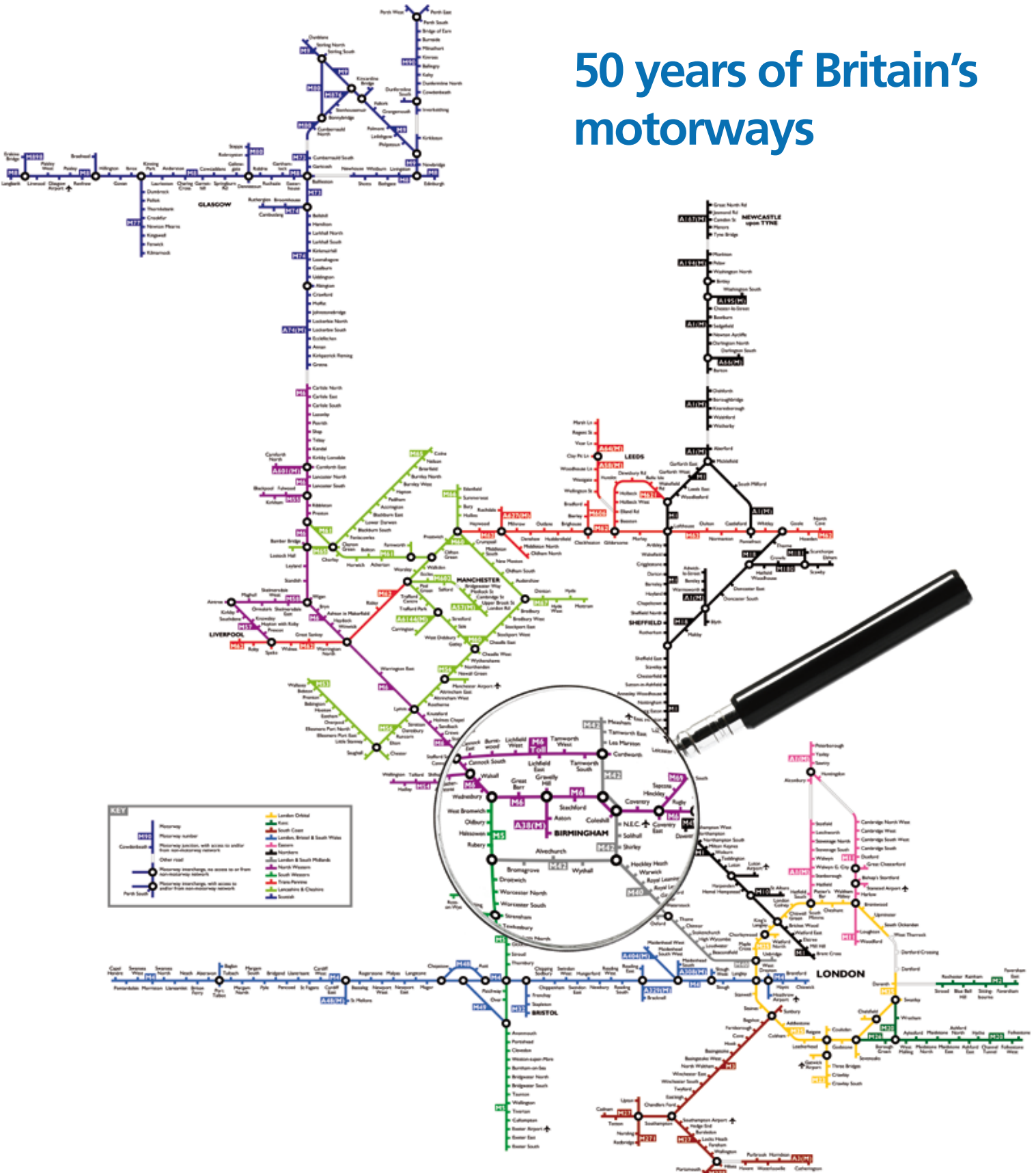


BRITPAVE® NEWS



50 years of Britain's motorways



DIARY DATES

- Britpave Annual Dinner and Seminar – 5 and 6 October 2009, Oxford

WELCOME

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Editors Note



Dear Member,

Britpave always tries to keep abreast of developments and be up to date with the marketplace in which its members operate. In the current climate we can't fail to be feeling the 'credit crunch' and the downturn. In many areas of our industry, this is a cause of concern for us all. Britpave is pressing for continued investment in all its market areas believing strongly that concrete solutions are more relevant than ever in offering long life, value for money improvements to the country's infrastructure.

The team at Britpave has been very active over the past few months. The Annual Seminar back in September was a huge success and we have received very positive feedback from all those who attended. I'm sure you will be pleased to hear that we are already planning the 2009 Seminar; this is to be held in Oxford on the 5th and 6th October. There is a special incentive to help ease the cost with a 'buy one get one free' offer on seminar places.

In November we had the opportunity to attend our first Road Expo in Edinburgh. This annual event is the only one of its kind in Scotland. Over the two days both local and national authority personnel come together to learn and update their knowledge within the road industry. Britpave were lucky enough to hold two seminars at this prestigious event, the full write up can be seen on page 3.

As always I would like to welcome our new members. Plus its nice to see as people move organisations, they stay in touch with Britpave to continue their working relationship with us.

Best regards

David Jones
Director of Britpave

Motorways (front cover)

Much has been written about the 50th Anniversary of the opening of Britain's first motorway, the 8 mile long M6 Preston Bypass. This was opened by the Prime Minister, Harold Macmillan, in December 1958, who promptly committed the first offence on a motorway by stopping and getting out of his car to admire the works!

The map on the front cover, depicted by Gerald Higgins in the style of the classic London Underground map, shows how much progress has been made in that 50 years. Britpave would be amongst the first to point out that the concrete sections of the network have performed very favourably compared with the often reconstructed asphalt sections. The UK now has over 3,500 km of motorway. Less than 200 km of this length is protected by Britpave concrete barrier, so there is plenty for our Installers to go for!

For your own copy of the map please contact www.themapcentre.com.

NEWS ROUNDUP

Road Expo Scotland

Britpave attended Road Expo Scotland for the first time on 5 and 6 November in Edinburgh. Road Expo is the only event of its kind in Scotland where delegates have the opportunity to network with hundreds of roads, transport and traffic management professionals, see the latest products and services and attend topical and informative seminars, all under one roof.

Britpave had an exhibition stand for the two day event, which attracted both public and private sector visitors.

These included:

- Central Government & Local Authority Departments
- Designers
- Highways Maintenance and Construction
- Road Safety Personnel
- Transport Planners
- Surveyors
- Emergency Services
- Civil Engineers
- Consultants
- Educational and Research Organisations
- Architects

Presentations

Britpave were delighted to be able to give two informative presentations within the Information Exchange on day one of the event. James Charlesworth of Extrudakerb and Peter Abel of Laing O'Rourke kindly gave up their time to assist Britpave.

James Charlesworth, Director of Extrudakerb, gave a presentation on 'The Latest Developments in Concrete Step Barrier'. The presentation covered the safety crash testing of Britpave Step Barrier to withstand the impact of a 13 tonne bus. The audience were able to watch the footage of this test, alongside the computer simulations of a crash with steel barrier. They were also able to watch the Britpave video of a HGV driver reporting on the day he was unfortunate enough to have a tyre 'blow out' on the M25. He believes the fact a Concrete Barrier was on the road saved his life, as his HGV caught fire after being directed along the length of the barrier. Had the barrier been steel, he would have certainly crashed through it.

Peter Abel, Chief Materials Engineer for Infrastructure of Laing O'Rourke, gave a presentation on 'Designing for Quality and Durability'. This presentation was to aid those who are involved in the construction or design of concrete pavements. It covered ways of ensuring that the various product testing is carried out correctly, in both the laboratory tests and on site. Emphasis was also given to possible issues and common problems faced whilst on site, together with recommendations on how to achieve top quality pavement concrete.

Best visitor promotion

Britpave were honoured to receive an award by the event organisers, Faversham House Group. This was awarded for going over and above the call of duty in promoting their presence at the show.

All in all the event was a success and Britpave enjoyed two very busy days, introducing themselves to the Scottish public.



David Jones greets Edwin Petrie - Holcim



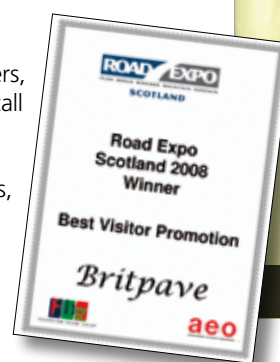
James Charlesworth – Extrudakerb



Peter Abel – Laing O'Rourke



Leanne Cobb receives commendation





**President – Aniceto ZARAGOZA RAMÍREZ,
General Director Oficemen**

**Vice-President – David P. JONES,
Director Britpave**

Eupave in Development

2007

September

Sonja Bruyninckx started working as Marketing and Communication Coordinator under Febelcem contract as of **18 September 2007** for the foundation of EUPAVE.

November

Mid November 2007 EUPAVE welcomed an Italian delegation for a two-day visit in Belgium.

November

At the request of Mr Claude Van Rooten (President of the Forum for European National Highway Research Laboratories (FEHRL)), EUPAVE was invited to attend the New Road Construction Concepts Workshop in Brussels on **16 November 2007**. A short introduction about EUPAVE was given.

December

EUPAVE, the European Concrete Paving Association, is officially formed 4 December 2007.

2008

January

21 January 2008 EUPAVE assisted in a meeting with MM. Covarrubias (Sr. & Jr.) from TCPavements concerning a new pavement technique.

March

Eupave ratified by publication in the Belgian Bulletin of Acts on **5 March 2008**.

20 March 2008, www.eupave.eu is launched. Average of 400 visitors a month

April

First Newsletter was launched on **30 April 2008**.

May

EUPAVE became member of the European Union Road Federation in **May 2008**. Since then, EUPAVE participated in several activities and working groups, organised by the ERF:

- 3rd European Road Congress, Brussels;
- ERF General Assembly;
- ERF Working Group on Noise;
- ERF Working Group on Sustainable Construction;
- ERF Working Group on Road Restraint Systems;
- ERF Infrastructure Safety Forum.



2008 (cont.)

July

In **July – August 2008**, the EUPAVE prospectus was reviewed and a total of 1,000 copies were printed.

August

01 August 2008 Sonja Bruyninckx – transferred to Eupave Contract

During the summer of 2008, EUPAVE produced two promotional pull up banners.

September

29 & 30 September 2008 EUPAVE attended the Britpave Annual Dinner and Seminar in Stratford-upon-Avon. This business meeting opportunity was an excellent occasion for networking and to give more visibility to the Association.

30 September 2008
2nd Newsletter



EUPAVE TIMELINE



June

3 June 2008

EUPAVE organised a lunch meeting in the European Commission in cooperation with Alonso Asociados. A distinguished audience, which included representatives from the main EU institutions (EU representatives, MEPs and members of the DG TREN of the European Commission), was present. EUPAVE took the opportunity to present its reason for founding, its activity areas and presented its future goals.

Speeches were given by:

- EUPAVE President, Mr. Aniceto Zaragoza
- EUPAVE Managing Director, Mr. Jean-Pierre Jacobs
- EUPAVE Vice President, Mr David Jones
- Mrs. Inés Ayala Sender, member of the Commission Transport & Tourism in the European Parliament.

June

4 June 2008

EUPAVE organised its first site visit on the E34 near Antwerp, entitled: "Maximising sustainability in road construction". A delegation of about 40 people from 7 different countries attended this event.

October

ISCP – International Society for Concrete Pavements

EUPAVE was present at the 9th International Conference on Concrete Pavements, organised by the ISCP in San Francisco. The EUPAVE President gave a welcome speech and keynote address during the first day of the conference. In future, the EUPAVE Technical Committee will maintain close contact with the ISCP in order to evaluate and compare the different technical aspects in the USA and Europe regarding concrete pavements.

7 October 2008 launch of Extranet – members have access to the EUPAVE extranet. This tool allows the members to be kept informed on the latest information regarding meetings, budget, website statistics, etc.

Mid-October 2008 – 3rd Newsletter

November

Mid November 2007, EUPAVE welcomed an Italian delegation for a two-day visit in Belgium. At request of FEHRL's (Forum of European National Highway Research Laboratories) President, Mr. Claude Van Rooten, EUPAVE was invited to attend the New Road Construction Concepts Workshop in Brussels on **16 November 2007**. A short introduction about EUPAVE was given.

On **25 November '08**, EUPAVE had 18 members from 9 different European countries.

December

Eupave moved to new offices

15 December 2008
4th Newsletter

What's to come 2009 and beyond

ECTP – European Construction Technology Platform

The ECTP consists of contractors and is supported by the concrete industry regarding applied research & development. ECTP's approach is more technical and could therefore cooperate with EUPAVE's Technical Committee. EUPAVE applied for membership and the cooperation agreement was received Mid November 2008. EUPAVE will be member as of 2009. A delegate to participate in the meetings of the ECTP will be appointed.

ACPA – American Concrete Pavement Association

In 2009, EUPAVE will have a meeting with the ACPA regarding future cooperation between both associations. The meetings will also serve to investigate how ideas and experiences can be shared to the benefit and promotion of concrete pavements in both the USA and the European Union.

ECF – European Construction Forum

EUPAVE applied for membership of the the ECF. The membership procedure is ongoing and EUPAVE will possibly be member as of 2009.

International Symposia on Concrete Roads

Having taken over the ownership from CEMBUREAU in organising the future international symposia on concrete roads, EUPAVE is charged with the technical aspect of these symposia. This entails the organisation of the ITPC (International Technical Programme Committee) meetings, promotion of the symposium, assembling abstracts, papers, presentations and producing the proceedings.

EUPAVE also gives its support to the Organising Committee of the hosting country in circulating the promotional material, helping with the translations and lay-out of the first announcement, call for papers and other inputs.

BRITPAVE STEP BARRIER®

Joint venture completes Belfast project early

DBFO 1, Project 3 – M2 junction 3 to 4, Northern Ireland

Work on a major motorway refurbishment scheme is now complete, following over 12 months of planning and design development.

In June 2008, a joint venture between Extrudakerb and their Irish partner Highway Barrier Solutions, was awarded by the principal contractor, HMC Joint Venture. This was a £2.2m sub contract to design and build a central reserve concrete barrier, retaining wall and associated linear insitu concrete drainage system.

Extrudakerb / HBS partnership have integrated within the HMC Joint Venture team and designers Arup to ensure that the demands and expectations of their clients were fully realised by the Extrudakerb design.

Extrudakerb's designers, Norder, worked closely to develop an industry first: a concrete barrier system and retaining wall to accommodate carriageway level differences of up to 1.2m. The system, based upon the Britpave Concrete Step Barrier, is primarily slipformed with some conventional hand poured foundation elements.

The concrete structure needed to meet the structural requirements of a carriageway retaining wall and that of the foundation for a Britpave concrete barrier system.

The brief stipulated that the overall width of the barrier system should not exceed 1.0m, not too difficult for a standard barrier with a footprint of only some 542mm. However carriageway street lighting had to be sited within the central reserve.



As a standard Britpave Wide CSB has a footprint of some 942mm, Extrudakerb and their designers spent many hours in brain storming meetings to develop compliant but ground-breaking structural design as well as minimum clearance width paving moulds, to meet this demanding overall width requirement.

The solution developed saw the construction of in-situ mass poured foundations and two parallel CSBs placed in very close horizontal proximity to each other and each aligned with the adjacent carriageway such that their base level differences were up to 1.2m.



Reinforced concrete build-outs were designed by Norder upon which 15m high street lights are mounted. A special reduced depth cradle anchorage was developed by Fixing Centre to fit within the limited space available.



Bespoke steel formwork was designed and manufactured by Extrudakerb for each uniquely shaped light column build-out.

Where existing carriageway levels differed by less than 300mm a standard Britpave variable profile barrier was incorporated. To allow for

the incorporation of street lighting along the line of the central reserve the wide version including a longitudinal trough, where ducting and cabling is installed, was constructed.



This variable profile Wide Britpave barrier was constructed using one of Extrudakerb's variable profile moulds. These moulds are designed and fabricated in house where the blend of experienced slipform contractor and machinery manufacturer has resulted in class-leading technology.

In line with Britpave Specification heavy duty stainless steel anchors, again supplied to Extrudakerb by supply chain partner Fixing Centre, were installed and tested by Extrudakerb. Specific transition details from the twin barrier system to the standard wide variable Britpave barrier were designed and constructed by Extrudakerb, again using bespoke steel formwork manufactured in-house.



Asymmetric and symmetric transitions were required from the barrier systems to existing strengthened concrete bridge piers and concrete sign gantry bases. The Britpave design

was developed by Extrudakerb and Norder to simplify construction and meet specific project demands.



In-situ concrete drainage channels and slot drains were developed as well as the associated outfall chambers and gulleys. In total over 4,500 metres of in-situ concrete drainage system was slipformed.



Separate formwork gangs worked in tandem with the slipform paving crew to ensure that these works progressed concurrently with the main line slipform elements. In fact, it was the completion of this formwork construction that proved to be the critical path for the works.



Extrudakerb utilised a number of their own HGVs fitted with integral Hiab cranes to transport and handle the heavy steel formwork that had been specifically designed and fabricated for this project.

In total some 8 lorry loads of equipment were shipped from England to Belfast; including over 50 metres of barrier steel forms and seven slipform paving moulds.

Paving works were carried out using one of Extrudakerb's four Gomaco Commander III slipform machines. Like all Extrudakerb's slipform pavers, the machine was set up in a 4-track configuration and its ability to mount moulds to both sides again proved vital. This allowed paving to always progress in the same direction as adjacent traffic flow therefore avoiding the need to turn supply wagons around on a congested and narrow site.

The paving and shuttering crews were supported by a fleet of some six medium vans that carried both the manpower and their specialised equipment.



Extrudakerb set up a local site office to better manage construction on site. Crews from England travelled to Belfast working two full weeks on and one long weekend off. Throughout the works all vehicles and equipment remained in Belfast stored in the principal contractor's site compound. Extrudakerb purchased minibuses that were used to transport the crews between England and Belfast.

An original four month programme developed by Extrudakerb to best meet the critical path of this complex scheme was completed some

four weeks ahead of schedule with principal works completed by the end of November 2008.

Concrete to this project was again supplied by Cemex, Extrudakerb and HBS's supply chain partner in Northern Ireland.



Mix was based upon previous proven design although some tweaks were made to suit variations in currently available local aggregates.

Outputs peaked at over 24m³ per hour with the company's previous daily productivity records being exceeded. In total over 8,000m³ of concrete were supplied to the barrier works, and was independently tested for Extrudakerb by Mattest.

Highway Barrier Solutions, a leading steel barrier erector, again provided Extrudakerb with valuable local assistance and guidance as well as construction of the insitu concrete foundation slabs and light column build out reinforcement.

Highway Barrier Solutions also provided steel barrier in the verges and across Greencastle Bridge where loading capacity precluded the use of concrete barrier.

Our partnership with Highway Barrier Solutions grows from strength to strength and now includes concrete barrier installation on the A2 Sydenham Bypass and the A1/N2 Newry to Dundalk cross border motorway. The blend of two specialised concrete and steel barrier contractors with the added benefit of local knowledge and reputation has become an unbeatable combination.

BRITPAVE STEP BARRIER®

PJ Davidson reaches 1,000,000 metres of slipformed concrete

Peter Davidson, a Britpave Licensed Installer, reached the 1,000,000 linear metre mark for slipforming in December 2008. Davidson slipforms Britpave Step Barrier®, slot drain, v-channels and concrete pavements.

Originally from a farming background, Davidson started the business in 1978, muck shifting, using County tractors and tipping trailers to haul materials for larger contractors in the concrete business. He considers that his big break came in 1981, when John Ferguson, currently of Gill Civil Engineering, called about a concrete paving train job in Abergavenny and this led to work on the A40 Abergavenny to Raglan.

In 1994 Davidson purchased his first Gomaco Commander III and has used nothing else since. The machines are replaced on a three-year cycle and to date they have had 13 of these machines. At three years old, his Commander III's tend to have around 5000 hours on the clock. This is partly the nature of the job, as the machines are regularly working 24 hours a day to provide continual barrier or v-channel drain on road construction and tunnel projects.

Davidson is almost permanently on the road and the majority of the company organization is done from the seat of his Range Rover. There are 80 men working on a 12 hour rotation, 12 hours on and 12 hours off to keep the machines running. "Usually on an ordinary day shift we can average 300 linear meters of wall," Davidson said. "If we go 24 hours nonstop, we'll average around 700 linear meters. I wanted to hit one kilometer of production in a day, but we haven't done that... yet."

The 1,000,000 paving milestone was reached on the M1 Motorway near London, between Junctions 6A and 10. Davidson has the contract to slipform 32 kilometres of Britpave Step Barrier®, 28 kilometres of v-channel, and 3 kilometres of slot drain. Kent Godbersen, Gomaco's Vice President of Worldwide Sales and Marketing, Rory Keogh, Gomaco International Ltd.'s Managing Director, and Randy Bean, Gomaco's International Sales Coordinator, joined Davidson on the project as the million mark was hit.

"Peter is not only a long-time customer of ours, but also a true friend of Gomaco,"



Godbersen said. "It's been fun watching him take on all of the challenging projects that he has, and it was an honor to be a witness to his paving milestone. It is always interesting to see what unique projects Peter will come up with next."

The machine is fed by four 6x4 concrete trucks from an on-site batching plant. This keeps the machine working, allowing for a production between 30-40 linear metres per hour. Even though the concrete is coming from a known source, every truck is tested by the on-site lab man Chris Tyrrell. Each sample test cube is tested after 7 and 28 days for strength. Tests are also carried out for the degree of compactability by compressing a small amount of concrete in a pressure vessel.

Davidson's Commander III on the project is as unique as the accomplishment. It has been adapted to fit the company's demand for accomplishing challenging projects.

It's a four-track machine with the capability of either right-side or left-side slipforming. Gomaco engineers basically took the standard Commander III framework and rotated it 180 degrees underneath the prime mover.



The hydraulics normally used for telescoping the four-track frame are now used to position the conveyor. The conveyor can be positioned by the operator for right-hand or left-hand pours by simply pushing a button from the operator's platform.

This Commander III features a hydraulically folding conveyor. It's a standard 24 inches wide, 20 ft long conveyor, with a 5.5 foot folding section. Again, the operator can accomplish the task simply by pushing a button from the operator's platform. The folding conveyor cuts down on the overall length of the machine and makes loading and transporting the machine easier.



Davidson's machine also has 300 millimeters (11.8 in) of offset built into the mold's mounting beams. He can position the Commander III's tracks on the roadway and hydraulically offset the mold in or out for correct placement.

"It's a great feature," Davidson said. "Sometimes the people who are preparing our grade and saw cutting the existing roadway get it grossly wrong. Before, we'd either have to come in and back fill or run our tracks down in the hole. Now, we just position the machine on the roadway, hydraulically move the mold out, and set the machine up."

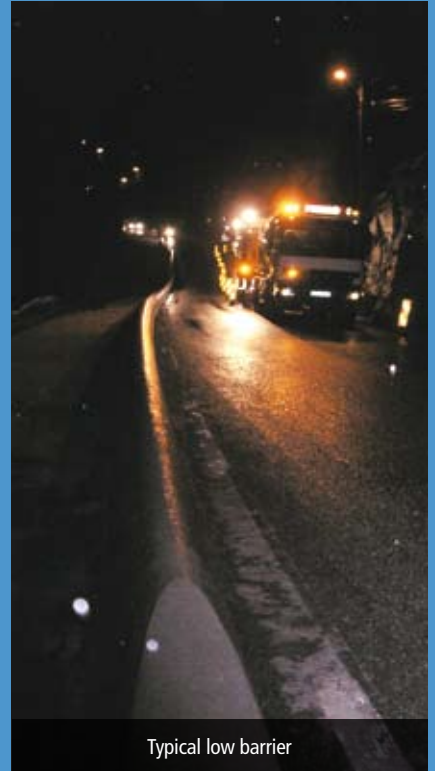
Davidson has taken over 14 years to achieve the 1,000,000 metre mark, but he is very confident that the next 1,000,000 won't take nearly as long. He is currently working in the UK on the Channel Tunnel Rail Link project beneath London and on a tunnel project in Sweden. These stories will be featured in a future edition of Britpave News. You will also see PJ Davidson working on the M25 later this year.

Paving at night in Norway

Mesta AS, Norway's Britpave Licenced Installer, invited Director David Jones to see some typical barrier construction. This visit coincided with Mesta's annual audit and the visit took place in December in Bergen on Norway's West Coast.

Norway's vast network of main roads is undergoing a major programme of barrier installation and upgrading. The site visit saw a typical verge application, with short runs of barrier being installed throughout the region. In addition to the programme of verge protection there is also a programme of improving the protection offered by existing low barrier. These simple, curved top, low barriers are being transformed into standard 900mm high step profile Britpave barriers. Again, short paving lengths are typical, with off-peak construction at night for both the new verge barrier and the re-profiled barrier. As the photos show, paving continued in the sleet and snow!

Special thanks to Truls Eversen and Roar Kristiansen for making the visit possible.



Typical low barrier



Night paving

AIRFIELDS

High-speed measurement of airfield pavement condition

Alex Wright

Group Manager, Technology Development and Quality Assurance, TRL .

The last ten years has seen a significant growth in the application of high-speed techniques for the measurement of surface condition on the UK road network. This began with the development of the HARRIS1 survey vehicle at TRL, which took high-speed image collection equipment and applied this to the automated measurement of surface cracking. Laser systems were added to measure shape, and hence rutting and ride quality, to give a fully functional high-speed condition assessment system, see Figure 1. The developments demonstrated in HARRIS1 were used as the basis for the specification for the Highways Agency's TRACS survey of the motorway and trunk road network. This was later expanded to local roads under the SCANNER survey. Combined, these high-speed techniques now cover over 100,000km of the UK road network each year.

The introduction of high-speed survey techniques on the road network was stimulated by the need for an objective measurement of surface condition, which could be undertaken without the need for road closures. On the highway network the traffic-speed data is typically processed using standard algorithms to obtain parameters describing the surface condition in terms of the ride quality, cracking, rutting and texture. These parameters may be combined to obtain an overall condition for each 10m length, expressed as a defect index. Highway engineers can use this information in an initial sift of their network, including the identification of potential schemes, before targeted assessments are undertaken of those lengths short-listed for further attention. The data can also be used in the calculation of network performance indicators.

Whilst high-speed techniques are widely applied on the road network, these methods have only recently been introduced for the assessment of airfield pavements. Surveys of the visual condition of airport pavements are typically undertaken manually, by inspectors carrying out surveys on foot to record the presence, extent and severity of defects. Standard distress types assessed in these surveys include cracking, bleeding, erosion, patching, polishing, ravelling, rutting and shoving, on flexible pavements. On concrete pavements the survey includes common defects such as cracking, joint sealant defects, pumping,

spalling, pop outs and faulting. Each defect is assessed in terms of area or number of occurrences, and severity of each occurrence. This quantitative information is typically combined in an airfield Pavement Condition Index (PCI).

In common with highways, manual surveys of airfield pavements are slow and intrusive. Carrying out such surveys is becoming increasingly difficult as access to operational areas can be limited. The surveys are also subjective and can suffer from poor repeatability. Comparability of survey results across different survey teams can be poor. These surveys also place the inspectors at risk if carried out during operational periods.

High-speed survey methods can be applied in the assessment of airfield pavements at two levels of intensity. A basic application of the high-speed technique can be made by direct transfer of the technology from the road network. Here surveys can be undertaken on lengths of airfield pavements to obtain the rutting, ride quality and cracking information in order to calculate a defects index that estimates the overall condition of particular lengths of pavement. This data can be used in the general assessment of condition to target lengths for further investigation. However, it must be accepted that this automated approach can only provide an estimate of condition. This approach can assist airfield engineers in obtaining a general level of information, but manual surveys would still be required to obtain detailed condition data or for critical areas – for example to plan maintenance, or where there is a need to minimise the risk of pavement defects causing FOD (Foreign Object Debris or Damage).

High-speed survey techniques can also be used to directly replace slow-speed manual surveys, by carrying out more detailed investigation of the data collected by the survey vehicle. In this application the image data is assessed manually after the survey, to record the area and severity of defects. The condition data is provided at a high level of detail for each defect, and can directly feed the quantitative assessment of the condition of the surveyed site. The capability of the method can be enhanced by using the newest generation of survey vehicles, such as

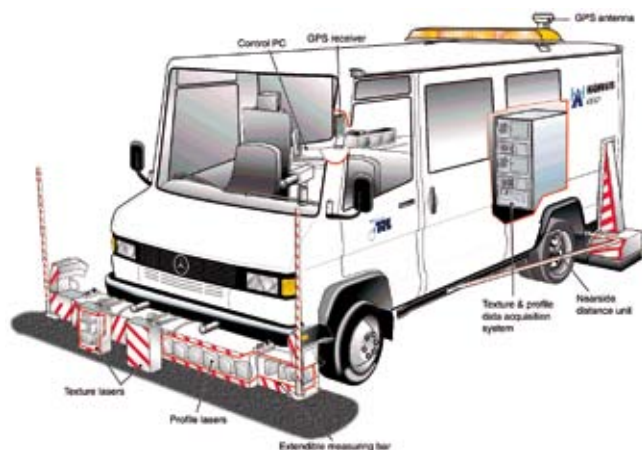


Figure 1: The HARRIS1 survey vehicle



Figure 2: The HARRIS2 survey vehicle



Figure 3: Surface images collected at traffic-speed

HARRIS2. This HARRIS2 employs the latest developments in high-speed data collection, providing high-resolution colour images of the pavement, linked to a scanning laser for the measurement of shape – see Figure 2. The example images shown in Figure 3 clearly show the defects such as joint failure, spalling, and surface loss, which are easily recorded in the manual assessment.

One of the limitations of high-speed image collection systems has been the inability of images to show depth. Although an assessment of the images can provide a report of the presence of defects such as spalling or potholes, the assessor is unable to quantify the depth, and hence the overall severity, of the defect. High-resolution laser measurements provide a three-dimensional picture of the pavement alongside the images, which can be used to assess depth and height. Tools can also be provided to assist the assessor by automatically highlighting severe features, as shown in Figure 4.

Clearly this technique can only be applied practically if the data can be accurately located in relation to the airfield. Developments in inertially aided Global Positioning Systems have simplified the achievement of highly accurate location referencing. The data collection has therefore become the simple process of driving over the areas to be assessed, ensuring that the survey is planned such that the vehicle covers the entire area (for example using several passes each covering a 4m width).

The potential of this approach has recently been demonstrated on the concrete taxi-ways

of a major UK airport. Image, shape and location data was collected at high-speed (around 40km/h) and manually analysed following the survey. The defects identified in a 60m x 40m area are shown graphically, as a defect map, in Figure 5. The number and variety of defects identified can be structured to suit individual client needs. Because each defect is related to its Ordnance Survey Grid Co-ordinate it is a simple matter to transfer the defects to a GIS for further processing and, for example, calculation of a PCI.

Work on the highway network has shown that this approach to the assessment of high-speed survey data can provide a measurement of condition that compares directly with manual on-site surveys. However, the surveys are more consistent and less hazardous than the manual surveys, and they provide the additional benefit of delivering a permanent visual record that can be used later for auditing, assessing changes in condition, or determining treatments. With the increasing demand for airfield and runway space, combined with the need to achieve high levels of safety, there is significant potential for the application of this approach in the assessment of airfield pavements.

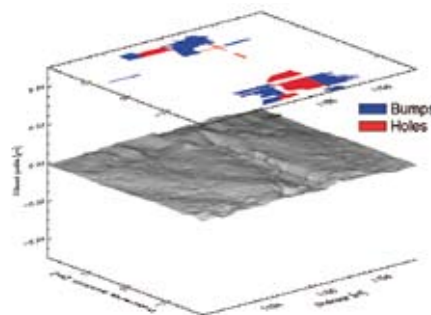


Figure 4: Surface shape measured at traffic-speed

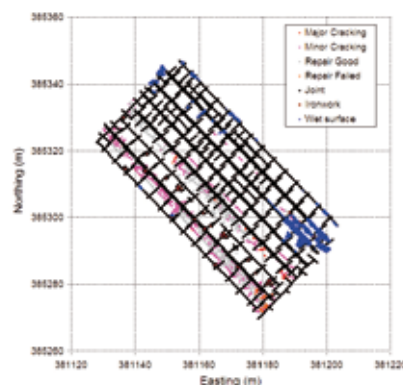


Figure 5: Map of defects identified in high-speed survey data

Cargo Stands Replacement Project at London Luton Airport

In partnership with Lagan Construction, WSP have recently completed a design and build airfield pavement project for London Luton Airport Operations Ltd. The project consisted of a total of 14,000m² of new Pavement Quality Concrete to accommodate concurrent operations of two A300-600 freighter aircraft and their associated ground service equipment.

The construction of the works, required to facilitate the move of part of the business aviation facility, had to be phased in order to maintain the continued operation of the adjacent cargo operation and was completed within the programmed 12 week construction period.

The replacement pavement areas, consisting of 335mm thick Pavement Quality Concrete on 150mm of wet lean concrete, was constructed by Lagan sub-contractor Gill Civil Engineering utilising an on-site batching plant with quality control assured by Lagan's on-site materials testing laboratory.



AIRFIELDS

How Amsterdam's Schiphol Airport prepared for the Airbus A380



Wirtgen's slipform paver SP 1600 easily met the high quality demands at Amsterdam Airport, which specified a maximum tolerance of 5 mm over a length of 3 m in both longitudinal and transverse direction.



Reef Infra's engineers Willem Verstraaten (left), Product Manager Concrete Paving, and Site Manager Tom Steenhagen.



Dowel bars are inserted to ensure the bond between the 10m wide concrete slabs.



Verification measurements during the paving operation showed that the SP 160 worked with maximum precision: level and slope of the concrete surface precisely matched the specified requirements.

In 2006 Amsterdam's Schiphol Airport was ranked Europe's 4th busiest airport having a total of 46 million passengers and 1.5 million tons of airfreight. To retain this top ranking, preparations had to be made to enable the giant Airbus A380 to land, taxi and park at Schiphol.

The suitably large and stable parking and traffic areas were built in front of the terminal between the summer of 2006 and spring 2007, by Dutch contractor Reef Infra B.V., using a Wirtgen slipform paver SP 1600. A special characteristic of this pavement build was the use of wireless control, avoiding the need for stringlines.

The XXL-size aircraft has a maximum takeoff weight of 560 tons, which is higher than that of any other civil aircraft. To accommodate these high loads, the SP 1600 was equipped with a dowel bar inserter (DBI) which reinforced the concrete by inserting dowel bars with a diameter of 45 mm at 5 m intervals. The paver's central tie bar inserter (TBI) inserted longitudinal tie bars to reinforce the concrete across the paving direction. The slipform paver was additionally equipped with a heavy-duty oscillating beam and super smoother to ensure good surface evenness. A well-rehearsed team followed behind the slipform paver, applying a special manual broom finish and spraying a dispersion to prevent the concrete from drying out.

Less personnel + less time = cost savings

A surprisingly small number of personnel were required to carry out this pavement job. In addition to the site manager and truck drivers responsible for transporting the concrete, no more than 2 machine operators, 6 concrete workers and 2 crew members taking care of the wireless control system worked in the immediate vicinity of the Wirtgen slipform paver.

Wireless control produces perfect concrete surfaces

Using proven paving machines combined with a highly mature machine control

system, which furnishes all signals for steering and height adjustment, enables the slipform paver to achieve a high degree of precision. In this project, the specifications for cross-section, line and level of the concrete pavement were not fed into the machine's control system by scanning a stringline, but via the computer of the wireless 3D levelling system. This 3D controller made by Leica Geosystems uses a special interface to communicate with the SP 1600's standard levelling and steering controller. This system has been used in other applications, such as rail slabtrack.

Concrete paving without using stringlines saves a lot of time: costs are incurred neither for surveying and installing the stringlines nor for their subsequent removal.

Work becomes easier also for the drivers of transport trucks and mixer trucks, since they need not pay attention to tensioned stringlines and can drive directly up to the paver. This saves both fuel and time, thus increasing the overall profitability. The system also provides increased safety for the crew working on site, as the wireless system eliminates the hazard of stumbling over the stringlines.

The system also offers a higher degree of operational safety: touching the stringlines may alter their surveyed position, resulting in an incorrect position of the paved concrete layer. This is particularly critical, because damages to the stringlines or an alteration of their position are not necessarily visible to the naked eye. This cause of sometimes serious mistakes is eliminated completely when using the wireless control system.

A positive side effect: reducing costs! All the contractor has to do is engage a surveyor to establish the digital data model. And that service is much less expensive than the time-consuming installation of stringlines. Taking care of the wireless control system on site does not necessarily require a surveyor or an engineer but can also be easily performed by appropriately trained technicians.

Laing O'Rourke pave the first private runway for 60 years.



After years of pursuing planning permission to build an all-weather runway at Sywell Aerodrome, consent was awarded in April 2008 to build the 1.5km, 30m wide runway at this historic site. Laing O'Rourke were engaged in May 2008 to deliver the concrete paving for the new runway

Working closely with Sywell Aerodrome, an integrated approach was developed for designing, producing and placing the runway pavement that ensured everyone worked towards delivering a high quality finished product. Laing O'Rourke's specialist plant division

Select, which owns and manages a Guntert and Zimmerman S850 high performance mid-range slipform paver engaged Laing O'Rourke Infrastructure materials specialist to work internally to develop a high quality pavement concrete using locally sourced multi-supplier constituents.

With effective transitions from laboratory, plant and paving trials, runway full production paving commenced in September 2008. Over the next eight weeks 11,000 cubic metres of pavement concrete was laid to complete this runway, noting that the site batching plant



was a Leibherr mobilmix 2.25 which peaked at around 60 cubic metres an hour of production. All aspects of the pavement delighted Sywell design team – laying tolerance, texture, durability and consistency all met the high standards demanded by the integrated team. The new Sywell PQ design and the rapid deployment into full production placement amounts to a job well done.

There were four Select employees on the site from 1st September and a further four men were employed locally. Select's high safety standards set the benchmark on this job which were adopted by the entire workforce, including subcontractors and agency labour.

As the first light aircraft runway for the UK that has been built in the last 60 years, Sywell aerodrome with its fantastic historic heritage finally has its all-weather runway which hopefully will see the desired increase in corporate traffic into the aerodrome and give it a long-term hub status for the East Midlands.



ROADS

Stock car racing at the famous Bristol Motor Speedway in Tennessee, USA, has been 'souped up' thanks to the new concrete race track



The new 0.86km track was part of a major project that involved replacing not only the existing worn out track but also adjacent structures. All of the work had to take place within a short 13-week time frame between the spring and autumn race seasons.

Ohio-based Baker Concrete Construction was awarded the contract to build 884m of perimeter crash wall, 1030m of interior crash wall, 33344m² of 178mm apron paving, 10,892m² of 102mm to 152mm lean concrete base and 10,869m² 178mm continuously reinforced concrete pavement.

Baker Concrete worked closely with Speedway Motorsports and consulted the race drivers to determine that best track solution. "Many of the drivers complained that the old track's transitions were very short where they came out of the turns and went into the straight-away", explained Steve Swift, construction manager for Speedway Motorsports. "The old track had a transition that rolled the car over from being in the high bank to a relatively flat bank. It actually had a crown in it. For this reason only one groove was run because, in the second groove, the track rolled over and pushed the drivers into the wall".

The new track has the opposite effect. It has a parabolic shape so that the higher the drivers go, the faster they can go and so can keep up with the bottom car. The upper car can keep up with the lower car and overcome distance with speed.

Paving a parabolic-shaped track was not without its challenges. It called for paving on slopes up to 30 degrees and, despite the slope, for a finish that was consistently smooth. Baker Concrete turned to GOMACO for the paving solution.



GOMACO's answer was a SL-450 slope finisher with additional features. Two work bridges followed behind the finisher for hand-working, brooming and curing. All the equipment ran on a rail system with the top section of the rail being mounted to the new crash wall using specially designed brackets. "The key was to keep the end of the C-450 paver frame close to the wall to minimize the amount of hand finishing", said Rob Ford, project coordinator for Baker Concrete. "There was a lot of intensive engineering involved to ensure that the machine was in the right place everywhere on the track".

"The slope changes required significant surveying", explained Dennis Ernst, service manager for GOMACO. "The rail height changed as the sloped changed. As the track widened through

the transition the rails would widen and adjust horizontally. Slope sensors on the legs of the SL-450 allowed them to automatically adjust to plumb, or a true vertical position as the rails changed widths through the transitions. No manual adjustments were necessary".

The 103mm lean concrete base of the track was finished with the SL-450. The roller was replaced with an augur to provide a rougher finish to help create a better bonding surface for the top finish. The concrete was a standard mix design of a 276 MPa strength. Slump averaged 44mm to 64mm. Paving production on the CRC averaged 13.7m to 18.33m per hour. The automatic advance feature on the SL-450 was set to advance 203mm on each pass.

The Sharpie 500, a major fixture on the stock car racing calendar, was the first race run on the new track. The feedback from the drivers was positive. "The drivers were very appreciative of the track and the way that it drove", said Swift. "Baker Concrete and GOMACO have given us an excellent track. This is an outstanding job of planning and partnership to complete a challenging project in a short amount of time".



State of the Art Cement Bound Materials in Highways

Sitebatch Technologies and Needham & Cullen worked together on many road projects throughout the 1990's and early 2000's in the UK, ranging from trunk roads to major motorways. Over this period, many improvements and innovations in the methodology behind the mass production and laying of a tightly controlled quality CBM product have evolved.

Both companies are now part of Aggregate Industries UK Ltd and trade as Roller Compacted Concrete Company. This coming together coincided with an unprecedented road building programme in Ireland and the resurgence of CBM as the subbase and base material of choice among designers and contractors seeking the most cost-effective pavement solution.

Average daily output in the 1990's was around 500m³. Now average output in the region of 800m³ per day is commonplace, with peaks of up to 2500m³ being achieved. In terms of scale and speed, there has been a quantum leap forward in both production and laying systems.

The current generation of continuous mixing plants in the company's fleet feature computer

controlled weigh systems and offer a range of production rates which are matched to the programme and logistical constraints of each project.

Heavy duty tracked pavers with dual compaction screeds, which are capable of paving up to 12m wide and up to 300mm thick in one pass, are the backbone of the laying fleet.

This is a far cry from paving half the width of the carriageway at 150mm depth, pulling back and paving the other half, then waiting seven days for the CBM to cure before putting another 150mm layer on top!

Induced cracking is now a requirement of the Specification and Needham & Cullen have improved the original method of crack insertion involving a vibrating plate compactor with fin, to the current method using a roller-mounted groove former with simultaneous bituminous emulsion injection.

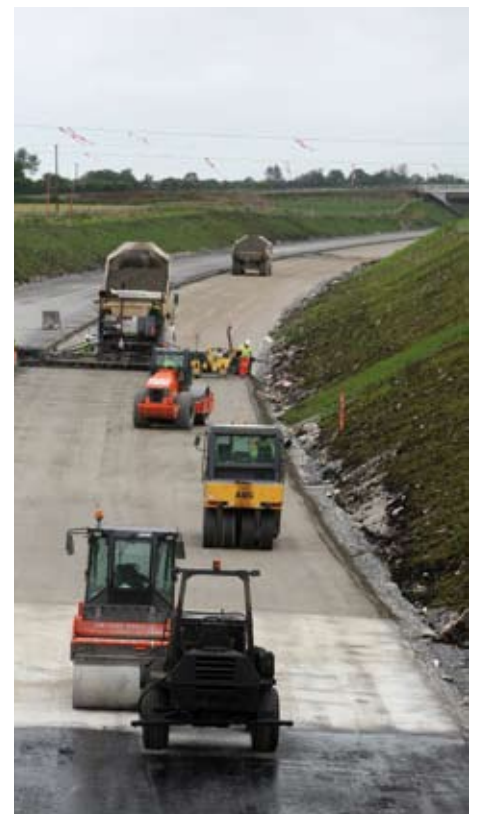
The transportation of the CBM has, of necessity, had to improve to keep pace with increased outputs of the mixing and paving plant. On Irish projects, 40 tonne dump trucks

are now commonly used, whereas it would have been normal to use 25 tonne dumpers or 20 tonne road wagons on a typical UK road project in the past.

Since 2004, in the region of 172km of newly constructed motorway/dual carriageway in Ireland have incorporated CBM in the pavement. A further 230km are under construction in 2008/9/10.

Recent changes in the Highways Agency's Design Manual for Roads & Bridges, including the introduction of Interim Advice Note 73/06, must surely herald the renaissance of cement bound material (now CBGM) on UK roads and the opportunity to capitalise on the vastly improved methodologies for mixing and paving tried and tested in Ireland.

The acceptance of the concept of Immediate Bearing Index (IBI) in the Specification for Highway Works now means that with suitably designed mixtures giving a mechanically stable material, subsequent layers can be paved over the CBGM without waiting for the traditional 7 days for strength to develop.



ROADS

Azerbaijan expands infrastructure using technologies 'made in Germany': biggest slipform paver project for Wirtgen

Azerbaijan is a country in the process of change: as a result of the oil boom and increasing revenues from the natural gas business, the southern Caucasian republic at the Caspian Sea counts among the fastest growing economies in the world. Commissioned by the country's national government, a private group of construction companies and major customer of Wirtgen International GmbH – Akkord – is currently building an almost 200km long motorway from the capital city of Baku with its major industrial port to the city of Quba in the North of the Asian republic. The project involves the use of Wirtgen slipform pavers.

The goal is to optimize the transport network between the country's economic regions, and to also strengthen the major transport routes for heavy goods traffic into the neighbouring states of Russia, Georgia, Iran and Armenia.

Other family members of the Wirtgen Group are playing a part in the extensive earthmoving operations as well: 40 single-drum compactors type 3516 from Hamm are involved in the required preliminary work in earth construction on the various construction sections, efficiently compacting the subsoil for the concrete pavement to be built.

Four complete paving trains in action

The dimensions of the construction site are truly enormous. This is confirmed by Werner Aeschlimann, Product Support Manager Slipform Paving at Wirtgen GmbH: "It's the biggest construction project in our product division to date. Four complete paving trains type SP 1500 L and SP 1600 are operated

simultaneously by one single customer, each comprising a bottom-layer paver, top-layer paver and TCM 1800 texture curing machine. The machines have been paving a new, dual-lane concrete motorway since the end of April 2008. Two additional SP 250 slipform pavers are in operation carrying out offset work, such as safety barriers, gutters and kerbs."

The motorway has been designed for high traffic loads and a long service life. The concrete pavement has a total thickness of 28 cm. 20 cm are paved for the bottom-layer concrete, 8 cm for the top-layer concrete. On the various construction sections, the largest machines in the Wirtgen slipform paver division are working at paving widths of 9 m and 12 m respectively. Paving crews of around 25 men are working on each construction lot, operating the machines – which are geared for high precision and automatic concrete paving – around the clock.

24-hour job for Wirtgen customer service

A customer service team from the Windhagen main plant provided extensive support to the customer and his brand new machines during the first project stage. Teams of two service technicians for each paving train supported the slipform pavers on the various construction lots for almost three months – a highly demanding job that gave impressive proof every day of the efficiency of the Wirtgen customer service. Their range of responsibilities was a challenge, indeed. Setting up the paving trains, familiarizing the operating crew with the new machines, and supporting the machines during the first phase of the large construction project were part of their comprehensive service package.



Dual-layer concrete paving for optimum quality and durability: The new traffic artery linking the capital city of Baku with the north of the country needs to withstand heavy goods traffic.

Conditions on the construction site were extremely tough even for the internationally experienced service technicians. During the peak period of the construction project in the hot summer months, the scorching heat of the steppe climate took its toll on everyone involved. Mario Weber describes the additional machine-related challenges that the customer service teams were facing on site: "In some construction sections, the machines needed to be repositioned several times within an extremely short period of time because the earthmoving operations were delayed. Yet concrete paving was to continue 24 hours a day and seven days a week, which meant that the Wirtgen customer service needed to be available 24 hours a day as well." As a result, the three construction sections on which work progressed simultaneously entailed great logistical efforts under tremendous pressure of time.

To be able to manage the large volumes and rapid speed, the construction lots were supported by four mixing plants which had been set up along the Baku to Quba stretch especially for this purpose. For each paving train, containers holding not only emergency kits but also spare parts and wearing parts for the first 1,500 operating hours were stored in the immediate vicinity to cater for any emergencies.



Heavy-duty finishing beams and super smoothers installed in the slipform paving trains are responsible for producing a surface of superior evenness.

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SOIL STABILISATION

Con-Form develop mobile batch plant

The problem of requiring large areas of working and storage space for the on-site stabilisation and remediation of contaminated land is addressed by the new ECO-WARRIOR mobile batch plant developed by Con-Form.

The amount of onsite land required to carry out remediation can be excessive. In order to treat 1500m³ of material per day the footprint required can be 5000m³. ECO-WARRIOR is designed specifically for sites where space may be limited. It is highly portable, easy to use and versatile and can be set up next to stockpiled material to batch process this for reuse. Operating along similar lines to a mobile crusher or screening plant, ECO-WARRIOR is a road-towable unit on a semi-trailer.

The plant is capable of processing a wide range of materials due to the provision of an interchangeable rotor system that enables cohesive materials to be processed using a twin rotor grinding mechanism to ensure optimum pulverisation and particle breakdown, and for granular materials to be processed using a hammer and grinder combination for dense materials to be crushed prior to pulverisation. Maximum particle size able to enter the mixing chamber is 200mm. The ECO-WARRIOR can mix powders into the treated material by applying the powders directly into the mixing area. This eliminates the problem of dust.

The ECO-WARRIOR is able to treat a wide range of contaminants including heavy metal contamination using the proven stabilisation and solidification process where cementitious binders are used to lock in the contaminants within the soil matrix to prevent leaching. Up to 2,000m³ of material per day (depending on particle size, moisture content etc) with the addition of up to 200kg/m³ of binder and 100 litres/m³ of water. The machine incorporates its own cleaning and maintenance systems for washing and greasing the plant.

ECO-WARRIOR has undergone a number of successful trial deployments on various live sites. Testing a range of soil conditions, the machine performed well and proved its versatility. It efficiently produced some 200m³ per hour of stabilised or remediated material with a small operating footprint.



Express Delivery for TNT

Geofirma's fast and complete soil stabilisation and earthmoving expertise got the construction of a new strategic distribution depot from TNT off to a flying start.



The site, located at the intersection of M6, M61 and M65 close to the A6 trunk road into Preston covered over 24,00m². It was the last to be developed on a large industrial estate and had been used as a dumping ground for material excavated from other sites. The result was an unstable and variable water-logged mass of clay, topsoil and organics.

Following testing of the variable spoil heaps using an in-house UKAS accredited laboratory and assessment of the necessary quantities of earthmoving and soil stabilisation using computer-aided ground modelling techniques, Geofirma were able to offer the optimum ground engineering solution.

This involved separating the organics and soil. The dumped material was treated with a lime/cement mix using Geofirma's Firmafil for the structural fill to 5%, then topped with a Firmabase subbase to achieve a CBR strength of 30%. In all, 30,000m³ of material was treated and levels raised by up to 1 metre in places. The Firmabase subbase covered an area of 24,000m² to a depth of 250mm, with 100mm Type 1 stone over this for protection.



In addition to saving a six figure sum, this approach provided substantial time savings. This was a real bonus for the main contractor Conlon who were able to get the project underway very quickly. In addition, the approach used by Geofirma provided significant environmental benefits as it reduced the consumption of aggregates, minimised the disposal of site material and lowered the number of truck movements.



Increasing the use of hydraulically bound mixtures in construction



Material change for a better environment

WRAP (the Waste & Resources Action Programme), supported by ALSF (Aggregate Levy Sustainability Fund) for England, aimed to raise awareness and increase the adoption of hydraulically bound mixtures (HBMs) in more construction projects by providing free workshops in the use of HBMs. The use of HBMs can improve the materials resource efficiency of construction projects as well as reducing costs and carbon emissions.

HBMs include both soil and aggregate mixtures and have been used for over 50 years, mainly within the foundations of major roads. However, the potential applications for the use of HBMs in construction are much wider, and include:

- piling platforms
- liners
- flood defences and erosion protection

- earthworks
- in trench reinstatement
- as highway pavement bases.

The use of HBMs within these applications has the potential to reduce project costs, lower carbon emissions, limit the need for primary aggregates and minimise the materials removed from site. Despite these distinct advantages, HBMs are still relatively underused in the UK.

The free workshops are organised by Scott Wilson on behalf of WRAP and draw on the knowledge and experience of a team of experts in the areas of both ex-situ production and in-situ treatment. Nine workshops were held around the UK in January and February 2009.

Some feedback comments from previous attendees:

"Great event... plenty of information available" (delegate at the London HBM Roadshow)

"Very informative... food for thought" (delegate at the Cambridge HBM Roadshow)



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SUSTAINABILITY & ENVIRONMENT

Sustainability Benefits of Concrete Step Barrier®

Structured under the four, UK-established, priority areas for immediate action in relation to sustainable development, this document provides a detailed report on Concrete Step Barrier's (CSB) positive contribution to delivering an economic, environmentally sensitive and socially responsible infrastructure solution.

Concrete Step Barrier delivers the following key sustainability benefits:

- **80% less embodied Co₂ than competing systems**
- **Minimum material usage and waste**
- **Non-polluting in service**
- **Fully recyclable**
- **Virtually maintenance-free over its 50 year design life**
- **Reduces traffic congestion and associated emissions**
- **Enhances road user and worker safety**



Sustainable consumption & production

CSB production involves a fully-automated, accurate process that ensures a high quality product in terms of functionality and appearance, using the minimum amount of material and producing the minimum amount of waste. Both recycled aggregates and cement replacement materials can be used in its construction, and the barriers provide a maintenance-free service life of at least 50 years.

Climate change & energy

CSB out-performs competing solutions in terms of both embodied levels of CO₂ in the materials used and holistic impacts over the solution's whole life cycle. The average embodied quantity of CO₂ in a metre of surface-mounted CSB can be as low as 19% of a similarly performing (H2) containment steel solution over a 50-year period. Further long-term benefits are due to CSB's long maintenance-free service life that reduces CO₂ emissions and energy impacts related with routine repairs and traffic management, and the virtual elimination of potential delays and traffic congestion associated with these operations.

Natural resources & enhancing the environment

CSB can be constructed using a wide range of secondary and recycled materials, is non-polluting in service and, at the end of its 50 year design life, is fully recyclable. CSB requires minimum maintenance so reducing potential sediment loadings to drainage systems, and takes up less space than its competitor barriers.

Creating sustainable communities

By restraining traffic effectively and withstanding impact damage, CSB provides for the safety and well-being of road users and construction workers alike, helps to keep traffic moving and has a neutral impact on vehicle noise. To date there have been no cross-over accidents when using CSB in the central reserve.

Available from: www.britpave.org.uk



Concrete Flood Barrier developed by Britpave

The prevention of flooding to homes and infrastructure is a very significant item on the agenda of many organisations, not least of which were insurance companies, who were considering withdrawal of flood insurance cover for low-lying properties. Agreement with government bodies including the Environment Agency (EA) regarding the need to enhance flood protection measures within a relatively short period (approximately, the next five years) implies the need for systems that can be rapidly executed in a cost efficient manner. Similarly, the Pitt Review recommends the need for developing solutions for the long term rather than solving the short term scenario only.

The above situation has created an opportunity to develop solutions that may reduce the risk of flooding and improve safety for both homes and infrastructure.

The slipformed concrete flood barrier idea developed following a few months of 'blue sky' thinking where Britpave compiled a list of potential areas for the development of slipformed systems. Through debate, priorities were determined and bearing in mind the increase in rainfall intensities experienced and associated flood problems in the UK, it was considered that this was an area well worth investigating.

The first port of call was the Environment Agency because of their responsibility to protect the nation's assets and their access to significant funding for the realisation of projects. Similarly, obtaining their support was considered to offer opportunities in terms of opening doors elsewhere. First contact was made with the Environment Agency in June 2008 to enquire about their potential interest. The EA requested a presentation of the concept within two weeks of the enquiry being raised, thereby confirming significant interest in our possible solution.

The first presentation highlighted the potential benefits for the slipformed concrete approach. This generated significant interest and Britpave developed a flood barrier presentation CD to assist the EA in sharing product awareness within their various regional offices. This information is now available on the Britpave website: www.concretebarrier.org.uk by clicking on the icon 'flood barrier'. We are also in the process of creating literature presenting the basic information on the flood barrier concept that can be used to develop market awareness.

Of significant importance and interest to the EA is the ability to achieve aesthetically pleasing surfaces. This is a significant problem for them when they have to deal with planning authorities and of course it is in the public's interest to live within a pleasing environment. On this basis, if the concrete industry can offer durable and aesthetic surfaces at reasonable cost when compared to current accepted finishes, then it will have created an opportunity and market place for itself.

One of the difficulties is the level to which conventional concrete surfaces are prone to suffer graffiti. The cost of cleaning can be addressed by the application of anti-graffiti paint but in general the public's impression of formed concrete surfaces is that they are not pleasing to the eye. By accepting this fact and doing something about it we could help the public to accept more concrete in the environment. With this in mind, many possibilities become available:

1. Mechanical imprinting to copy accepted hard surfaces such as stone walls
2. Stencil application to mimic brick walls for example
3. The use of coloured concrete
4. The use of exposed aggregate finishes
5. Cladding the concrete with alternative materials such as timber, masonry, stone, synthetic timber,
6. Covering with steep slope earth embankments from local materials in order to blend in with the environment

At recent follow-up meetings with the Environment Agency (EA), Britpave have been made aware that new ideas sometimes take time to develop because of the more significant risks



associated with new technology as opposed to tried-and-tested solutions. In this respect the following point was made by the EA:

'You are provided with an opportunity as well as an expression of interest in the concept from the EA - our industry needs to develop its solutions and contribute its part towards promotion, development and implementation of slipformed flood barrier projects...'

The ultimate aim is that procurers of projects should become aware that there are alternatives to working with fixed form concrete construction methods that can realise substantial time and cost savings – specifically on larger projects. Continued effort in developing and marketing the product concept will help to increase the potential of realising projects which in turn will create a track-record which can be used to justify future use.

For more information on the potential application of flood barrier solutions, please contact Adrian Erwee at adrianerwee@norder.co.uk



ENVIRONMENT/NEW MEMBERS



Britpave and The People's Trust for Endangered Species Environmental Involvement

As part of Britpave's environmental commitment we sponsored the 2008 Mammals on Roads survey. This survey takes place annually during July, August and September. With the support of Britpave, PTES were able to place a promotional leaflet within two very popular magazines, BBC *Wildlife* Magazine and BBC *Countryfile* Magazine. PTES are currently collating all the data and analysing the results of this survey. But, as a direct result of the promotional leaflet, PTES reported a 33% increase in people taking part in the survey. Please look out in future editions of *Britpave News* for an update on this survey.

Britpave further continued its environmental consideration by taking a view not to send

paper Christmas cards in 2008. Instead we contacted the PTES and sponsored the planting of 20 trees in Briddlesford Woods, in the Isle of Wight.

Briddlesford Woods is a large area of ancient semi-natural woodland and a Site of Special Scientific Interest. It is recognised as a special area of conservation because it is the habitat for a number of threatened species including Bechstein's bats, Barbastelle bats, red squirrels and dormice. PTES, with Britpave support, are trying to conserve these woods by planting new native trees such as oak, ash and hazel to expand and reconnect areas of woodland as well as restoring hedgerows, home to special wildlife.



■ For more information: www.ptes.org

LAGAN CONSTRUCTION

Established civil engineering and building contractor Lagan Construction operates throughout the UK, Ireland, Isle of Man and internationally delivering capital and maintenance projects across a range of key sectors.

The £150 million business, part of the Lagan group of companies, has invested heavily in people and resources in recent years, resulting in rapid growth and increased capability, enabling the contractor to take on larger, more complex projects. In the last 18 months the company has established three operational bases in the UK alone – at West Drayton on the M25 motorway network, at Oldham in greater Manchester and in Scotland.

As a specialist in airport projects, Lagan Construction has delivered infrastructure schemes both locally and in some of the world's most remote environments. The business has an experienced airports team with specific 'airside' and 'landside' expertise in delivering both asphalt and Pavement Quality Concrete (PQC) runway contracts.

This team completed a record breaking £14.2 million project at London Luton International

Airport – resurfacing the runway in night possessions of under six hours in just 12 weeks, a challenge the industry said was impossible. Similar projects followed at Bristol International Airport (£12.3 million), at Heathrow International's Terminal 5 (£1.2 million), at Bournemouth International Airport (£3.3 million) and at Newquay in Cornwall (£4.5 million), where an existing military airfield is being converted into a new commercial airport.

Lagan has recently completed two further fast track schemes at London Luton Airport as part of ongoing improvement and maintenance works, worth in the region of £3 million and finished ahead of programme.

Overseas, Lagan has been involved in a number of airport projects including those in Puerto Rico, the Bahamas, Hong Kong, British Virgin Islands and Bermuda, where work is progressing on a US\$ 14.2 million rehabilitation of the taxiway and apron pavements. Another team is working in Pakistan on the £105 million development of the new Benazir Bhutto International Airport at Islamabad.

Lagan Construction is also active in the roads sector and has a successful track record working both as main contractor on traditional schemes or as a partner on major design and construct projects. The company combines creative planning, design and construction to

develop bespoke transport solutions for urban and rural environments – including major road networks, airport and rail infrastructure and bridgeworks. A key advantage for Lagan Construction is its considerable in-house range of plant and equipment which can be mobilised quickly to locations across the world, creating added value and increased efficiencies for customers.

The company is currently involved in the DirectRoute consortium delivering the €400 million Limerick Road Tunnel PPP in the Republic of Ireland for the National Roads Authority. The scheme is part of a larger project to construct the final link in the ring road around Limerick.

In Northern Ireland, Lagan Construction is part of the Amey Lagan Ferrovial Agroman (ALF) joint venture undertaking DBFO 2, the largest PPP road scheme in the province. The £250 million project for the Roads Service will complete the dualling of the Belfast to Dublin route and significantly improve access to the western counties of Fermanagh and Tyrone, reducing traffic congestion and improving journey times and road safety.

In another project, Lagan in partnership with Sisk is delivering the marine civil engineering work on the €50 million redevelopment of Greystones Harbour in County Wicklow,



Republic of Ireland. The contract for Sispar will see the creation of luxury housing and leisure facilities including a 230-berth marina and public plaza. The civil works include the construction of the marina, together with breakwaters, quay walls, reconfiguration of the beach and coastal protection measures.

Meanwhile, in the UK, the business has been appointed by the Olympic Delivery Authority (ODA) to build the Central Park Bridge, one of the most important structures in the South Park during the 2012 London Games. Situated 13 miles east of London at Stratford on the central pedestrian concourse, it will span the River Lea, forming a key connection between the Basketball Arena, the Aquatics Centre and the Olympic Stadium.

Lagan Construction is a major player in the water sector and has made its name delivering a number of key projects. These include wastewater treatment works at Larne, Omagh and Enniskillen in Northern Ireland and at Douglas and Sulby in the Isle of Man, in addition to a water pipeline in Fiji, Asia Pacific.

In the energy sector, Lagan is well known for its expertise in wind farm development – including at Tappaghan, Bindoo, Bessy Bell and Coomacheo in Ireland – as well as the construction works for power stations at Ballylumford and Kilroot in Northern Ireland.



Complete Design Partnership Ltd. (CDP) was formed in 1994 and is a general practice providing consultancy services in civil and structural engineering. Our personnel have a breadth of experience and can offer expertise in most structural and civil engineering fields, including ground engineering and conservation of historic buildings. We carry out all stages of design from investigations and feasibility, through to design and detailing for full structural requirements.

Our civil engineering work includes design and checking of ground improvement and remediation schemes, and design and layout of external concrete yards, car parks and service areas. We also design roads and sewers for adoption, and schemes incorporating Sustainable Drainage Systems (SuDS).

CDP's structural engineering work is diverse, covering office buildings, warehouse sheds, residential and retail projects in a variety of materials, including projects with an emphasis on sustainability.

We strive to provide economic and viable solutions for any size of project by working closely with the client, consultants and contractors from the inception through to completion. The work produced is of a high quality and this is reflected in repeat business and client recommendation.

John Blackhall, Company Director, has particular expertise in ground engineering and soil stabilisation works. Over the last ten years much of his work has concentrated on site appraisals for ground and water engineering and associated contamination, and development of remedial strategies to allow for safe, economic construction and long term environmental benefits.



Heather Ceney joined CDP as a Senior Engineer in January 2008. She has worked on a wide variety of transport infrastructure schemes including highways, heavy rail and light rail. She has expertise in guided busway systems and vehicle restraint systems. Heather has been an active participant of Britpave's Rail & Guided Bus and Barrier task groups for several years.

As a company we will be involved in the Rail & Guided Bus task group and also the Soil Stabilisation group, where we hope to be able to contribute our experience in these fields.

■ For more information:
Heather Ceney T: 01527 832 307
heather@cdpbroms.co.uk

Rail and Guided Busway Task Group

2009 will see a re-launch of the Rail & Guided Busway task group with Heather Ceney again acting as chairman. The task group website is currently being reconstructed. The new-look website will see an increase in technical content and the development of a resource for use by the Britpave members, and those in industry.

Britpave members are invited to participate in the Rail & Guided Busway task group. A meeting date will be announced shortly. Those interested in joining the task group should contact Heather Ceney (T: 01527 832 307 heather@cdpbroms.co.uk).

BRITPAVE® SEMINAR 2008

Britpave Annual Dinner and Seminar 29 and 30 September 2008



Stratford-upon-Avon, the birthplace of William Shakespeare, was the location for the Britpave Annual Dinner and Seminar. In the heart of the Warwickshire countryside and on the river Avon, it was a perfect location. Britpave would like to thank all those who helped to make our Annual Dinner and Seminar such a success.

Annual Dinner – 29 September

The guests who attended the Britpave Dinner on the 29 September thoroughly enjoyed the evening. The complimentary drinks reception in the exhibition area was a hub of activity with members making the most of the networking opportunity. Dinner was very well received and we heard lots of good comments about the food and company.

After the dinner guests were entertained by Eddie Large, one half of the legendary comedy duo 'Little and Large'. Their show was a top-billing television show of the 1980's.



Iain Campbell, Richard Trinick

David York also presented our winning golfers with the Britpave Cup, We're sure it has taken pride of place within their offices.

Seminar – 30 September

David York, Britpave Chairman opened the day's proceedings and welcomed all to the 2008 seminar. He introduced the first speaker, Tim Smith of The Cement and Concrete Association in Canada (CCAC). Tim gave a

thought-provoking presentation describing initiatives that the CCAC has taken in the area of sustainability. Of particular interest to the Britpave members was Tim's description of the research showing how trucks running on concrete surfaces save significant fuel compared with running on asphalt.

Rob Gifford – Parliamentary Advisory Council for Transport Safety (PACTS). Rob gave an interesting insight into the work of PACTS and in particular showed how fatal accidents in the UK have ceased to decline and how Britain is performing compared to the rest of Europe.

Paul Daniel – SIAC. Paul's presentation with copious photographs and graphics showed how slipformed paving has developed within the Irish Republic. An interesting feature of the market in that country is the use of small paving machines to produce in-situ kerbs on residential and industrial projects.

Paul Edwards – Lafarge. Paul covered a definition of hydraulically bound mixtures together with some examples of ongoing research within his presentation. Durability is one of the key areas of research and Paul showed how procedures and testing are key to the process.

Angus Hunter – Optimat. Optimat is commissioned by the cement and concrete industry to develop their sustainability strategy. Angus gave delegates an insight into this work and highlighted the challenges ahead.

The afternoon session opened with **James Charlesworth – Extrudakerb**, supported by **Bryan Magee – The Concrete Centre** and **Adrian Erwee – Norder Design Associates**. James updated the audience on progress with

the barrier project, whilst Bryan efficiently summarised the contents of the new sustainability publication. This was issued to all seminar delegates. Adrian showed delegates some of the work that had been done to develop the market for flood barriers and a CD containing a lot of detailed information was given within the delegate packs.

Bob Tebb – First Group. Bob ran through the various options of guided bus systems in the UK. He showed many examples of systems and explained how attempts were being made to upgrade the image of bus usage. Coloured and patterned concrete has a part to play in this.

The day rounded off with a joint presentation by **Alex Lake – Faber Maunsell** and **Tony Parry – The University of Nottingham**. They described the methodology that the sustainable construction working group used to produce its report on barrier. Similar methodology will be used to produce position papers for the other Britpave task groups.

Exhibition

The exhibitors at this year's event were:

- Beach Soil Stabilisation
- Elkem
- Eupave
- Extrudakerb
- Gomaco
- Power Slipformers
- The Concrete Centre
- Wirtgen

The exhibition area was a hub of activity and also hosted the pre-dinner drinks reception, giving all those attending an opportunity to meet the exhibitors.





Golf Day

Ingon Manor with its beautiful 14th Century Country House Hotel and challenging 18 hole golf course, welcomed the Britpave golfers.

The event was off with a swinging start, on the beautifully sunny Monday morning. 11 teams entered this year's Golf Tournament, and we were pleased to welcome a few new faces. The winners of the Britpave Cup were Iain Campbell of Concrete Cutters and Richard Trinick of Carillion, both playing the tournament for the first time. Other winners were Kent Godbersen of Gomaco for the Longest Drive and Tim Beynon of Bristol Airport for his 2nd nearest the pin. We would like to thank our various sponsors for the golf prizes, which included golf towels, golf balls, golf bags and t-shirts.

The teams were as follows:

Player	Score	Back 9 Score	Company
Iain Campbell & Richard Trinick	44		Concrete Cutters (Sarum)/Carillion Civil Engineering
Richard Offord & Tim Benyon	40	B20	Fitzpatrick/Bristol Airport
Adrian Erwee & John Donegan	40	B18	Norder Design Associates/Aggregate Industries UK
Alan Bromage & Stephen Bullock	39	B21	The Concrete Centre/Power Slipformers
Barney Patel & John Talbot	39	B19	Cemex Cement UK
Al McDermid & Rory Keogh	39	B18	Beach Soil Stabilisation/Gomaco
Kent Godbersen & Randy Bean	35		Gomaco
Tim Eden & David Mason	32		Fitzpatrick/Capita Symonds
John Finch & Jerry Brown	32		Elkem Materials
Bryan Magee & Tony Parry	31		The Concrete Centre/ University of Nottingham
David York & David Lee	30		Aggregate Industries UK/Highways Agency

Note: Back Hole Scores – If there is a tie, the team with the highest points on the back nine wins.



Tim Beynon, Richard Offord, David Mason, Tim Eden



Gerry Brown, John Finch, John Talbot, Barney Patel



Tony Parry, Bryan Magee, John Donegan, Adrian Erwee



David York, David Lee, Iain Campbell, Richard Trinick



Rory Keogh, Al McDermid, Kent Godbersen, Randy Bean



Alan Bromage, Stephen Bullock

NEW FROM BRITPAVE



Sustainability Benefits of Concrete Step Barrier – This document provides an overview of CSB's positive sustainability credentials by assessing its impact against established sustainability indicators identified by both industry and key construction clients.
Ref.BP42. Price £10. Free to Britpave Members



Guidance Notes 5: Keyed longitudinal joints for concrete airfield pavements – Describing the requirement for load transfer at joints, the potential advantages of using keyed joint, historical practice and performance, design methods and construction practice.
Ref. BP40. Price £10. Free to Britpave Members



Concrete Flood Barriers – This publication is designed to give the reader an overview of the benefits of concrete flood barriers, why we use them and also guidance on construction.
Ref.BP45. Free publication.

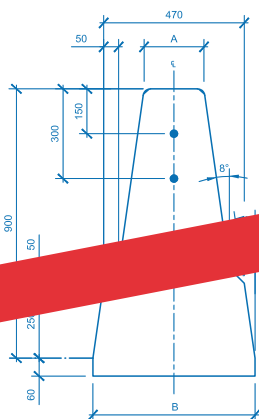
Coming Soon...

Guidance Notes 6A: Pavement quality concrete for airfield pavements – Aimed at clients, project managers and engineers involved in the design and construction of concrete airfield pavements who need or want an understanding of the reasons for using Pavement Quality Concrete, including the background to current specifications, and future developments.
Ref. BP43. Price £10. Free to Britpave Members

Guidance Notes 6B: Pavement quality concrete mix design and production – Aimed at engineers who are involved in the design and construction of concrete airfield pavements and who want an understanding of Pavement Quality Concrete. The document will identify key characteristics of airfield pavement concrete and reference methods that can be used to achieve the required performance.
Ref. BP44. Price £10. Free to Britpave Members



Also... New barrier drawings and datasheets



Issue 3 - coming March 2009!!!



ALMOST THE LAST WORD

Quick round-up of facts and figures on quarry products

Aggregates

The backbone of our world – an end product in themselves but also a raw material for other products such as ready-mixed concrete, asphalt, lime and mortar. In a typical year, we need some 225 million tonnes of aggregates in the UK – four tonnes for every man, woman and child.

Recycled Aggregates

Britain leads Europe in the use of recycled and secondary aggregates, which today account for around 26 per cent of the total market. That's three times higher than the European average.



Ready-mixed Concrete

The second most used material in the world and at the core of most construction projects. There are 1,300 ready-mixed concrete plants in the UK. The average delivery distance is less than 30 miles, making it a very sustainable construction product.

Cement and Lime

Cement is a vital ingredient in concrete, one of the most versatile, durable and sustainable building materials. Lime is used to fertilise our fields but also in a wide range of other applications from industrial processes to food manufacture. It is increasingly employed as a medium for treating ground that has been polluted or needs to be stabilised.

Slag

Slag is a by-product from the production of iron and steel and is an increasingly important sustainable source of aggregates and cementitious material. It can be used in a variety of ways including within concrete, for soil stabilisation, as an aggregate or even in surfacing.

PFA

PFA, or fly ash, is produced from the combustion of coal in power stations. It can be used as a cementitious material and also as a lightweight aggregate in the manufacture of blocks.

Where in the World?

Please send your answers to the Britpave Office. One person randomly selected from entries received by 1 August 2009 will receive advertising at the Britpave seminar to a value of £150.



Where in the World? Issue 17 were...



Forbidden City, Beijing



Mekong River, Laos.

Welcome to newmembers

Britpave is pleased to welcome the following new members and looks forward to their participation in the Association's activities.

Poldim SA

Tel: 0048 698 689 895

www.poldim.com.pl

Principal contact: Ryszard Ingot

Barton Plant

Tel: 01536 722100

www.barton-plant.co.uk

Principal contact: Eddie Ronald

Lagan Construction

Tel: 028 9045 5531

www.laganconstruction.com

Principal contact: Simon Jukes

Ferroval Agroman Airports

Tel: 0208 750 2100

www.ferroval.com

Principal contact: Declan Davis

Faber Maunsell Ltd

Tel: 020 8784 5784

www.fabermaunsell.com

Principal contact: Alex Lake

Complete Design Partnership Ltd.

Tel: 01527 832 307

www.cdpbroms.co.uk

Principal contact: Heather Cenev

O'Regan Slipform Kerbing Ltd.

Tel: 00 353 69 83007

www.slipformkerbing.com

Principal contact: Brian O'Regan

THE LAST WORD...

2009 Conference in Oxford

Britpave are pleased to announce our Keynote Speaker at this years seminar on 6 October is

GRAHAM DALTON
CHIEF EXECUTIVE, HIGHWAYS AGENCY

 **HIGHWAYS**
AGENCY



Located just two miles from Oxford City Centre, and a few minutes from the A34 and M40, the **Barceló Oxford Hotel** is one of the City's leading four-star hotels.

The dinner will be held on the Monday evening, **5 October** and is an excellent opportunity to invite both colleagues and clients to enjoy the evening. As always Britpave will provide after dinner entertainment to finish the evening. The seminar takes place on Tuesday **6 October**.

The dinner and seminar holds pride of place within the Britpave calendar and each year brings together clients, consulting engineers and suppliers in an informal and enjoyable event.

SPECIAL OFFER

**BUY ONE GET ONE FREE
ON SEMINAR PLACES.**

**BOOK BEFORE 7 SEPTEMBER
TO QUALIFY.**

**DELEGATE NAMES MUST
BE GIVEN AT TIME
OF BOOKING.**

Corrections and Clarifications

It is the policy of Britpave News to correct significant errors as soon as possible. Readers may contact the office on: info@britpave.org.uk. Please quote the issue number and page.

Trade Marks Registered

The trade marks Britpave® and Britpave Step Barrier® have been registered with the Trade Marks Registry. This protects the use of these words and makes it easier to defend what has become an important brand. People cannot use our trademarks without our express permission. If someone deliberately uses our registered trade marks, without our knowledge or comment, they may be guilty of the crime of counterfeiting.

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

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The British In-situ Concrete Paving Association