# CODE OF PRACTICE FOR CRACK SEALING & JOINT REPAIR SYSTEMS FOR ROAD SURFACES

Overband

Fill & Overband

Inlaid Single & Multiple Cracks

## Foreword

This first edition of the Code of Practice has been produced by the Road Surface Treatments Association (RSTA) sub-committee for Crack Sealing & Joint Repair Systems for Road Surfaces.

It embraces industry best practice and references current specification guidance contained in the following documents:

- BBA HAPAS Guidelines Document for the Assessment and Certification of Crack Sealing Systems for Highways – October 2010.
- The Highways Agency Design Manual for Roads & Bridges, Volume 7, Section 4, Part 7, HD31/94 Maintenance of Bituminous Pavements.
- Specification for Highways Works Volume 1, Series 700, Section 711 Overband & Inlaid Crack Sealing systems.

For clarity, the HAPAS guidelines document refers to crack sealing, but many of the activities then described in the HAPAS guidance document are for repairing joints in asphalt, as well as repairing cracks. Therefore, for the purposes of this code of practice, the terms joints and cracks are interchangeable.

This code of practice covers the following:

- Overbanding as a repair or preventative treatment for narrow cracks and joints in asphalt and concrete.
- Fill & Overband systems for the infill, repair and sealing of open or fretted joints and wide cracks in asphalt and concrete.
- Inlaid crack repair systems for the repair of single or multiple cracks in asphalt and concrete over any width

It does not cover:

- Routine sealing of expansion joints in concrete roads which is covered in:

  A Standard for the Application of Horizontally Applied Joint Sealants for Concrete & Asphalt Pavements January 2012 published by the Extruded Sealant Association References:

  1. BS EN 14188-1 Specification for Hot Applied Joint Sealants: 2004

  2. BS EN 14188-2 Specification for Cold Applied Joint Sealants: 2004

  3. Specification for Highway Works, Volume 1 Series 1000: Road Pavements – Concrete materials

- Expansion joints for bridges which are covered in the Design Manual for Roads & Bridges, Volume 2, Section 3, Part 6, BD33/94 – Expansion joints for use in highway bridge decks.

This document has been peer reviewed by ADEPT Soils, Materials, Design and Specifications Committee.

The information contained herein is intended to represent industry best practice. No liability is accepted by RSTA or ADEPT for any damages caused to property or personal injury resulting from using the guidance contained within this document.

**RSTA** is the Road Surface Treatments Association www.rsta-uk.org

**ADEPT** is the Association of Directors of Environment, Economy, Planning and Transport www.adeptnet.org.UK

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## 1. Introduction

This Code of Practice has been written by the Road Surface Treatments Association and ADEPT to assist procurers and installers to obtain high quality installations of a range of crack sealing and joint repair systems for road surfaces, intended to repair and reinstate the road surface in a safe and serviceable condition, to protect the road surface from premature degradation and hence enhance pavement service life.

It represents best practice for the selection and application of Crack Sealing & Joint Repair systems to maximise their performance and durability.

Crack Sealing & Joint Repair systems are essential to:

- Reduce water ingress into the pavement surface and sub-surface layers
- Reduce pavement damage by hydraulic pumping and freeze / thaw action
- Reduce erosion by tyre interaction with a damaged surface or open joint
- Reinstate the road surface to it's original profile
- Maintain skid resistance and texture depth

To obtain the best results it is necessary to give careful consideration to the deterioration method, the traffic density and whether movement is present, before selecting only from BBA HAPAS Approved systems. BBA HAPAS categorises systems, in the "Guidelines Document for the Assessment and Certification of Crack Sealing Systems for Highways" (October 2010), as follows:

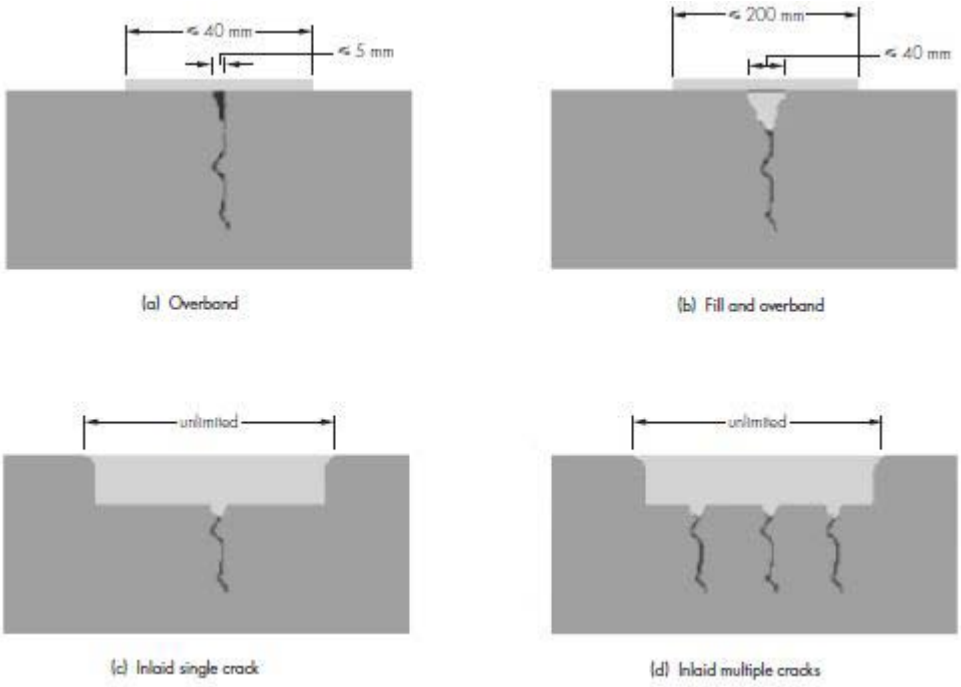
(a) – Overband – Seal and infill cracks and joints up to 5mm wide, using a surface applied band up to 40mm wide, using a fluid product that penetrates the crack / joint.

(b) – Fill and Overband – Infill and seal cracks and open joints up to 40mm wide, by infilling the open crack / joint and then applying a surface mounted sealing band up to 200mm wide

(c) – Inlaid Single Crack – Rout or plane out over the crack and reinstate the pavement surface flush with its original profile by infilling the void. A minimum width of 20mm but no maximum width restriction.

(d) – Inlaid Multiple Cracks – Rout or plane out over multiple cracks and reinstate the pavement surface flush with its original profile by infilling the void. A minimum width of 20mm but no maximum width restriction.

These 4 options are illustrated well by the figure below from the BBA HAPAS guidance document:




(Reproduced with kind permission of the BBA, from the Guidelines Document for the Assessment and Certification of Crack Sealing Systems for Highways, Figure 1, October 2010.)

The purpose of this Code is to identify the important aspects of crack sealing and joint repair processes, to provide guidance for consideration in the selection of the most appropriate method in each location and to refer to other relevant documents and so give practical guidance on achieving high quality.

RSTA codes of practice are updated on an annual basis. As such they are live documents that reflect current best practice and we therefore encourage industry practitioners to "have your say". So if you have any comments you would like to make on the content of this, or any other RSTA Code of Practice, please contact the RSTA Chief Executive using the Feedback form in Appendix D with a brief outline of your input and it will be considered for inclusion at the next scheduled review.

## 2. Suitable Applications for Crack Sealing & Joint Repair for Road Surfaces

The presence of a crack or open joint in a road surface may be due to a number of factors which include:

- Thermal movement in the surface course
- Structural movements in the binder course of sub-base
- Lack of compaction / cold joints / lack of a vertical seal between adjacent asphalt mats in highway construction
- Lack of compaction / cold joints / lack of a vertical seal in utility reinstatements and highway patch repairs

Left untreated, cracks and open joints in the pavement allow water ingress in to the asphalt layers and ultimately into the pavement foundation. Water ingress, hydraulic pumping action and freeze thaw will all create further damage to the pavement and ultimately shorten the effective working life of the road surface.

Timely intervention using crack sealing and joint repair systems can both seal against the ingress of water and reinstate the surface profile, skid resistance and texture depth to acceptable levels to prolong the life of the pavement.

However, in order to select an appropriate system from those available, there are a number of considerations:

2.1 - What has caused the defect? If the sub-structure of the road has failed, then treatment of the surface expressions of the defect is unlikely to be successful in the long term if the sub-structure is still inadequate. However, defects from the surface (thermal cracks and open joints) can be successfully treated and provide a long term successful repair.

2.2 - Is the crack or joint still moving significantly? If the surface has been damaged by movement below from a predictable source – such as asphalt overlay of a concrete road creating reflective cracking in the asphalt over transverse joints for example – then a repair should be undertaken that is capable of withstanding that ongoing movement. If however a joint is open due to erosion but not to movement – a longitudinal joint between asphalt mats for example, then a judgement must be made on which system to specify depending whether there is significant movement present.

2.3 - Life expectancy & traffic density – Is the intention to do a quick repair to make the road safe and to re-surface the road within a short timescale, or is the intention to maximise the life of the road by installing repair systems with the longest possible life span? Systems are classified under the BBA HAPAS system as >3 years or >5 years, but do not specify a traffic density for each. The system selected would reflect both the timescale required of the repair and the traffic density present on a particular site.

## 3. Types of Crack Sealing and Joint Repair Systems for Road Surfaces

There are three main categories of BBA HAPAS Approved Crack Sealing Systems;

Overband, Fill & Overband and Inlaid. The performance test criteria for all three categories are recorded in the BBA's Guidelines Document for the Assessment and Certification of Crack Sealing Systems for Highways. (Tables 1, 2 & 3; Pages 5, 7 & 8.) The required Skid Resistance Values are the same for all three product categories.

Products generally fall into two broad categories:

- Cold applied thermoset resins e.g. Methyl Methacrylate (MMA).
- Hot applied thermoplastic resins and/or bituminous materials.

### 3.1 - Overband

Simple overbanding systems for repairing joint or crack widths up to 5mm wide, tested with a finished bandwidth ≤40mm.

Refer to the BBA certificate website for currently approved Overbanding materials: www.bbacerts.co.uk

### 3.2 - Fill and Overband

Fill and Overband systems are tested and approved by the BBA for joints and cracks up to 40mm wide.

BBA HAPAS approved systems include; single part products with a single fill and overband application, single part products applied in two operations (fill and overband) and two component products applied in two operations (fill and overband). BBA HAPAS testing and approval only extends to a maximum bandwidth of 200mm.The system is especially suitable where the road surface immediately adjacent to the crack is worn or fretted.

As a general rule cold applied systems require over scattering with small, typically 3mm high PSV aggregate, as part of the overband application, to meet the BBA HAPAS requirements for initial Texture Depth and Skid Resistance Values whereas hot applied systems generally do not. Cold applied systems have aggregates throughout the body of the material for long term retained skid resistance. However, because the resins used are very hard wearing these aggregates that are coated by a film of resin may not contribute fully to effective skid resistance from day 1. So an over scatter of aggregate appropriate to the road surrounding the repair is used as well, to ensure appropriate early life skid resistance when the road is re-opened to traffic.

Hot applied systems generally utilise softer resins. The skid resistant aggregates are contained within the surface layer of the system only and will also be covered by a thin film of resin, but this is quickly lost from the aggregate surface under traffic, providing

appropriate skid resistance. Therefore an over scatter is not generally considered to be necessary.

All approved systems contain high PSV aggregate to provide long term skid resistance and texture depth.

### 3.3 - Inlaid

Inlaid systems are approved for single and multiple cracks. They are installed by planing out a required recess depending on the system's specification. The product is then used to fill the recess flush to the surface and dressed with high PSV aggregate to provide texture depth and skid resistance.

Certificates can be granted to both flexible and high modulus systems. Flexible systems are categorised as Grade F and the stiffer high modulus systems are categorised as Grade H. Grade F should be used where movement is anticipated and Grade H where no significant movement is expected, but greater rutting resistance is required.

Grade F (Flexible grade) materials are tested to ASTM D5329: 2009 to show that an extension of 30% can be achieved at a load of ≤ 1000N. (Note that this equates to a modulus of≤ 0.4MPa at 30% extension under the conditions of the test for F grade materials).

### 3.4 - Grades within Certificate Categories

All three types of treatment can be described as either Flexible or High Modulus.

For Inlaid Systems the two sub-categories are clearly defined as described in the previous paragraph.

For Simple Overband and Fill and Overband systems the difference is not so well defined within the BBA HAPAS guidance document. The designer/specifier must consult the product's HAPAS certificate Section 3, Design Considerations; (Use) for product specific considerations. A judgement must be made on which system to specify.

## 4. Specification for Crack Sealing & Joint Repair Systems for Road Surfaces

Crack Sealing and Joint repair systems must comply with Specification for Highway Works (SHW) Clause 711 which requires such systems to be BBA HAPAS certificated.
Successful certification under the BBA HAPAS scheme involves meeting demanding performance criteria which are given in the BBA Guidelines Document for the Assessment and Certification of Crack Sealing Systems for Highways document dated October 2010 reference Tables 2-5. Certificate holders must also meet stringent Quality Assurance and Quality Control requirements on an ongoing basis via auditing of the QA management system.

### 4.1 - Overband, Fill & Overband and Inlaid Crack Sealing Systems

a) All systems shall have current BBA HAPAS certificates.

b) A crack sealing system with a current BBA/HAPAS certificate shall only be installed by a contractor approved by the Certificate Holder as an Approved Installer for that system.

c) The Certificate Holders can provide lists of Approved Installers upon request.

### 4.2 - Overbanding Systems

a) The installed width and nominal thickness of overbanding sealants applied on the road surface shall not exceed 40 mm and 3 mm respectively.

b) The initial skid resistance will be >60 SRV as measured by the pendulum tester using the narrow slider.

c) Retained skid resistance will be > 50 SRV as measured by the pendulum tester using the narrow slider.

### 4.3 - Fill & Overband Systems

The fill and overband crack sealing system required for each location shall be specified in Appendix 7/11. This will include surface band width (up to 200mm), degree of movement required, colour, skid resistance requirements and texture depth requirements.

### 4.4 - Inlaid Crack Sealing Systems

The inlaid crack sealing system required for each location shall be specified in Appendix 7/11. This will include depth, width, degree of movement required, colour, skid resistance requirements.

### 4.5 - Installation and Quality Control Procedures

The installation and quality control procedures for all systems shall be in accordance with the BBA/HAPAS Certificate for each system and the current Method Statement agreed by the BBA. The results of all quality control checks carried out on site by the Contractor and quality assurance information, shall be compiled in accordance with the requirements of the BBA/HAPAS Certificate.

The selection of a system to treat cracks and joints will depend on the individual case as outlined in sections 2&3.

This guidance and the indicated service life it states, only applies to systems manufactured and installed in accordance with Clause 711. The BBA website provides a full list of approved systems for each product should the client wish to verify any information.

Further information on the requirement of the BBA HAPAS Scheme is given in Section 12 Performance Criteria.

## 5. Information to be provided by the Client

The contract documents should state

a) A list of site specific hazards that are relevant to the activity proposed.

b) A clear site drawing indicating the section of carriageway to be treated, the site name, site parameters and an indication if longitudinal and/or transverse cracks/joints are to be treated.

c) The site length and average carriageway width of each section, possibly by means of a schedule.

d) The reason they believe the crack has appeared and their recommended type of treatment in line with the categories specified in the BBA HAPAS Guidelines Document for the assessment and certification of crack sealing systems for highways.

e) Preliminary and additional works required before and after system installation over and above those stated in the product method statement.

f) The existing surface type on which the treatment is to be installed. This should highlight if any tar based products are affected.

g) The period over which the cracks/joints can be treated including any restricted working hours.

h) Specific traffic management required. Consideration should be given to the type of plant required to install the recommended treatment system including the required safety zones.

i) Other site specific requirements e.g. noise

j) The material specification to be applied

k) The client to specify how road markings and road studs are to be treated. Both operations may need to be planned in conjunction with the joint or crack sealing.

l) The BBA HAPAS certificate does not require any post installation testing to be carried out on site. If the client does require additional tests they should be specified in detail in the tender document to allow the installer to price accordingly.

The documents shall be in sufficient detail for the scope of the works to be clearly

identified and all the necessary Health and Safety issues identified.

Prior to commencement the client must give the chosen installer the opportunity to inspect the existing surfaces included in the program and then it is the installer's responsibility to confirm the suitability of their system.

## 6. Information to be provided to the client by the Installer

The approved installer should provide the client with the following information;

a) Confirmation from the Certificate Holder that the installer is approved for installation of their proposed system.

b) A copy of the Method Statement in line with the BBA HAPAS Certificate for the chosen system.

c) A copy of the material data sheets and/or company COSHH sheets.

d) Site specific Risk Assessments for each site that are in line with the clients hazard identification.

e) A programme of works in accordance with the client requirements and working restrictions.

## 7. Planning and Co-ordination

Careful and detailed planning before work commences is an essential element of successful treatment processes. It is in the interests of both installers and clients that the site/programme of works flows smoothly.

There must be close co-ordination between installers and their clients at every stage of the planning process, commencing with a pre-works meeting, the purpose of which is to ensure total understanding of the way that the site works and the stages required in the treatment process.

The client must be aware that a significant reduction in the size of the indicated site/programme will increase the installer's overhead costs per metre of work undertaken. Significant changes can lead to a compensation event and contracts should make provision for compensating installers under these circumstances.

## 8. Health, Safety and Environment

All those involved in preparing and executing crack sealing and joint repair operations have a legal duty of care for the health and safety of both the operatives carrying out the works, and those who come into contact with the operation including the public, whilst works are in progress and during aftercare.

The planning and organising for health, safety and environmental issues commences as soon as a site / programme is envisaged.

The Construction Design and Management (CDM) Regulations 2007 generally do not apply to the application of the process on single sites, however on larger schemes and on larger programmes clients are urged to follow closely the advice in the relevant Approved Code of Practice as they have the responsibility under the new version of the Regulations for initiating the framework for safe working practices.

This will enable the CDM Co-ordinator and Principal Contractor to plan and prepare the

information and documentation necessary to ensure the specific hazards are identified on the various sites and the level of risk that is envisaged.

This must take into account the nature of the site, the materials to be used, the traffic management requirements and any special health, safety and environment issues that have become evident during the pre-tender stage. At tender stage the client must detail any traffic management requirements such as diversions, no parking notices and any other requirements which are addition to the scope of Chapter 8 so that these costs can be accounted for.

On the appointment of the Principal Contractor to carry out the crack sealing or joint repair operations, it is his duty to prepare a detailed Health and Safety Plan for that particular contract or works from the pre-construction information supplied by the Client, Designers and CDM-Coordinator. This must itemise the methods to be employed to overcome the specifically identified hazards and risk reduction measures that will be in force on this contract. They must also ensure adequate welfare is provided from the start of the contract.

The noise levels of all plant should be ascertained from manufacturers or suppliers so that due provisions can be made. If they are not available, the user must take measurements themselves and, ensure that all operators are provided with the correct hearing protection, where necessary.

Once the works commence the Principal Contractor has the control of health, safety and environment matters but liaison with the client, police and the general public on issues of congestion, diversions or closures must be ongoing throughout the contract.

The Principal Contractor has additional duties under other legislation to look after the health and safety not only of his own employees but of other persons who work alongside them and also of the passing public.

Written full site specific risk assessments must be prepared which can be used to identify control measures for both physical and chemical hazards. The measures must form the Contractor's safe systems of work which enhance the safe behaviour of the workforce as well as protect the general public during the various stages of the works.

This Risk Assessment and the measures contained within it must be communicated to all involved in the project during the Induction procedure.

Account must also be taken of environmental factors with pollution from fumes, noise and dust being the main concern during the work phase. Disposal of waste and protection from spillage and contamination are other considerations when looking at the overall activity. Particular attention should be made to the presence of any tar based products that are affected by the treatment process of which the client must make the installer fully aware.

## 9. Planning the Execution of the Work

On narrow roads, it is best practice to undertake these works within a road closure. This allows an improved quality of application and provides safety for the operatives and passing traffic.

Where wider roads are being treated, there are also distinct advantages, in respect of the speed of application and overall finish of the application, lane or complete road closures

will be necessary until the treatment is ready for trafficking. This should be applied to cause minimum inconvenience to road users but separate traffic from the installation operations.

Poor planning can result in low daily output, increased costs and public criticism. The risk assessments undertaken in advance of the works enable supervisory staff to give proper consideration to the layout of the application process. This is particularly critical on complex junctions, lane closures and busy urban areas to ensure that maximum output is achieved with minimal disruption.

In addition to compiling the site information, the Installer responsible for the application must decide on the methodology of how the application of the material is applied to the site in accordance with the relevant method statement.

Many considerations need to be taken in account when planning the operations in relation to: type of treatment required, the necessary plant and equipment to conduct the treatment, the location within the works area of the crack/joint, existing site conditions, traffic flows, application period and time of year the works are planned to take place.

The information detailed in Section 13 provides the relevant details on the relevant application method.

## 10. Traffic Management

When undertaking all types of crack sealing and joint repair the needs of both the operatives and the road users whether on foot or in motor vehicles must be considered at all stages; their safety is paramount.

All traffic management erected on sites must be in accordance with Chapter 8 and the design of the traffic management system per site must be completed during the design stage.

A full site risk assessment must be undertaken during the design and preparation of the works and this must include what traffic management system is required to be installed. This risk assessment must identify all areas of application and aftercare measures that are required within the required application.

When designing the required traffic management, clients and installers must take account of necessary safety zones that need to be achieved, the locations of the cracks/joints within the carriageway lanes and the application process being specified. This consideration is important especially when applying hand applied systems due to the nature of the application.

The correct selection of traffic management to be adopted is important not only to provide the safe working environment but also consider that the public should not be unduly inconvenienced by detours or long delays.

## 11. Surface Preparation

Prior to any crack or joint repair being planned a detailed joint inspection should be undertaken between the Client and Installer to identify the areas within the road surface to

be repaired, and to determine that the proposed crack repair system is appropriate for the size and type of cracks/joints to be repaired.

Where cracks have been caused by structural failing resulting in significant movement under traffic, it is not possible to predict a life expectancy for the repair. In structurally sound pavements where cracks or fretting joints are confined to the surface layer which remains bonded to the road-base, and are not subject to further movement, the life declared in the system's BBA HAPAS Certificate should be achieved.

In wheel track zones, particularly those subjected to heavy goods vehicles, the expected minimum life of a repair is unlikely to be exceeded, while those outside the wheel track zone may exceed it. On heavily trafficked exposed carriageways with significant gradients in cuttings, and pavements to elevated structures, and sites where surface temperatures may reach or even exceed 50°C, the expected service life of the system may not be achieved.

The cleanliness of the existing crack or joint is critical to the success of the repair. Refer to the Certificate Holder's installation method statement for system specific advice. In general, heat and compressed air is used to remove dust and debris from the crack and to dry the surface to achieve a good bond. However, care should be taken not to burn the bitumen in the host asphalt – for example by prolonged use of a thermic lance – as this will damage the bond between the repair material and the asphalt.

## 12. Performance Criteria

The performance criteria of all the various systems are listed in the current BBA Guidelines Document for the assessment and certification of crack sealing systems for highways.

Individual product performance criteria are included in the Certificate Holder's BBA HAPAS Certificate.

## 13. Quality Assurance

The Quality Assurance of Crack Sealing & Joint Repair Systems for Road Surfaces is operated by the British Board of Agrément under the Highway Authorities Product Approval Scheme (HAPAS).

The systems are based upon a set of performance parameters agreed by an expert Specialist Group (SG2) set up by BBA and containing members of RSTA, HESA and IAT.

The specialist group has produced the Guidelines used by BBA HAPAS assessors to audit product manufacture of the systems. The Guidelines are available on the BBA website www.bbacerts.co.uk.

In the first instance all the products go through an approval process where the companies quality assurance documentation is scrutinised and independent laboratory tests are carried out on the product, checking for compliance with the Guideline parameters. In addition the product manufacturer and the system installer have their own in-house procedures within a method statement showing how they monitor quality on an ongoing basis to control and deliver a quality system.

BBA carry out factory surveillance visits on a regular basis including the taking of samples of the system, laid on to specially prepared slabs, for testing in the laboratory.

A Certificate is reviewed every 5 years and remains in force unless withdrawn for any reason.

In order to demonstrate best practice client organisations, including Local Authorities and Highways Agency, directly or through their maintenance contractor, are committed to only use BBA Accredited systems.

A key part of the systems is the use of trained and competent staff and it is the responsibility of the Certificate Holder's to ensure that their Approved Installers meet this criteria.

## 14. Training

### 14.1 - Installation Operatives

At this moment there is no formal recognised training and/or qualification available for installation operatives, and it is up to the specialist contractor and/or material manufacturer to ensure that their operatives are trained internally to meet the skills necessary to install the chosen system in accordance with the system BBA Certificate.

The RSTA, working closely with ConstructionSkills (the Sector Skills Council for Construction), installation contractors and manufacturers, are aiming to develop a suitable national qualification at operative level (QCF (NVQ) Diploma Level 2) to further endorse the in-house training currently delivered by manufacturers and specialist contractors, and link this into the CSCS card scheme in the same manner as all other qualifications within the RSTA portfolio of surface treatments.

As a minimum all operatives should have a CSCS card to show a basic understanding of Health & Safety.

### 14.2 - Supervisory Staff

There are national qualifications available for Supervisory staff and therefore Supervisors should hold a relevant QCF (NVQ) Level 3 Diploma and CSCS cards.

In addition Supervisors should maintain competency by attending an appropriate training course specific to Crack Repair and Joint Sealing, every 5 years. The RSTA run a training course on this and offer a Silver certificate as evidence of maintaining competency. Course details can be found at www.rsta-uk.org/calendar .

### 14.3 - Engineers and Technicians

It is the RSTA's view that a full understanding of all processes throughout the industry and the workforce makes a fundamental contribution to achieving high quality crack sealing and joint repair applications and to this end the RSTA recommends that Engineers and Technicians should also maintain competency by attending an appropriate training course on Crack Repair and Joint Sealing every 5 years.

## 15. Road Surface Treatments Association

Membership of the Road Surface Treatments Association is available to manufacturers, contractors, client bodies, material suppliers, specialist consultants and test houses. The unanimous decision of the Association is to contribute to and adopt this Code of Practice as an example of its commitment to quality in all its undertakings.

The attainment and maintenance of BBA HAPAS certification represents a substantial financial commitment to member companies.

BBA HAPAS certification is the minimum standard required for the installation of Crack Sealing and Joint Repair Systems. All contractors registered to a recognised trade association (i.e. RSTA) will only install systems that have BBA HAPAS certification and comply with this Code of Practice as it is a mandatory requirement of Association membership.

## APPENDIX A

### Pre-Contract Checklist for the Client

1. Have the reasons for the cracks appearing been identified?
2. Has the existing road construction type including materials been identified?
3. Has the type of crack sealing or joint repair been correctly identified in line with SHW clause 711?
4. Have the site specific hazards been identified?
5. Have the locations of the cracks (longitudinal, transverse) been identified?
6. Has the road width been obtained and type of traffic control been correctly identified in line with the proposed treatment process?
7. Has the programme date including working hour restrictions been identified?
8. Are the traffic management arrangements fixed, including traffic orders if necessary?
9. Has the Contract Review meeting been held with the contractor prior to works commencing?
10. Has a start up meeting addressed all the necessary details as given in this document?
11. Have the training records for the staff and operatives to be employed been inspected?
12. Is the staffing for the supervision in place?
13. Has the extent of the site been identified by the client?

### Pre-Contract Checklist for the Installer

1. Has the installer got all relevant site information i.e. location of schools, bus route, market days, events etc?
2. What type of traffic control is to be operated and is there enough labour to carry out the works in a safe and proper manner?
3. Have all labour received the appropriate training?
4. Has the correct and adequate plant been allocated to carry out the works at and in the time available?

### Installation Checklist

1. Is the proposed treatment type suitable to treat the crack or joint?
2. Is the existing surface appropriate for the treatment?
3. If the site is inappropriate, has the client agreed that the system shall go ahead without any guarantee of performance?
4. Has the site induction been carried out covering Health, Safety & Environmental and technical issues for the site?
5. Does everybody understand the method of operation for the site?

6. Is the road clear of parked vehicles or any other obstructions?
7. Is the correct traffic management in place?
8. Has the extent of the site been marked out by the client?
9. Has all necessary masking of cat eyes and street furniture been carried out?
10. Are all operatives present on site wearing the relevant Personal Protection Equipment?
11. Is all the plant present and in safe working order?
12. Are the weather conditions appropriate to commence work?
13. Is the method statement and risk assessment available?
14. Is the planned method of operation safe, both to the operatives and the public?
15. Has the method of application been approved?
16. Has all the excess aggregate been swept up?
17. Have all on site tests, measures and checks required by the Certificate Holder and client been carried out and recorded?
18. Have arrangements been made for road marking replacement where necessary?

**Post Contract Checklist**

1 Have arrangements been made for post-contract inspections and maintenance?

2 Has all the aftercare given in the relevant section above been implemented?

3 Has the required contract information being collected and documented?

**APPENDIX B**

GLOSSARY

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| ADEPT: | Association of Directors of Environment, Economy Planning & Transport |
| BBA: | British Board of Agrément |
| COSHH: | Control of Substances Hazardous to Health |
| HAPAS: | Highways Authority Product Approval Scheme |
| MASKING: | The use of an adhesive tape or other similar material to cover cat's eyes, road ironwork, etc, in such a way that after removal, they are free from binder or chippings |
| PLANE: | Mechanical means of removing existing surface to a required width and depth |
| PSV: | Polished Stone Value |
| QA: | An abbreviation for Quality Assurance. Is the systematic monitoring and evaluation of the various aspects of a crack sealing & joint repair operation to maximize the probability that minimum standards of quality are being attained by the production process. Registration to BSEN ISO 9001 given to a contractor by a certification body indicates minimum standards are being attained. |
| ROUT: | Mechanical means of opening an existing crack to a required width and depth |
| RSTA: | Road Surface Treatments Association |
| SKID RESISTANCE: | The frictional forces between tyre and road which are available to oppose skidding |
| SRV: | Skid Resistance Value as determined by the portable skid resistance tester with procedures as described in TRL report 176. |
| TEXTURE DEPTH: | A term used to denote the measure of projection of aggregates in a surface course |
| THERMOPLASTIC: | The property of material by which their viscosity changes in relation to temperature change |

## APPENDIX C

## REFERENCES


Design Manual for Roads and Bridges. Her Majesty's Stationery Office, London.
HD 31/94 Maintenance of Bituminous Roads (DMRB Volume 7 Section 4 Chapter 2 Surface Treatments).

BBA HAPAS Guidelines Document for the Assessment and Certification of Crack Sealing Systems for Highways – October 2010.

Specification for Highways Works Volume 1, Series 700, Clause 711 Overband & Inlaid Crack Sealing systems.

DEPARTMENT OF TRANSPORT (2006*). Traffic Signs Manual, Chapter 8; Traffic safety measures & signs for road works and temporary situations. Her Majesty's Stationery Office, London.

HOUSE OF COMMONS (1974). Health and Safety at Work, etc., Act 1974. Her Majesty's Stationery Office, London.

## APPENDIX D

## FEEDBACK ON THIS DOCUMENT

Any observations, feedback or complaints ***relating to the content of this document*** **or the process described** herein should be addressed (using the form below) to:

Chief Executive
The Road Surface Treatments Association
Westwood Park, Little Horkesley
Colchester, Essex
CO6 4BS
Email: enquiries@rsta-uk.org
Tel: 01206 274052

**Issue Identified:**

**Suggested Action:**

Name:

Organization:

Address:

Contact details:

Date:

## APPENDIX E

## DOCUMENT CONTROL

Issue Statement

Issue 1 March 2013

REVISION LIST – AMENDMENTS MADE IN THIS ISSUE

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