Pavement
Contract preparation

CP 205 Instructions for specifiers for CC 205 Maintenance of pavements with an asphalt surfacing

(formerly)

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Contents

Latest release notes

Document Code	Version number	Date of publication of relevant change	Changes made to	Type of change
CP 205	NI/LIVE_2025-02-14	Not available	Core document	Change to policy, major revision, new document development
This document supersedes Series 900, Series NG 900 and parts of Series 700, NG 700, Series 800, NG 800 and Series 1000, NG 1000, which are withdrawn. It has been rewritten to be compliant with the latest drafting rules, extensively restructured and includes technical revisions.				

Previous versions

Document Code	Version number	Date of publication of relevant change	Changes made to	Type of change

Foreword

This document provides specifier instructions for the production of the works specific requirements for CC 205 Maintenance of pavements with an asphalt surfacing.

This document does not form part of the works specification.

The works specification is made up of both the Specification for Highway Works and the works specific requirements completed by the Specifier.

This document is applicable for contracts throughout the UK, complemented by the additional specification requirements and contractual changes of each Overseeing Organisation.

Users are responsible for applying all appropriate documents applicable to their contract.

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1. General requirements for maintenance of pavements with an asphalt surfacing

1.1 Maintenance of pavements with an asphalt surfacing shall be as specified in CC 205/WSR/001.

Maintenance of pavements with an asphalt surfacing						
Drawing/ model number	**Design level document number**	**Description**	**Chainage from**	**Chainage to**	**Pavement option**	**Minimum PSV**
(a)	(b)	(c)	(d)	(e)	(f)	(g)

a) Enter text, to define the drawing or model number which contains the location of the pavement treatment.
b) Enter text, to define the documentation which contains design level information.

c) Enter text, to define the location of the pavement treatment [e.g. road name, direction, lane].

d) Enter a number in units of m, to define the start chainage for the pavement treatment.

e) Enter a number in units of m, to define the end chainage for the pavement treatment.

f) Enter one or more values, from options as defined in Pavement options of WSR 205/001, to define the corresponding reference for work specific pavement treatment.

g) Enter text, to define the minimum PSV of the coarse aggregate or coated chippings in the surface course.

Maintenance of pavements with an asphalt surfacing (continued)	
Drawing/model number	**Maximum AAV**
(a)	(h)

h) Enter text, to define the maximum AAV of the coarse aggregate or coated chippings in the surface course.

1.2 Pavement options shall be as specified in CC 205/WSR/001.

Pavement options						
Pavement option	**Treatment design thickness (mm)**	**Pavement course 1 type**	**Pavement course 1 material reference**	**Pavement course 1 thickness (mm)**	**Pavement course 2 type**	**Pavement course 2 material reference**
(a)	(b)	(c)	(d)	(e)	(f)	(g)

a) Enter a unique reference, to define the work specific pavement construction requirements for the pavement option.
b) Enter text, to define the treatment design thickness for the pavement option.

c) Enter a value, from options Surface treatment, Surface course, to define the pavement course 1 type.

d) Enter one or more values, from options as defined in Pavement course materials of WSR 205/001, to define the corresponding material reference.

e) Enter text, to define the pavement course 1 thickness.

f) Enter a value, from options Surface course, Binder course, Regulating course, Base course, Other, Not used, to define the pavement course 2 type.

g) Enter one or more values, from options as defined in Pavement course materials of WSR 205/001, to define the corresponding material reference.

Pavement options (continued)				
Pavement option	**Pavement course 2 thickness (mm)**	**Pavement course 3 type**	**Pavement course 3 reference**	**Pavement course 3 thickness (mm)**
(a)	(h)	(i)	(j)	(k)

h) Enter text, to define the pavement course 2 thickness.

i) Enter a value, from options Binder course, Regulating course, Base course, Other, Not used, to define the pavement course 3 type.

j) Enter one or more values, from options as defined in Pavement course materials of WSR 205/001, to define the corresponding material reference.

k) Enter text, to define the pavement course 3 thickness.

1.3 Pavement options (continued) shall be as specified in CC 205/WSR/001.

Pavement options (continued)						
Pavement option	**Pavement course 4 type**	**Pavement course 4 material reference**	**Pavement course 4 thickness (mm)**	**Pavement course 5 type**	**Pavement course 5 material reference**	**Pavement course 5 thickness (mm)**
(a)	(b)	(c)	(d)	(e)	(f)	(g)

a) Enter a unique reference, to define the work specific pavement construction requirements for the pavement option.
b) Enter a value, from options Binder course, Regulating course, Base course, Other, Not used, to define the pavement course 4 type.

c) Enter one or more values, from options as defined in Pavement course materials of WSR 205/001, to define the corresponding material reference.

d) Enter text, to define the thickness of pavement course 4.

e) Enter a value, from options Binder course, Regulating course, Base course, Other, Not used, to define the pavement course 5 type.

f) Enter one or more values, from options as defined in Pavement course materials of WSR 205/001, to define the corresponding material reference.

g) Enter text, to define the thickness of pavement course 5.

1.4 Pavement course materials shall be as specified in CC 205/WSR/001.

Pavement course materials		
Pavement course material reference	**Material designation**	**Document and section reference**
(a)	(b)	(c)

Pavement course materials		
Pavement course material reference	**Material designation**	**Document and section reference**

a) Enter a unique reference, to define the material reference that assigns work specific material requirements.
b) Enter text, to define the material [e.g. AC 20 dense bin 40/60 des].

c) Enter text, to define the SHW document number and section for the associated material [e.g. CC 205.16].

1.5 The installed treatment thickness shall be not more than 6 mm less than the treatment design thickness specified in WSR 205/001.

1.6 Deviations in the installed thickness of the preceding pavement layers shall not result in the installed thickness of the surface course being more than 6 mm less than that specified in WSR 205/001.

Requirements for substrate inspection and preparation requirements

1.7 Inspection and preparation of the substrate to receive the pavement treatment following removal of the bituminous layers shall be as specified in CC 205/WSR/001.

Inspection and preparation of the substrate to receive the pavement treatment following removal of the bituminous layers				
Drawing/ model number	**Description**	**Inspection requirements**	**Testing requirements**	**Treatment requirements**
(a)	(b)	(c)	(d)	(e)

a) Enter text, to define the drawing or model number which contains the location of the substrate to be inspected and prepared prior to installation of the pavement treatment.
b) Enter text, to define the location and extent of the substrate to be inspected and prepared [e.g. road name, direction, lane, GPS coordinate].

c) Enter text, to define the requirements for inspection of the substrate prior to the installation of the pavement treatment.

d) Enter text, to define any testing requirements of the substrate prior to the installation of the pavement treatment.

e) Enter text, to define any treatment requirements for the substrate prior to the installation of the pavement treatment based on the findings from the inspection and/or testing of the substrate.

1.8 Substrates to receive the pavement treatment shall be prepared in accordance with BS 594987 [Ref 1.N].

Requirements for substitution of pavement materials and course thicknesses

1.9 Substitute pavement materials and course thicknesses shall be as specified in CC 205/WSR/001.

Substitute pavement materials and course thicknesses				
Permitted pavement option	**Pavement course material reference**	**Pavement course type**	**Permitted substitute pavement course material reference**	**Substitute material nominal layer thickness range (mm)**
(a)	(b)	(c)	(d)	(e)

a) Enter a unique reference, from options as defined in Pavement options of WSR 205/001, to define the permitted pavement option where substitute pavement materials and layer thicknesses can be used.
b) Enter a unique reference, from options as defined in Pavement course materials of WSR 205/001, to define the pavement course material reference that is permitted to be substituted for another pavement course material.

c) Enter one or more values, from options Binder course, Base course, Subbase, Other, to define the pavement course type of the pavement course that is permitted to be substituted for another pavement course material.

d) Enter a unique reference, from options as defined in Pavement options of WSR 205/001, to define the pavement course material reference for the permitted substitute pavement material.

e) Enter text, to define the permitted nominal layer thickness range (mm) for the substitute pavement material.

Requirements and verification for changes in design finished road level

1.10 Changes in design finished road level shall be as specified in CC 205/WSR/001.

Changes in design finished road level				
Drawing/ model number	**Design level document number**	**Description**	**Design level change range (mm)**	**Permitted pavement option**
(a)	(b)	(c)	(d)	(e)

a) Enter text, to define the drawing or model number which outlines the location and extents of the change in the design finished road level.
b) Enter text, to define the design level document number which outlines the change in the design finished road level.

c) Enter text, to define the location of the change in the design finished road level [e.g. road name, direction, lane].

d) Enter text, to define the range of change of the design finished road level.

e) Enter a unique reference, from options as defined in Pavement options of WSR 205/001, to define the permitted pavement option to be used in the location of the change in the design finished road level.

1.11 Where there is a change in the design finished road level, prior to opening to traffic, the surface level of the surface course shall be at the design level subject to the following tolerances: ± 6 mm.

1.12 Verification shall be undertaken for the surface level of the surface course by measurement against the datum level on a grid of points not more than 2 m spacing transversely and not more than 10 m spacing longitudinally.

1.13 The frequency of measurement of surface levels shall be once prior to opening to traffic.

1.14 The requirements for "Verification" in Section 14 of GC 101 [Ref 21.N] shall apply to the measurement of the surface level of the surface course.

Requirements and verification for surface regularity of surface course

1.15 Following the completion of the surface course, surface water shall flow into the surface drainage system without ponding.

NI/1.16 The number of surface irregularities in the surface course greater than or equal to 25 m in length, when measured along any line parallel to the edge of the pavement, shall be within the limits as detailed in table N/1.16a and table N/1.16b.

Table NI/1.16a Longitudinal irregularity limits for surface course measured using a rolling straightedge for Category A roads

Surface course length	Section length	Maximum permitted number of longitudinal irregularities		
		≥ 4 mm	≥ 7 mm	> 10 mm
≥ 300 m	00 m	20	2	0
25 - 299 m	75 m	9	1	0

Table NI/1.16b Longitudinal irregularity limits for surface course measured using a rolling straightedge for Category B roads

Surface course length	Section length	Maximum permitted number of longitudinal irregularities		
		≥ 4 mm	≥ 7 mm	> 10 mm
≥ 300 m	300 m	40	4	0
25 - 299 m	75 m	18	2	0

NI/SI.1.16 The road category used to determine the maximum number of permitted longitudinal irregularities shall be [select one from: Category A road, Category B road].

1.17 The maximum permitted number of longitudinal irregularities for section lengths that are less than 300 m but form part of a surface course more than 300 m in length, shall be that for a 300 m section length, pro rata then rounded up to the nearest whole number.

1.18 The maximum permitted number of longitudinal irregularities for section lengths that are less than 75 m and form part of a surface course length up to 299 m, shall be that for a 75 m section length, pro rata then rounded up to the nearest whole number.

1.19 Verification shall be undertaken for the longitudinal regularity of surface course greater than or equal to 25 m in length by testing continuously along the entire length of surface course using a rolling straightedge, or equivalent apparatus capable of measuring irregularities over a 3 m length.

1.20 The frequency of longitudinal regularity testing shall be once prior to opening to traffic.

1.21 The requirements for "Verification" in Section 14 of GC 101 [Ref 21.N] shall apply to the testing of the longitudinal regularity of surface course greater than or equal to 25 m in length.

1.22 Verification for longitudinal regularity testing shall be undertaken by an accredited testing laboratory in compliance with "Accredited laboratory" in Section 16 of GC 101 [Ref 21.N].

1.23 Prior to opening to traffic, the longitudinal regularity of surface course less than 25 m in length, measured as the difference between the surface and the underside of a straightedge placed parallel to the direction of travel, shall be not more than 3 mm.

1.24 Verification shall be undertaken for the longitudinal regularity of surface course less than 25 m in length by testing at 5 m intervals using a 3 m straightedge and wedge in accordance with BS 8420 [Ref 27.N].

1.25 The frequency of longitudinal regularity testing of surface course less than 25 m in length using a 3 m straightedge shall be once prior to opening to traffic.

1.26 The requirements for "Verification" in Section 14 of GC 101 [Ref 21.N] shall apply to the testing of longitudinal regularity of surface course less than 25 m in length using a 3 m straightedge.

1.27 Verification for the longitudinal regularity of surface course less than 25 m in length using a 3 m straightedge by testing shall be undertaken by an accredited testing laboratory in compliance with "Accredited laboratory" in Section 16 of GC 101 [Ref 21.N].

NI/1.28 Prior to opening to traffic, the transverse regularity of surface courses, measured as the difference between the surface and the underside of a 3 m straightedge and wedge placed at right angles to the centre line of the road in accordance with BS 8420 [Ref 27.N] shall be not more than 3 mm.

Requirements for rectification of flexible pavement layers during maintenance

1.29 Where a bituminous layer is to be removed and replaced for the purposes of rectification, the rectification shall be to the full depth of the layer, full lane width and not less than 15 m in length for surface course and not less than 5 m in length for the binder course or base course.

1.30 Where lower strength concrete is to be removed and replaced for the purposes of rectification, the rectification shall be the full depth of the lower strength concrete layer, full lane width and not less than 5 m in length.

2. Excavation and reinstatement of trenches in flexible pavements

General requirements for excavation and reinstatement of trenches in flexible pavements

2.1 Excavation and reinstatement of trenches in flexible pavements shall be as specified in CC 205/WSR/002.

Excavation and reinstatement of trenches in flexible pavements		
Drawing/model number	**Detail/model number**	**Bound pavement thickness**
(a)	(b)	(c)

a) Enter text, to define the drawing or model which outlines the location and the extents of the trench.
b) Enter text, to define the drawing or model which outlines the details for the reinstatement including materials, thicknesses, widths for each reinstatement layer and steps between layers.

c) Enter a number in units of mm, to define the thickness of the bound pavement to be excavated.

2.2 The edges of trenches in the surface course shall be saw-cut.

2.3 The edges of trenches in bituminous material shall be parallel or perpendicular to the direction of travel.

NI/2.4 Vertical faces of successive bound layers in trenches shall be offset by a minimum of 75 mm from vertical faces in the preceding layer.

2.5 The edges of trenches in bound layers that are parallel to the direction of travel shall be outside of wheel track zones, where wheel track zones are 600 mm wide with the inside edges offset from the centre of the lane by 720 mm.

2.6 The edges of trenches shall be free from undercutting of the overlying layers.

2.7 The surface level of subbase for the reinstatement of trenches shall be at the design level subject to the following tolerances: + 10 / - 30 mm.

3. Treatment of flexible pavement layers to be retained by breaking up or perforation in situ

General requirements for treatment of flexible pavement layers to be retained by breaking up or perforation in situ

3.1 Treatment of flexible pavement layers to be retained by breaking up or perforation in situ shall be as specified in CC 205/WSR/003.

Treatment of flexible pavement layers to be retained by breaking up or perforation in situ				
Drawing/ model number	**Description**	**Treatment type**	**Depth of layer below the existing surface**	**Depth of bound construction**
(a)	(b)	(c)	(d)	(e)

a) Enter text, to define the drawing or model number which outlines location and extents of the breaking up or perforation treatment.
b) Enter text, to define the location of the pavement foundation option [e.g. area, road name, direction, lane].

c) Enter one or more values, from options Breaking up, Perforation, to define the permitted treatment types.

d) Enter a number in units of mm, to define the depth below the existing surface at which the breaking up or perforation treatment is to be undertaken, where the existing surfacing is to be removed in advance.

e) Enter a number in units of mm, to define the depth of the bound construction to be broken up or perforated.

3.2 The breaking up or perforation treatment to flexible pavement layers shall be to the full depth of the bound construction.

3.3 The breaking up or perforation treatment to flexible pavement layers shall avoid causing damage to existing structures and utilities that are to be retained.

3.4 The breaking up or perforation treatment to flexible pavement layers shall be free draining such that the surface is free from any accumulation of standing water.

4. Tar bound materials

4.1 Location of tar bound material shall be as specified in CC 205/WSR/004.

Location of tar bound material					
Drawing/ model number	**Description**	**Sample reference**	**Sample document number**	**Depth of detected tar bound material (mm)**	**PAK marker result**
(a)	(b)	(c)	(d)	(e)	(f)

a) Enter text, to define the drawing or model number which outlines the location of the tar bound material.
b) Enter text, to define the location and extent of the tar bound material [e.g. road name, direction, lane, chainage, GPS coordinate].

c) Enter a unique reference, to define the sample reference(s) for the detected tar bound material.

d) Enter text, to define the document numbers for the sample for the detected tar bound material.

e) Enter text, to define the depth of the detected tar bound material below current road level.

f) Enter text, to define the PAK marker result for the tar bound material.

Location of tar bound material (continued)			
Drawing/model number	**PAH results**	**WAC Classification**	**Comments**
(a)	(g)	(h)	(i)

g) Enter text, to define the Polyaromatic Hydrocarbon (PAH) results for the tar bound material, if undertaken.

h) Enter text, to define the Waste Acceptance Criteria (WAC) Classification for the tar bound material, if undertaken.

i) Enter text, to outline any additional supportive information.

5. Removal of bound pavement layers

General requirements for milling of bound pavement layers

5.1 Nominal depth milling of bound pavement layers shall be as specified in CC 205/WSR/005.

Nominal depth milling of bound pavement layers				
Drawing/model number	**Description**	**Chainage from**	**Chainage to**	**Nominal milling depth**
(a)	(b)	(c)	(d)	(e)

a) Enter text, to define the drawing or model number which outlines the location and extents of the nominal depth milling.
b) Enter text, to define the location and extents of the milling [e.g. milling area, road name, direction, lane, GPS coordinate].

c) Enter text, to define the start chainage of the nominal depth milling area.

d) Enter text, to define the end chainage of the nominal depth milling area.

e) Enter a number in units of mm, to define the nominal milling depth for the milling area.

5.2 Profile milling of bound pavement layers shall be as specified in CC 205/WSR/005.

Profile milling of bound pavement layers						
Drawing/ model number	**Design level document number**	**Milling area**	**Location**	**Chainage from**	**Chainage to**	**Profile milling depth and requirements**
(a)	(b)	(c)	(d)	(e)	(f)	(g)

a) Enter text, to define the drawing or model number which outlines the location and extents of the profile milling.
b) Enter text, to define the documentation which contains design level information.

c) Enter a unique reference.

d) Enter text, to define the location and extents of the milling [e.g. road name, direction, lane, GPS coordinate, as appropriate].

e) Enter a number in units of m, to define the start chainage of the profile milling area.

f) Enter a number in units of m, to define the end chainage of the profile milling area.

g) Enter text, to define the depth range of profile milling and any specific requirements for the profile milling in the area.

Profile milling of bound pavement layers (continued)	
Drawing/model number	**Substrate to be exposed by milling**
(a)	(h)

h) Enter text, to define the type of substrate to be exposed by the milling operation [e.g. Bituminous layer, HBM layer, Unbound layer, URC, JRC, CRCP, CRCB, RCC, Geosynthetics, Structure, Waterproofing layer, Tar bound material].

5.3 Nominal depth milling shall be undertaken to the specified depth ± 6 mm.

5.4 Milled vertical faces in bituminous layers parallel to the direction of travel shall be as specified in CC 205/WSR/005.

Milled vertical faces in bituminous layers parallel to the direction of travel						
Drawing/ model number	**Detail/ model number**	**Lane(s)**	**Lane edge**	**Chainage from**	**Chainage to**	**Pavement course interface**
(a)	(b)	(c)	(d)	(e)	(f)	(g)

a) Enter text, to define the drawing or model number which outlines the location and extents of the milled vertical face.
b) Enter text, to define the detail or model number which outlines the detail of any milled vertical face offset, including any requirements for sacrificial material.

c) Enter text, to define the applicable lanes.

d) Enter text, to define the applicable lane edge [e.g. nearside or offside].

e) Enter a number in units of m, to define the start chainage for the milled vertical face.

f) Enter a number in units of m, to define the end chainage for the milled vertical face.

g) Enter text, to define the applicable pavement course interface for the milled vertical face location [e.g. surface course and binder course].

Milled vertical faces in bituminous layers parallel to the direction of travel (continued)	
Drawing/model number	**Vertical face location**
(a)	(h)

h) Enter text, to define the vertical face location in relation to the lane and any offset from the preceding course.

5.5 Where multiple new bituminous layers are to be placed, vertical faces perpendicular to the direction of travel shall be cut back such that successive vertical joints in the new bituminous layer are offset by not less than 300 mm.

5.6 Vertical faces around the perimeter of the removed bound pavement layers shall be vertical and parallel or perpendicular to the direction of travel without undercutting.

5.7 Ironwork in the pavement shall not be disturbed or damaged by the milling action.

5.8 Following milling, all dust and debris shall be removed from milled bound substrates.

5.9 Following milling, grooves in milled bound substrates shall be not more than 10 mm in depth.

5.10 Depressions in milled bound substrates, measured as the difference between the substrate and the underside of a straightedge, shall be not more than 10 mm in depth.

5.11 Milled material shall be removed from site, unless otherwise stated in CC 205/WSR/005.

SI.5.11 Milled material shall be [enter free text].

5.12 Milled substrates shall not be opened to traffic, unless otherwise stated in CC 205/WSR/007.

SI.5.12 Milled substrates that are opened to traffic shall be [enter free text].

General requirements for removal of bituminous layers using hand tools

5.13 Removal of bituminous layers using hand tools shall be as specified in CC 205/WSR/005.

Removal of bituminous layers using hand tools					
Drawing/ model number	**Location**	**Equipment requirements**	**Substrate to be exposed using hand tools**	**Substrate depth below surface (mm)**	**Minimum depth above the substrate to be removed using hand tools**
(a)	(b)	(c)	(d)	(e)	(f)

a) Enter text, to define the drawing or model number which outlines the location of the bituminous layer to be removed by hand tools.
b) Enter text, to define the location of the bituminous layer to be removed by hand tools [e.g. road name, direction, chainage].

c) Enter text, to define the equipment that is permitted to be used to remove the bituminous layer.

d) Enter text, to define the substrate that is to be exposed using hand tools.

e) Enter text, to define the depth below the surface of the substrate to be exposed.

f) Enter a number in units of mm, to define the minimum depth above the substrate to be removed using hand tools.

5.14 The preparatory works prior to the removal of bituminous layers using hand tools shall be as stated in CC 205/WSR/005.

SI.5.14 The preparatory works prior to the removal of bituminous layers using hand tools shall be as follows: [enter free text].

5.15 The condition of the substrate following the removal of bituminous layers using hand tools shall be as stated in CC 205/WSR/005.

SI.5.15 The condition of the substrate following the removal of bituminous layers using hand tools is as follows: [enter free text].

6. Top of foundation performance assessment

General requirements for assessment of the foundation surface modulus prior to the placement of new pavement layers

6.1 Assessment of the foundation surface modulus prior to the placement of new pavement layers shall be as specified in CC 205/WSR/006.

Assessment of the foundation surface modulus prior to the placement of new pavement layers		
Drawing/model number	**Location**	**Minimum foundation surface modulus**
(a)	(b)	(c)

a) Enter text, to define the drawing or model number which contains the location of the area requiring foundation surface modulus testing.
b) Enter text, to define the location of the area of where the foundation surface modulus testing is to be undertaken [e.g. road name, direction, lane, chainage, GPS coordinate].

c) Enter a number in units of MPa, to define the minimum foundation surface modulus requirement for the area.

6.2 The foundation surface modulus of the substrate shall be determined in accordance with Pavement foundation surface modulus testing in "Performance pavement foundation testing" in Section 13 of CC 201 [Ref 28.N].

7. Use of base course, binder course and milled substrates by traffic

General requirements for the use of base course, binder course and milled substrates by traffic

7.1 The requirements for bituminous layers and milled substrates that are opened to traffic as a temporary running surface shall be as stated in CC 205/WSR/007.

SI.7.1 The requirements for bituminous layers and milled substrates that are opened to traffic as a temporary running surface shall be as follows: [enter free text].

7.2 Where a bituminous layer is opened to traffic as a temporary running surface, following trafficking, the surface shall be free from potholing, fretting, rutting, loose materials, deleterious materials, surface water ponding and open joints.

7.3 Where temporary ramping is used, it shall be removed prior to the surfacing operation.

8. Lower strength concrete for the reinstatement of trenches in flexible pavements

General requirements for lower strength concrete for the reinstatement of openings in pavements with an asphalt surfacing

8.1 Lower strength concrete for the reinstatement of openings in pavements with an asphalt surfacing shall comply with "Lower strength concrete for pavements" in Section 3 of CC 206 [Ref 26.N].

9. Foamed concrete for the reinstatement of trenches in flexible pavements

General requirements for foamed concrete for the reinstatement of trenches in pavements with an asphalt surfacing

9.1 Foamed concrete for the reinstatement of trenches in pavements with an asphalt surfacing shall comply with "Foamed concrete for pavement foundations" in Section 12 of CC 201 [Ref 28.N].

9.2 Foamed concrete for the reinstatement of trenches in pavements with an asphalt surfacing shall have a maximum mean compressive strength from a set of three cubes at 7 days of 10 MPa.

9.3 The testing of the compressive strength of foamed concrete for the reinstatement of trenches in pavements with an asphalt surfacing shall comply with Product requirements for foamed concrete for pavement foundations in "Foamed concrete for pavement foundations" in Section 12 of CC 201 [Ref 28.N].

10. Formation of joints in bituminous layers for maintenance

General requirements for the formation of joints in bituminous layers for maintenance

10.1 Longitudinal joint offset from parallel joints in preceding layers for maintenance shall be as specified in CC 205/WSR/010.

Longitudinal joint offset from parallel joints in preceding layers for maintenance					
Drawing/ model number	**Description**	**Chainage from**	**Chainage to**	**Minimum longitudinal joint offset (mm)**	**Applicable paving sequence**
(a)	(b)	(c)	(d)	(e)	(f)

a) Enter text, to define the drawing or model number which contains the location where the minimum longitudinal joint offset from parallel joints in the preceding layer applies.
b) Enter text, to define the location of the longitudinal joint offset [e.g. road name, direction, carriageway position].

c) Enter a number in units of m, to define the start chainage for the longitudinal joint offset.

d) Enter a number in units of m, to define the end chainage for the longitudinal joint offset.

e) Enter a number in units of mm, to define the minimum longitudinal joint offset from parallel joints in the preceding layer.

f) Enter text, to define the paving sequence to which the minimum longitudinal joint offset is applicable, i.e. the installation of multiple construction widths (or lanes) prior to overlay.

10.2 Longitudinal joints in bituminous layers shall be situated outside of wheel track zones, where wheel track zones are 600 mm wide with the inside edges offset from the centre of the lane by 720 mm.

10.3 Unless longitudinal joints in bituminous layers are formed using echelon paving, they shall be cut back to a vertical face that exposes the full thickness of the layer, or formed with an edge compactor.

10.4 Prior to the placement of bituminous layers, a uniform layer of bitumen shall be applied to the entire face of all vertical faces against which the layers are to be laid, including previously laid asphalt.

10.5 Within 24 hours of forming abutting longitudinal joints in all bituminous base and binder course layers, a uniform layer of bitumen shall be applied over the top surface of the joint, spanning to a minimum of 75 mm on either side of the joint at a residual rate of not less than 0.50 kg/m^2.

10.6 Longitudinal joints in the surface course for maintenance shall coincide with either the lane edge, lane marking or middle of a traffic lane.

10.7 A uniform layer of bitumen shall be applied to the entire face of any freestanding edge of bituminous layer at the high side of a camber.

10.8 Bitumen for application to joints and edges of pavement layers shall be compliant with BS EN 13808 [Ref 6.N]or BS EN 12591 [Ref 8.N].

10.9 The bitumen for application to joints and edges of pavement layers shall meet the performance characteristics as stated in table 10.9.

Table 10.9 Permitted penetration grades for bitumen for application to joints and edges of pavement layers

Bitumen type	Permitted penetration grades
Paving grade bitumen to BS EN 12591 [Ref 8.N]	40/60 70/100 100/150
Cationic bitumen emulsion to BS EN 13808 [Ref 6.N]	≤ 100 (Class 3) ≤ 150 (Class 4)

10.10 The requirements of "Designated standards" in Section 10 of GC 101 [Ref 21.N] shall apply to bitumen for application to joints and edges of pavement layers.

11. Ex situ cold recycled bound material for maintenance

General requirements for ex situ cold recycled bound material (CRBM) for maintenance

11.1 Ex situ cold recycled bound material (CRBM) for maintenance shall be as specified in CC 205/WSR/011.

Ex situ cold recycled bound material (CRBM) for maintenance		
Pavement course material reference	**Mixture type**	**Stiffness Class**
(a)	(b)	(c)

a) Enter a unique reference, from options as defined in Pavement course materials of WSR 205/001, to define the corresponding reference for the material.
b) Enter a value, from options QVE, SVE, to define the ex situ CRBM material type.

c) Enter a value, from options B2, B3, B4, to define the ex situ CRBM stiffness class.

11.2 Constituent materials, product requirements, mixture design, production, installation and process control testing for ex situ CRBM used for maintenance shall comply with "Ex situ cold recycled bound material" in Section 6 of CC 202 [Ref 20.N].

12. In situ cold recycled bound material

General requirements and verification of in situ cold recycled bound material (CRBM)

12.1 In situ cold recycled bound material (CRBM) shall be as specified in CC 205/WSR/012.

In situ cold recycled bound material (CRBM)		
Pavement course material reference	**Material type**	**Stiffness class**
(a)	(b)	(c)

a) Enter a unique reference, from options as defined in Pavement course materials of WSR 205/001, to define the corresponding reference for the material.
b) Enter a value, from options QVE, SVE, QH, to define the in situ CRBM material type.

c) Enter a value, from options B1, B2, B3, B4, to define the in situ CRBM stiffness class.

12.2 Constituent materials, mixture design, production, process control, installation, compaction, quality control testing, surfacing and quality plans for in situ CRBM shall comply with deep in situ recycling in BS 9228 [Ref 29.N].

NI/12.3 No nationally determined requirement is provided.

12.4 Verification shall be undertaken for the surface modulus of the in situ CRBM by testing using a calibrated, correlated Light Weight Deflectometer (LWD) in accordance with BS 1924-2 [Ref 23.N].

12.5 The frequency of testing of the surface modulus shall be at 20 m intervals along each lane, staggered 10 m between adjacent lanes.

12.6 The requirements for "Verification" in Section 14 of GC 101 [Ref 21.N] shall apply to the testing of surface modulus of the in situ CRBM.

12.7 The LWD used for assessing the surface modulus of the in situ CRBM shall have either a site specific correlation with a Falling Weight Deflectometer (FWD), or an annual correlation certificate.

NI/12.8 No nationally determined requirement is provided.

12.9 Verification shall be undertaken for the back-analysed stiffness modulus of the in situ CRBM by testing using a FWD, at a pavement temperature of 15 °C - 25 °C in accordance with CS 229 [Ref 19.N].

12.10 The frequency of FWD testing shall be at 20 m intervals along each lane, staggered 10 m between adjacent lanes.

12.11 The requirements for "Verification" in Section 14 of GC 101 [Ref 21.N] shall apply to testing the in situ CRBM with an FWD.

12.12 The back-analysed stiffness modulus of the in situ CRBM shall be derived by modelling the pavement as a three-layer system.

13. In situ cold recycled bound material - the down cut process

General requirements and documentation for In situ cold recycled bound material using the down cut process

13.1 In situ cold recycled bound material (CRBM) using the down cut process shall be as specified in CC 205/WSR/013.

In situ cold recycled bound material (CRBM) using the down cut process	
Pavement course material reference	**Stiffness class**
(a)	(b)

a) Enter a unique reference, from options as defined in Pavement course materials of WSR 205/001, to define the corresponding reference for the material.
b) Enter a value, from options B3, B4, to define the in situ CRBM using the down cut process stiffness class.

13.2 The material type for in situ CRBM using the down cut process shall be QVE.

13.3 Constituent materials, mixture design, production, process control, compaction, quality control testing, and quality plans for in situ CRBM using the down cut process shall comply with deep in situ recycling in BS 9228 [Ref 29.N].

13.4 Cement for in situ CRBM using the down cut process shall be compliant with BS EN 197-1 [Ref 17.N].

13.5 The cement for in situ CRBM using the down cut process shall meet the following performance characteristics: be CEM I, CEM II/A-L, CEM II/A-S, CEM II/A-V, CEM II/B-L, CEM II/B-S, CEM II/B-V or CEM IV/A.

13.6 The requirements of "Designated standards" in Section 10 of GC 101 [Ref 21.N] shall apply to the cement for in situ CRBM using the down cut process.

13.7 Cement for in situ CRBM using the down cut process shall be compliant with BS EN 197-5 [Ref 18.N].

13.8 The cement for in situ CRBM using the down cut process shall meet the following performance characteristics: CEM II/C-M.

13.9 The operating weight of the recycler for in situ CRBM using the down cut process shall be not less than 45 tonnes.

13.10 The recycler for in situ CRBM using the down cut process shall pulverise the existing pavement material with the pulverising drum operating in the same direction as the direction of travel of the machine.

13.11 The recycler for in situ CRBM using the down cut process shall be fitted with an integrated injection system for the addition of foamed bitumen and water in accordance with the mixture design.

13.12 The recycler for in situ CRBM using the down cut process shall be fitted with a proportioning system that automatically adjusts the rate of addition of mixture constituents to suit the recycling speed and depth.

13.13 The recycler for in situ CRBM using the down cut process shall be fitted with flow meters, calibrated in accordance with the manufacturer recommendations, that measure and record the addition rate of the constituents relative to recycling rate at all states of pipeline flow.

13.14 The recycler for in situ CRBM using the down cut process shall operate within the declared range for operational speed, operating weight and recycler rate.

13.15 The following Documentation shall be submitted for the in situ CRBM using the down cut process prior to the commencement of works: declaration of recycler operational speed, recycler operating weight and recycling rate.

13.16 The requirements for "Documentation" in Section 2 of GC 101 [Ref 21.N] shall apply to the recycler operational speed, recycler operating weight, and recycling rate for in situ CRBM using the down cut process.

13.17 In situ CRBM using the down cut process shall be paver laid.

13.18 The finished surface of the in situ CRBM using the down cut process shall be free from segregation.

13.19 Where adjacent rips of in situ CRBM using the down cut process are required to treat the whole lane or pavement width, the subsequent rips shall cut no less than 150 mm into the previous rip of in situ CRBM.

13.20 The following Documentation for the in situ CRBM using the down cut process shall be submitted as continuous records: equipment calibration records, constituent testing results, mixture proportion records, laying records, surface level records and test reports.

13.21 The requirements of "Records" in Section 3 of GC 101 [Ref 21.N] shall apply to the equipment calibration records, constituent testing results, mixture proportion records, laying records, surface level records and test reports for in situ CRBM using the down cut process.

14. Designed asphalt concrete base course for maintenance

General requirements for designed asphalt concrete base course for maintenance

14.1 The constituent and product requirements of the designed asphalt concrete base course for maintenance shall comply with "Designed asphalt concrete base course" in Section 8 of CC 202 [Ref 20.N].

Installation requirements and verification of designed asphalt concrete base course for maintenance

14.2 Designed asphalt concrete base course for maintenance shall be installed by organisations registered to and operating in compliance with a quality management scheme in accordance with "Quality management schemes" in Section 7 of GC 101 [Ref 21.N].

14.3 Prior to placing bituminous mixtures on any new or existing bound substrate, a bond coat shall be applied in accordance with BS 594987 [Ref 1.N].

14.4 Verification shall be undertaken for the rate of spread of the bond coat by testing in accordance with BS 594987 [Ref 1.N].

14.5 The frequency of the rate of spread of bond coat testing shall be once per week.

14.6 The requirements for "Verification" in Section 14 of GC 101 [Ref 21.N] shall apply to the testing of the rate of spread of bond coat.

14.7 Designed asphalt concrete base course for maintenance shall be transported, laid and compacted in accordance with BS 594987 [Ref 1.N].

14.8 The minimum temperature immediately prior to the compaction of warm mix designed asphalt concrete base course for maintenance shall be 90 °C, when measured in accordance with BS EN 12697-13 [Ref 16.N].

14.9 Joints in designed asphalt concrete base course for maintenance shall comply with "Formation of joints in bituminous layers for maintenance" in Section 10 of this document.

14.10 On completion of compaction of the designed asphalt concrete base course, the mean of six consecutive in situ air void content measurements in the wheel tracks, where wheel tracks are 600 mm wide with the inside edges offset from the centre of the lane by 720 mm shall be not more than 7%.

14.11 Verification shall be undertaken for for the in situ air void content of the designed asphalt concrete base course by measurement using a correlated indirect density gauge in accordance with BS 594987 [Ref 1.N].

14.12 The frequency of in situ air void content measurement shall be 1 per 20 m in alternate wheel tracks, where wheel tracks are 600 mm wide with the inside edges offset from the centre of the lane by 720 mm.

14.13 The requirements for "Verification" in Section 14 of GC 101 [Ref 21.N] shall apply to the measurement in the wheel tracks of the in situ air void content of the designed asphalt concrete base course.

14.14 On completion of compaction of the designed asphalt concrete base course, the mean of six consecutive in situ air void content measurements at unsupported edges shall be not more than 9%.

14.15 Verification shall be undertaken for for the in situ air void content of the designed asphalt concrete base course at unsupported edges by measurement using a correlated indirect density gauge, centred 200 mm from the final joint position in accordance with BS 594987 [Ref 1.N].

14.16 The frequency of in situ air void content measurement shall be 1 per 20 m.

14.17 The requirements for "Verification" in Section 14 of GC 101 [Ref 21.N] shall apply to the measurement at unsupported edges of the in situ air void content of the designed asphalt concrete base course.

15. EME2 asphalt concrete base course for maintenance

General requirements for EME2 asphalt concrete base course for maintenance

15.1 The constituent and product requirements of the EME2 asphalt concrete base course for maintenance shall comply with "EME2 asphalt concrete base course" in Section 9 of CC 202 [Ref 20.N].

Installation requirements and verification for EME2 asphalt concrete base course for maintenance

15.2 EME2 asphalt concrete base course for maintenance shall be installed by organisations registered to and operating in compliance with a quality management scheme in accordance with "Quality management schemes" in Section 7 of GC 101 [Ref 21.N].

15.3 Prior to placing bituminous material on any new or existing bound substrate, a bond coat shall be applied in accordance with BS 594987 [Ref 1.N].

15.4 Verification shall be undertaken for the rate of spread of bond coat by testing in accordance with BS 594987 [Ref 1.N].

15.5 The frequency of the rate of spread of bond coat testing shall be once per week.

15.6 The requirements for "Verification" in Section 14 of GC 101 [Ref 21.N] shall apply to the testing of the rate of spread of bond coat.

15.7 EME2 asphalt concrete base course for maintenance shall be transported, laid and compacted in accordance with BS 594987 [Ref 1.N].

15.8 The minimum temperature immediately prior to the compaction of warm mix EME2 asphalt concrete base course shall be 110 °C, when measured in accordance with BS EN 12697-13 [Ref 16.N].

15.9 Joints in EME2 asphalt concrete base course for maintenance shall comply with "Formation of joints in bituminous layers for maintenance" in Section 10 of this document.

15.10 On completion of compaction of the EME2 asphalt concrete base course, the mean of six consecutive in situ air void content measurements in the wheel tracks, where wheel tracks are 600 mm wide with the inside edges offset from the centre of the lane by 720 mm shall be not more than 6%.

15.11 Verification shall be undertaken for the in situ air void content of the EME2 asphalt concrete base course by measurement using a correlated indirect density gauge in accordance with BS 594987 [Ref 1.N].

15.12 The frequency of in situ air void content measurement shall be 1 per 20 m in alternate wheel tracks, where wheel tracks are 600 mm wide with the inside edges offset from the centre of the lane by 720 mm.

15.13 The requirements for "Verification" in Section 14 of GC 101 [Ref 21.N] shall apply to the measurement in the wheel tracks of the in situ air void content of the EME2 asphalt concrete base course.

15.14 On completion of compaction of the EME2 asphalt concrete base course, the mean of six consecutive in situ air void content measurements at unsupported edges shall be not more than 8%.

15.15 Verification shall be undertaken for the in situ air void content of the EME2 asphalt concrete base course at unsupported edges by measurement using a correlated indirect density gauge, centred 200 mm from the final joint position in accordance with BS 594987 [Ref 1.N].

15.16 The frequency of in situ air void content measurement shall be 1 per 20 m.

15.17 The requirements for "Verification" in Section 14 of GC 101 [Ref 21.N] shall apply to the measurement at unsupported edges of the in situ air void content for the EME2 asphalt concrete base course.

16. Designed asphalt concrete binder course for maintenance

General requirements for designed asphalt concrete binder course for maintenance

16.1 The constituent and product requirement of the designed asphalt concrete binder course for maintenance shall comply with "Designed asphalt concrete binder course " in Section 10 of CC 202 [Ref 20.N].

Installation requirements and verification of designed asphalt concrete binder course for maintenance

16.2 Designed asphalt concrete binder course for maintenance shall be installed by organisations registered to and operating in compliance with a quality management scheme in accordance with "Quality management schemes" in Section 7 of GC 101 [Ref 21.N].

16.3 Prior to placing bituminous material on any new or existing bound substrate, a bond coat shall be applied in accordance with BS 594987 [Ref 1.N].

16.4 Verification shall be undertaken for the rate of spread of bond coat by testing in accordance with BS 594987 [Ref 1.N].

16.5 The frequency of the rate of spread of bond coat testing shall be once per week.

16.6 The requirements for "Verification" in Section 14 of GC 101 [Ref 21.N] shall apply to the rate of spread of bond coat.

16.7 Designed asphalt concrete binder course shall be transported, laid and compacted in accordance with BS 594987 [Ref 1.N].

16.8 The minimum temperature immediately prior to the compaction of warm mix designed asphalt concrete binder course shall be 90 °C, when measured in accordance with BS EN 12697-13 [Ref 16.N].

16.9 Joints in designed asphalt concrete binder course for maintenance shall comply with "Formation of joints in bituminous layers for maintenance" in Section 10 of this document.

16.10 On completion of compaction of the designed asphalt concrete binder course, the mean of six consecutive in situ air void content measurements in the wheel tracks, where wheel tracks are 600 mm wide with the inside edges offset from the centre of the lane by 720 mm shall be not more than 7%.

16.11 Verification shall be undertaken for the in situ air void content of the designed asphalt concrete binder course by measurement using a correlated indirect density gauge in accordance with BS 594987 [Ref 1.N].

16.12 The frequency of in situ air void content measurements shall be 1 per 20 m in alternate wheel tracks, where wheel tracks are 600 mm wide with the inside edges offset from the centre of the lane by 720 mm.

16.13 The requirements for "Verification" in Section 14 of GC 101 [Ref 21.N] shall apply to the measurement in the wheel tracks of the in situ air void content of the designed asphalt concrete binder course.

16.14 On completion of compaction of the designed asphalt concrete binder course, the mean of six consecutive in situ air void content measurements at unsupported edges shall be not more than 9%.

16.15 Verification shall be undertaken for for the in situ air void content of the designed asphalt concrete binder course at unsupported edges by measurement using a correlated indirect density gauge, centred 200 mm from the final joint position in accordance with BS 594987 [Ref 1.N].

16.16 The frequency of in situ air void content measurement shall be 1 per 20 m.

16.17 The requirements for "Verification" in Section 14 of GC 101 [Ref 21.N] shall apply to the measurement at unsupported edges of the in situ air void content of the designed asphalt concrete binder course.

17. EME2 asphalt concrete binder course for maintenance

General requirements for EME2 asphalt concrete binder course for maintenance

17.1 The constituent and product requirements of the EME2 asphalt concrete binder course for maintenance shall comply with "EME2 asphalt concrete binder course " in Section 11 of CC 202 [Ref 20.N].

Installation requirements and verification of EME2 asphalt concrete binder course for maintenance

17.2 EME2 asphalt concrete binder course for maintenance shall be installed by organisations registered to and operating in compliance with a quality management scheme in accordance with "Quality management schemes" in Section 7 of GC 101 [Ref 21.N].

17.3 Prior to placing bituminous materials on any new or existing bound substrate, a bond coat shall be applied in accordance with BS 594987 [Ref 1.N].

17.4 Verification shall be undertaken for the rate of spread of bond coat by testing in accordance with BS 594987 [Ref 1.N].

17.5 The frequency of the rate of spread of bond coat testing shall be once per week.

17.6 The requirements for "Verification" in Section 14 of GC 101 [Ref 21.N] shall apply to the testing of the rate of spread of bond coat.

17.7 EME2 asphalt concrete binder course shall be transported, laid and compacted in accordance with BS 594987 [Ref 1.N].

17.8 The minimum temperature immediately prior to the compaction of warm mix EME2 asphalt concrete binder course shall be 110 °C, when measured in accordance with BS EN 12697-13 [Ref 16.N].

17.9 Joints in EME2 asphalt concrete binder course for maintenance shall comply with "Formation of joints in bituminous layers for maintenance" in Section 10 of this document.

17.10 On completion of compaction of the EME2 asphalt concrete binder course, the mean of six consecutive in situ air void content measurements in the wheel tracks, where wheel tracks are 600 mm wide with the inside edges offset from the centre of the lane by 720 mm shall be not more than 6%.

17.11 Verification shall be undertaken for the in situ air void content of the EME2 asphalt concrete binder course by measurement using a correlated indirect density gauge in accordance with BS 594987 [Ref 1.N].

17.12 The frequency of in situ air void content measurement shall be 1 per 20 m in alternate wheel tracks, where wheel tracks are 600 mm wide with the inside edges offset from the centre of the lane by 720 mm.

17.13 The requirements for "Verification" in Section 14 of GC 101 [Ref 21.N] shall apply to the measurement in the wheel tracks of the in situ air void content of the EME2 asphalt concrete binder course.

17.14 On completion of compaction of the EME2 asphalt concrete binder course, the mean of six consecutive in situ air void content measurements at unsupported edges shall be not more than 8%.

17.15 Verification shall be undertaken for the in situ air void content of the EME2 asphalt concrete binder course at unsupported edges by measurement using a correlated indirect density gauge, centred 200 mm from the final joint position in accordance with BS 594987 [Ref 1.N].

17.16 The frequency of in situ air void content measurement shall be 1 per 20 m.

17.17 The requirements for "Verification" in Section 14 of GC 101 [Ref 21.N] shall apply to the measurement at unsupported edges of the in situ air void content for the EME2 asphalt concrete binder course.

18. Stone mastic asphalt binder course for maintenance

General requirements for stone mastic asphalt binder course for maintenance

18.1 Constituents and product requirements of the stone mastic asphalt (SMA) binder course for maintenance shall comply with "Stone mastic asphalt binder course" in Section 12 of CC 202 [Ref 20.N].

Installation requirements and verification of the SMA binder course for maintenance

18.2 SMA binder course for maintenance shall be installed by organisations registered to and operating in compliance with a quality management scheme in accordance with "Quality management schemes" in Section 7 of GC 101 [Ref 21.N].

18.3 Prior to placing bituminous material on any new or existing bound substrate, a bond coat shall be applied in accordance with BS 594987 [Ref 1.N].

18.4 Verification shall be undertaken for the rate of spread of the bond coat by testing in accordance with BS 594987 [Ref 1.N].

18.5 The frequency of the rate of spread of bond coat testing shall be once per week.

18.6 The requirements for "Verification" in Section 14 of GC 101 [Ref 21.N] shall apply to the testing of the rate of spread of the bond coat.

18.7 SMA binder course shall be transported, laid and compacted in accordance with BS 594987 [Ref 1.N].

18.8 The minimum temperature immediately prior to the compaction of warm mix SMA binder course, when measured in accordance with BS EN 12697-13 [Ref 16.N], shall be as detailed in table 18.8.

Table 18.8 Minimum compaction temperature of warm mix SMA binder course

Binder grade	Minimum temperature (°C)
Paving grade bitumen conforming to BS EN 12591 [Ref 8.N]	90
Polymer modified bitumen conforming to BS EN 13924-1	Documented and declared by the producer

18.9 Joints in SMA binder course for maintenance shall comply with "Formation of joints in bituminous layers for maintenance" in Section 10 of this document.

18.10 On completion of compaction of the SMA binder course, the mean of six consecutive in situ air void content measurements shall be as detailed in table 18.10.

Table 18.10 Mean in situ air void content of the SMA binder course

Nominal thickness (mm)	Mean in situ air void content in the centre of the mat (%)	Mean in situ air void content at unsupported edges (%)
≥ 30	≤ 5	≤ 7
20 - 30	≤ 7	≤ 9

18.11 Verification shall be undertaken for the in situ air void content of the SMA binder course by measurement in the centre of the mat using a correlated indirect density gauge in accordance with BS 594987 [Ref 1.N].

18.12 The frequency of in situ air void content measurements shall be 1 per 50 m.

18.13 The requirements for "Verification" in Section 14 of GC 101 [Ref 21.N] shall apply to the measurement in the centre of the mat of the in situ air void content of the SMA binder course.

18.14 Verification shall be undertaken for the in situ air void content of the SMA binder course at unsupported edges by measurement using a correlated indirect density gauge, centred 200 mm from the final joint position in accordance with BS 594987 [Ref 1.N].

18.15 The frequency of in situ air void content measurement shall be 1 per 50 m.

18.16 The requirements for "Verification" in Section 14 of GC 101 [Ref 21.N] shall apply to the measurement at unsupported edges of the in situ air void content of the SMA binder course.

19. Performance hot rolled asphalt binder course for maintenance

General requirements for performance hot rolled asphalt binder course for maintenance

19.1 Performance hot rolled asphalt (HRA) binder course for maintenance shall comply with "Performance hot rolled asphalt binder course " in Section 13 of CC 202 [Ref 20.N].

19.2 Joints in performance HRA binder course for maintenance shall comply with "Formation of joints in bituminous layers for maintenance" in Section 10 of this document.

20. Recipe hot rolled asphalt binder course for maintenance

General requirements for recipe hot rolled asphalt binder course for maintenance

20.1 Recipe hot rolled asphalt (HRA) binder course for maintenance shall be as specified in CC 205/WSR/020.

Recipe hot rolled asphalt (HRA) binder course for maintenance		
Pavement course material reference	**Installation requirements**	**Surface level requirements**
(a)	(b)	(c)

a) Enter a unique reference, from options as defined in Pavement course materials of WSR 205/001, to define the corresponding reference for the material.
b) Enter text, to define the installation requirements for the mixture.

c) Enter text, to define the surface level requirements for the mixture level relative to the design level.

20.2 Recipe HRA binder course for maintenance shall comply with "Recipe hot rolled asphalt binder course " in Section 14 of CC 202 [Ref 20.N].

Installation requirements for recipe HRA binder course

20.3 Recipe HRA binder course shall be installed by organisations registered to and operating in compliance with a quality management scheme in accordance with "Quality management schemes" in Section 7 of GC 101 [Ref 21.N].

20.4 Prior to placing bituminous mixtures on any new or existing bound substrates, a bond coat shall be applied in accordance with BS 594987 [Ref 1.N], unless otherwise stated in CC 205/WSR/020.

20.5 Recipe HRA binder course shall be transported, laid and compacted in accordance with BS 594987 [Ref 1.N], unless otherwise stated in CC 205/WSR/020.

21. Asphalt stress absorbing membrane interlayer

General requirements, verification and documentation of asphalt stress absorbing membrane interlayers

21.1 Prior to the commencement of the works, the location of all transverse and longitudinal cracks and joints in the existing pavement course where the asphalt stress absorbing membrane interlayers (SAMI) is to be installed shall be recorded to a location accuracy of ± 1 m.

21.2 Verification shall be undertaken for the location of all transverse and longitudinal cracks and joints in the existing pavement surface where the asphalt SAMI is to be installed in accordance with CS 229 [Ref 19.N].

21.3 The frequency of recording of existing transverse and longitudinal cracks and joints shall be once prior to the commencement of the works.

21.4 The requirements for "Verification" in Section 14 of GC 101 [Ref 21.N] shall apply to the location of all transverse and longitudinal cracks and joints in the existing pavement surface where the asphalt SAMI is to be installed.

21.5 The following Documentation shall be submitted for the existing pavement surface where the asphalt SAMI is to be installed prior to the commencement of the works: the location of all transverse and longitudinal cracks and joints in the existing pavement surface in spatial data format (e.g. shape file) with linestrings in OSGB36.

Constituent requirements for asphalt SAMI

21.6 Coarse aggregate and fine aggregate for asphalt SAMI shall comply with "Constituents for bituminous mixtures" in Section 7 of CC 202 [Ref 20.N].

21.7 The percentage of crushed or broken particles in coarse and fine aggregates for asphalt SAMI shall be Category $C_{100/0}$.

21.8 Added filler aggregate for asphalt SAMI shall be limestone filler complying with "Constituents for bituminous mixtures" in Section 7 of CC 202 [Ref 20.N].

21.9 Asphalt SAMI shall not contain reclaimed asphalt.

21.10 Polymer modified bitumen for asphalt SAMI shall be compliant with BS EN 14023 [Ref 7.N].

21.11 The polymer modified bitumen for asphalt SAMI shall meet the performance characteristics as stated in table 21.11.

Table 21.11 Performance requirements for polymer modified bitumen for asphalt SAMI		
Requirement	Standard	Category/Limit
Penetration at 25 °C	BS EN 1426 [Ref 2.N]	65-105
		75-130
Softening point	BS EN 1427 [Ref 4.N]	≥ 70
Elastic recovery at 25 °C	BS EN 13398 [Ref 3.N]	≥ 70
Cohesion using the force ductility method (50 mm/min traction)	BS EN 13589 [Ref 5.N]	≥ 2 at 5 °C

21.12 The requirements of "Designated standards" in Section 10 of GC 101 [Ref 21.N] shall apply to the polymer modified bitumen for asphalt SAMI.

Product requirements for asphalt SAMI

21.13 The requirements for "Product acceptance schemes" in Section 12 of GC 101 [Ref 21.N] shall apply to the asphalt SAMI.

21.14 Asphalt SAMI shall meet the following performance requirements as detailed in table 21.14.

Table 21.14 Performance requirements for asphalt SAMI		
Requirement	Standard	Category/Limit
Minimum target design binder	BS EN 12697-8 [Ref 12.N]	$B_{min8.5}$
Design air void content	BS EN 12697-8 [Ref 12.N]	V_{max4}
Resistance to permanent deformation (small device procedure A)	BS EN 12697-22 [Ref 11.N]	$WTR_{AIR5.0}$ at 45 °C
		RD_{AIR5} at 45 °C

21.15 Asphalt SAMI shall have undergone a System Installation Performance Trial (SIPT).

21.16 The Product Acceptance Scheme certificate for the asphalt SAMI shall demonstrate that the product has met the requirements of the SIPT.

Product documentation for asphalt SAMI

21.17 The following Documentation shall be submitted for asphalt SAMI prior to the commencement of the installation of the asphalt SAMI: Product Acceptance Scheme certificate.

21.18 The requirements for "Documentation" in Section 2 of GC 101 [Ref 21.N] shall apply to the asphalt SAMI.

Installation requirements for asphalt SAMI

21.19 Asphalt SAMI shall be supplied and installed by organisations registered to and operating in compliance with a quality management scheme in accordance with "Quality management schemes" in Section 7 of GC 101 [Ref 21.N].

21.20 Asphalt SAMI shall be installed in accordance with the manufacturer's installation method statement.

The guarantee period for asphalt SAMI

21.21 For a period of five years following the installation of the asphalt SAMI, not more than 10% of the cracks or joints recorded in the pavement surface prior to the installation of the asphalt SAMI shall manifest as reflective cracking in the surface course, where the length of pavement is segmented into 100 m lengths for the purposes of assessment.

Installation documentation for asphalt SAMI

21.22 The following Documentation for asphalt SAMI shall be submitted as continuous records: as built manual including the product name and all test results including records of the pre-crack investigation as detailed in 21.22.

21.23 The requirements of "Records" in Section 3 of GC 101 [Ref 21.N] shall apply to the documentation for asphalt SAMI.

22. Geosynthetics and steel meshes

General requirements, verification and documentation for geosynthetics and steel meshes

22.1 Geosynthetics and steel meshes shall be as specified in CC 205/WSR/022.

Geosynthetics and steel meshes					
Pavement course material reference	**Drawing/ model number**	**Description**	**Chainage from**	**Chainage to**	**Nominal overlay thickness**
(a)	(b)	(c)	(d)	(e)	(f)

a) Enter a unique reference, from options as defined in Pavement course materials of WSR 205/001, to define the corresponding reference for the material.
b) Enter text, to define the drawing or model number which contains the location where the geosynthetic or steel mesh is to be installed.

c) Enter text, to define the location of the geosynthetic or steel mesh [e.g. road name, direction, lane].

d) Enter a number in units of m, to define the start chainage of the geosynthetic or steel mesh installation.

e) Enter a number in units of m, to define the end chainage of the geosynthetic or steel mesh installation.

f) Enter a number in units of mm, to define the nominal overlay thickness for the geosynthetic or steel mesh.

22.2 Prior commencement of the works, the location of all transverse and longitudinal cracks and joints in the existing pavement surface where the geosynthetic or steel mesh is to be installed shall be recorded to a location accuracy of ± 1 m.

22.3 Verification shall be undertaken for the location of all transverse and longitudinal cracks and joints in the existing pavement surface where the geosynthetic or steel mesh is to be installed by assessment in accordance with CS 229 [Ref 19.N].

22.4 The frequency of recording of existing transverse and longitudinal cracks and joints shall be once prior to the commencement of the works.

22.5 The requirements for "Verification" in Section 14 of GC 101 [Ref 21.N] shall apply to the location of all transverse and longitudinal cracks and joints in the existing pavement surface where the geosynthetic or steel mesh is to be installed.

22.6 The following Documentation shall be submitted for the existing pavement surface where the geosynthetic or steel mesh is to be installed prior to the commencement of the works: the location of all transverse and longitudinal cracks and joints in the existing pavement surface in spatial data format (e.g. shape file) with linestrings in OSGB36.

Product requirements for geosynthetics and steel meshes

22.7 The requirements for "Product acceptance schemes" in Section 12 of GC 101 [Ref 21.N] shall apply to the use of geosynthetics and steel meshes.

22.8 Geosynthetics and steel meshes shall be compliant with BS EN 15381 [Ref 22.N].

22.9 The geosynthetics and steel meshes shall meet the following performance characteristics: Annex ZA of BS EN 15381 [Ref 22.N].

22.10 The requirements of "Designated standards" in Section 10 of GC 101 [Ref 21.N] shall apply to geosynthetics and steel meshes.

Product documentation for geosynthetics and steel meshes

22.11 The following Documentation shall be submitted for geosynthetics and steel meshes prior to the commencement of installation of geosynthetics and steel meshes: Product Acceptance Scheme certificate.

22.12 The requirements for "Documentation" in Section 2 of GC 101 [Ref 21.N] shall apply to the Product Acceptance Scheme certificate for geosynthetics and steel meshes.

Installation requirements for geosynthetics and steel meshes

22.13 Geosynthetics and steel meshes shall be supplied and installed by organisations registered to and operating in compliance with a quality management scheme in accordance with "Quality management schemes" in Section 7 of GC 101 [Ref 21.N].

22.14 Geosynthetics and steel meshes shall be installed in accordance with the manufacturer's installation method statement.

22.15 Trafficking of the installed geosynthetic and steel mesh shall be limited to construction equipment used to construct the overlying layers.

22.16 At the point of installation of the overlying layers, the surface of the installed geosynthetic or steel mesh shall be free from foreign matter, standing water and ice.

22.17 Prior to and during the installation of the overlying layers, the installed geosynthetic or steel mesh shall remain bonded to the substrate without separation or creasing.

22.18 Following the installation of the overlying asphalt, the substrate, geosynthetic or steel mesh, and overlying asphalt shall be bonded.

The guarantee period for geosynthetics and steel meshes

22.19 For a period of five years following the installation of the geosynthetic or steel mesh, not more than 10% of the cracks or joints recorded in the pavement surface prior to the installation of the geosynthetic or steel mesh shall manifest as reflective cracking in the surface course, where the length of pavement is segmented into 100 m lengths for the purposes of assessment.

Installation documentation for geosynthetics and steel meshes

22.20 The following documentation shall be submitted for geosynthetics and steel meshes following the completion of the works: as built manual including product name, test results, and the location of all transverse and longitudinal cracks and joints in the existing pavement surface in spatial data format.

23. Thin surface course systems for maintenance

General requirements for thin surface course systems for maintenance

23.1 Thin surface course systems (TSCS) for maintenance shall be as specified in CC 205/WSR/023.

Thin surface course systems (TSCS) for maintenance					
Pavement course material reference	**Location type**	**Maximum nominal aggregate size**	**Binder type**	**Maximum noise level**	**Fuel resisting properties**
(a)	(b)	(c)	(d)	(e)	(f)

a) Enter a unique reference, from options as defined in Pavement course materials of WSR 205/001, to define the corresponding reference for the material.
b) Enter a value, from options High speed roads, Lower speed roads, Roundabouts on high speed roads, Roundabouts on lower speed roads, to define the Location type.

c) Enter one or more values, from options 14 mm, 10 mm, 6 mm, to define the maximum nominal aggregate size for the TSCS.

d) Enter one or more values, from options Polymer modified bitumen (PMB), Paving grade bitumen, to define the permitted binder type in the mixture.

e) Enter a value, from options Level 4 [- 6 dB(A)], Level 3 [-3.5 dB(A)], Level 2 [-2.5 dB(A)], Level 1 [-0.5 dB(A)], Level 0 [+1.2 dB(A)], No requirement, to define the road/tyre noise level.

f) Enter a value, from options Ci_{max6}, No requirement (Ci_{maxNR}), to define the fuel resisting properties (applicable to TSCS used in lay-bys, emergency areas and maintenance hardstanding locations).

23.2 TSCS for maintenance shall comply with "Thin surface course systems" in Section 15 of CC 202 [Ref 20.N].

23.3 TSCS for maintenance shall comply with the Surface regularity requirements and verification of surface courses in "General requirements

for maintenance of pavements with an asphalt surfacing" in Section 1 of this document.

23.4 Joints for TSCS for maintenance shall comply with "Formation of joints in bituminous layers for maintenance" in Section 10 of this document.

NI/23.5 The initial surface macrotexture depth for roads other than trunk roads and motorways shall be as stated in CC 205/WSR/023.

NI/SI.23.5 The initial surface macrotexture depth of TSCS for roads other than trunk roads and motorways shall be within the range [enter a number] to [enter a number] .

24. Coloured thin surface course systems for maintenance

General requirements for coloured thin surface course systems for maintenance

24.1 Coloured thin surface course systems (TSCS) for maintenance shall comply with "Coloured thin surface course systems" in Section 16 of CC 202 [Ref 20.N].

24.2 Coloured TSCS for maintenance shall comply with the Requirements and verification of surface regularity of surface courses in "General requirements for maintenance of pavements with an asphalt surfacing" in Section 1 of this document.

24.3 Joints for coloured TSCS for maintenance shall comply with "Formation of joints in bituminous layers for maintenance" in Section 10 of this document.

25. Performance hot rolled asphalt surface course for maintenance

General requirements for performance hot rolled asphalt surface course for maintenance

25.1 Performance hot rolled asphalt (HRA) surface course for maintenance shall be as specified in CC 205/WSR/025.

Performance hot rolled asphalt (HRA) surface course for maintenance		
Pavement course material reference	**Road type**	**Fuel resisting properties**
(a)	(b)	(c)

a) Enter a unique reference, from options as defined in Pavement course materials of WSR 205/001, to define the corresponding reference for the material.
b) Enter a value, from options High speed roads, Lower speed roads, Roundabouts on high speed roads, Roundabouts on lower speed roads, to define the road type to select the appropriate surface macrotexture depth.

c) Enter a value, from options Ci_{max6}, No requirement (Ci_{maxNR}), to define the fuel resisting properties of the performance HRA surface course.

25.2 Performance HRA surface course for maintenance shall comply with "Performance hot rolled asphalt surface course " in Section 17 of CC 202 [Ref 20.N].

26. Recipe and designed hot rolled asphalt surface course for maintenance

General requirements for recipe and designed hot rolled asphalt surface course for maintenance

26.1 Recipe and designed hot rolled asphalt (HRA) surface course for maintenance shall be as specified in CC 205/WSR/026.

Recipe and designed hot rolled asphalt (HRA) surface course for maintenance			
Pavement course material reference	**Coated chippings**	**Installation requirements**	**Surface level requirements**
(a)	(b)	(c)	(d)

a) Enter a unique reference, from options as defined in Pavement course materials of WSR 205/001, to define the corresponding reference for the material.
b) Enter one or more values, from options 14/20 mm, 8/14 mm, Not required, to define the size of the coated chippings.

c) Enter text, to define the installation requirements for the mixture.

d) Enter text, to define the surface level requirements for the mixture relative to the design level.

26.2 Recipe and designed HRA surface course for maintenance shall comply with "Recipe and designed hot rolled asphalt surface course " in Section 18 of CC 202 [Ref 20.N].

Installation requirements for recipe and designed HRA surface course for maintenance

26.3 Recipe and designed HRA surface course shall be installed by organisations registered to and operating in compliance with a quality management scheme in accordance with "Quality management schemes" in Section 7 of GC 101 [Ref 21.N].

26.4 Prior to placing bituminous mixtures on any new or existing bound substrate, a bond coat shall be applied in accordance with BS 594987 [Ref 1.N], unless otherwise stated in CC 205/WSR/026.

26.5 Recipe and designed HRA surface course shall be transported, laid and compacted in accordance with BS 594987 [Ref 1.N], unless otherwise stated in CC 205/WSR/026.

26.6 The initial surface macrotexture depth of chipped recipe and designed HRA surface course before opening to traffic shall be in accordance with table 26.6, unless otherwise stated in CC 205/WSR/026.

Table 26.6 Initial surface macrotexture depth of chipped recipe and designed HRA surface course

Location type	Mean per 1,000 m section (mm)		Mean for a set of 10 measurements (mm)
	Minimum	Maximum	Minimum
High speed roads Posted speed limit ≥ 50 miles/hour (80 km/hr)	1.5	2.0	1.2
Lower speed roads Posted speed limit ≤ 40 miles/hour (65 km/hr)	1.2	1.7	1.0
Roundabouts on high speed roads Posted speed limit ≥ 50 miles/hour (80 km/hr)	1.2	1.7	1.0
Roundabouts on lower speed roads Posted speed limit ≤ 40 miles/hour (65 km/hr)	1.0	1.5	0.9

26.7 Verification shall be undertaken for the initial surface macrotexture depth of chipped recipe and designed HRA surface course by measurement in accordance with BS EN 13036-1 [Ref 31.N].

26.8 The frequency of the initial surface macrotexture depth of chipped recipe and designed HRA surface course shall be 10 individual measurements at 5 m spacing along a diagonal line across the lane width with one set per 250 m of carriageway lane.

26.9 The requirements for "Verification" in Section 14 of GC 101 [Ref 21.N] shall apply to the measurement of the initial surface macrotexture depth of chipped recipe and designed HRA surface course.

27. Recipe asphalt concrete surface, binder, and base courses for maintenance

General requirements for recipe asphalt concrete surface, binder, and base courses for maintenance

27.1 Recipe asphalt concrete surface, binder, and base courses for maintenance shall be as specified in CC 205/WSR/027.

Recipe asphalt concrete surface, binder, and base courses for maintenance		
Pavement course material reference	**Installation requirements**	**Surface level requirements**
(a)	(b)	(c)

a) Enter a unique reference, from options as defined in Pavement course materials of WSR 205/001, to define the corresponding reference for the material.
b) Enter text, to define the installation requirements for the mixture.

c) Enter text, to define the surface level requirements for the mixture relative to the design level.

27.2 Recipe asphalt concrete surface, binder, and base courses for maintenance shall comply with "Recipe asphalt concrete surface, binder, and base courses " in Section 19 of CC 202 [Ref 20.N].

Installation requirements for recipe asphalt concrete surface, binder and base courses

27.3 Recipe asphalt concrete surface, binder and base courses shall be installed by organisations registered to and operating in compliance with a quality management scheme in accordance with "Quality management schemes" in Section 7 of GC 101 [Ref 21.N].

27.4 Prior to placing bituminous mixtures on any new or existing bound substrate, a bond coat shall be applied in accordance with BS 594987 [Ref 1.N], unless otherwise stated in CC 205/WSR/027.

27.5 Recipe asphalt concrete surface, binder and base courses shall be transported, laid and compacted in accordance with BS 594987 [Ref 1.N], unless otherwise stated in CC 205/WSR/027.

28. Bituminous mixtures overlaying waterproofing on concrete bridge decks

General requirements for bituminous materials over waterproofing on concrete bridge decks

28.1 Bituminous mixtures over waterproofing on concrete bridge decks shall be as specified in CC 205/WSR/028.

Bituminous mixtures over waterproofing on concrete bridge decks	
Pavement course material reference	**Installation requirements**
(a)	(b)

a) Enter a unique reference, from options as defined in Pavement course materials of WSR 205/001, to define the corresponding reference for the material.
b) Enter text, to define the installation requirements for the mixture.

28.2 Bituminous mixtures over waterproofing on concrete bridge decks shall comply with "Bituminous mixtures overlaying waterproofing on concrete bridge decks" in Section 20 of CC 202 [Ref 20.N].

29. Crack sealing treatment to flexible pavement layers

General requirements for crack sealing treatments to flexible pavement layers

29.1 Crack sealing treatment to flexible pavement layers shall be as specified in CC 205/WSR/029.

Crack sealing treatment to flexible pavement layers					
Drawing/ model number	**Treatment ID**	**Treatment type**	**Material grade**	**Nominal sealing width (mm)**	**Nominal sealing depth (mm)**
(a)	(b)	(c)	(d)	(e)	(f)

a) Enter text, to define the drawing or model number that outlines the location and extents of the crack sealing treatments.
b) Enter a unique reference.

c) Enter one or more values, from options Fill, Overband, Fill and Overband, Inlaid sealing, Rout and seal, to define the type of treatment to be used for the crack sealing treatment.

d) Enter one or more values, from options F, H, Type N2, No requirement, to define the grade of the material to be used for the crack sealing treatment.

e) Enter text, to define the nominal sealing width for the crack sealing treatment.

f) Enter text, to define the nominal sealing depth for the crack sealing treatment.

Crack sealing treatment to flexible pavement layers (continued)				
Drawing/model number	**Crack length**	**Crack orientation**	**Layer to be treated**	**Limitations on crack sealing treatment**
(a)	(g)	(h)	(i)	(j)

g) Enter a number in units of m, to define the length of the crack to be treated.

h) Enter text, to define the orientation of the crack to be sealed to the direction of traffic.

i) Enter a value, from options Surface layer, Sub-surface layer, to define the type of layer to be treated.

j) Enter text, to define any limitations on the usage of the crack sealing treatment (i.e. depth and/or width of treatment) based on product or design requirements.

Product requirements for crack sealing treatments to flexible pavement layers

29.2 The requirements for "Product acceptance schemes" in Section 12 of GC 101 [Ref 21.N] shall apply to overbanding and inlaid crack sealing systems for crack sealing treatments to flexible pavement layers.

29.3 Overbanding and inlaid crack sealing systems for crack sealing treatments to flexible pavement layers shall be as per with table 29.3.

Table 29.3 Performance characteristics for overbanding and inlaid crack sealing systems

Performance characteristic	Requirement	Method	Applicability
Tensile adhesion	≥ 50 MPa initial	TRL 176 [Ref 25.N]	All systems
Tensile adhesion	≥ 60%	TRL 176 [Ref 25.N] after heat ageing at 70 ± 2 °C for 28 days	All systems
Skid resistance value	≥ 60	BS EN 13036-4 [Ref 30.N]	All systems
Resistance to permanent deformation	$WTR_{AIR5.0}$	BS EN 12697-22 [Ref 11.N] (small device, procedure A at 50 °C)	Grade F only
	$RD_{AIR10.0}$		
Resistance to permanent deformation	$WTR_{AIR5.0}$	BS EN 12697-22 [Ref 11.N] (small device, procedure A at 50 °C)	Grade H only
	$RD_{AIR7.0}$		
SRV after wheel tracking at 50 °C	≥ 50	BS EN 13036-4 [Ref 30.N]	All systems

29.4 Overbanding and inlaid crack sealing systems for crack sealing treatments to flexible pavement layers shall be assessed for elastic behaviour under the Product Acceptance Scheme.

29.5 Hot-applied sealants for crack sealing treatments to flexible pavement layers shall be compliant with BS EN 14188-1 [Ref 24.N].

29.6 The hot-applied sealants shall meet the following performance characteristics: Type N2.

29.7 The requirements of "Designated standards" in Section 10 of GC 101 [Ref 21.N] shall apply to hot-applied sealants for crack sealing treatments to flexible pavement layers.

Product documentation for crack sealing treatments to flexible pavement layers

29.8 The following Documentation shall be submitted for overbanding and inlaid crack sealing systems for crack sealing treatments to flexible pavement layers prior to the commencement of the works: Product Acceptance Scheme certificate.

29.9 The requirements for "Documentation" in Section 2 of GC 101 [Ref 21.N] shall apply to the Product Acceptance Scheme certificate for overbanding and inlaid crack sealing systems for crack sealing treatments to flexible pavement layers.

Installation requirements and documentation for overbanding and inlaid crack sealing systems

29.10 Crack sealing treatments to flexible pavement layers shall be installed in accordance with the system manufacturer's installation instructions.

29.11 The following Documentation shall be submitted for crack sealing treatments to flexible pavement layers prior to the commencement of the works: system installation method statement including acceptable weather conditions.

29.12 Overband systems shall be installed not more than 40 mm wide.

29.13 Overband systems shall be installed not more than 3 mm thick.

29.14 Prior to opening to traffic, crack sealing treatments in surface layers shall have a skid resistance value (SRV) of not less than 60, when tested in accordance with BS EN 13036-4 [Ref 30.N] using the pendulum test, except for sealant widths less than 75 mm, where the narrow slider is to be used over the full 126 mm sliding length utilising the normal slider scale C.

Installation requirements for hot applied sealants for crack sealing treatments to flexible pavement layers

29.15 Cracks or joints to receive hot applied sealant shall be not more than 20 mm wide.

29.16 Prior to the application of the hot applied sealant, the edges of cracks or joints in bituminous layers to receive hot applied sealant shall be sawn or routed out.

29.17 Cracks or joints to receive hot applied sealant shall be dry and free from debris and slurry.

29.18 Hot applied sealants shall be applied in accordance with the sealant manufacturer's instructions.

30. Saw-cut and seal treatment to bituminous overlays on existing jointed concrete pavements

General requirements for saw-cut and seal treatment to bituminous overlays on existing jointed concrete pavements

30.1 Saw-cut and seal treatment to bituminous overlays on existing jointed concrete pavements shall be as specified in CC 205/WSR/030.

Saw-cut and seal treatment to bituminous overlays on existing jointed concrete pavements						
Drawing/ model number	**Description**	**Chainage from**	**Chainage to**	**Bituminous overlay thickness**	**Joint spacing**	**Joint orientation**
(a)	(b)	(c)	(d)	(e)	(f)	(g)

a) Enter text, to define the drawing or model number which outlined the location of the saw-cut and seal treatment.
b) Enter text, to define the location of the treatment [including road name, direction].

c) Enter a number in units of m, to define the start chainage treatment.

d) Enter a number in units of m, to define the end chainage treatment.

e) Enter a number in units of mm, to define the bituminous overlay thickness over the existing jointed concrete pavement.

f) Enter a number in units of m, to define the spacing of the joints to receive the saw-cut and seal treatment.

g) Enter one or more values, from options Transverse, Longitudinal, to define the orientation of the joints to receive the saw-cut and seal treatment.

Product requirements for saw-cut and seal treatment to bituminous overlays on existing jointed concrete pavements

30.2 Sealant for the saw-cut and seal treatment shall be compliant with BS EN 14188-1 [Ref 24.N].

30.3 The sealant for the saw-cut and seal treatment shall meet the following performance characteristics: Type N1.

30.4 The requirements of "Designated standards" in Section 10 of GC 101 [Ref 21.N] shall apply to the sealant for the saw-cut and seal treatment.

Installation requirements and verification for saw-cut and seal treatment to bituminous overlays on existing jointed concrete pavements

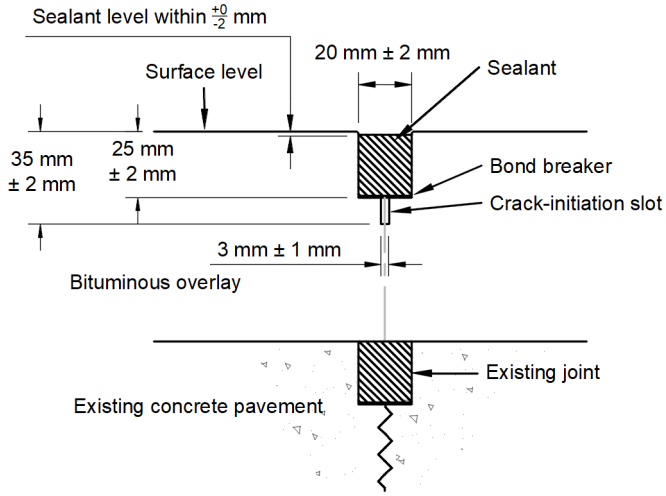
30.5 The saw-cut and seal treatment shall be completed within 24 hours of the bituminous overlay being applied.

30.6 From the point of bituminous overlay until the slot has been sealed, the area to receive saw-cut and seal treatment shall be free from trafficking from vehicles other than those performing the saw-cut and seal treatment.

30.7 Following the application of the bituminous overlay and before the saw-cut and seal treatment, the location of the underlying joint groove in the concrete pavement shall be marked on the surface of the bituminous overlay.

30.8 The saw-cut and seal treatment to bituminous overlays with a thickness of more than 50 mm shall be undertaken in accordance with figure 30.8.

Figure 30.8 Saw-cut and seal treatment to bituminous overlays with a thickness of more than 50 mm



30.9 The saw-cut and seal treatment to bituminous overlays with a thickness of more than 50 mm shall comprise a sealant groove and a crack initiation slot.

Sealant groove formation

30.10 The sealant groove and any crack initiation slot shall be formed in one operation.

30.11 The crack initiation slot shall be centred in the sealant groove.

30.12 The sealant grooves in bituminous overlays with a thickness of more than 50 mm shall be 20 mm wide ± 2 mm.

30.13 Verification shall be undertaken for the sealant groove dimensions by measurement at three locations along the joint.

30.14 The frequency of sealant groove dimension measurement shall be 1 per 5 joints.

30.15 The requirements for "Verification" in Section 14 of GC 101 [Ref 21.N] shall apply to the measurement of the sealant groove dimensions.

30.16 Crack initiation slots in bituminous overlays with a thickness of more than 50 mm shall be 3 mm wide ± 1 mm.

30.17 Sealant grooves in bituminous overlays with a thickness of 50 mm or less shall be to the full depth of the bituminous overlay.

30.18 Sealant grooves in bituminous overlays with a thickness of 50 mm or less shall be the same width as the underlying joint groove in the concrete pavement.

30.19 Following the formation of the sealant groove and any crack initiation slot, the horizontal distance from the edge of the sealant groove in the bituminous overlay to the joint arris in the underlying concrete shall be in accordance with table 30.19.

Table 30.19 Alignment tolerance from the edge of the sealant groove in the asphalt to the edge of the joint arris in the underlying concrete

Bituminous overlay thickness (mm)	Horizontal distance from the edge of the sealant groove in the bituminous overlay to the joint arris in the underlying concrete
≤ 50	Not more than 2 mm
> 50 - ≤ 70	Not more than 5 mm
> 70 mm	Not more than 10 mm

30.20 Verification shall be undertaken for the horizontal distance from the edge of the sealant groove in the bituminous overlay to the joint arris in the underlying concrete by measurement at three locations along the joint.

30.21 The frequency of sealant groove alignment measurement shall be each joint.

30.22 The requirements for "Verification" in Section 14 of GC 101 [Ref 21.N] shall apply to the measurement of the alignment of the sealant groove.

30.23 Debris and slurry in the sealant groove and any crack initiation slot and on the road surface produced by the saw-cutting operation shall be removed prior to the application of bond breaker tape.

30.24 Prior to the sealant application and following the cleaning of the sealant groove, bond breaker tape shall be applied to the entire horizontal face of the sealant groove.

Sealant installation

30.25 At the point of installation of the sealant, the sealant groove shall be clean, dry and free from frost.

30.26 Installation of the sealant shall be in accordance with BS 10948 [Ref 32.N].

30.27 Prior to opening to traffic, the installed sealant shall be level with the bituminous overlay + 0 / - 2 mm.

30.28 Verification shall be undertaken for the installed sealant level by measurement in accordance with BS 10948 [Ref 32.N].

30.29 The frequency of installed sealant level measurement shall be 1 per 5 joints.

30.30 The requirements for "Verification" in Section 14 of GC 101 [Ref 21.N] shall apply to the measurement of the level of the installed sealant.

Installation documentation for saw-cut and seal treatment to bituminous overlays on existing jointed concrete pavements

30.31 The following Documentation for saw-cut and seal treatment to bituminous overlays on existing jointed concrete pavements shall be submitted as continuous records: : Sealant groove dimensions and alignment, sealant installation weather conditions, sealant storage and installation temperatures and installed sealant level.

30.32 The requirements of "Records" in Section 3 of GC 101 [Ref 21.N] shall apply to the saw-cut and seal treatment to bituminous overlays on existing jointed concrete pavements.

31. Local repairs to asphalt surfaces

General requirements for local repairs to asphalt surfaces

31.1 Local repairs to asphalt surfaces shall be as specified in CC 205/WSR/031.

Local repairs to asphalt surfaces					
Local repair location	**Local repair area**	**Permitted techniques for local repair**	**Permitted local repair materials and thicknesses**	**Minimum PSV**	**Maximum AAV**
(a)	(b)	(c)	(d)	(e)	(f)

a) Enter text, to define the location of the local repair [including road name, direction, lane, GPS coordinates].
b) Enter a number in units of m^2, to define the local repair area.

c) Enter a unique reference, to define the permitted techniques for the local repair.

d) Enter text, to define the permitted materials and thicknesses for the local repair.

e) Enter a number, to define the minimum polished stone value (PSV) of the coarse aggregate or coated chippings in the surface course.

f) Enter a number, to define the maximum aggregate abrasion value (AAV) of the coarse aggregate or coated chippings in the surface course.

Product requirements for local repairs to asphalt surfaces

31.2 Mastic asphalt for local repairs to asphalt surfaces shall be compliant with BS EN 13108-6 [Ref 10.N].

31.3 The mastic asphalt for local repairs to asphalt surfaces shall meet the performance characteristics as stated in table 31.6.

31.4 The requirements of "Designated standards" in Section 10 of GC 101 [Ref 21.N] shall apply to mastic asphalt for local repairs to asphalt surfaces.

Proprietary products for local repairs to asphalt surfaces

31.5 The requirements for "Product acceptance schemes" in Section 12 of GC 101 [Ref 21.N] shall apply to proprietary products for local repairs to asphalt surfaces.

31.6 The performance requirements in table 31.6 shall be declared in the product acceptance scheme certificate of proprietary products for local repairs to asphalt surfaces.

Table 31.6 Performance requirements for proprietary products for local repairs to asphalt surfaces

Requirement	Standard	Category/Limit
Wet skid resistance value (SRV)	BS EN 13036-4 [Ref 30.N]	≥ 60
Initial surface macrotexture depth	BS EN 13036-1 [Ref 31.N]	≥ 0.8 mm
Water sensitivity	BS EN 12697-12 [Ref 9.N]	$ITSR_{70}$
Resistance to permanent deformation	BS EN 12697-22 [Ref 11.N]	$WTS_{AIR1.0}$ at 60 °C
Stiffness	BS EN 12697-26 [Ref 15.N]	≥ 1000 MPa at 20 °C

31.7 The performance requirements in table 31.7 shall be declared in the product acceptance scheme certificate of proprietary products for local repairs to asphalt surfaces installed with infra-red thermal repair techniques.

Table 31.7 Performance requirements for proprietary products for local repairs to asphalt surfaces installed with infra-red thermal repair techniques

Requirement	Standard	Category/Limit
Air voids	In accordance with BS EN 12697-8 [Ref 12.N] and the relevant bulk densities defined in Appendix B of BS EN 12697-20 [Ref 13.N]	< 8% average of a pair of cores taken from an area less than 5 m^2 in size.
Torque bond	In accordance with BS EN 12697-48 [Ref 14.N]	535 kPa in area within a local repair less than 5 m^2 in size.
Wet skid resistance value (SRV)	BS EN 13036-4 [Ref 30.N]	≥ 60
Initial surface macrotexture depth	BS EN 13036-1 [Ref 31.N]	≥ 0.8 mm
Water sensitivity	BS EN 12697-12 [Ref 9.N]	$ITSR_{70}$
Resistance to permanent	BS EN 12697-22 [Ref 11.N]	$WTS_{AIR1.0}$ at 60 °C

deformation		
Stiffness	BS EN 12697-26 [Ref 15.N]	≥ 1000 MPa at 20 °C

Product documentation for proprietary products for local repairs to asphalt surfaces

31.8 The following Documentation shall be submitted for proprietary products for local repairs to asphalt surfaces prior to the commencement of installation: Product Acceptance Scheme certificate.

31.9 The requirements for "Documentation" in Section 2 of GC 101 [Ref 21.N] shall apply to the Product Acceptance Scheme for proprietary products for local repairs to asphalt surfaces.

Installation requirements for local repairs of asphalt surfaces

Inset patch repairs

31.10 Inset patch repairs shall be undertaken by organisations registered to and operating in compliance with a quality management scheme in accordance with "Quality management schemes" in Section 7 of GC 101 [Ref 21.N].

31.11 Where inset patch repairs are undertaken, the full depth of the existing surface course shall be removed.

31.12 The edges of inset patch repairs shall be saw-cut or mechanically removed to form a rectangular or rounded shape extending at least 250 mm beyond the edge of any defect.

31.13 The edges of inset patch repairs shall be situated outside of wheel track zones, where wheel track zones are 600 mm wide with the inside edges offset from the centre of the lane by 720 mm.

31.14 The edges of inset patch repairs shall be vertical for the full depth of the removed layer.

31.15 The edges of successive layers for inset patch repairs shall be offset by not less than 150 mm.

31.16 Inset patch repairs greater than 1.0 m^2 shall be undertaken with bituminous mixtures.

31.17 Following the completion of inset patch repairs, the surface regularity of the inset patch shall comply with the Requirements and verification of surface regularity of surface courses in "General requirements for maintenance of pavements with an asphalt surfacing" in Section 1 of this document.

31.18 Following the completion of inset patch repairs, the surface level of the inset patch shall be at the level of the adjacent surfacing within the following tolerances: + 5 / - 0 mm.

31.19 Prior to opening to traffic and for two years, inset patch repairs shall have a skid resistance value (SRV) of not less than 60, when tested in accordance with BS EN 13036-4 [Ref 30.N].

Infra-red thermal patch repairs

31.20 Infra-red thermal patch repairs shall be undertaken by organisations registered to and operating in compliance with a quality management scheme in accordance with "Quality management schemes" in Section 7 of GC 101 [Ref 21.N].

31.21 Infra-red thermal patch repairs shall be undertaken in accordance with the installation method statement.

31.22 Following the completion of infra-red thermal patch repairs, the surface regularity of the infra-red thermal patch shall comply with the Requirements and verification of surface regularity of surface courses in "General requirements for maintenance of pavements with an asphalt surfacing" in Section 1 of this document.

31.23 Following the completion of infra-red thermal patch repairs, the surface level of the infra-red thermal patch shall be at the level of the adjacent surfacing within the following tolerances: + 5 / - 0 mm.

31.24 Prior to opening to traffic and for two years, infra-red thermal patch repairs shall have a SRV of not less than 60, when tested in accordance with BS EN 13036-4 [Ref 30.N].

Paver-laid patch repairs

31.25 Paver-laid patch repairs shall be undertaken by organisations registered to and operating in compliance with a quality management scheme in accordance with "Quality management schemes" in Section 7 of GC 101 [Ref 21.N].

31.26 Bituminous layers to be removed prior to paver-laid patch repairs shall be removed in accordance with "Removal of bound pavement layers" in Section 5 of this document.

31.27 Paver-laid patch repairs to base and binder course layers shall be not less than 5 m in length.

31.28 Paver-laid patch repairs to surface course layers shall be not less than 15 m in length.

31.29 Where paver-laid patch repairs are undertaken, the full depth of the existing surface course shall be removed.

31.30 Longitudinal joints in surface course layers in paver-laid patch repairs shall be situated at lane edges.

31.31 Longitudinal joints in base and binder course layers in paver-laid patch repairs shall be situated outside of wheel track zones, where wheel track zones are 600 mm wide with the inside edges offset from the centre of the lane by 720 mm.

31.32 Following the completion of paver-laid patch repairs, the surface level of the paver-laid patch shall be at the level of the adjacent surfacing within the following tolerances: + 5 / - 0 mm.

31.33 Following the completion of paver-laid patch repairs, the surface regularity of the paver-laid patch shall comply with the Requirements and verification of surface regularity of surface courses in "General requirements for maintenance of pavements with an asphalt surfacing" in Section 1 of this document.

Bituminous mixtures for local repairs to asphalt surfaces

31.34 Bituminous mixtures for local repairs to asphalt surfaces shall be installed in accordance with BS 594987 [Ref 1.N], unless otherwise stated in CC 205/WSR/031.

SI.31.34 The installation of bituminous mixtures for local repairs to asphalt surfaces shall be [enter free text].

31.35 Thin surface course systems for local repairs to asphalt surfaces shall be installed in accordance with the manufacturer's installation method statement.

Proprietary products for local repairs to asphalt surfaces

31.36 Proprietary products for local repairs to asphalt surfaces shall be installed in accordance with the manufacturer's installation method statement.

NI/32. Stone mastic asphalt surface course for maintenance

General requirements for stone mastic asphalt surface course for maintenance

NI/32.1 Stone mastic asphalt (SMA) surface course for maintenance shall comply with "Stone mastic asphalt surface course" in Section NI/21 of CC 202 [Ref 20.N].

NI/32.2 The installed SMA surface course shall comply with the Requirements and verification of surface regularity of surface courses in "General requirements for maintenance of pavements with an asphalt surfacing" in Section 1 of this document.

33. Normative references

The following documents, in whole or in part, are normative references for this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

Ref.	**Document**
Ref 1.N	BSI. BS 594987, 'Asphalt for roads and other paved areas. Specification for transport, laying, compaction and product type testing protocols'
Ref 2.N	BSI. BS EN 1426, 'Bitumen and bituminous binders. Determination of needle penetration'
Ref 3.N	BSI. BS EN 13398, 'Bitumen and bituminous binders. Determination of the elastic recovery of modified bitumen'
Ref 4.N	BSI. BS EN 1427, 'Bitumen and bituminous binders. Determination of the softening point. Ring and Ball method'
Ref 5.N	BSI. BS EN 13589, 'Bitumen and bituminous binders. Determination of the tensile properties of modified bitumen by the force ductility method'
Ref 6.N	BSI. BS EN 13808, 'Bitumen and bituminous binders. Framework for specifying cationic bituminous emulsions (Designated Standard - CPR)'
Ref 7.N	BSI. BS EN 14023, 'Bitumen and bituminous binders. Specification framework for polymer modified (Designated Standard - CPR)'
Ref 8.N	BSI. BS EN 12591, 'Bitumen and bituminous binders. Specifications for paving grade bitumens. (Designated Standard - CPR)'
Ref 9.N	BSI. BS EN 12697-12, 'Bituminous mixtures - Test methods: Determination of the water sensitivity of bituminous specimens'
Ref 10.N	BSI. BS EN 13108-6, 'Bituminous mixtures. Material specifications. Mastic Asphalt (Designated Standard - CPR)'
Ref 11.N	BSI. BS EN 12697-22, 'Bituminous mixtures. Test methods for hot mix asphalt. Wheel tracking'
Ref 12.N	BSI. BS EN 12697-8, 'Bituminous mixtures. Test methods. Determination of void characteristics of bituminous specimens'
Ref 13.N	BSI. BS EN 12697-20, 'Bituminous mixtures. Test methods. Indentation using cube or Marshall specimens'

Ref 14.N	BSI. BS EN 12697-48, 'Bituminous mixtures. Test methods. Interlayer Bonding '
Ref 15.N	BSI. BS EN 12697-26, 'Bituminous mixtures. Test methods. Stiffness.'
Ref 16.N	BSI. BS EN 12697-13, 'Bituminous mixtures. Test methods. Temperature measurement'
Ref 17.N	BSI. BS EN 197-1, 'Cement. Composition, specifications and conformity criteria for common cements. (Designated Standard - CPR)'
Ref 18.N	BSI. BS EN 197-5, 'Cement. Portland-composite cement CEM II/C-M and Composite cement CEM VI'
Ref 19.N	National Highways. CS 229, 'Data for pavement assessment'
Ref 20.N	National Highways. CC 202 'Flexible pavement construction'
Ref 21.N	National Highways. GC 101 'General requirements for the Specification for Highway Works'
Ref 22.N	BSI. BS EN 15381, 'Geotextiles and geotextile-related products. Characteristics required for use in pavements and asphalt overlays'
Ref 23.N	BSI. BS 1924-2, 'Hydraulically bound and stabilized materials for civil engineering purposes. Sample preparation and testing of materials during and after treatment '
Ref 24.N	BSI. BS EN 14188-1, 'Joint fillers and sealants. Specifications for hot applied sealants (Designated Standard - CPR)'
Ref 25.N	TRL. J C Nicholls. TRL 176, 'Laboratory tests on high-friction surfaces for highways'
Ref 26.N	National Highways. CC 206 'Maintenance of concrete pavement layers'
Ref 27.N	BSI. BS 8420, 'Methods of measuring irregularities on surfaces of roads, footways and other paved areas using straightedges and wedges'
Ref 28.N	National Highways. CC 201 'Pavement foundation construction'
Ref 29.N	BSI. BS 9228, 'Recycling of roads and other paved areas using bitumen emulsion, foamed bitumen or hydraulic material. Materials, production, installation and product type testing. Specification. Specification for materials, production, installation and product type testing'
Ref 30.N	BSI. BS EN 13036-4, 'Road and airfield surface characteristics. Test methods - Method for measurement of slip/skid resistance of

	a surface: The pendulum test'
Ref 31.N	BSI. BS EN 13036-1, 'Road and airfield surface characteristics. Test methods. Measurement of pavement surface macrotexture depth using a volumetric patch technique'
Ref 32.N	BSI. BS 10948, 'The application and use of hot- and cold-applied joint sealant systems for concrete pavements. Code of practice '