BRITPAVE NEWS

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New EV Charging Approach Needed

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The British Cementitious Paving Association

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IN THIS ISSUE:

CHAIRMAN'S WELCOME

Welcome to the Spring 2024 issue of Britpave News.

This issue of Britpave News highlights some of the issues facing the infrastructure sector. These are issues requiring forward-thinking solutions that are both 'thinking outside the box' and practical. These are essential if Britain is to have the infrastructure that it needs and deserves.

Such a solution is the next generation concrete surfacing (NGCS) that is performing well in trials on the M1. NGCS is an innovative concrete surface treatment developed in the United States in 2007 for new and existing concrete. The technique is a refinement of conventional Longitudinal Diamond Grinding (LDG), which has also been successfully used to restore concrete surface characteristics and for noise reduction elsewhere in the UK. Keeping with roads, a new soil stabilisation option for subgrade improvement has been successfully deployed. The option needed a departure from standard but its success underlines the need to 'think outside the box'. Likewise new transport developments such as vertiports, highlighted in this issue, will require new infrastructure solutions. Similarly, the ongoing concerns over range anxiety and woeful lack of electric vehicle charging points call for a new solution.

A major issue facing the infrastructure sector is carbon reduction. The recent revision of BS 5800 will increase the range of low carbon cements that can be specified. The development of these ternary cements is being spearheaded by Britpave members. The construction of low carbon transport infrastructure will play a significant role helping to achieve the UK's net zero greenhouse gas emissions targets by 2050. Concrete infrastructure has inherent durability and resilience that is long-lasting, requires minimum maintenance, offers significant whole life cost benefits, and climate change resilience. The ongoing development of new low carbon cements means that this durability and long-term performance can be delivered with reduced carbon emissions.

Forward thinking that allows Britain to move forward is essential. Britpave aims to provide an industry forum that encourages the development of best practice, industry networking and provision of technical information to help provide Britpave members with the confidence to 'think outside the box'.

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 in-situ 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.

LONG AWAITED INFRASTRUCTURE PIPELINE PUBLISHED

The long-awaited National Infrastructure and Construction Pipeline (NICP) from the Infrastructure and Projects Authority has been published. It outlines 660 projects and programmes across the public and private sectors in the pipeline of investment. The 2023 NICP says over the period up to 2025, the total value of planned public and private investment is £164bn. Over the longer term, the report estimates a planned and projected £700-775bn overall investment during the next 10 years.

Infrastructure and Projects Authority

Nick Smallwood, chief executive of the Infrastructure and Projects Authority, said: "This pipeline will support industry in making strategic and informed decisions about their long-term business and project planning.

The report says the NICP "provides a clear and robust assessment of infrastructure investment over the next decade" and provides industry and investors with a consistent view of planned and predicted spending on infrastructure projects and programmes. Above all, the NCIP is "critical to support companies in their short and long-term business planning, and enable them to invest in the right skills, technologies and practices for the future".

The IPA, which reports to reporting to the Cabinet Office and HM Treasury, collates data from multiple sources to form the pipeline including the public sector, private sector and regulators. The pipeline is mainly related to England and does not include devolved spending in Scotland, Wales and Northern Ireland and by local authorities.

To deliver the £164bn of planned investment over the next two years, the IPA estimates an annual average of 543-600,000 workers will be required across different industry groups including construction and engineering construction.

To read the NICP analysis visit: **https://bit.ly/3ORz4C1**

CONSTRUCTION COSTS TO RISE IN 2024

Construction costs in the UK are predicted to rise by 3–3.8% this year, following an increase of 4.1% in 2023 – according to a new report, 'How to navigate 2024: balancing challenge with opportunity', by management consultants Currie & Brown.

Currie & Brown says increases will challenge construction firms, which will need to develop new processes and capabilities to keep costs under control and projects on track.

In the UK, cost increases could impact strategic initiatives, such as the National Infrastructure and Construction Pipeline (NICP). The report says around £1.56bn could be added to the cost of delivering approximately £82bn already earmarked for 2024.

Unless swiftly identified and managed, such increases could impede the delivery of key projects within the National Infrastructure and Construction Pipeline or lead to substantial rescoping.

To help organisations navigate uncertainty and be more cost effective, the report advises project teams adopt new ways of working, such as modular construction. It also encourages incorporating sustainability at every stage and embracing digitisation. To download the report visit: **https://bit.ly/3IgPMH1**

CIVILS CONTRACTORS SET OUT PRIORITIES

Britain's civil engineering contractors have released the priorities that must be pursued by the next UK Government if it is to deliver economic, sustainable growth.

'Priorities for an incoming Government 2024/25', published by the Civil Engineering Contractors Association (CECA), sets out an ambitious agenda for an incoming UK Government to be pursued following a General Election, which Prime Minister Rishi Sunak has confirmed will be held later this year.

The document focusses on:

- Investing in the future – through maintaining delivery of projects outlined in the National Infrastructure Strategy (NIS);
- Maintaining confidence – through ensuring the 'Star Chamber' for infrastructure announced at Autumn Statement 2023 immediately puts infrastructure back at the heart of policy-making;
- Enabling UK regions to thrive – by pursuing the 'Levelling-Up' agenda and supporting industry to develop an independent and impartial advisory bank of expertise to offer local authorities advice on planning issues, unblocking projects and optimum procurements;
- Delivering world-class connectivity – via a high-level English Transport Strategy which supports Sub-National Transport Bodies, integrates with the devolved nations and delivers firm five-year capital settlements complemented by indicative five-year funding;
- Strengthening water resilience – publish a cross-cutting National Water Strategy driving collaboration across sectors, government departments, regulators and industry, and drive improvements upgrading wastewater networks and reducing water demand;
- Supporting SMEs – by accelerating progress in abolishing retentions and ensuring social value requirements are reflective of SME needs;
- Maximising best practice & driving innovation – by encouraging public and private sector clients to adopt and track progress against the utilisation of best practice models;
- Delivering skills for the 21st century – by developing an apprenticeship system for construction employers that is supported by public sector clients.

To download the report visit: **https://bit.ly/3IajJIV**

LORD BANNER KC TO LEAD REVIEW ON NATIONAL INFRASTRUCTURE

Top planning barrister, Lord Charles Banner KC, will lead an independent review to look into speeding up the delivery of major infrastructure projects.

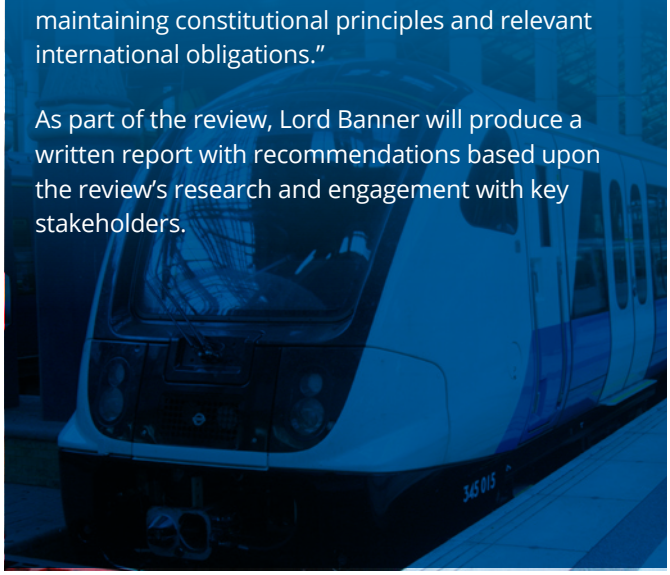
The review builds on wider government reforms to streamline the process for Nationally Significant Infrastructure Projects (NSIPs), which are often held up by legal barriers and judicial reviews. The review was announced in the 2023 Autumn Statement in the policy paper 'Getting Great Britain building again: Speeding up infrastructure delivery'.

Banner, assisted by fellow barrister Nick Grant, will explore whether NSIPs are unduly held up by inappropriate legal challenges, and if so what are the main reasons and how the problem can be effectively resolved, whilst guaranteeing the constitutional right to access of justice and meeting the UK's international obligations.

Even unsuccessful challenges can set major projects back years in delays. This includes new road improvements, offshore wind farms and waste water management facilities.

Lord Banner KC said: "I am looking forward to analysing the information available, as well as the feedback from key stakeholders, to ascertain whether, within the terms of reference, there is a case for improving the process for legal challenges of NSIPs in a way that would reduce any identified impacts of inappropriate legal challenges whilst maintaining constitutional principles and relevant international obligations."

As part of the review, Lord Banner will produce a written report with recommendations based upon the review's research and engagement with key stakeholders.



GRAPHENE-ENHANCED CEMENT FOUND TO REDUCE CO_2 EMISSIONS

Britpave member Morgan Sindall Infrastructure have facilitated an innovative trial to prove the concept of using graphene-enhanced concrete in a live infrastructure project to reduce the CO_2 emissions associated with construction activity.

The trial is the culmination of an 18th-month collaborative project which was supported in Innovate UK, the UK's national innovation agency. It was a team effort involving a range of partners including First Graphene Ltd, Breedon Cement Ltd and the University of Manchester.

The 'innovation' came from the use of graphene-enhanced CEM II A/L. This was produced at industrially relevant quantities at Beedon Cement's Hope cement plant, which is recognised as being the UK's largest facility. CEM II A/L cement has a lower clinker factor than the CEM I cement that is typically used. CEM II A/L cement with small amounts of graphene nanoplatelets has been demonstrated to increase the early-stage strength gain of cement.

These benefits led to the use of graphene-enhanced CEM II A/L at a temporary wheel washing facility. This challenging environment allowed the testing of the strength and permeability of the graphene-enhanced concrete slab where it continues to be subjected to constant heavy vehicle traffic, abrasion and wetting from washed wheels.

The graphene-enhanced concrete slab is subject to a harsh environment where is subjected to over 150 vehicle movements per day. It continues to perform well, having demonstrated early-strength gain. Most importantly, it has met the specifications for the concrete pad (37 MPa after 28 days) using a lower clinker factor variant thereby delivering an immediate reduction of up to 15% in the CO_2 emissions associated with the cement used as a binder in the concrete.

The trial is continuing with all parties now actively exploring future collaboration opportunities to take this exciting technology further.

Sarah Reid, Morgan Sindall Infrastructure highways managing director said: "We are delighted to have been involved in the full-scale production trial from the beginning. The work undertaken provides an exciting opportunity for cement carbon reduction helping towards achieving Net Zero. The trial results are very promising and we are keen to see further applications of this product as it shows great promise to reduce the carbon content of concrete. Graphene is just element that will contribute to our responsible business strategy to protect our environment."

NEXT GENERATION CONCRETE SURFACING TRIAL PERFORMING WELL

Next Generation Concrete Surfacing (NGCS) is an innovative concrete surface treatment developed in the United States in 2007 for new and existing concrete. The technique is a refinement of conventional Longitudinal Diamond Grinding (LDG), which has also been successfully used to restore concrete surface characteristics and for noise reduction elsewhere in the UK.

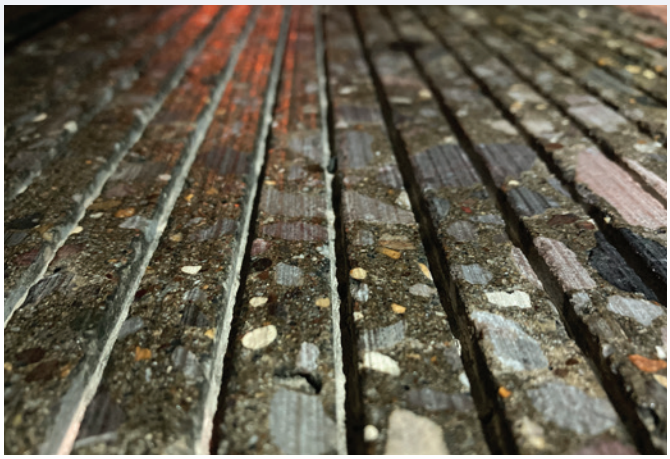


Figure 1 M1 NGCS trial installation (above left) and surfacing (above right)

The first use of Next Generation Concrete Surfacing (NGCS) on the UK Strategic Road Network (SRN) was installed on the M1 in November 2021 (Figure 1). The approach was based on the tried and tested specification US IGGA specification. The work was a collaboration of the M25 Community which includes Connect Plus (CP), Connect Plus Services (CPS), AtkinsRéalis, RoadGrip, Milestone Infrastructure, Tyrolit and National Highways. CP has a 30-year contract to operate and manage the M25 Network on behalf of National highways. The M25 design build finance operate (DBFO) contract includes development of innovations and CP and CPS invested in a programme to install and evaluate NGCS to aid their future strategy for the treatment of exposed concrete pavements. The NGCS was installed across all three running lanes over a 550m length of carriageway on the M1 southbound between Junctions 6A and 6. This has been regularly monitored for road-tyre noise, skid resistance, texture depth, and visual condition.

NOISE

Measurements using both Statistical Pass-by (SPB) and Close Proximity (CPX) methods have shown clear reductions compared with untreated sections. Initial roadside noise measurements (Table 1) show that the NGCS was significantly quieter than pre-treatment levels (-8 dB), while the latest results are -6 dB lower the untreated control section. The initial Road Surface Influence (RSI) value showed that it is equivalent to a very quiet surfacing material (Level 3) in accordance with the Manual for Contract Documents for Highway Works (MCHW).

Table 1 Roadside noise

Survey Date	NGCS		Control	
	SPBI (dB)	RSI (dB)	SPBI (dB)	RSI (dB)
Pre-treatment	91.8	+4.9	-	-
Mar 2022	83.7	-4.4	90.4	3.2
Nov 2023	84.6	-3.2	90.6	3.2

The CPX results support the findings from SPB results in demonstrating a significant reduction in the road-tyre noise levels (4-5 dB(A) initially, 4 dB(A) latest), as shown in Figure 2. Continued testing is planned for 2024 to capture any further changes in noise levels.

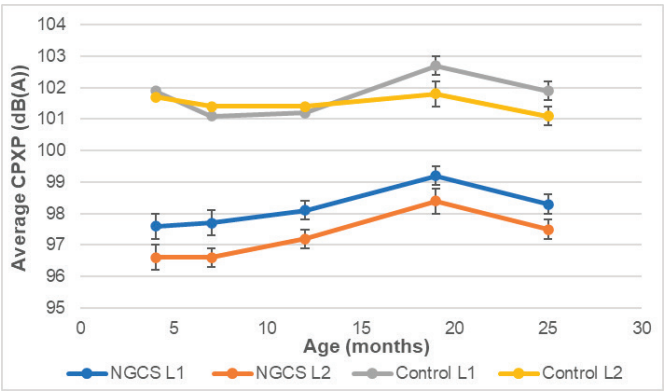


Figure 2 Average road-tyre noise

SKID RESISTANCE

Measurements using the pavement friction tester showed an initial improvement in high-speed friction measurements. The average Peak (slip) and Locked-Wheel (skid) friction measurements in lane 1 were 70% and 28% higher respectively, than pre-treatment levels. The high-speed skid resistance results have been consistent over the first two years showing superior performance to the untreated control and well within the typical range expected for retextured concrete (Figures 3 and 4).

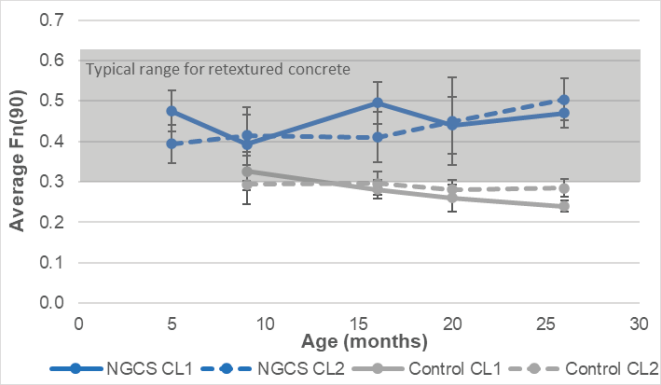


Figure 3 Average Peak friction

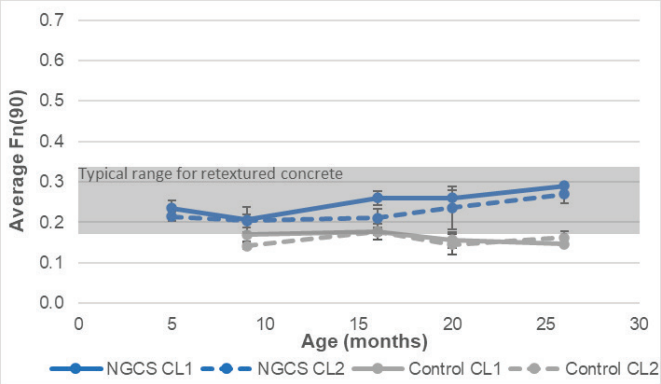


Figure 4 Average Locked-Wheel friction

TEXTURE DEPTH

Improvement more than doubled following the application of the NGCS treatment. The pre-treatment volumetric patch surface texture measurements showed an average texture depth of around 0.4mm for all three lanes.

The 2023 results showed improved average texture depths of 0.9mm to 1.3mm across all running lanes.

LIFE CYCLE CARBON ASSESSMENT (LCCA)

LCCA of the trial showed that the NGCS treatment resulted in a 22% carbon footprint saving when compared to the thin asphalt overlay option. This is due to: reduced use of primary resources associated with an asphalt overlay.

- 100% reduction in high quality aggregate demand.
- 100% reduction in Polymer Modified Bitumen (PMB).
- 58% reduction in embodied carbon.

There is also a significant carbon footprint reduction associated with transportation of these materials.

SUMMARY

The early life results from the first successful UK NGCS trial have demonstrated excellent initial skid resistance (+70% increase in high-speed friction) and roadside noise reduction (up to -8 dB) performances to date. Subsequent results show minimal change after 2 years of service with no evidence of deterioration (Figure 5). These findings support the results from international research in demonstrating that NGCS can positively impact the driving experience associated with existing concrete pavements by maintaining adequate safety in terms of skid resistance and reducing road noise. In addition, this technique offers significant whole life cycle carbon savings when compared with thin asphalt overlays, which may result in more frequent maintenance interventions and requires increased use of primary materials.

This research has been presented at UK (2022 Britpave Industry Conference, Banbury) and international conferences (2023 World Roads Congress (PIARC), Prague).

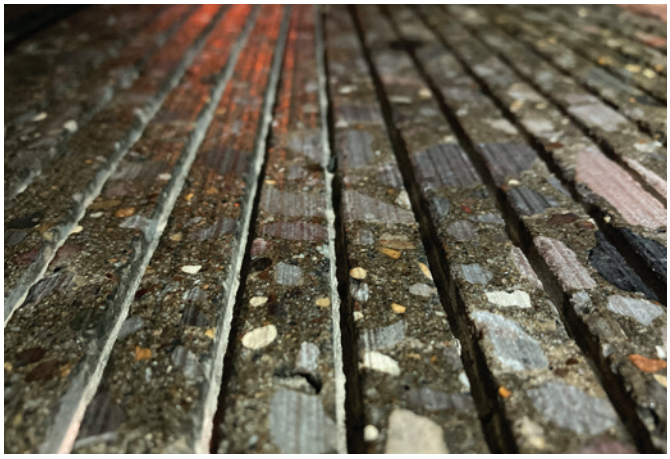


Figure 5 M1 Junction 6A-6 NGCS trial

HS2 ECONOMIC BENEFITS

A new report by consultancy Arcadis has confirmed the economic benefits of the HS2 London to Birmingham railway.

The study found that since 2017, the West Midlands region had attracted the most inward investment outside London and the South East with the railway providing a potential economic boost of £10 billion over the next 10 years.

There was also a knock-on effect on other building projects. Arcadis reported that areas close to three HS2 hubs had seen planning applications rise by two-thirds. They include places within a 1.5-mile (2.4km) radius of Curzon Street station in Birmingham, along with Interchange station in Solihull, and the Washwood Heath Depot.

The report stated: "While there are undoubtedly other factors at play in the emergence of new schemes, including the uplift created by the West Midlands hosting the 2022 Commonwealth Games and the support provided by Birmingham's city centre Enterprise Zone, it is vital that we gather evidence that definitively outlines the scale of influence HS2 is having on the West Midlands' economic renaissance."

It added "this report gives definitive proof that investor appetite, regeneration activity and investment close to HS2's regional assets has surged".

The report was commissioned by HS2 Ltd. Phase One of HS2 is due to open between 2029 and 2033, with services initially running to and from Old Oak Common in west London.

The report may be downloaded at:
https://bit.ly/3wjMsbo

INFRASTRUCTURE INVESTMENT HAMSTRUNG BY POLITICAL SHORT-TERMISM

Public sector bodies must be given greater powers to ease the impact of "short-term political disruption" if top investors are to pump up to £100bn into UK infrastructure projects, a new report from the Association of British Insurers (ABI) has warned.

ABI called for more long-term planning was required if the fresh investment was to be used effectively. The call came as the insurance market prepares for the introduction of the so-called Solvency UK regime, which will scale back the amount of cash that top insurance firms will need to hold on their balance sheet.

By reducing the buffer, top insurance firms claim they will be able to free up around £100bn to pump into the UK economy into so-called productive assets like green energy projects and transport projects.

However, the ABI said that "more long-term strategies" were required and public sector bodies should be given greater powers to plan beyond a government's horizon.

"Firms invest their customer's money over decades, so need to be as sure as possible of the long-term horizon," the ABI said. Steps to resolve the issue could include national transition plans, sector strategies or empowering arm's-length agencies like the National Infrastructure Commission to be "less at the mercy" of "short-term political disruption". The use of a regulatory sandbox and asset 'pre-identification' could also speed up investment by identifying assets suitable for investment from insurance firms.

The report comes amid concerns over the structural issues holding back infrastructure development in the UK. A recent report by Boston Consulting Group found that poorly defined objectives, changing priorities and narrow valuation criteria, were among the chief obstacles to UK infrastructure development.

VERTIPORT TAKE-OFF

Skyports Infrastructure (Skyports) has signed an agreement to develop the UK's first vertiport testbed at Bicester Motion, Oxfordshire.

The new vertiport, which will include a compact 160 sq m passenger terminal, will be a critical facility for testing ground infrastructure and flight operations and will play a significant role in enabling the next generation of electric, low noise aviation in the UK.

Developed as part of the Advanced Mobility Ecosystem Consortium and backed by Innovate UK's Future Flight Challenge, the vertiport will serve as a key node for early vertiport network planning and demonstrations, as well as for the Consortium's wider testing programme and public and stakeholder engagement. This will include being flown at by Vertical Aerospace, the global company developing one of the world's most advanced electric aircraft in the UK, to conduct demonstration flights and test key procedures ahead of commercial launch.

Skyports' new vertiport at Bicester Motion will include:

- A compact terminal, constructed on a plot of 0.42 acres (0.17 hectares), to showcase vertiport infrastructure's efficient nature and highlight the capacity for seamless integration into urban landscapes, where space is at a premium, and facilitate fast passenger throughput;
- Passenger processing facilities which will include access control gates, weight and balance optimisation, and identity validation, verification and screening. The addition of a dedicated passenger lounge will demonstrate a comprehensive customer experience;
- Operations room will be equipped with Skyports' suite of Vertiport Automation System (VAS) technology, which will feature a bespoke resource management and scheduling module, to enable high throughput aircraft agnostic operations;
- A situational awareness module to provide visualisation tools for comprehensive airspace and vertiport perimeter monitoring. The airside area will comprise a single final approach and take off area and one stand.

The UK vertiport design, which has been submitted to Cherwell District Council, has drawn inspiration from Skyports' existing testbeds in Paris and California. Skyports aims to open the UK vertiport by the end of 2024 to align with the AMEC testing programme.

The strategic location of Skyports' Bicester Motion vertiport, approximately 1hr and 40min drive from central London and close to Oxford and the Cotswolds, will demonstrate how air taxi services will provide a vital link between urban centres, regional, tourism and retail hubs. By air taxi, the same journey will take less than 25 minutes.

ACHIEVING LOW CARBON CONCRETE INFRASTRUCTURE

The recent revision of BS 5800 will increase the range of low carbon cements that can be specified. The development of these ternary cements is being spearheaded by Britpave members.

The construction of low carbon transport infrastructure will play a significant role helping to achieve the UK's net zero greenhouse gas emissions targets by 2050. Concrete infrastructure has inherent durability and resilience that is long-lasting, requires minimum maintenance, offers significant whole life cost benefits, whole life CO_2 reduction and climate change resilience. The ongoing development of new low carbon cements means that this durability and long-term performance can be delivered with reduced carbon emissions.

This CO_2 reduction will be further delivered by the recent revision of BS 5800 Concrete – Guidance and Specifications increases the range of low carbon cements that can be specified. The updated standard allows for the replacement of carbon-intensive Portland cement with low-carbon additions. These include natural pozzolana, natural calcined pozzolana, high-reactivity natural calcined pozzolana and a new range of ternary cements that include up to 20 per cent limestone fines.

The allowance for a reduction in the minimum cement content required so permits a greater range of cement combinations. This, in turn, allows the use of ternary cement blends to replace more carbon intensive binder materials. The increased development and specification of ternary cements will further open the road to decarbonisation with a new generation of concrete transport infrastructure.

LOWERING CONCRETE CO_2

The key component of ordinary Portland cement is clinker which creates a strong bond when mixed with sand and aggregate. Clinker is formed by baking limestone with clay in a rotating kiln. Making clinker generates a huge amount of carbon. For every tonne of cement produced is it estimated that 622kg of CO_2 is emitted. The concrete and cement industry undertaken considerable investment and taken direct action to significantly reduce its CO_2 impact by 53% since 1990 thanks to more efficient cement manufacturing, switching to renewable energy, and increased used of waste materials.

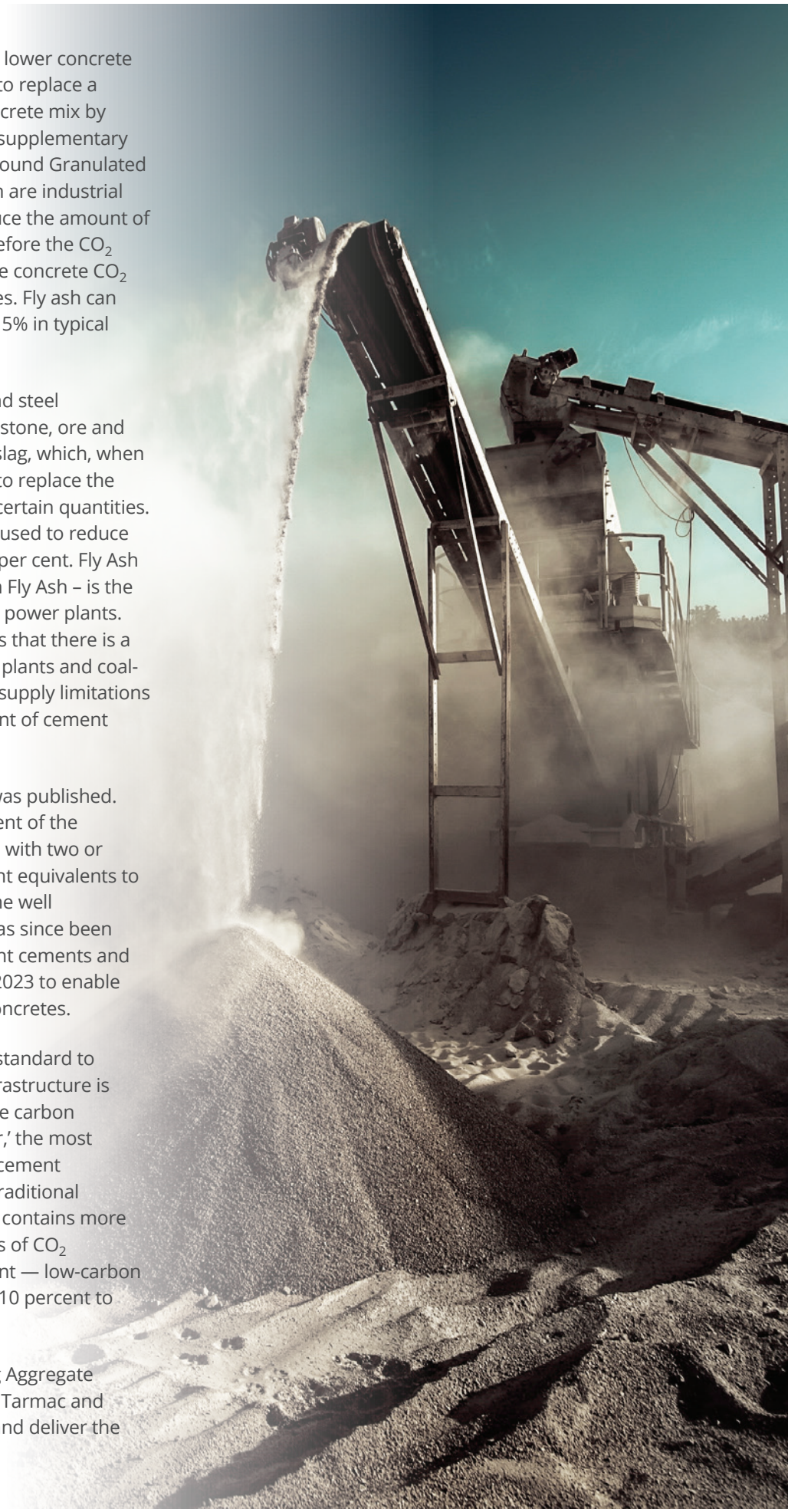
Since the 1980s, a method widely used to lower concrete construction carbon emissions has been to replace a substantial amount of the clinker in a concrete mix by combining Portland Cement (CEM I) with supplementary cementitious materials (SCMs) such as Ground Granulated Blast Furnace Slag (GGBS) or Fly Ash. Both are industrial waste products that can significantly reduce the amount of clinker used in Portland cement and therefore the CO_2 emissions of concrete. GGBS can decrease concrete CO_2 emissions by 22% in typical concrete mixes. Fly ash can decrease concrete CO_2 emissions by 13–15% in typical concrete mixes.

GGBS is a waste by-product of the iron and steel industries. When iron is smelted, the limestone, ore and coke fed into furnaces produce iron and slag, which, when quenched, forms a substance that's able to replace the largely clinker-based Portland cement in certain quantities. In ready-mixed concrete, GGBS is usually used to reduce the proportion of Portland cement by 50 per cent. Fly Ash – including Pulverised Fly Ash and Bottom Fly Ash – is the waste ash material produced al coal-fired power plants. However, the transition to net zero means that there is a declining supply as more traditional steel plants and coal-fired plants are decommissioned. Future supply limitations have focused attention to the development of cement binder alternatives.

In 2021, the cement standard EN 197-5, was published. This allowed cements with up to 65 per cent of the Portland cement clinker to be substituted with two or more SCMs, so providing multi-component equivalents to the binary combinations that have become well established in the UK. Extensive testing has since been carried out on these new multi-component cements and this resulting in the updating of BS 8500:2023 to enable the specification of these lower carbon concretes.

The opportunities presented by the new standard to reduce the CO_2 emissions of concrete infrastructure is significant. Low-carbon cement tackles the carbon emissions by directly targeting the 'clinker,' the most energy- and carbon-intensive part of the cement manufacturing process. Compared with traditional ordinary Portland cement (OPC) — which contains more than 90 percent clinker and emits 0.6 tons of CO_2 equivalent on average per tonne of cement — low-carbon cement can reduce process emissions to 10 percent to 100 percent.

Britpave cement manufacturers including Aggregate Industries, MPA Lime, Cemblend, Cemex, Tarmac and Heidelberg are working hard to develop and deliver the cements for the future.



BS8500: THE NEW STANDARD

The revision of the key UK standard for the specification of concrete, BS 8500, allows for many more different cement combinations using ternary blends. The revised standard provides for increased options for achieving lower carbon concrete and represents one of the most significant changes to the traditional 'recipe' for making concrete since the 1980s. If used across all UK construction sites the use of multi-component, lower carbon cements and concretes could save 100,000 tonnes of carbon dioxide emissions each year The UK concrete and cement sector is committed to achieving net zero by 2050. The sector has already delivered a 53 per cent reduction in CO_2 emissions since 1990.

BS 8500 is made up of two parts: BS 8500-1 and BS 8500-2.

BS 8500-1 describes the most up-to-date methods of specifying concrete – making it an essential guide for UK concrete buyers. It describes ways of specifying concrete and gives specifiers guidance. Annex A provides details on the concrete quality to be specified for selected exposure classes, intended working life and nominal cover to normal reinforcement.

Part 1 covers:

- Requirements for the constituents of concrete
- Properties of fresh and hardened concrete and their verification
- Limitations for concrete composition
- Specification of concrete
- Delivery of fresh concrete
- Production control procedures
- Conformity criteria and evaluation of conformity.

Meanwhile, BS 8500-2 provides concrete producers with essential up-to-date specifications on constituent materials and concrete. It specifies several basic requirements for concrete and its constituent materials and gives specific requirements relating to the types of concrete listed in BS 8500-1.

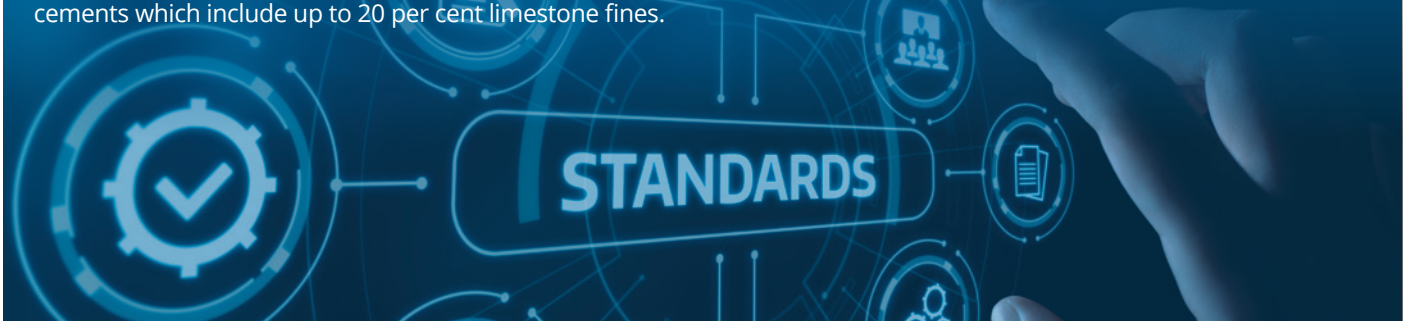
Part 2 covers:

- Requirements relating to fresh concrete delivery
- Conformity testing
- Production control and transport as well as requirements for the constituents of concrete
- The properties of fresh and hardened concrete and their verification
- Limitations for concrete composition
- Specification of concrete, the delivery of fresh concrete, the production control procedures and the conformity criteria and evaluation of conformity.

The standards have been amended because it became evident that both parts of BS 8500 should change to reflect the increased range of cementitious materials in use.

These materials include natural pozzolana, natural calcined pozzolana or high reactivity natural calcined pozzolana as an addition, Portland-pozzolana and pozzolanic cements, as well as a range of ternary cements which include up to 20 per cent limestone fines.

Consequently, new recommendations have been added to Part 1 on the use of natural, natural calcined and high reactivity natural calcined pozzolana, as part of cement or in combination, based on the assumption that the performance in concrete will be similar to fly ash. In addition, new recommendations for ternary cements have been added, which include up to 20 per cent limestone fines for applications where their use is considered safe and durable.



TARMAC LAUNCHES NEW LOWER CARBON CONCRETE BRAND

Tarmac has launched a new brand that includes a simplified system for rating the carbon footprint performance of its concrete products. The new brand is part of a commitment to make it easier for Tarmac customers to make informed decisions and procure lower carbon concrete mixes and solutions.

The company's new umbrella brand, known as CEVO, aligns its extensive range of concretes to the leading industry standard ratings provided by the Institution of Civil Engineers (ICE) Green Construction Board Low Carbon Concrete Routemap.

CEVO stands for 'concrete evolution'. Through the new system, all of Tarmac's concrete mixes are graded by strength into a series of bands to meet customer requirements. Just like energy ratings that are provided to consumers buying white goods, the carbon performance of each concrete mix is visually represented by a transparent and easy-to-understand colour-coded benchmark, from A++ to G.

The company has also unveiled a new carbon calculator which provides customers with access to concrete carbon footprint data at the click of a button. The tool has been created using Tarmac data benchmarked against the Green Construction Board standard and calculated in accordance with PAS 2050 methodology. It makes it easier to compare different products and identify lower carbon alternatives from the range of concretes in use across the market.

Andrew Campling, head of readymix concrete performance at Tarmac, said: "With the introduction of our new CEVO range – which is the first in the UK concrete industry to align with the Green Construction Board's rating system – together with the new carbon calculator, we've listened to our customers and made the process of accessing transparent data and procuring lower carbon concrete as simple as possible. Through the benchmarking, the options to deliver carbon savings are even easier to understand and measure – it really is designed to be specification, made simple."

Tarmac's new carbon calculator and CEVO offer coincides with a recent major update to the BS8500 British concrete standard for concrete that is helping to lower the carbon emissions from cement by allowing up to 20% of the cementitious elements of concrete to be limestone filler as well as other traditional replacements.

The business has also developed an alkali-activated material (AACM) system to replace cement in concrete. This Tarmac AACM system has been trialled over the past two years, including by National Highways on a project on the M42, and the Environment Agency and BAM Nuttall in permanent works at the Hexham flood defence scheme. British Standards have just released the first version of a new performance standard to which AACMs can be specified, and this is likely to accelerate the use of this technology.

STABILISED SUCCESS ON THE A14

The A14, a two-lane concrete constructed dual carriageway near Stowmarket was at the end of its design life. The east bound carriageway was re-constructed in 2023 but issues with failing subgrade hindered the project, therefore National Highways, Sisk and NORSE Highways (a local authority trading company covering Norfolk and Suffolk) decided to look at alternative options for the west bound carriageway reconstruction.

Britpave member Combined Soil Stabilisation were contacted by NORSE Highways to assist with obtaining a departure from standard to undertake an alternative subgrade improvement technique currently not included in MCHW series 600. This would be to stabilise the subgrade to prevent deterioration due to construction activities.

Following initial discussion on the feasibility and material types, a design mix was agreed upon in line with a CL840 Soil Cement HBM, a much higher requirement than normally required for similar works but as this was a major highway scheme looking at new techniques, we had to ensure all based were covered.

Tight timescales were required due to programmed start dates and due to a relationship formed when CSSL delivered the 22km Norwich Northern Distributor Road, Norse recommended that Sisk the main contractor for the scheme engage with CSSL to ensure successful delivery of the scheme due to our extensive knowledge and expertise in stabilised road foundations.

Once the design results were received and assessed CSSL proposed the cement addition and upper and moisture contents for the soils and worked with NORSE, Sisk and National Highways to obtain the departure from standard and agree the specification for the works.

The subgrade required a 51MPa surface stiffness, that had to be retained following site traffic, construction activities and adverse weather to ensure the minimum stiffness was achieved at time of the following layer being placed.

Consideration for the sequencing of work was critical, due to it being next to a live carriageway and that the two-lane bypass had to be constructed so that access for construction, delivery vehicles and site operatives could always be retained. Therefore, one lane for each visit was required ensuring that no joints would fall under the wheel paths.

Feedback from Sisk and National Highways was excellent and it is hoped that this technique will form part of the MCHW or DMBR in future editions, which will remove the requirements for a departure from standard.

SOIL STABILISATION TO THE RESCUE

Increased use of soil stabilisation could help realise Government ambitions to increase the use of brownfield land.

The Government has announced proposals for a major shake-up to planning rules to boost house building while protecting the Green Belt. In future, planners in England's largest cities and towns will have to adopt an overreaching presumption in favour of building on brownfield land. This new rule will apply if house building falls below expected levels. London councils will be under particular scrutiny. The Government is also planning to help developers overcome bureaucracy by proposing to reduce the red tape that stops derelict sites and unused buildings being turned into new homes.

The proposals have been welcomed by Britpave who believes that increased use of soil stabilisation could provide more land for house building.

"Brownfield land can be sustainably and cost-effectively developed by using soil stabilisation techniques. This would address any issues resulting from the sites' previous use and provide a viable alternative to greenfield sites. Soil stabilisation is proven civil engineering approach for giving new use to brownfield land" said Al McDermid, Chair of the Britpave Soil Stabilisation Task Group.

Using cementitious binding materials such as cement, lime, fly ash or ground granulated blast furnace slag (GGBS), soil stabilisation treats potential contaminants on site to provide a soil that is non-toxic or will contained possible leaching and delivers a stronger engineered material to be built upon.

WEST MIDLANDS £6.1 BILLION TRANSPORT EXPANSION

Transport for West Midlands (TfWM) is investing £6.1 billion to deliver a green transport revolution across the region, expanding Metro, bus, rail, cycling and walking networks to better connect people to job and leisure opportunities.

The funding has been secured since TfWM was formed as part of the West Midlands Combined Authority (WMCA) and will be invested over the 15 years to 2032, funding scores of projects and connecting communities across Birmingham, Coventry, Dudley, Sandwell, Solihull, Walsall and Wolverhampton.

Since 2017, a £3.5 billion investment secured by TfWM has boosted the region's transport network with scores of large and small projects. These include the four extensions to the existing Metro line and six new railway stations in Birmingham and the Black Country, a major Sprint rapid bus route stretching from Walsall to Solihull, a fleet of more than 300 zero-emission electric vehicles in Coventry.

The next two rapid transit routes, for which detailed business cases are now being worked up, are along Hagley Road in Birmingham and on through Sandwell to Dudley and further extending the line from Digbeth, through East Birmingham and North Solihull. Subject to the business case, construction work could start as early as 2028.

Plans are also being worked up to extend the Wednesbury to Brierley Hill Metro route into Walsall at one end and Stourbridge at the other. A rapid transit route will also be introduced on the A38 between Birmingham and Longbridge. Longer term development of a link from Wolverhampton city centre to New Cross Hospital is subject to a feasibility study.

Three locations have also been earmarked for new railway stations at Castle Bromwich, Coventry East and Tettenhall – with early planning work underway.

In tandem with these, the ground-breaking Very Light Rail technology, which could build tram systems for half the cost, in half the time of traditional light rail, is being developed in the region with the construction of a demonstrator track in Coventry city centre planned for later this year.

These, as well as the ongoing development of a network of cross-city rapid bus routes, are part of TfWM's plans to decarbonise our transport by offering people sustainable, convenient and affordable alternatives to the private car for their journeys. Some of the cross-city bus routes could be upgraded to full Sprint or Metro routes as demand increases.

Soon to benefit from this investment are the residents and businesses in Dudley town centre where the new Metro tramway, due to open within the next year, will offer direct rapid connections to Wolverhampton, West Bromwich and Birmingham.

Work is also progressing on phase 1 of the Metro extension, one of the schemes being designed and delivered by the Midland Metro Alliance. This will introduce rapid transit services to the town centre, as well as stops for the Black Country Living Museum and Dudley Zoo and Castle, for the first time. Communities along the route – including Tipton and Great Bridge - will also benefit from better connections.

Construction work on phase two of the extension between Dudley town centre and Brierley Hill will start next year following the confirmation of full funding last autumn in the Government's Network North announcement. This phase will link Metro to the Merry Hill Shopping Centre.

£2BN LEEDS TO BRADFORD TRAM PLAN

Plans for a tram system running between Leeds and Bradford have been announced. Construction of the two new lines could, with Government backing, start in 2028. The plans are subject to a full business case and approvals process.

The Leeds Line would take people between St James' Hospital, through Leeds city centre to Elland Road and then on to White Rose Shopping Centre.The Bradford Line would run from Leeds city centre to Bradford city centre – also linking Bradford Forster Square station with the new Bradford rail station. This line would support Bradford's plans to regenerate the city's southern gateway, which includes the new Bradford rail station.

The West Yorkshire Combined Authority has said the network could be extended to include Dewsbury, Wakefield, Kirklees and Calderdale. Funding availability for a £2.5bn tram system was floated by Prime Minister Rishi Sunak after axing the northern leg of the HS2 project to Manchester.

MID CORNWALL METRO PROJECT ON TRACK

Britpave member AECOM is to take the Mid Cornwall Metro project through to the detailed design stage. The company has already completed the outline design and business plan for the scheme.

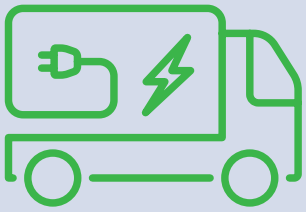
The announcement follows Cornwall Council Cabinet members agreeing to provisionally accept the offer of £50m Levelling Up Funding towards the delivery of the £56.8m Mid Cornwall Metro initiative in December.

Mid Cornwall Metro, led by Cornwall Council, Network Rail and Great Western Railway, will create a sustainable transport corridor between the county's north and south coasts. It will improve the current links between four of Cornwall's largest urban areas - Newquay, St Austell, Truro and Falmouth/Penryn. Passengers currently must take three trains to travel from the north to the south of the county.

AECOM has been appointed as engineering lead for the scheme, coordinating various disciplines including track, civils, signalling, environmental, electrical and plant and fire safety systems. The scheme is being delivered through the South Rail Systems Alliance (SRSA), a 10-year Framework awarded in 2019 between Network Rail, Colas and AECOM for delivery of railway systems renewals across three Network Rail Regions in the South of the UK, Western and Wales, Southern and Anglia. Colas is the designer for the signalling and telecoms.

COSTAIN TRIALS ELECTRIC VANS

Britpave member Costain has undertaken a pilot trial, in partnership with Enterprise Flex E-Rent, testing the use of electric vehicles (EVs) on three civil engineering projects – the Preston Western Distributor Road scheme in Lancashire, the A30 Chiverton to Carland Cross project near Truro in Cornwall and the A12 widening scheme near Chelmsford in Essex.



Electric vans were used by Costain's health and safety, environment and laboratory teams, with the vehicles typically carrying lighter materials and equipment.

Enterprise fitted the vehicles used for the pilot with technology to capture detailed data and provide insights on the electric vehicle usage. Costain also installed banks of up to 25 EV charging points at the three pilot locations to meet the challenge of long-distance charging.

Mark Ashenden, head of plant and fleet supply chain at Costain, said: "Understanding and reducing the impact of vehicle emissions at our project sites will be key to us reaching our net zero targets. This trial has given our project teams a greater understanding of what commercial EVs can do and helps give them the confidence to utilise EVs where they can. By showing what can be possible, we hope to help create a blueprint for the industry to minimise carbon emissions and pave the way for a greener future for infrastructure."

RIBBLESDALE TO HOST HYDROGEN FUEL TRIALS

Britpave member Heidelberg Materials' Ribblesdale cement works in Lancashire is taking part in a feasibility study into using ammonia as a source of hydrogen to fuel cement kilns.

The 12-month project with engineering consultants Stopford and Cranfield University has been awarded funding by Innovate UK through its UK Research & Innovation (UKRI) fund.

This research builds on a previous project at Ribblesdale that demonstrated the use of hydrogen as part of a net zero fuel mix to power a cement kiln. The new project will explore the potential use of ammonia as a low-cost, low carbon hydrogen carrier, evaluating the most efficient method of 'cracking' the ammonia on-site to release the hydrogen for use as a fuel in the kiln.

"We have already proved the success of using hydrogen as part of a lower carbon fuel mix, but its storage and transportation are technically challenging and, at present, costs are prohibitive," said Marian Garfield, sustainability director at Heidelberg Materials UK.

She continued: "Ammonia potentially offers a more energy-dense, cost-effective source of hydrogen that could be used as a fuel enhancer to allow the use of more lower grade waste derived fuels to power the kiln and cut CO_2 emissions.

If the project is successful, further work can be carried out to explore the commercial viability of using ammonia as a hydrogen carrier for combustion within cement manufacturing as well as other industries."

NEW APPROACH TO ELECTRIC VEHICLE CHARGING

Fleet companies and taxis firms are turning their back on electric vehicles. Sales of EVs are slowing down and even Japanese car giant Toyota has stated that electric vehicles will never account for more than 30% of the market. If Government-backed net-zero emissions targets are to be reached then a new charging infrastructure approach is required.

Whilst the expense of repairs and high insurance costs are proving a barrier to the uptake of low emission electric vehicles, a more fundamental problem is the continued inadequacy of the UK electric car charging network. There are only some 60,000 charging points to serve over 900,000 electric vehicles (EV). As charging an EV can take anything from 30 minutes to 10 hours - depending upon the battery size, mileage between charges and the power rating of the charger – the high demand for the limited available charging points often results in significant queues, driver frustration and range anxiety over concerns of reaching the next available charging point.

This is having a negative impact upon the Government's ambitions that by 2030 80% of new cars and 70% of new vans sold in the UK should have zero emissions. This target is to increase to 100% by 2035. The inadequate charging infrastructure means that these targets may not be met as drivers and fleet owners prove increasingly reluctant to switch from petrol and hybrid to fully electric.

The Society of Motor Manufacturers and Traders (SMMT) has reported that the UK market share of electric cars went into reverse in 2023 as drivers baulked at high prices and the lack of charge points. EVs' share of the new car market fell from 16.6% in 2022 to 16.5% last year. That compares to a forecasted figure of 17.2%. Meanwhile, Toyota Chairman, Akio Toyoda, has said that electric vehicles would only ever command a market share of 30% and that alternative technologies need to be developed.

The concern of car markers over the falling demands for EVs is underlined by the Government's zero emission vehicle mandate whereby they will face fines if they fail to hit sales of pure EV targets which amount to 22% in 2024, 28% in 2025, 53% in 2028 and 80% by 2030.

Their concern is not helped by news that taxi and car firms are turning their back on EVs. Due to range anxiety and lack of charging points, Addison Lee has abandoned its pledge to reach zero emission by 2030 and is replacing its EV fleet with petrol vehicles. Hertz has announced it is to sell-off 20,000 electric cars and buy petrol and diesel cars instead, while Uber has reported that it is struggling to get drivers to adopt EVs in the numbers that it expected.

"The lack of charging points, range anxiety and excessive charging times means that the Government plans for zero emission motoring is going into reverse", said Joe Quirke, Chairman of Britpave, the infrastructure industry association. "If the zero emission ambitions are to be met then a new approach to vehicle charging is needed."

Quirke points to the potential of concrete eRoads that allows EVs to charge are they pass over them. A number of concrete eRoad solutions are being trialled in the USA, Europe and Australia.

Concrete eRoads allow vehicle batteries to be charged inductively via wireless systems using magnetic coils installed in the road surface that feed an electric charge to magnetic coils fitted on a vehicle's undercarriage and so charge the battery. Other developments include mixing graphene or magnetic ferrite particles into the concrete to make the road surface itself conductive.

"The long-term strength and performance of concrete makes it the better option for such roads as, unlike asphalt, they would not need regular maintenance, are far less prone to pot holes and in hot summers do not melt. Road surface potholes and melting could dislodge and compromise the embedded coils," explained Quirke.

He continued: "If the zero emission potential for EVs is to be realised then there must be a ready and easily available charging supply. Concrete eRoads could provide such a supply. The Government needs to rethink its approach and examine the potential of concrete eRoad alternatives to chargers."

MEMBERS' NEWS

SAVE THE DATE

The 2024 Britpave Industry Conference will take place on Thursday 3rd October at the Sketchley Grange Hotel, Hinckley. The theme of the conference will be 'The Next Generation'. It will examine the next generation of infrastructure solutions, the materials to construct them and the next generation of engineers and contractors to build them. The conference will be followed by the Britpave annual networking event. Further details to follow.

NEW KENT CROSSING

VolkerFitzpatrick has been appointed to design and build a highway crossing over a rail line and river in Kent as part of Kent County Council's £34m Sturry Link Road project. The 550-metre-long road will have a 250-metre viaduct over the Great Stour River, the river's flood plain, and the railway line between Canterbury and Ramsgate. The viaduct will be supported by a five-span structure, with the longest span distance being 56 metres. Construction is scheduled to start next year and is expected to take 93 weeks, completing in the first quarter of 2026.

PLANT INVESTMENT

SGE Ltd has invested in another Komatsu D71PXi in preparation for the earthworks season ahead.

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