BRITISH READY-MIXED CONCRETE ASSOCIATION

Ready-mixed Concrete News

January 2009

Offering the most cost effective and sustainable method of construction

1 CONTENTS

Specialist concrete contractor - MPB Structures

Introduction:

The British Ready-mixed Concrete Association (BRMCA) would like to introduce you to its first ‘Ready-mixed Concrete News’ magazine.

Specialist concrete contractor - PC Harrington

BRMCA leads the way in sustainability and responsible sourcing and is working with the Building Research Establishment (BRE) with regard to the ‘Green Guide’ and the development of BES 6001 (Framework Standard for the Responsible Sourcing of Construction Products). Please see pages 13 and 14 of this magazine for more information.

BRMCA's remit covers generic issues such as sustainability, reduction of CO_2 emissions, product development, technical requirements and design, health and safety, industry legislation and government policy/liaison, plus the promotion of building systems using ready-mixed concrete. BRMCA also works with key stakeholders such as the UK Green Building Council to develop its positioning and response on sustainability issues and is also a signatory of the Trade Association Forum.

BRMCA represents the interests of ready-mixed concrete producers across the UK and is part of the Quarry Products Association (QPA), offering a wealth of information and downloads via our web site www.brmca.org.uk.

Our partner organisation, The Concrete Centre, provide further information on how to effectively and efficiently design in concrete. Please visit www.concretecentre.com for more information.

Specific sustainability information for the concrete industry is also available at www.sustainableconcrete.org.uk.

BRMCA/CONSTRUCT – Working together to meet the needs of clients

BRMCA and CONSTRUCT (The Concrete Structures Group) have developed a joint steering and technical group designed to enhance the concrete sector's client interface.

The two associations have agreed to work together to better understand the nuances of each others particular element of the overall construction process.

Each is committed to working together to improve understanding of the market requirements and to improve working practices, serving to enhance the service given to end users and clients.

Pictured above are Mr Chris Chapman (former chairman of BRMCA) and Mr Martin Stephenson (chairman of CONSTRUCT) at the inaugural joint steering committee meeting 07 May 2008

The chairmen were enthusiastic about the potential of the initiative and stated:

"We feel that the benefits of this initiative to the industry as a whole could be huge. Collaboration between the supply industry and contractors can only increase awareness and improve understanding and co-operation between all concerned.

It is essential that both parties understand the needs of the other and work together to deliver the complete package to clients. It is hoped that this initiative will be the first of many and will set the template for future industry development".

A number of meetings have since been held, culminating in a joint presentation evening 24 September 2008 in central London, concentrating on the design and availability of High Strength Concrete (HSC) and the specification and testing requirements of ready-mixed concrete.

Please refer to pages 8 and 9 of this magazine for more information on HSC.

Further presentations are planned for 2009 covering a wide range of topics, with clients, engineers, architects, main and management contractors invited to attend.

It is hoped that the above can feed back into the further development of the National Structural Concrete Specification (NSCS) and enhance its influence and utilisation within the market sector.

Committed participation by member companies from both associations has helped the success of the initiative, and the level of interest shown reflects the enthusiasm on all sides.

Self Compacting Concrete (SCC) – Building up a head of steam

Market data

Following extensive investigation and feedback from ready-mixed concrete companies and contractors supplying/utilising SCC, BRMCA has concluded that demand in the market place is growing rapidly as contractors and clients alike begin to recognise the significant benefits of using SCC.

Via a combination of the European Ready-Mixed Concrete Association (ERMCO) statistics and specific survey information, the following can be approximated:

- Number of enquiries - 10% growth year on year
- Growth in volume terms – from virtually zero in 2000, to approximately 400,000m³ projected for 2008, increasing rapidly year on year
- Current market share against standard concretes is still extremely low and therefore this product is believed to have significant growth potential, which will be significantly accelerated if specified and utilised within concrete frame applications

Background and design of SCC

Developed in Japan and continental Europe, SCC is now being increasingly used in the UK where apart from health and safety benefits it offers faster construction times, increased workability and ease of flow.

SCC is a generic term for concrete mix designs that differ from traditional concretes at the molecular interface between the cement compounds and the admixture polymers.

By its very nature, SCC does not require vibration. It achieves compaction into every part of the mould or formwork simply by means of its own weight without suffering any segregation.

The fluidity of SCC ensures a high level of workability and durability whilst the rapid rate of placement provides an enhanced surface finish.

SCC's high overnight strength gains allow rapid striking of forms and early loading of cast elements. High ultimate strengths in excess of 60N/mm² are achievable, and it is anticipated that, with further development, strengths of 100N/mm² and greater will be available.

During the last decade, concrete technology has made enormous advances through the introduction of SCC. This application of nanotechnology in construction provides benefits from the perspective of materials technology and environmental protection and is presenting diverse opportunities to engineers and architects alike.

The range of benefits offered go beyond the fundamental aspects of concrete quality and productivity, as the product offers both economic and environmental improvements over standard production and placement techniques.

Benefits

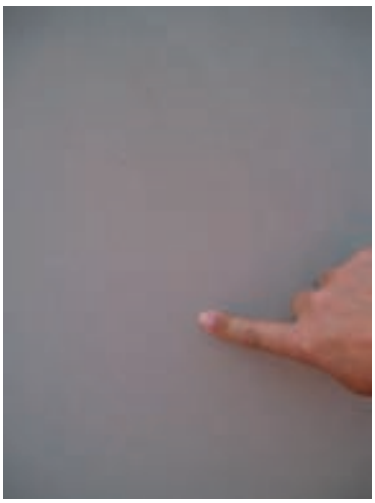
The Health and Safety Executive (HSE) have recognised the significant health benefits of utilising SCC and as a result have produced a 'SCC HSE Good Practice Guide' covering the 'Control and management of noise risks in concrete and cement products', available on the HSE web page www.hse.gov.uk/noise.

The major benefits of SCC are summarised below:

- Labour savings
- Easier placement over any distance or constraints
- Accelerated project schedules
- Reduced noise, safety and environmental concerns
- Reduced equipment wear
- Fast placement without vibration or mechanical consolidation
- Excellent surface finish

Surface finish

Typical ‘as struck’ finishes are shown below. It should be noted that no repairs or ‘rubbing down’ were applied to these columns.



Contractor - Stephenson construction – ECHO 2, Leeds. Agilia self compacting concrete supplied by Lafarge Readymix Ltd

Contractor feedback indicates that, overall, the benefits of utilising SCC may outweigh the additional ‘initial or up front costs’ involved in its production and supply.

Hence, BRMCA members aim to build on the progress made to date and demonstrate to specifiers and specialist concrete contractors the benefits of using SCC within concrete frame applications. Consequently BRMCA intends to implement a proactive programme of raising awareness of SCC during 2009.

BRMCA Excellence in customer service award 2008

BRMCA was delighted to present Bardon Concrete the 2008 BRMCA Excellence in customer service award for its outstanding level of engagement and client service offered to Edmund Nuttall at the Queen Street contract in Glasgow.

The award was presented to Bardon Concrete during the Concrete Society awards evening held at the London Marriott, Grosvenor Square 07 November 2008.

From Left to Right - Mr Martin Hardwick (BRMCA Product Director), Mr Brad Murphy (Bardon Concrete Scotland General Manager) & Guest Speaker Mr John Sergeant

Bardon Concrete was approached by Edmund Nuttall to ask if it would be able to supply services to a critical element of the Queen Street Network Rail contract, which required essential repairs over the Christmas period, specifically on Christmas Day 2007.

Following numerous meetings between Bardon Concrete and Edmund Nuttall's staff, it was agreed to undertake supplies on the understanding that this critical contract had to be completed on Christmas Day, with guaranteed completion and standard train services resumed by 7am on Boxing Day.

Early consultation was the key to the success for this project and both Edmund Nuttall and Bardon Concrete entered into negotiations to agree and clarify the remit in an open and co-operative manner.

Bardon Concrete's technical department worked closely with the Edmund Nuttall management and design teams to ensure that the most suitable concrete design was used in terms of consistency/workability, high early strength and ultimate strength. The performance criterion of the concrete was paramount and far outweighed the design strength requirements in terms of 28-day compressive cube strength.

After much consideration, both parties agreed to use Bardon's high early strength, micro-silica concrete 'Diamondcrete', which would achieve the high initial strengths critical to completing the contract on time.

Placement techniques were also carefully considered as the requirements were far from standard, which when coupled with the use of specialist concrete, provided the team with challenging decisions.

As with all railway possession works, detailed planning and numerous site visits were required to refine the actual method of discharge and delivery of concrete into the tunnel and specialist 'road rail' plant was mobilised to assist in this operation.

The concrete was delivered to site and discharged onto a conveyor, which in turn filled a 3m³ rail-mounted small truck mixer. This then discharged the concrete into the tunnel.

Specialist monitoring systems were also used that required a significant technical presence on-site, in addition to the production and site teams.



Figures above illustrate discharge onto conveyor, which filled a 3m³ rail-mounted small truck mixer

At early ages of concrete structures, strength monitoring is important to determine the structure's readiness for service.

Hence, a temperature match curing (TMC) system was used to monitor the early strength development of the concrete and provide an accurate indication of strength within the in-situ concrete. This process can be briefly described as follows:

When concrete is cast, heat liberated by the hydrating cement causes a rise in concrete temperature. The larger the mass of concrete, the greater the rise in temperature, with a consequent increase in the rate of strength development.

Cubes stored alongside the mass concrete will also exhibit a rise in temperature, but to a much lesser degree. Hence, generally speaking, at any time during the early age of the concrete, the strength developed by the test cube will be less than that developed by the mass concrete and so will provide an underestimation of the latter's strength.

The TMC system ensures that the temperature experienced by the reference cubes matches that of the structure and so the strength developed by the cubes will increase at the same rate as that of the mass concrete.

During the continuous supply throughout the hours of Christmas Day and into the early hours of Boxing Day, management and staff from both Bardon Concrete and Edmund Nuttall were on hand to monitor the strength gain and crush the cubes until the required strength was achieved.

The concrete was placed and the strength confirmed within the extremely tight works schedule. Keith Roman of Edmund Nuttall confirmed that the company considered Bardon Concrete's approach to its unusual request to be nothing short of "excellent" and went on to say that Bardon Concrete had supplied, "Excellent service throughout the year as well as to this particular element of the contract."

BRMCA considered the combination of outstanding service, difficult site conditions and restrictions, coupled with working over the Christmas period to be clearly worthy of the prestigious 'Excellence in Customer Service Award' and would once again like to congratulate Bardon Concrete on this achievement.

High Strength Concrete (HSC) design and availability

The information below and an associated PowerPoint presentation are available as downloads on the BRMCA web site www.brmca.org.uk and are intended to offer guidance for clients, main/management contractors, engineers and specialist concrete contractors alike with regard to HSC design and availability.

Basic design and constituent materials

HSC is defined within BS EN 206-1 as concrete with a specified characteristic strength of C50/60 or above, although significantly higher strengths have been achieved and used.

The terms "High performance concrete" and "High strength concrete" are often taken to mean the same thing. However, "High performance" strictly relates to a concrete that has been designed to have specific characteristics, such as high resistance to chloride ingress or high abrasion resistance. As a result it may also have a high strength, but this is not the main consideration.

Whereas 'High Strength Concrete' is designed to achieve exactly that. Indeed, characteristic cube strength levels of '80 to 100 N/mm²' and even higher can be achieved and are currently being supplied within the UK market.

Constituent materials – Aggregates

A wide range of aggregates can be used, although crushed rock aggregates offer enhanced characteristics in terms of HSC Design. Not all aggregate types are suitable as they may restrict the overall strength potential of the concrete due to the 'ceiling Strength' of the material, which may break down before the cementitious matrix.

Typically, aggregate with a good 'Los Angeles coefficient' and 'impact test' results should be used (values of around 30 or 35 unless satisfactory performance data is available for aggregates with higher values).

The use of Recycled Aggregate (RA), Recycled Concrete Aggregate (RCA) or secondary aggregates within HSC is largely restricted due to the intrinsic affect of reducing compressive strength, which would normally be counterbalanced by increased cement contents. However, with the already high cement contents associated with HSC, this would obviously not be desirable in this case.

Note 1 - BS8500-2 also limits the use of recycled aggregates to classes up to C40/50.
Note 2 - Generally, for higher strength classes 10 or 14mm aggregate is preferred.

Constituent Materials – Admixtures and additions

High range water reducers should be used to achieve maximum water reduction, although plasticisers may be adequate for lower strength HSC (e.g. C50/60 and C55/67).

Silica fume or metakaolin is often used to enhance the strength at high levels, but is generally not needed for lower HSC classes (although it can still be used).

It should be recognised that cements/combinations such as fly ash or ground granulated blastfurnance slag (GGBS) can improve the performance of both fresh and hardened concrete. In fact, some of the technical advantages made possible by their use in concrete are unattainable when CEM I is used alone.

These advantages include improvement in consistence, reduction in heat of hydration, reduction in permeability, increase in ultimate strength, and enhanced resistance to sulfate attack and to alkali-silica reaction.

Ordering and Availability of High Strength Concrete

In general terms, all BRMCA member companies can produce and supply HSC from any ready-mixed concrete plant, given sufficient notice and preparation time.

However, availability also largely depends upon the coarse aggregate type stocked at any given production plant, as a result of its composition and resultant ceiling strength.

Hence, where locally stocked materials are limited in this regard, the importation of high quality aggregates is possible with certain considerations:

These considerations are:

- Number of aggregate storage bins available
- Current production requirements and existing commitments
- Plant capacity

Planning is the key, with as much information supplied to the ready-mixed concrete supplier as early as possible in the tender process, with close liaison between all parties thereafter.

It should be noted that all UK ready-mixed concrete plants can supply HSC with sufficient notice and the importation of suitable aggregate types. Higher classes of HSC concrete will however require more consideration and discussion than that required for low/medium classes, as some ‘stocked’ material may not be suitable.

The following illustration summarises the UK ready-mixed concrete plants capable of supplying HSC instantly and with prior notice:

Key:

- Δ **HSC available with standard stocked materials**
- Δ **HSC available with importation of materials**

Project Spotlight – EPS3 Project, Sellafield

Hanson Concrete are supplying 40,000m^3 of high specification ready-mixed concrete to Laing O'Rourke for the Encapsulated Product Store (EPS3), Sellafield from an on-site batching facility located in the Laing O'Rourke site compound.

The £85m structure is heavily reinforced, containing 7000t of rebar, is the size of a football field and 20m high, with elements approaching 3m thick being placed in pours of up to 1500m^3.

Having been awarded the contract, technical personnel from Hanson and Laing O'Rourke adopted a 'one team' approach to developing the concrete design and placement techniques specified by the client. Working together their aim was not just to meet the client's requirements but to significantly exceed them.

The initial laboratory trial mix programme focused on delivering a highly workable concrete that required minimal compaction. The rheology of the mixes and ease of placement by pump were of paramount concern, while also ensuring minimal bleed from the 70% ground granulated blastfurnance slag (GGBS) designs.

Having completed the initial trials, a joint presentation was made to the client, with the principle aim to demonstrate that working together Hanson and Laing O'Rourke would deliver a 'best in class' approach to reliability and responsibility through stringent quality assurance (QA) protocols and teamwork ethics.

The presentation detailed all aspects of the design, production, supply, placement and finishing processes, with a series of test samples also made available indicating the levels of compaction and surface finish that would be achieved on site. In addition, laboratory concrete was produced early the same morning, retarded and transported to the presentation in order that the client could get an early 'hands-on' feel for the concrete to be produced.

A series of 'plant/site trials' were also carried out which included a prolonged pumping sequence whereby each concrete mix design was circulated back into the pump hopper on a 15 minute cycle, and then left to stand in the line for 30 minutes before a further 15 minute pump cycle was undertaken. The concrete was then taken beyond the specification limits for consistence to demonstrate the robustness of the designs against segregation.

As a result of the nature of the materials to be stored in EPS3, each delivery is checked for consistence, batching tolerance, water cement ratio conformity and temperature prior to placement.

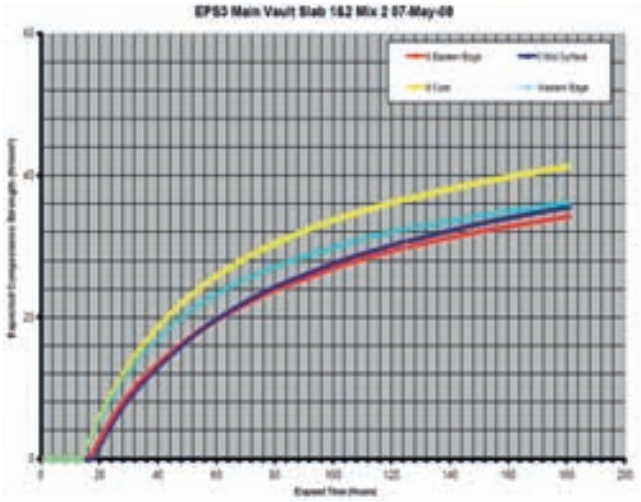
Following the completion of each pour this information is collated into four profiles and presented to the client, detailing:

Performance trends
Supply rates
Conformity data
Temperature

Operating along side the Hanson batching plant, Laing O’Rourke have installed a UKAS accredited testing laboratory to provide immediate feedback on the quality of concrete to the client. In addition, the data from this facility is also fed into the Hanson ‘National data office’ based in Leicestershire, where it is used within their in-house conformity system.

The contract is the first of its kind at Sellafield to fully utilise ‘real time’ automated temperature monitoring via the Laing O’Rourke in-house ‘Intillirock’ system to optimise shutter strike time.

The benefits of this compared to other systems is that the embedded ‘logger’ is cast into the test location. The ‘reader box’ then downloads the data, leaving the ‘logger’ in a protected in-situ location. The device is capable of monitoring and recording data for a four week period in order that the complete ‘heat gain/loss profiles’ can be extracted, reviewed and utilised to manage strike times and programming.



Working in the nuclear sector requires exceptional levels of concrete quality to ensure ‘Nuclear safety’ - that is no radiation leaks over the 100 year design life of the nuclear store, and it is clear that Hanson and Laing O’Rourke have worked in tandem to achieve this.

BRMCA Guidance on Sustainable Concrete Design and Rating Systems

BRMCA have produced a publication offering guidance on sustainable construction and rating systems to aid in the understanding of the considerations to be taken into account when designing in concrete, and to also provide terms of reference for main/management contractors and specialist concrete contractors alike.

The document explains how the BRE Green Guide, Code for Sustainable Homes and BREEAM documents fit together and how to interpret their requirements in terms of concrete construction to ensure the best 'whole life option' is used.

The complete document is available in PDF format on the BRMCA web site www.brmca.org.uk and is also available as a hard copy brochure.

Extract/Introduction taken from the Guidance document:

The BRE Green Guide, Code for Sustainable Homes and BREEAM documents are part of a building assessment tool kit designed to help deliver sustainable construction. The Green Guide feeds into the 'Materials' sections of both BREEAM and the Code for Sustainable Homes…The Green Guide currently applies to 'Low rise' housing only, with a specific 'High rise' version under development.

To achieve the most sustainable building design, a balance between material impacts and in-life performance is required. Often elements that do not score the highest ratings within the Green Guide are actually proven to be the most sustainable option in terms of 'In-use' and 'Whole-life' performance.

Extract of recent BRE press release supporting the approach taken by BRMCA:

Specifying materials or products solely on one criterion, such as embodied carbon or recycled content, can lead to sub optimal overall sustainability choices. Specifiers must understand that the embodied environmental impacts, as measured in the Green Guide, are only a part of (and not the same as) the overall sustainability of a building as measured in BREEAM and CSH. Materials or products not getting A or A+ ratings in the Green Guide can still be, and already are, part of buildings achieving high levels in CSH or BREEAM. The total amount of credit available, based on the Green Guide, within CSH for "Mat 1: Environmental Impact of Materials" is 4.5% and for BREEAM Offices 2008 it is 4.16%.

Concrete industry responsible sourcing launch to support BRE BES 6001

The UK concrete industry manufacturers and trade associations have come together as 'The Concrete Industry Sustainable Construction Forum' (CISCF) to produce a sector wide guidance document to support the BRE Environmental & Sustainability Standard BES 6001 - Framework Standard for the Responsible Sourcing of Construction Products.

The concrete sector and its upstream supply chain now becomes the first construction products sector to accept the new BRE standard and offer guidance to member companies. Ready-mix and precast product manufacturers are now able to arrange for their products to be certified against BES 6001.

The launch of the guidance document took place at a joint event with BRE on December 18th at the Building Centre, 26 Store Street, London.

Dr Peter Bonfield, Chief Executive of BRE welcomed the positive lead taken by the concrete sector. He said 'The new responsible sourcing standard BES6001 has been created for the construction industry so it can better manage the social, environmental and economic impacts of its products from cradle to grave. It's crucial that the industry embraces it as we strive to build in a less impactful way. I applaud the concrete sector for providing its members with this great framework which will enable them to achieve compliance with the new standard'.

Nigel McKay, Head of Supply Chain Management at Bovis Lend Lease was a key note speaker, offering Bovis' support for the guidance document and the approach taken by the concrete industry in tackling such a key issue. Mr McKay confirmed that Bovis would be incorporating the requirements of the document within their procurement procedures.

Responsible sourcing of materials provides a holistic approach to managing the social, environmental and economic impacts of a product from the sources of its raw materials, through its manufacture and delivery, and, ideally, through its use, re-use and recycling, until its final disposal as waste with no further value. Responsible sourcing of materials is demonstrated through an ethos of supply chain management and product stewardship and, importantly, includes a commitment to engage with stakeholders that may be affected by the impacts of a product.

The Concrete Industry Guidance Document provides an interpretation of how an organisation can meet the requirements of BES 6001. In addition it provides background and guidance to be used by assessors in the process of confirming third-party certification against BES 6001.

The Concrete Industry Guidance Document and BES 6001 are available in PDF format on the sector website www.sustainableconcrete.org.uk or www.brmca.org.uk.

Sustainability and responsible sourcing credentials of ready-mixed concrete

BRMCA member companies are committed to utilising 'sustainable resources', protecting the environment for years to come and reducing CO_2 emissions.

BRMCA and its members formally 'Signed up' to the 'sustainable construction strategy for the concrete industry' led by Jonathon Porritt 30 July 2008.

BRMCA members are committed to:

- Sustainability management - Working with Government and the Building Research Establishment (BRE) to enhance current performance and reduce CO_2 emissions
- Governance and business ethics
- Working with local communities
- Environmental performance
- Responsible sourcing and procurement
- Utilising locally available constituent materials wherever possible
- Material suppliers demonstrating ongoing efforts to reduce CO_2 emissions
- Fair trade products
- Research and development to find alternative and/or more 'eco-friendly' products

Ready-mixed concrete offers one of the most sustainable and cost effective methods of construction, with the final product and its constituents already providing the following benefits in terms of sustainability and responsible sourcing:

- The majority of ready-mixed concrete contains cement produced as a by-product of other industries such as fly ash from coal-fired power stations and ground granulated blastfurnace slag from the iron industry; both of these would historically have gone to land-fill
- Concrete has inherent thermal mass properties. When used in buildings, concrete reduces the need for air conditioning and so saves energy and reduces CO_2 emissions
- At the site, the 'plastic' product is placed into purpose made reusable moulds (formwork), and with good site supervision this results in virtually zero waste
- Any excess concrete returned from site is re-constituted and is very rarely sent to tip
- All reinforcement bars produced in the UK are manufactured from recycled scrap
- The majority of ready-mixed concrete is produced using UK sourced cementitious materials
- A large proportion of constituent materials are transported by rail or barge, thus reducing CO_2 emissions
- The average delivery distance is only 6 radial miles, again saving on transport fuel and CO_2 emissions
- All cement products are produced by BS EN ISO 9001 certified suppliers, also operating BS EN ISO 14001 and OHSAS 18001 certified systems
- The majority of aggregates used within ready-mixed concrete are sourced locally and travel minimal distances to ready-mixed concrete plants

SpeCC – The registration scheme for specialist concrete contractors

SpeCC is a non profit making company designed to offer a register of reputable specialist concrete contractors (confirmed by annual audits covering all office and site operations) to clients, main contractors, engineers and architects.

The scheme certifies specialist concrete contractors against the following systems, together with specific additional requirements pertaining to concrete construction techniques:

Health and safety
Environmental
Quality
Financial
Technical capability
Training

SpeCC offers a list of specialist concrete contractors covering the following sectors:

Sector 1 – Concrete frame and major Construction
Sector 2 – Concrete basement construction
Sector 3 – Concrete barrier construction (Slip-Form)
Sector 4 – Piling
Sector 5 - Flooring

SpeCC officers are keen to emphasise that SpeCC is not a membership organisation, and as such can independently assure clients that contractors registered with the scheme can offer a reliable and reputable service.

The scheme chairman, Prof. Peter Hewlett is pleased with the scheme's progress to date, stating:

"The scheme has seen further growth in both registrations and a broadening of sectoral representation and use by specifiers/procurers of the SpeCC recognised brand. The development of voluntary certification and competent person schemes is a slow process and there can be a temptation to reduce entry requirements to attract registrees.

However, such a tactic is not acceptable to SpeCC and our standard will be maintained, as to do otherwise would reduce the value to both clients and registrees alike.

A significant recent event was the recognition by Bovis Lend Lease (BLL) of SpeCC registered contractors within their procurement process. This is a win/win situation both for BLL and registered contractors alike, as both parties should see immediate benefits in terms of the overall quality of work undertaken and increased tender opportunities respectively. The scheme has also recently welcomed both Stanhope and Morgan Sindall to the SpeCC board, represented by Mr Steve Moschini and Mr Graham Edgell respectively.

The future is bright for the SpeCC scheme and we expect to continue to grow over the coming years and expand our client base in doing so".

More information can be obtained by visiting www.SpeCC.co.uk.

BRMCA member listing

BRMCA represents the interests of ready-mixed concrete producers across the UK and is part of the Quarry Products Association (QPA). The association leads the way in the strategic development of the concrete industry in terms of innovation, product development and client/contractor liaison.

Allen Newport Limited Walton House Fordham, Ely, Cambs, CB7 5JZ **Tel: 01638 720 228** **Fax: 01638 721 332** www.allen-newport.co.uk	**H Tuckwell & Sons Limited** Thrupp Lane Radley, Abingdon, Oxon OX14 3NG **Tel: 01235 521 251** **Fax: 01235 559 323** www.tuckwells.co.uk	**London Concrete** London House 77 Boston Manor Road Brentford, Mddsx TW8 9JQ **Tel: 0208 380 7300** **Fax: 0208 380 7301** www.londonconcrete.com
Angle Park Sand & Gravel Co Melvill Gates Ladybank, Fife KY7 7RE **Tel: 01337 830 303** **Fax: 01337 810 303**	**Hanson plc** The Ridge Chipping Sodbury Bristol BS37 6AY **Tel: 01454 316 000** www.hansonplc.com	**Morris & Perry** (Gurney Slade) Limited Tout Quarry, Charlton Adam nr Somerton, Somerset TA11 7AN **Tel: 01458 223 991** **Fax: 01458 223 181** www.smorris.co.uk
Bardon Concrete Bardon Hill, Coalville, Leicestershire, LE67 1TL **Tel 01530 512 102** **Fax: 01530 512 198** www.aggregate.com	**Hillhouse Quarry Company Limited** Hillhouse Quarry Troon, Ayrshire, Strathclyde Scotland **Tel: 01292 313 311** **Fax: 01292 314 640** www.hillhousegroup.co.uk	**Readymix Huddersfield Ltd** Red Doles Lane, Leeds Road Huddersfield HD2 1YD **Tel: 01484 535 311** **Fax: 01484 558 255** www.readymix-huddersfield.co.uk
Bonnar Sand & Gravel Co Limited Clachan Quarry Cairndow, Argyll PA26 8BH **Tel: 01499 600 269** **Fax: 01499 600 210**	**J Clubb Limited** Church Hill Wilmington, Dartford, Kent DA2 7DZ **Tel: 01322 225 431** **Fax: 01322 289 932** www.jclubb.co.uk	**Rotherham Sand & Gravel** Scrooby Top Quarries Scrooby Top, Doncaster DN10 6AY **Tel: 01777 818 203** **Fax: 01777 816 040**
Brett Concrete Limited Brett House, St Michael's Close Aylesford, Kent ME20 7XE **Tel: 01622 793 800** **Fax: 01622 793 890** www.brett.co.uk	**Kendall Brothers (Portsmouth) Ltd** Kendalls Wharf, Eastern Road Portsmouth, Hants PO3 5LY **Tel: 02392 662 801** **Fax: 02392 670 889** www.kendalls.co.uk	**Tarmac Group** Millfields Road Ettingshall Wolverhampton, West Midlands WV4 6JP **Tel: 01902 353 522** www.tarmac.co.uk
Cemex Cemex House Rugby, Warwicks CV21 2DT **Tel: 01788 542 111** **Fax: 01788 540 166** www.cemex.co.uk	**Lafarge Aggregates Limited** Granite House Watermead Business Park Syston, Leicester, Leics LE7 1PF **Tel: 0116 264 7000** www.lafarge.com	**Tudor Griffiths Group** Wood Lane Ellesmere, Shropshire SY12 0HY **Tel: 01691 626 262** **Fax: 01691 626 309** www.tggroup.co.uk

BRITISH READY-MIXED CONCRETE ASSOCIATION

BRMCA contact details

BRMCA
Gillingham House
38-44 Gillingham Street, London
SW1V 1HU
Tel – 0207 9638000
Email – mhardwick@qpa-brmca.org.uk
Web – www.brmca.org.uk

BRMCA
Riverside House
4 Meadows Business Park
Blackwater, Camberley, Surrey
GU17 9AB

Ref. BRMCA/RMN/01
First Published January 2009