

BRITPAVE NEWS

ISSUE 46 - WINTER 2023



Britpave Industry Conference Report

INFRASTRUCTURE COMMITMENTS
NEED TO BE ACTIONED

NEW £750 MILLION CONCRETE ROAD
REPAIR FRAMEWORKS

ROAD AND RAIL PLANNING POLICIES
NEED NET ZERO CLARIFICATION

TRIAL FOR LOWER CARBON CONCRETE

AIRPORT INFRASTRUCTURE

TARMAC CELEBRATES 120 YEARS

WRITTEN BY INDUSTRY FOR INDUSTRY

BRITPAVE MEMBERS' NEWS

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CHAIRMAN'S WELCOME

Welcome to the Winter 2023 issue of Britpave News.

The word 'potential' encompasses new innovation and the realisation of new opportunities. That was certainly proven at this year's Britpave industry conference which saw presenters from both academia and industry forward new ideas for improved infrastructure solutions that offer both an increase in performance and a decrease in carbon emissions. Those who missed the conference and the excellent academia/industry networking can view all the presentations on the Britpave Youtube channel

However, it is not just in the hallowed university halls and laboratories where potential is being examined. Britpave members are delivering on site the more efficient solutions with increased productivity, better long-term performance and reduced carbon emissions as the projects and initiatives covered in this issue of Britpave news testify.

Another feature of this year's conference was the importance of the development of new data models to help make an informed choice. Enabling such decision making has been a hallmark of Britpave since its inception way back in 1991. Since then, the association has developed a library of technical and best practice guidance that has been written by industry for industry. I would like to take this opportunity to thank those Britpave members who have given their time, experience and expertise to help with the provision of such a valuable resource. A flavour of the range of publications available is provided in this issue.

It is with such involvement – whether at conference, providing input to technical guidance, networking with government, clients, academia and industry that Britpave can forward the potential of concrete and cementitious infrastructure solutions.

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.

Disclaimer: All articles are published in good faith. Britpave will not be held responsible for any errors, misinformation and opinions in articles submitted for this newsletter.

➤ INFRASTRUCTURE COMMITMENTS NEED TO BE ACTIONED

Improved infrastructure that can boost UK economic growth across the UK and meet climate goals is both achievable and affordable if the right policy steps are taken now, according to the National Infrastructure Commission (NIC).

The Second National Infrastructure Assessment – a NIC five yearly review Commission – sets out a programme of transformation for the country's energy, transport and other key networks over the next 30 years. Its recommendations include:

- Backing electrification as the only viable option for decarbonising buildings at scale, to reduce reliance on volatile fossil fuels, lower energy bills over the long term and to meet the UK's climate targets.
- Adding low carbon, flexible technologies to the electricity system to ensure a highly renewable energy system remains reliable.
- Major public transport upgrades in England's most congested cities to unlock economic growth, and an urgent and comprehensive review of rail priorities for the North and the Midlands following government's recent decision on High Speed 2.
- Better maintenance of existing roads and targeted enhancements to speed up journeys on underperforming parts of the national road network.
- Building additional water supply infrastructure and reducing leakage.

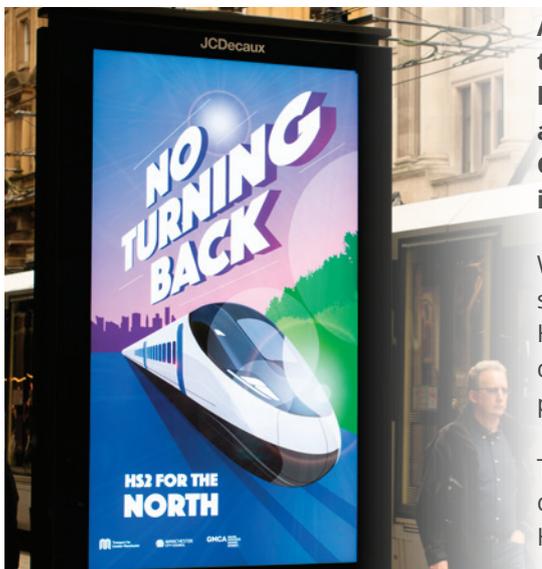
The report acknowledges the need for significant public and private investment in infrastructure if the UK is to rebalance its economic geography, meet climate obligations, improve resilience and enhance the natural environment.

The Commission calculates that government's commitment to a sharp increase in public sector investment in infrastructure to around £30 billion per year will need to be sustained until 2040. This sits at the top of the funding envelope set by HM Treasury for the Commission's recommendations of up to 1.3% GDP a year. Meanwhile, private sector investment will need to increase from around £30-40 billion over the last decade to £40-50 billion in the 2030s and 2040s.

Noting that most assets that will be operating in 2055 have already been built, the Assessment calls for government to set outcome-based service standards for infrastructure. Operators should be required to set out the costs of meeting these standards while adapting their networks to climate and other risks, to inform future regulatory and funding settlements.

The Commission restates its calls for increased investment in infrastructure to reduce the risk of coastal, river and surface water flooding, and to reduce the at least 4,000 mega litres per day water supply gap by 2050 by tackling leaks, reducing demand and building new storage and transfer networks. The Government is expected to respond formally to the Infrastructure Assessment within the next 12 months.

➤ DISAPPOINTMENT AS NORTHERN LEG OF HS2 IS SCRAPPED



Across the construction industry disappointment has been expressed that the northern leg of HS2 has been scrapped. The decision has not helped the belief in the Government's inability to provide commitment and long-term strategy to deliver ambitious infrastructure projects. Government must change how it approaches planning and delivering infrastructure.

When making the announcement, the Prime Minister Rishi Sunak outlined several projects and schemes as part of a 'Network North' programme. However, many of the projects are not new and have been previously delayed. Furthermore, there is much uncertainty about the details of the programmes.

This uncertainty needs to be addressed and the Network North projects be delivered on time and on budget to minimise the impact of scrapping the HS2 northern leg.

> GGBS MAY NOT BE THE ANSWER

Ground granulated blast furnace slag (GGBS), widely seen as the key to eco-friendlier concrete, may not be the silver bullet that many have assumed.

A new report, 'The efficient use of GGBS in reducing global emissions: An appraisal of the global availability of ground granulated blast furnace slag', from the Institution of Structural Engineers (IStructE) says that ground granulated blast furnace slag (GGBS) is "a limited and constrained global resource" and that sustainable alternatives need to be found.

For many years GGBS has been specified as a partial replacement for Portland cement clinker in concrete due to its technical properties, such as improving concrete's durability. More recently, substituting clinker with GGBS has become the 'go-to' method for decreasing the carbon intensity of concrete in the UK, as the production of GGBS results in fewer greenhouse gas (GHG) emissions than the production of the clinker that it replaces.

The IStructE points out that GGBS is a limited and constrained resource that is almost fully used up globally. Any increase in its use in one country is likely to result in a reduction elsewhere, balancing each other out overall. The report concludes that any local increase in the amount of clinker substituted with imported GGBS is unlikely to decrease global emissions – which means that GGBS should not be used in high proportions just in the hope of reducing emissions.

Will Arnold, IStructE head of climate action, said: "Our purpose is to explain that GGBS is not a silver bullet for GHG emissions in concrete production due to global constraints in GGBS availability. As a material, GGBS needs to be carefully considered to ensure it's being used efficiently, and in the most appropriate manner."

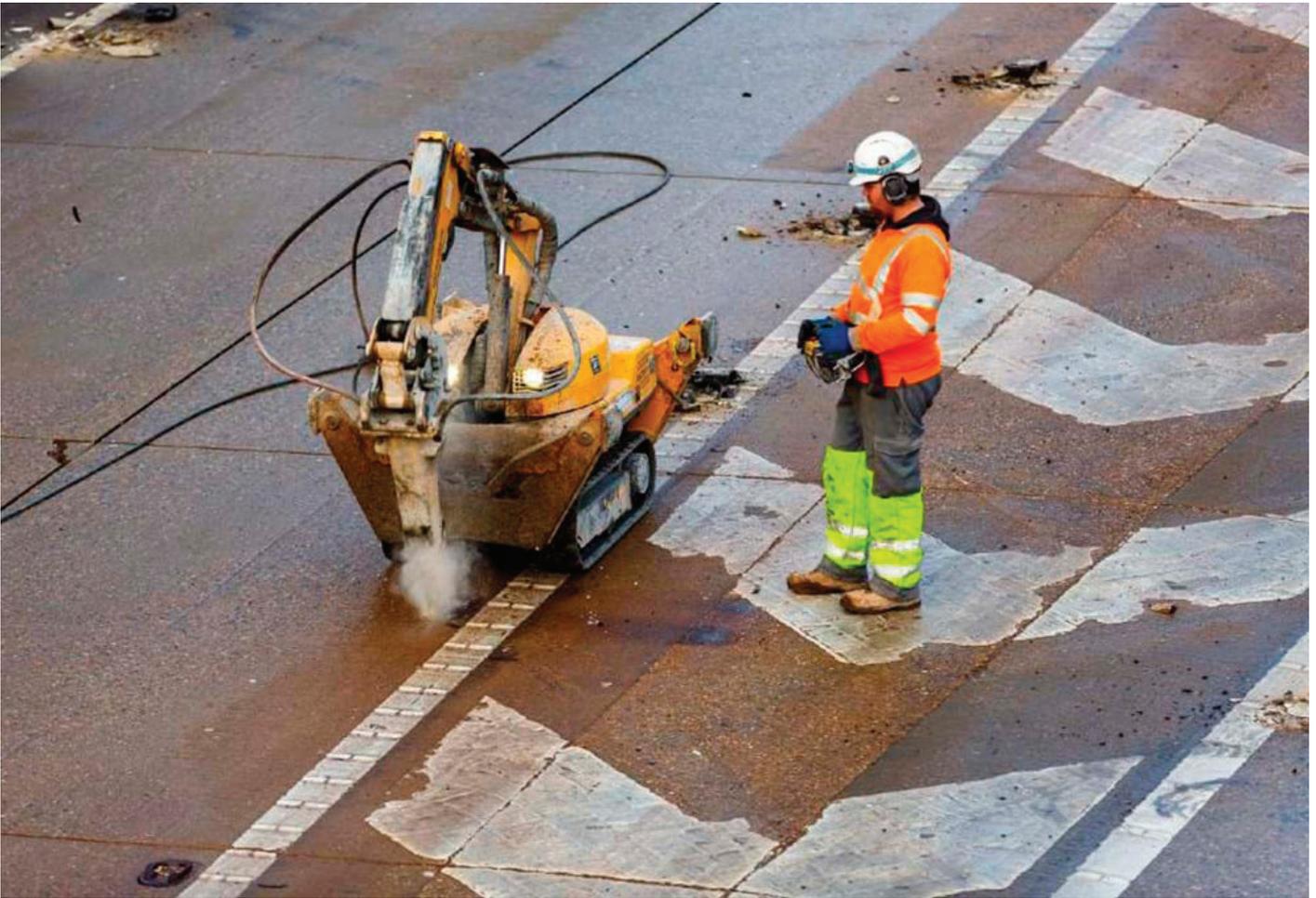
However, this does not mean that the use of GGBS should stop altogether since that would increase global emissions as more clinker would need to be produced globally to compensate. Rather, global supplies of GGBS should continue to be used up, particularly where it is required technically, and should come from well-established supply chains.

Co-author of the report, Iva Munro, ConcreteZero Lead at Climate Group, explained: "Alternative options beyond GGBS exist for reducing clinker usage and global GHG emissions – and engineers and designers should work with the supply chain to identify the best way to do this on each individual project."

Noushin Khosravi, another co-author and sustainable construction manager at the Mineral Products Association (MPA), added: "By encouraging efficient utilisation of SCMs (supplementary cementitious materials) at a local level and accelerating adoption of new technologies, we can effectively reduce global GHG emissions."

The paper recommends that designers, contractors and those along the supply chain ask three questions early in the design process to optimise GGBS use. These questions aim to secure a better understanding of the project opportunities regarding the need for, and availability of, GGBS.

The efficient use of GGBS in reducing global emissions: An appraisal of the global availability of ground granulated blast furnace slag is available via www.istructe.org



➤ NEW £750 MILLION CONCRETE ROAD REPAIR FRAMEWORKS

National Highways has started the procurement process for two new concrete-road reconstruction frameworks worth a combined £750m. National Highways said it was planning to put in place “a new procurement vehicle that will continue to deliver the Legacy Concrete Roads Reconstruction programme”.

A market-engagement event was held at the beginning of November, with the contract notices expected to be published in July 2024. The contracts will continue ongoing work repairing concrete-surfaced roads that were mainly built in the 1960s and 1970s.

Work under the Legacy Concrete Roads Reconstruction Framework, worth £476m, will include highway maintenance and road repair works as well as design consultancy whilst the £274m Legacy Concrete Pavement Framework will be divided into three lots and will include similar work.

National Highways stated that, while concrete roads have proved “tougher and longer-lasting” than asphalt, decades of use meant they were nearing the end of their working lives. As a result, these roads “need vital upgrades to ensure they remain safe, dependable and durable”.

The existing five-year, £400m concrete-roads programme, which aims to repair or replace roads typically built in the 1960s and 1970s, is set to conclude in 2025.

Under the current contract, Morgan Sindall Infrastructure and Sisk were appointed to a reconstruction framework worth £218m, with VolkerFitzpatrick, Colas, Dyer & Butler and Tarmac awarded a separate £67m lifecycle-extension framework.

According to National Highways, concrete roads make up around 400 miles (4 per cent) of England’s motorway and long-distance A-road networks. These roads are mostly found along the eastern side of England, with some stretches in the West Midlands, Merseyside and Greater Manchester.

NEW ROAD AND RAIL PLANNING POLICIES NEED NET ZERO CLARIFICATION

The Transport Select Committee has published its analysis of the Government's proposals to revamp planning policies for nationally significant road and rail infrastructure projects. The policies are contained in a draft revised National Networks National Policy Statement (NNNPS), published by the Department for Transport (DfT) earlier this year.

In its report, the cross-party Committee urges ministers to redraft sections that would be used to determine whether major new projects are compatible with Net Zero legislation, based on the carbon emissions that would be produced during and after their construction.

The Government said it wants to revise the NNNPS to avoid legal challenges that have delayed new projects by clarifying how planning policies would interact with climate legislation. But the Committee warns that the draft NNNPS wouldn't achieve this in its current form.

MPs also make recommendations on the way DfT looks at different options for projects and road-traffic demand forecasts, and how to make its decision-making more transparent. There are also recommendations on biodiversity, active travel, and restructuring the various national policy statements for transport.

The draft NNNPS have been criticised for failing to adequately set out how new infrastructure projects should be assessed on the carbon emissions they will produce. This could lead to legal challenges to development consent orders as the Government would not be able to explain how an order would align with legally binding Net Zero goals.

The draft NNNPS does not take note of the Climate Change Committee's recommended that new projects should only be permitted if they "meaningfully support cost-effective delivery of Net Zero and climate adaptation"

There was also criticism of the way that the draft NNNPS permits "residual" emissions – which result during construction of new infrastructure – while lacking a clear definition or criteria of what "residual" means.

When it comes to forecasting future demand, the Committee recommends that DfT should be more transparent and open to scrutiny in the way it judges the need for major new infrastructure projects. It believes that DfT is overly led by a "predict and provide" approach, where it seeks to deliver new road projects based on forecasts that congestion and demand from motorists will increase. There is insufficient transparency on how these demand calculations are made. DfT should publish its National Transport Model - used for forecasting how development options impact congestion – so that it can be independently tested and verified.

A further recommendation from the Committee is that the Government should consider restructuring the National Policy Statements for transport into one overarching Transport NPS, which covers National Networks, airports and ports. This would be used for determining new infrastructure for road, rail, strategic rail freight interchanges, ports, and airports. Ministers should then provide a clear rationale if they decide not to.

The Government will respond to the Committee's report by December 2023.

To download a summary of the Transport Select Committee report, visit: <https://bit.ly/3tTCDQ9>



BRITPAVE CONFERENCE EXAMINED THE POTENTIAL FOR IMPROVED INFRASTRUCTURE

The 2023 Britpave industry conference was all about potential. The potential for concrete and cementitious solutions to provide improved infrastructure offering greater performance and sustainability. Delegates learnt about a number of key current research projects that demonstrated that concrete, far from being the problem, is part of the solution.

The conference opened with Dr Federico Perrotta, Principal Consultation at AECOM, underlining the need for robust and comprehensive data in order to ensure the best possible asset management for concrete roads.

Built decades ago, National Highways' legacy concrete roads are typically at or beyond their design life. These aged assets have specific management challenges linked to predictability of operational expenditure, customer experience and maintainability. Faced with a situation where neither current condition nor deterioration rates were well understood, it is key to provide a consistent and technically robust approach to define priorities and determine funding needs.

Combining advanced statistics with engineering inputs and leveraging the power of real-world data, a series of data-led performance-based deterioration curves was created and a new model developed.

Fully transferrable and scalable, the model represents an innovative and powerful tool to enable better understanding of current conditions, simulate multiple intervention scenarios and set a strategy to keep the network safe, reliable and respectful of local communities and the environment, in RIS3 and beyond.

Making an informed decision based on reliable data was also the theme of the next presentation. Michal Drewniok, Lecturer in Civil Engineering at the University of Leeds, forwarded the work being done to develop an early design decision-making tool that compares whole life cost and embodied carbon of different pavement solutions in accordance with the Design Manual for Roads and Bridges (DMRB). He explained how the tool will cover mainline, shoulder and central reserve and include pavement structure. It will also include a material library with whole life embodied carbon coefficients, maintenance regime as well as information on capital and maintenance cost.

It is expected that the road repairs in Great Britain will cost UK £12.6bn in financial year 2023/2024. Investing in long-term, low-carbon and sustainable solutions for new and existing roads is crucial to achieve UK net zero carbon goals. This tool will help to determine the best whole life cost and CO₂ solutions.

Concrete roads have the potential to provide best solution for long-term whole life cost and CO₂ reduction, it also has potential for 'recarbonation' explained Dr Rachel Capon from the Mineral Products Association. 'Recarbonation', or carbonation, describes the process of concrete naturally reabsorbing CO₂ throughout its lifecycle, effectively reversing the calcination reaction that occurs during cement production. Carbonation has been



recognised by the Intergovernmental Panel on Climate Change (IPCC) as an important carbon emissions sink, but there is no recommended methodology for including it in National Greenhouse Gas Reporting under the UNFCCC Kyoto Protocol. In 2018, the Swedish Environmental Research Institute (IVL) proposed calculation methodologies including three tiers of increasing complexity – in line with IPCC requirements. Sweden first reported a Tier 1 calculation of its carbonation concrete emissions sink in 2020.

The UK is the first country to create a scientifically robust Tier 2 model to calculate the carbon emissions sink benefit provided by the carbonation of concrete over its lifecycle. The model was commissioned by the Department for Energy Security and Net Zero, and developed by the Mineral Products Association. In 2020 around 1.548 million tonnes of atmospheric carbon dioxide were reabsorbed by concrete in the built environment. The potential for concrete to absorb CO₂ is significant.

Having learnt about concrete's innate cost and CO₂ benefits, the conference moved on to the potential benefits of new materials.

David Ukala from Nottingham University presented on work investigating the effect of basalt fibre reinforced polymer (BFRP) bar on the performance of Continuous Reinforced Concrete Pavement (CRCP). The construction of CRCP with Fibre Reinforced Polymer (FRP) bar instead of traditional steel bar is gathering wider acceptance. This is primarily due to the non-corrosive nature of FRP bars. Nevertheless, a lack of research and standardization has made its growth slower than expected. Recent reports show that Glass-FRP (GFRP) bars compete favourably with steel bars in CRCP. However, GFRP degrades in heavy moisture, acidic or alkaline environments, losing a considerable amount of its tensile strength, young modulus and bond, casting doubts on its long-term potentials in CRCP. The non-corrosive Basalt-FRP (BFRP) bar on the

other hand, performs better than the GFRP under these conditions. Therefore, this research being carried out at Nottingham University investigates the potential of using BFRP bars in CRCP to eliminate the corrosion induced distresses of steel-CRCP. A direct tensile test has been conducted on six reinforced concrete samples. Two samples were reinforced with 8mm diameter BFRP bar each, two with 8mm steel bar each and 2 with 12mm steel bar each. It was observed that the BFRP-concrete had larger crack spacings but similar crack widths when compared to steel-concrete. Ukala recommended that design methods for BFRP are developed in order to determine the quantity of BFRP bars needed to satisfy performance requirements and promote use acceptance.

From theory to practice. The next presentation provided an overview of a low carbon basalt fibre trial carried on the M42. Paul Coles, Chief Engineer at Skanska, presented on a National Highways funded innovation project delivered on the M42 Junction 6 improvement scheme. The trial project was carried out by Skanska together with National Composites Centre, Tarmac, Basalt Technologies and National Highways. It was focused on reducing capital carbon emissions and gaining a better understanding of the use of Basalt Fibre Reinforced Polymer (BFRP) reinforcement in an Alkali-

Activated Cementitious Material (AACM) concrete. The trial utilised these materials in a low-risk temporary works structure to help inform future use in permanent structures. The trial found a reduction of over 50% in carbon and that the use of BFRP in AACM concrete proved to be equally as resilient when compared to conventional reinforced concrete using steel. The plan is to trial the low carbon combination on a permanent road with the ultimate aim of rolling the solution across the UK's strategic road network.





The potential for low carbon infrastructure was the theme of the next presentation 'Cement 2 Zero' given by Mark Connelly, Chief Engineer of Professional Head of Highways at Atkins and Philippa Horton, Business Manager at the University of Cambridge.

They asked the conference delegates to fast forward to 2050, or even to just 2040. What does a future look like where Ordinary Portland Cement (OPC) can no longer be produced and won't be readily available like it is today, and how do we prepare for the consequences of that?

Researchers at University of Cambridge (UoC) have developed a solution – 'Cambridge Electric Cement' (CEC) showing that recovered cement paste from concrete demolition waste can be recycled in electric arc furnaces as a substitute for the lime-dolomite flux used in today's steel recycling. The paste can be re-clinkered over molten iron and the resulting slag meets existing specifications for Portland clinker.

To grow CEC from research to a viable product, the UoC team joined up with partners from across the value chain including the Materials Processing Institute, Days Aggregates, Tarmac, Celsa, Atkins, and Balfour Beatty. Following a successful Innovate UK bid, the 'Cement 2 Zero' project was created.

The first phase of trial melts was carried out by the Materials Processing Institute, initially in a 250 kg induction furnace, before being scaled up to 6 t in an Electric Arc Furnace (EAF). Once the process has been substantially trialled, developed and de-risked effectively, industrial scale melts will follow in CELSA's EAF steel mill in Cardiff.

The two-year industrial trial will test each stage of the production process and brings together the expertise of the Materials Processing Institute, the University of Cambridge and key supply chain partners – Atkins, Balfour Beatty, CELSA, Day Aggregates and Tarmac – before using the innovative product in a live UK construction project.

The theme of innovation was continued by Dr Lisa Scullion, Application Manager Construction and Coatings, Graphene Engineering Innovation Centre at the University of Manchester.

Graphene was first isolated at the University of Manchester in 2004 and was shown to have a wide range of unique properties. Dr Scullion outlined how graphene-based materials (GBM) can be incorporated into cements, mortars and concretes, leading to improvements in mechanical performance, in particular compression and flexural strength. GBM can also impart additional benefits such as robustness, durability, improved setting times and reduced shrinkage.

There are many different types and grades of graphene now available from commercial suppliers and its 2D

dimensional nature results in a huge surface area. Graphene also has incredible tensile strength so just a tiny amount of graphene is needed to give significant uplifts in many types of concrete mixes. Increases in strength means that potentially less concrete can be used for certain applications and also cement levels can be reduced.

The Graphene Engineering Innovation Centre has significant expertise in applying and incorporating graphene into a vast range of materials. The past few years have seen a growing interest in the use of graphene in cement-based construction materials and the GEIC have a breadth of knowledge around the use of graphene and graphene related materials for this purpose.

The final presentation changed the focus on potential, from something to be encouraged to something to be negated. Dr Paul Beetham, Association Professor in Geotechnical Engineering at Nottingham Trent University presented on a leachate testing of stabilised soil project being carried out with members of the Britpave Soil Stabilisation Task Group.

The stabilisation of weak natural soils using binders such as lime or cement is a sustainable method to economically re-use otherwise unsuitable fill material or provide enhanced solutions in civil engineering projects is widely used.

However, Britpave members have recent experience of the Environment Agency (EA) strongly questioning the potential for pollution from binder leachate to cause discharge of high pH water concerns, and whether

Chromium VI (a carcinogen and cause of industrial dermatitis) could leach from cement stabilised soil. Such pollution is considered highly unlikely, however, the absence of literature to refute EA concerns have led to refusal of stabilised solutions on several sites.

In response, Britpave commissioned a research project delivered through Nottingham Trent University. Dr Beetham summarised the results to date from this research program where 60 specimens from two different host soils have been prepared with different combinations of quick lime and cement, before undertaking leachate tank testing. The results demonstrated a lack of any significant hazardous elements to date. The findings of the research to be published next year should help remove EA doubts on the use of soil stabilisation.



Many thanks to all the presenters, delegates and exhibitors who helped to make this year's conference and networking event to be such a success. The conference is available on the Britpave youtube channel.

See: www.youtube.com/@britpave7320

If you require any individual presentation, please contact the Britpave office: info@britpave.org.uk

MAKING AN EXHIBITION OF THEMSELVES

The annual Britpave conference provides a great opportunity for industry networking. This year delegates had the opportunity to meet with industry suppliers offering innovative infrastructure solutions. Britpave wishes to thank the exhibitors highlighted below for their support of the 2023 industry conference.



BLUE PHOENIX

Part of the international Blue Phoenix Group, Blue Phoenix UK operates Incinerator Bottom Ash (IBA) recycling facilities throughout the country and specializes in the production of manufactured aggregates. Blue Phoenix UK assures the production of a constant quality aggregate from a daily changing and inhomogeneous IBA flow while assuring maximized metal recoveries. The processing of IBA provides a valuable supply of non-ferrous and ferrous metals for further recycling and an aggregate suitable for use in construction. IBAA (Incinerator Bottom Ash Aggregate) is a true demonstration of Circular Economics and offers a sustainable alternative to natural aggregates.

Blue Phoenix Group do not see landfills as the final destination for residue ash. Instead, they see new beginnings and a future in which waste-to-energy plants are fully circular. For more information on Blue Phoenix UK visit: www.bluephoenix-group.com



ORLITECH

ORLITECH BAR is a high-strength and durable basalt fibre bar reinforcement with a diameter from 2.5 — 32 mm. This reinforcement is produced in straight bars with a length of 2 to 12 m. Reinforcement with a diameter of 4 to 10 mm is also available in coils of 50-100M. ORLITECH BAR has the advantage over steel reinforcement in faster installation and less connection. We offer bars in two variants, with a sand surface treatment and without a sand surface treatment. The use of ORLITECH BAR composite reinforcement increases the lifetime of concrete structures as it is unaffected by the presence of chlorides and carbonation. In fact, research suggests the carbonation process will improve the strength of the concrete in the long term. ORLITECH BAR has a high resistance to corrosion in acidic, alkaline and other corrosive environments. For more information on ORLITECH BAR visit: www.orlitech.co.uk



ECOCEM



Ecocem GB is a subsidiary of Ecocem Global. The company supplies the entirety of the UK from two strategic UK locations in Sheerness and Runcorn. First and foremost, Ecocem are innovators developing low-carbon cement solutions. These include:

- › Ecocem GGBS, a high-performance alternative to traditional cement that will increase the technical performance of your application, improve its appearance, and minimise its environmental impact,
- › Ecocem Superfine, a finer grade of Ground Granulated Blastfurnace Slag (GGBS) designed to be used as a specialist additive in binders, all dry-mortar applications, ultra-high-performance concrete, and precast concrete to help reduce carbon emissions, improve strength, and durability.
- › Ecocem Ultra, a hydraulic binder that is manufactured in a specific process and used in the preparation of concrete, mortar, and other construction mixes and in the manufacture of construction products.

Ecocem has an in-house technical team of chartered engineers and concrete technologists that can advise at any stage of a project and has a state-of-the-art laboratory for material testing. For more information on Ecocem visit: www.ecocemglobal.com

▶ TRIAL FOR LOWER CARBON CONCRETE AIRPORT INFRASTRUCTURE

Britpave members Cemex and Jacob are working with Heathrow Airport, London, and Ecocem on a trial exploring the viability of lower carbon concrete for airports.

Following a series of lab and plant trials, the trial has been designed to test the concrete's durability and longevity in a true to life airport setting. Initially, two lower carbon solutions will be tested: a Pavement Quality Concrete (PQC) equivalent mix containing 50% GGBS, and a zero-clinker product. The lower carbon concrete will be trialled at the airport in a pouring site under the watch tower as part of a phased process to test its strength and durability in the field. The project, led by fellow Britpave member Jacobs and implemented by Cemex and Ecocem, will see the lower carbon concrete assessed for use in main airport areas, groundworks and auxiliary purposes.



Mark Till, UK National Sales Manager at Ecocem, said: "Our technical solutions have long helped large scale infrastructure projects to reduce carbon emissions across Europe. Having the opportunity to partner with Heathrow airport on a project with

The aim is for the trial's findings to be used to set out a blueprint that other airports, keen to reduce carbon from all facets of their operation, can follow.

Richard Kershaw, Technical Manager at Cemex said: "Cemex is renowned across the construction industry for its commitment to providing customers with more sustainable concrete solutions. We hope that this trial will prove successful and demonstrate to the aviation sector the opportunities available to cut emissions during their development projects."

Nigel Milton, Chief of Staff and Carbon at Heathrow said: "Heathrow is once again serving as a testbed for ground-breaking technologies, demonstrating global leadership with regards to sustainable travel. We are delighted to be hosting one of the first airport trials in the world to test lower carbon alternatives. I hope that this trial will help radically transform the built environment at Heathrow in the years to come."

huge potential in the UK and for the aviation sector is a testament to the innovation of our products and team."

Richard Moore, Europe Aviation Engineering Lead at Jacobs said: "Jacobs are delighted to have been the technical consultant on the Low Carbon Concrete initiative at Heathrow since its inception in 2018. The trial is an exciting milestone in the development of lower carbon infrastructure solutions at the airport. It is the culmination of four years of research and planning towards these initial trials which will form the foundation of further work exploring other lower carbon products and materials. Testing the materials in a range of airport infrastructure applications, not just runway and taxiway pavements, allows us to maximise the opportunity to reduce embedded carbon in a wide variety of concrete types. Building on the success of the trial, we look forward to upscaling to usage in airfield projects being delivered by Ferrovial Construction, Dyer and Butler and other major programme partners across the airport."

> CHOCKS AWAY FOR SOUTHAMPTON AIRPORT RUNWAY EXTENSION

Britpave member VolkerFitzpatrick has completed a £6m project to extend the runway at Southampton Airport. The project included the 164m extension to the northern end of Southampton's runway which has allowed the airport to attract new airlines and offer new routes, creating exciting opportunities for business and leisure, while guaranteeing the airport's viability.



As well as extending the runway, VolkerFitzpatrick provided a wider 'turning pad', to allow planes to u-turn at the end of the runway and a new blast screen, to minimise the impact of airport operations. Associated changes to drainage and lighting along the runway, the realignment of the northern perimeter fence and related works to the airside perimeter road and landside access track were also provided.

The project team worked at night and liaised closely with airport staff on a daily basis to avoid disruption. The work was carefully planned to ensure there was no impact on airfield operations and flights were able to continue as scheduled throughout.

Kevin Berry, VolkerFitzpatrick operations director, commented: We're very pleased to have completed this important work at Southampton Airport on schedule. Needing to keep the runway open while works were underway, to minimise the impacts on day-to-day airport

operations and the surrounding area, was always going to present us with some challenges. We'd like to thank everyone at the airport, as well as surrounding neighbours, for their understanding and cooperation over the last several months.'

Steve Szalay, operations director at Southampton Airport, said: "I am proud to say the programme of works to extend the airport's runway by 164 meters was completed on time and under budget. I would like to thank everyone involved in this project for their hard work and dedication. The completion of the runway extension is an important milestone and will ensure Southampton Airport's vital connectivity continues to deliver social and economic prosperity for the wider region."



The new runway extension gives the airport the capacity to handle traditional short-haul aircraft such as the Airbus A320 or Boeing 737, which would previously have struggled to take off when fully loaded.

> IN THE MIX

Britpave member Combined Soil Stabilisation worked with VolkerFitzpatrick on the Southampton Airport project and oversaw a late change of method from batched and paver laid HBM to mix in place HBM as the foundation to increase the length of the current runway.

As the stabilisation works were on a live airport every operation had to be undertaken through the night after the last plane had landed and completed well before the first departure the following day.

The works re-used previously laid HBM and by adding cement and water a high compressive strength was

achieved. Hydraulically Bound Material was placed to the tight trim tolerances required.

Heavy compaction was achieved using the company's new 20t HAMM CCC roller followed by a 120 roller for a super level finish. This was followed by a bitumen curing emulsion to seal the layer to ensure curing was optimised.

➤ MOTT MACDONALD TAKES THE LEAD



Britpave member Mott MacDonald has supported the launch of new open access carbon database for infrastructure by being the first company to provide client approved, detailed carbon data for completed construction projects to the newly developed Built Environment Carbon Database (BECD), a free to access benchmark tool for infrastructure carbon assessment.

Created by the Building Cost Information Service (BCIS), the BECD will allow precise calculation of the embodied carbon in all elements of a project, rather than an estimated single value for an overall project.

The move has been driven by criticism of the shortage of openly available industry data and of the lack of a clear 'starting point' as identified in the 'Is our Carbon Wallet Empty' report, published in 2021 by Skanska with the Net Zero Infrastructure Industry Coalition, which is chaired by Mott MacDonald. The BECD's launch is initially focused on highway assets and uses a substantial body of infrastructure carbon data harvested from highways projects delivered by Mott MacDonald over the last seven years. Plans are in place to roll the database out to assets in the rail, energy and water sectors.

Kim Yates, UK and Europe climate change lead at Mott MacDonald said: 'The datasets will allow you to look at the carbon cost of a typical highway asset, such as a

roundabout or flyover, and piece them together in a detailed fashion, rather than just a single figure for an overall project. It is that breakdown of the numbers on an asset-by-asset basis that makes this an industry first and differentiates it from carbon calculators, as it is based on built assets rather than predictions at design stage.

By having a clear view of the current carbon cost, we can truly track the impact of carbon reduction measures taken at the design stage and compare them with industry norms. Using this data will aid design decisions to be made that enable our carbon reduction efforts to go further and faster."

BCIS CEO James Fiske, is calling for others to share their data and give the database a broader range of data. "The clock is ticking and we can no longer hold back on sharing anything that could help in our fight against climate change. This does not mean losing your competitive advantage – more data held centrally benefits everyone and helps reduce risk. If Mott MacDonald can do it, what is stopping everyone else? The only way we can be sure that we are making the right decisions to reduce the environmental impact of our activities in the infrastructure sector, is to learn from and share data with each other. BECD does this."

The tool may be accessed at: www.BECD.co.uk.

➤ PORT TALBOT TRANSPORTATION

Mott MacDonald has been appointed by Associated British Ports (ABP) to support the development of one of the UK's largest port projects at Port Talbot.

With partner Royal HaskoningDHV, Mott MacDonald will be leading a series of reports on Port Talbot's design, including the development of a detailed masterplan building on the previous ABP Wales Future Vision. In addition to key environmental and consenting studies, the reports will look at how the port should be transformed to enable it to serve as a prime hub for the floating offshore wind industry, contribute to decarbonisation of industry in South Wales and play a major role in the socio-economic regeneration of the area.



The port is one of the only harbours in the UK capable of handling vessels of up to 170,000 dwt (deadweight tonnage). Around 6.6 million tonnes of cargo and more than £760m of trade pass through it every year. There are also considerable areas of brownfield land on the port estate offer significant development opportunities.

COSTAIN WINS AWARD FOR M6 EMISSIONS REDUCTION

Britpave member Costain has won a Green Apple award for significantly reducing by an overall 40% the carbon footprint of their M6 motorway project.

The Costain Smart Motorways Alliance project on the M6 between the Croft Interchange at junction 21a to the Orrell Interchange at junction 26 successfully reduced the carbon footprint in both the construction plant and van fleet, cutting emissions by 38%. Emissions from vehicles 'idling' on site was reduced from 56% to 18%, between the start of 2022 and June 2023, using innovative enhanced idling sensors and behavioural training. Site vans were fitted with trackers and between February and June 2023, this reduced van idling by around 25%, with associated carbon emissions and cost falling, on average, by 35kg and £4.19 per driver.

Switching from diesel fuel to hydrotreated vegetable oil (HVO) in February 2022 reduced carbon emissions by 679tCO₂e; which is the equivalent of 27,000 trees absorption of CO₂ in one year according to figures sourced from www.ecotree.green

Catherine Warbrick, Costain's executive lead on sustainability said: "I'm really proud of the work the team has done on the M6, and the amazing results they have achieved. Costain aims to be a force for change and to safeguard the future of our planet for generations to come. Projects like this one on the M6 demonstrate our commitment to finding solutions to tackle the environmental challenges facing our planet."

The Green Apple Environment Awards were established in 1994 as an annual campaign to recognise, reward and promote environmental best practice. Entries are invited from any company, organisation, community or individual that is helping the environment. It was the first scheme to be accredited as an official feeder scheme into the European Business Awards for the Environment and it is now the only official feeder scheme into the global Green World Awards, which are held in a different country every year.



> TARMAC CELEBRATE 120 YEARS



Tarmac Sentinel steam-powered truck, circa 1930s

Britpave member Tarmac is celebrating 120 years from the first 'sticky' road and the D-Day landings to low-carbon asphalt and electric vehicles.

Tarmac's founder Edgar Hooley first perfected how to make road surfaces stick. Originally founded as the Tarmacadam Patent Syndicate Ltd in 1903, Tarmac quickly became synonymous with roads and supported the national effort in both the first and second world wars, where they helped prepare for the D-Day landings, before building the UK's very first motorway, the Preston Bypass, in 1958.

The business diversified into construction in the 1920s and has since been involved with some of the UK's most complex and iconic projects, including Wembley Stadium, Heathrow Terminal 5, The Shard, London 2012, and Silverstone resurfacing.

Now, as the company celebrates its 120th anniversary, its team of around 6,000 people is focused on creating the next generation of innovative, sustainable construction materials to support net zero and tackle climate change. It is also ensuring the land the business works on continues to be operated efficiently before being restored and regenerated, creating a positive, lasting legacy.

Tarmac were first to pioneer and launch warm-mix asphalt in 2014, which reduces carbon emissions and can be laid quicker to reduce roadworks for the travelling public. As part of their transition to net zero, they also became the

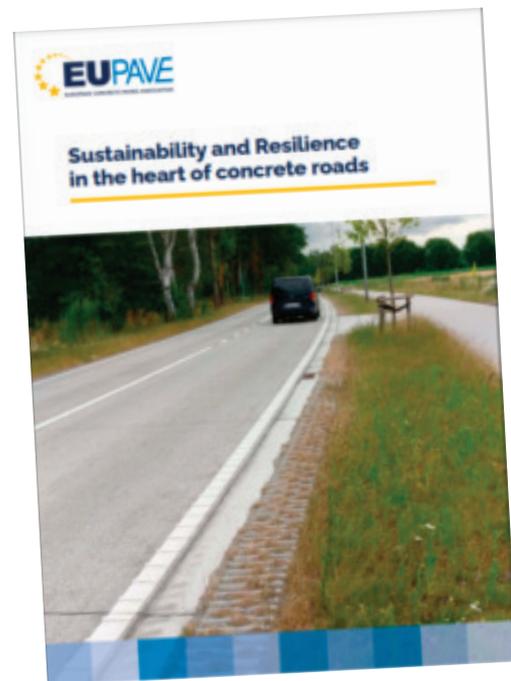
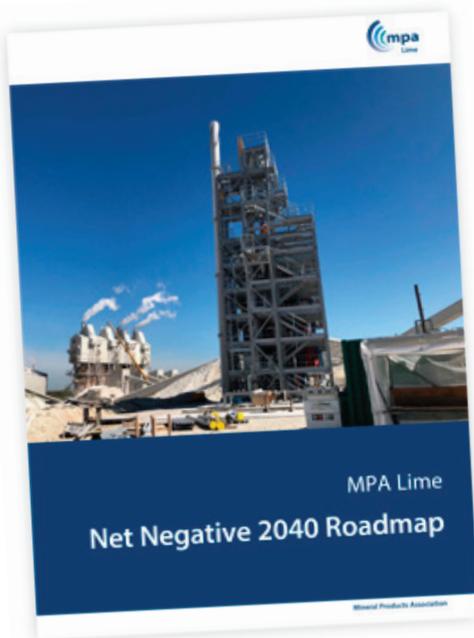
first company to purchase and operate a battery electric concrete truckmixer, and currently transport millions of tonnes of materials across the UK by rail freight each year.

Celebrating the 120-year milestone, Bevan Browne, managing director of UK Materials at Tarmac, said: 'From the day that Edgar Hooley first patented Tarmac, our business has been synonymous with innovation and part of the fabric of everyday life. Hooley's innovative spirit is embedded at the heart of our business and we're constantly identifying ways of delivering construction and infrastructure for a net-zero world.'

'While our business is constantly looking forward, we're incredibly proud of our British heritage, so it's fitting that we celebrate the achievements of our current and former colleagues as well as the great work with clients and partners, past and present.'

Tarmac will be sharing memories from the business' rich history across their various social media channels and website. Activity will include stories from colleagues past and present, including some of Tarmac's longest servers and employees with a Tarmac family tree, along with photos of key milestones and from sites over the years.

For more info, visit: <https://bit.ly/3EUv7Xy>



> MPA LIME NET NEGATIVE WEBINAR AND ANIMATION

On Wednesday 27th September, Britpave member MPA Lime held a live webinar to explain the Net Negative 2040 roadmap and answer questions. The webinar provided an opportunity to discuss the importance of decarbonising lime and how the industry plans to make progress on the five key levers towards decarbonisation and removing barriers to the changes that are essential for the future. The webinar included a preview of a short animation that explains the net zero ambitions of the sector. This is available on Youtube at: www.youtube.com/watch?v=tSTH1cs_6ls&t=3s

A recording of the webinar, the animation and the Roadmap document are all available on the MPA Lime website and are well worth a look.

Visit: <https://mpalime.org/Climate-Change.aspx>



> EUPAVE SUSTAINABILITY COMPILATION

EUPAVE has released a compilation of fact sheets "Sustainability and Resilience in the heart of concrete roads"

The fact sheets underline how rigid solutions – concrete pavements and hydraulically bound base layers – can contribute to a more sustainable and resilient transportation network. The fact sheets include:

- > Concrete roads can strongly contribute to reduction of CO₂ emissions from road transport – HIGH ALBEDO.
- > Concrete roads can strongly contribute to reduction of CO₂ emissions from road transport – LESS FUEL CONSUMPTION.
- > Concrete roads are made with local raw materials, offer a long service life and are 100% recyclable – 100% RECYCLING.
- > Concrete roads are made with local raw materials, offer a long service life and are 100% recyclable – LONG SERVICE-LIFE – LOW LIFE-CYCLE IMPACT AND COST – LOW MAINTENANCE, LESS DISRUPTION.
- > Concrete roads show better resilience to climate change and extreme meteorological events – HIGHER RESILIENCE.
- > Concrete contributes to more ecological water cycle management – SUSTAINABLE WATER MANAGEMENT

The fact sheets may be downloaded at: <https://bit.ly/3SwmDy9>



FORWARDING SOIL STABILISATION

Britpave, has published a new report advocating the use of soil stabilisation to improve poor soils. The report, 'Forwarding Soil Stabilisation' is one of two parts. Firstly, it outlines how Britpave and its members are forwarding the benefits of soil stabilisation with a range of industry initiatives. Secondly, it provides a series of HS2 project case studies that demonstrate the civil engineering case for using soil stabilisation.

Soil stabilisation is a well-established civil engineering technique that treats and strengthens poor or unsuitable soils to provide a value-added material with enhanced performance. Importantly, it does this on site thereby reducing the need for importation of new aggregates, reducing the need for exporting material to landfill and so significantly reducing the number of lorry trips.

The benefits of using soil stabilisation have been underlined by its use by Balfour Beatty VINCI (BBV), the joint venture building the 90km West Midlands section of HS2's Phase One. A series of industry trials examined how to lower lime content and reduce mellowing periods, reduce the risk of stabilising sulfate-rich soils and extend the lime stabilisation working window beyond the usual September restrictions. The report covers in detail the trials' work scopes and results.

The innovative trial work was carried out by the BBV Materials Engineering team led by Steve Phipps in collaboration with Nick Sartain, Head of Geotechnics HS2 Limited and Dr Paul Beetham, Nottingham Trent University, is expected to forward the knowledge and use of soil stabilisation for challenging civil engineering projects.



UPDATED

CONCRETE HARDSTANDING DESIGN HANDBOOK

Britpave has updated the Concrete Hardstanding Design Handbook. The Handbook provides guidance on hardstanding design and construction.

Updated in accordance with the latest design methodology and construction standards, the Handbook is aimed at designers, contractors, owners and operators of concrete hardstandings that are subjected to heavy goods vehicle and forklift trafficking.

This 3rd edition includes reference to the commonly adopted C32/40 and RC40 concretes, simplified concrete specifications, updated information on foundation materials and case studies that reflect the very latest industry practice. It benefits from the experience and expertise of the Britpave hardstanding working group. Members include: Joe Quirke, VolkerFitzpatrick; Jack Bull, Mott MacDonald; Alex Lake, Norder Design Associates Ltd; Calvin Pretorius, Danely Ltd; Bachar Hakim, AECOM; Nick Thom, University of Nottingham.



WRITTEN BY INDUSTRY FOR INDUSTRY

A main priority for Britpave is the provision of technical and best practice information. It has developed a library of reports and guidance that forward concrete and cementitious solutions across the infrastructure sectors. Written by industry for industry, the library is a free resource based on experience and expertise.

The Britpave library is available at www.britpave.org.uk/publications. The examples below show the range of publications available either as pdf downloads or as hard copy from the Britpave office:



CONCRETE RESILIENCE: PROTECTING TRANSPORT INFRASTRUCTURE FROM THE IMPACTS OF CLIMATE CHANGE

The report shows how concrete can provide infrastructure that has built-in resistance and that be future-proofed against the impacts of climate change. The inherent performance benefits of concrete means that it can withstand extreme heat, storm and flooding events.



ROLLER COMPACTED CONCRETE PAVEMENTS: GUIDELINES FOR DESIGN, MATERIALS AND CONSTRUCTION

The guide describes the benefits, properties and applications of roller compacted concrete. It provides recommendations on mix design and materials selection and discusses applicable pavement design methods, construction methodology and techniques.



SOIL IMPROVEMENT AND SOIL STABILISATION: DEFINITIVE INDUSTRY GUIDANCE

Provide an introductory technical guide to mix-in-place soil stabilisation and improvement. Although it primarily covers highway works it does so as part of a wider scope of soil stabilisation applications.

Outlines industry best practice and provides technical information plus signposts to industry standards and further reading.



AN INTRODUCTION TO HORIZONTAL SLIPFORM PAVING

The guide provides an overview of horizontal slipform paving used for infrastructure projects underlining the benefits of high construction productivity, minimum maintenance and long-term performance. It outlines the construction process, design and construction processes and the plant used.



NON-DESTRUCTIVE DENSITY TESTING OF CONCRETE PAVEMENTS

The guide explains how the use of nuclear density gauges avoids the need to take cored samples from a newly laid concrete pavement for non-intrusive testing of concrete strength and in-situ density. It outlines non-destructive testing approaches, offers a methodology for nuclear density gauge testing and provides a series of worked examples.

MEMBERS' NEWS

O'KEEFE JOINS BRITPAVE

O'KEEFE

O'Keefe Construction Ltd, part of the Byrne Group, has become a member of Britpave, the infrastructure trade association. With over 50 years' experience, O'Keefe is a leading civil and structural engineering contractor and have been specialising in soil remediation and stabilisation since 1995 for a wide range of clients throughout the UK.

The company's membership of Britpave supports its objective to further develop its soil stabilisation services. MD Marc Daly said: "We are delighted to be able to add our expertise in soil stabilisation to Britpave's pedigree and look forward to developing solutions and best practice methods alongside fellow members that benefit the industry as a whole.

The new member was welcomed by Joe Quirke, Britpave Chairman, who said: "We are delighted to welcome O'Keefe to Britpave. Their experience and expertise will be a welcome addition in helping Britpave to forward best industry practice and construction solutions".

Visit: www.okeefe.co.uk/

HANSON UK IS NOW HEIDELBERG MATERIALS UK



Hanson UK has rebranded to Heidelberg Materials UK, reflecting the trading name of its German parent company.

Hanson has been part of the Heidelberg Materials Group for 16 years, following its acquisition in 2007. The new branding will be rolled out at sites and on vehicles over the next two years with new packaging following in early 2024.

"Having a single brand name and identity sends a clear and consistent message to our increasingly global customers and fosters collaboration across both geographical and organisational borders," said Simon Willis, chief executive of Heidelberg Materials 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

Atkins Ltd - www.atkinsglobal.com

Balfour Beatty Ltd - www.balfourbeatty.com

Blue Phoenix Ltd - www.bluephoenixgroup.com

MPA Lime - www.mpalime.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

Gill Civil Engineering Ltd - www.gillgrouphouse.com

Gomaco International Ltd - www.gomaco.com

Heidelberg Materials UK Ltd - www.heidelberg.co.uk

Jacobs - www.jacobs.com

Lagan Aviation and Infrastructure - www.laganaviation.com

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

Mott MacDonald - www.mottmac.com

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

O'Keefe Construction Ltd - www.okeefe.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

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

VolkerFitzpatrick Ltd - www.volkerfitzpatrick.co.uk