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## britpave nevvs





## airfieds down under report from John Cairns on major projects

Following a spell in the Middle East, John Cairns, a former member of Britpave's Airfield Task Group, headed south to New Zealand, joining Beca (a 1,800 strong firm of consulting engineers, planners and managers) in their airports group. In the last 16 months, John has worked on projects at a number of international and regional airports in New Zealand, Australia and the Pacific Islands. John and his colleagues (including former BAA Pavement Team members, Jon Hall and Tristan Hughes) have kindly offered to share some of Beca's recent airfield concrete paving experience's from down under.

In the last 18 months, Beca has designed and completed two major award-winning concrete airfield pavement paving projects: the reconstruction of Runway 05R-23L at Auckland International Airport in New Zealand and the Runway 16-34 outer shoulder widening at Melbourne Airport in Australia.

### Auckland International Airport runway reconstruction

By the early 1990s, the 350 mm thick concrete pavement constructed in 1966 on the main Runway 05R-23L at Auckland International Airport had exceeded it's original design life. Accessible areas of the runway had been reconstructed by conventional slab replacement, but the central portion of the single 3,635 m long runway required rehabilitation and a new technique was required to undertake this, without disrupting

The decision to convert the existing parallel taxiway to a temporary, but fully functional, runway allowed the main runway to be reconstructed without disrupting traffic. The resulting NZ\$100 million (£35m) project took eight years to plan and execute. Over a period of five years, the runway was closed for typically four to six week periods, between April and May (with operations on the standby runway) and during these periods it was reconstructed with a new concrete pavement achieved by working 24 hours a day.

The final section of the runway was completed in May 2006. Beca was the Principal Consultant and overall Project Manager for the client, Auckland International Airport Ltd.

A number of technical innovations were adopted by Beca and contractors (Brian Perry and Kiapara), to improve the project budget, programme achievement and safety. These included use of a hydraulic blast fence to protect workers; large loaders to remove concrete slabs quickly;





buried light bases to speed up concrete placing; temperature probes to monitor concrete strength development; and high performance concrete mix designs. Recycling and crushing the old concrete slabs provided low cost hardcore material and eliminated the cost of disposal and harm to the

During the course of the project, over 150,000 m<sup>2</sup> of original concrete pavements were reconstructed and some 85,000 m<sup>3</sup> of new, high-performance grade 6 MPa flexural strength concrete was placed on an in-situ cement stabilised base. The 500 mm thick pavement has keyed and dowelled sealed joints. The concrete was batched on site and was discharged between steel forms by concrete agitator trucks, compacted and finished by handheld poker vibrators and a Bidwell 5000 paver. It was cured by a combination of two applications of a wax-based curing compound and mist spraying for seven days.

In recognition of the significance of the project and successful planning, design and project management, Beca was awarded the ACENZ Gold Award of Excellence in 2003, one of the most prestigious awards in the New Zealand consulting engineering and infrastructure communities.

### **Melbourne Airport** outer shoulder widening

In April 2005, Runway 16-34 at Melbourne Airport became one of the first airport runways in the southern hemisphere with a paved runway width of 75 m capable of accommodating the A380 aircraft. Beca Airports was the designer for the works and a key part of the Melbourne Airport-led project team. Widening the airport's 3,657 m main runway by 15 m (7.5 m either side) provided for jet blast protection for the new generation A380 aircraft when it arrives. The project was completed by contractor, John Holland Pty Ltd, in a 29-day period with the main runway closed and the subsidiary cross runway being used.

During the course of the project, 15,000 m<sup>3</sup> of bulk excavation was undertaken in a nineday period and over 50,000 m<sup>2</sup> of 350 mm thick, 4.8 MPa flexural strength, un-reinforced concrete pavement was constructed on an in-situ lime stabilised weathered basalt base. In addition, 60 concrete runway slabs were replaced with 500 mm thick concrete slabs whilst the runway was closed. In total, 18,000 m³ of concrete was placed in 12 days and cured by a combination of a wax-based curing compound and the use of wet hessian for seven days.

The project was highly commended in the Victorian Engineering Excellence Awards in 2005 and won the Australian Construction Achievement Award in 2006.

For more information on the above projects and other airfield paving projects "down under" please contact Dr John Marsh, General Manager, Beca Airports (john.marsh@beca.com) or John Cairns, Associate, Beca Airports (john.cairns@ beca.com). John, Tristan and Jon hope to hear from their former airfield paving UK colleagues soon.



## Stabilisation Tesco's largest distribution centre

### Getting to grips with saturated boulder clays

Taylor Woodrow was awarded a contract by Tesco to build a new distribution centre at Livingston, West Lothian, at the site of a former electronics components factory. It will be Tesco's largest distribution centre in the UK, covering 70,000 m<sup>2</sup> with a further 180,000 m<sup>2</sup> of service yards. Project timing for completion of the building is 12 months and Taylor Woodrow has appointed three main contractors, Chartrange, Stent Piling and Pennant Construction to assist them in the delivery of the project.

CON-FORM has partnered with Chartrange to carry out all earth works to the underside of the concrete slab with around 320,000 m<sup>3</sup> of site material to be cut and filled for the building and service yards. A further 150,000 m³ is being removed and will be used to profile and landscape the site. The cut operation involves the removal of material up to 4 m in depth, with fill then being placed up to 7 m in depth.

CON-FORM's extensive experience of dealing with Scottish boulder clays was a major advantage as it had invested heavily in specialist rippers and civil engineering discs to enable it to modify this type of material effectively without incurring major damage to its stabilisation equipment.

The material is being moved and treated at the rate of approximately 10,000 to 12,000 m³ per day. The adverse weather conditions encountered have affected the earthworks operations but progress has been maintained due to the power of lime stabilisation, which has managed to keep the site operational by rapidly drying up the ground and haul roads following the cessation of the rain. It is estimated that over 10,000 tons of lime and 2,500 tons of cement will be used on the job.

CON-FORM's proposal enabled half of the building footprint to be treated with the company's innovative E-Found alternative foundation solution with the other half piled. The half of the building area carried out by CON-FORM is where the old building stood. This was demolished and the crushed material was laid out over the footprint. E-Found works were then carried out and the top 250 mm of the re-engineered material then treated to achieve a 15% CBR.

The piling mat area was filled with 5% CBR treated material up to the underside of the piling

All hardstanding areas were built up with 5% CBR treated material and topped off with a 15% CBR capping layer, including all service roads and car parks.

During the fill operation, a soft peat area was identified within the fill area, which needed to be improved before the fill operation could be completed. CON-FORM therefore engineered and carried out the following solution to enable the works to proceed:





- The peat was removed down to soft material and settlement plates were then laid on the soft material.
- A geo-grid was then laid down with 300 mm of drainage stone laid on top with another layer of geo-grid added over the stone.
- A layer of 1 m of lime-stabilised material was placed on top of the geo-grid and filter drains were installed by a specialist sub-contractor. These were connected to a carrier drain to carry the water to a pumping shaft.
- The area was rolled with CON-FORM's rolling dynamic compaction equipment to force the water from the lower areas up into the drainage system, thereby enabling consolidation of the lower layers due to the release of the pore water pressure.
- The area was then backfilled with the limestabilised material to an average depth of 7 m.
- Settlement was monitored to ensure compliance with the strict 50 mm maximum settlement criteria.
- For further information contact Simon Harding, CON-FORM Quality Assurance and Marketing Manager on 01621 843938.

### Where in the world?

Take part in Britpave's own travel quiz



Congratulations to Luc Rens of Febelcem who correctly guessed that the picture showed barrier paving in Israel. The photo was kindly submitted by Ahron Zorawsky of Arden Construction, Britpave member in Israel.

Readers are invited to submit challenging photographs for further competitions to the Britpave office. Please send them to

## news round up

Britpave cordially invites you to visit our Stand Z71 at TRAFFEX 2007

17-19 April at the National Exhibition Centre, Birmingham. Situated in the Passive Safety Zone, we will be showcasing the Concrete Step Barrier and Drainage.

### Transport polices and sustainable development

The Centenary World Road Congress will be held under the auspices of PIARC in Paris from 17 to 21 September. This promises to be an information-packed event, addressing the issue of what road transport polices should be pursued to encourage economic and social progress without jeopardising the natural balance of the planet. Providing networking opportunities for experts, professionals and contractors, the Congress will cover:

- Governance and management of the road system.
- Sustainable mobility.
- Safety and road operations.
- · Quality of road infrastructure.
- For more information visit www.paris2007route.fr or contact the Britpave office.

### Guided bus presentation at international symposium

Some 500 delegates from all over the world attended the 10th International Symposium on Concrete Roads held in Brussels during 18 to 22 September 2006. Britpave interests were represented by a powerful presentation on the guided bus by David Hunt of Arup and an informative poster prepared by Adrian Erwee of Peter Cole Consultants.

The Conference was split between a wide range of site visits and sessions held in the conference hall. Papers for the conference can be obtained by Britpave members upon request from the Britpave office.

### Concrete pavements improve fire safety in tunnels

Spain has joined Austria and Slovakia in requiring the use of concrete road pavements in tunnels longer than 1000 m, according to the 'Real Decreto 635/2006' published in the BOE 29 June 2006. Spanish law specifies "... concrete pavement, with colouring admixtures in order to provide sufficient contrast with traffic marks, shall be used in tunnels longer than 1000 metres".

The benefits of concrete pavements are:

- Improved safety to people and the structure, as concrete does not burn or emit toxic fumes.
- Improved durability of the road pavement, facilities and structure, as any fire causes limited damage.
- Reduced maintenance results in fewer tunnel closures and lower risk to workers.

### **Cheltenham for 2007**

This year's Dinner and Seminar will be held on

## 24 and 25 September at The Chase Hotel, Cheltenham

The Chase sits among open countryside, yet is still within easy reach of the spa town of Cheltenham and commercial Gloucester. Getting there couldn't be easier: The Chase is just one mile from the M5 motorway, within an hour of Birmingham and Bristol Airports and close to direct train links to London Paddington.

Britpave attendees will benefit from The Chase's £3m refurbishment in public areas, bedrooms and conference rooms. Due for completion in early July 2007, the hotel will boast a new extension to the largest conference suite accommodating up to 400 delegates. There will also be a fresh new pre-function bar area, air conditioning in all bedrooms with new opulent feature furnishings and all you'd expect from a deluxe hotel.

The Dinner on 24th will be an excellent networking opportunity. Book a table and invite your colleagues/clients along for this event. After dinner speaker, Terry Crystal, doctor to the England rugby team during the 1990s, is booked to entertain diners. With 83 international matches under his belt Dr Crystal has a reputation for providing an enjoyable after-dinner event.





### Strong internati

Britpave once again hosted a series of successful events at its Conference in Buxton on September 25 and 26.

#### **Golf Day**

In beautiful autumn sunshine, some 26 golfers teed off at the picturesque and challenging Cavendish Golf Club in Buxton. The overall winners of the Britpave cup were Rob Cundy and John O'Neil, a team from Tarmac. The prize for the 'shot closest to the pin' was won by John Donegan of Roller Compacted Concrete Company and Simon Renker of Gill Civil Engineering took the prize for the 'longest drive'. Several international golfers added spice to the competition.

#### **Tunstead Quarry Visit**

During Monday afternoon, Tarmac very kindly offered delegates the chance to visit one of Europe's largest quarrying operations at Tunstead Quarry. In addition to seeing the quarry itself, the group of Britpave visitors was shown the full range of quarry activities including the high capacity rail head. They also visited the coated stone, readymixed concrete and lime operations. Finally they were treated to a tour of one of Britain's most modern cement works. All who experienced the trip agreed they had had a stimulating and informative visit.

#### Dinner

The Britpave Dinner was again a great social and networking success. Diners enjoyed a complimentary bar sited in the Exhibition area and were then treated to a premiere of the new Barrier video fronted by Vicky Butler-Henderson of 'Fifth Gear' fame. After the meal, members and guests alike were entertained by Tom Sutton, the after dinner speaker and comedian.

#### **Seminar**

Britpave's new Chairman, David York, set the scene for the technical Seminar with his address. For the first time at a Britpave Conference, a husband and wife team got the Seminar underway. Robert Garbini gave a presentation on the move in the States from Prescriptive to Performance Specifications. This was followed by his wife, Julie Luther-Garbini, who explained the role of the Readymix Research Foundation.



## highlights from Buxton 2006

## onal presence at Britpave Conference

Roland Brueckmann of RAIL.ONE brought the first session to a close with a wide ranging review of slab track projects throughout Europe and worldwide.

Following coffee, Naomi Green of Arup gave a presentation dispelling some of the myths surrounding concrete barrier and accident injuries. James Charlesworth, standing in for the absent speaker on Fuel Savings, provided the audience with a real insight into the role of Britpave as promoter of the Concrete Step Barrier.

After lunch, Heather Ceney countered the disappointment over the Airbus presenter not being present by giving a briefing on the contents of the new Guided Bus Construction Handbook. This had been made available to all delegates in their pack. John Donegan then provided a concise resumé of the activities of all the Task Groups within Britpave, demonstrating the wide-ranging scope of the organisation. The afternoon was rounded off by a very clear presentation from John Kennedy on the opportunities for Hydraulically Bound Mixtures and Soil Stabilisation.

Feedback from conference attendees shows that Britpave continues to provide high quality speakers covering a broad range of cement and concrete related subjects. The high standard of 2006 will be a challenge that those presenting this year on 24 and 25 September will surely be pleased to meet.

Another successful Britpave event





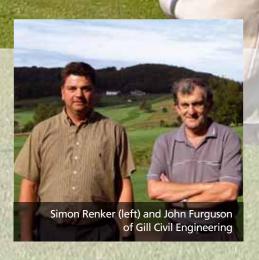




## A good day for golf







## technical issues environmental impacts of rail trackbed roller compacted concrete

## Britpave compares rail trackbeds

Traditional ballast remains the most commonly constructed railtrack type in the UK, partly due to its lower initial cost compared with concrete trackbed systems. However, concrete slab tracks, regularly used in Europe and Japan, can have lower whole-life costs because almost no maintenance is needed. (See www.britpave.org.uk/pub\_busrail.html)

Britpave's Sustainable Construction Task Group is currently helping in an investigation into the lifecycle environmental impacts of the construction and maintenance of these systems. If a cheaper whole-life cost system can be delivered without increased environmental impacts, this could form an important part of promoting less traditional systems in the UK.

The study is being undertaken at the Nottingham Centre for Pavement Engineering at the University of Nottingham and will be completed by summer 2007. It is being conducted as part of an EPSRC Platform Grant in Pavement Engineering by Mohamad R. Kiani and supported by Britpave and members of the Rail Task Group.

The work will compare the whole-life environmental impact of ballast compared with concrete cast-in sleeper and embedded track systems. The scope of the study includes manufacturing, construction, maintenance, dismantling and recycling of the track bed components; and the impacts on energy consumption, carbon dioxide emissions, water pollution and resource use.

The initial results suggest that the concrete trackbeds have a similar level of environmental impact to ballast track over a 60-year lifetime. The final outcome of this study will highlight the environmental impacts of trackbeds but will also provide a methodical inventory analysis that can be used by designers and decision makers to reduce environmental effects by targeting those factors with the largest impacts.

For further information contact Tony Parry,
 University of Nottingham Civil Engineering
 Department (tony.parry@nottingham.ac.uk).





Roller compacted concrete used for composting facility

The Ashbourne Composting Facility was constructed for Longcliffe Quarries/Vital Earth by Whitehouse Construction Ltd to provide for the processing of green waste into a bagged product. Roller compacted concrete was chosen for both internal and external slabs and supplied by Britpave members, Roller Compacted Concrete Company, who used 200 mm of RCC on Type 1 granular subbase.

For programme reasons, the building was erected first and its RCC floor was paved at the same time as the external hardstanding. This was possible due to the long 30 m spans of the portal frames and 90 m length of the building.

The RCC material was mixed on site using a high output, continuous mixing plant and transported to the paver in 25-tonne dump trucks. Longcliffe Quarries provided specially graded aggregate from their plant in Derbyshire.

The RCC was laid using a tracked paver with high compaction screed. Compaction was achieved by vibratory steel drum and pneumatically tyred rollers. The curing agent was applied by spray to the daily output of 2000 m<sup>2</sup>.

RCC provided a cost-effective solution to the pavement requirements for this composting facility, with superior strength and durability characteristics compared with conventional pavement quality concrete. Flexural strengths averaging 5.5 N/mm² were achieved at 28 days.

The principal advantages of RCC are derived from the method of construction. Production costs are lower – there is no reinforcement or formwork and the lower water/cement ratio reduces the cost.

Normally the building floor slab is laid in advance of the superstructure – the slab is cut out for the column bases and reinstated after erection of the columns.

For more information contact
 John Donegan on 01778 394400
 (info@rollercompactedconcrete.co.uk).

A new year at the Britpave headquarters welcomes a new face. Jaime Norris joined Britpave as Marketing Coordinator in January and is excited about the road ahead.

'It looks to be a challenging year and one I am excited to be a part of. I look forward to working with everyone in meeting and exceeding our collective goals and objectives for 2007 and beyond' (jnorris@britpave.org.uk).



## new from britpave



from www.concretebookshop.com

### **Guided busway:**Construction handbook

Developed as a sequel to the *Guided busway:* design guide, which was published in 2004, this construction handbook sets out best practice for highway and busway schemes constructed in slipformed in-situ concrete. It gives recommendations and advice on:

- Design aspects influenced by the construction techniques.
- Concrete production and supply.
- Surface texture and smoothness.
- Interfaces and the construction process.

Ref. BP/24. Free to Britpave members, £60 to non-members.

### **Guided busway:** Design handbook

#### **Update sheet Summer 2006**

Presents the latest information on the tolerances required on site to deliver good ride quality and on the interaction between the bus and the guideway.

Free

### **Step barrier drawings on CD**

This 2nd comprehensive folder of technical drawings and specifications was commissioned from Arup. It contains 70 drawings of both concrete and steel step barrier and ancillary products. Produced in pdf format, it includes AutoCAD blocks of principal items for download. It contains drawings for both surface-mounted and embedded barrier.

Ref. BP/22. Britpave members £450, non-members £2.000, from the Britpave office.

### Concrete step barrier: Data Sheets

There is now a full suite of 22 Data Sheets covering most aspects of Concrete Step Barrier design and installation together with background on the requirements of BS EN 1317.

Ref. DS/CSB/500 to 522. Free of charge from Britpave office to members, £10 to non-members. Downloadable from Britpave website.

#### **Barrier acoustic study**

This study, carried out by Ove Arup and Partners International Ltd, examined the effect of concrete safety barriers constructed in the central reserve of dual carriageways or motorways on the noise levels alongside the road. The results demonstrated that differences in noise levels alongside concrete and steel safety barriers are negligible at a range of receiver heights.

Ref. BP/20. Free to Britpave members, £10 to nonmembers

### Concrete step barrier: a new era in safety barrier design

Top TV presenter on motorist issues, Vicki Butler-Henderson, presents this factual and hard-hitting documentary that brings home the role of the new step barrier in improving the safety and reliability of the UK's motorways and trunk roads.

Ref. BP/29. Free.

#### Stabilisation case studies

Stabilised alluvium takes the strain for composting

Stabilisation transforms former power station site

Two new case studies that explain how soil stabilisation improved the site material in a cost-effective and environmentally friendly way to produce a bearing layer while reducing contract duration.

Ref. DS/SS/001 and 002. Free.

### HBM and stabilisation – design and specification for:



- 1 Parking areas and hardstandings
- 2 Residential and commercial road pavements
- 3 Heavy-duty paving

Produced to complement the base publication, Hydraulically-bound mixtures for pavements (see below), this suite of three Technical Guidelines is produced to help make clients, designers and contractors aware of the technical issues when using hydraulically-bound materials to produce pavements for three different situations.

Ref. BP/26, 27 & 28. Free to Britpave members, £10 each to non-members.

### Rigid airfield pavements 4:

#### Surface finish, regularity and texture

Prepared by the Britpave Airfields Task Group on the principles governing the requirements and current specifications for concrete airfield pavements. It provides advice on:

- The types and specification of surface finishes for new concrete pavements.
- Surface regularity.
- Surface textures and friction requirements.

Ref. BP/25. Free to Britpave members, £10 to non-members.

#### Also available

### Hydraulically-bound mixtures for pavements

Written by a Britpave member and published by The Concrete Society, this guide covers the stabilisation of naturally occurring soils or other materials to improve their mechanical properties and performance for use in capping layers, subbases and bases for roads. It includes treatment with cement and the full range of hydraulic combinations, dealing with:

- Binder selection
- Soil/aggregate selection
- Site investigation and preliminary assessment
- Mixture design
- Production and construction
- Construction control

Ref. CCIP-009. £29.50 from www.concretebookshop.com

## the last word...

# Britpave introduces licence scheme for CSB installers

The design, testing and installation of the Britpave Concrete Step Barrier (CSB) is, like all safety restraint systems, bound by the requirements set out in BS EN 1317: Road restraint systems.

Britpave, as the nominated Highways Agency Promoter, has an obligation to ensure that controls are provided to ensure that the products it promotes are installed in accordance with BS EN 1317, Road Overseeing Authority Specification and Britpave's own specification.

Britpave also acknowledges that it has an obligation to Members, Funders and Clients to make every effort to ensure that compliant product is provided, existing products are fully supported, revisions to Standards reflected and future development undertaken.

The licence scheme will also provide an income stream that will be used to ensure that the development and support of CSB can continue in the years ahead.

For the above reasons and following discussion and agreement with the Highways Agency, the Britpave Council unanimously decided last year to adopt a Licence system for CSB installers. A Britpave Licensed CSB installer is the company which directly constructs the barrier. It is not the main contractor where a specialist sub-contract installer is used.

A Licence will be considered only when an application is received from a current member of

Britpave. Therefore, if a company which does not currently hold Britpave membership wishes to be considered for Licence they must firstly apply and receive confirmation of Britpave membership.

The licence application covers the following:

- Fees
- Independent auditing of Licence holders' quality procedures.
- Royalty levy, which is directly proportional to the quantity in linear metres of CSB constructed per annum.
- Third-party certification to BS EN ISO 9001: 2000 and to BS EN ISO 14001: 2004 from a UKAS accredited certification body.
- Development of Sector Scheme 21.
- Employer and Public Liability insurance.
- Employee training and slipform paving equipment maintenance record.
- Requirement to purchase a current set of Britpave's CSB installation drawings.
- Time taken to process applications.
- Rules regarding revocation of the licence.

The current list of Licensed Britpave Concrete Step Barrier Installers is published on line at www.concretebarrier.org.uk/construction/licensed\_installers.html. Application forms are available from the Britpave office.

For further information on the scheme contact David Jones (djones@Britpave.org.uk).

### New chairman for Soil Stabilisation Task Group

The newly appointed chairman of the busy Soil Stabilisation Task Group is Alastair McDermid, a familiar face to many at Britpave.

Al is Managing Director of Beach Soil Stabilisation Ltd, a company that he set up with his father, following a management buyout from the Ringway Group in September 2006.

He has been closely connected with soil stabilisation for 15 years, having been involved in setting up two companies, and has worked for one of the largest SS contractors in Australia.

Outside of work, Al is a keen rugby fan and still plays every Saturday for his home town club, Haywards Heath. Off the pitch he enjoys swinging a golf club (sometimes hitting a ball!) and spending time with his friends – although all of this is soon to come to an end as he and his fiancée are expecting their first child in February!



## Welcome to **new** members

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

Tel: 01454 338650 www.hanson.biz Principal contact: Rick Green

Fixing Centre Ltd

Tel: 01344 635787 fixingcentre@btconnect.com Principal contact: David Godbehere

Smith Construction (Heckington) Ltd Tel: 01529 461500 www.smithsportscivils.co.uk Principal contact: Ken Smith Cement & Concrete Association of New Zealand Tel: +64 (0) 4 499 8820

www.cca.org.nz Principal contact: Alan Kirby

P J Davidson (UK) Limited Tel: 01647 61030 Principal contact: Peter Davidson

Birse Civils Limited
Tel: 01937 830091
www.birsecl.co.uk
Principal contact: Steven D Parry



**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.

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