

NEC4

Term Maintenance Contract

Scope S2200 Client's service specification and drawings

**Series 900 – Road Pavements – Bituminous Bound
Materials
DN581359**

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971AR: Stress Absorbing Membrane Interlayer (SAMI)

1. The Product shall be installed in accordance with the manufacturer's instructions unless otherwise instructed by the Overseeing Organisation. It shall have a British Board of Agrément HAPAS Roads and Bridges Certificate, CE Marking or a certificate issued by other recognised independent technical approval body. In the event that no such certificates have been issued, the product shall have the approval of the Overseeing Organisation.

973AR: Retread Process

1. Unless otherwise specified by the Overseeing Organisation, Retread shall only be adopted for use on footways and lightly trafficked roads. Lightly trafficked roads typically carry no more than 5 millions of standard axle (msa) cumulative traffic.
2. Joint site investigations shall be carried out by the Service Manager and Contractor prior to the work to assess the consistency and condition of the existing pavement material. The site investigation shall at least include visual condition survey, coring assessments and determination of grading of the recovered aggregates.
3. The existing road surface should be pulverized, full width, up to a depth of about 75 mm. This pulverized material should then be worked using suitable tools such as reciprocating harrows and rollers to reduce it to a suitable grading with no material over 75 mm in size. If the grading is deficient in aggregate of one or more sizes, new aggregate may be added at this stage to rectify the grading. The surface shall then be reshaped to the required profile.
4. Depending on the grading and type of surface to be treated, bitumen emulsion conforming to BS EN 13808 C55 B 5 or C55 BF 5 should be applied by bulk distributor conforming to BS 1707 at a total rate of 5.5 l/m² to 8 l/m² in two or three applications. After each application, except the last, the material should be mixed using suitable equipment to ensure good mixing and even distribution of the binder.
5. Following the last application of emulsion, the road should be reshaped if necessary and then rolled with an 8 t to 10 t deadweight roller. Any surface voids should be filled with either 8/14 mm or 6.3/10mm chippings applied at a suitable rate and rolled.
6. The surface should then be sealed by applying bitumen emulsion conforming to BS EN 13808 C60 B3, C60 BF3, C69 B3 or C69 BF3 at a rate of 0.9 l/m² to 1.2 l/m², blinding with 2.8/6.3mm chippings and rolled.

7. If required, surface treatment (slurry seal, microsurfacing or surface dressing) may be applied to the retread layer.

974AR: Reconstruction – Haunching

General

1. Construction and construction materials shall comply with the relevant clauses of the Specification, Appendix 7/1 and sub-clauses 2 to 15 of this clause.

Thickness of Layers of Reconstruction

2. The permitted thickness of the layers of reconstruction shall be as follows:

Construction Layer	Nom Size mm	Min mm	Max mm
Surface Course	6	15	30
	10	25	35
	14	35	55
Binder Course	20	50	100
Base (Roadbase)	32	55	150
Sub-base	Type 1	100	----

Jointing to Existing Carriageway

3. The surface and binder course layers shall be stepped back horizontally from the extremity of the base (roadbase) layer by 150 mm, unless otherwise instructed by the Service Manager.

Edge of Reconstruction

4. Unless otherwise instructed by the Service Manager, each construction layer (above sub-base) shall be stepped in horizontally from the extremity of the layer below it, so that the edge of the surface course is stepped in a total of 300 mm from the edge of the sub-base.

Preparation

5. The surfacing material to the limits marked out shall be broken up and edges cut back to form vertical faces in sound material, and the material removed.

6. The extent of any base (roadbase) which has failed shall be agreed with the Service Manager and then broken up and removed.
7. Similarly any failed sub-base and sub-grade shall be removed as necessary. All loose material shall be removed and the resulting cavity cleaned, ensuring that the bottom of the excavation is sound and flat.
8. Excavation of failed material shall only be to the next sound layer as agreed by the Service Manager.

Sub-Grade

9. Where sub-grade material has to be replaced, the replacement material shall be capping in accordance with Clause 613, Class 6F1.

Sub-Base

10. Where sub-base material has to be replaced it shall be Granular sub-base Type 1 to Clause 803. Compaction shall be carried out by the method specified in Table 8/1. Except where otherwise specified granular sub-base up to 225 mm compacted thickness shall be spread in one layer so that after compaction the total thickness is as specified. Granular sub-base of compacted thickness greater than 225 mm shall be laid in two or more layers and the minimum compacted thickness of any such layer shall be 110 mm. Where the layers are of unequal thickness the lowest layer shall be the thickest layer.

Cavity Treatment

11. All vertical faces shall be completely painted with a thin uniform coating of 50 (40/60) or 85 (70/100) pen hot bitumen or cold applied thixotropic bitumen of a similar grade.
12. Where the existing material at the bottom of the excavation is of an asphalt concrete nature, a bond coat to Clause 920 shall be applied.

Materials

13. The materials for base (roadbase), binder course and surface course shall be as described in Appendix 7/1 manufactured, supplied, laid and compacted in accordance with the relevant Clauses of Series 700 and Series 900 of the Specification. The type and PSV of the material used in the surface course shall match that of the material in the surrounding area of the repair unless instructed otherwise by the Service Manager.

Finish

14. On completion, the surface of the treated areas and the adjacent pavement shall be cleaned.

Reconstruction Areas

15. For pre-identified areas of reconstruction, the reconstruction works shall precede general planing or regulating operations prior to overall surfacing.

975AR: Inlay Patching

Definition

1. Inlay Patching is defined as the replacement of defective flexible pavement material with new flexible material, hand laid, to any depth not less than the surface course thickness nor greater than 150 mm to effect a permanent restoration of the stability and/or riding quality of the pavement. The definition specifically excludes the following:
 -
 - i. the filling of depressions not involving the removal of existing pavement surfacing;
 - ii. the replacement or repair of base (roadbase) layer, sub-base layer, or sub grade.

General

2. The material, to the limits marked out, shall be broken out or planed out one course at a time to the average depth of patch specified. The edges of the patch shall be sawn or planed to form straight vertical faces in sound material. The material shall be removed and the resulting cavity cleaned, ensuring that the bottom of the excavation is sound and flat.

Cavity Treatment

3. All vertical faces shall be completely painted with a thin uniform coating of 50 (40/60) or 85 (70/100) pen hot bitumen or cold applied thixotropic bitumen of similar grade.
4. A bond coat to Clause 920 shall be applied to the bottom of the excavation.

Materials

5. The materials for base (roadbase), binder course and surface course shall be as described in Appendix 7/1 manufactured, supplied, laid and compacted in accordance with the relevant Clauses of Series 700 and Series 900 of the Specification. The type and PSV of the material used in the surface course shall match that of the material in the surrounding area of the repair unless instructed otherwise by the Service Manager.

Finish

6. On completion, the surface of the patch and the adjacent pavement shall be cleaned.

977AR: Testing for Tar

1. Unless instructed otherwise the designer is responsible for pre-works testing for the presence tar on all resurfacing / footway schemes involving the excavation/planing of 200 square metres or more of existing bound material. The investigation report for each site will identify any areas of tar-bound materials within the depth to be excavated/planed using the PAK marker test. It is a condition precedent that the Service Manager instructs the Contractor to undertake testing of tar to ensure compliance within the applicable law and pre agreed standards for such costs attributable being recoverable by the Contractor.

SUBSTITUTE CLAUSES

903SR: Placing and Compaction of Bituminous Mixtures

General

1. This clause gives general requirements for the placing and compaction of bituminous mixtures, which are complementary and additional to the requirements of BS 594987. These requirements and the requirements of BS 594987 apply to all bituminous mixtures, unless otherwise specified in the other Clauses in this Series or in Appendix 7/1.
2. Bituminous pavements shall be constructed using the materials specified in Appendix 7/1 and shall be laid by contractors that are registered to the BS EN ISO 9001 'Sector Scheme for the Laying of Asphalt Mixes' described in Appendix A.
3. In order to exclude moisture from interfaces and ensure full interlayer bonding, the surface of all bituminous materials shall be kept clean and uncontaminated. Unless agreed with the Overseeing Organisation, the only traffic permitted to run on the surface of bituminous material to be overlaid shall be that engaged in laying and compacting the next course or, where a binder course is to be blinding or surface dressed, that is engaged on such surface treatment. If any surface becomes contaminated, it shall be made good by cleaning and, if this proves impracticable, by rectification in compliance with Clause 702.
4. Prior to placing bituminous material on any new or existing bound substrate, a bond coat or track coat shall be applied in accordance with Clauses 920 or 942, as appropriate.
5. Before work commences, the contractor shall submit a method statement to the Overseeing Organisation that includes:
 - (i) Laying and compaction procedures for each layer – including paving speed and paved width; size, type and number of rollers; and number of roller passes.
 - (ii) This joint formation procedure for each layer – including the location of longitudinal and transverse joints; and the method(s) of treating upstanding edges.

Transporting

6. Hot bituminous mixtures shall be transported in accordance with the requirements of BS 594987 and shall remain covered whilst awaiting tipping.

- (i) Material for machine lay works shall be fully used within 4 hours of mixing at the coating plant.
- (ii) Material for hand lay works that is not likely to be fully used within two hours of mixing at the coating plant shall be transported in and used directly from a "hot box" type system. Notwithstanding this, the temperature limits stated in BS 594987 shall be adhered to. The maximum time the material shall be allowed to stay in a "hot box" is 12 hours after which it shall be discarded. Prior to loading the "hot box" all unused material from previous loading shall be removed. On dual box systems care shall be taken to prevent cross contamination or intermixing of different materials. Thermostats on "hot box" type systems shall be fitted, set & maintained so as to ensure that the temperature shall not exceed 160°C.

Laying

- 7. Hot bituminous mixtures, other than those specified under Clause 942, shall be laid in accordance with the requirements of BS 594987 and sub- Clauses 8 to 14 of this Clause. Surfacing specified under Clause 942 shall be laid in accordance with the requirements of that Clause and sub-Clause 8 to 14 of this Clause.
- 8. Wherever practicable, hot bituminous mixtures shall be spread, levelled and tamped by a self-propelled paving machine. The rate of delivery of material to the paver shall be regulated to enable the paver to operate continuously.
- 9. Hand placing of hot bituminous mixtures shall be restricted to the following circumstances:
 - (i) For laying regulating courses of irregular shape and varying thickness.
 - (ii) In confined spaces where it is impracticable for a paver to operate.
 - (iii) For footways.
 - (iv) At the approaches to expansion joints at bridges, viaducts or other structures.
 - (v) For laying mastic asphalt.
- 10. Hand-raking of surface course material or the addition of such material by hand-spreading to the paved area, for adjustment of level, shall be restricted to the following circumstances:
 - (i) At the edges of the layers of material and at gullies, manholes and other ironwork.
 - (ii) At the approaches to expansion joints at bridges, viaducts or other structures.

11. The method of laying shall be such that the finished mat is free from dragging, tearing and segregation of the material.
12. When laying mixtures from more than one source, the mixtures shall have equivalent laying and compaction characteristics so that surface evenness is not compromised.
13. When paving adjacent to an expansion joint of a structure, the joint or joint cavity shall be kept clear of material. When laying binder course or surface course, the paver shall be taken out of use whilst laying the remainder of the pavement up to the joint and the corresponding area beyond it. This requirement has been based on practices commonly used in asphalt construction for airfields. It may warrant future review if this requirement proves to be excessively onerous for highway contracts.
14. When paving directly onto bridge deck waterproofing systems, any special requirements which apply to that system shall be complied with.

Compaction

15. The adopted mix design must be optimised for mixture volumetrics (density and air voids), performance and durability. The compaction of hot bituminous mixtures shall be in accordance with BS 594987 but with sampling frequencies and target conforming to Table 903SR/1. These requirements are based on testing of road pavement cores and the requirement for footways shall refer to Table S10.1 of Specification for the Reinstatement of Openings in Highways (SROH). At locations where core removal is not desirable, a trial section of a dimension as approved by the Overseeing Organisation shall be constructed using the proposed construction plant to establish that the design material will meet the air voids requirements.

Table 903SR/1 Compaction requirements (air voids of cores extracted from the road)				
Materials	Clause	Mean of any pair taken from the centre of the mat and/or at wheel-track lanes		Any single core taken from/adjacent to joints and/o unsupported edges
		Min %	Max %	Max %
Dense asphalt concrete	906 909 912	2	7	9
HRA	911 943SR	-	6	8
EME2	930	2	6	8
SMA	937 971AR	2	6	8
Thin surface coarse system	942	2	X + 1	X + 2
Permitted hand lay materials	-	2	8	10
Bridge deck surfacing	-	In accordance with CD 358 – Waterproofing and Surfacing of Concrete Bridge Decks, the asphalt layer directly overlaying the waterproofing system should have a design air void content of no more than 4%		
Non-BBA/HAPAS thin surfacing	-	Compaction level to be determined prior to use and agreed with the Overseeing Organisation		
Patching and repair materials	-	Compaction level in accordance with SROH (2020) or as agreed with the Overseeing Organisation		
Note: X denotes air void content achieved on the BBA/HAPAS trial or the Contractor's declared mix design after approval by the Overseeing Organisation				

16. Except where otherwise specified, rollers shall comply with the general requirements of BS 594987 except that the minimum mass of deadweight smooth wheeled rollers shall be 8 tonnes. Multi-wheeled pneumatic-tyred rollers and vibratory rollers may be used if they are capable of achieving at least the standard of compaction of an 8-tonnes deadweight roller.
17. Where compaction is to be determined in accordance with Clauses 929 and 930, the requirements to prove the performance of rollers do not apply. In such cases, the Contractor may use any plant to achieve the specified level of compaction and shall finish compaction at temperatures above the minimum specified rolling temperature.

18. Vibratory rollers shall not be used in vibrating mode on bridge decks.

Chippings

19. The application of coated chippings to areas of surface course shall be by a mechanical spreader capable of distributing chippings to an even rate of spread. Addition of chippings by hand operation shall only be permitted in the following circumstances:

- a) In confined spaces, where it is impracticable for a chipping spreader to operate.
- b) As a temporary expedient, when adjustments have to be made to the spreader distribution mechanism
- c) When hand laying of the surface course is permitted.
- d) To correct uneven distribution of chippings.

20. Chippings shall be applied uniformly and rolled into the surface so they are effectively held and provide the initial macrotexture depth specified in Clause 921.

Joints

21. For new pavement construction, all longitudinal joints in all layers shall be situated outside wheel-track zones. Where an existing road pavement is resurfaced or reconstructed, joints in the surface course shall coincide with either the lane edge, the lane marking, or the middle of a traffic lane, whichever is appropriate. Joints shall not coincide with the wheel path. For the purposes of this Clause, the wheel-track zones shall be taken to be between 0.5 m and 1.1 m and between 2.55 m and 3.15 m from the centre of the nearside lane markings for each traffic lane (or, in the absence of lane markings, lane edges). All joints shall be offset at least 300 mm (where possible) from parallel joints in the layer beneath. For narrower roads, further adjustment may be proposed to the Overseeing Organisation.

22. Unless otherwise specified in Appendix 7/1, the faces of all cold upstanding edges, including previously laid asphalt, against which hot bituminous mixtures are to be laid to form joints shall be treated with one of the following:

- (i) hot bituminous binder with a penetration of not less than 40 pen;
- (ii) hot elastomeric polymer-modified bituminous binder complying with BS EN 14023 with a penetration of not less than 40 pen;
- (iii) cold applied thixotropic bituminous compound of similar bitumen or polymer-modified bitumen grade;

- (iv) polymer-modified adhesive bitumen strip with a minimum thickness of 2 mm.

This operation shall be done so that the binder adheres to both the cold and the warm upstanding edges when the asphalt is placed.

- 23. Unless otherwise specified in Appendix 7/1, joints in binder courses and bases shall be compacted such that the air voids content measured from core pairs whose centres are not more than 100 mm from the final joint is not greater than 2% above the maximum permitted limit for core pairs in the body of the mat. The air voids content shall be calculated in accordance with BS EN 12697-8 using the relevant bulk and maximum densities defined in Appendix B of BS EN 13108-20 for the relevant mixture type.
- 24. Within 24 hours of the joint being formed, a sealant shall be applied to the top surface of all base and binder course joints such that there is not less than 0.50 kg/m² of residual bitumen 75 mm either side of the joint, unless otherwise specified in Appendix 7/1. The sealant, which may contain mineral filler to BS EN 13043, shall be one of the following:
 - (i) hot elastomeric polymer-modified bituminous binder complying with BS EN 14023 with a penetration of not less than 40 pen;
 - (ii) bitumen emulsion with a cohesion by pendulum of Class 4 or above in accordance with BS EN 13808;
 - (iii) slurry surfacing complying with Clause 918.
- 25. Unless otherwise specified in Appendix 7/1, a sealant, as specified in sub- Clause 24 of this Clause, shall be applied to the whole of any freestanding edge on the outside of the finished pavement on the high side of the camber and, when specified in Appendix 7/1, on the low side.

Regulating Course

- 26. Regulating course material shall be made and laid in accordance with the requirements of Clause 907.

Use of Surfaces by Traffic

- 27. Where a bituminous layer other than the surface course is to be opened to highway traffic as a temporary running surface it shall either:

(i) be surface dressed in accordance with Clause 919 using chippings of category not less than PSV unless otherwise specified in Appendix 7/1; or

(ii) contain a coarse aggregate of category of not less than PSV, unless otherwise specified in Appendix 7/1.

28. Construction plant and traffic used on pavements under construction shall be suitable in relation to the material, condition and thickness of the courses it traverses so that damage is not caused to the subgrade or the pavement courses already constructed. The wheels or tracks of plant moving over the various pavement courses shall be kept free from deleterious materials.

907SR: Regulating Course

1. Regulating courses, which may consist of one or more layers of a bituminous material, shall have their finished surfaces laid to achieve the appropriate tolerances for horizontal alignments, surface levels and surface regularity for pavement layers, in accordance with Clause 702.

2. Unless otherwise specified in Appendix 7/1, stone mastic asphalt complying with Clause 937, or base or binder course asphalt concrete complying with Clause 929 or hot rolled asphalt complying with Clause 943, shall be used for regulating courses immediately below surface courses. Bituminous mixtures for regulating courses shall meet the requirements for the appropriate material, as specified above.

3. Unless otherwise specified in Appendix 7/1, the following materials shall be used for regulating courses:

- (i) AC 6 dense surf 100/150 (Clause 909)
- (ii) AC 10 close surf 100/150 (Clause 912)
- (iii) SMA 6 bin 100/150 (Clause 937)
- (iv) SMA 10 bin 40/60 (Clause 937)
- (v) SMA 14 bin 40/60 (Clause 937)
- (vi) HRA surf/bin (Clause 943SR)

4. The maximum and minimum compacted layer thicknesses for each regulating layer shall meet those recommended in BS 594987 for the selected material. Minimum regulating course thickness shall not be less than 15mm.

5. An increased thickness of the new binder course or base shall be applied in the situation where regulating course is required underneath a new overlay of binder course or base. A separate regulating course layer shall be avoided. Nevertheless, the

maximum and minimum compacted layer thicknesses for the new binder course or base shall meet those recommended in BS 594987.

6. Regulating course mechanical properties shall be sufficient to support the overlaying material without compromising the durability and bearing capacity of the new overlay.

921SR Surface Macrottexture of bituminous surface courses

1. Where specified in Appendix 7/1, the initial surface macrottexture for bituminous surface courses shall be measured using the volumetric patch method described in BS EN 13036-1 and the procedures in BS 594987, clause 8.2. The sand patch method in BS 598-105 (now withdrawn) may be used for routine monitoring, but the BS EN 13036-1 method shall be used as the reference method in case of dispute.
2. Texture depth shall be measured by 10 individual measurements taken at approximately 5m spacing, along a diagonal line, across the lane width. Unless otherwise specified in Appendix 7/1, at least one set of 10 measurements shall be made for each 250m section of carriageway lane. The average texture depth for each set of 10 individual measurements and the average texture depth of each 1,000m section (or complete carriageway lane where this is less than 1,000m) shall not be less than the appropriate values shown in Table 9/3, unless otherwise specified in Appendix 7/1.
3. The requirements for initial texture depth shall comply with Table 9/3 of Annex B of IAN 154/12, but with the following additional notes:
 - i) The length for each section may be either 1,000m or the scheme length (if shorter than 1,000m).
 - ii) High stone content HRA such as 55/10 HRA and 55/14 HRA shall be classified within the same category as hot applied thin surface course system to Clause 942 with upper (D) aggregate sizes of 10mm and 14mm respectively.

Annex B: Clause 921 Table 9/3 Table 9/3SR Requirements for Initial Texture Depth				
Road Type	Surfacing Type	Average per 1,000 section mm		Average for a set of 10 measurements, mm (minimum)
		Min	Max	
High speed roads Posted speed limit >= 50 miles/hr (80km/hr)	Hot applied d thin surface course systems to Clause 942 with an upper (D) aggregate size of 14mm	1.3	1.8	1
	Hot applied d thin surface course system to Clause 942 with an upper (D) aggregate size of 10mm	1.1	1.6	0.9
	Hot applied d thin surface course systems to Clause 942 with an upper (D) aggregate size of 6mm	1	1.5	0.9
	Cold applied ultra-thin surface course system to Clause 942	1.5	2	1.2
	Chipped hot rolled asphalt, surface dressing and all other surfacing	1.5	2	1.2
	Thin surface course systems to Clause 942 with an upper (D) aggregate size of 14mm or less	1	1.5	0.9
Lower speed roads Posted speed limit <40 miles/hr (65 km/hr)	Chipped hot rolled asphalt, surface dressing and all other surfacing	1.2	1.7	1
	Hot applied d thin surface course systems to Clause 942 with an upper (D) aggregate size of 10mm	1.1	1.6	0.9
Roundabouts on high-speed roads Posted speed limit > 50 miles/hr (80 km/hr)	Chipped hot rolled asphalt, surface dressing and all other surfacing	1.2	1.7	1
	Hot applied d thin surface course systems to Clause 942 with an Upper (D) aggregate size of 10mm	1.1	1.6	0.9
Roundabouts on lower speed roads Posted speed limit < 40 miles/hr (65 km/hr)	Hot applied d thin surface course systems to Clause 942 with an upper (D) aggregate size of 6mm	1	1.5	0.9
	Chipped hot rolled asphalt, surface dressing and all other surfacing materials	1	1.5	0.9

943SR Hot Rolled Asphalt Surface Course and Binder Course (Performance related design mixtures)

1. Performance related design hot rolled asphalt surface and binder courses shall conform to BS EN 13108-4, the detailed requirements from BSI PD 6691 Annex C section C.2.5.1.3, the requirements of this Clause and those specified in Appendix 7/1.

Layer Thickness

2. The nominal thickness of the hot rolled asphalt surface course layer shall be either 45 mm or 50 mm unless otherwise specified in Appendix 7/1.

Binder and Binder Modification

3. Bitumen processed during refining to provide a binder with enhanced properties without the addition of a modifier, shall have a British Board of Agrément HAPAS Roads and Bridges Certificate.
4. For binders without BBA HAPAS certification, the Contractor shall provide data sheets giving details of the properties of modified binders, whether the modifier is pre-blended with bitumen, the bitumen is modified during refinery processing or modified by addition into the asphalt mixer, including those specified in Appendix 7/1. These shall include rheological data in accordance with Clause 956 and cohesion in accordance with Clause 957. Without BBA HAPAS certification, polymer modified binders, modified binders or additives shall not be used without the approval of the Overseeing Organisation.

Coarse Aggregate

5. Coarse aggregate shall be crushed rock or slag complying with BS EN 13043 and Clause 901. The resistance to polishing of the coarse aggregate for surface course shall comply with category PSV44 in accordance with BS EN13043, clause 4.2.3.

Deformation Resistance

6. The resistance to permanent deformation of the mixture shall be in accordance with the appropriate class selected from Table C.3 of BSI PD6691, as specified in Appendix 7/1.

Coated Chippings for Surface Course

7. When required, coated chippings shall be 14/20 mm or 8/14 mm size as specified in Appendix 7/1 and comply with Clause 915.

Surface Macrotexture for Surface Course

8. The surface macrotexture shall comply with Clause 921.
9. Compaction Control Procedures
10. Control testing for compaction and resistance to permanent deformation shall be carried out in accordance with BS 594987 section 9.5.2.
11. When specified in Appendix 7/1, the resistance to permanent deformation of material laid in the permanent works shall be monitored by testing in accordance with clause F.3 of BS 594987 Annex F. Six cores shall be taken from the first kilometre length of material from each mixing plant and thereafter one further core from each subsequent lane kilometre. Results shall be assessed on successive rolling means of sets of six consecutive results and shall be deemed to conform if the mean is no greater than the specified value and individual values not more than 50% greater than the specified value.

Trafficking Newly Laid Surfacing

12. The Contractor shall ensure the pavement material has adequately cooled and hardened before the road is opened to traffic. Unless otherwise agreed by the Overseeing Organisation, the road shall not be opened to traffic if its surface temperature exceeds 25°C unless the maximum temperature within the mat has fallen below 35°C.

946SR Patching and repairs to potholes and depressions (including emergency patching)

General

1. Patching is defined as replacement of surface course, binder course and base where the materials are laid in small areas.
2. The existing defective surfacing and/or temporary filling of trenches and depressions shall be broken out so as to provide a cavity with straight vertical edges. The edges of patch repairs are to be cut back to sound, full thickness material and are to be clean and dry prior to application of any sealing compound on the vertical faces of joints.

3. Joint edges shall be formed as specified in sub-Clause 903.22.
4. All loose material shall be removed off site.
5. Replacement materials shall be as specified in Appendix 7/1.
6. Bond coat shall be applied in accordance with Clause 920.
7. All construction layers shall be laid and compacted such that on completion each layer shall be at the same level as the adjacent course.
8. Alternatively, patching may be carried out using proprietary in-situ recycling repair systems, incorporating indirect infra-red heating, having an appropriate British Board of Agrément HAPAS Roads and Bridges Certificate

Emergency Patching

General

9. Emergency patching shall be carried out with approved kits of proprietary Emergency Patching Materials (EPM) complying with this clause.

Surface preparation and usage

10. The surface of the road shall be brushed mechanically or by hand with a stiff broom to remove loose material. Any standing water shall be brushed away, but the surface may remain damp.
11. Installation shall not be undertaken unless weather conditions are such that the repair material will have at least 30 minutes in which to cure and harden.

Components of the Emergency Patching Material Kit

12. Each kit shall comprise the materials and tools necessary to carry out an emergency repair to the surface of a road.
13. Each kit shall contain all the constituents which, when mixed together, will satisfy the performance requirements set out in this clause. It shall contain sufficient coarse aggregate with a minimum PSV of 55, for application to the laid material to ensure that a durable, skid resistant surface can be produced.

14. Each kit shall contain full and detailed instructions, including, if necessary, a cd/dvd video, or a series of still photographs, to ensure that inexperienced operatives can prepare and lay the emergency patching material correctly, without difficulty.

15. No individual part of a kit shall weigh more than 20 kg.

Performance Requirements for the Patching Material

16. The repair material shall have the following characteristics:

(i) It shall be capable of being mixed and spread by hand in thickness from 3 mm to 30mm.

(ii) It shall cure to a strength such that it is capable of being trafficked by heavy vehicles without damage within 30 minutes of installation when laid at surface temperatures between 3°C and 40°C.

(iii) None of the material shall de-bond or delaminate from the existing surface of the road for a period of at least 7 days from installation. Any subsequent delaminated material shall not be of sufficient size as to cause a hazard to traffic.

(iv) It shall retain surface applied aggregate.

(iv) It shall have a minimum shelf life of 12 months.

17. The performance shall be demonstrated at a site installation trial and by laboratory evaluation.

18. Products shall be independently certified to show compliance with this Clause.

Repairs to Potholes and Depressions

19. Temporary repairs to small areas of surface courses, including holes for road stud sockets, shall be carried out in accordance with clause 7306AR. Alternatively, patching may be carried out using proprietary in-situ repair systems incorporating indirect infra-red heating, having an appropriate British Board of Agrément HAPAS Roads and Bridges Certificate.

20. Temporary filling to depressions shall be carried out using a proprietary material specifically formulated to treat such depressions, all in accordance with sub-clause 2 to sub-clause 18 of this clause.

21. Permanent filling to depressions shall be carried out using hot mix material, or proprietary in-situ recycling systems complying with Series 900, having an appropriate British Board of Agrément HAPAS Roads and Bridges Certificate, CE Marking, or a certificate issued by other recognised and independent technical approval body.
22. All repairs shall ensure the presence of an impermeable seal with any joint and/or interface with the surrounding material to prevent moisture ingress.
23. Temporary and permanent repairs are expected to last longer than 12 months and 5 years, respectively. Applied repair materials shall be guaranteed to be in serviceable condition for at least 3 years for temporary and 15 years for permanent repairs, respectively.