

Examining infrastructure issues. Forwarding infrastructure solutions.

BRITPAVE EVOLUTION

**SURFACE GRINDING
OF PAVEMENTS**

**LOW MAINTENANCE
PAVEMENTS REPORT**

**SOIL STABILISATION
FOR MORE HOUSING**

**THE CASE FOR
CONCRETE
SLAB TRACK**

AIRPORT INVESTMENT



In this issue:

Britpave Evolution	3
UK in Top Ten for Infrastructure Investment	3
Calls for Infrastructure Authority	3
Surface Grinding of Concrete Pavements	5
Low Maintenance Highway Pavement Seminar Report	6
Britpave to Back Plantworx	7
Soil Stabilisations Forwards Brownfield Land Use	8
Britpave Soil Stabilisation Task Group Update	8
New UK Specification for Roller Compacted Concrete	8
Hydraulically Bound Materials for Pavements in Winter	8
The Case for Concrete Slab Track	9
Reading Train Care Report	10
Gatwick Runaway Success	11
Airport Investment	11
Britpave Members	12

Editor's Note

There is a growing recognition that the UK's infrastructure needs significant investment. There is also a growing recognition that that investment could be best spent on concrete solutions.

The recent Low Maintenance Highways Pavements Seminar, organised by The Concrete Centre in partnership with Britpave, saw the Highways Agency outlining the many challenges that it faces and inviting the concrete industry to work with it in developing pavement solutions that are long-lasting, need minimum maintenance, are quiet and sustainable and offer good whole life cost and performance. These are all criteria that concrete pavements can meet. There is no reason why the road ahead should not be concrete.

Meanwhile, work by the Britpave RCC Ports Specification Working Group will demonstrate why roller compacted concrete is the right solution for port pavements. There continues to be a growing interest into the potential of concrete slab track not just for high speed rail lines but also with Crossrail and Network Rail. In addition, soil stabilisation could play a major role in rehabilitating brown field land for much needed housing thereby minimising the need to use green field sites.

To help ensure that concrete and insitu cementitious solutions are properly considered by clients and consultants and properly delivered by contractors, Britpave continues to develop and publish technical outputs. To facilitate this, it is proposed that the current Task Group structure evolves with a greater emphasis being placed in specific issue Working Groups to drive through the development of technical specification and guidance. Member input to this evolution is very much welcomed.

There are growing opportunities for concrete and insitu cementitious solutions. Britpave is working to bring those opportunities to its members.

Steve Elliott
Britpave General Manager

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.

Britpave Evolution

With time becoming an ever increasing scarce and valuable resource, the Britpave Council, on behalf of the Britpave membership, is reviewing the operation of the Task Groups. The challenge is to achieve an evolution of the Britpave Task Group structure that reflects the ever-changing demands of industry and ensure more focused and effective technical output with reduced demand on members' valued time resource.

The Task Groups are an important and integral part of Britpave. They provide the vehicle for addressing industry issues, developing infrastructure solutions, forwarding best practice and promoting industry networking. There is no intention to abandon the Task Groups but there is a growing recognition that the effectiveness and efficiency of the Task Groups could be further improved.

Council proposes to achieve this with the establishment of a Council Task Group Steering Group. This Steering Group, comprised of Council Members with specific responsibility for each Britpave Task Group, would direct the overall aims and development of the Task Groups.

In particular, the Steering Group will oversee the development of Task Group strategy and the operation and outputs of issue-specific Working Groups. These Working Groups would be dedicated to examining and resolving specific issues. The existing Task Groups would operate as an umbrella for these issue-specific Working Groups and would report on new industry developments and outputs at biannual Britpave Task Group Seminars that would be open to all Britpave members to attend. The seminars would be used for information exchange on current issues, update on working group progress and networking.

The Task Groups will evolve with Special Projects being absorbed into Roads and Heavy Duty Pavements being split into two separate Task Groups: Airfields and Ports. This would give the following Task Groups: Airfields; Ports; Rail; Road; Soil Stabilisation.

The Council believes that the proposed evolution and focus on specific industry issues would provide the following benefits:

- Increased Council connection with the Task Groups and Working Groups
- More productive use of members' time and expertise
- Increased reason to participate in Working Groups
- Better focus on delivery of industry outputs
- Enhanced opportunities for industry networking and synergy across Task Groups

The Britpave Council welcomes your thoughts and input on the above proposals which are aimed at taking the Association forward to meet the ever changing challenges of the construction industry.

■ Please contact Steve Elliott, Britpave General Manager, on selliott@britpave.org.uk

UK in Top Ten for Infrastructure Investment

New research by the construction consultancy Arcadis has found that the UK has, for the first time, entered the top ten of the Global Infrastructure Index which ranks 41 countries by their attractiveness for investment in infrastructure. In Europe only Sweden and Norway are considered more attractive than the UK.

The Index uses five key criteria including economic profile, business environment, infrastructure quality and needs, financial environment and political risk. The UK has shown improvement in all areas. The research follows the HM Treasury's launch of its 'Investing in Infrastructure' guide which for the first time outlines 14 individual infrastructure programmes and projects worth over £15 billion that are open for private investment.

Meanwhile, figures released from UK Trade and Investment show that the UK has attracted the most inward investment for projects since records began in 1980s. Within the 1,777 investment projects set up by foreign businesses in the UK during the 2013/14 financial year, 310 were for infrastructure and energy. HM Treasury hopes its guide will build on this success, ensuring investors are aware that British infrastructure continues to be an attractive prospect because of its long term and stable returns, plus support from policies such the Green Investment Bank and UK Guarantees Scheme.

In addition, after decades of underinvestment, the government is now providing clarity around its infrastructure priorities; publishing the first ever UK National Infrastructure Plan in 2010 and compiling a detailed National Infrastructure Pipeline for the first time in 2011. The latest update of the Infrastructure Pipeline will show that planned infrastructure investment has now increased to £383bn to 2020 and beyond.

However, to remain attractive to investment the government must ensure that political intent is backed up by action. There must be clarity on long-term infrastructure policy and real delivery of its pipeline promises.

Calls for Infrastructure Authority

EEF, the manufacturers association, has called for the government to create a permanent infrastructure authority to identify, plan and deliver major infrastructure projects and encourage investment. EEF argue that such an authority would end decades of policy reversals acting as a barrier to growth and investment. Chris Richards, EEF's business policy advisor said: "The neglect of our roads, the indecision on expanding airport capacity and, the agonising over high speed rail routes connecting our major cities have only served to exacerbate the feeling that Britain's infrastructure is not geared up to support growth."

The EEF's proposals would see the creation of a single, centralised Infrastructure Authority, which would be set up as a non-ministerial government department, making it accountable to parliament but allowing it to work across government. Every five years, the authority would develop a new national infrastructure assessment, planning the UK's infrastructure needs over a ten, twenty and fifty year horizon at national and regional level, identifying future trends and challenges in the process.

This is not the first time that a permanent infrastructure authority has been proposed. Sir John Armit's review, which examined long-term decisions on upgrading the UK's ageing infrastructure, has also proposed that an independent commission be created.

Whitetopping Success with GOMACO G+® Controls and 3D Guidance

G+ Connect™



Contact your GOMACO representative for assistance in determining which concrete paver model best fits your concrete overlay specifications.



CONCRETE STREETS AND HIGHWAYS | AIRPORT RUNWAYS | CURB AND GUTTER | SIDEWALKS
RECREATIONAL TRAILS | SAFETY BARRIER | BRIDGE PARAPET | BRIDGE DECKS | IRRIGATION CANALS
GOMACO INTERNATIONAL LTD. - WITNEY, OXFORD, ENGLAND | GOMACO CORPORATION - IDA GROVE, IOWA, USA

Once you experience G+ controls, you won't be satisfied with anything else. It's a control system that is both easy to learn and easy to operate. G+ expresses itself in easy to understand international icons and full script explanations. It operates in all the major languages of the world in either imperial or metric numbers. It has a lightning-fast processing speed and features two-way communications between paver accessories and G+. Its instant digital feedback combined with the tight closed-loop electronic and hydraulic control creates a G+ paving experience that is smooth, efficient, and accurate. There is nothing on the market that can compare, because G+ was designed by our in-house team from what we have learned from years of experience in the field and from what we have learned from you, our customer. Isn't it about time you had the world's most revolutionary control system on-board?

pavinguk@gomaco.com | www.gomaco.com

Surface Grinding of Concrete Pavements

Below is an abridged version of the paper present by Britpave member John Willis, Tyrolit Ltd, at the recent 12th International Symposium on Concrete Roads 2014, held in Prague, Czech Republic.



In the UK concrete roads have been considered to be expensive to build, noisy in use and, in some instances, difficult to maintain. However, these misconceptions are changing as the long-term performance, low- maintenance whole life cost benefits of concrete road surfaces are increasingly recognised.

Diamond grinding, a process used in the United States since 1965, offers a cost effective way to restore the skid resistance and noise reduction of concrete roads. Tests in the US have demonstrated that the longevity of a diamond ground surface are between 11 years to 17 years. Tests undertaken in the UK also continue to show positive results.

Grinding involves diamond blades removing and retexturing the surface of concrete roads. Up to 250 diamond tipped lades of 400 to 450mm diameter are used to remove 3 to 8mm of worn surface to provide a renewed surface finish of longitudinal grooves. As only 3 – 8mm of road surface is removed the grinding process can be stopped at any time and the road reopened to traffic thereby allowing grinding to be carried out during off-peak hours or with short-term mobile lane closures. No remedial work to drains, crash barriers or clearance heights for bridges is required unlike with the use of asphalt overlays. In 2009, a 500m section of the A12 Chelmsford bypass at Boreham

was treated using longitudinal diamond grinding. The same treatment was applied on a section of the A12 at Kelverdon. During 2010, a 6km four-lane section of the A14 Whitehouse to Copdock was treated.

Road noise is not resultant from the material used but from the surface texture. 70% of road noise from passenger vehicles is created when air is compressed between the road surface and the tyre. UK concrete roads generally have a tined surface that is transverse across the carriageway. This improves the level of friction but also creates an undesirable tonal noise of 1000 hertz. Grinding imparts a surface roughness that is longitudinal rather than traverse this and the higher surface roughness allows the air between road surface and tyre to more readily escape significantly reducing traffic noise levels. Following grinding, the sections of road trialled demonstrated a reduction s noise levels of between 4 – 6dBA at speeds of 50 – 80 kph. This is the equivalent of halving the traffic density.

Skid resistance is related to surface roughness and over time worn road surfaces result in decreased skid resistance. Following diamond grinding on the A12 and A14 sections their low speed skid resistance improved considerably rising from 0.29 to 0.36 to 0.49 to 0.57. The test sites were monitored for 3 years and the improvement was found to have remained at an average rate of 54%.

The trials and subsequent monitoring proved that diamond grinding is a sustainable repair option for the renovation of worn, polished concrete roads. The result is quieter roads with improved skid resistance. Whilst the trails did not evaluate costs, evidence from the US shows that if the road surface is structural sound then the grinding process can be used at least three times without significant loss to load carrying ability. With each treatment lasting at least ten years, this would mean an extension to road life of 30 years.

As a result of the trials, the Highways Agency has now adopted the diamond grinding process for use of roads with flint aggregates without the need for departures. Diamond grinding is to be written into the highways design and repair manuals currently under review.

■ For a full copy of the paper 'Surface Grinding Concrete Pavements', John Willis, 2014, contact the Britpave office, email: info@britpaveorg.uk



Low Maintenance Highway Pavements Seminar Report

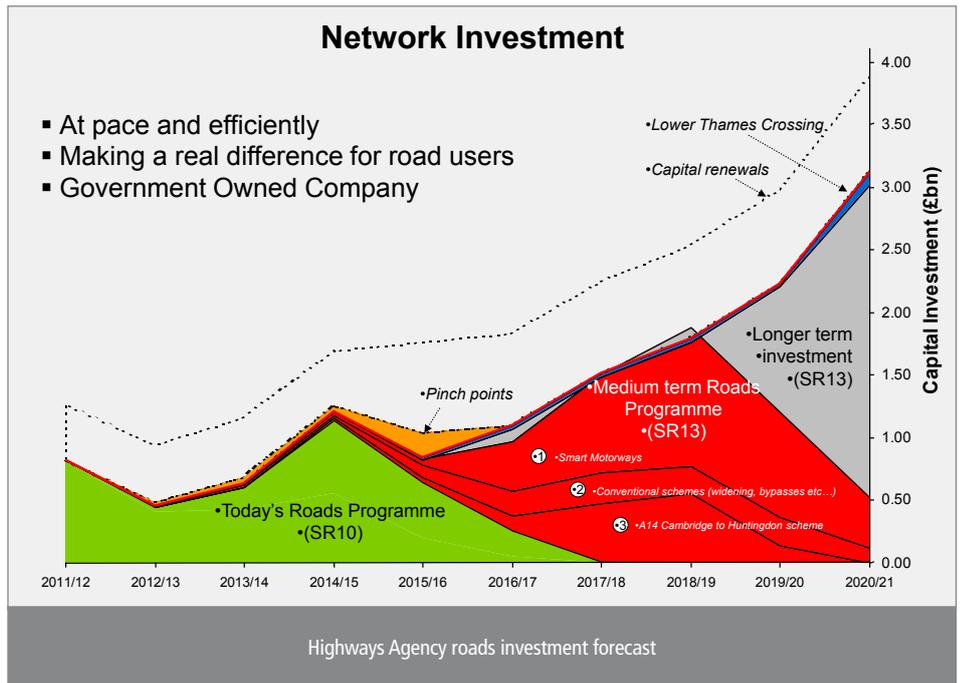
At the recent 'Low maintenance highway pavements' seminar, the concrete pavement sector outlined the options that can enable the Highways Agency to meet the challenges of operating and maintaining a strategic road network faced with a forecast traffic growth of 46% by 2040.

The seminar, organised by The Concrete Centre in partnership with Britpave, heard from Mike Wilson, Chief Highway Engineer at the Highways Agency, how road traffic congestion on the UK motor ways and 'A' trunk roads costs the UK economy some £2 billion a year. He also reported that so far in 2014, 224 people have been killed and many more injured, traffic noise adversely impacts 4.3 million, traffic air pollution is increasing and that road user satisfaction of the performance and maintenance of roads continues to decline. However it is not all bad news. Wilson explained how the planned restructure of the Highways Agency into a customer-focused, government-owned Strategic Highways Company offers a very real opportunity to address these issues thanks to a tripling of investment to £24 billion by 2021.

Critically, in future the Highways Agency will plan investment over a five year period. This will offer long-term funding certainty and clarity that will be welcomed by those involved with planning, building and maintaining the strategic road network.

However, in return for this funding certainty the Agency is seeking to save £2.6 billion of the cost of running the road network over the ten years. To help realise this, there needs to be an increased focus on whole life costing, long-term performance, minimum maintenance and interventions, and the adoption of a more product-based approach. To forward this the Agency will seek to work closer with the supply chain to develop new delivery models that are focused not only on value and cost but also on delivering the road network that road users' demand.

The emphasis on delivering a road network that carries traffic safely, comfortably, economically and with minimal disruption was underlined by Ramesh Sinhal, Chief Pavement Engineer, Highways Agency. He explained how the strategic road network exists to meet the needs of road users - the customers - and stakeholders. Those needs drive the objectives of the Highways Agency. Meeting those objectives calls for road pavement surfaces that provide good



friction at all traffic speeds, have good longitudinal and transverse profiles, low noise and dust emissions and provide a good interface with road markings. They should be durable and resilient, require minimal maintenance and offer sustainable recyclability. Crucially, they should offer good whole life costing and long-term performance that translates into good asset management.

He outlined the way forward as being based on closer liaison with the concrete pavement industry that allows the development of cost efficient, high performance, low noise, long lasting concrete solutions. Challenging the seminar audience, Sinhal stated: "We want to see concrete solutions on the strategic road network."

His challenge was taken up by John Donegan, Chairman of the Britpave Roads Task Group. Donegan outlined how concrete road pavements can offer more-for-less in terms of price certainty, better long term performance and less maintenance. This translates into more reliable journeys for road users, less interventions therefore less need for road workers to work on live carriageways, less congestion due to road works so reduced traffic emissions and, above all, better use of the road network asset. In addition, there is the certainty of material supply and ready availability of multi and single-lane slipform pavers plus mobile concrete plants.

As proof of this, Donegan asked why is it that DBFO road projects are predominately concrete pavements? The answer is that they provide better journey reliability, need less maintenance interventions and offer lower whole life costs. Furthermore, with the confirmed upward trend of bitumen prices,

increasingly concrete offers comparable if not better initial construction costs.

There is a range of proven concrete pavement solutions that meet the requirements of the Highways Agency and the demands of traffic and road users. These include rigid concrete options for inlays to flexible pavements, lane replacement and hard shoulder upgrade for all-lane running. Continuously Reinforced Concrete Pavements (CRCP) with Thin Surface Course offers the lowest maintenance option currently approved. CRCP with Exposed Aggregate Concrete Surface (EACS) for low noise and even less maintenance, will be an option available without a Departure from Standards from 2015. All of these options are enshrined within existing HA specifications. There are no reasons against their widespread adoption.

Demonstrating that the proof is in the pudding, Jeff Curry from Carillion plc provided a case study on the M6 Junctions 10A – 13. The £70 million contract called for turning this section of the M6 into a Smart Motorway using a range of innovative technologies and operating procedures to actively control traffic flow. The challenges faced included getting the best from an existing infrastructure asset, enabling all lane running, and providing accelerated delivery with a fast investment return.

Key to this was the reconstruction of the hard shoulder to allow its use to reduce congestion and improve journey times and safety. On a typical UK motorway, 77% of all heavy good vehicles use the inside lane, therefore, the use of the hard shoulder calls for a pavement solution that has the strength to cope with this traffic load. A range of construction solutions was examined. Carillion choose a full depth,

flexible/rigid reconstruction that could be built during a series of six hour windows and provided guaranteed pavement longevity. The success of the project proved that concrete pavement parity is achievable and the lessons learnt from this project underline the material's ability to deliver solutions for future motorway widening and full lane running projects.

Concrete's long-term performance means that it is well suited to Design, Build, Finance and Operate (DBFO) contracts. As explained by Ali El Jaber of Connect Roads, this is where a company takes on the responsibility, over a 30 year period, for the maintenance of a section of the motorway network including the structures and the carriageway. A key feature of this is the focus on whole life costs – an area where concrete excels. Jaber outlined the maintenance management strategy adopted by Connect Roads. It has three main approaches: condition survey; probabilistic scenario; risk management. All three are used to work together to verify each other with onsite verifications of one year, five year and 30 year life cycles being undertaken.

Experience of DBFO maintenance contracts has shown that with a CRCP road base the second and third lanes are invariably in good condition, with only the inside lane showing damage to the surface course from HGVs. The main maintenance expense came from renewing the top flexible surface course layer. Furthermore in terms of maintenance costs, those of concrete have flatlined while the cost of asphalt continues to rise.

Further proof of the ability for concrete pavements to deliver was given by Joe Quirke of VolkerFitzpatrick. Traffic noise is a major issue for the Highways Agency. Examining the use of Exposed Aggregate

Concrete Surface (EACS) on the A449 in South Wales, Quirke explained how concrete can provide a long term quiet road surface.

The A449 Coldra to Usk rehabilitation scheme constructed in 1998/9, was one of the most innovative highway projects of the time, involving the first overlay in the UK of a life expired rigid carriageway with a continuously reinforced concrete pavement (CRCP). The project also incorporated the UK's first full scale use of two-layer EACS and it remains the largest such project in the UK.

TRL has carried out an assessment of the noise characteristics of the surface after 15 years. The long term acoustic performance of the EACS was assessed by repeating noise measurements originally taken in 1999. The testing showed that the surface is degrading acoustically at a very slow rate, when compared with other asphaltic low noise surfaces, such that noise levels from EACS are ultimately lower than asphaltic surface courses.

The road surface is performing very well in terms of skidding resistance with the latest SCRIM results indicating levels considerably above intervention point, and the possibility of 10 to 15 year's further service in hand.

This is very encouraging news for clients and contractors seeking a low maintenance, low noise pavement solution for heavily trafficked roads. It is evident that EACS can be expected to provide up to 30 years maintenance free operation. With the HA design manual now being updated, EACS will no longer require a Departure from Standards for use in England and is a very viable option for road pavements.

This was an interesting seminar that saw the client, the Highways Agency, outlining

its objectives, investment plans and ongoing future requirements and inviting the supply chain to work with it to develop solutions. The Agency underlined the challenges to meet the demands for long life pavements that require minimum maintenance, offer low traffic noise and low emissions and provide good whole life cost. They are challenges that the concrete pavement sector is fully ready and able to meet in order to ensure that the road ahead is concrete.

Britpave to Back Plantworx

Britpave is to exhibit and hold specialist industry seminars at the biennial Plantworx 2015 construction equipment exhibition show.

Plantworx is run by the Construction Equipment Association and takes place at Bruntingthorpe Aerodrome, just off the M1 in Leicestershire on June 2-4.

It is a unique "live" outdoor exhibition - some of the equipment will be working, as though on a construction site - with indoor pavilions for meetings and smaller exhibitors.

The inaugural show in 2013 attracted over 11,000 visitors and just under 300 exhibitors - numbers the organisers expect to be comfortably exceeded next June.

Plantworx attracts many visitors from the civil engineering and groundworks sectors, plus many specialist and general contractors. Its supporters include the Civil Engineering Contractors Association (CECA); National Specialist Contractors Council (NSCC); Construction Plant-hire Association (CPA); and the Construction Industry Training Board (CITB).

■ For further information visit: www.plantworx.co.uk



Soil Stabilisation to Forward Government's Drive to Use Brownfield Land

Increased use of soil stabilisation could help realise Government plans to build new homes on brownfield land.

Brandon Lewis, the Planning and Housing Minister, has announced the bidding criteria for councils to share a £200 million fund to create 10 housing zones on brownfield land. The new zones, all of which will be outside of London must support the building of 750 to 2,000 homes. A separate bidding process for £400 million for 20 housing zones in London is already underway. Lewis underlined the need to prioritise building on brownfield rather than green belt land by saying: "We need to build more homes in this country, but it's also vital that we protect the countryside that people rightly treasure. The new dedicated housing zones will transform disused and derelict land". The Department for Communities and Local Government believe that across England there is enough brownfield land to build 200,000 new homes.

The emphasis on using brownfield land has been welcomed by Britpave as it will boost the use of soil stabilisation over inefficient and environmentally questionable 'dig and dump' and relieve the building pressure on green field sites.

Brownfield land is often more difficult to use than green field sites particularly if the site has been contaminated by previous industrial use. The traditional approach to this has been to simply dig up the problem soil and dump it elsewhere. This is not the most sustainable or cost effective approach. "A far better approach is to use soil stabilisation and solidification to deal with the problem on site", explained Al McDermond, Chair of Britpave Soil Stabilisation Task Group. "Insitu remediation and improvement of poor quality brownfield land using cementitious materials removes the cost of landfill taxes and the cost and environmental impact lorry movements and importation of virgin aggregate."

He continued: "Soil stabilisation/solidification is a most effective way to bring brownfield land back into productive use and so help provide the land needed to increase the country's housing supply."



Britpave Soil Stabilisation Task Group update

In addition to its ongoing reviewing and updating of the Highways Agency HA74 'Treatment of fill and capping materials using either lime or cement or both', progress is being made on the draft of the NHBC/BRE soil stabilisation guidance for housing developments and on addressing the illogicality of the Aggregates Levy.

Other issues being addressed by the Task Group include the development of new site guidelines on the use of FP3 and FP1/FP2 face masks, how best to educate clients on the benefits of employing reputable soil stabilisation contractors and the provision of an industry briefing at the forthcoming 2015 PlantWorx exhibition. The Task Group is celebrating ten years of representing the soil stabilisation industry and forwarding industry development and best practice. As soil stabilisation is being increasingly recognised as an engineering solution the Group continues to help take the industry forward.

New UK Specification for Roller Compacted Concrete

Britpave has established a Working Group to facilitate the wider use of roller compacted concrete (RCC) in the UK by producing a specification which would allow the use with confidence of RCC into mainstream ports and road applications.

There is no current published specification in the UK other than an outline produced by ERMCO (European Ready Mixed Concrete Organisation) and RCC has consequently been largely confined to low grade applications. There is a need for a robust specification to address the issues, such as multi-lift paving and joints, encountered with cement bound granulated mixtures (CBGM) paving.

The Working Group, which has recently produced the Britpave Guide to Roller Compacted Concrete Pavements, will also liaise with like-minded groups involving the Mineral Products Association and the Highways Agency to develop pavement design and materials production standards for RCC.

Hydraulically Bound Materials for Pavements in Winter

The guidance report on hydraulically bound materials for pavements in winter is now due for publication.

The guide addresses the practicalities of mix-in-plant production and laying hydraulically bound mixtures (HBM) in ambient temperatures around and below the freezing point of water. Specification of HBM is covered in the Highways Agency's Manual of Contract Documents for Highway Works, Volume 1, Specification for Highway Works Series 800, and in the Defence Infrastructure Organisation's Specifications 51 and 52. It will be a companion document to the Britpave guide 'Concreting Pavements in Winter'.

The Case For Concrete Slab Track

The growing focus on minimum maintenance and whole life cost is increasing the attractiveness of concrete slab track reports Joe Quirke, Chairman of the Britpave Rail Task Group.

A number of factors are combining to forward the benefits of concrete slab track over other track options. Increased train speeds and axle loads are challenging the performance limits of conventional ballast track systems. The growth of rail traffic is reducing the opportunity to carry out track maintenance and renewal with night-time possessions becoming increasingly limited. In addition, there is a growing appreciation of the beneficial whole life costs that sees the impact of construction more than recouped with the long-term savings of reduced maintenance and renewals over a track's lifetime.

For the UK, these factors are coming together at a time of increased investment in the rail network, notably with major capital schemes and a considerable Network Rail programme of works. It means that interest in the long-term performance and minimum maintenance potential of ballastless concrete slab track, which to date has had limited installation in the UK, is gaining momentum.

Evidence from those countries that have rail networks based on concrete slab track, such as Japan, Germany and Holland, shows that although there are significant number of developed concrete slab track systems they share common benefits not least of which is a high safety, enhanced ride quality and punctuality record. For high speed rail, concrete slab track offers particular benefits. High speed trains travelling between 300kph to 400kph produce powerful air flows that can cause ballast to fly and damage the undercarriage of the train. There is also the issue of ballast settlement. In France, where they opted for traditional ballast for the high-speed TGV rail network, some lines have to be swept clean and have the ballast replaced and repacked every night. The French are now reported to be examining replacing ballast with concrete track slab.

In essence, concrete slab track is where the sleepers are cast into a concrete surround that provides inherent mass, stability and track restraint. Concrete slab systems offer permanent track solutions with a fixed alignment that does not move under loading from trains and they do not need to be regularly maintained to restore track position. There are basically two ways of designing slab track. Where no soil settlement is expected the supporting layer should have significant bearing stiffness with the concrete slabs containing reinforcement to control the crack width. Where the slab track is to be placed upon subgrade soil where settlement may occur, the concrete slab has reinforcement placed at the top and at the bottom in order to accommodate bending stresses and axial forces. In terms of construction, concrete slab track may be prefabricated, cast in situ or slipformed.

The many different slab track systems available have varying levels of complexity and performance which means that the engineer must take responsibility to determine the optimum design for a particular application such as high speed, tunnel, viaduct or noise sensitive areas. In addition to the generic benefit of low maintenance, all of the available systems offer reduced construction depth and structure gauge. Providing slim line construction with fixed geometry results in a reduced structure gauge which in turn means that tunnel bore diameters and viaduct widths can be reduced. Concrete slab track also offers opportunities for optimising the design of trackside elements. The foundations for trackside or in-track structures such as noise barriers, derailment containment and overhead electrification equipment can be integrated into the slab design. Slipformed drainage channels can be incorporated into the slab track. In addition, when designing concrete sub-structures such as viaducts, piled slabs and tunnel inverts, the shape and structural performance of the concrete track slab can be taken into account thereby providing a more efficient design.

Although slab track installation costs can be typically some 10 per cent more than for ballast track installation, the ongoing yearly maintenance costs for slab track are significantly lower and the overall whole life costs are considerably better due to a design life of 60 years which is double than that of ballast. This favourable cost equation is now being increasingly examined as rail designers look for a low maintenance, whole life solution.



Reading Train Care Depot

Concrete slab track has been installed at the new 6,500m² £36m Reading Train Care Depot constructed by VolkerFitzpatrick on behalf of Network Rail.

The new depot has been built to the west of Reading station to free up the depot's previous location for new rail routes to increase rail transport capacity. Built with enhancements to allow for future stabling and servicing of electric trains, the new depot provides capacity for 147 vehicles made up of a mixture of diesel and electric trains. Slab track was installed in the carriage wash and the under-frame buildings.

In total, the project involved the construction of a new 210m long, 37m wide depot shed with a three -road light-maintenance 'through' road shed and a single road heavy maintenance shed, main stores, a workshop, plant rooms, a signalling room, a three storey production management office with 17 associated buildings and a 30 space car park.

Other works included a new access road and associated drainage works, site drainage including interceptors, pump chambers, soakaways and holding tanks, fuel farm, drivers walkway and lighting, under track crossing (UTX's) and duct routes, a substation and troughing routes.

This project also saw the first overhead wires installed for Network Rail's £895 million Great Western Electrification Programme. 2,000m of overhead line was installed on 211 head spans from the east sidings to the west sidings, along with depot ballasted track involving overhead line electrification (OLE), piling, construction of OLE structures and bases and OLE bonding.

VolkerFitzpatrick also introduced new innovative products and procedures to this project, including the use of syphonic drainage to prevent overcrowding of the underground services and GRP duct boxes to reduce manual handling. Other innovations included a change from insitu to precast GRP pumping stations thereby saving time and improving health and safety and using a Geo-light system rather than stormblock soakaway/attenuation systems.

Collaboration was a key feature of this project with Bill Henry, Network Rail project director, commenting: "VolkerFitzpatrick's multi-disciplinary team has performed since day one to a consistently high standard, collaborating with Network Rail and our stakeholders to meet project objectives safely and on time."

This was echoed by Richard Offord, managing director of VolkerFitzpatrick, who said: "This project show cases how VolkerFitzpatrick, through collaboration and understanding the needs and challenges associated with depot works, has gained a reputation as market leader in the delivery of rail depots and train care facilities."

In recognition of the high level of collaboration VolkerFitzpatrick and the Network Rail team achieved BS11000 certification for collaborative working.



Gatwick Runaway Success

The pressure of keeping airports fully operational is considerable. Repair and maintenance work can only be undertaken during limited possession times and so has to be fast, efficient and long-term. Allied Infrastructure has undertaken many airport projects including London Gatwick.

An example of the need to work within the tight parameters of night possessions, is the contract undertaken by Allied Infrastructure for the Aviation Ground Lighting (AGL) runway rehabilitation at Gatwick.

The contract, awarded by principal contractor VolkerFitzpatrick, involved installing 20km of sacrificial temporary secondary cables in cable chases to the runway edge and approach lighting to maintain category one lighting. Once the temporary wired system was in place, 2220 existing AGL seating rings were removed by coring 800mm diameter holes x 400mm deep. The seating rings were then reinstated in rapid set concrete. Following this, 2200 bases for the new seating ring locations were installed by coring 600mm diameter holes by 400mm deep and again then reinstated in rapid set concrete.

Next, 22km of ducting was installed in the runway pavement in trenches 300mm wide and 650mm deep. These were diamond saw cut and the centre removed with a 17t rock wheel. This significantly improved efficiency compared to traditional breaking out techniques. The ducting was reinstated in rapid set concrete. Once that the new AGL infrastructure had been installed in the existing surface, the surfacing and grooving was undertaken and Allied installed the 2200 new seating rings.

All works were undertaken during five hour night possessions and, although inclement weather proved particularly challenging, by working closely with VolkerFitzpatrick the overall programme was not only maintained but accelerated by provided additional resource at critical times.



Airports Bid Attracts Overseas Investment

Singapore's sovereign wealth fund, The Government Investment Corporation of Singapore (GIC), is planning significant investment into UK airport infrastructure having joining a consortium vying to buy three of the UK's largest regional airports.

GIC is expected to invest equity together with Ferrovial, the Spanish infrastructure group, and Macquarie, the Australian bank which are finalising a £1 billion take-over of Aberdeen, Glasgow and Southampton airports. The airports which handle 13 million passengers a year are being sold by Heathrow Airport Holdings as part of the process to break-up the company, formerly known as the British Airports Authority, which began in 2008 following calls from the Competition Commission for it to sell three of its seven airports. Gatwick and Edinburgh airports were sold for a total of £2.3 billion to Global Infrastructure Partners, while Stansted was sold to the Manchester Airports Group for £1.5 billion in 2013.

It is thought that the sale of Aberdeen, Glasgow and Southampton will allow Heathrow Airport Holdings to concentrate on lobbying for a third runway at Heathrow, a recommendation on which is due next year from Sir Howard Davies's commission.

New Members

A warm welcome to the following new Britpave members:

Barr Quarries



Britpave welcomes new member Barr Quarries. Barr Quarries deliver materials such as aggregate, ready mix concrete, asphalt, sand and gravel and decorative stone. They also supply materials to their Barr Surfacing and Civil Engineering Division.

Barr Surfacing and Civil Engineering is primarily involved with the completion of civil engineering and surfacing works on the trunk road and local road network throughout Scotland and Northern England. During the past 50 years Barr have completed a number of significant road construction and maintenance projects across the UK.

These projects have involved all aspects of road construction and civil engineering works and project range from £50,000 to £10 million, covering trunk roads, urban roads, rural roads, principal routes, motorways, delivery areas and car parks. Clients include local authorities, operating and maintenance companies and major contractors. We provide our clients with solutions and services as both a main contractor and sub-contractor delivering outstanding service and reliability of performance for our customers.

For further information contact:

Chris Edwards, General Manager
Barr Surfacing and Civil Engineering

T: 01290 700 700
E: chris.edwards@barr.co.uk
W: www.barr.co.uk

Allied Infrastructure Management Ltd



Providing specialist maintenance and repair expertise for the airport, highways and defence sectors is new Britpave member Allied Infrastructure Management Ltd. Allied has developed a range of specialist BBA HAPAS approved materials such as thin-bond recessed repair materials and is one of the largest joint sealant providers

in the industry with their materials being specified at a number of major UK airports. With over 20 years' experience of airfield and highway maintenance, Allied are able to provide solutions and products that offer fast curing and long-term durability and performance.

Services include AGL civils works, AGL seating ring installation, rock wheeling and duct installation with rapid set concrete reinstatement. The company also carry our general maintenance works such as ironwork repairs, concrete protection, concrete and asphalt repairs (both hot and cold applied), extruded joint sealing and recessed/standard overbanding. Civil engineering works include PQC and PQX (rapid set) bay replacement, ducting, drainage, ground works and footpath projects.

Recent accolades for Allied include the International Safety Award 2014 from the British safety Council, Innovation and Safety Award 2013 from Heathrow Airport and Manchester Airport Specialist Contractor of the Year Award 2010.

For further information contact:

Tricia Green, Business Development Manager and Key Account Manager

T: 07442 531152
E: tricia.green@alliedinfrastructure.co.uk
W: www.alliedinfrastructure.co.uk

Britpave Members

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

Allied Infrastructure Management Ltd – www.alliedinfrastructure.co.uk
Arup and Partners Ltd – www.arup.com
Atkins Ltd – www.atkinsglobal.com
Balfour Beatty Ltd – www.balfourbeatty.co.uk
Ballast Phoenix Ltd – www.ballastphoenix.xo.uk
BAM Contractors – www.bamcontractors.ie
Barr Quarries Ltd – www.barr.co.uk
Bardon Composites Pavements t/a Aggregate Ind – www.aggregate.com
Barton Plant Ltd – www.barton-plant.co.uk
Beach Soil Stabilisation – www.beachstabilisation.com
Birse Civils Ltd – www.birsecl.co.uk
British Lime Association – www.britishlime.org
Carillion Group – www.carillionplc.com
CEMEX UK – www.cemex.co.uk
Colas Ltd – www.colas.co.uk
Combined Soil Stabilisation Ltd – www.combinedssl.co.uk
Complete Design Partnership Ltd – www.cdpbroms.co.uk
Costain Ltd – www.costain.com
Dublin Airport Authority plc – www.dublin-airport.com
East Midlands Drilling – www.emdd.com
Elkem Materials Ltd – www.concrete.elkem.com
Extrudakerb Ltd – www.extrudakerb.co.uk
Fixing Centre Ltd – www.fixingcentre@btconnect.com
Geofirma Soil Engineering Ltd
Gill Civil Engineering Ltd – www.gillgrouphouse.com
Gomaco International Ltd – www.gomaco.com
Halcrow Group Ltd – www.halcrow.com
Hanson UK Ltd – www.hanson.biz
Interserve Construction Ltd – www.interserveplc.co.uk
John Donegan Consultant – www.jpdonegan.consult@gmail.com
Lafarge Tarmac Ltd – www.larfargetarmac.com
Lagan Construction Ltd – www.laganconstruction.com
Morgan Sindell plc – www.morganest.com
Norder Design Associates Ltd – www.norder.co.uk
PJ Davidson (UK) Ltd – www.pjd.uk.net
Pryor Stabilisation – www.pryor.co.uk
RJT Excavations Ltd – www.rjtexcavations.co.uk
RPS Group plc – www.rpsgroup.com
Skanska UK plc – www.skanska.co.uk
TR Stabilisation – www.trstabilisation.co.uk
TRL Ltd – www.trl.co.uk
Tyrolit Ltd – www.tyrolit.com
University of Nottingham – www.civeng.nottingham.ac.uk
UK Quality Ash Association (UKQAA) – www.ukqaa.org.uk
VolkerFitzpatrick Ltd – www.volkerfitzpatrick.co.uk
Wirtgen Ltd – www.wirtgen.co.uk



Britpave, Indigo House, Unit 10, Mulberry Business Park,
Fishponds Road, Wokingham, Berkshire, RG41 2GY
United Kingdom
Tel: +44 (0)118 402 8915 Email: info@britpave.org.uk
Web: www.britpave.org.uk