The Institute of Concrete Technology

NEWSLETTER

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EDITORIAL

I've just joined the ranks of those who are entitled to a reduction in their subs because of age. (Not that I intend retiring just yet!) It really does bring about quite a change in attitude to life, as I am sure my fellow oldies have already realised. But enough about that – we should be concentrating on those coming into the industry at the start of their careers. The ICT Technical and Education Committee have almost completed revisions to the progression of exams from Technician level through to ACT. Do you think that there is need for a Technician Diploma, for example? Or do you think we should be considering other options? What else can we do to attract more members? Do we have the right grades of membership? There are many questions to be answered – please let us have your views.

Happy Christmas and a Prosperous New Year.

Graham Taylor

Lytag Lightweight Self Compacting Concrete

Lytag have developed a self-compacting concrete using Lytag lightweight coarse and fine aggregate. The mix was designed using a 4/8mm Lytag granular material and a 0/4mm Lytag fines, and developed with Fosroc using their 111X SCC admixture.

The material is now being used for a precast application that combines the benefits of self-compacting concrete, in placing and handling and reduced concrete weight, benefiting in the structural design process.

For more information on the use of Lytag Lightweight Self Compacting Concrete contact Lytag on 01977 661661 or through the web site www.lytag.co.uk

ICT Revitalisation – A message from the President

Dear Member

My Address at Convention this year made significant reference to the need for us to revitalise our Institute if it is to remain a sustainable entity. I also stressed the importance of engaging with our members to ensure that we are adding real value to their membership.

As part of this process, therefore, to formulate a wider strategic review, I am seeking your views. This is your opportunity to help Council to shape your Institute.

I look forward to hearing from you.

Kind regards,

Rob

rob.gaimster@rmc.co.uk

Continuing Professional Development

All members are reminded that they are obliged to keep records of their CPD as a condition of membership and that these can be called in for checking. Just to help you along, the Reviewer has produced some notes, which supplement those on CPD in your Membership Handbook, because he felt that "there were too many shortcomings in the information submitted for me to be at all confident that the need for the review was generally understood. Each constituent word of CPD has an individual meaning – Continuing: extending or prolonged without interruption or cessation; Professional: of or belonging to or connected with a vocation or calling; Development: growth leading to maturity."

He had comments on items written in the three main columns on the CPD record sheet:

Activity: Not sufficiently detailed. Descriptions of normal job functions are not acceptable. A reminder that activities outside work are acceptable in the context of growth leading to maturity (e.g. school governor).

Activity Evaluation and Benefits: Poor response. For example, the plus and minus points arising from a training course should be identified.

Further Action: The worst responses. The self-appraisal implicit in Activity Evaluation and Benefits should yield something to note, even if it is only 'none' or 'no further action required'.

And a very telling point – "The manner in which many of the reports were presented strongly suggests that they were prepared in a short time, possibly after the request for them to be submitted had been received. Such action can scarcely be classed as a 'continuing' activity."

CPD records will be requested from another representative sample of members in the new year.

Are yours up-to-date?

The P O Box we had in Crowthorne is now closed. Please make sure you use our Blackwater address when writing to us.

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Rice Husk Ash

There is an increasing importance to preserve the environment in the present day world. Rice Husk Ash (RHA) from the parboiling plants is posing a serious environmental threat and ways are being thought of to dispose them. This material is actually a **Super-Pozzolan** since it is rich in Silica and has about 85% to 90% silica content. A good way of utilizing this material is to use it for making **'High Performance Concrete'**, which means high workability and very high early strengths, or, consider high workability and long-term durability of the concrete.

Each tonne of paddy produces about 200 kg of husk, which on combustion, yield approximately 40kg of highly siliceous ash, and release 3800 kca/kg of heat energy. In the conversion of rice husks to ash, the combustion process removes the organic matter and leaves the silica rich residue. However, such thermal treatment of the silica in the husk results in structural transformations that influence both the pozzolanic activity of the ash and its grindability. The silica is still in an amorphous form below 600ºC.

Lots of research has been carried out in this context and it has been proved beyond doubt that by utilizing these Super-Pozzolanic materials even in small amounts (5% to 10% cement replacements) can dramatically enhance the workability, strength and impermeability of concrete mixes, as a result the concretes are highly durable to chemical attacks., abrasion and reinforcement corrosion.

From the standpoint of durability a better way to improve the workability of a concrete mixture is through the incorporation of fine particles of a materials, which are less reactive, then Portland cement. The mechanism by which RHA particles improve workability is as follows: if well distributed in the cement paste, the particles of RHA segment the bleed-water channels and consequently are able to prevent bleeding and segregation. The physical effect, followed by the chemical effect involving the pozzolanic reaction (in which the calcium hydroxide formed during hydration of cement in concrete reacts with the silica present in the admixture to form calcium hydride silicate), fill up the empty spaces and cause densification (pore refinement) and strengthening of the microstructure, particularly in high porous and least cracking-resistant interfacial zone which exit in the vicinity of coarse aggregate particles. Studies have shown that 10% cement replacement with RHA can reduce large pores. Note that the transformation of an open-pore system into a closed-pore system, through the process of pore refinement has a much greater effect on the permeability than on the strength of the materials.

Compressive strength can be increased up to 30%, Water permeability can be reduced up to 60% . Chloride penetration can be reduced by up to 60% and Heat of Hydration up to 25 %, with 10 % replacement of cement in concrete.

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Information about Barcons Patented System

BARCONS is the producer of a Patented System of high precision, integral, metallic moulds, which are used for the industrialized construction of complete dwellings in one day.

The System of integral moulds for monolithical concreting is the most advanced, developed and systematic construction technique that exists. Each day its use and principles are becoming more commonplace.

The Barcons patented System is the worlds first trademark to offer complete moulds for all types of mechanized constructions. It is adaptable to all projects, architectures, designs and specifications of any structure. Its modular pieces are designed for the construction of dwellings, industrial buildings, sport centres, enclosure walls, modules, etc. The System includes exclusive solutions for foundation rafts, walls, doors, windows, electrical, plumbing and telecommunication installations, etc. all of them pre-planned, centred and perfectly integrated into the interior of the construction mould.

BARCONS is a new concept that has revolutionised conventional construction and has entailed an evolution that has brought construction methods into the industrialized and mechanized rationale, making it indispensable in this technological era.

The basic principles of the System are speed, since it reduces construction times by up to 30%; efficiency, guarantee and unparalleled quality of the structures, and above all, the important cost savings of up to 25%.

BARCONS is a high precision System that allows the complete planning of the work and its exhaustive control throughout, which in turn facilitates all the construction process from start to finish, guaranteeing high productivity and incomparable results.

It is, without a doubt, the Construction System of the Present and of the Future.

A Tribute to Dick Watson

On Monday 19 July 2004 the Chilterns Crematorium, Amersham, was packed to the rafters for Dick Watson's Thanksgiving Service. The Tribute was given by Peter Knight, his son-in-law and is paraphrased and partially quoted here.

"I would like to say a few words about Dick's life. That in itself will be a challenge because how can you do justice to a person who was a loving husband and father, a mentor and confidence builder to many, and a generous and enthusiastic friend to all who encountered him, in just a few words?

All of you here could cite numerous examples of Dick's character and behaviour that have made us all the better for knowing him.

Dick had a first class education at Christ's Hospital School in Horsham and it is perhaps this early experience of the generosity of others that reinforced his own generous and giving nature throughout his life.

As a young man, and paraphrasing Dick's own words, he was lucky enough to just miss involvement in the Second World War. He had trained for the RAF in Texas as a pilot and gained his wings. But his brief military career ended there and he happily went on to other things.

Dick studied at Imperial College and graduated as a civil engineer, a skill that he put to immediate use when he went

to St Lucia in the Caribbean to help rebuild the capital after a fire had devastated the town.

Dick was not all work though and he soon met and married Jean and they raised a tall and happy family in Kingston Vale and Chalfont St Peter. And it was in these happy homes that Dick indulged his love of problem solving, mostly through the recycling of rescued materials, to come up with innovative and often beautifully simple solutions, be they for his own home or to help a friend or neighbour.

The challenge was the thing for Dick, and when, for example he was given some difficult prop or gadget to manufacture for the St Peter Players, the local amateur dramatic group, it was like letting a child loose in a sweetie shop; he was in heaven.

But we will also remember Dick for himself, as a loving and giving person throughout his life.

He was unceasingly generous of his time and effort, and he would strive to help people to help themselves. He would always try to build a person's self-esteem; confidence and self reliance, helping them find their own route out of a difficult situation and learn from it,

People would also seek out Dick to ask his advice and guidance and he was respected as a person of practicality and wisdom who would help you think through your problems and find a way forward.

How do you do justice to this generous, kind, loving, self effacing, dry humoured and sometimes maddeningly logical man? Well I think the answer is in the legacy he has left behind in his children and grandchildren, and the lives of those he has touched and made better for his having been here.

He was a good man, and we were lucky to have known him."

Editor's note:

Dick was one of the founding engineers of the Institute and has influenced its development in many ways. Looking back through the archives, his large footprints are to be seen everywhere. We are all deeply thankful for his hard work over the past thirty years or so and will miss him.

Laminated Concrete Construction

by Martin Pullan AMICT

Laminated concrete layers of mortar embedded between reinforcing mesh provides an alternative way of constructing structures for everyday use. Sections of 30 – 40 mm thick laminated layers produce a better product in terms of high quality and strength-to-weight ratio. For the construction of a concrete pontoon, layers of mesh are laminated within the panels and a 50 mm square mesh applied in 3 layers and sandwiched together with mesh. Once cured, it provide a structure with C40 strength which is then cast into the outer skin of the pontoon.

The main pontoon is constructed using marine ply boards to act as the mould. A gel-coat is applied using sprayed mortar and left until it has almost gone off. A layer of mesh is then applied to the walls and floors in sections and laminated to the sides. By using a wooden trowel the mortar is skimmed over the mesh to compact the layer to the walls and floor. Once the first layer is laid the second layer is placed in alternative pattern to strengthen the structure. 10mm reinforcing bar sections are then cut and placed into position. The inner sections of these bars are then sprayed again with a final coat of mortar. Thus leaving a total thickness of 30 mm. By using fibres and admixtures within the mix a workable mortar is provided after being sprayed onto the surface.

Once the top deck sections are placed on the pontoon it is then ready for placing in a river, and in this case the River Thames will house these 4 pontoons on which a 36 tonne prefabricated house will be erected.

Authors Notes; The process of spraying and laminating concrete, together with associated systems of floating moulds, Ferro cement slip forming and sequential construction are the subject of patents and licences registered in the names of Martin Iorns and Michael Pemberton.

NEW FROM BSi

The following standards have been received:

BS EN 13584:2003 Products and systems for the protection and repair of concrete structures – Test methods – Determination of creep in compression for repair products.

BS EN 14068:2003 Products and systems for the protection and repair of concrete structures – Test methods – Determination of watertightness of injected cracks without movement in concrete.

BS EN 13295:2004 Products and systems for the protection and repair of concrete structures – Test methods – Determination of resistance to carbonation.

BS EN 13396:2004 Products and systems for the protection and repair of concrete structures – Test methods – Measurement of chloride ion ingress.

BS EN 12637:2004 Products and systems for the protection and repair of concrete structures – Test methods – Compatibility of injection products – Part 1: Compatibility with concrete.

BS EN 12504-4:2004 Testing Concrete – Part 4: Determination of ultrasonic pulse velocity.

The copies we receive are available to you on a first-come basis

NEW MEMBERS

WELCOME

We extend a warm welcome to the following new members:

Members:

Jaco Cokart, Sivakumar Kandasami, Willfried Krieg and Neil Crook.

Associate Members:

Vince Sibbald, Gina Al-Talal, Craig Simmonite, George Beggan, Jonathan Collyer and Brian O'Shea.

Technician Members:

Boateng Anarfi and Isaak Tladi.

Richard Day has upgraded from Member to Fellow.

Chromium (VI) in cement - Implementation of the EU Chromium (VI) Directive

The BCA has produced three 'BCA Information Sheets', on the above subject, identified as: ST/IS/14 c), ST/IS/14 d) and ST/IS/14 e), the Sheets are aimed at three different product sectors:

- Ready-mixed concrete producers and precast concrete product manufacturers;
- Retailers;
- Formulators.

They are the 3rd, 4th and 5th in a series that will deal with the many issues that the UK cement industry, and its customers, will need to address during implementation of the Chromium (VI) Directive.

Copies are available from the BCA, cement producers and, in pdf format, from ICT.

Letter

I have come across daft requirements before and ought to put together an article for a newsletter but this clause from a spec. for some marine works in Bahrain really tickled me.

"Where a sudden change in weather conditions occurs or is imminent during continuous casting operations such as will, in the Engineer's opinion, affect the quality of the concrete, the specified characteristic cube strength for cast in place concrete shall be increased by 5N/mm2."

This from a European Engineering firm; of course it is not clear if the concrete already placed should have an increased strength nor is there any guidance on what type of weather conditions would require such an increase.

Regards

Ray Austin

A Special Chemistry

STATS is delighted to announce the arrival of Mandy La Grange to head up their dedicated analytical chemistry team at St Albans. Mandy graduated from Witwatersrand University in South Africa where she majored in chemistry and geology, before completing her Masters degree in geochemistry at Cape Town. She has published work relating to spectroscopy and oxygen isotope analysis and her sound geochemistry background will complement and strengthen STATS' existing materials consultancy team.

In addition to having operational responsibility for the chemistry laboratory, including the standard scope of analysis of inorganic materials, Mandy will pursue her special interest in the increasing range of polymeric materials used in construction, from coatings and plastics to admixtures and adhesives.

Please contact Mandy direct (mandy.lagrange@stats.co.uk) or ask for Ian Sims or Fergus Collie

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Diary Dates

30th November 2004 - Palliative Repairs for Reinforced Concrete: A Best Value Approach, Aston University – 1-day meeting.

January to April 2005 – ICT/TCC One-day seminars on the basics of concrete technology and construction. Details will be circulated shortly.

4 - 5 April 2005 – ICT Annual Convention.

Further details of any of the above are available from the ICT office

... and finally ... some more nuggets from Rob McCaffrey ...

Why does the sun lighten our hair but darken our skin?
Why can't women put on mascara with their mouths closed?
Why do doctors call what they do 'practice'?
Why is lemon juice made with artificial flavourings but dishwashing liquid is made with real lemons?
Why isn't there mouse-flavoured cat food?
Why do they call the airport 'the terminal' if flying is so safe?