

BRITPAVE® NEWS



Infrastructure Matters

The Need to Invest in Infrastructure

WELCOME

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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.

Editor's Note



With the bulk of the Coalition Government's cuts now announced, the construction industry can at last plan on the basis of what has been announced.

Britpave members will be heartened to hear that despite the scale of the cuts, the Chancellor has pledged to maintain investment in both new and existing infrastructure that supports the economy. Graham Dalton, Chief Executive of Highways Agency said "This is a new Era for the Highways Agency and we will be affected as much by what happens outside our organisation as what happens inside it, such as with planning and local authorities. Ultimately there will be significant changes required – there are things we will have to stop doing and things we will need to do differently."

This is a clear challenge, as Mr Dalton put on record with his recent interview with Britpave. Britpave and its members have shown resilience over the last two decades and as in every situation there will be opportunities as well as threats. This is the challenge for Britpave and through our networks and Task Group activities we shall come up with concrete solutions appropriate for the current situation.

By working together, companies both large and small will make better opportunities for their businesses, and I thank you all for your continued support.

David Jones
Director of Britpave



INFRASTRUCTURE INVESTMENT

Greater Infrastructure Investment is Essential

There is a direct correlation between investment in transport infrastructure and economic growth. If the government is sincere in its wish to see sustained economic recovery then real action and long-term vision are required.

The government demonstrated that it understands the link between infrastructure investment and economic growth with the focus on key projects in its 2010 Spending Review. The Chancellor, George Osborne, used the Review to confirm the government's commitment to major road and rail schemes including the High Speed rail link between London and Birmingham, Crossrail, the Tyne and Wear Metro, widening the A11 to dual carriageway between Norwich and the M11, upgrades to the M1 and A46 in the Midlands, M4 and M5 improvements plus further strategic widening of the M25.

However, whilst funding will be made available for these headline projects many other essential projects have been postponed or cancelled. A functioning, coordinated transport network is vital. Gaps in that network can be counter-productive.

An attempt to close the gaps was made by the National Infrastructure Plan, launched shortly after the Spending Review. Although welcomed, the Plan is shortsighted with a vision of only five years and a focus on the smarter use of assets which could be translated to mean 'patch and mend' rather than the real long-term investment in new transport infrastructure. The Plan is disappointing as it fails to acknowledge the fact that transport should be a long-term investment not a short-term fix.

Unfortunately, the UK does not have world class infrastructure. Our motorways are congested, local roads are crumbling, airports are over capacity and our railways use 19th century-based ballast track system. The problems of lack of investment in our transport infrastructure was highlighted by the 2009 Policy Exchange report, 'Delivering a 21st Century Infrastructure for Britain', that found the UK is ranked as 34th in the world in terms of infrastructure quality, behind Malaysia, despite having the 6th largest economy. Indeed, the UK spends less on transport and development as a percentage of economic output than any other OECD country. France has a 20% higher productivity level than Britain primarily due to its better infrastructure provision.

The publication of a co-ordinated National Infrastructure Plan following the Government's commitment to major transport projects in the recent Spending Review is welcomed, but we need real, long-term vision and investment to get Britain moving and ensure economic growth.



"Our motorways are congested, local roads are crumbling, airports are over capacity and our railways use 19th century-based ballast track system."

ROADS

Highways Agency's Future Delivery Programme

Last October's Spending Review had a headline figure of £30 billion investment in road and transport projects. This was greeted with a general sigh of relief by the industry. Now that the dust has settled the small print becomes apparent, not least of which is how the Department of Transport proposed to fulfil its project programme and improve the country's transport infrastructure with a 21% budget cut.

Following the Spending Review, the Department of Transport published its 'Investment in Highway Transport Schemes' which sets out the delivery programme of major schemes on the strategic road network. Here, it becomes apparent that many schemes have delayed start dates or been postponed for future review.

The schemes are split into five categories as follows:

Schemes under construction

These schemes currently under construction will be completed to their current timetable

Schemes to be prepared for start of construction in the current spending review period

14 schemes will be prepared for start of construction by 2015. These include:

- M1 Junctions 28 – 31
- M1 Junctions 32 – 35a
- M1 Junctions 39 – 42
- M25 Junctions 5 – 6/7
- M25 Junctions 23 – 27
- M4 Junctions 19 – 20
- M5 Junctions 15 – 17
- M6 Junctions 5 – 8
- M60 Junctions 8 – 12
- M60 Junctions 12 – 15
- M62 Junctions 25 – 30
- A11 Fiveways – Thetford
- A23 Handcross – Warninglid
- A556 Knutsford – Bowdon

Schemes to be prepared for start of construction in future spending review periods

14 schemes are to be developed under the current spending review for potential construction in future spending reviews. No firm dates are given and all will be subject to a revised scheme appraisal to be introduced by the Department in spring 2011. The schemes include:

- M1/M6 Junction 19 improvement
- M25 Junction 30
- M6 Junctions 10a – 13
- A14 Kettering Bypass
- A160/A180 Immington
- A19 Testos
- A19/A1058 Coast Road Junction
- A21 Tonbridge – Pembury
- A27 Chichester Bypass
- A38 Derby Junctions
- A45/A46 Tollbar End
- A453 Widening
- A5-M1 Link Road
- A63 Castle Street

Schemes to be reviewed for start of works in future spending review periods

Four schemes are subject to further review and appraisal concerning design and traffic projections. These include:

- M20 Junction 10a
- M3 Junctions 2 – 4a
- M4 Junctions 3 – 12
- M54 to M6/M6 Toll Road Link

Cancelled schemes

Seven schemes were cancelled and will be removed from the roads programme. These include:

- A1 Leeming to Barton
- A19 Seaton Burn Interchange
- A19 Moor Farm
- A21 Kippings Cross
- A21 Flimwell to Robertsbridge
- A21 Baldstow
- A47 Blofield to North Burlingham

ROADS

The Cost of Congestion

Congestion in the UK is getting worse and this has serious implications for the economy, for the environment and for the stress levels of travellers.

The financial cost of congestion for the UK is often quoted as being £20 billion a year, based on figures from the CBI. This figure was supported by a government-sponsored report, the Eddington Transport Study carried out in 2006 that estimated that congestion would cost the UK economy some £22 billion in lost time by 2025. The study set out the need for action to improve road and rail networks as a "crucial enabler of sustained productivity and competitiveness" and warned that failure to invest in the transport infrastructure would have serious consequences for the economy.

The poor UK transport network has long been seen to be a constraint to business both by UK and international firms. Quite simply our congested roads, overcrowded railways and peak capacity airports are not up to the job.

Our congested road network is a particular problem. The majority of business travel and freight movements are road based. In a 2008 CBI London survey, 90% of respondents said poor reliability of the road network has a negative impact on their productivity. Across the UK, 80% of CBI members regard the road network as vital to their business.

Transport congestion puts the brakes on economic growth and so will make it harder to recover from recession. Government plans for high-speed rail links are welcomed as are some elements in its roads policy such as the trialling of hard shoulder running at motorway congestion blackspots. But while the investment for improving the rail network show vision that for roads is tentative and short-sighted. There needs to be a strengthening of capital investment in roads. Reducing capital investment on our road network is not the way forward if the economy is to grow.

Reducing congestion, investing in transport infrastructure and enabling the free flow of traffic and passengers is essential if UK plc is to trade productively and cost efficiently.



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CE MARKING



CE Marking – What You Need to Know

From January 2011 it has become a legal requirement for all vehicle restraint systems (safety barriers, parapets and crash cushions) sold in the EU to carry the CE mark. CE marking is a declaration by the manufacturer that the product meets the requirements of the applicable European Directives. CE marking gives companies easier access into the European markets to sell products without adaptation or rechecking.

The main requirements of the Directives are laid out in Annex ZA of EN1317 Part 5 as a harmonised standard within the Construction Products Directive (CPD). This specifies the conformity requirements of testing as well as factory production control. CPD has confirmed the need for an overall harmonised legislative framework and in order to progress this, the European Commission is to replace the CPD with the Construction Products Regulation.

Within Part 5 there is reference to the test standard parts of EN1317 relating to the different vehicle restraint systems such as safety barriers in Part 2 and crash cushions in Part 3. Also referenced are proposed standards that have not been ratified into European legislation such as terminals (Part 4) and transitions (Part 7). As EN1317 or non-ratified standards, these systems cannot be CE marked.

This is causing some confusion as many European nations who are now insisting on CE marked products are preventing installations of products that although meet the current test requirements cannot be CE marked due to the ratification process. If a traffic authority is insisting on installation of CE products only, they are effectively stating that only steel safety barriers and crash cushions can be installed as these will not have any terminal sections or transition pieces. In reality, they are likely to continue to refer to their national standards requirements which the CPD is intending to replace!

Current thinking is that cast in-situ concrete barriers are 'part of a construction' and not a construction product placed on the market. As such they themselves cannot be CE marked but all their components (aggregates, cement, admixtures, reinforcement, etc) should be.

As part of national approval, most European nations insist on approval to EN1317-1 (Terminology and general criteria for test methods) and Part 2 (Performance classes, impact test acceptance criteria and test methods for safety barriers) as their national specification which is where the confusion of CE marked products has crept in for vehicle restraint systems particularly for systems which under European law cannot carry a CE mark.

Where a product does not qualify for CE marking, it can still be assessed to the full requirements of EN1317-5 but instead of being issued with an EC Certificate of Conformity that entitles CE marking, it can be issued with a Notified Body Opinion Certificate of Conformity that illustrates compliance to EN1317-5. Adopting this regime illustrates that the manufacture and provision of in-situ concrete barriers meets the same level of quality control that is required for the steel industry. Indeed, it may be seen as being a stronger endorsement of the quality process for the installation of slip-form concrete barriers.



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BRITPAVE STEP BARRIER®

Concrete Antidote for Infrastructure Terrorism Concerns

The discovery of security weaknesses at the Sellafield nuclear reprocessing site in Cumbria has resulted in a significant anti-terrorism review of key elements of the UK's critical national infrastructure. In turn, this could see the concrete security barrier being increasingly used to protect sensitive and critical infrastructure.

The review has been carried out by HM Inspectorate of Constabulary and is understood to follow a 'red team exercise', when special forces posed as terrorists or foreign agents to test the security at large infrastructure facilities and other potential targets. Scotland Yard's Counter-terrorism Command and MI5, which operates the Centre for the Protection of National Infrastructure, have been consulted as part of the review.

Part of the review includes the examination of perimeter security and protection. Here, the concrete security barrier, which is a development of the concrete step barrier that is replacing steel barriers on central reservations throughout the UK, has the potential to provide a strong defence. Developed by Britpave (the transport infrastructure group) the concrete step barrier is very effective at preventing that most dangerous of motorway accidents: the crossover. That same robustness is offered by BsecB, the concrete security barrier.

"There is considerable interest in the potential of the concrete barrier to be used for perimeter protection"

To demonstrate the potential of the BsecB, Britpave has undertaken a programme of rigorous testing which have shown that it meets the security impact standards of PAS68:2007. Full scale tests proved that the concrete security barrier can stop a 7.5tonne lorry travelling at 50mph (80kph).

The first location to benefit from the installation of the BsecB concrete security barrier is Edinburgh Airport. A 120m length of the barrier has been placed to protect the terminal building from the threat of cars and lorries from the adjacent road being used by suicide bombers.

Construction of the concrete barrier is simple and fast. Depending upon the cross section of the barrier being slipformed, it is possible to construct up to 200m/8 hour shift/machine. Once installed BsecB requires little or no maintenance and is built to last for up to 100 years.

The potential of BsecB is to be realised by a number of high profile projects to be installed during 2011.

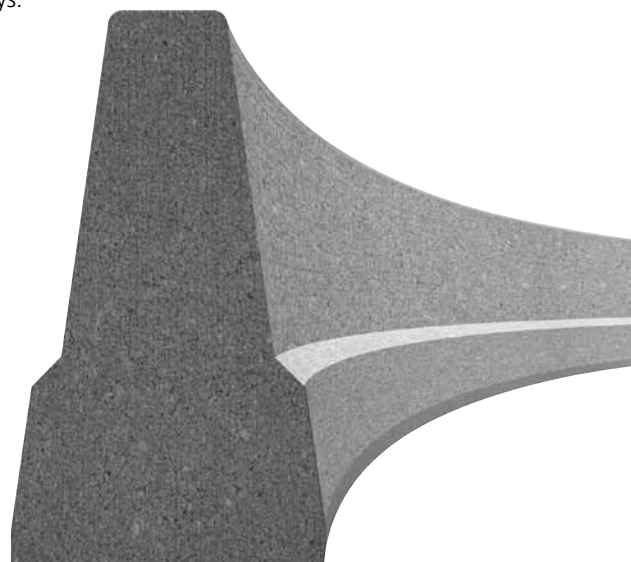
Trunk Roads Second Best?

A 2km section of wire rope barriers on the A21 Lamberhurst Bypass is to be replaced. That's the good news. The bad news is that the wire rope barrier is being replaced with a steel post system.

The news that the wire rope barrier, often nicknamed the cheese slicer because of the potential guillotine injuries to motorcyclists, is being replaced was welcomed by the British Motorcyclist's Federation. However, its spokesman Jeff Stone said that concrete barriers provide the best form of protection for motorcyclists, with steel barriers next best.

This raises the question of why should the safety of trunk roads be second best to that of motorways. On motorways concrete barriers are the Highways Agency's preferred option for central reservation barriers because of their acknowledged superior containment and safety levels. Many trunk roads have high traffic levels and are used by heavy goods vehicles. Steel barriers have been proven to be inadequate in offering the necessary levels of containment to restrain and contain such traffic. Compared to concrete barriers, which offer a containment level of H2 enough to stop a 13tonne vehicle, steel barriers only offer a containment level of N2 enough to stop a 1.5tonne car.

The ever growing levels of traffic using the trunk road network means that the use of concrete step barriers should not be restricted to motorways.



BRITPAVE STEP BARRIER®

Parliamentary Briefing

Following his asking the Secretary of State for Transport "what research his Department has undertaken on the cost-effectiveness of concrete central reservations barriers compared with metal barriers?" Britpave provided Greg Knight MP for East Yorkshire with a briefing information note on the range of benefits that the concrete step barrier provides not least of which is improved safety, long-term performance, minimum maintenance and better whole life cost-effectiveness when compared with metal barriers.

The note explained that these benefits supported the Highways Agency decision that the concrete step barrier is the preferred option for motorway barrier installation and replacement works where the Average Annual Daily Traffic Flow exceeds 25,000 vehicles per day.

The note highlighted how the success of the concrete step barrier was underlined by an accident in adjacent constituency on the M180 between Junction 2 – 3, Scunthorpe, Lincolnshire, in June 2010. The barrier performed above and beyond its H2 containment specification by stopping a 40tonne lorry. The momentum of the impact resulted in the lorry resting on the concrete barrier rather than crashing through as would have been the case with a steel barrier. No costly repairs or replacement were required for the concrete barrier as it remained undamaged and fit for purpose. In addition to saving motorists lives, the long-term robust performance and minimum maintenance of concrete step barriers helps saves the lives of road workers by reducing their having to work on live motorways.

The cost benefits of concrete step barrier were underlined by an independent cost analysis carried out by Arup. The study found that the initial costs for standard motorway concrete step barriers and untensioned steel barriers are comparable. However, the concrete step barrier offers a containment level of H2, steel barriers only offer N2. For steel barriers to offer the same level of safety as concrete step barriers their cost would be doubled at £100 - £126 per linear metre compared to £55 for concrete.

Furthermore, concrete barriers, unlike steel, do not require on-going maintenance, renewal every 15 – 20 years or replacement following vehicular impact. All of which carry significant cost implications. To these costs must be added the considerable costs of road works and congestion that results from the closing of motorway lanes to maintain, repair or replace steel barriers.

Britpave has offered to meet with Mr Knight should he require any further information on the reasons why concrete step barriers are the preferred option.

Concrete Safety in Yorkshire and Humberside

Drivers will benefit from improved safety on the M180 near Scawby, Brigg, in North Lincolnshire, with the Highways Agency's scheme to replace the steel central reservation barrier with a safer, concrete barrier, improving drainage and carriageway repairs on a 0.8 mile (1.3km) stretch of the motorway at Junction 4. The work will involve lane closures, some overnight carriageway closures and a 50mph speed limit. It will be undertaken by Extrudakerb and is due to be completed in March.

Also in the Yorkshire and Humberside region, concrete barriers are replacing steel central reservation barriers on a two mile stretch of the M621 between Junction 1 and 3, near Leeds. Work will be completed by the end of March.

"The new barriers are stronger and more robust - reducing the risk of vehicles involved in accidents crossing from one side of the motorway to the other."



The benefits of concrete barriers were summed up by Highways Agency project manager, Steven Wright, who said: "This barrier replacement scheme will increase safety on the M180 in North Lincolnshire. The new barriers are stronger and more robust - reducing the risk of vehicles involved in accidents crossing from one side of the motorway to the other, and improving the safety of road users and road workers. The barriers also require less maintenance and repairs and hence will reduce the likelihood of future disruption to the road user."

BRITPAVE STEP BARRIER®

New Launch

Drawings for Britpave Step Barrier® and Ancillary Items

Issue 4 - 2010

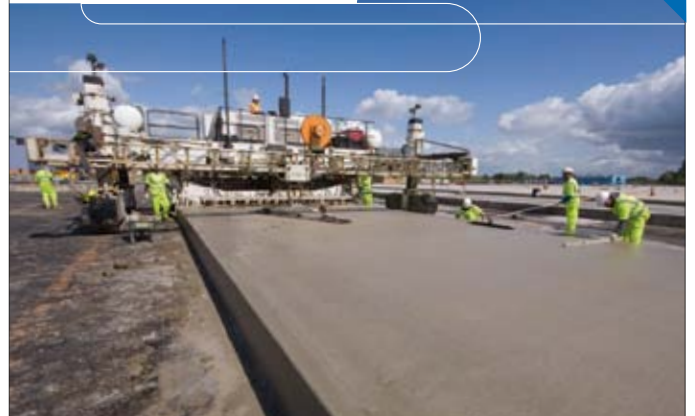
The latest issue of the Britpave Step Barrier Systems Drawings are now available on CD and contain the latest revision of installation drawings for concrete and steel barrier. This also contains a quick reference page identifying changes between issues. Copies can be obtained by calling the Britpave Office.

All users are to ensure that they are in possession of the latest issue of the drawings - currently Issue 4. For queries, please refer any details to our Technical Query Service via the website www.britpave.org.uk or by email to: technical@britpave.org.uk



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20TH ANNIVERSARY 1991-2011

2011 is our 20th Anniversary year and we look forward to celebrating with you.

Further details will be forwarded in our next newsletter.

RAIL

High-speed Vision

The confirmation by Transport Secretary Philip Hammond of the go-ahead of the high-speed rail link from London to Birmingham, albeit on a modified route, has been welcomed by Britpave with the caveat that the line is built right first time with 21st century technology and not 19th century-based ballast track.

The £33 billion rail link would see trains travelling at over 200mph, cutting journey times between the cities by 30 minutes. A spur line to Heathrow airport would not be part of the London-Birmingham stage of the project, but would be included in the second phase that will also see extensions to Manchester and Leeds.

The high speed rail link offers considerable economic and environmental benefits. However these benefits will not be realised if the line is built using modern 21st century technology rather than outdated ballast tracks.

Ballast track has been used since the earliest days of the Victorian railways and has changed little in concept since then. It has the advantage of being relatively quick to lay and can be readily maintained by a fleet of specialist plant. However, the nature of ballast track means that the track can and will move under load which results in the need for on-going maintenance to restore the line and level and for the ballast to be cleaned or replaced.

“Concrete slab track provides the long-term cost economies and performance necessary for the proposed high speed rail link”

In France they opted for traditional ballast when the high-speed TGV network was developed. They have managed to make it work – but at a cost. On some lines the rails have to be swept clean and the ballast replaced and repacked every night. The French are now reported to be examining replacing ballast with concrete slab track having found that the use of ballast tracks undermines the speed, efficiency and safety of high speed trains.

Concrete slab track, as used by the highly successful Japanese rail network and increasingly throughout mainland Europe, is the way forward for high speed rail networks. It maximises operating efficiency by eliminating unplanned maintenance, provides high levels of safety and comfort and impressive long-term performance.

Concrete slabtrack has been used in the UK for tunnels and for short stretches of the Heathrow Express, Stansted airport links and at the Eurotunnel terminal. Initial cost has always been given as the reason why slabtrack is not more widely used in the UK. This is short-sighted and a false economy and, thanks to ongoing slabtrack development, incorrect. The maintenance costs of slabtrack are dramatically less than that for ballasted systems and the long-term performance is significantly superior which means, that over the whole life of the slabtrack, its cost is considerably less than that for ballast. Concrete slab track provides the long-term cost economies and performance necessary for the proposed high speed rail link.



RAIL

East London Line

A major innovation of the £700 million East London Line, constructed by the Balfour Beatty/Carillion Joint Venture for Transport for London, is the use of concrete slab track rather than conventional ballast track. The use of slab track for the sections of viaduct and tunnels will provide long-term performance with little or no required maintenance. The line travels from West Croydon to Dalston and is expected to be used by 39 million passengers per year by 2016.

The slab track system used was the Sonnevile system. Concrete blocks support either end of the sleeper, all embedded in a concrete slab. Each block sits on a neoprene pad inside a rubber 'boot' in order to dampen vibration. Noise suppression was important, particularly for the viaducts as they run through high density residential areas, whilst for the tunnels minimum maintenance was the key issue as only night-time access is possible.

The solution was to install two variants of slab: the basic one and in some locations one using a mass spring system. The difference lies in the concrete surround for the blocks. Mostly this is mass concrete poured around the booted blocks that are positioned by hanging them from the rails placed inside a concrete trough. For the additional noise suppression required for the viaducts, the trough is lined with additional sound absorbent membrane with the concrete track slab poured around it being reinforced to accommodate any movement caused by the addition of the membrane. The boot system was complex to install as each sleeper end is independent. High accuracy levels for rail inclination, gradient, gauge and alignment were necessary before fixing in concrete.

And the result? Train drivers have said that the track is the smoothest they have experienced.



Slip Form Track Work Success

The paving division of VolkerFitzpatrick has used its experience in slip form to lay the base slab for the 1,000m of track work at the new Blackpool Tramway Depot.

Unlike the traditional method of constructing track encased in concrete, using a hanging rail, a stable base is formed first to allow all disciplines to work safely alongside each other and the track is formed from the bottom up.

As main contractor on the site for clients Blackpool Borough Council and Lancashire County Council, VolkerFitzpatrick used this new way of working as part of its value engineering. Not only is it a cheaper method of constructing track it also has health and safety benefits and can be undertaken much more quickly.

Joe Quirke, general manager for paving at VolkerFitzpatrick, said: "We have never laid rail track in this manner and it is probably one of the first times in the UK this method has been used for this purpose. Not only does it provide a cheaper alternative to the traditional method, but one days paving can save around seven days conventional pouring."

The bottom slab is 2.7m wide by 400mm deep with 400mm wide troughs for the rail to sit in with a 1435mm track gauge. Plastic structural fibres were used in the c40 air entrained mix instead of steel reinforcement to aid paving methods and also eliminate current and signal loop detection failures.

VolkerFitzpatrick started work on the £18.1m contract to design and build the new tram maintenance depot and covered stabling in September 2009. It is due for completion in spring 2012.

VolkerFitzpatrick's paving division has now completed the track construction at Blackpool and has already started work on two new projects. The construction of 18 kilometres of concrete barrier on the M80 construction near Glasgow and the construction of an airport infrastructure at Lakenheath in Suffolk.

The Lakenheath project is to provide a new purpose built hardstanding with an access taxiway onto existing Taxiway Victor.

The new PQ apron is approximately 40,000m². Other works associated with the new apron will be new AGL, markings and the associated drainage.

Programme duration is 35 weeks, completion is expected in April 2011.

AIRFIELDS

Airport Growth

Growth at regional airports looks set to take off with several having their expansion plans approved and others are developing future proposals. The expansion of regional airports is in contrast with the main London airports.

The plans of Heathrow, Gatwick and Stansted have all been put on hold, whilst those of many of the regional airports are aiming to realise their potential for new routes, increased passenger numbers and a significant contribution to the local economy. In addition, increased flight capacity at regional airports, particularly for holiday flights, could help reduce congestion at the overcrowded London airports.

Bristol Airport is a case in point. It has recently been given the go-ahead by North Somerset Council for £150 million expansion scheme that includes an extended airport terminal, increased car parking and new aircraft stands to accommodate a predicted 60% increase in passengers. It is believed that the expansion will allow the airport to deal with 10 million passengers a year by 2019 and could create 4,000 jobs and inject £340 million into the local economy. The plans have been granted outline planning permission.

Lydd Airport in Kent has been granted planning approval for a £25 million extension of the runway and building of a new terminal building. Meanwhile, expansion plans of £28 million have been approved for Leeds Bradford Airport. Plans for a runway extension at Birmingham Airport have the backing of Birmingham City Council. East Midlands, Liverpool John Lennon and Farnborough airports all have plans to increase flight and passenger capacity.

The ambition of regional airports is demonstrated by Southend Airport in Essex. During the 1970s it was the third busiest airport in the UK. However, the introduction of larger jet-engine aircraft and tougher runway regulations saw its status downgraded to becoming primarily a site for aviation maintenance and repair. A new expansion plan hopes to place Southend firmly back on the aviation map. A 300m runway extension will allow the airport to handle larger aircraft such as the Airbus A319 and the Boeing 737. The new railway station, opened in August 2010, runs direct to

Liverpool Street via the Stratford Olympics Park and a new air traffic control tower and passenger terminal will be completed in 2011. The airport plans to provide a strong alternative to Stansted and Luton.

Concrete paving will play a significant role in the expansion of regional airports. The long-term, maintenance-free performance of concrete pavements makes them particularly well-suited to runways, taxiways and aircraft stands due their resistance to fuel spillage damage, resistance to heat from engine blast, reduced runway water due to slipform slot drainage and high bearing capacity to cope with new and heavier aircraft. The long-life performance of concrete pavements means reduced unplanned maintenance, an important issue for airports which are frequently running at full capacity.

The expansion plans of the regional airports goes against the perceived coalition government's opposition to airport expansion following its dismissal of the Heathrow, Gatwick and Stansted proposals. A report from the Institution of Civil Engineers, 'Rethinking Aviation', highlighted the dangers of Britain failing to increase its airport capacity and urged the government to think carefully about the UK's long-term airport infrastructure needs.

The value of the aviation sector to the UK economy is significant. In 2007 it directly generated £8.8 billion of economic output. When you add the economic activity of aviation's supply chain, the total economic footprint equals £18.4 billion or 1.5% of the UK economy. Beyond the headline figures, there are the issues of how greater connectivity encourages increased trade and investment by both UK and overseas companies.

Philip Hammond, the Transport Secretary, has promised that the UK is to get its first significant aviation policy review in seven years. The review will be the first since the Labour Government published an air transport white paper in 2003. It will begin early in 2011 with the Department of Transport issuing a 'scoping document' setting out the questions to be covered in the study. This will be followed by industry consultation. A draft policy document for formal consultation will be published early in 2012. It is hoped that the review will take full account of how investment in airport infrastructure is an investment in the UK economy.

"Growth at regional airports looks set to take off"



AIRFIELDS

VolkerFitzpatrick's paving division is undertaking the construction of an airport infrastructure at Lakenheath in Suffolk. The project will provide a new purpose built hardstanding with an access taxiway onto existing Taxiway Victor.

The new PQ apron is approximately 40,000m². Other works associated with the new apron will be new AGL, markings and the associated drainage. Programme duration is 35 weeks, completion is expected in April 2011.

Heathrow a 'dead end'

Heathrow has been described as a "dead end" and should be allowed to fall behind as a secondary point-to-point airport according to Daniel Moylan, deputy chairman of the Mayor of London's transport body. He recommends that, in order to safeguard London's position as a global trading centre, a new hub airport with four runways must be built in the South East.

With Heathrow near to full capacity and potential expansion being restricted by its urban location there is no opportunity to develop it into a four-runway hub. The growth of China and Asian markets to which London has limited services has highlighted the lack of capacity. Moylan will publish a further report in April examining possible locations for a new airport, including a site in the Thames Estuary northeast of the Isle of Sheppey.

The recommendations have been welcomed by Boris Johnson, the London Mayor, but not by the government which has ruled out any new airport in the South East. However, time could be running out for this stance as British Airways, following its merger with the Spanish carrier Iberia, has plans to centre a network on Madrid which has four runways and ample capacity. Whiles business groups such as London First believe that new runways for London are essential if the capital is to remain globally competitive.



"Concrete paving will play a significant role in the expansion of regional airports"

PORT PAVING

Felixstowe South Reconfiguration

“Expansion through sustainable means” was Hutchison Ports (UK) Limited’s (“HPUK”’s) philosophy behind the latest of the Port of Felixstowe’s development the Felixstowe South Reconfiguration (FSR). The project involved the extensive re-engineering (and therefore maximisation) of existing and defunct operational areas within the port.

The first phase of the project comprised:

- The creation of a major new deep water terminal able to accept the latest generation of large container vessels
- The creation of 730m³ of new quay wall
- Infilling of the original Dock Basin and reclamation of a section of the River Orwell with circa 3 million cubic metres of fill
- Dredging to create the berthing pocket (16m below chart datum adjacent to the quay face initially but capable of being deepened to 18m) and on the main approach channel to 14.5m below chart datum.

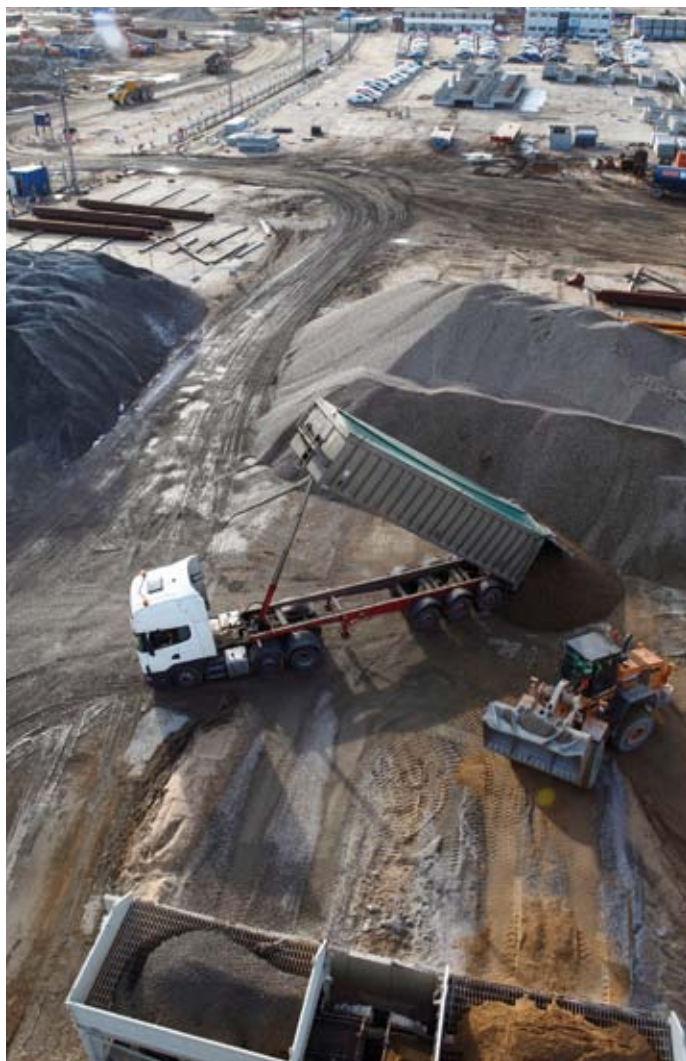
The new terminal will have a storage yard capacity of 20,000 TEU (Twenty foot Equivalent Units) over an area of 35 hectares in the first phase.

The pavement required a design load that could accommodate the location of 13 huge ship-to-shore gantry cranes, 50 rubber tyred gantry cranes and the large static loads imposed by stacked containers over a 20 year life period. As with many of the port’s other developments the optimum solution was block paving laid over a cement bound material (CBM) base, which forms the backbone of the structure.

Bardon Composite Pavements (BCP) were employed by main contractor Costain Limited to provide the specialist sub contract work in paving 130,000m³ CBM. The cement bound base overlays the foundation and is designed at 375mm thick.

At site trial stage, BCP proposed the use of an alternative, 100% recycled aggregate to resolve a technical issue with the mechanical stability of a deep lift CBM. An Incinerator bottom ash aggregate (IBAA) was sourced and trialled. The material was used as a percentage replacement of the sea dredged sand and gravels. The use of IBAA provided improved mechanical stability, enabled speedier rolling and finishing of the CBM and provided a superior



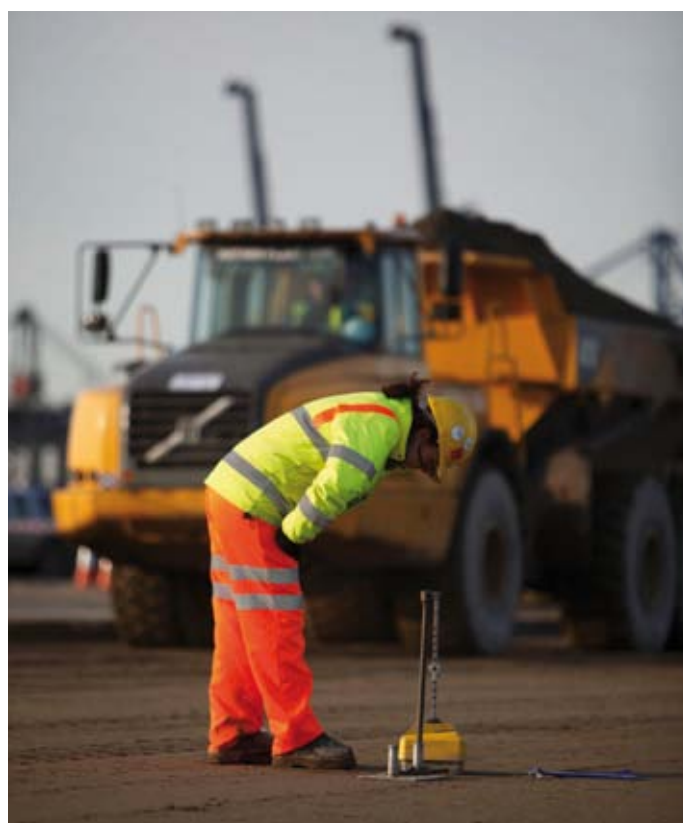


surface finish. Utilising a secondary aggregate within the CBM also greatly improved the sustainability of the overall pavement. The CBM element of the pavement is fully recyclable at the end of its service life.

The CBM was mixed on site using a high output continuous mixing plant, transported to the paver in 30tonne dump trucks and placed using a heavy duty tracked paver with a dual, high compaction screed. The current generation of continuous mixing plants in the company's fleet feature internet linked computer controlled weighing systems. Utilising a site based mixing plant minimises the vehicle miles of the CBM delivery vehicles and therefore reduced CO₂ emissions. The use of 30tonne dump trucks to deliver the CBM to the paver not only increases productivity but also reduces the overall vehicle miles in delivering 130,000m³ CBM. Control over the quality of the product is also increased by the close proximity of the site mixing plant and paver. BCP has a BS EN ISO: 9001:2008 quality registration with British Standards covering both its mixing and paving operations. Average productions of 750m³ per day are currently being achieved which has peaked at 950m³ in a single day.

The CBM is placed in two discreet lifts of 200mm and 175mm. Both lifts are paved, rolled and cured within the specified construction period forming a monolithic slab. This method of paving, developed by BCP, offers a number of advantages. The ability to pave the CBM layer in one layer massively speeds up the pavement progress, as instead of waiting seven days to place the next layer of CBM, after the seven day curing period, the CBM is ready to receive the block paving.

Felixstowe is already the UK's busiest container port, handling over 3 million TEUs each year, however, following these latest improvements handling capacity will be sustainably increased by 50%. Phase 1 of the project is due to be completed in 2011 with the construction programme currently running on time.



BRITPAVE 2010 CONFERENCE

At the Britpave's Annual Conference held last October the key speaker threw down an economic and low carbon challenge to his fellow speakers and delegates who responded with infrastructure innovation and a demonstration how the low maintenance, long benefits of concrete road and pavement construction means that it is well suited to the economic and climate change demands of more for less.

Terry Last, CEO of Tarmac Limited, pulled no punches over the economic challenges facing the construction industry as a whole. Saying that even if economic recovery began in 2012 it would take until the end of the decade to reach the outputs of 2007, Last explained that public sector investment will fall from 3.9% of GDP in 2009/10 to just 1.25% in 2013/14 – considerably lower than the 2.25% level below which public buildings and infrastructure conditions deteriorate. Roads are a case in point. After some recent fiscal stimulus, government road expenditure in 2013 is expected to be some 50% less than it was in 2010. However it was not all doom and gloom. Last pointed to the opportunities presented by the high speed rail proposals but stated that investment in high speed rail should only be done once the road network is significantly improved, for roads are the real economic arteries of the country.

Concluding his view of economic challenge ahead, Last added a further challenge to the delegates: that of delivering the sustainable low carbon infrastructure solutions. Both of these challenges were taken up by the following speakers.



Kent Godbersen (Gomaco), Neil Mangham,
Danny Falls & Dave Webster (Extrudakerb)

Dr Lindon Sear, Technical Director of the UK Quality Ash Association, demonstrated how the challenge of providing infrastructure solutions that were both economic and low carbon can be answered by the use of fly ash as part of the concrete mix. Fly ash is a by-

product of coal-fired electricity generation. It offers a range of benefits when used for roads including enhanced durability, reduced leaching potential and increased compressive strength. The use of fly ash has strong sustainability credentials. By using a by-product it reduces the amount of waste going to land fill, reduces the cement content of concrete thereby reducing both the use of virgin raw materials and the embodied CO₂ of the concrete and provides a finished product that requires less on-going maintenance. In addition, fly ash is a locally produced by-product which is an important factor which you consider transportation can equate to 60% of a material's CO₂. That is the good news. The bad news is that a shift away from coal-fired electricity generation and increased demand, despite the recession, means that future supplies of fly ash are under threat.

Britpave is working with the University of Nottingham to develop a carbon footprint calculator tool for concrete pavements. Outlining current progress, Dr Tony Parry, associate professor with the University of Nottingham, explained what is meant by a whole life cycle assessment of CO₂ and how that can apply to the carbon footprint of concrete pavements. This will require contractors being asked to supply information on the carbon footprint of their products and operations. It is expected that the Britpave calculator will be integrated into the overall Highways Agency asPECT tool.

The calculator will not only enable Britpave members to ascertain the carbon footprints of their products and processes but will also allow the identification of carbon 'hot spots' where major reduction in carbon emissions can be made. Currently 'cradle to laid' process maps have been drafted for HBM paving and barrier slipforming. Parry warned that the success of the tool is subject to the quality of data provided by Britpave members and called for their support and input.

“The demands of reduced local and national highway budgets plus those of sustainability and reduced carbon footprints could be met”



David Lee (Highways Agency)

The conference heard how a new process for extending the life of UK roads offers both cost and sustainability benefits. Currently being examined by the Highways Agency diamond grinding and grooving has been successfully used for many years in the United States. The process restores the surface performance of concrete road at less than half the cost of overlaying the concrete with asphalt.

Introduced into the UK by Concrete Cutters (Sarum) Ltd, in partnership with UK abrasives company, Tyrolit, the diamond grinding technique is half the cost of overlaying concrete with asphalt, is much faster and requires considerably less investment in capital plant. In addition to cost savings, the process is fast, is environmentally friendly as it has a lower carbon footprint than an asphalt overlay and provides a road surface that is noticeably quieter than untreated concrete as traffic driving over a textured surface emits less noise than when driving over a smooth surface.

Last year, as David Lee of the Highways Agency's Network Services Division Pavement Team explained, a series of grind and groove trials in East Anglia at Alconbury Airfield, Cambridgeshire, between the A318 and A1114 junctions on the A13 Chelmsford Bypass, Essex, and on the A12 Chelmsford Bypass were carried out. Further trials have been carried out on the 1.61km of the A12 Kelvedon, both directions, 745m of the A12 Chelmsford Northbound, 1km of the A11 Ketteringham Northbound and a major maintenance project on the A14 near Ipswich has used the technique. Early indications from accelerated wear tests are that the surface is durable and will retain its skid resistance and noise attenuation characteristics for many years. There has been a significant improvement in skid resistance of 54 per cent. Reductions in noise levels compared with a smooth concrete surface with traffic flowing at 30 to 50mph range from 4 – 6dBA. At higher vehicle speeds the noise reduction is even more apparent. It is anticipated that the results of the TRL study will be published later this year.

The site management and grind and groove operations for the A14 project was carried out by main contractor VolkerFitzpatrick. Tim Eden, a civil engineer with VolkerFitzpatrick, reported that one of the main benefits of the process was that it can be carried out

during off-peak hours with short lane closures and without encroaching into adjacent lanes plus drainage and the clearances underneath bridges are not affected.

With its considerable potential cost savings and long term performance benefits, grinding and grooving offers the enticing possibility of its being used on new build and major reconstruction road projects and this could result in concrete roads making a surprising comeback in the UK.

Cost and waste reduction was also the theme of Harris Angelakopoulos's presentation. A PhD Scholar at the University of Sheffield, Angelakopoulos outlined the findings of the EcoLanes research project that examined the potential benefits of using recycled tyre-cord fibres in reinforced concrete pavements. Four demonstration projects were carried out in the UK, Romania, Turkey and Cyprus. The results were impressive with environmental and cost life-cycle studies showing that the energy consumption of steel fibre reinforced roller compacted pavements came by up to 40% less than that of commonly used asphalt pavements and up to 12% cheaper.

So although the future may be challenging, conference delegates were convinced that the long-term durability and sustainability benefits of concrete roads, pavements and barriers meant that the demands of reduced local and national highway budgets plus those of sustainability and reduced carbon footprints could be met.



Dr Jim Troy and Mr Terry Last (Tarmac)



Dr Tony Parry (University of Nottingham)



Environmental Credentials of Concrete Pavements

Sustainability was an important theme of the 11th International Symposium on Concrete Roads, 'The Answer to New Challenges', held in Seville.

35 countries were represented, nearly 80 papers were presented and 500 hundred delegates attended. Subjects covered included concrete pavements and long-term performance, reduced noise, road widening and efficient construction.

Several papers, as abstracted below, demonstrated how concrete pavements have both passive and active environmental credentials.

Sustainability Opportunities with Pavements: Are we Focusing on the Right Stuff?

L.Wathne, American Concrete Pavement Association

In the context of sustainability and sustainable practices, the highway engineer or administrator often tends to focus on elements of the structural design, the pavement materials, or the construction operation itself. Items such as recycling, use of industrial by-products (fly-ash, slag cement etc), resource conservation, CO₂ footprint and even embodied energy all tend to get a fair amount of attention in this context. However, even though these factors are all important, significant sustainability opportunities may be missed by the ignoring the benefits offered by the operational phase of a pavement's life. Recent research suggests that the long-term

cumulative sustainability benefits of concrete pavements can be significant and can dwarf those gained during production and construction phases. These benefits include improved vehicle fuel efficiency as well as energy savings associated with the use of high-albedo pavements. The paper focuses on these long-term operational benefits and calls for them to be properly accounted for when making decisions about road pavement sustainability.

Decision Making Support Model for Sustainable Road Pavements

Steeff B. van Hartkamp, Consultant, and Adrian J. van Leest, CROW Technology Platform

The range of possible solutions can complicate the choice of road pavement. Added to the issue of technical specification, bearing capacity, safety and durability, construction and maintenance costs is the consideration of environmental impact and sustainability.

Calculating environmental impact of road pavements involves consideration of CO₂ emissions, the use of natural resources, the use of energy during material production, construction process and required maintenance, material waste, and long-term durability. CROW has developed a model to objectively evaluate the environmental impact of asphalt, concrete and block pavements. In addition to the areas outlined above, the model is able to compare traditional road pavement materials with new materials such as lightweight materials, low-temperature asphalt, fibre reinforced concrete and concrete with recycled aggregates.

The paper explains how the model can help with the choice of the most sustainable option for road pavements.

Concrete Pavement Recycling Practices in the U.S.

M. Snyder, Engineering Consultant and R. Rodden, American Concrete Pavement Association

Concrete pavements are recycled for paving applications in at least 41 U.S. states and production of recycled concrete aggregate (RCA) in the U.S. currently averages 140 million tonnes. The primary application of RCA has been sub-base materials, but it is also used for paving layers, high value rip-rap, general infill and embankment applications. The paper examines current U.S. concrete pavement recycling practices and explains the physical, mechanical and chemical properties of RCA and their impact upon the performance of plastic and hardened concrete. It provides examples of RCA pavement projects including the use of RCA recycled from pavements that were severely damaged by D-cracking or alkali-silica reaction.

Effect of Pavement Type on Rolling Resistance and Fuel Consumption of Heavy Duty Vehicles

T. Yoshimoto, Japan Cement Association; T. Kazato, Nippon Expressway Research Institute; I. Hayakawa, National International Airport

The paper examined the relationship between the fuel consumption of heavy duty vehicles and pavement type. It explained the use of a new approach for determining the vehicle fuel consumption/ measurement of the running resistance of vehicles to investigate their rolling resistances due to different pavements types. The research found that the rolling resistance of asphalt pavement is higher than for concrete pavement by 5.9 to 19.4% and that the fuel consumption rate from driving on asphalt pavement is 0.8% to 3.4% higher than for concrete pavement.

Measurements of Fuel Consumption on an Asphalt Pavement and a Concrete Pavement in Sweden

B.A Hultqvist, Dept of Road Engineering, Road and Transport Research Institute, Sweden

The research examined the correspondence between the fuel consumption and pavement type. A Road Surface Tester was used to determine the pavement texture and depth of both asphalt and concrete pavement lanes of a motorway sector north of Uppsala, Sweden. The tester found that the two pavements were almost the same in terms of slope gradient along and across the lanes while the asphalt pavement had a rougher macro texture than the concrete pavement.

The research found 1.1% less fuel consumption on the concrete pavement compared to the asphalt pavement. This difference could be even greater for heavy goods vehicles especially during the summer when stiffness of asphalt is reduced.

Concrete Pavements as a Source of Heating and Cooling

P. Keikha, University of Nottingham; M.R. Hall, University of Nottingham; A.R. Dawson, University of Nottingham

There is considerable potential to use the large open space of pavements, equipped with embedded pipe network and a heat pump, to provide heating and cooling for adjacent buildings. Due to the high thermal mass of pavement materials, seasonal temperature fluctuation under the pavement is much less than that of ambient air. Therefore, pavements could be used as a low grade heat source during winter and as a heat sink during summer. Airports, for example, offer a key potential application as they are very large consumers of energy, have high cooling demands and have a large amount of adjacent pavement area.

As part of the research, the temperature distribution into pavement with different thermo-physical properties was modelled in order to evaluate their effects on depth of seasonal temperature fluctuation. The results show that there is a linear relationship between the thermal diffusivity and depth of seasonal fluctuation and that it decreases in relation to the thermal diffusivity of the pavement.

For copies of the conference report giving a full abstract listing of the papers contact the Britpave office.



THE LAST WORD...

Getting to Know You: Graham Dalton



Name:
Graham Dalton

Location:
London

Occupation/Job Title:
Chief Executive

Organisation:
Highways Agency

Top of your in tray?:
The 2010 Spending Review set our budgets for 2011-15 at a challenging, but achievable, level. So priority now is to make the changes to how we work and how our suppliers work so that we can live within our means and continue to keep the motorway and trunk road network in good order.

Biggest Work Achievement?:
I have been lucky enough to work on and lead many major projects over 20+ years, and all have been hugely satisfying to deliver. But the biggest achievement? I think is still to come!

Best Part of your job?:

Working with my staff at the HA – whether operational staff in the Traffic Officer Service or members of the professional teams, they are a highly motivated and capable group of people. There is nothing like spending an hour in a depot or regional office to remind me how committed and innovative our staff are to running a vital national transport network.

Top Business Tip:

Keep focussed on the outcome you are trying to achieve, and look at everything through the eyes of your customers.

Do you have a personal business philosophy?:

Be honest. Be fair. And do what you say you will do.

Do you speak any other languages?:

Enough French, German, and Hungarian to get by on holiday. Which is not a lot.

Favourite Holiday Destination:

Racing my sailing dinghy anywhere on the UK coast, or walking in the Lake District.

Favourite Book:

Driving Over Lemons by Chris Stewart.
Though On Roads – A Hidden History by Joe Moran makes good reading for a busman's holiday.

One key word to describe yourself:

Focussed.

Interest/hobby or favourite sport:

Sailing my Laser 2000 (see above) in Chichester Harbour – or sailing just about any boat anywhere warm and windy!



The girls in the Britpave Office would like to help more people to beat cancer. We have signed up to do a local Race for Life.

We would appreciate all your support and any donations to this worthy cause, I'm sure we all know someone that has been affected by the Big C!!!

Please feel free to come and join us on the day and cheer us on.

The Race is on Saturday 2nd July at 11am in Windsor, Berkshire.

The link to the sponsorship page is www.raceforlifespansome.org/Britpave



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Corrections and Clarifications

It is the policy of Britpave 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.

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