

Cracking Matters



THE JOURNAL OF THE CONCRETE REPAIR ASSOCIATION

ISSUE NO. 30

Associations to form Structural Concrete Alliance

The Concrete Repair Association (CRA), Corrosion Prevention Association (CPA) and Sprayed Concrete Association (SCA) are to form an Alliance aimed at providing a single co-ordinated voice for the structural concrete refurbishment and repair industry.

The new Structural Concrete Alliance will be launched at the UK Concrete Show at the NEC on 27-28 February, where representatives from all three of the constituent Associations will be available to provide advice and comment.

The new Alliance will bring together over 70 companies drawn from contractors, manufacturers, distributors, consultants, test houses and equipment suppliers. It will offer a single point of contact for major clients and a definitive source of information and advice for all involved in the repair, refurbishment and management of concrete infrastructure and the protection from corrosion of a wide range of structures. CPA Chairman Chris Atkins explains the philosophy behind the new Alliance:

“The Alliance enables us to pool resources and provide a single portal for anyone wanting to know about how to repair or manage degrading structures.

“The strengths of each association complement each other and together we can provide a unified voice to address the significant problems of degrading infrastructure.”

Although all three Associations will continue to operate, providing detailed advice and comment within their individual speciality areas, the Alliance will reduce



duplication in many areas including the development of publications and technical guidance documents.

“The formation of this Alliance represents a major step forward for the industry. It provides an opportunity to raise awareness of the professionalism of those who work within this specialist construction sector,” declares CRA Chairman Ken Dykes.

“The Structural Concrete Alliance aims to advance education, technical training and health & safety in the sector and will campaign for greater recognition of competence and quality for both services and products.”

Future association meetings will be scheduled to coincide, offering members and guests the opportunity to network with individuals working across the entire sector. The Associations’ Technical and Publicity Committees will also be combined to ensure that technical information and promotional campaigns will share a united vision.

“Combining the expertise, experience and wealth of knowledge from each of the constituent Associations will enable the Associations to focus their efforts on developing a unified vision for the sector.

“This will ensure that clients and members alike will have easy access to reliable, independent and professional advice,” says SCA Chairman Andy Dunlop.

VISIT THE CRA AT THE UK CONCRETE SHOW

The Concrete Repair Association will once again be joining forces with the Corrosion Prevention Association and the Sprayed Concrete Association at the UK Concrete Show, being held on 27-28 February at the NEC in Birmingham.

Exhibiting together on stand A56, as the Structural Concrete Alliance, representatives of each Association will be offering advice to visitors on the repair, refurbishment and management of concrete infrastructure.

In addition, each of the Alliance member associations will be providing a CPD presentation in Seminar Theatre 3 on Thursday 28 February. The CPD presentations will provide an introduction to each Association’s particular area of expertise. They will include the CRA’s newly updated *Route to Successful Concrete Repair*; the CPA’s *Understanding the Corrosion Process and Cathodic Protection*; and the SCA’s *Introduction to Sprayed Concrete*.

For further information on the UK Concrete Show visit www.concreteshow.co.uk

The UK CONCRETE Show
February 27 & 28, 2013 The NEC, Birmingham

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www.cra.org.uk

CRA urges industry to control silica dust exposure

The concrete repair sector must develop procedures to control exposure to respirable silica dust, says Nigel Roper of the Concrete Repair Association.

For employees working in the concrete repair industry, the main long term health risks relate to hand arm vibration syndrome (HAVs), noise induced hearing loss, skin sensitivity and lung disease caused by substances hazardous to health.

The industry has been tackling HAVs and noise for sometime since the introduction of the Control of Vibration at Work Regulations and the revision of the Control of Noise at Work Regulations by means of assessing likely exposure, workplace monitoring, plant purchasing policies etc. In contrast, the control of silica dust is seldom given serious consideration even though this is a requirement of the Control of Substances Hazardous to Health Regulations (CoSHH).

In the past, silica dust has only been controlled if there are visible clouds of 'nuisance' dust, mainly for the purpose of housekeeping. The industry needs to take action to educate managers, operatives, clients, and to lobby manufacturers and hire companies to develop engineering controls. The industry should also educate designers, as defined in the Construction (Design and Management) Regulations, (CDM), in developing safe systems of work to eliminate or reduce exposure to silica and to specify and design with safety in mind as is their duty under CDM.

The problem

The long term health risks associated with exposure to respirable crystalline silica are well established. In the past, miners, potters, construction and concrete workers accepted silica-related disease as an occupational risk, but now it is vital that employers recognise the problem and take action.

Exposure to silica dust can lead to a myriad of diseases, chiefly restrictive or obstructive respiratory conditions such as silicosis (a type of pneumoconiosis which translates as 'dusty lung') asthma and chronic obstructive pulmonary disease (COPD) to name a few. These diseases cause disability and impair the lung function, making the individual susceptible to other conditions such as heart failure, bronchitis and pneumonia, eventually leading to premature death.

Inhalable and respirable dust

Silica dust is created when workers drill, grind, polish, cut or break concrete and other materials containing silica such as bricks, blocks, tiles etc. The dust created is either classified as 'inhalable' or 'respirable' depending on the particle size. Of the two, respirable dust (which is normally invisible to the naked eye) is far more damaging as it enters deep in the respiratory tract causing fibrosis in the gaseous exchange region of the lungs.

Legislation

The Control of Substances Hazardous to Health Regulations explain the duties that employers have to control exposure to hazardous substances which includes dust present at dangerous levels. The general duties within CoSHH require employers to:



- Assess the risk to health from substances hazardous to health
- Prevent or control exposure
- Use appropriate controls and ensure they are maintained, examined, tested and used correctly
- Monitor exposure (to ensure individuals daily exposure remains below the workplace exposure limit of 0.1mg/m³, as set out in EH40-Workplace Exposure Limits)
- Carry out health surveillance (where appropriate to protect the health of workers)
- Provide information, instruction and training

In cases where elimination is not reasonably practicable suitable controls may include extraction at source or damping down. These methods are likely to be used in conjunction with suitable respiratory protective equipment. Individuals will need to be face fit tested when the performance of the RPE relies on a tight fit. When considering controls, collective measures should be favoured over individual ones to protect the whole workforce.

Safety initiatives

The CRA is urging companies involved in concrete repair to improve the safety of employees who may be exposed to dust.

CRA member Concrete Repairs Limited (CRL) has been working to tackle the

silica dust problem through the development of management systems and engineering controls since early 2008. The CRA declares that others in the sector can learn from these initiatives.

The Association recommends that companies introduce a procedure to identify the health risks associated with their operations and set out requirements for the creation of assessments and safe systems of work using a hierarchical approach. Such a procedure should provide information on managers' and employees' duties and offer information, instruction and training.

It should also discuss the importance of maintenance, examination and testing of controls (which may include air monitoring), along with arrangements for ensuring good hygiene and the correct use of personal protective equipment.

Other recommendations include working with clients and designers to find ways to eliminate or greatly reduce the creation of large quantities of respirable silica dust.

Although slow progress is being made to convince designers to eliminate saw-cutting operations when cutting out concrete patch repairs, it is important for CDM duty-holders who are appointing Principal Contractors and Contractors to ensure that they are assessed on their arrangements for managing, not only the safety, but also the health of their employees, contractors and others who may be affected by their operations.

In short, employers (and Designers under CDM Regulations) who create specifications or design work processes need to consider how work is to be undertaken in an effort to eliminate or greatly reduce the amount of respirable dust created during construction and maintenance operations.

Case Study 1

A designer wrote a specification that required the perimeter of concrete repairs to be cut out by means of an angle grinder with a cutting disc. The Principal Contractor explained that they could create a suitable edge to the repair using breakers, which would greatly reduce the amount of respirable dust produced and would provide an adequate key for the concrete.

Available guidance

Practical guidance is available to assist employers in carrying out their duties in assessing the risk, implementing practical measures and in developing suitable health surveillance programmes. Advice is available from: **HSE Silica essentials:** www.hse.gov.uk/pubns/guidance/cnsersies.htm; European Network on Silica (NEPSI) – **Good Practice Guide:** [www.nepsi.eu/media/2276/good%20practice%20guide%20%20english%20original%20additional%20task%20sheets%20\(251006%20modified%2016072012\).pdf](http://www.nepsi.eu/media/2276/good%20practice%20guide%20%20english%20original%20additional%20task%20sheets%20(251006%20modified%2016072012).pdf)

Manufacturers and plant hire companies are also available to advise on suitable damping down and extraction equipment which is becoming ever more available for grinders, breakers and drills. However, availability will only improve with industry demand.

If in doubt consult an expert to assist in detailed risk assessment, the development and implementation of health surveillance programmes and workplace and personal air monitoring strategies.

Case Study 2

A specialist concrete repair contractor decided to break out large areas of concrete using hydrodemolition rather than traditional breaking out. HSE studies (SIM 05/2002/53) have shown that hydrodemolition poses negligible risk of silica dust.

Companies should identify employees exposed to silica dust and create a regime for statutory health assessment. Baseline assessments should be carried out initially and a programme of annual lung function tests implemented to monitor workers health.



Investigating exposures

In a move to gain a better understanding of the problem, CRL has also conducted personal dosimetry studies to quantify each employee's likely daily exposures to silica dust.

The personal dosimetry equipment consists of a small pump connected by a tube to a filter which is worn close to the nose and mouth. The filter collects both inhalable and respirable particles which are sent to a laboratory for analysis.

The studies are ongoing. The information collated will be used to create a database of tasks and likely exposures (from the likes of grinding, drilling and breaking) and to monitor the effectiveness of controls to ensure that employees' exposures remain within safe limits.

The company has also been liaising with a researcher from the HSE who is developing and revising silica guidance sheets for the industry. It has provided feedback in relation to the availability and effectiveness of technological solutions and will offer its personal dosimetry findings.

*Nigel Roper is Safety Advisor for CRA member Concrete Repairs Limited.
For further information please e-mail nroper@concrete-repairs.co.uk*

Putting up with health and safety?

Allen's observations

Recently I have been receiving overtures in my email inbox from a lady called Irina (27) from Moscow. Apparently she has heard of me and knows that I am kind and generous and the kind of person that she could really relate to. I suspect that she means relate but you never know. Having regretfully decided that Irina was probably not going to relate (or even relate) to me I contacted the parallel dimension where our IT people live and was assured that this was the sort of thing that you have to put up with, but they would block her access, which sounds a lot more painful than it probably is.

The phrase I would like to pick up on here is "the sort of thing that you have to put up with", because it used to be a standard response for far more than unwanted emails. Those of us who have been about for a while will remember operatives breaking out and using abrasive wheels to clean back concrete and steel with hardly any kind of protective clothing to speak of. Many of them went on to develop Vibration White Finger (VWF) and a range of respiratory conditions that shortened their lives by many years. Back then, that was "the sort of thing that you have to put up with" and I can recall the peer group mockery of anyone who thought that they might wear gloves or a facemask to carry out their work.

Today, when it seems that our every move is constrained by health and safety regulations and there is a school of thought that sees such regulation as petty interference (double that if it comes from Europe), I feel we should take a moment to consider a few home truths.

Construction in its widest context used to have a safety record on a par with deep sea fishing and military service. In fact more people died in construction-related accidents during the 1960s than in any other area apart from road traffic incidents. You actually have to get into the 1980s before you begin to see a drop off in fatalities. Nowadays its news if someone is killed on a construction site: the whole Olympic set-up was built with zero fatalities which was not news – it was what was expected.

As for anyone who worked with concrete, well they were identifiable by a whole range of unpleasant syndromes: lime burns; dust contamination of the lungs leading to pulmonary disease; deafness caused by excess noise; and of course the crippling VWF. So the



decision that this was not "the sort of thing that you have to put up with" was one of the most significant that has been made in our lifetimes, removing the prospect of a number of terrible conditions from the lives of concrete repairers and similar. We need to remember this the next time we complain about regulations and pine for the old days when things were easier.

As for Irina? Well she is no longer in contact, the IT wizards having exorcised her from my computer. However, only today Natasha (19) has been in touch, so who knows what the future may hold...

CRA updates CPD presentation

The Concrete Repair Association (CRA) has re-launched its popular CPD presentation, *The Route to Successful Concrete Repair*.

The presentation, which provides an excellent introduction to the issues to consider in the repair of reinforced concrete, has been updated to ensure that it presents the information in a form which is easy-to-understand. The revamp has resulted in new clearly defined sections which will lead the delegate through the essential steps that need to be followed when embarking on a concrete repair project and the best approach to be adopted.

The presentation is now arranged in five key sections. The first describes the aims & objectives of the CRA and explains the benefits of appointing a CRA contractor to undertake any such work.

Section 2 provides an introduction to the many applications of concrete in the modern built environment. It then describes what can go wrong and explains the causes of corrosion.

Section 3 details how concrete failures can be diagnosed and describes the latest methods of testing and monitoring.

Meanwhile, sections 4 and 5 offer advice on devising a project strategy, selecting a contractor and finally undertaking the project. These sections introduce BS EN 1504, the concrete repair standard and explain the stages and methods used when undertaking a concrete repair.

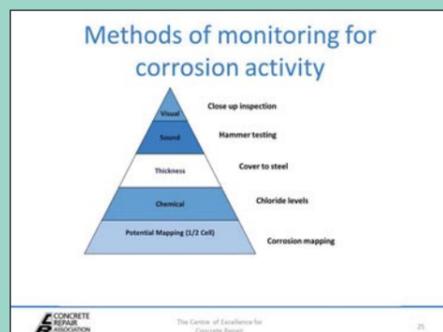
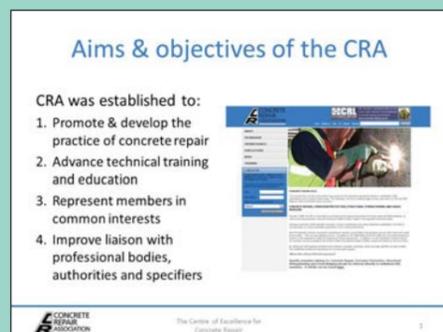
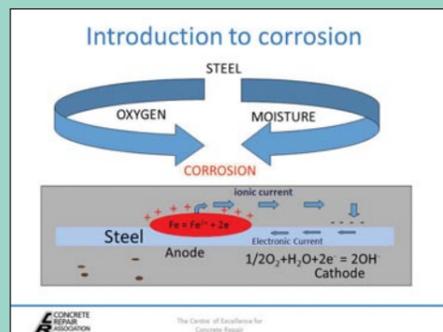
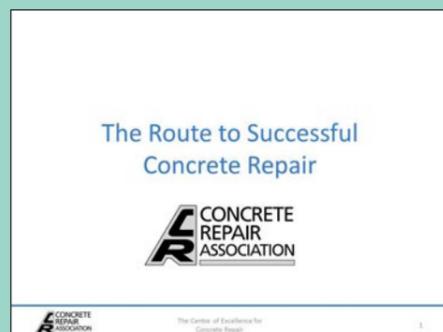
The presentation is one of a series of three CPD presentations that are available from the CRA. *Structural strengthening with fibre reinforced polymers* considers the different types of fibre-reinforced polymer (FRP) composite materials and the types of structure they are used to strengthen, to enable the viewer to avoid basic errors when employing, specifying and/or applying such systems.

Electrochemical rehabilitation of steel reinforced concrete structures explains the primary causes of steel reinforcement corrosion in concrete and the various remedial options.

The CRA offers its CPD presentations free of charge to professional groups, in their premises, at a mutually convenient date and time. The presentations, which are each about 45 minutes in duration, are delivered by a specialist CRA contractor and CRA product manufacturer member.

The presentations have been produced for the benefit of specifiers, contractors and owners of structures/buildings containing concrete components who need a brief introduction to the methods and, just as importantly, the critical matters to be taken into account when looking at specific projects.

For further information or to arrange a free CPD seminar contact the Concrete Repair Association, tel: 01420 471615 email: admin@cra.org.uk web: www.cra.org.uk



CURRENT CRA MEMBERS

Contractors:	Telephone:
AMBER CONSTRUCTION SERVICES LTD	020 85925699
APA CONCRETE REPAIRS LTD	01422 379640
ALFRED BAGNALL & SONS (RESTORATION) LTD	020 83113910
BALVAC LTD	01606 333036
CEMPAS WATERPROOFING & CONCRETE REPAIRS LTD	020 86543149
CONCRETE REPAIRS LIMITED	020 82884848
CONCRETE RESTORATION LTD	020 89948860
CURRALL LEWIS AND MARTIN (CONSTRUCTION) LTD	0121 5229292
FREYSSINET LTD	01952 201901
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JB SPECIALIST REFURBISHMENTS LTD	01487 834017
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MARRIOTT CHOOSES GUNITE REFURBISHMENT



In 2009, **Gunite (Eastern) Ltd** was contracted by the Marriott Hotel to refurbish its underground car park. Gunite carried out extensive concrete repairs and cathodic protection to the car park soffits and applied Triflex waterproof coatings to the car park deck.

Following the successful completion of works in 2009, Gunite negotiated the next phase of works and was appointed as Main Contractor to carry out an extensive external refurbishment of the hotel between October 2011 and April 2012.

Prior to starting the latest works, Gunite undertook a make-safe abseil survey and hammer testing to establish the full extent of repairs.

The scope of works included water-jetting; hammer testing; extensive concrete repairs; application of epoxy primer and render coat to eliminate the glazed tiled finish; mastic to all movement joints and window surrounds; and the application of three coats of Remmers Silicone Paint LA. Access to the works was gained using powered cradles.

Working alongside Remmers, Gunite was able to offer the client a range of tailor-made remedial solutions, including: a fixed-price lump-sum quotation for all works, including concrete repairs; a unique coating system to overlay glazed mosaic tiles; and a 20-year insurance-backed guarantee on all concrete repairs and coatings.

Additionally, as part of its on-going maintenance programme, Gunite will be carrying out periodic routine cleaning to the car park deck.

GUNITE (EASTERN) LTD
TEL: 01480 466880
www.gunite.co.uk

VOLKERLASER SHORTLISTED FOR CN SPECIALIST AWARD

Contractor **VolkerLaser** has been shortlisted in the Concrete Specialist of the Year category of the Construction News Specialist Awards 2013.

The company, which specialises in structural strengthening, repairs and waterproofing in the civil engineering and building sectors, now goes through to the face-to-face judging stage.

Mike Weaver, managing director at VolkerLaser, said: "Everything we do focuses on being technically advanced, especially in the maintenance, strengthening or repair of concrete. We protect our clients' infrastructure; providing integrated, safe, cost effective and high quality work."

"We have never aspired to be the biggest specialist in the business, simply well respected and trusted through transparent relationships with our clients. This award, as recognition of the hard work put in by all our team, would be a fitting end to a fantastic year."

The judges will not only be looking for examples of great projects, but business acumen, a clear strategy and commitment to health and safety, staff and training in order to judge the business as a whole.

Winners will be announced at an Awards evening on 26th March 2013.

VOLKERLASER LTD
0844 800 4560
www.VolkerLaser.co.uk



SIKA REPAIRS CLYDEBANK FLYOVER



West Dunbartonshire Council has specified a concrete repair system from **Sika** to refurbish the Mountblow flyover in Clydebank, which was suffering from corrosion due to years of carbonation and chloride attack.

Mackenzie Construction carried out over 500m² of concrete repairs across the structure of the bridge which included the soffit, columns, deck and abutment walls. As the bridge was a key part of Clydebank's road infrastructure, the project was considerably undertaken so it could remain open for the duration of works.

The concrete repairs were conducted using cementitious polymer modified Sika Monotop 610/615. First a layer of Sika Monotop 610 was applied. This inhibits corrosion and improves the lifespan of steel reinforcements. It also acts as a bonding bridge for Sika Monotop 615 high build repair and re-profiling mortar.

The entire reinforced concrete sections of the bridge were then covered by a spray-applied coat of Sika Ferroguard 903. This innovative liquid inhibits corrosion, delaying its start and slowing its rate thus extending the maintenance and service life cycles for reinforced concrete by 15 years.

Easily and economically applied to surfaces, Sika Ferroguard 903 offers a simple way to protect reinforced structures. Since it does not have an adverse effect on concrete, it is frequently specified on valuable structures and heritage projects.

Sika's concrete repair system has ensured simply applied, economical and long-standing preservation of the flyover. And, like all Sika concrete repair products, the system is certified to BS EN 1504.

SIKA LTD
0800 1123 863
www.sikaconstruction.co.uk

FOSROC OFFERS BALCONY SOLUTION



Built in 1960s, the 2/3-storey residential blocks of flats at Harwood Grove had been the subject of many previous low quality repairs that had failed.

A survey carried out by Pennycuik Collins, established that there was severe deterioration of the balcony slabs, particularly around the balustrade fixing, where there were signs of corrosion and spalling of concrete.

Fosroc designed a complete long-term solution for the flats, involving both concrete repair and waterproofing protection.

All existing coatings were removed by grit-blasting, before taking up a thin cracked screed and removing a dangerously rusty balustrade. Repairs were then carried out by Sealability using two high performance Fosroc repair mortars: Renderoc HB45, fibre reinforced reinstatement mortar and Renderoc LA55, free flowing low alkali micro concrete, with Renderoc ST 05 as a fairing coat.

Fosroc's Nitoproof 800 System, a flexible, skid-resistant, decorative liquid waterproofing system, particularly suitable for exposed concrete elements such as balconies, was then used for protection.

To allow for rapid progression over the fresh repairs Nitoflor DPM solvent-free, liquid damp-proof membrane was applied prior to the laying of Nitoproof 800. The system was terminated on the up stands and at the underside drip to create a meaningful waterproof detail.

To complete the repair, Dekguard 5 anti-carbonation protective coating was applied to the underside of the balcony.

A new balustrade will be fixed through the Nitoproof 800, but with a steel plate that compresses when tightened on to a waterproof gasket to prevent water penetration and any future corrosion.

FOSROC LTD
01827 262222
www.fosroc.com

FREYSSINET TAKES THE HIGH ROAD



In early 2010, **Freyssinet Makers**, the northern structural repair division of Freyssinet Ltd, was appointed by Balfour Beatty Civil Engineering to assist with the refurbishment works on the north and south approach viaducts of the Forth Road Bridge in Scotland.

The work included the replacement of all the mechanical bridge bearings that support the bridge deck and enable it to move, as required by changes in temperature. The contract also required an extensive overview of the concrete pier condition in conjunction with repair works and the installation of an impressed current cathodic protection system (ICCP).

Some 40 permanent mechanical bearings were specially designed and manufactured in Freyssinet's factory in Telford. There were two types of bearing to be installed - fixed rocker and sliding guided, each weighing a massive 2,500kg. These replaced the existing mechanical rocker and pin roller bearings, which were badly worn and corroded.

In addition, the contract included the design and supply of 35 temporary support bearings and use of over 100 hydraulic jacks to meet the requirements of the temporary support and restraint works. High-tensile Freyssibar was also supplied and stressed to assemble and fix the longitudinal restraint frames onto the structure.

The ICCP system uses three anode systems: titanium mesh, titanium ribbon and discreet mixed metal oxide anodes. In addition, galvanic anodes were installed into repairs outside the impressed current zones.

Over 14km of titanium ribbon anode strip was installed into the concrete faces of the pier head cross beams and legs to form part of the CP system.

The works were successfully completed in September 2012.

FREYSSINET LTD
01952 201901
www.freyssinet.co.uk

CRL ON CN SPECIALIST AWARDS SHORTLIST

Concrete Repairs Ltd has been shortlisted by Construction News for a Health & Safety Award for its work on silica dust control.

The CRL Safety Department has conducted personal dosimetry studies to quantify employees' likely daily exposures to silica dust when drilling and breaking concrete.

The personal dosimetry equipment consists of a small pump connected by a tube to a filter which is worn close to the nose and mouth. The filter collects both inhalable and respirable particles which are sent to a lab for analysis.

The studies will be ongoing. The information collated will be used to create a

database of tasks and likely exposures and to monitor the effectiveness of controls to ensure that employees' exposures remain within safe limits.

CRL is also liaising with a researcher from the HSE to discuss industry best practice and to assist in the review of the HSE's Silica Essentials guidance sheets that can be found on:

www.hse.gov.uk/pubns/guidance/cnseries.htm

CONCRETE REPAIRS LTD
01246 544900
www.concrete-repairs.co.uk

MATRIX HEALS LEICESTER ROYAL INFIRMARY



The multi-storey staff car park at Leicester Royal Infirmary had fallen into a critically bad state. Years of exposure to the elements and to de-icing salts had caused widespread delamination on the top deck, leaving large sections of the steel reinforcement completely exposed.

Continual water ingress had also led to substantial salt leaching on lower levels, where large stalactites had formed across the soffits on the majority of parking decks.

Although rebuild was considered, the costs were prohibitive. **Matrix Solutions** secured a refurbishment contract by recommending alternative, cost effective repair techniques as part of a value engineering exercise.

The original specification involved significant patch repairs to the top decks using pre-bagged mortars. Matrix recommended an alternative solution - a pumped, polymer modified, fibre reinforced screed which, although requiring specialist equipment, proved to be more cost effective.

The modified screed also provides a strong bond to the existing substrate which will prevent cracking and future delamination. Patch repairs will also be carried out to all defective soffits, columns and walls using Sika repair mortars.

A migrating corrosion inhibitor (MCI) will be used on the lower decks to protect the embedded steel reinforcement against chloride-induced corrosion.

Further value engineering will see a specialist fast cure waterproof deck coating system installed to all eight decks, ensuring the parking facility can remain largely operational throughout, causing minimum disruption.

Work is currently underway and due to be completed in Autumn 2013.

MATRIX SOLUTIONS
0845 230 1456
www.matrix.uk.com

STRUCTURAL RENOVATIONS PERFORM AT THE BARBICAN



Structural Renovations Ltd has been employed by the Corporation of London to carry out surveys at the Barbican Estate in the City of London.

The Barbican Estate was built in the 1960s and 1970s and is one of London's principle examples of Brutalist Architecture. The Estate is Grade II listed as a whole.

Because of the height of the three 42-storey residential tower blocks and age of the Estate generally, the Corporation embarked on a plan to survey these three structures and carry out necessary concrete repairs.

Structural Renovations Ltd has been carrying out surveys to the tower blocks by abseil techniques and to other properties on the Estate, over the last two years. The company will also survey properties on its earlier built neighbour, the Golden Lane Estate.

A range of make safe repairs have already been carried out on many of the properties using polymer modified repair mortars.

Following sampling of the existing concrete and laboratory analysis, trials are being undertaken to establish mix designs that will enable the repairs to be completed. The mix designs need to replicate the many types of exposed concrete finish that are found on the Estate, to satisfy the requirements of its Grade II listing.

It is intended that once these designs are complete they can be used as a standard for the whole estate.

STRUCTURAL RENOVATIONS LTD
01753 825511
www.structren.co.uk

BRISTOL FASHION FOR MAKERS



Makers Construction Ltd has provided a repair solution for College House, a five-storey building in central Bristol, which offers commercial office space above a ground floor of retail units.

Typical of many 60s/70s buildings the structure had some precast panelled elevations, as well as some storey-height precast mullions to the back and front. The mullions were of a reconstituted bath stone finish on concrete. Typically these units involved a concrete core, cast on to the facing stone mix and with handling reinforcement within them.

The mullions had previously been repaired, although the standard of repair was not good and further spalling both at the repair and at other sites was occurring.

Makers conducted a health and safety abseil survey to remove loose material, together with material testing. This revealed that carbonation had occurred to the elements and indeed had reached the steel reinforcing in places, hence the on-going corrosion.

The solution was to carry out traditional concrete repairs to the mullions using a concrete repair system produced by Sika Ltd. A surface-applied corrosion inhibitor was then applied to negate the corrosion issue in un-repaired areas. This was followed by the application of an anti-carbonation coating over the elements, in order to give protection and uniformity of colour.

The specification was designed to give long term protection to the concrete elements of this structure.

MAKERS CONSTRUCTION LTD
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www.makers.biz

'CRACKING MATTERS' is published by the Concrete Repair Association (CRA), Kingsley House, Ganders Business Park, Kingsley, Bordon, Hampshire GU35 9LU
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