BRITPAVE NEWS

ISSUE 37 - WINTER 2018

New concrete pavement guide published

Invest in urban rail

New BSI standard for stabilised road mixtures

Pavement course success

Sulfate guidelines to be updated

Britpave members' project and contract news

New aircraft stands at London Stansted

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CHAIRMAN'S WELCOME

The resounding success of the Britpave concrete pavements course held at the end of September and the soil stabilisation workshop held earlier this year plus the significant increase in the number of technical publication downloads from the revamped Britpave website underline the demand for information and guidance on cementitious infrastructure solutions.

The benefits of long-term performance, minimum maintenance and impressive whole life cost savings are increasingly being recognised and appreciated by clients and their consultants who are turning to Britpave for assistance with specification development, technical information on a range of infrastructure solutions and best practice installation guidance. The broad membership of Britpave means that it is well placed to provide that assistance and in doing so forward the increased use of concrete and cementitious solutions and best practice for the benefit of member's own businesses.

Encouraged by the success of initiatives delivered this year, Britpave is planning to do even more next year with technical introductions to the use of soil stabilisation for brownfield land redevelopment and the potential of slipform construction for a wide range of transport solutions plus a further pavement course examining the new technical specifications. In addition, a number of new industry guidance documents are to be published.

However, none of the above can be achieved without the support and input of Britpave members. Active participation in task groups, provision of industry insights on circulated guidance drafts and provision of speakers for industry events will enable Britpave to further forward the use of cementitious materials and concrete solutions. It is not all about self-sacrifice either for active participation also increases the chance to network and to raise your own business profile. Get in touch and get involved for what really is a "win win".

Joe Quirke
Britpave Chairman and Engineering Manager, VolkerFitzpatrick

Britpave, the British In-situ Cementitious Paving Association, promotes the better and greater use of concrete and insitu cementitious infrastructure solutions. Its members include major contractors, specialist equipment and material suppliers, consulting engineers and interested trade associations. Together, they provide a single voice for the insitu concrete paving industry.

Britpave News is published regularly by Britpave with the aim of keeping members up to date on Association matters, industry developments and member company news and views. Please help keep us in the picture on all of this by sending us any relevant information that you feel may be of interest to the membership.

BRITPAVE WELCOMES NATIONAL INFRASTRUCTURE ASSESSMENT

Britpave has welcomed the UK's first ever National Infrastructure Assessment launched by the National Infrastructure Commission (NIC) earlier this summer.

Faced with a growing UK population of up to 77 million by 2039, the Assessment provides a number of recommendations for delivering the necessary improvements to the national infrastructure. It spans a range of infrastructure sectors including transportation, digital technology, waste, flood management and water supplies. In addition, the Assessment underlines how good infrastructure design can deliver projects on time and save money and examines funding and financing.

"Provision of quality infrastructure that is well designed and constructed is essential for the social and economic well-being of the country. Yet, all too often in the UK delivery of major infrastructure projects has been slow and uncertain. This Assessment of the national infrastructural needs shows the government want needs to be done in order to have the infrastructure that is necessary for a modern, vibrant country," said Joe Quirke, Britpave Chairman.

In particular, Quirke welcomed the National Infrastructure Assessment spending plans that include funding for Crossrail 2 in London and the Northern Powerhouse rail links and its recommendations to provide a road network that is suitable for electric autonomous vehicles and to boost funding for major cities by £43 billion up to 2040 for improved transportation, housing and employment. He also welcomed the focus on good design and construction. "Britpave is recognised as a developer of good industry practice and promoter of efficient, long-term infrastructure solutions. We welcomed the emphasis on good design and practice," said Quirke. "The NIC has provided a detailed and comprehensive plan of action. The infrastructure industry supply chain is ready to work with government to deliver those plans."

INVEST IN URBAN RAIL TO UNLOCK CITIES' POTENTIAL

Greater investment in expanding urban rail systems is the best way forward for cities to achieve economic growth, meet housing demand, reduce road traffic and improve air quality according to the report, 'Rail Cities UK – Our vision for their future', by the Urban Transport Group – representing the UK's largest urban transport authorities.

The report highlights how urban rail has been "one of the big transport success stories of recent times", with patronage levels soaring. For example, over the last decade, rail passenger numbers have grown by 184% at St Helens Central station, by 149% at Birmingham New Street, and by 96% at Bradford Interchange.

But the report argues that current investment in urban rail "falls short" of what is needed for cities to meet their wider economic, environmental and social goals. In particular, the report calls more cross-city routes, the use of tram-trains that can switch from suburban rail lines to city centre streets, greater integration with other public transport modes and station hubs for business and housing.

"Urban rail networks offer significant potential to make cities more economic dynamic, to tap into new housing development areas and to improve quality of life," said Heather Ceney, chair of the Britpave Rail and Bus Task Group. "There are a range of concrete solutions that provide the cost-effective, minimum maintenance, long-term performance rail tracks that would forward the realisation of the potential of urban rail networks."

To download a copy of the Rail Cities UK report visit: **https://bit.ly/2A3zija**

SOIL STABILISATION GUIDELINES REVISED

The Britpave Soil Stabilisation Task Group, led by Jack Bull, has undertaken a comprehensive review and updating of the 'Stabilisation of Sulfate-Bearing Soils: Guidelines for best practice'.

The guide opens with an overview of the potential issues relating to adding lime to improve clay soils. One of the most significant of these is sulfate heave and the guide is focussed on how best to mitigate this. In particular provides:

- a review of the sulfate minerals found in soils
- an explanation of lime improvement, mellowing and lime stabilisation
- a description of how sulfate heave can occur
- a description of ground investigation and laboratory testing requirements
- strategies for reducing the risk of sulfate damage.

Complete with an updated library of references for further information, the new guide will be published by the end of the year.

NEW BRITISH STANDARD FOR STABILISED ROAD MIXTURES

BSI, the business standards company, is currently developing a new British Standard to provide requirements on stabilized road mixture site investigations. BS 9227 cementitious bound materials, unbound granular materials, waste materials and marginal materials relates to hydraulically bound materials and stabilized soils for use in pavement layers (including the pavement foundation), and provides a UK specification for their use in pavement layers.'

It is envisaged that the standard will be used on all UK pavement schemes that incorporate hydraulically bound materials and stabilized soils. It will support the appropriate investigation, specification and application of these materials in pavement applications on roads, ports, airfields and heavy industrial areas.

From initial assessment and laboratory design, to placement in the road ready to receive an overlying pavement layer or traffic, the forthcoming standard specifies:

- the requirements for the constituents of the mixtures
- the preliminary laboratory testing methodology
- the laboratory performance classification, production, transportation, laying and compaction of hydraulically bound materials and stabilized soils for pavement applications.

Existing European specifications provide requirements for constituents, composition and laboratory performance classification. They do not, however, provide designers with reference values suited to applications in the UK. In addition, no UK national specification exists for the site investigation of stabilized mixtures. BS 9227 will help rectify this.

Currently, the primary source of specifications for the construction of hydraulically bound pavement layers is the Highways England Manual of Contract Documents for Highway Works, Volume 1 Specification ('SHW') Series 800 clauses. The Series 800 clauses require revision in the light of changes to the BS EN 14227 Hydraulically bound mixtures — Specifications series. Furthermore, it is evident that some heavily loaded non-highways designs might require more exacting specification limits than are used for highways, and a national specification is needed to provide designers with a framework allowing more flexibility in their specification.

BS 9227 is being developed primarily for civil engineer contractors and consultants; local authority engineers; port authority designers; the Defence Infrastructure Organisation; airfield owner/operators; Environment Agency operatives; dam engineers; and industrial developers.

It is due for publication in 2019 and BSI welcomes comments on the draft when it is sent for DPC (Draft for Public Comment) toward the end of this year.

Please get in touch with the programme manager, Gavin Jones, for further information: **gavin.jones@bsigroup.com**

NEW AIRCRAFT STANDS AT LONDON STANSTED AIRPORT

Four new aircraft parking stands have become operational this October, marking the completion of the first phase of airfield works as part of London Stansted Airport's £600m transformation programme.

The echo stand extension, spanning 40,000m², is the size of four premiership football pitches and boosts the airport's ability to handle more aircraft during peak hours, making airfield operations more efficient. Britpave member VolkerFitzpatrick, the project's principal contractor, poured a total of 70,000m³ of concrete, laid 1850 metres of cabling and installed 15 km of drainage during the seven-month development.

Phase two of the project is already underway and includes new taxiways, additional aircraft holding areas and a further 20 new aircraft stands.

This is the first step in an extensive programme of works to our airfield at London Stansted, which includes new taxiways, additional aircraft holding areas as well as the new aircraft stands. It is always a challenge undertaking large scale construction programmes in a 24/7 live environment, however, our principal contractor Volker Fitzpatrick and our team here at Stansted have provided an excellent standard of build and project management.

Paul Willis, Programme Delivery Director for the Stansted Transformation Project said: "London Stansted is the only major airport in the South East that has potential to grow in line with the Government's aviation strategy of optimising existing runway capacity. These new stands will provide extra capacity for aircraft to park, unlocking spare capacity and improving operations from the airport's single runway."

The success of the working partnership was underlined by Chris Evans, Managing Director VolkerFitzpatrick's Civils Division who said: "We are delighted to be part of London Stansted's transformational journey and continue to successfully deliver challenging airside projects, as part of our core business. This project, like many of ours, has been delivered on time and to budget; and we look forward to continuing to work in partnership with Stansted – providing our usual high level of service and satisfaction and helping to enable the airport's potential."

The Stansted Transformation Programme is one of the largest airport projects currently underway in the UK. The plans include a new arrivals terminal and the reconfiguration of the existing terminal into a departures only facility. It also features a revamped retail and restaurant offer, as well as new car parks and airfield infrastructure.

NEW CONCRETE ROAD PAVEMENT COURSE

The new Britpave concrete road pavements course held at the end of September was well attended and proved the increasing interest in the potential of concrete pavements and the demand for technical information. Feedback from delegates was very positive.

The course provided a technical introduction to the design, specification and construction of concrete road pavements. It opened with Nick Thom, Assistant Professor at Nottingham University, examining the principles of pavement design. In particular, he covered the influence of the range of potential pavement variables including foundation quality, thickness, strength and modulus joints and then went on to describe the various approaches to design including Highway England standards, ports and airports design guides and analytical tools.

Moving from pavement design theory to design reality, Jack Bull, materials engineer at Mott McDonald, provided a number of pavement examples to HD26 arguing that this should be a simple matter if the input parameters including foundation class and traffic loading. However, he warned that designers should be aware of possible nuances that could affect the design.

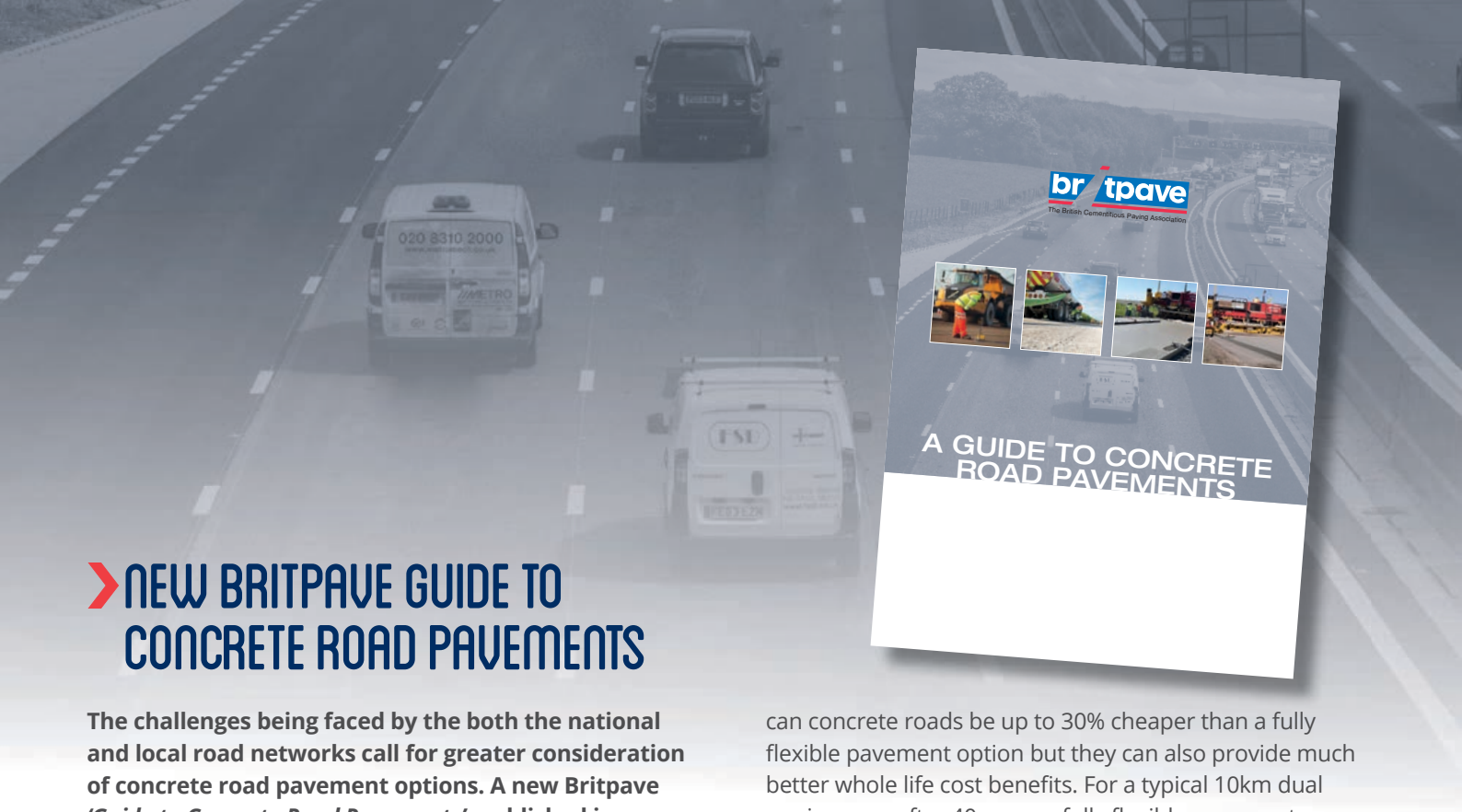
From design theory to design reality to performance proof. Joe Quirke, Britpave chairman, examined the whole life cost benefits of concrete road pavements. He referenced 'The Design Manual for Road and Bridges HD26/06 that describes whole life cost as "the costs of a project from inception to disposal, including the direct costs of constructing and maintaining highway and the indirect costs imposed on society and the environment by its use and operation" and demonstrated how the whole life cost benefits of concrete road pavements far surpasses that of other road surfaces.

The course then moved from design to construction with Steve Phipps of Balfour Beatty examining the principles of mix design. He provided an overview of the key specifications requirements and practical considerations for the mix design process and made particular reference to the selection of constituent materials, approach to designing mixes, different mix designs, laboratory trail processes, watch points and how to validate performance.

The next presentation was from Alan Tuck of PJ Davidson. He provided an introduction to continuously reinforced concrete pavements (CRCP). Each stage of batching and construction from mesh reinforcement to placement, including cement mix design, delivery and finishing, was examined. Alan also examined options such as this surface courses and the slipformer's preference for air entrainment.

The final presentation looked at Highways England requirements for concrete road surface finishes. Donald Burton, Highways England, examined a range of surface texture finishes including matching brush finishes for repairs and widened roads, exposed aggregate, new performance surfaces and the rejuvenation of old concrete surfaces.

Summing up the course, following a question and answer session, Joe Quirke thanked the industry speakers for their insight into the design and construction of concrete road pavements. The relevance of the course was underlined by the interest of the delegates who are increasingly examining concrete pavement options in recognition of the wide range of performance and whole life benefits that these option provide.



NEW BRITPAVE GUIDE TO CONCRETE ROAD PAVEMENTS

The challenges being faced by the both the national and local road networks call for greater consideration of concrete road pavement options. A new Britpave *'Guide to Concrete Road Pavements'*, published in association with the new concrete pavement course, explains what these options are and what benefits they offer current and future road networks.

The strategic and local roadworks are facing considerable challenges not least of which are the predicted increases in traffic demands. Traffic on the strategic road network is forecasted to increase by 60% from 2010 to 2040. Meanwhile, urban and local roads carry nearly 80% of all traffic. In addition, there is a greater expectation of roads in terms of whole life costing, long-term performance, minimum maintenance, journey reliability, low noise and high recyclability.

There are a number concrete road pavement solutions to meet these challenges that, although are tried and tested overseas, have yet to have widespread recognition and use in the UK. The new Britpave guide hopes to address this by providing details of a range of road pavements that can not only meet the demands being placed on today's roads but could also provide solutions for the future. The options discussed include Continuously Reinforced Concrete Pavements (CRCP), Exposed Aggregate Concrete Surface (EACS) Roller Compacted Concrete (RCC), Groove and Grind and Whitetopping.

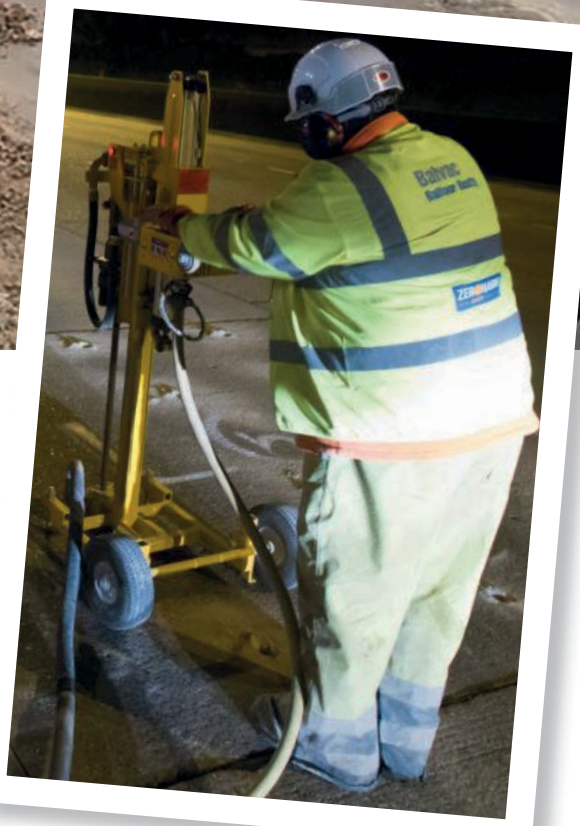
Whilst all of these have particular features, they share a number of performance benefits such as long-service life of up to 50 years, minimum maintenance, and 100% percent recyclability. In addition, they offer a key benefit to today's heavily trafficked roads: noise reduction.

Long-term performance and noise reduction benefits are not the only issues. The new guide explains how not only can concrete roads be up to 30% cheaper than a fully flexible pavement option but they can also provide much better whole life cost benefits. For a typical 10km dual carriageway after 40 years a fully flexible pavement option, due to resurfacing and reconstruction needs, will be almost 2.5 times more expensive than the EACS option.

The Britpave guide examines possible future applications of concrete road pavements. In the future it is predicted that roads will no longer just be a medium to go from one place to another. Instead of being inanimate they will have a number of active infrastructure roles.

These could include having integrated transmitter and connectors for easy vehicle battery recharging and internet connection for traffic and road condition updates. Sweden has already opened its first stretch of electrified road that allows lorries to recharge as they drive along it. At the University of Huston, Texas, researchers are working on incorporating carbon nanofibre heating elements in concrete roads to melt snow and ice whilst in the Netherlands the world's first road that can harvest energy from inserted solar panels was opened in 2015 and promised significant potential. Keeping with the Netherlands, researchers have found that concrete pavements that incorporate titanium dioxide reduce nitrogen oxide, one of the main vehicle pollutants, by up to 40%.Meanwhile, in the UK researchers at the universities of Bath, Cardiff and Cambridge are working on a self-healing concrete that uses bacteria to seal cracks to further reduce maintenance and improve structural service life.

For a free download of *'A Guide to Concrete Road Pavements'* visit the publications section of **www.britpave.org.uk**



BALVAC BATTLES HAVS

Balvac Ltd, part of the Balfour Beatty Group, are a leading specialist in the repair, strengthening and maintenance of all types of infrastructure, including concrete pavements and bridges. As a consequence a lot of man hours are spent breaking out and drilling in to concrete, leading to potential health, safety and environmental concerns regarding Hand Arm Vibration Syndrome (HAVS) and dust.

The company has invested heavily in safeguarding their workforce from these hazards. The largest investment is in robotic machinery, specifically Positioner-Actuator-Manipulators, or "PAM" for short. An air-over-hydraulic powered two-piece arm almost completely isolates the operator from any vibration and, combined with additional investment in Reactec HAVWear, has positioned Balvac at the forefront of the battle against HAVS.

The versatility of the PAM's two-piece arm is of particular benefit for breaking out or drilling at odd angles, but Balvac's core specialist concrete pavement services, Vacuum Void Grouting and Slablifting, only require holes to be drilled straight down. Still with the battle against HAVS in mind, the company has invested in Semi-Automated Rig Mounted Drills, to remove the operator from the vibration. In addition a vacuum collar, fitted around the drill stem at ground level, enables dust from the drilling operation to be captured and bagged for subsequent safe disposal.

Balvac's initiatives in the battle against HAVS have so far earned them 3 coveted Blue Star Awards from Highways England, recognition in the inaugural Highways England Health, Safety and Wellbeing awards, (Highly Commended in the "Health and Safety Innovation" category) and many favourable comments from other clients.

For further information call: **+44 (0) 1928 719875** or email: enquiries.**balvac@balvac.co.uk**

COSTAIN AWARDED CONNECTED VEHICLE TECHNOLOGY CONTRACT

Britpave member, Costain, has been awarded a technology contract by Highways England, to work in collaboration with them, the Department for Transport, Transport for London (TfL) and Kent County Council to design, install and implement one of the UK's first pilot connected vehicle corridors on a live road.

Under the contract, known as the A2M2 connected corridor, Costain will deliver roadside technology using data supplied by TfL, Highways England and Kent County Council and a technology testbed for Cooperative Intelligent Transport Systems (C-ITS). This flagship contract will help to promote the UK as market leader in Connected and Autonomous Vehicle (CAV) and C-ITS technology.

Andrew Wyllie CBE, chief executive said, "This is an important step in making our roads safer and improving journey time reliability by embracing cutting edge technology. It is a further demonstration of Costain's capability and we look forward to leading the way with the deployment and testing of this exciting technology".

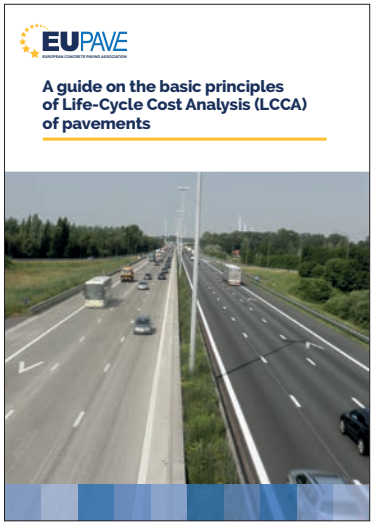
Mike Wilson, safety, engineering and standards executive director, Highways England, said, "Having the technology in place to allow vehicles to connect to each other and the road around them has the potential to improve journeys, making them safer and more reliable by providing real-time, personalised information directly to the driver. It could also help us manage traffic and respond to incidents. The A2/M2 trial will test and demonstrate how this may work in the real world. We are delighted to be jointly funding and part of this international project."

Within the A2M2 connected corridor contract, Costain will be testing the wireless transmission of data to and from travelling vehicles. Trial vehicles will be fitted with onboard technology that will communicate with roadside units via ITS G5 wireless communication and with the service provider via cellular communication. This will convey information to the vehicle relating to road works, road conditions, temporary speed limits and the time remaining before a traffic light turns to green. This information could then be used by the vehicle to vary speed, for example. Information from the contract will be used to develop connected vehicle standards and facilitate a widescale deployment of connected vehicle technology.

Costain will deliver this contract with core partners, Mott MacDonald, 4way Consulting, TRL, Kapsch TrafficCom AG, Altran, Cohda Wireless, Telent Technology Services Ltd and Telefonica.

This contract win follows the announcement of the Group's contract with Highways England to supply Motorway Incident Detection and Automated Signalling (MIDAS) technology systems to help improve road user safety and builds on the recent announcement of Costain's key role supplying smart autonomous vehicle monitoring technology for the Midlands Future Mobility testbed.

NEW EUPAVE LIFE-CYCLE COST GUIDE



Eupave has published a new 'Guide on the basic principles of Life-Cycle Cost Analysis (LCCA) of pavements'. The guide offers advice on undertaking LCCA in order to meet the requirements of the EU Directives on Public Procurements and Concessions under which 250,000 public authorities in the EU should have contracting bids assessed on the basis of best price – quality ratio that includes life cycle costing.

The guide notes that life-cycle costing is rarely applied for transport infrastructure procurement despite the savings that it can offer during the overall life of an infrastructure asset. It points out that by focussing on the initial construction costs, authorities fail to realise the possible long-term cost savings offered by adopting a life-cycle costing approach.

The guide provides an understanding of LCCA and how it can be used for transport infrastructure. Of particular use is guidance on the degree of detailing by both a deterministic approach and by agency costs, a LCCA standard procedure using an excel spreadsheet and references to specific LCCA software for more advanced applications.

'A Guide on the basic principles of Life-Cycle Cost Analysis (LCCA) of pavements' maybe downloaded from: **https://bit.ly/2x2t2FL**

NEW EUPAVE CONCRETE PAVEMENT VIDEO

Eupave launched a new promotion video outlining the benefits of concrete road pavements at the recent 13th International Symposium on Concrete Roads. The video may be viewed at: **https://bit.ly/2CFMWMV**

E420 - N5 COUVIN, BELGIUM, SITE VISIT

Eupave hosted a site visit of the E420 – N5 Couvin bypass in November. The new 4.6km bypass is an excellent example of the use of two-layer continuously reinforced concrete. The need to for a bypass to minimise traffic entering Couvin was first proposed in 1546!

ROSPA GOLD FOR ALLIED INFRASTRUCTURE MANAGEMENT LTD

Britpave member Allied Infrastructure Management Ltd has been presented with a prestigious award in recognition of its practices and achievements in helping its staff, clients and contractors get home safely at the end of the working day. The company has achieved a Gold in the internationally-renowned RoSPA Health and Safety Awards, the longest-running industry awards scheme in the UK.

The RoSPA Awards scheme, which receives entries from organisations around the world, recognises achievement in health and safety management systems, including practices such as leadership and workforce involvement.

Tricia Green, head of quality & business support, said: *"Safety is a top focus for the company and the achievement of this award is an indication of our commitment and drive to ensure all our works are carried out safely. We have achieved Bronze and Silver Awards in the past but this is the first time Allied have been issued with a Gold award."*

Julia Small, RoSPA's head of qualifications, awards and events, said: "The RoSPA Awards are the most highly-respected in the health and safety arena, with almost 2,000 entrants every year, and allow organisations to prove excellence in the workplace, demonstrating a commitment to the wellbeing of not only employees but all those who interact with it."

The majority of awards are non-competitive and mark achievement at merit, bronze, silver and gold levels. Gold medals, president's awards, orders of distinction and the Patron's Award are presented to organisations sustaining the high standards of the gold level over consecutive years.

HEATHROW AIRPORT EXTENDS ATKINS' ASSET REPLACEMENT ROLE

Atkins, a member of the SNC-Lavalin Group, has secured an extension to its role as programme designer for Heathrow Airport's £1.1bn Asset Replacement programme. The extension will see SNC-Lavalin's Atkins business advising on the replacement and repurposing of airport infrastructure that has reached the end of its life.

As a result of Heathrow's current regulatory cycle being extended to 2019, SNC-Lavalin's Atkins business has been awarded a contract extension, which will run for at least one year, to continue working with the airport to reduce operational risks, improve resilience and reduce energy consumption across the airport's estate.

The Asset Replacement programme encompasses all parts of airport infrastructure, from the replacement of life-expired mechanical and electrical plant within the passenger terminals, through to the delivery of new stands and taxiways on the airfield. A focus has also been placed on upgrading and repurposing existing assets. The team will deliver the programme through the use of operational technology, providing solutions that maximise offsite manufacture and assembly, which is safer and involves improved quality control procedures.

BRITPAVE MEMBERS NEWS

A FOCUS ON INFRASTRUCTURE

Britpave, the British Cementitious Paving Association, is the industry association established to develop and forward concrete and cementitious infrastructure solutions. It is active in the development of solutions and best practice for roads, rail, airfields, guided bus, and soil stabilisation.

The broad membership of Britpave encourages the exchange of pan-industry expertise and experience.

The association works closely with national and European standards and regulatory bodies, clients and associated industry organisations. It provides a single industry voice that facilitates representation to government, develops best practice and technical guidance and champions infrastructure solutions that are cost efficient, sustainable, low maintenance and long-lasting.

NEW BRITPAVE MEMBER

THE TKL GROUP

EARTHWORKS - EXCAVATION - PROPERTIES - PLANT

TKL Earthworks, part of the TKL group, has joined Britpave. TKL Earthworks has earned a reputation for reliability for excavation and earthworks over the past 8 years due to its attention to planning, organisation and management in every stage of the contract with the aim of giving total satisfaction to the client and his professional team.

With a proven track record for industrial, commercial and residential projects throughout the midlands and north of England, TKL prides itself on its use of the latest technology to aid production and supply real time information to clients, keeping them informed of the dynamic environment, with staff using portal tablets to instantly update site plans, records and other metrics. The company offers a full estimating and survey service using the latest software and GPS technology to provide quicker, more accurate outcomes. Geographic locations – Midlands and the North of England

For further information visit: **www.thetklgroup.co.uk**

BRITPAVE MEMBERS

As the focal point for in situ concrete and cementitious infrastructure solutions, Britpave offers its members a recognised industry voice, market sector development and beneficial industry networking opportunities. Britpave members include clients, consultants and engineers, contractors, material and plant suppliers and academia.

AECOM Ltd - www.aecom.com

Aggregate Industries - www.aggregate.com

Allied Infrastructure Management Ltd - www.alliedinfrastructure.co.uk

Arup and Partners Ltd - www.arup.com

Atkins Ltd - www.atkinsglobal.com

Balfour Beatty Ltd - www.balfourbeatty.co.uk

Ballast Phoenix Ltd - www.ballastphoenix.co.uk

BAM Contractors - www.bamcontractors.ie

Barton Plant Ltd - www.barton-plant.co.uk

British Lime Association - www.britishlime.org

Cambrian-UK – www.cambrian-uk.com

CEMEX UK - www.cemex.co.uk

CH2M - www.ch2m.com

Colas Ltd - www.colas.co.uk

Combined Soil Stabilisation Ltd - www.combinedssl.co.uk

Complete Design Partnership Ltd - www.cdpbroms.co.uk

Costain Ltd - www.costain.com

Dublin Airport Authority plc - www.dublinairport.com

Ecocem - www.ecocem.ie

Extrudakerb Ltd - www.extrudakerb.co.uk

Geofirma Soil Engineering Ltd - www.geofirma.co.uk

Gill Civil Engineering Ltd - www.gillgrouphouse.com

Gomaco International Ltd - www.gomaco.com

Hanson UK Ltd - www.hanson.biz

Lagan Construction International - www.laganconstruction.com

Morgan Sindall Construction and Infrastructure Ltd - www.morgansindall.com

Norder Design Associates Ltd - www.norder.co.uk

PJ Davidson (UK) Ltd - www.pjd.uk.net

RJT Excavations Ltd - www.rjtexcavations.co.uk

RPS Group plc - www.rpsgroup.com

SGE - www.sgeworks.co.uk

Smith Construction (Heckington) Ltd - www.smithsportscivils.co.uk

Tarmac Ltd - www.tarmac.com

Tata Steel Shapfell - www.tatasteeleurope.com

TKL Earthworks - www.thetklgroup.co.uk

TR Stabilisation - www.trstabilisation.co.uk

University of Nottingham - www.civeng.nottingham.ac.uk

VolkerFitzpatrick Ltd - www.volkerfitzpatrick.co.uk