BRITPAVE NEWS

ISSUE 44 - WINTER 2022

Climate Change Needs Concrete Resilience

ENVIRONMENTAL BENEFITS OF SOIL STABILISATION

BRITPAVE CONFERENCE REPORT

ROAD BARRIER TO SELF-DRIVE REVOLUTION

INTEGRATED RAIL PLAN NEEDS REVISITING

ROAD NETWORK UNDER PRESSURE

BRITPAVE MEMBERS' NEWS AND UPDATES

britpave
The British Cementitious Paving Association

www.britpave.org.uk

britpave
The British Cementitious Paving Association

IN THIS ISSUE:

Front cover image: HS2 tunnelling under London, see page 15

CHAIRMAN'S WELCOME

Welcome to the Winter 2022 issue of Britpave News.

Forward thinking is essential for successful infrastructure solutions. Not only for the planning and delivery of infrastructure projects but also to ensure their long-term performance against future demands.

The need for forward thinking is highlighted by the challenges being faced by the road and rail networks, the need to find more land for development and the impact of climate change. All of these challenges can be addressed by some cementitious forward thinking.

This issue of Britpave News examines the forward thinking of Britpave members that is behind new product, plant and project solutions ranging from new collaborative partnerships and investing in the next generation of engineers to new construction guidance and approaches. Forward thinking was also much in evidence at the recent Britpave industry conference which is reported in this issue. Conference delegates learnt about infrastructure developments and the future potential of a range of university research projects.

I would like to take this opportunity to thank all the Britpave members for their forward thinking which is underlined by their continued support to the association that allows it to forward, on their behalf, the cementitious solutions that the UK infrastructure needs.

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.

CLIMATE CHANGE NEEDS CONCRETE RESILIENCE

2022 has seen heavy flooding and extreme heatwaves. Both are indicative of the impacts of climate change. Both have had detrimental impacts on UK transport networks. A new report from Britpave calls for transport infrastructure that can cope with extreme weather events.

This year, the cluster of three major storms in February and the extreme heatwaves of the summer have underlined the impacts that major weather events can have upon our transport infrastructure. This includes severe flooding and erosion damage plus road and runway surfaces melting.

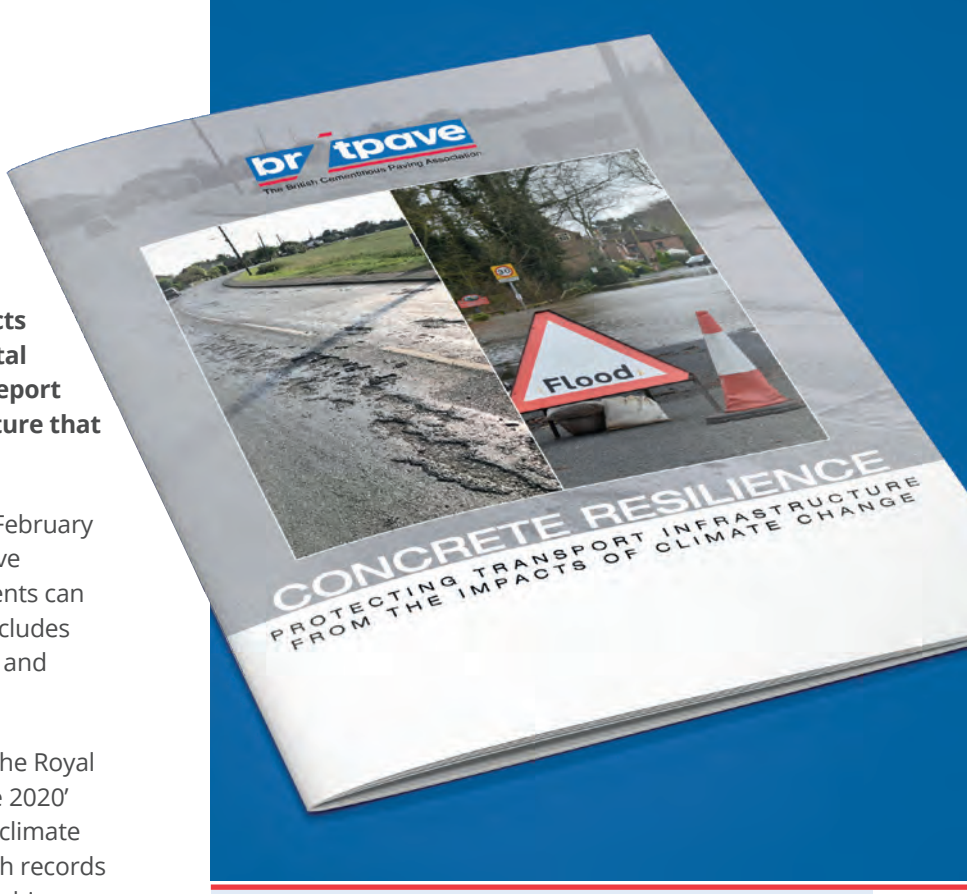
The most recent analysis of the UK climate by the Royal Meteorological Society, 'State of the UK Climate 2020' published in 2021, showed that the impacts of climate change are already being felt across the UK with records being broken for daily rainfall and monthly sunshine hours. That included severe flooding from heavy rainfall in February 2020 and major heatwaves in July and August 2020.

Future forecasts for the climate do not look good with the Met Office predicting that current heatwaves exceeding 32°C could by 2070 be exceeded by summer temperatures regularly reaching 40°C. The intensity of rainfall could see summer heavy rainfall increase by 20%. In winter, it could increase by 25%.

The report, 'Concrete resilience: protecting transport infrastructure from the impacts of climate change', calls for transport infrastructure to have built-in resilience and be future-proofed against the impacts of climate change. It points out that concrete infrastructure is resilient to heatwaves temperatures and will not melt or catch fire. In addition, the stiffness of concrete surfaces remains constant so they will not suffer from softening or rutting. This stiffness and ability to carry traffic loads remains for the performance life of the concrete pavement.

As well as being heat resistant, concrete is also robust and water resistant. This inherent performance benefit enables concrete roads to withstand the impacts of increased rainfall and flooding.

Concrete pavements and rail systems thus provide better environmental and economic solutions as they will not need maintenance or repair due to climate change impacts. For a free download visit: **www.britpave.org.uk/publication**



CLIMATE CHANGE THREATENS UK INFRASTRUCTURE

The Joint Committee on National Security Strategy (JCNSS), has called on the government to do much more to improve the resilience of critical infrastructure to the ravages of climate change. The committee is comprised of MPs from different parties and members of the House of Lords.

In its report, 'Readiness for storms ahead? Critical national infrastructure in an age of climate change', the JCNSS writes: "The evidence is overwhelming that the effects of climate change on our critical national infrastructure are already significant and are set to worsen substantially under all reasonable climate change scenarios. Buckling train lines, flooding of major infrastructure sites, landslides and power outages are all realistic outcomes. They may also happen simultaneously, causing multiple cascading effects across different infrastructure sectors. The scale of the challenge facing government, operators and regulators is clear: there is an urgent need to adapt our infrastructure to the potentially rapid effects of climate change."

The report criticised the lack of cross-government co-operation and planning on the issue and the delay in publishing the planned National Resilience Strategy.

'Readiness for storms ahead? Critical national infrastructure in an age of climate change – First report of the Joint Committee on National Security Strategy', is available at: **https://bit.ly/3DBEjjL**

ENVIRONMENTAL BENEFITS OF SOIL STABILISATION

A new report from Britpave explains the environmental benefits of using soil stabilisation. Not least of which is the rehabilitation of brownfield land to reduce the pressure to build on greenfield sites.

Soil stabilisation involves using cementitious binding materials such as cement, lime, fly ash or ground granulated blast furnace slag (GBBS) to strengthen poor soils and to treat potential contaminants on site to provide a soil that is non-toxic, can contain potential leaching and delivers a strong engineered material that can be built upon. The process is carried out on site and so provides a sustainable and cost-effective alternative to 'dig-and-dump'.

Soil stabilisation is more than simply rotovating binders into soil. It requires the proper ground investigation, soil sampling and laboratory trials to determine the right binder mix, good site quality control, use of appropriate plan and good on-site working practices. Done correctly, and soil stabilisation offers a wide range of environmental and CO2 reduction benefits.

The report, 'Environmental benefits of soil stabilisation', explains that the main ethos of being environmentally friendly is reusing, recycling and reducing. Soil stabilisation does exactly that. By being part of a process that enables the reuse and recycling of brownfield land, it can reduce the need to build on new greenfield sites, promote the reuse of existing soils rather than importing and using virgin aggregates and reduce transportation and landfill environmental impacts. For a free download, visit: **www.britpave.org.uk/publications**

SOIL STABILISATION AT SKELMERSDALE

Combined Soil Stabilisation has carried out a large earthworks and stabilisation contract for Volker Fitzpatrick in Skelmersdale. The very large plot consisted of two steel frame industrial warehouses and covered an area of approx. 90,000m^2. An extensive cut full exercise was required with approximately 35,000m^3 of soils placed and lime improved with additional treatment to any soft areas prior to upfilling and at the base of the cut.

The approximate hardstanding surface area of 70,000m^2 was lime and cement stabilised to achieve 30% CBR as well as offering non-frost susceptibility to this layer. On completion this layer was topped with 100mm tof Type 1.

DON'T BE UNIQUE BE CONSISTENT

Infrastructure professionals should focus more consistently on embedding best practice across their projects instead of emphasising why they are unique, according to a new report on productivity from the Institution of Civil Engineers (ICE).

This is one of the findings of the ICE's State of the Nation 2022: Improving Infrastructure Productivity. It seeks to understand why so many infrastructure projects have been seen as unproductive or wasteful because of over-runs or over-spends, and what can be done to change this.

The report comes just weeks after the UK Government released a list of 138 major infrastructure projects it wants to accelerate. The need to reduce waste has arguably never been greater as public finances come under unprecedented strain, and as the cost of building materials is rising.

Unlike in other sectors where productivity is measured by goods or services delivered in relation to costs or hours worked, the report argues that infrastructure is different: it suggests a measure that also considers effectiveness – whether the project fulfils its aims – as well as how efficiently this was achieved.

The report proposes three key lessons to boost productivity:

- People, culture and mindset are just as important as process change and new technology. Creating "psychological safety" so that all participants in a project feel able to tell the truth about performance and suggest improvements is key.
- The sector needs to simultaneously embed established best practices and drive continuous improvement across programmes. Don't focus on what is unique about a project - instead look for what is common and how established best practices can be used more consistently.
- The greatest productivity improvements are available before construction begins – but there are opportunities throughout the lifecycle.

The ICE is also publishing the first part of an online resource to help infrastructure professionals pinpoint practical, evidence-based actions they can take to improve productivity. Driving Productivity: Infrastructure Lifecycle Guidance will be easy to navigate by job role and by the relevant stage of the project lifecycle. The first stage of this guidance – relating to design – is available on the ICE website and future stages will be added in the coming months.

Ed McCann, President of ICE, said: "Productivity means civil engineers maximising the effectiveness and efficiency of what they do at every stage of the infrastructure lifecycle so that we can make the most of our finite resources and deliver more services, with a lower environmental impact. The guidance we are developing highlights that it is everyone's duty to improve productivity at every stage of a project."

The report also suggests that infrastructure professionals should borrow ideas from other sectors – such as manufacturing and digital - that have succeeded in standardising processes and ruthlessly driving out sources of waste. It provides several case studies where this approach has been adopted on infrastructure projects.

To download a copy of the State of the Nation 2022, visit: **https://bit.ly/3saWlTu**

ROAD NETWORK UNDER PRESSURE

The UK's road infrastructure could come under increased loading pressure from longer heavier vehicles (LHVs) of up to 25.25m in length and 60t in weight if the Department for Transport (DfT) gives the go ahead for a trial of the expanded cargo carriers. This could call for specific truck lanes designed to cope with increased traffic loads believes Britpave.

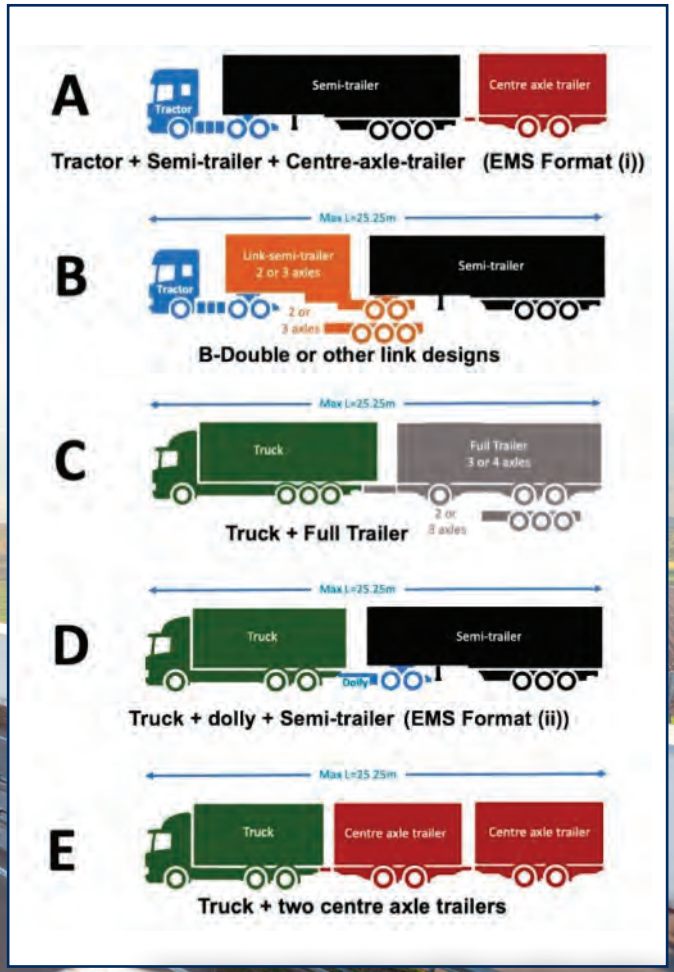
The DfT has commissioned a report from consultants WSP to look into possible ways to carry out a trial of LHVs, which it hopes to begin using as a means of reducing emissions. The report, 'LHV Trial Feasibility Study' forwards that although the emissions for individual LHVs would exceed that of standard HGVs, the additional carrying capacity would result in fewer vehicles needed and deliver a significant emissions reduction. Currently, the maximum permitted weight of a lorry is 44t.

Joe Quirke, Britpave chairman, said: "What is needed is a construction solution that can successfully meet the demands being placed upon it. The way forward is to provide specific truck lanes where the road is specifically constructed to meet the demands of heavy traffic loads. Otherwise, the increased lorry weight could result in the need for more frequent road maintenance and reconstruction and, therefore, more road works and congestion and more CO_2 emissions."

There are a number of long-term, minimum maintenance concrete road options including continuously reinforced concrete pavement with exposed aggregate and Next Generation Concrete Surface that offers the long-term performance of concrete with significant traffic noise reduction.

In addition, Quirke explained that low carbon concretes, 100% recyclability and evidence that concrete rolling resistance can reduce fuel consumption offers further CO_2 reduction benefits of concrete roads. These and the superior whole life performance of concrete roads should be more widely recognised and considered by the government. He said: "In other countries, the whole life cost of a pavement is considered as paramount and if this is taken into account, together with its CO_2 reduction benefits then concrete should definitely be the road ahead for a stronger and greener infrastructure solution."

The DfT is now considering whether to go ahead with the LHV trials.



Core longer heavier vehicle configurations at 25.25m and 60t

ROAD NETWORK BARRIER TO SELF-DRIVE REVOLUTION

The Government's self-driving motoring revolution requires more robust pavement designs which provide more long-term performance.

Under plans announced by the Department of Transport self-driving vehicles could be on UK roads by 2025. It said that self-driving vehicles could "revolutionise public transport and passenger travel, enhance transportation connections between rural communities, and reduce the number of road collisions caused by human error." The proposals would see cars, coaches and lorries boasting self-driving features operating on UK motorways within the next year, followed by fully self-driving vehicles by the middle of the decade.

Benefits of self-driving vehicles include less accidents, improved use of road space, reduced congestion and pollution and more efficient fuel consumption. The vehicles would be equipped to 'read the road' and replicate the instinctive human ability to simultaneously observe, analyse, decide and react to every potential different road scenario such as potholes and reduced skid resistance.

Self-driving vehicles require well-maintained road surfaces. Surface friction levels, road markings and signs must be in good condition in order to be correctly read by the vehicles' sensors. Embedded wi-fi antenna for vehicle connectivity needs to be protected from damaged caused by rutting from heavy traffic loads or the road surface melting in extreme temperatures.

Joe Quirke, Britpave chairman, explained: "The technological advancement of self-driving vehicles needs to be matched by investment in long-term, robust road solutions."

In particular, Quirke pointed to the fact that, unlike human drivers who may slightly shift left or right within lanes, self-driving vehicles guided by GPS and other navigational aids will follow and keep to a far more precise path. This means that each self-driving vehicle will drive over the same part of the road each time leading to significant repetitive wear-and-tear and increased ongoing maintenance. He said: "To counteract this, roads will have to provide far more long-term robustness than they do at present. They will also have to have far more built-in climate resilience if they are to continue to operate during the extreme weather events predicted as a result of climate change." Concrete roads, that are already currently designed for a performance life of 60 years, offer the required levels of long-term strength and resilience.

He concluded: "Concrete roads offer the robustness and resilience to withstand repetitive traffic loads as well as the structural integrity to support and protect installed sensors and wi fi antenna. A self-driving vehicle will only be as good as the road surface that it drives on."

CONSTRUCTING THE 100 YEAR ROAD FOR REDUCED WHOLE LIFE COST AND CO_2

For its 2022 industry conference, Britpave asked the question if it is possible to build a 100 year old road. The question, in terms of reduced whole life cost and CO_2, is an important one. The answer, examined and forwarded by a range of industry experts and academia, is a concrete yes.

Roads are expensive to build and maintain in terms of both financial cost and CO_2 emissions. It therefore makes economic and sustainability sense that they are built to last with minimum maintenance or need for replacement. Concrete roads already have a performance life of 40 – 60 years. Indeed, as Anne Beeldens from AB-Roads explained in Belgium there are examples of concrete roads that are 70 – 80 years roads that continue to perform well. Should the appropriate adjustments to current design, construction and maintenance specification be developed then there is no reason why concrete roads could not last for 100 years thereby providing significant extended whole life benefits.

Fundamental to long-term performance is the provision of a strong foundations. Al McDermid of Mick George and Steve Dunn from Combined Soil Stabilisation explained that many road failures are the result of poor foundations. The construction of a soil stabilised foundation that is installed following best practice addresses the presence of weak soils and increases the subgrade stiffness. This improves the long-term durability and performance of the road pavement above.

Concrete roads lend themselves to efficient rejuvenation. Presentations from Ian Carswell, Atkins, and Dr Omar Hadri, AECOM, both highlighted how Next Generation Concrete Surfaces (NGCS) using longitudinal diamond grinding and grooving can improve the long-term skid resistance and noise reduction qualities of concrete roads. This efficient technique has been proved at a number of sites across the UK including the A12 Chelmsford Bypass, the A14 Whitehouse to Copdock and on the M1.

Moving from the present and looking to the future, delegates learnt about a number of university research projects aimed at increasing concrete's material performance. Dr Brunella Balzano from the University of Cardiff forwarded the findings from the Materials 4 Life project which is focused on the self-healing potential of concrete roads to repair cracks and so prevent water ingress. Dr Alalea Kia from Imperial College London presented a new concrete that can provide highly efficient permeable pavements to reduce the potential of flooding. While Sampath Pasupunuri from the University of Nottingham explained the

development of a new data tool that will help predict the performance of a concrete pavement to ensure that correct maintenance programmes are implemented.

Innovation was also the focus of the presentation from Colum McCague from the Mineral Products Association. He highlighted the findings of a three-year research and demonstration programme that proved the suitability of new low carbon ternary cements for concrete roads. The new cements use limestone powder together with fly ash or ggbs as a substitute for energy intensive clinker to provide low embodied carbon solutions.

The future potential of concrete roads was forwarded by two innovative projects from Holcim. Duc Tung Dao presented a new road coating that can improve the long-term safety and durability of a concrete pavement. Previously used for light trafficked areas, Holcim has developed the concept to be applicable for heavy trafficked roads. Eugen Florescu forwarded the use of Magment concrete pavements that can re-charge vehicles via 'inductive charging' using magnetized concrete made from cement and magnetic particles from electronic waste. This would remove the need for charging stations and the range anxiety experience by many drivers of electronic vehicles.

Pulling all of this together are the highway specifications necessary for both present and future delivery. Neng Mbah and Yi Xu from National Highways explained the extensive review and update of the DMRB and MCHW highway specifications aimed at updating the construction and maintenance standards that are fundamental to the successful delivery of a safe, cost and carbon efficient strategic road network.

Thanking the presenters and delegates for their time and attendance and reviewing the conference, Joe Quirke, Britpave Chairman, concluded: "The conference heard from an impressive range of industry practitioners, cement manufacturers and university researchers. They demonstrated how concrete construction is already capable of delivering roads that can last for a 100 years. A wide range of innovations could further increase concrete whole life cost and carbon reduction plus increase operational, safety, noise reduction and climate resilience benefits. For 100 year performance, the road ahead should certainly be concrete."

The conference room was full to capacity. For copies of the powerpoint presentations, listed below, contact info@britpave.org.uk or to watch the full conference visit the Britpave YouTube channel:
https://bit.ly/3FebYBw

The conference heard from a wide range of speakers. Their powerpoint presentations are available from the Britpave office:

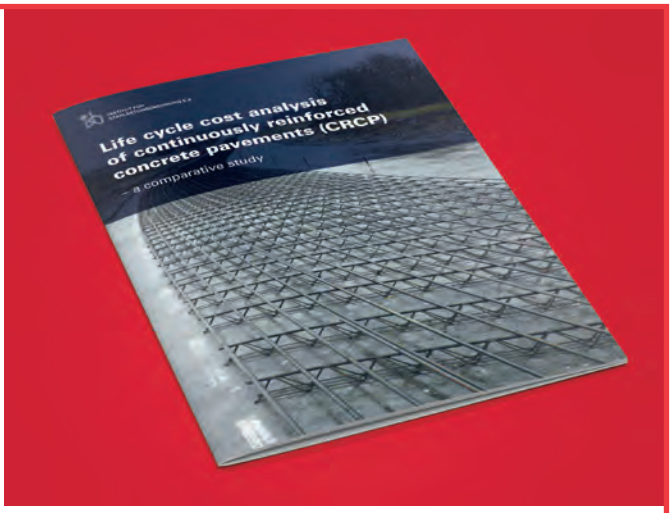
- Developing the road specifications for the future
  Neng Mbah, National Highways, and Yi Xu, National Highways
- The 100 year concrete road: Challenges for design and execution, based on the Belgium experience
  Anne Beeldens, AB-Roads
- Constructing from the bottom up: Long-term soil stabilised foundations
  Alastair McDermid, Mick George, and Steve Dunn, Combined Soil Stabilisation
- Predicting Concrete Pavement Performance
  Sampath Pasupunuri, University of Nottingham
- Resilient Materials 4 life research project
  Dr Brunella Balzano, Lecturer in Smart Civil Engineering, University of Cardiff
- The new ternary cements
  Colum McCague, Mineral Products Association
- Realising the potential of longitudinal diamond grinding & Next Generation Concrete Surfacing
  Ian Carswell, Atkins
- An Overview of Recent Developments in Next Generation Concrete Surfaces
  Dr Omar Hadri, AECOM
- Next-generation climate change resilient permeable pavement
  Dr Alalea Kia, UKRI Future Leaders Fellow, Imperial College London
- Innovative Road Coating: an original solution to improve safety and durability of Concrete Pavement
  Duc Tung Dao, Holcim
- Magment: the magnetizable concrete for dynamic wireless charging
  Eugen Florescu, Holcim

NEW CRCP STUDY PUBLISHED

At the recent Britpave conference, presenter Anne Beeldens of AB Roads made reference to a new study: 'Life cycle cost analysis of continuously reinforced concrete pavements (CRCP) – a comparative study'. This has since been published by the German Institut für Stahlbetonbewehrung.

Continuously reinforced concrete pavements (CRCP) have proved their value in many circumstances. In several countries, such as Belgium, the United States and South-Korea, CRCP is the main structure for highly trafficked highways. A major factor in selecting the type of pavement is cost. Often, this cost is limited to the initial construction cost. However, the longevity of CRCP concrete pavements and their lower maintenance costs result in an overall lower performance cost.

In order to account for the initial and future cost, a life cycle cost analysis (LCCA) was performed on different types of pavement structures. The LCCA considered the initial construction cost, the maintenance cost, and the rehabilitation cost. In addition, the social and environmental cost can be calculated.



The study reports that the life cycle cost analysis CRCP is not only initially competitive with JPCP and bituminous pavements but can be even more economical than the two other types of pavements. This is due to the low maintenance cost, taking place at a later stage in the pavement's lifetime. This does not only decrease the overall cost of the pavement structure, but also increases the lane availability, with a positive effect on the social cost of the pavement.

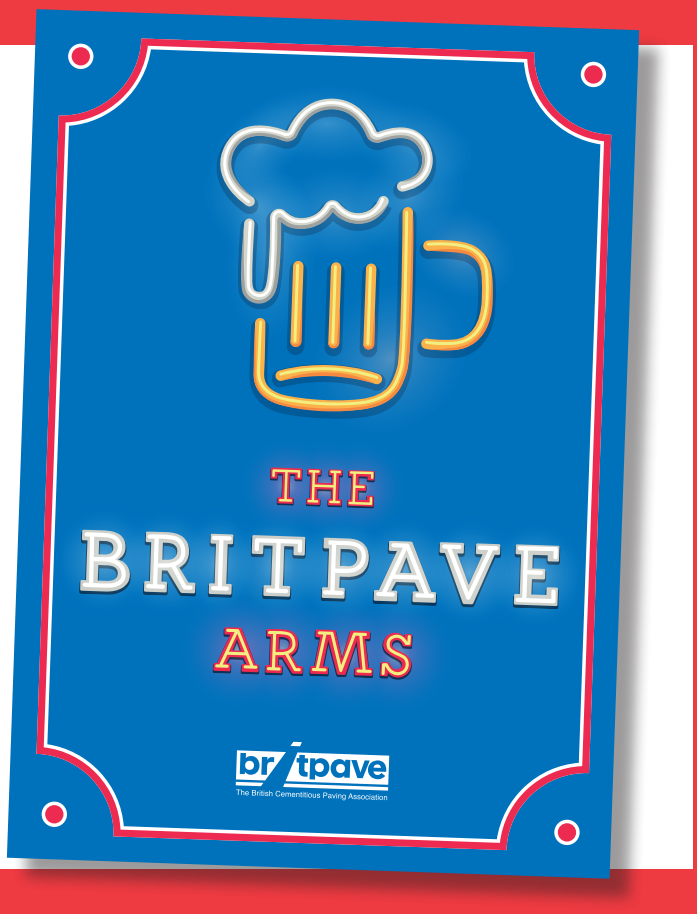
The study may be downloaded from:
https://bit.ly/3V8NazK

BRITPAVE CONFERENCE

THE BRITPAVE ARMS

After a day-long conference, delegates were given a warm welcome at the pop-up Britpave Arms complete with pub snacks, pub-themed supper and a range of pub-based games including table football, bar skittles and a huge inflatable darts board. These games saw industry networking give way to competitive matches. A good night was had by all and feedback for both the conference and pub has been very positive. One question was repeatedly asked....

"WHAT ARE YOU GOING TO DO FOR NEXT YEAR?"



NORDER AND FJORI JOIN FORCES

Two of Britpave's past and present members, Fjori Limited and Norder Design Associates Limited, joined forces in September to provide significant combined expertise to the pavement engineering market.

Fjori Limited started life in 2011 after Managing Director, Alex Lake, left AECOM to set up a company to specialise in pavement engineering across all sectors, and offer a full suite of services in airfield planning and engineering. The success of the last 11 years for Fjori and their suite of expertise made them a natural fit for Norder who acquired the Fjori business this Autumn. Over the last decade Norder, whose Managing Director is Adrian Erwee, has collaborated with Fjori on multiple projects and so the decision to join the companies together was an easy one.

Fjori and Norder collaborated on the recent concrete taxiway reconstruction at London City Airport

Norder started life in 1975 and offers a multi-disciplinary service to clients in a large range of sectors. Importantly, Norder retains the principle of Director-led projects where Director's expertise is available to all projects with a hands-on approach. This was a critical factor for Alex in choosing to make the move that Fjori has; "over the last decade we have built up strong relationships with some great clients, and a lot of this is down to giving access on projects to really strong expertise and team members who have the experience and empowerment to make decisions, both technically and commercially. Retaining this was one of my top priorities which is why Norder is such a good fit".

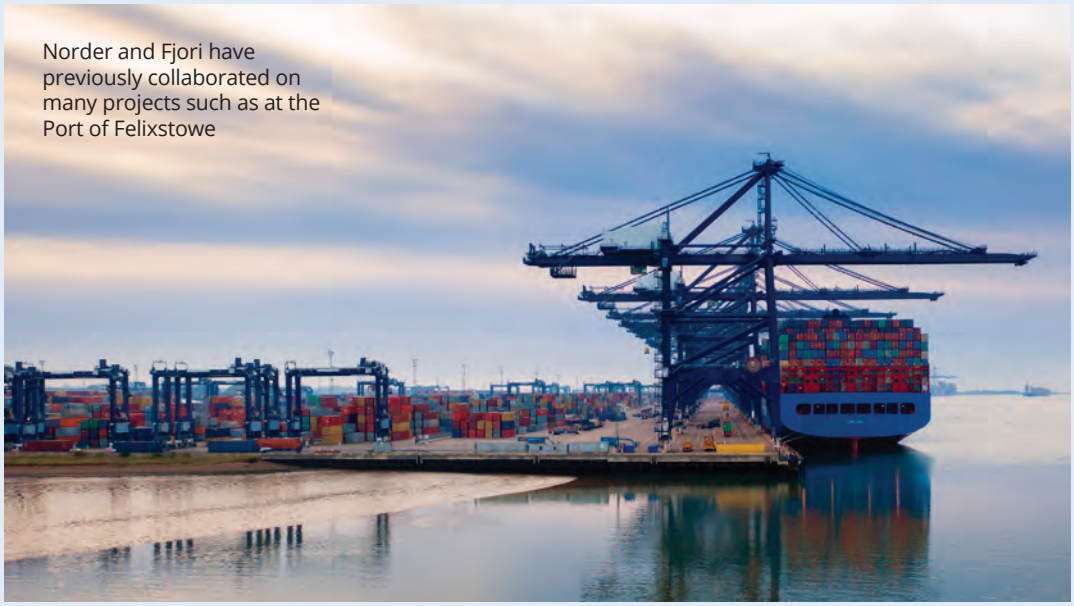
Alex has been involved on and off with Britpave for nearly 30 years and his move into Norder marks his return to the fold. Adrian, who has also been involved with Britpave for 21 years and ensured Norder became a member of Britpave in 2008 when he joined the company, was keen to emphasise the benefits of the two companies' combination of skills "while Norder expands its existing niche markets of industrial, manufacturing, distribution, ports, airports and highways markets, bringing the expertise of Fjori's staff into our business, and their clients, it is very exciting for us as it significantly raises the pavement expertise we can offer to our cross-sector markets while adding a completely new market of airfield engineering to Norder's capability and allows Norder to offer its full scope of services to Fjori's original clients".

Over the last decade, Fjori assembled an enviable range of aviation clients and expertise, including Government departments, States of Guernsey, London City, London Luton, London Southend, Birmingham and Dublin Airports for example in addition to providing services at military airfields including RAF Lakenheath, RAF Lossiemouth, RAF Mount Pleasant (Falklands) and RAF Wideawake (Ascension Island). Fjori's international aviation work has extended worldwide, from Colombia and Brazil to Japan, Iceland to the Middle East and across the EU. On highways Fjori has offered pavement engineering services on major PPP projects including the Croatian and Turkish motorway networks as well as motorways in Abu Dhabi, Netherlands, Ireland and Finland.

The new concrete runway at Dublin Airport where Fjori provided specialist advice to DAA on concrete materials

Although Fjori's pavement expertise is across all pavement materials, it is concrete pavements where Alex really started his career as he recollects; "I remember in the early 1990's walking up and down the 24km stretch of the A40/A449 dual concrete carriageways in South Wales, counting cracks in the rain for days, turning the surveys into a major reconstruction project. I learnt so much from that project, and indeed every project ever since – you never stop learning. But a big part of that learning involved Britpave and getting involved in the task groups where I could hear first-hand the experiences of others on concrete paving from different sectors. I would encourage any engineer to get involved. Now I see the young engineers I have working with me and being part of Norder will give them a great chance to broaden their horizons and get involved, as I did, in Britpave".

Indeed, between Adrian and Alex those many years of flat slab engineering lessons and working with concrete as a material has led to both being called upon by clients to act as Expert Witness from time to time. As Adrian says "I love working to try to solve problems for people by understanding actual behaviour of materials when things go wrong and the way in which different parties interact and are expected to interact with each other, and Expert Witness work is just that, and so having Alex join the team really adds to our forensic engineering capability".



Norder and Fjori have previously collaborated on many projects such as at the Port of Felixstowe

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

AECOM PARTNERS WITH DIGITAL ORIS

Britpave member AECOM has signed a memorandum of understanding (MOU) with digital start-up ORIS to collaborate on carbon impact assessments for road designs. The organisations will pursue joint opportunities for their combined approach, with AECOM using the ORIS software to assess the carbon emissions of road projects to enable its engineers to quickly compare and quantify different design solutions and scenarios.

Under the MOU, AECOM and ORIS will also gather further insights on road pavement materials and their lifecycle carbon impacts to help clients make data-driven decisions about the sustainability performance of road pavement designs.

Supported by Artificial Intelligence, the ORIS Digital Pavement Design and Material Management Platform gathers data on locally available construction materials and international and local standards and considers factors like expected traffic and weather conditions to assess the life cycle carbon and cost impacts of different design options. It employs a unique material sourcing database, which helps link projects to locally available and recyclable materials to encourage uptake of circular economy approaches.

The disruptive technology enables AECOM to quickly measure the sustainability performance of different design scenarios during construction and maintenance. With data generated rapidly, using the software can greatly reduce the design process when compared to manually assessing different factors.

The MOU follows a successful pilot project, with AECOM working with ORIS to measure the sustainability performance of its designs for the A50 Groby Road Corridor project for Leicester City Council. Funded by the government's Transforming Cities Fund, this road improvement project will introduce cycle lanes, new and enhanced pedestrian and cycle crossing facilities and safety improvements at a busy junction.

The digital platform generated multiple pavement scenarios that considered factors including carbon emissions, cost estimation and material consumption over the project's 40-year service life. The outputs provided the client with a full range of carbon and cost calculations to help inform decision making about different materials and design solutions.

AECOM

James Burdall, Head of Pavement Design and Asset Management, AECOM, said:

"Our work with ORIS on the A50 Groby Road Corridor project allowed us to apply their disruptive technology to a live project and see first-hand the benefits it can bring. It's a game changer for road pavement design that gives our clients a holistic view of the long-term impacts of different design options. There is huge potential to deploy this data-driven solution more widely across the roads, rail and other construction sectors. By signing an MOU with ORIS we can offer this approach to more clients, helping them make more informed decisions that will reduce the cost and carbon impacts of their construction projects."

ORIS

Nicolas Miravalls, CEO of ORIS, added:

"Already accessible in Germany and France, this MOU with AECOM will support furthewr deployment across the UK and Europe, to improve infrastructure sustainability and performance. "The ORIS team is proud and committed to accompany AECOM in their ambition to follow a disruptive approach to road structure design optimisation and carbon life cycle calculations."

ORIS has been recognized by the Solar Impulse Foundation as one of its 1,000 existing solutions that are both clean and profitable. In 2021, ORIS was one of the top 10 finalists of the GI Hub Challenge on resilient infrastructure. In February 2022, ORIS was awarded the prize for industry decarbonization through a technological change, by the National Highways annual Innovation Concourse in the UK. In September 2022, ORIS has won the CIHT 'International Infrastructure' Award 2022.

For more information about AECOM's partnership with ORIS, contact James Burdall: james.burdall@aecom.com
For further information about AECOM, visit:
https://aecom.com/

ORIS exhibited at the recent Britpave industry conference event. For further information visit:
https://oris-connect.com/en/about

The most impactful levers for carbon emissions reduction in road infrastructure are examined in a new video available from ORIS.

Road construction has a heavy impact on the environment, due to large natural resource consumption, massive carbon emissions and uncontrolled maintenance requirements at short or medium term. Analysis and comparison of these levers has the potential to reduce carbon emissions by 50%.

To watch the video, visit: **https://www.youtube.com/watch?v=RznwpstJ_cY**

A66 NORTHERN TRANS-PENINE UPGRADE WORKS COLLABORATION

Britpave members Balfour Beatty, Atkins and Costain have been selected by National Highways to deliver critical upgrade works to the A66 Northern Trans-Pennine route, alongside Keltbray and Kier, following the Planning Inspectorate accepting the projects Development Consent Order application.

The project, which is subject to approval from the Secretary of State in 2023, would see the dualling of the remaining 18-mile single carriageway sections and key junctions between the M6 Junction 40 at Penrith and the A1 at Scotch Corner improved under National Highway's Delivery Integration Partnership Framework.

During this time, Balfour Beatty will work alongside National Highways and the three other contractors to develop the detailed design of the project, integrating sustainable solutions such as the use of electric and hydrogen powered machinery to reduce carbon emissions by up to 30%.

If approved, the project – valued in its entirety at £1.3 billion – would form a key part of the UK Government's National Infrastructure Strategy, 'Project Speed', the UK Government's plan to speed up work on major infrastructure projects and stimulate the economy following the Covid-19 pandemic.

On completion, the improved A66 Northern Trans-Pennine route will reduce delays and queues and improve the performance of key junctions such as the A66/A6 and the M6 Junction 40. In addition, the improvement works will reconnect communities and link villages along the route, while also improving connections for people living and working nearby, providing better access to services such as healthcare, jobs and education.

Phil Clifton, Managing Director of Balfour Beatty's Highways business, said: "This vital piece of infrastructure for the North will not only improve national connectivity, but will provide faster, faster and more reliable journeys for road users across the UK. Throughout, we will utilise our longstanding expertise in delivering essential road upgrade works, whilst also leaving a lasting positive legacy for local communities; working with local supply chain partners and creating numerous employment opportunities."

Lee Hillyard, National Highways' A66 Northern Trans-Pennine Project Director, said: "We are delighted to welcome Costain, Keltbray, Kier and Balfour Beatty and we look forward to working with them on the biggest generational investment on the north's road network.

We have worked with all four contractors previously and know the quality of their work. The signing of the contracts is a huge step in the delivery of such a big scheme and it is an important milestone for the A66 Northern Trans-Pennine project."

Should National Highway's proposals be approved as a result of the Planning Inspectorate's process, and the Secretary of State's decision given next year, work on the project is expected to start in 2024.

GIANT HS2 TUNNELLING MACHINES START WORK UNDER LONDON

In October, HS2 and partners Skanska Costain STRABAG JV celebrated the start of the next phase of tunnelling on the enormous infrastructure project by launching the first of six tunnel boring machines that will dig over 26 miles of tunnels under the capital. “Sushila” - named after pupils nominated local teacher Sushila Harani - is the fourth of 10 HS2 tunnel boring machines to be launched. The milestone highlighted the progress being made on building Britain’s new high speed rail network, creating jobs, and providing contracts for businesses now.

stop for 22 months, except Christmas Day and bank holidays, to Green Park Way in Greenford, where they will be dismantled and lifted from the ground.

Separately, two other equally massive tunnel boring machines will set off towards Green Park Way from HS2’s Victoria Road site in 2023 to build a further 3.4mile twin-bore tunnel. Together the quartet of TBMs will build 8.4miles of twin bored tunnels between West Ruislip and the new high speed rail super hub station at Old Oak Common. Another tunnel 4.5-mile twin-bore

Later this year a second TBM, named after 18th century astronomer Caroline Herschel, will also be launched from the West London site to build the second of HS2’s twin-bore tunnels towards central London.

Speaking about the launch, the HS2 Minister, Kevin Foster MP, said: "This launch is a landmark moment in the delivery of HS2, helping link London to Birmingham and unlock better connections, quicker journeys and create thousands of skilled jobs across the North and Midlands.

“Already well underway, HS2 is set to revolutionise journeys for communities throughout the country, boost local economies and, at its peak, support more than 34,000 jobs across the UK.”

Each weighing over 2,000 tonnes and measuring 140 metres in length, both TBMs will bore five miles non-

tunnel extending from Old Oak Common to Euston will complete HS2’s journey to its London terminus.

Each TBM is operated by 15 people, working in shifts. A team of around 40 people assembled the TBMs, with 56 companies involved in getting the site ready and machines launched. In total the 10 TBMs will create 64 miles of tunnels on HS2 between London and the West Midlands.

HS2 Ltd CEO Mark Thurston: “The launch of the TBMs on the largest section of tunnels through London is a major moment for HS2, and one that demonstrates the brilliant momentum that has built behind Britain’s flagship levelling-up project. The construction of 170 miles of new high-speed railway between London and Crewe is now in full swing, supporting 27,000 jobs, 1,000 apprenticeships and contracts for over 2,500 businesses.”

GOVERNMENT NEEDS TO REVISIT INTEGRATED RAIL PLAN DECISIONS

The Parliament Transport Select Committee has called for a thorough reassessment of the Government's Integrated Rail Plan to ensure that this once-in-a-generation investment in rail is not a missed opportunity to address regional imbalances.

The Integrated Rail Plan for the North and Midlands report says that alternative options, which could transform stations and city centres in key Northern cities, have not been properly tested. Leaving out key elements of analysis of the wider economic impacts of the different options set out for Northern Powerhouse Rail means that value for money and economic return cannot be compared and validated.

The Committee has called for a full analysis of the wider economic impacts, and a full benefit-cost ratio, for the different Northern Powerhouse Rail options. If the results demonstrate that other options offer better value and outcomes for the taxpayer, economy and the communities directly impacted, MPs say Government 'must grasp the nettle' and make the necessary changes.

The revised Eastern leg of HS2 Phase 2b will see the Birmingham to Leeds route terminate at East Midlands Parkway. HS2 Limited was unable to tell the Committee how much the revised leg would cost. As a result, the Committee calls on the Department for Transport to publish an updated benefit-cost ratio for the entire HS2 project, including a direct comparison between the original and revised Eastern leg of HS2 Phase 2b, by March 2023.

The original purpose of Northern Powerhouse Rail - to connect the 'great cities of the north to build a northern powerhouse' – is at risk. Some towns and cities have already been disappointed by decisions, says the report, which looks at the implications for Leeds and Bradford in particular. Work is urgently needed to demonstrate the Government's commitment to high-speed connections to Leeds. MPs also ask Government to commit to supporting the redevelopment of the city's station by 2035.

The Committee is concerned that the case for the IRP is based on a best-case scenario which 'may not come to pass.' The promised journey times may not be feasible and the issue of how to increase track capacity, including for local services and freight, has been overlooked.

The Chair of the Transport Committee, Huw Merriman MP, said: "We welcome the scale of the Government's promised spending on rail. At £96 billion, the Government has billed it 'the largest single rail investment ever made by a UK Government'. The Committee agrees it has the potential to transform rail travel for future generations.

"However, many towns and cities are already disappointed by the proposals which have been set out. For these cities, and the taxpayer as a whole, the Government must demonstrate the rationale for its decisions. An investment of this substantial sum must be based on the best evidence and the best value for money. It must bring the greatest overall benefit to rail services, the economy, environment and communities across the North and Midlands.

We ask Government to revisit the evidence base for the decisions they have reached. In recommending this reassessment, we are mindful of a previous Transport Committee report which challenged the Government on its ability to deliver major infrastructure projects. Ministers must be cautious but transparent about the benefits that can be delivered by the Integrated Rail Plan. It is ambitious and exciting but public and stakeholders, especially in the North and Midlands, must be able to see that the benefits of the current proposals outweigh the other options which have been put forward."

For further information, visit: **https://bit.ly/3DcWOeb**

NATIONAL HIGHWAYS ANNOUNCED NEW LOWER THAMES CROSSING CARBON ACADEMY

National Highways is to set-up a new Carbon Academy that will help people and businesses develop the green skills needed to build the Lower Thames Crossing and future projects.

The proposed Lower Thames Crossing is a new road connecting Kent and Essex that will double road capacity across the Thames east of London through the UK's longest road tunnels. When it opens for traffic, it will ease congestion on the Dartford Crossing and improve journeys across the region.

The Lower Thames Crossing will provide work for more than 22,000 people during the six-year building phase. The project's new Skills, Education and Employment Strategy sets out how National Highways will help local communities benefit, and includes objectives such as:

- 45% of employees will be recruited from within 20-miles of the project
- Thousands of opportunities to raise the skill levels of local people with qualifications, early careers, new work skills, knowledge and training
- All staff will be enrolled in Carbon Academy to futureproof skills
- Specialist support for over 1,000 people who were previously unemployed from a disadvantaged or underrepresented group
- Staff will spend 7,000 hours in local schools with teachers and students
- Championing local businesses, and spending £1 in every £3 of construction budget with SMEs

As a pathfinder project exploring carbon neutral construction, the Lower Thames Crossing will test and scale up the use of modern methods of construction, low-carbon materials and digital technology during construction of the new road. The new Carbon Academy is being established to help develop the skills required to deliver the project, and in doing so set a new standard for low carbon construction that will support the pipeline of future investment in the region.

Everyone who works on the project will be enrolled in the Carbon Academy, undertake a core programme of learning, and be given access to a library of resources that will be updated as new lessons and innovations are identified. National Highways will also work with industry

professionals and local education and training providers to develop specialist training in a range of professions and trades. With almost half of the workforce targeted being recruited from within 20 miles of the route, the project can help local people and businesses be at the forefront of a new green economy and secure long term careers in a net zero future.

Matt Palmer, Executive Director for the Lower Thames Crossing, said: "The scale and opportunity presented by the Lower Thames Crossing is huge both during construction and once the road is open. We want local people at the heart of our workforce, and if we're given the green light to go ahead we are ready to create thousands of opportunities for local people and businesses to futureproof their skills and put them at the forefront of a new green economy."

Adam Bryan, Chief Executive, South East Local Enterprise Partnership: "The Lower Thames Crossing represents one of the biggest employment opportunities for our area over the next decade. We are delighted to see the publication of the Skills, Employment and Education Strategy for the Lower Thames Crossing today. This complements our ongoing work with Lower Thames Crossing and key other partners through the South East LEP (SELEP) Major Projects Skills Group which seeks to ensure that local residents and businesses can realise the benefits from the large scale investments planned for our area.

National Highways is currently preparing to submit a new application for a Development Consent Order and if consent is granted, construction is expected to start in 2024.

To find out more about the Lower Thames Crossing, visit: **https://nationalhighways.co.uk/our-roads/lower-thames-crossing/**

HANSON FORMS STRATEGIC ALLIANCE WITH LEICA GEOSYSTEMS

Britpave member Hanson has formed a strategic alliance with Leica Geosystems to improve road construction and maintenance safety, quality and efficiency through the use of the latest technology. The objective is to work towards creating a connected and autonomous construction site.

The Hanson contracting business will look to integrate Leica Geosystems' 3D machine control solution on both paving and milling operations to better understand the advantages for both contractor and client.

Ian Price, managing director of Hanson Contracting, said: "The benefits of automation are far reaching, in terms of quality and efficiency and, most importantly, safety for our workforce. Machine control is essential on all National Highways' projects and Leica Geosystems is supporting us on our journey to digitalisation."

Neil Williams, business director (heavy construction) at Leica Geosystems, added: "We are delighted to have been chosen as Hanson Contracting's technology partner. Knowledge sharing is key to the success and evolution of our solutions and working closely together allows us to improve our understanding of the world of surfacing and road construction. This will help us deliver a higher quality, safer working environment and a much-improved end product to the benefit of everyone involved."

TARMAC WELCOMES THE NEXT GENERATION

Tarmac has welcomed nearly 130 apprentices and graduates to the business, as it strives to upskill and grow talent within the construction industry.The cohort consists of 126 early careers roles – the business' largest ever intake – including apprentices, higher apprentices and graduates, which stretch the length and breadth of the UK, from Dunbar in Scotland, right through to Southwick in Brighton.

The apprentice and higher apprentice courses typically last two to four years and cover areas such as engineering, finance, human resources, sales, operations, quantity surveying, and logistics. Higher apprenticeships provide an opportunity to gain Level 4 qualifications or above, with most apprentices gaining an NVQ Level 4, HND, or foundation degree.

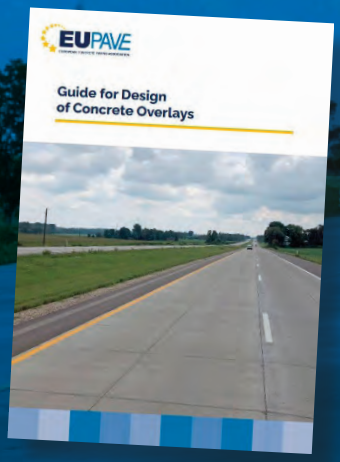
Graduates will enrol onto a course lasting two years, covering seven modules including finance, project and change management, communication and future development.

Following successful completion, the experience and expertise gained will enable the apprentices and graduates to transition into a variety of roles across the company.

To find out more about apprentice and graduate roles at Tarmac, visit: **www.tarmaccareers.com/early-careers**

EUPAVE GUIDE FOR DESIGN OF CONCRETE OVERLAYS

EUPAVE has issued a new publication 'Guide for Design of Concrete Overlays'. The Guide provides an overview of the basic principles of concrete overlay design and construction on concrete and asphalt-surfaced pavements. It discusses the importance of many design parameters, including overlay bond (or separation), joint layout and design, material selection, overlay thickness, and other details. This Guide also describes recommended practices for overlay construction and construction staging. Performance histories and expectations are also discussed. To download a copy, visit: https://bit.ly/3gfrpP7



THE LONG LIFE OF CONCRETE ROADS

Eupave has added to its series of sustainable concrete road fact sheets. Following fact sheets forwarding the high albedo, reduced fuel consumption, recycling and climate resilience benefits of concrete roads, Eupave latest fact sheet forwards the long service life of concrete roads which ensures a low life cycle environmental impact and cost with minimum maintenance or need for reconstruction.
To download a copy, visit: https://bit.ly/3MAl6lz

EUPAVE | 14TH INTERNATIONAL SYMPOSIUM ON CONCRETE ROADS

The Polish Cement Association and EUPAVE will host the 14th International Symposium on Concrete Roads to be held from 25 till 29 June 2023 in Krakow, Poland. The theme of the international conference is "Concrete Roads to the Green World". It is appropriate that the Symposium is being held in Poland which is seeing significant development of the motorway network in Poland, in which concrete plays an important role. In no other European country are so many concrete roads being built as in Poland. For further information and registration, visit: https://concreteroads2023.com/en/

MEMBERS' NEWS

CEMBLEND JOINS BRITPAVE

Britpave is delighted to welcome CEMBLEND as a new member. CEMBLEND provides bespoke powder blending solutions to the UK cementitious industry. An extensive range of products include cements including white and specialist cements, PFAs, GGBS and limes. Products are sourced based on a criteria of technical proficiency and cost efficiency and are independent of any parent company. A young company established in 2020, CEMBLEND is busily working towards ISO9001 and on getting their systems and procedures verified by third parties.

Of joining Britpave, Simon Boulter of CEMBLEND said: "Joining Britpave offers the opportunity for us to get involved with the main players in the UK cementitious industry. Of particular interest is the work of soil stabilisation task group in forwarding the environmental beneficial use of in-situ soil strengthening and improvement. Here, we look forward to playing an active role offering new products and new solutions."

Joe Quirke, Britpave Chairman, said: "I am delighted that CEMBLEND have joined Britpave. Excuse the pun, but they have the 'right blended mix' for Britpave's membership: forward thinking and solution focused."

NEW MOTT MACDONALD DIRECTOR

Mott MacDonald has appointed Thomas Knight as development director for its UK and Europe transport business.

Knight will focus on bringing technical excellence to clients, supporting the consultancy's account leadership programme and external client engagement and brings broad experience and skills to this key strategic role having worked on major transport projects for more than 25 years. He has successfully managed and led teams designing projects, particularly in the highway sector and with significant geotechnical or environmental works plus has led multidisciplinary teams working on airport expansion projects and provided leadership support for major prospects, including the consultancy's recent win for the A303 Stonehenge Delivery Assurance Partner.

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

Atkins Ltd - www.atkinsglobal.com

Balfour Beatty Ltd - www.balfourbeatty.com

Blue Phoenix Ltd - www.bluephoenixgroup.com

British Lime Association - www.britishlime.org

Cemblend Ltd – www.cemblend.co.uk

CEMEX UK - www.cemex.co.uk

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

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

Costain Ltd - www.costain.com

Danley Ltd – www.danley.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

Jacobs - www.jacobs.com

Lagan Aviation and Infrastructure - www.laganaviation.com

Mick George Ltd - www.mickgeorge.co.uk

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

Mott MacDonald – www.mottmac.com

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

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

Power Better Soil Solutions – www.powerbetter.biz

RJT Excavations Ltd - www.rjtexcavations.co.uk

Roadgrip Ltd - www.roadgrip.co.uk

Roocroft Road Restraints Systems – www.roocroftfencing.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

Techjoint Ltd www.techjoint.co.uk

TKL Earthworks - www.thetklgroup.co.uk

TR Stabilisation - www.trstabilisation.co.uk

VolkerFitzpatrick Ltd - www.volkerfitzpatrick.co.uk