

# Cracking Matters

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ISSUE NO. 7

## THE CRA - A CONSULTANT'S PERSPECTIVE

By: Bob Stagg, Director, Alan Conisbee & Associates (Consulting Structural Engineers)

You may be wondering why a consulting structural engineer should be apparently promoting the Concrete Repair Association (CRA). Alan Conisbee and Associates are involved in all aspects of new build and repair/refurbishment of existing buildings and although much of our work includes repair of reinforced concrete, we are not in any way connected with the CRA nor do we have any axe to grind. J.K. Rowling's position as highest paid author in the UK remains safe although I am looking forward to a sandwich and a pint lunch on CRA Chairman Bob Berry's expense account next time he is in London.

*Mud sticks, and it is of little comfort to be able to prove, perhaps many months or even years later, that the consulting engineer was whiter than the driven snow whilst all about messed up big time!*

concrete repair projects; their requirements for an accredited quality assurance scheme, formal training of operatives, the comprehensive checks on track record, financial integrity, and so on. In other words, a trade association acting as it should in today's post Thatcher, post Latham, post

Egan, construction industry. So what can I add?

The role of the consulting engineer in a concrete repair scheme certainly varies depending on circumstances and is sometimes a difficult one to pin down. At one extreme we merely hold the client's hand, giving a little friendly advice when needed

The CRA already has an effective marketing machine; the fact that you are reading this is testament to that. You are probably already aware that the CRA is the recognised trade association for concrete repair contractors and associated organisations. If you are not, the CRA is better placed than me to detail the advantages of selecting their members for

but leaving the technical stuff, particularly all that rather difficult chemistry, to the expert (we hope) contractor. At the other extreme, the consulting engineer is the expert (we hope), carrying out a detailed investigation followed by preparation of contract documents including a repair specification, and taking it right through to completion, checking and re-measuring on site and so on.

Whatever the role, and whatever the size of the job, no-one wants to be involved in a problematic job even if those problems are not of one's own making. Mud sticks, and it is of little comfort to be able to prove, perhaps many months or even years later, that the consulting engineer was whiter than the driven snow whilst all about messed up big time! What mud am I talking of? Let's consider what's involved.

Simplifying somewhat, obviously the concrete repairs themselves must be 'pukka' (good word that, contemporary, broad but generally well understood, and multi-cultural!), they must continue to be so for 25 or so years minimum and they probably need to look good as well. Repair of reinforced concrete genuinely is complex and its success needs real skill and knowledge. Less obviously, but still importantly, the project must be carried out in a reasonable time, even though it is sometimes difficult to predict the extent of work. In addition, disruption should be kept to a minimum and of course, safety is paramount. Many concrete repair projects involve residential property and it is essential to recognise these as 'homes', with all that word implies. Often residents remain in occupation and naturally,



emotion can play a big part in their response. Whilst not condoning it, society at least understands road rage. How much more understandable is it that unexpected or ongoing disruption of home life causes resentment?

Safety is a huge issue. Although the construction industry employs 6% of the country's workforce, it accounts for 30% of work related fatalities. No wonder it is high profile and politically charged. No wonder legislation such as the CDM regulations, with its somewhat grey areas of responsibilities, is put on the statute book, arguably without sufficient thought but with its heart in the right place i.e. all parties in the construction process, designers included, should take at least some responsibility for safety. Working in and around occupied premises adds yet another safety-related complication.

In summary then, there is a potentially large amount of mud to be thrown around if a

concrete repair project goes pear shaped; technical complexity, durability issues, delay, disruption and safety. All involved, consultants included, should seek to minimise those risks. Choosing the appropriate contractor for a project is one of the most fundamental parts of trying to ensure the mud doesn't even get stirred let alone thrown, and it's not an easy task. Whoever is involved in making that choice, client, consultant or both, should at least listen to any genuine advice on offer. Acceptance of a contractor by the CRA is just that. Of course there can be no guarantee that the use of a CRA approved contractor will result in a trouble free project but it's a good start. A project may warrant tender interviews but objective results can be difficult to achieve and the interviewing process would be greatly enhanced by using membership of the CRA as the starting point.

You may argue that I am merely looking to protect my own backside and yes, there is an element of that. I make no apology for it. In fact, the use of a CRA contractor would most likely protect other backsides as well as my own, including the client's. I also believe that the use of a CRA contractor will result in a 'better' job, but let's continue with the legal aspect. Society is regrettably becoming more litigious (another good word, means 'obsessed with suing', thanks USA/Ally McBeal), and as consulting engineers, it seems we are at greater risk with little recognition of this in our pay packet. I understand that strictly the CDM regulations require the client to be responsible for ensuring the principal contractor is competent, but in reality, we consultants are almost bound to be involved, either formally or informally. Even advice given informally, verbally and without payment can under certain circumstances be

*Continued on page 2*



### OPERATIVE TRAINING - where are we now?

It is widely recognised that there has been little interest or enthusiasm for trade or vocational training for site operatives in any area of the construction industry over the last twenty years or so. For some years now employers have not perceived apprenticeships as being a valuable investment and therefore little time or money has been directed towards the development of the skill levels of the labour force through other routes.

Among the reasons for this have been the increasing mobility of workers from one employer to another and, up until recently, the widespread use of self employed or sub-contract labour, where pay is agreed for the contract in hand rather than on a progressive scale of rates reflecting the experience and/or skill of the individual operative. Likewise, individual operatives, seeing no better pay or conditions resulting from the certification, have been reluctant to either press their employers for the training or to undertake it themselves.

The Construction Industry Training Board (CITB), who offers skills training and certification estimate that less than 30% of the industry's workforce hold any formal qualifications.

*Continued on page 4*

# CRA - a Consultant's perspective

Continued from page 1

relied on in law and I believe that the woolly responsibilities as set out in the CDM regulations do not help. It seems crazy not to take advantage of a vetting system, already in place, well established, recognised and respected.

The law does not require the consultant to be perfect but rather to use 'reasonable' skill and care. A recommendation to appoint a CRA member seems an easy but nevertheless good attempt at reaching that goal. Lawyers may disagree (they have to I suppose, that's how they earn their living), but common sense suggests that the measures taken by the CRA in vetting and checking members does go some way to using 'reasonable skill and care'. More may be considered necessary, a visit to the contractor's previous job for example or discussions with a former client and so on, but it makes no sense to ignore the checks already carried out. Providing we remain confident that the CRA is carrying out its role diligently, (I do currently but will keep monitoring), we seem to have reached a happy situation haven't we?

One final thought on a different aspect of the CRA's role. It produces useful and free documents to rationalise the complex issues surrounding concrete repair. Its well established publication 'Standard Method of Measurement for Concrete Repair' is just such an example. I believe that if you use

that document or any other CRA document or advice, there is almost a moral duty, and certainly a partnering ethos, for you then to specify only CRA members for concrete repair work, or am I being naive?

I have to admit to one difficulty with the logic detailed in this article. How does a contractor get the minimum of three years audited accounts and six jobs to use as references as required for application to the CRA? Answers on a postcard please, and the winner joins Bob and myself for that lunch!

## The Author

Bob Stagg is a Chartered Engineer, Fellow of the Institution of Structural Engineers, Member of the Institution of Civil Engineers and a director of Alan Conisbee and Associates. As a practice the Company undertakes a broad range of projects in both new build and refurbishment and Bob has been involved with concrete repair and all aspects of remedial work on existing buildings for over 20 years.

ENQUIRY NO: 714



# ALL CRA PUBLICATIONS NOW FREE OF CHARGE

The CRA, who recently agreed to make its established 'Standard Method of Measurement for Concrete Repair' document free of charge, has now decided to provide all of its publications at no cost to individuals and organisations involved in this specialist sector of the construction industry. Traditionally, the documents have carried price tags of between £5.00 and £15.00.

The list of documents include 'The route to a successful concrete repair', which emphasises the essential considerations to be taken into account when faced with the repair of reinforced concrete and provides useful guidelines to the best approach to be adopted.

'The application and measurement of protective coatings for concrete' is intended to help avoid the pitfalls that can occur when specifying coatings for concrete. It also contains a section on how to estimate quantities required, contractor selection and supervision.

'Electrochemical repair using realkalisation and chloride extraction techniques' explains the processes of carbonation and chloride attack on concrete and highlights the various electrochemical methods of repair - realkalisation, chloride extraction, cathodic protection and corrosion inhibiting.

The CRA's 'Standard method of measurement for concrete repair' was specifically designed to facilitate the production of clearer Bills of Quantity and to help produce a true quantification of necessary repair work. The publication deals with the measurement of surface cleaning; surveying; concrete repairs; crack repairs; pore/blow hole fillers; levelling mortars/fairing coats; coatings and resin injection. It also itemises time-related elements such as provision of access and site facilities and includes a useful specimen Bill of Quantities, with space where contract details can be added.

Free copies of each publication, together with a Members Directory, can be obtained from the Secretary, CRA, Association House, 235 Ash Road, Aldershot, Hants GU12 4DD. Tel: (01252) 321302. Fax: (01252) 333901. Email: info@associationhouse.org.uk www.concreterepair.org.uk

## Note from Ed.

A CD-ROM adaptation of 'The route to a successful concrete repair' publication, together with voice-over, is just about to be produced. The CD also lists all current CRA members and includes copies of all the above publications. If you prefer details in this format, please advise.

Alternatively a personal presentation of the program 'The route to a successful concrete repair' can also be organised.

# NEWS

## from CRA Members

Use the enclosed Fax-Back to obtain more information

### INNOVATION AT FURNACE GREEN

An innovative solution for enhancing concrete repair work through the use of sacrificial anodes, has been carried out by specialist Contractor **Llewellyn Stonecare Ltd** at Furnace Green, for Crawley Borough Council.

Over the years the use of de-icing salts on the elevated walkways serving the sheltered housing had led to chloride induced corrosion of the steel reinforcement. To combat corrosion hot spots, likely to develop immediately adjacent new repairs in chloride contaminated concrete (the incipient anode effect), Llewellyn Stonecare Ltd incorporated the latest product solution - Fosroc Galvashield, into the repair zones. Deck waterproofing and coatings completed the protection.

Llewellyn Stonecare has more than 35 years experience in concrete repair, electrochemical treatment and associated works. For more information on innovative concrete repair solutions, contact Brian Gardiner on 01908 679222



ENQUIRY NO: 701

### FLEXCRETE LTD LAUNCHES WEBSITE

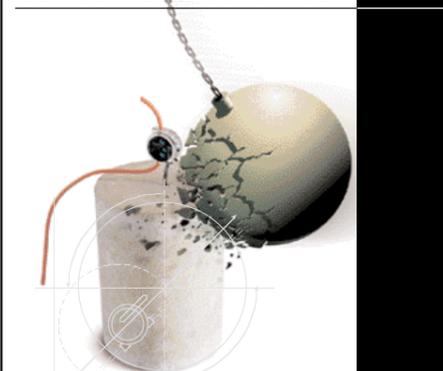


Flexcrete Ltd has launched a new website at www.flexcrete.co.uk. The site has been introduced to enable civil engineers, contractors, architects and specifiers to easily access information about Flexcrete and the Company's range of concrete repair materials, car park decking systems and high performance coatings for weatherproof, anti-corrosion and anti-carbonation protection.

The site features a whole host of information, such as technical data sheets, literature, case studies and a frequently asked questions section, which offers browsers the opportunity to pose their own technical questions about concrete repair. The site will be regularly updated to include all the latest project news and Company product developments.

ENQUIRY NO: 702

### The new kind of building and contents insurance



#### Stronger protection against corrosion in reinforced concrete.

Galvashield CC is a tougher customer. But there are brains to go with its considerable brawn. It works intelligently to fight corrosion for up to 20 years. So it's the insurance policy that every specifier should have.

Call our Marketing Department on 01827 265306 to find out more.

#### Galvashield CC

Fosroc Limited, Coleshill Rd Tamworth Staffordshire B78 3TL. Tel: 01827 265306, Fax: 01827 262444, Email: sales@fosrocUK.com, www.fosrocUK.com

ENQUIRY NO: 703

### COMPOSITE STRENGTHENING TECHNIQUE EMPLOYED ON TAY BRIDGE

Specialist contractor **Concrete Repairs Ltd (CRL)** has just completed another strengthening assignment on four six-metre tall piers forming part of the northern approach viaduct of the A92 Tay Road Bridge in Dundee.

The £60,000 contract was instigated as part of the bridge-strengthening programme necessitated to accommodate the 40-tonne vehicles now sanctioned to access Britain's road network. Strengthening was achieved with 700m<sup>2</sup> of MBT Feb 'Kevlar' fibre-reinforced polymer (FRP) composite fabric. The two-directional tapered configuration of each pier, required CRL to utilise a unique planning strategy and an efficient procedure for cutting the material.

Sheets were applied in strips of 3-metres by 0.3-metres. To meet the 2.5mm thickness design requirements, six 0.42mm sheets were applied horizontally in hoops of two halves to each pier and overlapped by 200mm. Concrete Repairs Ltd. Tel: 020 8288 4848 (Head Office)



ENQUIRY NO: 704

### BRAND NEW POWER FREE CP

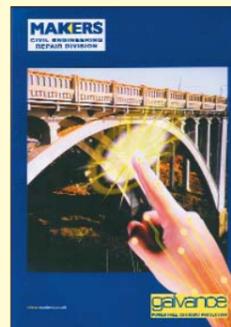
Established electrochemical system design and installation contractor, **Makers UK Ltd**, has introduced an entirely new galvanic cathodic protection (GCP) concept for repairing steel in reinforced concrete.

The new technique, known as 'Galvance', is suitable for all structures, but unlike conventional impressed current cathodic protection systems, Galvance has absolutely no reliance whatsoever on electrical power.

It functions by suppressing reinforcement corrosion through the action of an activated zinc anode and a humectant called 'Enhance™'. The humectant maintains the moisture level in the concrete pores, thereby reducing resistance to the current flow and ensuring that the chloride ions are attracted to the anode rather than the steel reinforcement. The system is based upon proven technology, is compatible with coatings, durable and economic to install and maintain.

For more details telephone: 01487 832288. email: marketing@makers.co.uk or visit website on www.makers.co.uk

ENQUIRY NO: 705



### BLUE CHIP SERVICE

Blue Chip clients require Blue Chip service, so when British Telecom needed some urgent

repairs to their exchange building in Crawley, they appointed specialist contractor **Yoldings Ltd**.

Although, on the face of it, a straightforward job, as the contract progressed, it became clear that, due to the design of the building, some unforeseen problems had arisen. With their policy of providing a Total Refurbishment Package to clients, Yoldings had the expertise to work with the Consultant to create a positive and workable solution. This inclusive approach to project management, together with a high standard of workmanship, has enabled Yoldings to secure a number of prestigious contracts, on a nationwide basis.

To learn more about Yoldings Total Refurbishment Package and how it can benefit you, contact Allen Broad on 01474 747144 (tel/fax), 07710 526656 (mobile), or Allen@yoldings.com or visit our website www.yoldings.com

ENQUIRY NO: 706



Freyssinet introduce Advitam ScanPrint a software system for structural inspection and asset management, just one of Freyssinet's repair & strengthening family of products and services that includes:-

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For more information, please contact Philip Deller:-  
Freyssinet Limited 7 Hollinswood Court, Stafford Park 1, Telford, TF3 3DE  
Tel: 01952 201901 Fax: 01952 201753 email: info@freyssinet.co.uk  
[www.freyssinet.co.uk](http://www.freyssinet.co.uk)

Construction  
Geotechnics  
Repair & Strengthening

ENQUIRY NO: 707

# DISINTEGRATING CONCRETE CAN DAMAGE YOUR HEALTH!

By: David Bowen Bravery, a Partner of Mitchell, McFarlane & Partners Limited

THE THIRD IN A REGULAR SERIES OF ARTICLES COVERING THE VARIOUS STAGES AND ASPECTS OF CONCRETE REPAIR WORK. THIS PIECE EXPLAINS HOW, IF SPALLING CONCRETE IS PREVALENT, YOU CAN MINIMISE THE RISKS WITHOUT SPENDING A SMALL FORTUNE.

Nowadays there is a wealth of best practice advice concerning the diagnosis and repair of reinforced concrete structures that should by now be well known to clients, contractors and engineers alike. Be this as it may, very little formal advice is provided to guide the inexperienced on sensible cost effective procedures to minimise possible dangers to the general public between completion of a representative concrete survey and the arrival of a specialist concrete repair contractor on site.

The following situation is all too common. Visual inspection and representative concrete testing has revealed corroding reinforcement in carbonated concrete (often with the added problem of chloride contamination) and much loose and spalled concrete has already been detected. Clearly, this represents a hazard as even small pieces of spalled concrete falling from height will cause severe injury (or, worse still, be fatal) to anyone unfortunate enough to be in its path. Such risks are very real and

woe betide a building owner and his engineer in the event of an accident who have been aware of such dangers but have not taken reasonable action to minimise the risks. Prosecution by the HSE and/or other parties is inevitable. Remember, hardly anything is seen as an accident in today's litigious climate!

In such a situation, the first course of action of any responsible engineer/contractor under their duty of care is to advise the client of such risks and recommend a course of action. In an ideal world, the

best action is to immediately appoint a specialist concrete repair contractor to get onto site and carry out proper long term repairs: but in the real world this is often not possible for a range of reasons, the two most common being the need to draw up repair specifications (including other works) and invite tenders, the other being the absence of any money to do the works. Therefore, although the minimisation of lead-in time should always be recommended, it is not very often achievable.

*This is like pouring money down a drain. Think of how many repair contracts could have been undertaken with these £millions!*

So, we now **know** we have a building suffering from reinforcement corrosion with dangerously loose spalled sections of concrete that pose a very real risk to the public and no chance of effecting meaningful repairs for some time. What should be done to minimise or acceptably reduce these risks?

In the writer's experience, the reaction to such risks has often been only extreme. Critically important decisions are often made by inexperienced non-specialist persons. In the one extreme, the risks are ignored and, on the other, the building is extensively scaffolded and boarded at huge (and often ongoing) cost to the client. Tens of millions of pounds have been expended in recent years by fully scaffolding and boarding buildings to minimise risks that could have been far better remedied by adopting less expensive, but nevertheless very effective, temporary measures. This is like pouring money down a drain. Think of how many repair contracts could have been undertaken with these £millions!

An immediate risk appraisal should be undertaken by an experienced engineer who has extensive experience of concrete deterioration problems and is knowledgeable of the form of construction of the particular structure (often such concrete problems are accompanied by similar brickwork problems and risks of falling masonry needs to be addressed at the same time). In some instances "political" factors have to be addressed in addition to technical matters, albeit the prime consideration should always be that of health and safety. Therefore, in some instances, emergency action may need to be taken. An indication of the range of measures to be considered is summarised below in ascending order of cost, although this must not be considered as exhaustive. It is usually the case that **combinations of measures** will be necessary depending on a range of factors including, amongst other things, the severity of the problem, location of defects, duration of temporary measures, site topography etc. It is to be emphasised, however, that increased expenditure does not always result in proportional reduction of risk as a well engineered, less expensive option will often provide a best value solution. Innovation is the name of the game!

**Do nothing** - If the degree of deterioration is small and the location of risk is acceptable (eg above open spaces), together with imminent proper repair of damaged elements, then this approach can be acceptable.

**Provide exclusion zones** - This usually entails the erection of fencing to prohibit public access to vulnerable areas and is



accompanied by signage to warn of the danger, eg "No Access - Danger of Falling Concrete".

**Safety surveys** - Such surveys often conducted by abseil techniques and/or from mobile access platforms entail the appraisal of the concrete by light hammer testing and the removal of any loose/debonded pieces. It is important that, if proper repairs are not to be effected prior to the onset of winter conditions, any exposed steel reinforcement is painted with a corrosion inhibitor to protect against corrosion and minimise further deterioration of the concrete. This minimises the risk of further detachment of concrete, render and the like. Further surveys should be undertaken on an annual basis. Whilst the safety survey is under way, exclusion zones may need to be formed by coning and/or taping off vulnerable areas. A banksman may sometimes need to be employed to direct people to alternative entrances during the short time that workmen are working overhead. Sometimes local protection may need to be erected for a short period over entrances and the like.

It is of particular importance, when considering safety surveys, that the work is only undertaken by specialist concrete repair contractors who have particular 'hands-on' experience of conducting such surveys and associated concrete testing. Only contractors who have a knowledge of the inherent problems posed by various generic types of construction should be considered. Complete thoroughness is essential such that all loose/debonded/spalled concrete, render and the

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## MOSAIC ENCAPSULATION

Structural Renovations Ltd has been awarded a £300,000 repair and mosaic stabilisation contract for Aberdeen Property Investors at the Centre Tower, Croydon.

Possible debonding of the render and mosaic finishes to the 20 storey office block, which stands above the Whitgift Shopping Centre, were recorded during a condition survey carried out by Consulting Engineers, Hunt Wilton, who then prepared the repair specification.



The existing render and mosaics are being re-tested, repaired, pinned, cleaned and overcoated with a fibreglass matting reinforced elastomeric coating by specialist repair contractor Structural Renovations Ltd with technical assistance from Quest Technical Services.

Whilst the access cradles and scaffolding fans are in place the opportunity will be taken to replace the window sealant, giving a totally encapsulated structure.

For further information contact Andrew Muirhead on 01753 825511.

ENQUIRY NO: 708

## NEW TECHNOLOGY FOR LISTED STRUCTURE

Modern technology, in the form of Ultracrete PY4 polyester resin mortar, manufactured by Tamworth based Instarmac Group plc, has been employed to form plinths to bed-in new replacement timber bearings on Isambard Kingdom Brunel's distinctive 140 year-old Royal Albert



Bridge near Plymouth. The bridge, a Grade 1 listed structure, traverses the River Tamar and carries the Great Western Railway to locations deep into the west of England.

By employing fast curing and rapid strength gaining Ultracrete PY4 each set of bearings were replaced in just two hours, significantly accelerating the work programme. Ultracrete PY4 is primarily designed for rapid installation of manhole frames, gully gates, kerbs and the like, but the Albert Bridge contract illustrates the material's extreme versatility.

Further details can be obtained on 01827 872244

ENQUIRY NO: 709

## ENFORCE ARAMID A120 SHEET "TOGETHER WE'RE STRONGER"

weber sdb has added a new Aramid A120 sheet, for wrapping applications, to its successful range of Enforce Composite Strengthening materials.

Based upon high performance Aramid fibres and woven into a high quality uni-directional sheet, Enforce Aramid sheet offers new opportunities for structural strengthening. Ductile Aramid fibres are non-conductive and provide strengthening systems that offer high impact resistance to both external and explosion damage. The Enforce Aramid A120 Sheet is supplied in a 300mm fabric width and in four distinct grades depending upon the sheet weight & thickness of Aramid required.

It is suitable for column strengthening, silo towers, chimneys, cooling towers, beams and bridge supports and fully complies with the Highways Agency specification for bridge support strengthening. weber sdb provide a first class service for all composite strengthening projects. 'Together we're stronger.'

ENQUIRY NO: 710



## BROOKES SECURE LARGEST SACRIFICIAL ANODE CONTRACT TO DATE

Moss Vale Bridge is situated in Trafford near Manchester. The structure carries Moss Vale Rd over the Warrington to Manchester main commuter line. It was originally envisaged that a cathodic protection system was the only treatment for the chloride inflicted bridge. Unfortunately costs prohibited this and Brookes Northern Ltd were asked to put forward alternatives solutions. Brookes came forward with a remedial solution using the new CC sacrificial anode produced by Fosroc. The solution was considerably cheaper than cathodic protection and enabled the project to go ahead. Brookes are currently carrying out the project on site.

If you are interested in further information or perhaps would like to make a site visit please contact Robert Lomax on 0161 789 0901.

ENQUIRY NO: 711



## Sika NEW CONSTRUCTION PRODUCTS CATALOGUE

Sika is a world leader in high performance construction chemicals. Our unrivalled portfolio of products includes the following:

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- ▲ STRUCTURAL STRENGTHENING - State-of-the-Art Solutions
- ▲ CORROSION INHIBITORS - Impressive Track Record
- ▲ PROTECTIVE COATINGS - Unrivalled Durability
- ▲ JOINT SEALANTS - Advanced Technologies

We offer a free and comprehensive technical support service. Please contact Jimi Fadayomi on 01707 394444 for assistance.

ENQUIRY NO: 712



## CATHODIC PROTECTION FROM MBT

London Berth at Jersey harbour had high levels of chloride-induced corrosion from the ingress of sea salts, causing rust staining, delamination and spalling. Concrete



Repairs Ltd was awarded a contract to trial and install a cathodic protection system.

Thoro CP60 Anode from MBT was chosen for its ease of application and was installed to the soffits, beams and caps, totalling some 1,520m<sup>2</sup>. Thoro CP60 Anode is a highly durable anode for impressed current cathodic protection of steel-reinforced concrete structures, giving high conductivity and good vapour permeability and long life with low maintenance. It requires a mesh anode net. The CP system is operating optimally at 2-3 UDC in constant voltage mode.

For more information telephone: 0161 794 7411

ENQUIRY NO: 713

# DISINTEGRATING CONCRETE CAN DAMAGE YOUR HEALTH!

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like is removed. Safety surveys conducted by inexperienced contractors are seldom adequate.

**Effect temporary repairs and/or additional safety works** - Such temporary repairs may entail "holding" concrete repairs, making the structure watertight after removal of loose concrete, restraining balustrade brickwork, dowelling brickwork, etc. This is often undertaken in conjunction with a safety survey as discussed above. Local demolition and rebuilding/modifications are also included under this item.

Additional safety works may entail the use of safety netting, local concrete containment, exclusion zones and protective fans over local areas.

**Provide scaffolded protective fans** - The fans, constructed in scaffolding with timber boarded and sheeted platforms, are generally provided around the perimeter of a block just above first floor level to protect the public from falling debris. Hire charges on such fans are usually relatively expensive and so the length of time such equipment is on hire is very important. In some circumstances the outright purchase of the scaffolding by the client is more cost effective as it can be sold on (or hired) to the repair contractor once the proper remedial works commence. In the writer's experience, such fans are usually only necessary in high risk areas when very rapid deterioration of the building fabric is anticipated and/or when access to effect temporary remedial works is unacceptable.

The big drawback with fans on tenanted blocks is that they not only are often subject to vandalism, but they also become receptacles for general debris and rubbish discarded from windows by tenants above and thus become a safety hazard themselves. The disturbance to occupants at first floor level is also of significance. In addition, on tall blocks, there is no guarantee that pieces of

falling, spalled concrete, render, etc will end up in the fan below. Wind effects often mean that debris is blown outwith the fan area.

**Full height boarded scaffolding and debris platforms** - Full height boarded scaffolding is usually only employed in extreme circumstances when the size of the falling "debris" is such that it cannot be safely collected by a boarded protective fan at low level. In view of the expensive hire charges associated with such scaffolding, outright purchase is often a cost effective alternative to hiring. Very often the scaffolding is eventually incorporated into the final contract to provide access for the repairs.

On very rare occasions debris platforms outwith the boarded scaffolding is sometimes deemed necessary in very sensitive areas, eg over entrances, etc.

However, be aware that full height scaffolding creates its own risks which often exceed those caused by falling concrete. I have known scaffold boards, blown off scaffolding erected to protect the public from falling pieces of concrete, to have been found some 30 metres away from the building! Scaffold security is also a major problem.

Therefore, in conclusion, I would simply say, be very aware of the risks posed from falling detached pieces of concrete. Take appropriate measures to reduce the risk to acceptable levels, but don't spend a fortune doing it. Such money is far better spent on carrying out proper repair and refurbishment.

#### The Author

David Bowen-Bravery is a Chartered Engineer, a Fellow of the Institution of Structural Engineers and a Partner of Mitchell, McFarlane and Partners. He has been actively involved in the diagnosis and repair of reinforced concrete structures for the past 25 years.

ENQUIRY NO: 715

# CHANGING ROOMS - Now there's a thought

**B**enchmarking. Now there's a buzzword that seems to have gone out of fashion a bit. Perhaps the omnipresence of partnering has something to do with it. Whatever the reason, there are still occasions when it is worth taking time to set an agreed standard, as we found out a little while ago...

In a manner which will be all too familiar to anyone preparing a project programme, the view of the management contractor - "this repair job can be knocked off in a couple of days" and that of the specialist - "we need at least a week to do this properly", had turned into entrenched positions from which there was, it seemed, no escape.

To eliminate charges of bias, it must be said that neither side was being bloody minded about the situation. However, what had happened was one of those situations that marriage guidance counsellors are all too aware of. Where, for example, the two sides were saying the same words but meaning different things. What was needed was a bit of common ground.

The specialist invoked many things. The CRA 'Standard Method of Measurement' and the CRA's 'Seven steps to a successful concrete repair' being but two. Appeals were made to 'Reason', to 'A Desire for Quality' and to the 'Consultant's Specification'. Each volley was neatly returned, quoting; 'The Client's Brief', 'The Need for Consistent Planning', 'CDM regulations' and, needless to say, the 'Consultant's Specification'.

After about two hours of this to-ing and fro-ing, there was a pause for breath.

Suddenly, the Site Supervisor, who's responsibility it was for overseeing the repairs (if and when they began) and who had been growing noticeably restive during the morning's harangue, spoke up.

"Look," he said, "Not even Carol and the Changing Rooms team could do this job in two days, so how do you expect me to?" The mood of the meeting changed at once. Now that a benchmark had been established it suddenly seemed that there was not such a problem after all. The Management Contractor admitted that there were probably a 'couple of days going spare', while on the specialist side, well, 'a week does mean four days at a push' - everyone knows that.

Progress after that was fairly swift. Programmes were established and the work got under way in a much better atmosphere than before. Now its fair to accept that what was needed was exactly what happened. A bit of humour to bring everyone out of the holes they were busily digging for themselves.

The fact is though; we do live in a society that demands instant satisfaction as a growing part of its culture and construction disciplines will probably never be able to conform to this demand. The products and services we use are simply not designed that way. But what we do need to understand is the growing impatience of our client with things like delay and postponements. Perhaps its something we should explain more fully.

One final point. On the site featured, tasks taking more than 48 hours are now sub divided into 'Carol Jobs', which just goes to show how life can imitate art, even on a building site.



## CRA PUBLISH MEMBERS DIRECTORY 2001

**T**he CRA has updated and published the latest edition of its popular Members Directory, which is specifically designed to be of every-day practical use to Specifiers, Consultants, Surveyors, Local Authorities and Clients.

The latest edition contains details on three new members, as well as updated information on the CRA's other thirty-four members, who comprise the UK's established concrete repair contractors and product manufacturers.

The comprehensive, 52 page, one-third A/4 pocket sized booklet, provides details of each member company. It gives Head Office and Regional Office details, contact names, a description of the company's specialist concrete repair activities (in the case

of manufacturers - its products), areas of operation and third party accreditations.

To assist when compiling tender lists for concrete repair work, each contractor's entry includes information on contract values catered for, the company's largest contract to date, its approximate annual turnover in concrete repair related business and total company turnover.

The Directory also includes details of the technical advisory assistance available from the Association, its NVQ related training scheme, Code of Practice and publications. In addition, it lists a bibliography of related literature and names and addresses of associated organisations.

Copies are available free of charge from: The Secretary, Concrete Repair Association, Association House, 235 Ash Road, Aldershot, Hants GU12 4DD. Tel: (01252) 321302. Fax: (01252) 333901. Email: info@associationhouse.org.uk Web site: www.concreterepair.org.uk

In the concrete repair industry, the take up of training opportunities is roughly in line with other areas of the construction industry. The Construction Skills Certification Scheme (CSCS) Board set up a programme for concrete repair operatives over ten years ago.

Despite the involvement of industry representatives in its development, however, the programme was felt by employers to be overly laborious, time consuming to administer and too complicated for the nature of the work involved. Not surprisingly, take up was practically nil.

To try and address the problem, the course was superseded by the new Level Two National Vocational Qualification (NVQ). There was a transition period during which experienced operatives could claim 'Grandfather Rights' to the CSCS card and be awarded the certificate without the need to go through the full process of assessment. This period expired in October 2000 and returns from CRA members to date indicate that there are more than 350 CSCS card holders, 26 people holding a Level 2 NVQ Certificate, with another 20 going through the process.

Much of the difficulty associated with training and certification is related to the perception of

its value within the industry's workforce itself. Experienced concrete repair operatives see the NVQ as being for new entrants to the industry and as such not relevant to them. In addition, the extra benefits of holding such a certificate are not deemed worthy of the time and effort required to achieve the qualification.

The complexity of the process has also been acknowledged by the CITB and the procedure has been further modified. There are now 6 elements to the certification, divided into two basic groups:

**Construction Operations;**  
Safe Site Working; Mechanical & Electrical Equipment; Scaffold and Access; General Working.

**Specialist Operations;**  
Concrete Repair & Coating Procedures; Diagnosis & Administration.

The streamlining of the process has taken place in conjunction with the Occupational Working Group of the Department for Education & Employment (DfEE), which co-ordinates the requirements of the various trade skills in the construction industry. Concerns, however, still remain. It is clear that any further reduction in the standards to be

achieved for certification will devalue the whole initiative and turning it into a pure rubber stamping process. If there is to be a serious improvement in the levels of training among site operatives generally, the impetus has to come from outside the specialist trades. One such source could be the MCG (Major Contractors Group). The MCG is an association of the UK's largest Main Contractors. It has determined that the only way to reduce the unacceptably high number of site injuries or fatalities is to raise the level of training of operatives on their sites, making them able to demonstrate their commitment to safety and safe working practices.

The target of the MCG is to have a fully qualified workforce by the end of 2003. This includes the operatives of all sub-contractors working on site and it is claimed that operatives without certification relevant to the operations they are engaged in will be required to leave site. It is at this stage

unclear how such objectives can be implemented and how such issues will be incorporated into tender assessments.

What is clear, however, is that there is growing pressure down the contract chain, from clients such as BAA and others, for main contractors to improve their levels of safety on site. Training of operatives is seen by many as a key element in the success of this drive and it is inevitable that the pressure felt by main contractors will be passed down to the specialist sub-contractors. What is also inevitable is that there will be precious little sympathy from the main contractor when it comes to covering the costs associated with having a fully qualified workforce. Indeed it may well be the case sooner rather than later that having such a workforce is just another pre-qualifier for getting on the tender lists.

Firms not making the commitment may not even get on the starting blocks.

'CRACKING MATTERS' is published by the Concrete Repair Association (CRA), Association House, 235 Ash Road, Aldershot, Hants GU12 4DD. Tel: (01252)321302 Fax: (01252) 333901 Email: info@associationhouse.org.uk Website: www.concreterepair.org.uk

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