



EDITION NO. 6

## BEST VALUE

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### **Jim Comport, Assistant City Engineer, Portsmouth City Council reflects on how 'Best Value' is impacting on the construction environment**

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Compulsory Competitive Tendering (CCT) for Local Authority highway maintenance activities was first introduced in the early 1980s and was later extended to other blue-collar services such as refuse, street cleaning and certain white-collar services, including construction design. Its introduction created efficiencies and forced the disciplines of writing formal specifications and obtaining competitive prices. The downside, however, was rigid procedures, which on occasion caused quality to suffer due to an almost universal adherence to the acceptance of the lowest price tender.

'Best Value' is the Labour Government's alternative to CCT. Contrary to initial expectations, following the election of the current Government, it is likely to have far reaching implications on service delivery. The Local Government Act 1999 sets out the statutory requirements for 'Best Value'. So like CCT it is, for a start, compulsory!

The similarities, however, do not stop there. 'Comparing' is a big feature of 'Best Value' and this implies a degree of market testing and services. In reality though, we are currently witnessing a propensity toward partnering, which in itself may be just a half way house to privatisation.

The Act requires Local Authorities to set themselves up in such a manner as to secure continuous improvement in the way they exercise their functions and to ensure their services are responsive to the needs of citizens - not the convenience of service providers! A Local Authority is now required to undertake a five-year programme of 'Best Value' Reviews in which it considers inter alia:

- whether it should be exercising the function
- the competitiveness of its performance
- its progress towards any relevant performance targets.

The requirements are summarised as the 4C's:

- Challenge:  
why, how and by whom a service is being provided
- Comparison:  
with the performance of others
- Consult:  
local taxpayers, service users, partners and the wider business community in the setting of new performance targets
- Competition:  
Use fair and open competition wherever practicable as a means of securing efficient and effective services.

Whilst the Act has only been in existence for six-months, way back in 1997 twenty-three Councils were originally selected to be 'Best Value' Pilots to pave the way and try out ideas. As a new unitary Council, Portsmouth City Council's stock of operational buildings had trebled to approximately 400 major buildings worth £500m. Its highway assets were even larger at £2b.

Although aware that it would involve fundamental change, Portsmouth offered to review the asset management of its operational buildings and to consider new ways of dealing with its highways infrastructure. The review highlighted that in 1998 the Audit Commission had advised that 'maintenance,

particularly structural work, was one area of expenditure where low spending may not be good practice'. Based on predictions that took account of the age and types of buildings in Authorities portfolios, notably post-war system-built property, it also warned of a 'maintenance time bomb'.

The findings, in addition to the generally ageing building stock, indicated that maintenance needs would peak around the year 2008. It was therefore important that Portsmouth Council had a maintenance budget in place that was adequate to protect the value of its long-term assets. As a result, Asset Management Plans (AMP) were born and are now very much a feature of the 'Best Value' approach in identifying the scale of infrastructure investment needs. AMPs also revealed how short-termism often resulted in an inefficient, ad hoc, fire fighting response. Certainly, a more fundamental solution was called for. It is generally accepted that the optimum whole-life cost for a building usually requires a maintenance investment in the range of 1.5% to 2% of the rebuild values, but in recent years the level of Portsmouth's investment had been only around 0.7%. It was essential that new ways of obtaining finance were found, hence the involvement of the longer-term 'finance and maintain' contracts, i.e. the Private Finance Initiative (PFI) procurement option. The project also served to highlight the difficulty of altering mindsets and culture to pursue radical change. However, once the inertia had been overcome, it was found possible to break out from conventional thinking.

A shortfall in maintenance investment is sometimes met by ad hoc windfall opportunities. A case in point is the Millennium Landmark Project - the renaissance of Portsmouth Harbour. Currently, a £2.4m contract (a significant part of which is replacement) is being undertaken by means of a partnering contract with P. Trant Ltd. The project includes concrete repair to historic fortifications in Old Portsmouth and reconstruction of the Sallyport Walkway shown in the photographs.

With regard to Portsmouth's highway infrastructure, the 'Best Value' Review exposed that the lack of maintenance investment had inadvertently resulted in a costly total replacement/rebuild programme being adopted. Nearly half of its twenty-six miles of principal roads will require rebuilding over the next ten years.

It is very difficult to change from a reactive to a proactive/preventative maintenance regime and a considerable level of investment is necessary. The Local Government Minister has just approved a £34m Private Finance Bid for better maintenance of roads and streeting. It will result in a twenty-five year contract being let that will cover the finance and maintenance for the total road network in the City, which includes the maintenance of sixty bridges and other highway structures.

The business case for the PFI demonstrated that the combination of investment, longer term contracts and the anticipated benefits of harnessing private sector expertise, has the potential to deliver real value-for-money. All of which is very much in keeping with the changes in Procurement and Contractual Arrangements contained in Sir Michael Latham's 1994 report 'Constructing the team'. Sir John Egans' subsequent report, 'Re-thinking Construction', set the national agenda and a framework for improving the culture of the construction industry.

Local Government and the construction industry are now both changing fast to meet the pressures of competition and value-for-money. The highway's PFI contract will be a long-term service contract and the industry will need to adapt accordingly. It is very likely that 'Best Value' will enhance the trend of long-term finance and maintenance contracts, offering continuity of work and scope for investment and innovation.

## **IS FIBRE YOUR FORTE?**

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### **John Clarke of the Concrete Society describes recent developments in fibre composites**

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Traditionally, strengthening concrete structures has meant casting additional reinforced concrete or doweling-in additional reinforcement. More recently, steel plate bonding has become a popular alternative. In the last few years the use of fibre reinforced composite plates (FRP), generally using carbon fibres, has been developed using the same basic techniques as for steel plate bonding. In addition to plates, carbon, glass and aramid fibres are available in the form of fabrics, which can be wrapped round curved surfaces, such as columns or completely surrounding the sides and soffits of beams.

To help clarify the situation, the Concrete Society has recently published Technical Report 55 entitled, Design guidance for strengthening concrete structures using fibre composite materials, which is the first document in the UK to give guidance in accordance with British design codes. The Report is not specific to any particular type of fibre or strengthening technique. It deals mainly with the design of strengthened members but includes other aspects, such as available materials, examples of use and appropriate application methods.

From the point of view of the repair contractor, the main advantages of FRP materials are their high strength and light weight. This makes installation simple and quick and eliminates the need for temporary support while the adhesive gains strength. The materials can be easily cut to length on site. The availability of long lengths and the flexibility of the materials also simplify installation because:

1. Laps and joints are not required; the material can take up irregularities in the shape of the concrete surface and can follow a curved profile.
2. The material can be readily installed behind existing services; overlapping, required when strengthening in two directions, is not a problem because the material is thin.

These factors in combination lead to a significantly simpler and quicker strengthening process than when using other methods. This is particularly important for bridges because of the high costs of lane closures and possession times on major highways and railway lines. For example, using FRP to strengthen a bridge in Canada showed approximately a 30% saving in costs, due chiefly to the fact that the traffic closures that would have been required for other strengthening techniques were avoided.

An additional advantage of FRPs over some other types of strengthening is that the weight of the structure and the dimensions of the member are not significantly increased. The latter may be particularly important for bridges and other structures with limited clearance.

One disadvantage of FRP strengthening is the risk of fire, vandalism or accidental damage. For bridges over roads the risk of soffit reinforcement being hit by over-height vehicles should be considered. In general, some form of protection will be required.

As strengthening with FRP is a relatively new technique, regular inspection and maintenance regimes should be instigated. This is particularly important for buildings which, unlike bridges, are not generally subjected to any form of routine inspection. Where practical, additional material should be installed, which can be removed at a later stage for testing.

There are a growing number of concrete structures in the UK, which have been externally strengthened with FRP. The floors of various buildings have also been strengthened to carry additional loads. In two department stores, the installation of new escalators and stairs required large holes to be cut through the existing floors. FRP was used to strengthen the adjacent slabs. The material was selected as it minimised disruption to the operation of the store. Columns have been strengthened in a number of multi-storey car parks by wrapping with carbon fibre sheet.

Several major highway bridges and a large number of relatively minor bridges have been strengthened. Most applications have been on the soffits but some bridges have had FRP bonded to the columns or to the upper surface. Other applications in the UK include lighthouses and cooling towers. Elsewhere in the world almost every type of concrete structure, from chimneys to tunnels, has been strengthened. The list of applications is growing rapidly as Owners begin to realise the benefits of this technique.

The installation of FRP materials must be carried out correctly, to ensure good long-term performance. The Concrete Society Technical Report gives detailed guidance, including the selection of the appropriate material and adhesive, adequate preparation of the concrete surface, application of the composite and correct curing of the adhesive. It is important that the work is carried out by a suitably qualified contractor, such as a member of the CRA, and uses suitably trained staff.

## **Make our day!**

The most memorable moment in a major film, at least according to a group of Barry Norman wannabees at a recent CRA meeting, was the incident when Clint Eastwood invited a poor unfortunate to "make his day".

Well, we all know what happened next and no doubt we all took comfort from the fact that this was a piece of fictional hokum. What it did do, however, was give the English language a new catch phrase, which has since been applied to just about every situation under (or, depending on your reading habits) in the Sun.

So it was unsurprising a while ago to hear a frustrated Q/S use a variation of this theme when discussing a re-measure of some concrete repair work on a job in the Midlands. The situation had arisen when, having agreed a form of contract that allowed for re-measurement, both client and contractor neglected to set a firm basis for the way the contract was to be evaluated. Both had their own ideas and, of course, assumed that the other would fall in with the method that each had separately adopted.

Unlike Dirty Harry's experience, the 'day was not made' and both parties left the site muttering darkly about arbitration, adjudication and legal action. Now, there is no doubt that with the usual outbreak of common sense that is the prime lubricant of this industry, they sorted it all out – but at what cost?

One thing that is certain is that disputes – any disputes - cost money. Lack of information and communication are among the highest hidden costs for the contractor and client alike. The nature of the business is such that there will always be areas to be reconciled at the end of a particular project. However, a reasonable reconciliation programme can be included in the budget for the job and neither party need lose out in the process.

Yet all of this is so unnecessary. The CRA have been preoccupied with this subject for some time and having built-in a set of agreed standards in its 'Standard Method of Measurement for concrete repair', you would think that that would be an end of it. Yet, as with so many things that make good sense, many in the industry have paid lip service to the idea and continued in their own sweet way. Hence the incident in the Midlands.

The trouble is, that we are all brought up on stories of how in the 'good old days' someone made a fortune from a re-measure, or, how someone had 'made a killing' and lets face it – we're as good as they were – aren't we?

Well, yes we are. In fact, it can be argued that we're better. What is not under debate, however, is the fact that the world has changed. It doesn't matter whether you think it's for the better or the worse - it has changed. Nowadays we even talk about going 'open book' with clients – and mean it! Try running that past some of the 'living legends' and note the reaction!

We now live in a world where the first reaction of anyone who believes they are wronged is to reach for their lawyer. We also live in a complex and highly regulated world that tries to eliminate doubt from the process. Doubt is a risk and nowadays we all have to manage out risk. It's a vital skill for survival in this modern world.

So to manage out your risk you need firm controls. You need a copy of the CRA's 'Standard method of Measurement for concrete repair'. On the other hand you can wing it like they did in the old days. If you feel lucky ..... well do you?

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**NOTE FROM ED:**

*In the interests of assisting the origination of clearer Bills of Quantities for concrete repair work, the CRA's 'Standard Method of Measurement for Concrete Repair', (originally £15.00 per copy) is now available free of charge. Copies can be obtained from the Secretary, Tel: 01252 321302, or Fax: 01252 333901. Also available as downloadable pdf go to [freedownload.asp](http://freedownload.asp)*

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## **CONCRETE DEFECT ASSESSMENT IGNORE IT AT YOUR PERIL**

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**David Bowen Bravery, Director, Mitchell, McFarlane & Partners Limited**

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*The second in a regular series of articles, written by consultants, covering the various stages of concrete repair work. This piece deals with the importance of testing and appraisal of the findings prior to the issue of tender documents.*

Despite the mass of best practice advice on conducting sensible, meaningful surveying, testing and engineering appraisal of concrete defects, many contracts for concrete repair are still tendering on very scant information, often based on visual appraisal information only.

Little wonder therefore that tenders are returned heavily qualified, or that repair budgets are hugely exceeded when the full extent of the problem only becomes apparent once the work begins on site. Without some simple testing, followed by a proper engineering appraisal to determine the basic durability characteristics of the concrete, it is virtually impossible to meaningfully determine the likely scope of work necessary to effect repairs and implement sensible preventative measures. Despite what some 'chancers' may tell you, any other way of doing things is a 'guesstimate' at best.

It is not possible in a brief article to go into matters 'chapter and verse' - one could write a book on the subject - but it is important to understand the basics. The range of defects on reinforced concrete structures (buildings) is very wide but really can be separated into two categories; long term durability problems and structural defects. The two categories can easily overlap and many a problem has been incorrectly diagnosed such that repairs designed to correct what was thought to be a durability problem have failed because the cause was later found to be a structural movement problem. Such mistakes can be very costly, notwithstanding the acrimony and litigation that can result. It is absolutely critical that the cause (or more

likely the causes) of the defects be determined rather than simply the treatment of the symptoms. This is a cardinal rule and is ignored at your peril.

Accordingly, it is paramount that only experienced, specialist Engineers are used for the diagnosis. Ideally, Engineers with good 'hands on' knowledge are best. Putting aside purely structural defects for the moment, a well designed and implemented concrete durability survey should include testing to determine the extent of carbonation, cover to the reinforcement and the extent of any chloride contamination, all in addition to visual examination and selected hammer testing. These should be considered as preliminary works, which may be found to be adequate, but which may need to be extended to include further, more specialised testing if the preliminary results so indicate. Such additional testing can include amongst other things, half-cell potential surveys, resistivity evaluation, surface absorption, galvanic current measurement, etc. The writer, together with several other Consultants and CRA members, are currently involved as Industrial Advisers on a D.T.I. funded study that is reviewing the range of non-destructive testing (NDT) survey techniques and the pros and cons associated with each particular test. The final report will be published by the BRE early in 2001 for use by Clients, Engineers and Contractors alike.

All testing is usually undertaken on a representative basis. Therefore the selection of which areas are to be tested is of importance so as to ensure that results really are representative of the building as a whole. Experienced Engineers will know vulnerable areas on the various generic types of buildings and the likely weaknesses in basic construction details. These are the areas to be targeted in conjunction with 'control' areas and past repairs. It is not always appreciated that concrete with a high degree of exposure is often not the area suffering from the highest degree of carbonation. The inner faces of concrete elements often have the greatest carbonation depths as they are protected and therefore carbonate continuously; whereas carbonation on exposed faces is more intermittent, being significantly reduced at times of extreme wetness, or dryness.

The engineering appraisal of the test results is also of critical importance although the evidence of one's own eyes must be borne in mind and evaluated in conjunction with the test results, which can prove misleading if appraised on a stand alone basis. The added effects of hygrothermal movements (moisture and temperature) together with the possible influence of other parts of the structure must also be carefully considered (e.g. brickwork movement, foundation settlement, etc.). In many instances it will be found that more than one factor is the cause of a particular defect. It is very easy to jump to conclusions based on symptoms alone and all relevant information from the durability testing, structural details and visual inspection must be carefully evaluated. In addition, a risk analysis should be conducted as part of the appraisal to advise the Client on short-term health and safety issues and the actions that may be necessary to reduce, or minimise unacceptable risks in the short-term.

Thereafter, based on this diagnosis, properly designed repair solutions and specifications can be drawn up (and sensibly costed) to remedy the problem and causes. Such repairs will be highly dependent upon the Client's design life requirements and any proposals for overall refurbishment. It must therefore be abundantly clear that the proper surveying and testing of reinforced concrete cannot be avoided unless one is prepared to accept the very real risks associated with misdiagnosis of the real causes. Does anyone really want that?

#### *The Author*

*David Bowen Bravery is a Chartered Engineer, a Fellow of the Institute of Structural Engineers and a Director of Mitchell, McFarlane & Partners Limited. He has been actively involved in the diagnosis and repair of reinforced concrete structures for the past 20 years.*

## **BOB BERRY ELECTED CHAIRMAN OF CRA**

Bob Berry, of specialist contractor Yoldings Ltd. and previously Deputy Chairman of the Concrete Repair Association, accepted the post of Chairman at the Association's recent AGM. He takes over from Mike Gibbs of specialist contractor Pitchmastic PLC and becomes the ninth individual to Chair the CRA since its inception in 1989. The post is usually held for a two-year period.

Tom McCulloch, of Glasgow based specialist contractor Mackenzie Construction Ltd., takes over the role of Deputy Chairman.

Mike Gibbs is to continue to serve as a member of the seven-man Executive Committee, which, in addition to Bob Berry and Tom McCulloch, comprises Chris Martin of Concrete Repairs Ltd., Mike Darby of Makers UK Ltd., Jimi Fadayomi of Sika Ltd and Tony Hansard of SBD Weber & Broutin.

## THIRTY-THIRD CRA SEMINAR ARRANGED

In November, the CRA's hugely successful seminar programme entitled 'The route to a successful concrete repair', received its thirty-second showing; this time to the Royal Institute of Consulting Engineers, Kent Branch, where 38 delegates attended.

The programme, originally set up in the Spring of 1997, has now been presented to more than 1,000 members of various professional groups, which in addition to RICS branches, include the Concrete Society, the Institute of Civil Engineers, Local Authorities, London Underground and private companies.

'The route to a successful concrete repair' was specifically designed to enhance awareness and understanding of this specialist activity among construction professionals. It highlights the various aspects to be taken into account when faced with the repair of reinforced concrete and provides guidelines as to the best approach to be adopted. Whilst it includes details regarding types of repair product, alternative repair techniques, the causes of concrete deterioration and methods of carrying out concrete repairs, the primary focus of the programme is more related to aspects of overall project control.

Elements covered include: safety of the structure and environmental hazards; assessment of damage, deterioration and diagnosis of its cause; definition of the clients objectives; design of the repair work and choice of methods and materials; preparation of contract documents, specification and Bill of Quantities; contractor selection and evaluation and supervision of the work.

The CRA will continue to present the programme, which in the Association's opinion is suitable for CPD to professional groups at no charge, provided 20 or more delegates are able to attend. Those wishing to organise an event should initially contact the Secretary at CRA, Association House, 235 Ash Road, Aldershot, Hants GU12 4DD. Tel: (01252) 321302. Fax: (01252) 333901.

The programme's success has also prompted the CRA to produce CD-ROM and video versions. Availability is anticipated early in 2001.

## MOM ON LINE

As many readers will be aware, in the interests of assisting the origination of clearer Bills of Quantities for concrete repair work, the CRA publication 'The Standard Method of Measurement for Concrete Repair' is now available free of charge. We therefore thought it a good idea to publish a recent response from a (hopefully) happy Design Consultancy recipient.

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Sirs,

**I have just completed a concrete repair project and if I had known previously about your Standard Method of Measurement document, I would have used it. It would be really useful if the document were available on disk or could be downloaded from the Internet.**

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As regards the second part of the response, the CRA is ahead of the game. The CRA document is now available on the net as a downloadable pdf, go to [freedownload.asp](http://freedownload.asp) to register.

## Company News

### BEST VALUE in MIDDLESBROUGH

Middlesbrough Council is leading the way in best value procurement by setting up a Partnering agreement with **Llewellyn Stonecare Ltd** for the refurbishment of Glastonbury House.

Concrete repair and window replacement work on the occupied 16 storey high-rise housing block needs to be handled sensitively. By involving the tenants at every stage, however, and by working in an open and consultative manner, Llewellyn Stonecare Ltd. has been able to deliver higher quality at a lower cost.

When you wish to consider refurbishment through a Partnering agreement please contact Brian Gardiner on 01908 679222

### Together we're stronger En-Force Carbon Fibre CD Design Software

Innovative materials, such as carbon fibre composites, need innovative ideas to bring viable solutions within the grasp of the designer. **weber sbd**, in collaboration with S&P Reinforcements, has developed the UK's first CD design software package for flexural strengthening. Drawing on the strength of the En-Force

Composite Strengthening brand, the design software is for carbon fibre plate and sheet strengthening techniques.

The software allows the designer the unique ability to design in accordance with either Eurocode 2, BS 8110, BS 5400 or American ACI code. The software programme is fully compatible with the Concrete Society's newly published Design Guidance Technical Report 55. The CD design software comes with fully illustrated design guide and worldwide case study information.

Copies of the Design Guide, CD Design Disk and Case Study information are available from weber sbd. Contact: John Keble, Composites Product Manager, Tel: 01525 718877

### **SIKAGARD® PROTECTIVE COATINGS FOR CONCRETE**

Sika is a world leader in proven, high performance construction chemicals. Our unrivalled portfolio of protective coatings offers the following:

- MAINTENANCE -FREE PROJECTS OVER 20 YEARS OLD
- UNSURPASSED ACCELERATED WEATHERING RESULTS
- ANTI-CARBONATION COATINGS & MASONRY PAINTS
- AVAILABLE IN ALL BS & RAL COLOURS
- COLOUR COMPUTER FOR MATCHING SPECIAL COLOURS
- PEACE OF MIND FROM PROVEN DURABILITY

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

### **MASTERSEAL® 2120 MCI® CORROSION INHIBITOR FROM MBT FEB**

In reinforced concrete structures, steel rebars are initially protected against corrosion by the alkalinity of the cement matrix. These rebars can become prone to attack and corrosion begins as the concrete itself succumbs to environmental factors. Masterseal® 2120 MCI® from MBT Thoro®, the concrete repair and waterproofing division of MBT Feb, has the solution.

Employing worldwide-proven technology, Masterseal® 2120 MCI® is a new advanced surface applied, migrating, corrosion inhibitor unique to international SKW MBT Group. Water-based and environmentally friendly (no nitrates) Masterseal® 2120 MCI® is much less volatile than other products, which means that the required application rate can be achieved in 1 or 2 spray operations - significantly reducing labour and site access costs.

Masterseal® 2120 MCI® is the perfect addition to MBT Thoro's range of concrete repair and protection systems, which includes MBrace®, Cathodic Protection and Emaco® Structurite® repair mortars. For further information tel: 0161 794 7411.

### **CARBON FIBRE TECHNOLOGY ANSWER TO FIRE DAMAGE**

Both carbon fibre plating and carbon fibre sheeting technology has been used at Clarke's Shoes retail outlet at the Arundel Shopping Centre, in Portsmouth, to strengthen fire damaged floor beams.

The 7-day installation was undertaken by specialist contractor **Concrete Repairs Ltd (CRL)**, who installed a 50mm wide by 3mm thick carbon fibre reinforcing plate to the soffit of each beam to improve shear resistance and increase flexural strength. The high tensile capacity and lightweight nature of carbon fibre reinforced plating, together with its ease of application, makes the method extremely cost-effective. Wet lay Sika Wrap carbon fibre sheeting, moulded in situ around each beam, helped support and improve the shear resistance.

CRL are currently installing fifteen kilometers of carbon fibre plates on a major project in the North East of England. For further information contact John Drewett on: 020 8288 4848

### **Supporting Power Generation**

The escalating contracting operations of **Yoldings Ltd** have recently included structural repair works to large section reinforced concrete beams/columns in power generation and other industrial establishments. The photograph shows one of a number of severely damaged 500mm x 400mm heavily reinforced concrete beams, located beneath the turbine hall of a huge power generating station. The damp environment, warm service conditions and high humidity had contributed to the corrosion of the steel reinforcement and spalling in the soffit area. Mechanical preparation was employed to remove the affected concrete and rust and to define the areas of repair. Due to the large volume of repairs involved and their location specialist shuttering techniques were adopted. A factory produced, pre-bagged, high strength, flowing concrete was pumped and

poured to recast the beams to their original line and profile. Additional information is available on 01323 442288

### **Makers on-line**

The entire scope of the Company's building and structural refurbishment expertise is included on the new **Makers UK Ltd** web site, which can be accessed at **www.makers.co.uk**

The very easy to navigate pages contain information on the Company's experience and knowledge in concrete repair, building refurbishment, civil engineering, car parks and cladding, as well as details of the Company's Partnering and Best Value scheme.

The interactive Concrete Repair Toolbox enables visitors to look up their concrete problem and obtain advice on the various repair options available. Concrete diagnosis techniques can be provided by Martech Technical Services, a division of Makers.

The 'Showcase' and 'Press Release' pages allow visitors to review recently completed projects and the 'Makers Care' section emphasises the Company's policy toward Customer Care and providing a first class service. The site also provides "links" to other Keller Companies around the world.

Additional information on: [www.makers.co.uk](http://www.makers.co.uk)

### **Protec Industrial Ltd - Perfect Partners**

**Protec Industrial Ltd** has extended 'Customer satisfaction' to 'Customer delight' through its pro-active approach to specialist Civil Engineering Projects.

With a combined total of 52 years experience in specialist contracting, principals Jim Whiteside and Gary McKenzie lead a highly respected, motivated and trained 'Team of electro-chemical chloride extraction, pressure grouting, sprayed concrete, concrete repairs, façade refurbishment, external insulated render and cladding systems specialists.

Protec is currently engaged in several high profile contracts including the Greenwich Millennium Village Project, where a cladding technique new to the UK, is being installed. The work, involving 'secret mounting' of an aluminium carcassing system with 8mm sealed neoprene gaskets panel joints to a timber frame structure, demands millimetre precision to engineer both the vertical & horizontal alignment.

The lightweight cladding panels, originally developed for the Nasa space programme, are manufactured in Italy and rendered with textured acrylic coatings at Protec's off-site premises. For further information contact: 01622 844899

### **Cathodic protection in Jersey**

**Brookes (Northern) Ltd** has recently beaten fierce competition from both CRA and the Corrosion Prevention Association members to secure a concrete repair and cathodic protection contract to a large Jetty on the island of Jersey.

New North Quay Jetty is the main jetty for moving bulk cargo on and off the island and is therefore an integral part of the islands infrastructure.

Brookes (Northern) Ltd. has designed an innovative system to ensure that the Jetty continues to serve the island for the next 20+ years.

If you would like to know more either about the project, or any other aspect of concrete repair and refurbishment, please contact Rob Lomax on 0161 789 0901

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