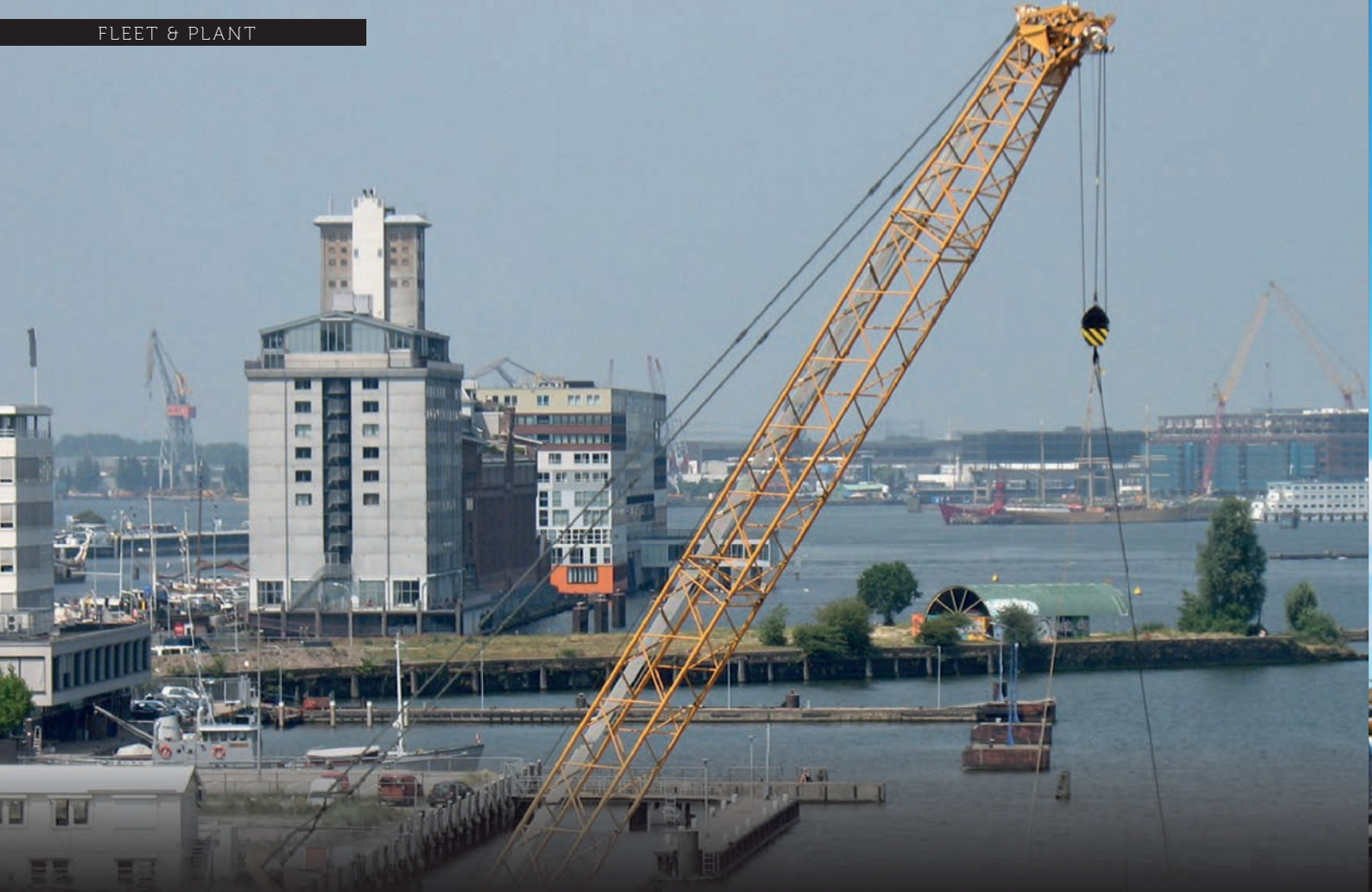
For instance, when developing the HMI screens for Crossrail, it became apparent that in areas where the metro lines split to take passengers north east or east, the initial design of the screens was overly complex for use in the event of an emergency. Working further with the controllers, the HMI was simplified to make the response simpler and therefore more effective.

Hands on controller training

Early training before deployment of the full system is another vital aspect of the implementation phase that RFL wanted to achieve. Traditionally, control systems training has been performed using static prototyped interfaces or with a comparable system, to teach the operational principles. For instance, providing training on another equivalent metro system in a different city. Whilst this gives controllers general experience of how the system works, it can never be as accurate as receiving training based on 'real life' actual scenarios.

Working with TfL, Applied Industrial Systems has taken the prototype user interfaces at different stages and provided operators with a hands-on training simulator early in the project life cycle. This simulator has two user interfaces – for trainers and trainees. The trainer can create live operating scenarios with the trainee's screen displaying information as it would for the live railway. The trainer can then introduce emergency scenarios – such as a train fire – for the controller to respond to. The system monitors the controller's response and reports on whether it was correct or not, which is used to provide further scenarios.

Ultimately, the ventilation training simulator is a key component of maintaining the safe operation of the Elizabeth Line and maintaining the SIL2 rating of the tunnel ventilation control system. Overall, simulation makes training more relevant and also means that training sessions can easily be repeated. Controllers can maintain their skills and remain capable and more confident about applying the tunnel ventilation control system, should an emergency occur.



New Lifting Technician trailblazer apprenticeship now ready for delivery

A new Lifting Technician Trailblazer Apprenticeship is now available and ready for delivery, following final approval from the Institute of Apprenticeships. The new apprenticeship framework has been devised by an employer-led Trailblazer working group and is supported by the Construction Plant-hire Association (CPA).

Designed for those who will operate a Mobile Crane, Crawler Crane or Tower Crane and undertake slinging and signalling duties, the new Lifting Technician Trailblazer Apprenticeship replaces the existing Construction Civil Engineering Plant Operator (Cranes Lifting) Framework Apprenticeship which will eventually be phased out.

The employer-led Trailblazer working group was headed up by Laing O'Rourke and also included several crane owners and contractors, namely Ainscough, Baldwins Crane Hire Ltd, BAM Nuttall, Balfour Beatty, Bronzeshield Lifting Limited, Emerson Cranes, Skanska, Select Plant Hire, Sarens, Liebherr and CITB. The working group was formed in early 2014 to devise the standards and assessment plan for the Lifting Technician Apprenticeship, with the aim of integrating crane operating

skills with slinging/signalling skills to provide both the apprentice and employer with a greater scope of skills and a full understanding of the lifting operations sector, preparing a pathway for the apprentice to become a Crane Supervisor and ultimately an appointed person.

The new Level 2 Lifting Technician Apprenticeship has a total training period of up to 24 months including work experience, of which 20% of the learning time needs to be delivered 'off the job'. The core training period has been derived as a minimum of 300 hours and, as with all Trailblazer Apprenticeships, a formal training qualification does not form part of the apprenticeship. It is the End Point Assessment (EPA) which determines the competency of the apprentice at the end of the learning period. However, NVQs in Plant Operations (Cranes and Specialist Lifting) and Controlling Lifting Operations (Slinger/Signaller) need to be achieved before the end assessment can be undertaken. This meets the construction industry's initiative of an NVQ qualified workforce holding a CSCS-badged scheme card.

There are no age restrictions for the

Lifting Technician Apprenticeship but suitable and effective supervision, based on thorough risk assessments, needs to be made for young people when working on site. The employer-led Trailblazer working group has devised a training record portfolio which is to be completed during the core training period, confirming that each element of the training syllabus has been completed. An End Point Assessment (EPA) Portfolio accompanies the training record portfolio and indicates the number and type of activities that the apprentice must complete during their work experience, along with the behaviours that need to be demonstrated. The End Point Assessment consists of a practical test on the relevant type of crane, a set of written questions and a professional discussion for which the content of the EPA Portfolio is used as the basis of the discussion. If the apprentice passes the End Point Assessment, then the apprenticeship has been successfully completed.

This apprenticeship has been placed within the Education and Skills Funding Agency's funding band 11, which allows employers paying the Apprenticeship Levy to spend up to a maximum of £15,000 for the training and assessment of the apprentice.



Non-levy payers can currently receive up to 90% of the maximum. Potential employers can approach an approved training provider of their choice and discuss a training delivery model that suits their needs. The Government's aim for Trailblazer Apprenticeships is that the employer retains a level of responsibility for the overall training of apprentice in conjunction with a lead provider. There are a number of conditions that relate to apprenticeship funding, for which further information can be found at <https://www.gov.uk/government/publications/apprenticeship-funding-bands>.

The standard and assessment plan for the Lifting Technician Apprenticeship can be downloaded from <https://www.gov.uk/government/publications/apprenticeship-standard-lifting-technician>. The CPA is hosting the training and assessment documentation and a training syllabus, training record portfolio and the EPA Portfolio can be downloaded free of charge from the CPA website at <https://www.cpa.uk.net/trailblazer-downloads/>.

The Chair of the Trailblazer working group, Elizabeth Astill of Laing O'Rourke, said: "We're very pleased and relieved to have received the final approval from the Institute for Apprenticeships after some three years of hard work by the working group. Being one of the first Trailblazer Apprenticeships to be developed meant

that we had to endure constant changes to the rules whilst the custodianship for apprenticeships transferred from one government department to another during that time, but we have managed to maintain our original criteria to ensure that the apprenticeship is fit for purpose for the construction and allied sectors. We look forward to industry supporting this apprenticeship and making the construction and lifting sectors an attractive place for new recruits to develop a long-lasting career."

The Trailblazer Apprenticeship Programme was launched in England in 2013 following the Richards Review of Apprenticeships which concluded that there was a need to redefine what an apprenticeship was, and that the original traditional values of an apprenticeship needed to be reinstated.

The report made a number of recommendations that were taken on board by the Government for the Trailblazer Programme and set out in the English Apprenticeships 2020 vision document. A set of principles were established that put employers in the driving seat, increasing the quality and consistency of apprenticeships, simplifying the system to aid understanding, and giving employers purchasing power and choice in the delivery of an apprenticeship.

The existing apprenticeship framework within England is intended to be phased out by 2020 and replaced by these new standards-led apprenticeships. There are no changes planned for apprenticeships administered through Scotland and Wales, which will continue to be offered through the existing framework programme. The CPA is also providing a project management service to employer development groups for a number of other Trailblazers, namely Construction Equipment Operative, Construction Equipment Maintenance Engineering (Mechanic and Technician) and Hire Controller (Plant, Tools & Equipment).

The Construction Plant-hire Association (CPA) is the leading trade association for the plant hire sector in the UK. The CPA has 1,600 members, who supply 85% of hired plant to the construction industry. The organisation is the UK's principal point of contact for all issues relating to the use of construction plant.

The CPA works with government departments and agencies, local authorities, construction clients, private companies, other trade associations, and third sector organisations, on issues including employee health and safety, machinery standards and emissions control, public safety and road transport, skills and employment.

Benefits of Vehicle Tracking for Construction Contractors

The challenges of running a construction-contracting company come at you from every angle. You need to juggle jobs across distant locations, properly allocate your staff and equipment, and keep your sites and employees safe. To stay competitive, you must do it all on time and within budget. Luckily, technologies such as real-time vehicle tracking can help. At its core, vehicle tracking pinpoints vehicles on online maps in real-time or over a defined period, freeing employees to focus on their work without distraction from office staff inquiring where they are and how long they've been there. Some solutions also offer functionality such as online timesheets, route reports, driving-safety analysis, and maintenance-tracking tools, leading to a safer and more efficient work environment.

Improved Site and Staff Management

Your equipment and staff are your livelihood. By knowing where they are, at any given moment, you can keep your business running smoothly. Vehicle-tracking can help with:

- Staff allocation – when employees call in sick or a job needs extra hands on board, see exactly where your staff are and reallocate as needed
- Maintenance reminders – avoid downtime due to unexpected repairs by tracking vehicle usage and ensuring maintenance is performed according to warranty and rental agreements
- Vehicle recovery – quickly locate lost or stolen vehicles using GPS-tracking
- More Accurate Accounting

With several jobs running at the same time, accounting can be a challenge. You want to ensure your employees are paid fairly and your customers are billed accurately. Some vehicle-tracking solutions can help you do this by automatically collecting data such as shift time, driving time, time at a work site, mileage, and fuel usage (see Figure 1).

Automatic data collection frees your employees to focus on the job, not on

filling out paperwork; it helps you ensure:

- Fair fuel and overtime pay – data can confirm whether claims align with miles travelled and time at job sites, reducing false claims while also reassuring employees that they will receive the pay due to them without having to fight for it
- More accurate billing – data on how long your employees have been at various job sites can help ensure accurate billing and help resolve billing disputes

Quartix www.quartix.net 31/01/18				
Daily Group Report for ABC Company				
	Daily Total	DS66 AYW	AP16 VZY	OV64 GHT
Number of Trips	23	3	7	13
Total Travel Time	5:43	1:13	2:08	2:22
Total Idling Time	0:06	0:02	0:03	.
Total Distance (miles)	137.6	34.1	44.6	58.9
Average Speed (mph)	24.0	28.0	20.8	24.9
Maximum Speed (mph)	58.4	58.4	57.8	57.8
Fuel consumption (mpg)	.	30.0	25.0	25.0
Expected fuel used (gals)	5.3	1.1	1.8	2.4
(litres)	24.1	5.0	8.2	10.9
CO2 emissions (kg)	64.6	13.4	22.0	29.2
Start of first trip	.	07:41	07:38	08:06
End of last trip	.	18:24	20:32	16:08
Total shift duration	31:38	10:42	12:54	8:01
Arrival at first location	.	07:53	07:55	08:22
Departure from last location	.	18:14	19:52	15:57
On-site shift duration	29:52	10:20	11:57	7:34

Figure 1: Data from vehicle-tracking solutions can provide actionable insight on vehicle movements, engine usage, driver behaviour, and fuel consumption.



Smarter Bidding

Over time, tracking data provides a better picture of how long certain types of jobs typically take and cost. Not only can this help you optimise staff and equipment allocation, but it can also help you bid smarter on new projects, keeping your business competitive without underquoting.

Safer Job Sites and Travel

Many vehicle-tracking solutions also offer tools for digging down into the details of a vehicle's routes travelled and driving metrics (speed, acceleration, braking, idling)—key factors influencing both safety and costs.

If your employees travel long distances to work sites, tracking data can help confirm they are getting proper rest before resuming work. If they are meant to stay within a defined work zone or onsite overnight, geofencing functionality can help ensure the proper guidelines are followed.

Using vehicle data, driving can be scored and training programs can be established to track, or even incentivise, better driving. Safer driving will not only reflect well on your brand within the local community, but it can also help reduce costs. For example, insurance costs may be reduced due to fewer violations and accidents, while fuel costs may be reduced through improved driving habits, such as less speeding or unnecessary idling.

Route and speed data can even be used to exonerate employees who may be subject to false claims. Imagine an employee is accused of speeding down a narrow lane or clipping a parked car's mirror, when in fact the vehicle wasn't even on the road at that time.

Location pinpointing can also provide peace of mind to employees as they venture into new, and sometimes dangerous, locations. For example, if an employee doesn't turn up when expected, the vehicle can be located and assistance sent in case of accident or illness.

Finding the Solution for Your Needs

Despite its benefits, adopting vehicle-tracking technology may still seem daunting to an overworked business owner. Luckily, solutions are available that are both easy-to-use and reasonably priced.

One provider—Quartix—has delivered real-time vehicle-tracking and telematics solutions for over 16 years. Nearly 10,000 small to mid-size businesses have chosen Quartix because it offers:

- tiered pricing options that let them select the level of functionality they need
- shorter contracts that don't require multi-year commitment
- contracts that do not auto-renew
- customer service by experts invested in their success

To learn how Quartix can help you better serve your business, your employees, and your customers, visit www.quartix.net or email enquiries@quartix.net.



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Construction Media incorporates the **UK Construction Online** website and **UK Construction Excellence**, along with bespoke media and marketing solutions for those working for or looking to engage with the construction supply chain. Our forward features list for 2018 encompasses the key themes and topics shaping the industry now and for the future.

UK Construction Online is the go-to resource for the latest news and insight for the construction industry. Our content keeps industry professionals ahead of breaking developments and fully informed on the factors influencing this multi-billion pound sector.

UK Construction Excellence is our flagship magazine, which showcases the very best in British building, high-end projects, construction suppliers and influential construction companies.

The publication is credible, vibrant and a voice for the industry. It offers a platform to position our client's company, products and services, and acts as the perfect vehicle to build a business's profile and brand in a publication which is read by the construction industry's leading players.



**UK CONSTRUCTION
ONLINE**



**UK CONSTRUCTION
EXCELLENCE**

April | Infrastructure

Deadline: Editorial - 12/03/18 Artwork – 19/03/18

Infrastructure is a key factor in government plans, with the National Infrastructure and Construction Pipeline & Transforming Infrastructure Performance recently launched. In April we look at major infrastructure projects and plans throughout the country, such as: AMP6, highways investment, rail strategy, waste water, water and utilities. We also cover the UK Infrastructure Show, which brings together leading infrastructure projects from across the UK.

May | Sustainability

Deadline: Editorial - 16/04/18 Artwork – 23/04/18

Green building & sustainability. With the advent of the Clean Growth Plan – we look at what construction can do to assist in creating a greener society; from sustainable buildings to waste and recycling.

June | Skills shortage

Deadline: Editorial - 14/05/17 Artwork – 21/05/18

Having weathered the economic downturn, the construction industry now contends with a worrisome shortage of skilled workers. This month we reflect on the contributing factors, the implications of the EU referendum for migrant workers, and the ways in which the industry is fighting back. Developing skills across the construction industry is core to ensuring it remains viable and effective.

July | Health & Safety, legislation, finance, adjudication

Deadline: Editorial - 18/06/18 Artwork – 22/06/18

Health & Safety is of paramount importance in the construction industry. From workwear to working at heights, we take a look at what's happening across the industry, together with the latest comments on litigation and adjudication decisions that affect the sector.

August | Housing

Deadline: Editorial - 16/07/18 Artwork 23/07/18

Tackling the housing crisis. Hand-in-hand with the skills shortage, the UK's much-publicised housing shortfall continues to dominate headlines nationwide. The government has pledged to build tens of thousands of homes ahead of 2020, and during August we evaluate what is being done to address this, and what opportunities exist within the construction supply chain.

September | Technology in Construction

Deadline: Editorial - 18/08/18 Artwork 25/08/18

Advances in technology are transforming the construction industry. From digitisation to drones, innovative new technologies are helping to increase quality, reduce costs and improve safety in all areas. This month we focus on the innovations that are moving the dial and helping to shape the construction industry of the future. Themes include software, BIM, UAVs and the Internet of Things.

October | Education

Deadline: Editorial - 17/09/18 Artwork – 22/09/18

As the nation opens its doors to a new school intake, we explore the opportunities for the construction industry arising from the Government's education agenda. From renovations and refurbishments to the building of new and interactive learning environments, what is happening and how can construction play a positive part in improving educational standards?

November | TBC

Deadline: Editorial - 15/10/18 Artwork – 19/10/18

December | TBC & Annual review

Deadline: Editorial - 16/11/18 Artwork - 20/11/18

We take a retrospective look at some of the year's biggest stories.

Additionally, each month the magazine features a project focus, as well as articles on BIM, construction software, legislation, Health & Safety, sustainability, fleet, and plant.

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