



THE JOURNAL OF THE CONCRETE REPAIR ASSOCIATION

ISSUE NO. 19

THE NEW BRITISH CONCRETE REPAIR STANDARDS

... how do they affect the various parties involved?

By: Roel van Es BSc(Hons), MCS, MICorr, Director - Martech Technical Services Ltd

As reported in the last edition of *Cracking Matters*, the new 'British Standards for Concrete Repair' (BS 1504) are now fully ensconced and the UK concrete repair industry has a comprehensive set of standards, for the process of concrete repair and the majority of the products it uses. The table opposite lists the Standard's ten parts.

TIMETABLE

After many years of hard work for the BSI committee, the British Standards for Concrete Repair are in place as BSI publications and the clock is ticking on the introduction of CE marking. Across Europe all conflicting standards are to be withdrawn before the end of 2008 which, of course, is not applicable to the UK since we have never previously had concrete repair standards.

As of 1st January 2009 CE marking will be mandatory in most parts of Europe. All materials intended for export (excepting to Finland, Portugal and Ireland) are to be CE marked. Materials intended only for UK consumption need not be CE marked, but note the next point.

All materials are to comply with the CPD as a legal requirement. There are six essential requirements that construction products need to satisfy and in simple terms, products are to be demonstrably fit for purpose. In practice this is easily demonstrated by compliance with the British Standard and hence CE marking.

Whilst nobody can be forced to follow BS 1504, the CRA will actively promote this route and specifiers will expect compliance.

As clients become aware of the standards, they will expect them to be used as the basis of the work to be carried out. This means that they will want products and specifications that meet the standard and that they will expect manufacturers, engineers, designers, specifiers, contractors and specialist consultants to follow the various parts for site execution of concrete repair works.

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BS 1504 – Protection and repair of concrete structures			
Part	Title	Published	CE marking possible from
1	General Scope and Definitions	1998, revised 2005	N/A
2	Surface protection systems	October 2004	August 2005
3	Structural and non structural repair	February 2006	December 2006
4	Structural bonding	November 2004	September 2005
5	Concrete injection	December 2004	October 2005
6	Grouting to anchor reinforcement or to fill external voids	September 2006	July 2007
7	Reinforcement corrosion prevention	September 2006	July 2007
8	Quality control and evaluation of conformity	November 2004	N/A
9	General principles for the use of products and systems	1997, under revision	N/A
10	Application of products & systems and quality control of the works	December 2003	N/A

Table courtesy of Hywel Davies Consultancy 2006

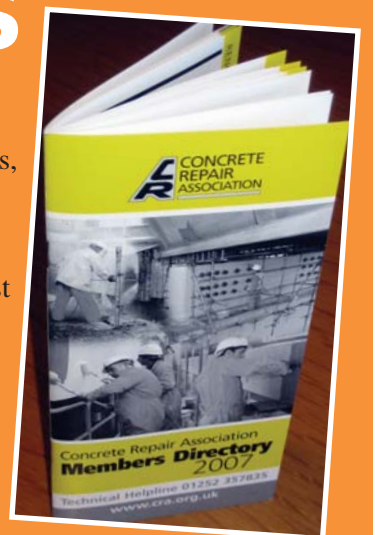
WHERE TO FIND THE UK'S CONCRETE REPAIRERS

For those that prefer to access hard copy information, the CRA has recently updated and published its 2007 Members Directory, which is specifically intended to be of practical, every-day use to Clients, Specifiers, Consultants, Surveyors and Local Authorities.

The 2007 edition includes updated information on all of the CRA's thirty-six member companies, who comprise the majority of the UK's established specialist contractors, product manufacturers and distributors involved in the business of concrete repair and allied activities.

The 56-page pocket-sized booklet gives information on each Member Company, its head and regional office locations, web site, email details and the names of primary contacts. A description of the company's specialist concrete repair

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THE NEW BRITISH CONCRETE REPAIR STANDARDS

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MANUFACTURERS

Manufacturers potentially have the most to do to comply with British Standards for Concrete Repair.

Your key parts of the British Standard for Concrete Repair are essentially Parts 2 through to Part 7. These parts deal with products. Part 8 is also key to you in that it deals with quality control and evaluation of conformity, hence issues such as factory production control and so forth. General FPC requirements are set out in section 5.5 of Part 8. Part 1 is an introduction setting out the general scope. It includes all the key definitions and may be of interest to you.

Manufacturers potentially have the most to do to comply with British Standards for Concrete Repair.

Testing in compliance with the product test methods stated in Parts 2 to 7 is expected to be substantially completed during the course of 2007. It is clear from the above that this process is to be complete by the end of 2008. The tests do not have to be carried out by third parties, i.e. specialist test houses, as there is no requirement to do so, with the exception of some fire testing. Having said that, it is clear that this route may well be the best option for some of the tests that do not have to be carried out too frequently and for which the manufacturer does not hold the specialist equipment. Products intended to be used in structural applications must be manufactured under a third party Q.A. system. Such systems are a requirement of full CRA membership.

It is clear that CE marking is the way forwards for all products, regardless of target market (even if it is only essential for export to other European states), given the CPD and legal requirements. The basis for CE marking in compliance with the (construction products directive) CPD (89/106/EEC) is stated in annexe ZA of the product standards, Parts 2 to 7 of BS 1504. It is also clear that products imported from other European states will inevitably be CE marked.

ENGINEERS, DESIGNERS & SPECIFIERS

Your key part of the British Standard for Concrete Repair is essentially Part 9. This part deals with design. Part 10 is also key to you in that it deals with site application; hence it needs to be understood, as contractors carrying out the repairs will work to this. Part 1 is an introduction setting out the general scope. It includes all the key definitions and may be of interest to you.

Briefly, a concrete repair design will be arrived at in active discussion with the client, bearing in mind his wishes for the life expectancy of the structure and/or the repair process. A good client relationship is assured as knowledge sharing is encouraged through the BS 1504 approach. It is required that the concrete be tested and inspected and that the nature and extent of the damage (including latent or hidden damage) be understood. It is also generally required that alternative combinations of repair principals be considered to arrive at an appropriate solution. Through this process a good team and mutual understanding will be established; hence a good client relationship and in turn, a successful concrete repair of good quality.

Issues such as HAV, noise and dust will have to be considered in the design, as this forms part of the control of risks and hazards at source. This is also essential for CDM compliance and is thus, a legal requirement. It must be noted here that the person making recommendations is considered in law to be the designer.

Questions that will obviously arise are those such as, can you eliminate the need for grit blasting? Can you eliminate excessive cutting out? Can you be less intrusive? Specifiers following good current practice are expected to be largely complying with British Standards for Concrete Repair. All CRA members will actively support and

indeed seek BS 1504 compliant concrete repair designs and specifications. Key government bodies will imminently be using BS 1504 compliant specifications.

CONTRACTORS

Your key part of the British Standard for Concrete Repair is essentially Part 10. This part deals with site application. Part 9 is also important to you in that it deals with the design of the repair process; hence it needs to be understood as the design of the concrete repair process being installed will have been done in accordance with this. Part 1 is an introduction setting out the general scope. It includes all the key definitions and may be of interest to you.

For contractors, compliance is quite simple. BS 1504 Part 10 sets out fairly detailed procedures for carrying out concrete repair and protection works on site. As CRA member contractors are, by implication, Q.A. compliant to ISO 9000, their site procedures should now be BS 1504 compliant too. This will enable them to meet all BS 1504 specifications and hence, demonstrate clearly that they are compliant with the good practice set out in the British Standard for Concrete Repair at all times.

Contractors following good current practice are expected to largely comply with British Standards for Concrete Repair. All CRA members will actively support and indeed seek BS 1504 compliant concrete repair designs and specifications.

SPECIALIST CONSULTANTS

Your key part of the British Standard for Concrete Repair is essentially Part 9, which deals with design, as your function is most often one of support to the designer/specifier. Part 10 is also key to you in that it deals with site application; hence it needs to be understood, as contractors carrying out concrete repairs will work to this. Part 1 is an introduction setting out the general scope. It includes all the key definitions, and may be of interest to you.

Specialist Consultants will generally be involved with the essential testing and inspecting of the concrete and would typically be a part of the design team.

CRA members will monitor the market to assess how the market approaches the new British Standards for Concrete Repair. As the industry gains experience of the standards it is almost inevitable that some problems may emerge.

The CRA is represented on the BSI Committee by a manufacturer's representative and a contractor's representative. As such it is ideally placed to bring evidence of problems to the fore and additionally to put forward appropriate solutions.

Manufacturers potentially have the most to do to comply with British Standards for Concrete Repair.



For a hard copy of the CRA's Advice Note N0 6 'British Standards for Concrete Repair', please complete and return the accompanying Reader Enquiry Form. For further information on the Standards and a full listing of the product standards and test methods, go to the Standards page on the CRA website at www.cra.org.uk

WHERE TO FIND THE UK'S CONCRETE REPAIRERS

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activities (in the case of manufacturers - its products) and third party accreditations are also included.

To assist selection when compiling tender lists for concrete repair work, each contractor's entry includes details of contract values catered for, the company's largest contract to date, its total turnover, the value of its concrete repair related business and its geographical area of operation.

The Directory also contains details of the Association's technical helpline; its NVQ/CSCS related training scheme and Codes of Practice. It also provides information concerning the Association's free CD-ROM, which contains audio-visual programmes on 'The route to a successful concrete repair' and 'Structural strengthening with composites', as well as other useful literature, a bibliography of allied documents and a list of closely related organisations.

Copies of the 2007 edition can be obtained free of charge by completing and returning the accompanying Reader Enquiry Form, or by contacting the Concrete Repair Association, Tel: 01252 357835. Fax: 01252 357831. Email: cra@associationhouse.org.uk

INDUSTRY Developments

Use the enclosed Reader Enquiry form to obtain more information

Another depot.....now open in Dartford!

resapol

Unit 13, Optima Trade Park
Thames Road, Crayford,
Kent, DA1 4QX

Sales & Technical Enquiries
Tel: 01322 550766
www.resapol.com

Depots Also at:

Park Royal, London 020 8965 5133	Leigh, Manchester 01942 609001	Billingham, Teesside 01740 645616
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Suppliers of concrete repair & waterproofing products

weber building solutions FOSROC FLEXCRETE Limited Jifka ARDEX GRACE Construction Products RIW

ENQUIRY NO: 1901

FATALITIES ON SITE

Where do you stand legally?

By: Paul Verrico, Regulatory Group Solicitor, Eversheds LLP

Whenver there is a fatality at work, the Police and Health and Safety Executive (HSE) will investigate and decide whether to bring any criminal charges. If this investigation reveals that gross negligence has brought about the death, the file is passed to the Crown Prosecution Service for a potential charge of gross negligence manslaughter.

OUT WITH THE OLD, IN WITH THE NEW

For large companies the current legal test makes it is very difficult to link the acts of directors with the errors which caused the death and many large companies have avoided manslaughter convictions as a result. The prosecution of P&O Ferries after the Zeebrugge ferry disaster illustrates the

working procedures or are corners sometimes cut to increase speed? Are all hazards identified and has appropriate consideration been given to operating conditions? In line with the new CDM Regulations 2007, have you designed safe maintenance systems into the building and considered the building ergonomics? If your staff go on site in a consultative role, has the working area been risk assessed and is the principal contractor notified when you are on site? With fire safety law tightening, have you considered the relevant fire safety guide for the building being constructed?

In Keymark Services, employees were under instructions to falsify records in order to maximise pay. Granted, your employees are not likely to be under the same tachographical requirements as lorry drivers,

THE NEW LAW

The Corporate Manslaughter and Corporate Homicide Bill is parliament's attempt to remove the barrier of having to identify the controlling mind of an organisation. The new Bill provides that an organisation will be guilty of Corporate Manslaughter if a gross organisational or management failing caused a person's death. This will mean that the actions of 'senior management', and not just directors, can be deemed as those of the organisation. Actions can be aggregated without the need for a specific individual having to be guilty of gross negligence manslaughter.

Charges under the Health & Safety at Work etc Act 1974 can run alongside a prosecution for Corporate Manslaughter. As fines under either charge are unlimited in the Crown Court, it may, in practice, be difficult to draw a distinction in the mind of a jury as to the point at which a serious Health & Safety breach crosses into the realm of Corporate Manslaughter. However, the perceived need for opprobrium may increase conviction rates, particularly as guilt will be determined by a jury.

As the Bill is still liable to change, further full comment is reserved until it is in its final form.

In conclusion, merely being a limited company will not shield you from the criminal consequences flowing from a fatality at work. The sad reality is that simple mistakes can give rise to catastrophic consequences, out of all proportion to the original act. The difficulty is spotting the potential harm before anything untoward occurs. Accidents do happen in the industry. People get injured. Some of these injuries prove fatal. The trauma of undergoing a lengthy trial and the years of waiting for it to come to court are terrifying experiences for otherwise law abiding people.

If you are prosecuted, your insurance cover may provide for legal costs, but it will not provide for any fine imposed upon you, nor is it likely to cover any prosecution costs that you may be called upon to pay. The fines are growing; Transco was fined £15 Million in recent months.

The law on corporate manslaughter is changing, but this will only tighten the duties on you and make it even simpler for a prosecution to be made out. Resolve to act now.

ENQUIRY NO: 1904

Decided Cases

Keymark Services

One of the company's employees fell asleep at the wheel of his lorry on the M1 and crashed into seven vehicles, killing two men. Drivers kept false records on working hours at the company's behest. Working practices were described as 'an accident waiting to happen'. Director Melvyn Spree received a 7-year prison sentence.

OLL

8 students, their teacher and two instructors from OLL tried to canoe across Lyme Bay as part of an organised expedition. The instructors only had basic proficiency skills in canoeing. The weather was bad. OLL had failed to equip any canoe with distress flares and had not informed the coastguard of the trip. Four students died. An OLL director was sentenced to a custodial sentence of three years. The company was fined £60,000, which put it out of business.

Teglgard Hardwood

Unsatisfactory hardwood stacking procedures led to an 18 year old man being killed when a load fell. The Managing Director was imprisoned for 15 months.

problems facing a prosecutor - the prosecution failed because the current law requires the prosecutor to identify a person as "the controlling mind" of the company at the time of the breach which led to the death and convict that individual of manslaughter in their own right.

For smaller companies it is far easier to make such a link and to prove a Director has a direct connection with the death.

In OLL, insufficient training and failure to appreciate the hazards were the main causal factors.

As a Design Engineer, are you confident that your operatives are fully trained in safe

but do you sometimes expect employees to be back at their desk for 9am, even though you know they have worked until the early hours as a project nears completion? Do you expect employees to do a job in Wrexham on Monday, in Skegness on Tuesday and Edinburgh on Wednesday? If so and employees are driving, are you culpable? When long hours on the road are married to company mobiles, the potential for hideous accidents is high.

The lessons from Teglgard Hardwood are to survey premises with a fresh pair of eyes and challenge practices, even if they are long established, if risks are posed. New or young employees are particularly vulnerable to old hazards.

CRL WEBSITE MAKEOVER

Specialist main contractor **Concrete Repairs Limited (CRL)** has just gone live with a completely revamped and updated website which, in addition to detailing the capabilities of Concrete Repairs Ltd and its Refurbishment and Surveys divisions, now includes information regarding the company's Facades division.

CRL services are divisionalised into separate structural and building types; rail bridges, car park, marine and water industry structures, tunnels, power and nuclear facilities, commercial, industrial, residential and listed buildings. Each section contains a drop-down menu showing the company's concrete repair, composite strengthening, corrosion control, waterproofing and external wall insulation, etc, capabilities.

The extensive website can be found at: www.concrete-repairs.co.uk Alternatively, the company can be contacted at Cathite House, 23a Willow Lane, Mitcham, Surrey CR4 4TU.

Tel: 020 8288 4848, Fax: 020 8288 4847. Email: mail@concrete-repairs.co.uk

ENQUIRY NO: 1902



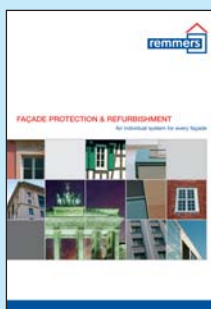
NEW FAÇADE REFURBISHMENT TECHNICAL MANUAL

Remmers UK Limited, global leaders in building restoration technology, has produced a new 60 page technical manual entitled 'Façade protection & Refurbishment - An Individual System for every Façade'.

Remmers are specialists in all common building façade materials, including concrete, cement and lime render, natural and reconstituted stone, brickwork, timber, complex traditional half timbered or mixed facades and heritage structures. The fully illustrated and easy to read manual gives detailed information on each material, problems that arise, the Remmers system solutions for resolving them and (importantly) to prevent future recurrence.

The use of the manual will give building owners, engineers, contractors and other building professionals a clear and easy route to complete and secure façade restoration and protection.

For your FREE hard copy, call Remmers on: 0845 373 0103 or email: sales@remmers.co.uk Copies can also be downloaded from www.remmers.co.uk



ENQUIRY NO: 1903

HAVE YOU MADE USE OF THE CRA TECHNICAL HELPLINE YET?

Is there anything left in life that's free? Well, the answer is yes!

Whilst the CRA recommends that your specific enquiries involving concrete repair, structural strengthening, or corrosion prevention, etc, are referred directly to individual CRA members, the CRA's Technical Helpline may also be able to assist.

Advice provided emanates from engineers and surveyors from within CRA-member companies; people with 'sharp end' practical knowledge of this specialist sector. So keep a record of the Helpline number: 01252 357835. Queries can crop up at any time and this facility could prove really beneficial.

All advice is provided without charge and without obligation, or liability on the part of the CRA, or its members.

The Association is committed to providing consistently high standards of business integrity, quality of materials and workmanship, as well as advancing the understanding, education, technology and practical development of concrete repair. The new CRA Technical Helpline fits perfectly into this scenario.



FRESHER FEEL TO NEW CRA WEBSITE

An entirely refreshed and updated CRA website, with a clearer and cleaner layout to each page, easier navigation across the various sections and updated information, went on line a short while ago. The site can be found at www.cra.org.uk

Importantly, the site flags up and provides information with regard to BS EN 1504, the newly completed British Standard for concrete repair. After many years the new Standard is now firmly in place and the clock is ticking on the introduction of CE marking, which is already in place for coatings, structural bonding and injection products and it will soon apply to repair mortars. All conflicting Standards across Europe must be withdrawn by the end of 2008 and from beginning January 2009, CE marking will be mandatory in many parts of Europe.

Engineers, Authorities and Clients will need to familiarise themselves with this new Standard and can do so by reading the article on page 1. If required, further information is available on the website.

Visitors are also able to access the Association's Technical Helpline facility, provided without charge and without obligation, directly from link on the site's 'Home Page'.

In addition to providing details of the CRA's new Health & Safety policy, visitors can also log in and download guidance documents, other news and subscribe for free copies of 'Cracking Matters', or the Association's free email newsletter.

As well as providing a full list of member companies, the site enables visitors to select specialist concrete repair contractors, or product manufacturers, by activity type and contract values catered for, which will assist when compiling tender lists for specific concrete repair and renovation projects.

The site now provides a complete breakdown of the principles to which each full CRA member must abide to become both a member and to retain membership, of the Association. As well as being able to demonstrate a proven track record and overall proven ability in this specialist construction sector, each full specialist contractor and product manufacturer member is obliged to be Q.A. accredited to BS EN ISO 9000, to meet the Association's Codes of Practice and Training requirements. The Association believes that by setting such self-regulating standards and procedures, Engineers, Authorities, Clients and other specifiers are able to select from established professional organisations for concrete repair projects.

CRA members currently account for the vast majority of concrete repair and associated work carried out in the U.K. The Association recommends that all those likely to be involved with concrete repair work, save the new website (www.cra.org.uk) in their 'favourites' section for future easy reference.



CRA ROAD-SHOWS CPD ACCREDITED



Unlike many organisations, who favour large centrally organised seminars, the CRA prefers to describe its educational and informative presentation programmes as 'Road Shows' and takes them directly to the offices of interested Consultants, Authorities, Surveyors and Engineers.

Not only has this arrangement proved extremely successful over recent years, with more than 150 events having been set up and over 1300 delegates having attended, the Association now anticipates additional interest as a result of the two programmes being recently CPD Certified by the Construction CPD Certification Service.

The CRA's Road Shows are organised at a time and date of the recipient's choosing. They are presented free of charge and can be arranged provided a minimum of 4 delegates are able to attend. In order that both technical and practical queries can be dealt with, both programmes are presented by a specialist contractor and a specialist product manufacturer member of the CRA. Each programme is about 45 minutes in duration, with another 15 minutes allowed for questions.

'The route to a successful concrete repair' programme emphasises the essential overall considerations to be taken into account when faced with the repair of reinforced concrete and provides a very useful guideline to the best approach to be adopted. The presentation does not deal in depth with specific types of repair product or system, the causes of concrete deterioration, nor the individual methods of carrying out concrete repair.

The 'Structural strengthening with composites' programme explains how the new technology has evolved, the types of composites available, quality control testing and how they are installed etc. Since the early 90s the UK has witnessed an increasing requirement for the strengthening and upgrading of many structures and commercial buildings. Concrete failure, inadequate design, poor quality construction, structural and fire damage, change of use and the need to accommodate increased loading, have all influenced the growing interest. This, in turn, has spawned the development of a number of new systems, with traditional methods such as additional reinforced concrete, or heavy steel plates, now being supplemented by fibre reinforced polymers (FRPs).

To find out more complete and return the enclosed Reader Enquiry form, call 023 8073 8953, or email: initialcontacts@ntlworld.com

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INDUSTRY Grapevine

NEW HIGH STRENGTH REPAIR MORTAR LAUNCHED

CRA member Fosroc Ltd has developed Renderoc HBS, a high build, high strength, low permeability concrete repair mortar for use where high compressive strength is required. Renderoc HBS is designed for repairs to concrete columns, beams and soffits with a compressive strength greater than 30N/mm².

The material can be used where strengths up to 40N/mm² are required, is easy to apply and removes need for formwork.

Fosroc Ltd. Tel: 01827 262222



STILL GOING STRONG ...

John Lynch has realised an achievement that you don't hear too much about these days. A few years ago it was relatively commonplace, but the manner of business life nowadays has all but eliminated the notion that it will ever be achieved again. John has just completed fifty years service with CRA member Concrete Repairs Ltd (CRL).

Tony Rimoldi, CRL's Managing Director commented, "I attended John's 65th birthday celebrations in 2000, but he doesn't let a silly thing like age get in the way of hard work. Sometimes we all find ourselves feeling just that little bit older with aches and pains, failing eye sight and memory not as good as it used to be. If we took a few little hints from John, we'd all feel a bit better!"

Concrete Repairs Ltd. Tel: 020 8288 4848.



CEMPHAS DEMONSTRATE CLEVER FOOTWORK AT WEMBLEY

The large concrete pedways, located between Wembley station and Wembley Stadium, have been refurbished by Cemplas Waterproofing and Concrete Repairs Ltd. The 100 metre concrete structure, built during the mid 20th century on giant columns, supports around 90,000 visitors at major events.

Cemplas was tasked with stripping out the structure, installing a non-slip waterproof deck coating, replacing all expansion joints and refurbishing spalled and cracked concrete. The contractor was initially given a generic engineering specification for the work, but past experience enabled the company to submit its own alternative spec, which exceeded requirements at a much lower cost.

Cemplas Ltd. Tel: 0208 654 3149



SILICATE TECHNOLOGY BREAKTHROUGH

Remmers Ltd research laboratories has announced a breakthrough in new product technology with the potential to transform building material development as it exceeds the performance of cement and epoxy resin based products

According to the company, the revolutionary silicate technology delivers extremely high chemical resistance, extremely high mechanical strengths, extremely high adhesive bonding, low and high temperature use and service, as well as being totally waterproof, abrasion and wear resistant.

The raw materials employed make the finished material remarkably easy to use and very cost effective. In addition, they are completely inorganic making them environmentally-friendly, with the packaging requiring no hazardous labelling. Remmers has released a joint filler and a waterproof grout based upon the new technology

Remmers: 0845 373 0103

CURRENT CRA MEMBERS

Contractors: Telephone:

APA CONCRETE REPAIR SPECIALISTS	01422 379640
ASL CONTRACTS	01264 335564
ALFRED BAGNALL & SONS (RESTORATION) LTD	020 8311 3910
BALVAC LTD	01773 542600
BROOKES SPECIALIST CONTRACTORS LTD	0161 789 0901
CEMPHAS WATERPROOFING & CONCRETE REPAIRS LTD	020 8654 3149
CONCRETE REPAIRS LIMITED	020 8288 4848
CONNAUGHT PARTNERSHIPS LTD	01293 572200
FREYSSINET LTD	01952 201901
GUNITE (EASTERN) LTD	01480 466880
INTERSERVE PROJECT SERVICES LTD	0121 344 4888
KAFFTEN LTD	01787 237980
LASER SPECIAL PROJECTS LTD	01905 742750
MACKENZIE CONSTRUCTION LTD	0141 633 5555
MAKERS UK LTD	01462 477333
QUICKSEAL SPECIALIST CONTRACTORS	020 8530 6808
RENOCON LTD	020 7538 5492
REPEX LTD	01435 866666
ROK STONECARE LTD	01908 679222
STRUCTURAL RENOVATIONS LTD	01753 825511
TOPBOND PLC GROUP	01795 414050

Manufacturers: Telephone:

BASF CONSTRUCTION CHEMICALS	0161 794 7411
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REMMERS (UK) LTD	0845 373 0103
RONACRETE LTD	01279 638700
SIKA LIMITED	01707 394444
TECROC PRODUCTS LTD	01827 711755
WEBER BUILDING SOLUTIONS	01525 718877

Distributors: Telephone:

BBM	01234 268452
BUILDSPAN LTD	0845 025 4321
W.T BURDEN LTD	0117 941 5495
RESAPOL LTD	01942 609001

Associates: Telephone:

BIRMINGHAM CITY LABORATORY	0121 303 9300
THE CONCRETE CONSULTANCY 2000 LTD	01707 647266
MARTECH TECHNICAL SERVICES LTD	01487 832288
ORBUS BUILDING SERVICES LTD	0141 647 7677