



THE JOURNAL OF THE CONCRETE REPAIR ASSOCIATION

ISSUE NO. 18

BRITISH STANDARDS FOR CONCRETE REPAIR

- *the clock is ticking!*

By: Hywel Davies,
Hywel Davies Consultancy



The concrete repair industry now has a comprehensive set of standards in place for the concrete repair process and the majority of the products it uses. BS 1504 is now complete, CE marking is already in place for coatings, structural bonding and injection products and it will soon be possible to CE mark repair mortars. National Building Specification (NBS) has already published a revised specification for concrete repair, based upon BS 1504, which subscribers will already be using and the Highways Agency is also amending its specifications to incorporate the new standards.

BS 1504 comes in ten parts, as listed in the table on page 2. It is important to realise that these are full British Standards. They provide, for the first time, a comprehensive set of requirements for concrete repair and protection products. As

specifiers become aware of the standards, they can be expected to start using them as the basis of their specifications. As a consequence, they will want products that meet the standard and they will expect contractors to follow BS 1504-10; the standard for site execution of concrete repair works.

Those that choose to ignore the standards may find it increasingly difficult to win work ...

After many years these standards are now firmly in place and the clock is ticking on the introduction of CE marking. Across Europe, all conflicting standards must be withdrawn by the end of 2008

and from 1st January 2009 CE marking will be mandatory in many parts of Europe. Even where CE marking is not mandatory, compliance with the requirements of the Construction Products Directive (CPD) is a legal requirement.

This means that all products used for construction must 'satisfy the [six] Essential Requirements'. In plain English, that means

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MANUFACTURERS FEEL THE HEAT

- *The impact of increasing energy costs on construction*

Unpredictable energy costs and new Government legislation in recent times has led to higher costs for all manufacturing companies. As if to exacerbate the situation, the Government's environmental targets on energy efficiency, carbon dioxide emissions, together with chromium VI legislation have all occurred at a time of unprecedented rises in energy costs. The recently published Construction Products Association (CPA) survey highlights the impact on manufacturers and producers of construction products.

As home owners we have all felt the impact of higher gas and electricity bills in recent months, but manufacturers have seen **huge** increases in energy costs.

The CPA states that energy costs alone are adding an extra £1.3 billion to the cost of construction projects. This has direct implications on public expenditure and of course the cost of repair work. The CPA also states that UK energy prices are rising above European prices and when manufacturers, like cement producers, report that at least 30% of their production cost is down to power,

this will significantly increase the burden on the construction industry.

So what does this mean for the concrete repair industry?

Well, it is not immune. As the price of energy and raw materials continues to increase, it follows that manufacturers and producers of concrete repair materials will inevitably have to pass on these costs to their customers.

Major price increases have been experienced in power, cement, resins, polymers, oil based products and liquid

coatings. The early rises were initially borne by producers, but further sharp increases over the past 12 months have led to material manufacturers being forced to raise their selling prices. This will inevitably lead to an increase in tender prices for concrete repair projects as contractors have to factor-in these increased material prices.

The direct implication is that both public and private clients will have to bear increased costs adding, it is anticipated, over £500 million a year to the cost of government sponsored construction work.

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www.cra.org.uk

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that products must be demonstrably fit for purpose. In practice, that is most readily demonstrated by compliance with the standard. Whilst nobody in the UK is going to be forced to abide by the standards, specifiers are increasingly likely to expect compliance. Those that choose to ignore the standards may find it increasingly difficult to win work and those that export to European states, which require CE marking, have no option but to comply and to complete the product testing requirements by the end of 2008.

So, what are the implications for specialist contractors and product manufacturers?

For contractors, the message is quite simple. BS 1504-10 sets out detailed procedures for carrying out repair and protection works on site. Any contractor operating under an ISO 9000 accredited quality system (as is the case with all CRA members) should be considering writing compliance with BS 1504-10 into their standard procedures. This will enable them to meet the requirements of specifiers and to clearly demonstrate that they have adopted good practice as set out in the standard.

For materials producers there may be more to do. For those supplying products to the parts of Europe that require CE marking, they will need to test their products against the requirements of the relevant parts (2 to 7) of the product standard. These tests do not have to be carried out by third parties. Manufacturers

may choose to use test houses, but they are not required to do so, except for some fire testing. Products and systems intended for use in structural applications must be manufactured under a third party certified QA system, but this will not be a problem for CRA members since that is a requirement of Association membership.

What next?

Now that the standards are in place and being incorporated into specifications, there will be a growing need for the industry to start using them. Some companies are already adopting the relevant parts for their products or services. It is too early to know how the market will react to the new standards, but contractors and manufacturers will need to monitor the market so that they are able to react to their customer's requirements.

As the industry gains experience of the standards, some problems are likely to emerge. The CRA is represented by a manufacturer and a contractor representative on the BSI Committee and is therefore well placed to bring evidence of problems to the Committee's attention and to propose solutions.

For further information refer to the Standards page on the CRA website (www.cra.org.uk). It incorporates a full listing of the product standards and the test methods. For further advice, including CE marking and compliance with the requirements, contact Hywel Davies at hywel@hyweldc.co.uk.

ENQUIRY NO: 1801

Part	Title	Published	CE marking possible from
1	General Scope and Definitions	1998, revised 2005	N/A
2	Surface protection systems	October 2004	August 2005
3	Structural and non structural repair	February 2006	December 2006
4	Structural bonding	November 2004	September 2005
5	Concrete injection	December 2004	October 2005
6	Grouting to anchor reinforcement or to fill external voids	September 2006	July 2007
7	Reinforcement corrosion prevention	September 2006	July 2007
8	Quality control and evaluation of conformity	November 2004	N/A
9	General principles for the use of products and systems	1997, under revision	N/A
10	Application of products & systems and quality control of the works	December 2003	N/A

BS 1504 – Protection and repair of concrete structures

CRISIS CONCRETE!

A spanner in the works ... literally!



Not the usual source of corrosion usually anticipated when rust stains are prevalent! You can imagine the comment at the time. Well Guv, me tool fell off when we was doin' the pour. I'm shuare some kind concrete repair fella will put it right in abat 20 years time

'SYNERGISING' THE COMMUNITY

A little while back, whilst stuck awaiting a train, I whiled away the time reading one of the many free papers that get thrust upon you at mainline stations.

Among the 'showbiz' news and the thinly veiled advertising, was a piece from the Plain English Society criticising the legal and financial fraternity. You have probably all heard of the annual awards in which legal and financial institutions generally receive a verbal 'doing-over' for the obscurity of their language. This was no different.

It has to be said that such institutions seem to be remarkably unaffected by this yearly criticism. But, then again, they do have the luxury of running businesses whose strategy appears to be to relieve the public of money. I'm not quite sure what else they do! Yes, you've guessed it ... I recently moved house.

We digress. Most of us at some time will be called upon to explain our proposals for a concrete repair contract to a panel of sceptical Clients and most of us will spend a lot of time agonising over how to best present ourselves. Yet how many of us will say anything different?

I recently had the opportunity to sit on a selection panel and interview six contractors for a reasonable, though not massive, project. Why in God's name nobody uses the word 'co-operation' any more is beyond me. But they don't; it's now 'synergy'. This word apparently derives from the Greek 'sunergos', which means to work together. But it has been hijacked by assorted fields of endeavour, each of whom have placed their own particular spin on it. So 'synergy' to a Housing Society is not quite the same as synergy to a Medical Institution. It reminds me of the new gibberish for 'Brain Storming Sessions'; have you heard of 'Thought showers'? No, neither had I!

Anyway, back to the selection panel. Given that it consisted of two elderly and somewhat baffled residents, a Housing Officer who understood only one thing, a Doctor who understood another and me (also baffled, but what else would you expect?), our synergising contractors really did not attempt to make us any the wiser as to what they meant.

The other word that kept coming up was 'community'. Sorry, that should read ... (um) ... 'Community'. The pause and the

clearly articulated capital are most important. Again, its one of those words we all use without taking the trouble to define what we really mean.

We are all members of various communities, be they social, professional, geographical, or ethnic in definition. The relative importance of these differing groups, to each of us in our personal lives, goes a long way to defining who we are. So to lump any group of people together as one homogenous 'community' is to deny the impact on each individual of all these other groupings. It also leads us to make a sweeping generalisation about that most unclassifiable of entities; the human being.

However, let's return to our starting point of Plain English. If we rely on these so called buzz words to make our case (whatever it may be) we run the risk of sounding like everyone else, which means we will be assessed like everyone else. If there is one thing that the CRA exists for, it is to say that we are not like the run of the mill concrete repairer – we are different and we sound different.

So, if everyone complies, I will have succeeded in 'Synergising the Cracking Matters Community' and, as Ken Dodd used to say, "they can't touch you for it!"

I can't fully end without including this issue's joke.

A guy walks into the Doctor's office.

The Doctor says "Good morning Mr. Smith. How are you today?"

"Doc", says the guy, "I think I'm a moth"

"Now look here Mr. Smith" said the Doctor, "You came in last week with the same problem and I told you to go and see a psychiatrist"

"I know, I know" said the guy, "I was actually on my way to see him, but as I was passing the surgery your light was on!"



CRL LAUNCH NEW FACADES DIVISION

Specialist main contractor Concrete Repairs Ltd (CRL) has formed a new division, to be known as **CRL Facades**, specifically to manage and develop the company's external render and cladding business. Primary services encompass impartial early guidance on façade finishes, advice on thermal efficiencies and carbon dioxide emissions, supply and installation of external wall insulation systems (EWI), façade finishes and rainscreen cladding, for both new build schemes and refurbishment projects. The company has the in house skills to manage and install a variety of finishes, either in the capacity of specialist sub contractor, or as main contractor and provides a nationwide service, via a network of regional offices located throughout the UK. To assist in the launch of CRL Facades, the company has produced a new brochure.

For copies telephone: 020 8288 4848, or email: mail@concrete-repairs.co.uk



ENQUIRY NO: 1802

New weber.cote range



Reinforced concrete can be a highly durable structural material, requiring little or no maintenance. However, it is recognized that without correct design, mixing, placement and curing, the durability of reinforced concrete may be impaired. Further protection should be provided immediately after construction if durability is to be achieved. A range of protective anti-carbonation coatings is now available from **weber building solutions**:

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For more information, Tel: 01525 722110 or Fax: 01525 718988



ENQUIRY NO: 1803

INDUSTRY Viewpoint

Talking recently, to an old friend who runs a specialist concrete repair company, the discussion led us into how procurement of concrete repair work has changed over the years and the different role that a Consultant Structural Engineer, like myself, now has compared with say, 25 years ago.

My first involvement in concrete repair was in the late 1970's, when I helped to set up a research project at Wimpey Laboratories looking into methods and materials for repairing North Sea oil industry structures. At that time, the bulk of research literature centred around the Mulberry Harbours, the floating reinforced concrete structures that were used by the allies for the August 1944 D-Day landings. Nevertheless, I gained a good understanding of what can go wrong with reinforced concrete and this, for me, was the foundation for understanding what constitutes a viable repair.

The methods of repair and the materials we used in those days were to some extent 'home made', in that the research into primers and repair mortars was done in-house. But talking to our men in white coats helped demystify the basic chemistry involved.

Having changed camps and started practising as a Consultant Structural Engineer, my concrete repair specifications were usually based on the use of simple, polymer modified mortars and fine aggregate concretes that I was confident would be compatible with the parent concrete and above all, would not be too expensive. I would usually inspect the structure armed with a lump hammer and record/gather as much information as possible on the existing structure, whilst at the same time developing an ever-increasing cynicism about the indiscriminate use of chloride based additives in the 60's.

I would almost always be employed by the owner of the building as their Consultant Structural Engineer and would seek tenders based on my specification (a simple form of contract, preferably JCT Minor Works) and my latest plan for controlling costs, as the extent of repair invariably increased during works on site. The approach only worked if a good relationship existed between me and the contractor, which meant (as ever) both parties being fair and reasonable with each other from the outset. I never had any real problems and coming from a contracting background probably helped.

During the tender process I still found myself, on occasions, fending off proposals from a 'specialist' seeking to get their latest product used, in place of the specified material. This often emanated from the manufacturer, who was keen on proposing a lower cost alternative to get in on the act, not particularly because it was a technically better or even a more suitable product.

As the range of repair materials and methods mushroomed over the intervening years, it has been difficult to keep up with all developments. As a general Consultant, as opposed to one specialising in concrete repair, I have therefore been indebted to the helpful advice I have received from colleagues in the specialist contracting industry. I have always found them to give straightforward and honest advice, often with the only reward being a place for their company on the tender list.

However, in recent years I have noticed an increasing trend for building owners and managing contractors to deal directly with

By: Alan Pemberton, Director, Clancy Consulting Ltd

the specialist contractors, rather than engage a Consultant Structural Engineer, in what they see as a superfluous role. As a consequence, I am increasingly involved as an expert where things have gone wrong and this can often be traced back to the method of procurement. I really would rather be employed at the other end of the process, making sure the work was done properly in the first place.

There are of course many excellent specialist repair firms around and because of their concentration in their specialist field, they have a far better knowledge of what is the best solution for the building and can also both investigate and undertake the work. This does, of course, rely on a sound relationship with the client, which most reputable companies would be keen to establish in any event. For example, I would see little need for a specialist Consultant

to submit bids based upon the use of the cheapest product, it is also creating a very uneven playing-field for those concrete repairers who are genuinely trying to compete on the basis of using the proper materials and methods for the task in hand. Consequently, as the selection process unfolds, without an appropriately experienced consultant on hand, the team desperately tries to grapple with the wide range of materials, methods, guarantees and prices it has on the table before them

What is their answer? Regrettably, it is often to go for the lowest price that comes with any sort of a guarantee, sit back and hope for the best. A crazy logic seems to set in, whereby the team believe that whatever minor mishaps might lie ahead, the saving they've made by going for the cheapest tender will cover the difference. That is seldom, if ever, the case. By the time problems come to light, the

contractor might not even be around and the guarantee is effectively worthless. The client now has to engage lawyers, an expert like myself and ultimately someone to put matters right; a very costly process and in my experience often more than it would have cost to do the job properly in the first place.

A crazy logic seems to set in, whereby the team believe that whatever minor mishaps might lie ahead, the saving they've made by going for the cheapest tender will cover the difference

appointment for what I would regard as routine repairs to a multi-storey car park but would, at the same time, hope that the specialist would also recognise the time when the best advice he could give the building owner would be to call in a Structural Engineer.

Unfortunately, building owners (and their Project Managers) often understand very little of the material science that lies behind concrete repair, never mind the intricacies of the British Standards that define how repairs are to be carried out. Their concern almost entirely centres on cost and the availability of a guarantee at the end of the day.

Management contractors would add to this an over-riding desire to tie the concrete repair company into strict sub-contract terms, conditions and warranties, etc. Tender documents are usually based on very general, performance based specifications. Not only is this inviting less than scrupulous tenderers

I'm not trying to do myself out of the good fees I can earn as an 'expert' in such cases, but I genuinely believe that the client is best served when a Consultant Structural Engineer works hand in hand with a specialist contractor. It is essential that both parties respect the contribution that the other can make. Most Consultants rely, to a greater or lesser extent these days, on the advice that specialist contractors can give on methods and materials and the contractor must recognise the duty of the Consultant to procure and then manage the work at a reasonable price for his employer.

Consultant Engineers will generally go for tender lists made up of reputable contractors who are bona fide members of recognised trade organisations, as this gives added reassurance to their client and ensures he receives a reliable guarantee at the end of the day. The Consultant has nothing to gain by going for a cheap job.

To justify the points raised, I'll conclude with an example of one of Clancy Consulting's recent projects; the refurbishment and alteration of the BT Building in Hastings to form the town's new University Centre.

Having just been appointed as Structural Engineers we were confronted with a report flagging up a problem that had not previously been recognised and allowed in the budget. Lumps of concrete were falling from the pre-cast concrete cladding panels onto the street! A very cursory inspection had been carried out by another



The Hastings building before repair work (and detailed investigation)

Consultant, which I hoped exaggerated the extent of the problem.

The refurbishment was being carried out in a number of phases and there was too little time to include the concrete repairs in the contract documents for Phase 1. The client therefore engaged Clancy Consulting to very quickly procure a completely separate package of work for the concrete repairs that could start on the Phase 1 part of the building almost

immediately and then roll-on to complete the work ahead of the following two phases. We would not get an opportunity to inspect the pre-cast panels close up until the specialist contractor's scaffold was erected, so we had to be very sure that we were going for methods of repair and controlling cost that were not effectively committing the client to writing a blank cheque. However, I was confident that by only going to firms within the Concrete Repair Association, there was no risk to the client of paying more than he would have to in order to make the building safe.

We also had to be confident that the appointed specialist contractor would fully cooperate with the (as yet to be appointed) main contractors for each of the major phases of refurbishment contract to follow. Definitely a case of going out to firms I could trust!

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INDUSTRY Developments

Use the enclosed Reader Enquiry form to obtain more information

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Buildspan is pleased to announce the opening of a new London depot situated close to Canary Wharf on 16th October. This prime location will increase the overall service package that Buildspan already provide and will ensure an even greater availability of goods whilst maintaining the lowest cost option for our customers. As with the company's other depots it will be pleased to offer a counter sales service from the new depot. Buildspan is committed to continuing to meet the ever changing needs of its customers and look forward to servicing future requirements.

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ADAMS CONSULTING ENGINEERS

KELLER

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In addition to the structural repairs, I recommended a coating system that would not just radically improve the durability of the pre-cast panels, but would transform the aesthetic appearance of the rather drab building. Unfortunately, due to the open aggregate finish to the panels, we could not select the material for the finish until work started on site, or before we could do some trial panels.



The completed building

As can be seen, the concrete repairs were finished, well ahead of the new glazed entrance structure being erected for the final phase of the main refurbishment programme.

The application of the coating system is a massive whole life benefit to the envelope of the building, not only increasing its durability by about twenty years but radically improving its appearance.

ENQUIRY NO: 1806

Once the works started on the first elevation, the contractor was entirely accommodating in allowing inspections to measure the work. As repairs proceeded, they enabled us to predict the likely extent of the work and to give our client some re-assurance as the likely costs out-turn.

Of the four elevations of the building, the final one to be tackled was that facing seawards and the deterioration of the concrete was about four or five times as bad as the other elevations. However, working hand-in-hand with the contractor, we kept the works to programme. The other three elevations had been in somewhat better condition than we had predicted, so overall costs balanced out quite well given the lack of reliable survey information we had when we started.

INDUSTRY Grapevine

OLD WITH NEW

A large 1960's office block in the city of Preston has been treated with a polymer-reinforced protective coating from Tecroc Products. Tecroc SBR Level Coat was used to provide both protection and an aesthetic uplift for concrete columns during major refurbishment of the 10-storey building. Work was carried out by main contractor, Interserve Project Services. The material was specified following trials, as it met the need for a light colour to complement new windows fitted throughout the complex and because it proved a practical solution for treating unsightly markings and weathering on the original columns. The material was also used on a more recent extension to the building, enabling the two sections to "blend" together.



Tecroc Products Ltd. Tel: 01827 711755

AND THE WINNER IS ... CRL

Multi-storey car park (MSCP) 3, located at Gatwick Airport South Terminal, has won the 'Best refurbished car park 2006' award, presented by the UK's 'Parking Review' journal. The renovation work was carried out by Concrete Repairs Limited (CRL), in partnership with Warings Construction Group and BAA. The 6-storey structure was originally built in 1973, with an anticipated lifespan of 30 years. It houses a bus station at ground level and a hotel is situated alongside. Disruption to passenger and hotel guests, as well as time out of service, made any considerations regarding demolition and replacement out of the question. In addition to providing corrosion control, concrete removal and replacement, anti-carbonation coating application and deck waterproofing expertise, the appointed company had to comply with BAA's latest and most highly specified car park standards. Concrete Repairs Ltd. Tel: 020 8288 4848



UNUSUAL CONCRETE REPAIR!

Structural Renovations Ltd was recently asked to carry out repairs to stained glass window panels at a Roman Catholic Church in west London. The window panels were originally constructed using a method known as Dalle De Verre, which involves setting thick chipped or faceted pieces of glass in a concrete surround, that is reinforced around the glass sections, using a copper lattice. The perimeter is further reinforced with mild steel to increase rigidity. The individual 1.5m x 0.9m panels unite to depict a huge biblical scene. The six-panels wide by five-panel high image is held within reinforced reconstituted stone mullions. When lit, the chipped or faceted pieces of glass produce a vibrant and colourful appearance. The panels, originally fabricated in the 1950s, were suffering from expansive corrosion of the perimeter reinforcement. Works involved removing the badly corroded mild steel and replacing it with stainless steel, prior to reinstatement of the carefully removed areas of concrete with a polymer modified mortar, bonded to the prepared substrate using an epoxy primer.

Structural Renovations Ltd. Tel: 01753 825511



NEW TECHNICAL TRAINING CENTRE FOR CONCRETE REPAIR SYSTEMS

Remmers have opened a Technical Training Centre at their new UK Headquarters in Crawley, where the company's concrete repair systems, resin flooring and car park decking, stone restoration systems and waterproofing techniques can be explained and fully demonstrated.

Attendees can evaluate the products and perfect their application techniques. The facility includes full technical, classroom and practical training facilities, with equipment for up to 40 people. Training courses can be arranged by contacting Steve Dunn on 0845 373 0103.



MANAGEMENT BUY CRL FROM MJ GLEESON

The senior management team at Concrete Repairs Limited (CRL) has acquired the issued share capital for the specialist contracting business from M. J. Gleeson Group plc. The new management team is confident that the change in ownership will enable the business to build on its recognised strengths and enhance the services provided to clients throughout the UK. Managing Director, Tony Rimoldi explained "The business is in a strong trading position and remains committed to controlled and profitable growth in future years. I can confirm that all normal contractors insurance arrangements remain in place and the company will continue to operate within a robust safety, health, environmental and quality system".

Concrete Repairs Ltd. Tel: 020 8288 4848

TECROC GOES WITH BECKETT FOR NORTHERN IRELAND

Tecroc Products has arranged an exclusive distribution agreement for Northern Ireland, with Belfast based Beckett Construction Solutions. Under the agreement, Beckett (part of CRH plc) will market Tecroc Products range of high performance grouts, anchors, concrete repair systems, ground engineering and highway products to public and private sector contractors throughout Ulster. Tecroc Managing Director Mark Shorrocks commented "Supply into Northern Ireland has been growing over recent years and in reaching this agreement with Beckett we are linking with an established and high profile company whose name is synonymous with quality and service. We are looking forward to forging a successful long-term relationship."

Tecroc Products Ltd. Tel: 01827 711755



Beckett's Managing Director Tom Sweeney (left) with Tecroc Products Managing Director Mark Shorrocks

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The CRA can arrange personalised FREE OF CHARGE CPD Seminars (covering the two audio-visual programmes listed above) in your office and at a time convenient to you, provided a minimum of 4 delegates are able to attend. Each programme is about one hour in duration.



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For copies, complete and return the enclosed Reader Enquiry form, call: 01252 739145, or email: cra@associationhouse.org.uk

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