

8 Preferred options for materials selection

	Option 1	Option 2	Option 3	Option 4	
Road Type 1					
Surface course	ST14 or ST10	ST14 or ST10	S1H	S1H	
Binder course	Bi1S	Bi1S	Bi1S	Bi1A	
Base	Ba1A	Ba1H	Ba1H	Ba1A	
	preferred	when overlaying /inlaying cracked material		When maximum stiffness is required	
Road type 2	Option 1	Option 2	Option 3	Option 4	
Surface course	ST14 or ST10	ST14 or ST10	S2H	S2H	
Binder course	Bi2S	Bi2H	Bi2H	Bi2C	
Base	Ba2A	Ba2H	Ba2H	Ba2C	
	preferred	when overlaying /inlaying cracked material		When maximum stiffness is required	
Road types 3 and 4	Option 1	Option 2	Option 3	Option 4	Option 5
Surface course	ST14 or ST10	ST14 or ST10	S3H	S3H	S3A
Binder course	Bi3S	Bi3H	Bi3H	Bi3A	Bi3A
Base	Ba3C	Ba3H	Ba3H	Ba3A	Ba3C
	preferred	when overlaying /inlaying cracked material		when maximum stiffness is required with HRA surface	cheapest solution for low speed/low stress sites
Footways					
Surface course	SFA	SFA			
Binder/base course	BiFC	BiFA			
Base Materials may not be necessary					

For details of materials see Draft Appendix 7/1 in Section 8

9 Draft Appendix 7/1 for preferred materials

9.1 Surface course materials			
Material Ref	Clause	Description	Special Requirements
ST 14	942	Thin Surface Course Systems TSCS 14	Thickness: Insert [in range 35mm-50mm] Traffic Count >600 cv/lane/day Stress Level: 2 Minimum Declared PSV: PSV _{xx} <i>[The minimum PSV to be inserted]</i> Maximum Aggregate Abrasion Value AAV ₁₂ Red colour: Both aggregate and binder shall be red to an approved mixture colour Minimum Wheel Tracking level required on BBS HAPAS Certificate: Level 2 Road / Tyre Noise Level Relative to HRA required on BBA HAPAS Certificate: Level 1 Minimum Compacted layer thickness: 35mm Average Macrotexture depth value: Level <i>[3, 2, or 1 as required NG 942]</i> Performance Guarantee Period: 5 years Surface Macrotexture – Performance Guarantee <i>[3, 2, or 1 as required NG 942]</i>
ST 10	942	Thin Surface Course Systems TSCS 10	Thickness: Insert [in range 25mm - 30mm] Traffic Count >600 cv/lane/day Stress Level: 2 Minimum Declared PSV: PSV _{xx} <i>[The minimum PSV to be inserted]</i> Maximum Aggregate Abrasion Value AAV ₁₂ Red colour: Both aggregate and binder shall be red to an approved mixture colour Minimum Wheel Tracking level required on BBS HAPAS Certificate: Level 2 Road / Tyre Noise Level Relative to HRA required on BBA HAPAS Certificate: Level 2 Minimum Compacted layer thickness: 25mm Average Macrotexture depth value: Level <i>[3, 2, or 1 as required NG 942]</i> Performance Guarantee Period: 5 years Surface Macrotexture – Performance Guarantee <i>[3, 2, or 1 as required NG 942]</i>
SAG	942.19	Surface applied Grit	0/4 clean dry or lightly coated grit Where required

9.1 Surface course materials			
Material Ref	Clause	Description	Special Requirements
S1H	911/943	Hot Rolled Asphalt HRA 35/14 F surf des PMB WTR 2 + PCC 14/20	Thickness: 50mm Grade of binder : a polymer modified binder to achieve the wheel tracking performance to PD 6691 Table C.3 Class 2 [Wheel Tracking test temperature 60°C] Coated chippings to PD 6618 C.8 Aggregate size 14/20 PSV _{xx} [XX PSV as required for site] AAV ₁₂ Deformation after installation: Required [CI 943:10] Red colour: Both aggregate and binder shall be red to an approved mixture colour
S2H	911/943	Hot Rolled Asphalt HRA 35/14 F surf des 40/60 WTR 1 + PCC 14/20	Thickness: 50mm Grade of binder : 40/60 pen paving grade or a polymer modified binder to achieve the wheel tracking performance to PD 6691 Table C.3 Class 1 [Wheel Tracking test temperature 45°C] Coated chippings to PD 6618 C.8 Aggregate size 14/20 PSV _{xx} [60 or 65 as required for site] AAV ₁₂ Deformation after installation: Required [CI 943:10] Red colour: Both aggregate and binder shall be red to an approved mixture colour
S3H	910	HRA 30/14 F surf 40/60 + PCC 14/20	Thickness: 40mm Coated chippings to PD 6618 C.8 Aggregate size 14/20 PSV _{xx} [60 or 65 as required for site] AAV ₁₂ Red colour: Both aggregate and binder shall be red to an approved mixture colour
S3A	912	Close Graded Asphalt Concrete Surface Course (AC10 Close Surf 40/60)	Thickness Insert [in range 25mm-35mm] Minimum declared PSV: PSV ₆₀ Maximum Aggregate Abrasion Value: AAV ₁₆ Binder Penetration: 40/60 pen
SFA	None	Dense Asphalt Concrete Surface Course (AC6 dense 100/150)	Thickness Insert [in range 20mm-30mm] Conform to EN13108:1 and PD6691:Annex B Minimum declared PSV: PSV ₅₀ Maximum Aggregate Abrasion Value: AAV ₁₆ Limestone fine aggregate shall not be used

9.2 Binder course materials [also suitable for regulating]			
Material Ref	Clause	Description	Special Requirements
Bi1S	937	SMA 14 bin 40/60 des WTR 2	Thickness: Insert [in range 35mm-60mm] Grade of binder : 40/60 pen paving grade or a polymer modified binder to achieve the wheel tracking performance to PD 6691 Table D.2 Class 2 [Wheel Tracking test temperature 60°C Deformation after installation: Required 937.6
Bi2S	937	SMA 14 bin 40/60 des WTR 1	Thickness: Insert [in range 35mm-60mm] Grade of binder : 40/60 pen paving grade or a polymer modified binder to achieve the wheel tracking performance to PD 6691 Table D.2 Class 1 [Wheel Tracking test temperature 45°C
Bi3S	937	SMA 10 bin 40/60	Thickness: Insert [in range 25mm-50mm]
SAG	942.19	Surface applied grit	Where required
Bi1H	943	HRA 60/20 bin 40/60* des WTR 2	Thickness: Insert [in range 45mm-80mm] * Grade of binder : 40/60 pen paving grade or a polymer modified binder to achieve the wheel tracking performance to PD 6691 Table C.3 Class 2 [Wheel Tracking test temperature 60°C]
Bi2H	943	HRA 60/20 bin 40/60* des WTR 1	Thickness: Insert [in range 45mm-80mm] *Grade of binder : 40/60 pen paving grade or a polymer modified binder to achieve the wheel tracking performance to PD 6691 Table C.3 Class 1 [Wheel Tracking test temperature 45°C]
Bi3H	943	HRA 60/20 bin 40/60	Thickness: Insert [in range 45mm - 80mm]
Bi2A	929	AC 20 HDM bin 40/60	Thickness: Insert [in range 50mm - 100mm] Composition PD 6691 Table B11 Volumetric properties after installation: Required [CI 929.3]
Bi3A	906	AC 20 dense bin 100/150	Thickness: Insert [in range 50mm - 100mm] Composition PD 6691 Table B11
For footways and cycleways			
BiFC	948	14 Cold Mix	Thickness: Insert [in range 40mm - 70mm] SVH or QVH as available Class B1
BiFA	906	AC14 dense bin 100/150	Thickness: Insert [in range 40mm - 55mm] Composition PD 6691 Table B14
For regulating (in addition)			
BiRH	911	HRA 50/10 F reg 40/60	Thickness: Insert [in range 20mm - 40mm]

9.3 Base materials			
Material Ref	Clause	Description	Special Requirements
Ba1H	929	HRA 60/32 base 40/60*	Thickness : Insert [in range 60mm - 150mm] *Grade of binder : 40/60 pen paving grade or a 30-45 depending upon stiffness required [CI 929.6] Volumetric properties after installation: Required [CI 929.3]
Ba2H	904	HRA 60/20 base 40/60	Thickness : Insert [in range 45mm - 80mm]
Ba2A		AC 32 HDM base 40/60	Thickness : Insert [in range 70mm - 150mm] Composition PD 6691 Table B11
Ba2C Ba3C	948	20 Cold mix	Thickness: Insert [in range 50mm - 100mm] QVH as available Class B2 Trafficking trial: Only if sand fines used [CI 948.8]
Ba3A	906	AC 20 dense base 40/60 rec	Thickness: Insert [in range 50mm - 100mm] Composition PD 6691 Table B.11
For footways and cycleways			
BaFC		14 Cold mix	Thickness: Insert [in range 40mm - 70mm] SVH or QVH as available Class B1
BaFA		AC14 dense base 100/150	Thickness: Insert [in range 40mm - 55mm] Composition PD 6691 Table B.14

10 Draft Bill of Quantities for preferred materials

Item No.	Description	Qty	Unit	Rate	Amount
	Surface Courses				
900.01	ST14 PSV 65 Macrottexture level 3, 2 or 1 Thickness 35mm		m ²		
900.02	ST14 Red Macrottexture level 3, 2 or 1 Thickness 35mm				
900.03	ST14 PSV 65 Macrottexture level 3, 2 or 1 Thickness 45mm thick		m ²		
900.04	EO 900.2 for ±5mm thickness		m ²		
900.05	ST14 PSV 60 Macrottexture level 3, 2 or 1 Thickness 35mm		m ²		
900.06	ST14 PSV 60 Macrottexture level 3, 2 or 1 Thickness 45mm thick		m ²		
900.07	EO 900.2 for ±5mm thickness		m ²		
900.08	ST10 PSV 65 Macrottexture level 3, 2 or 1 Thickness 25mm		m ²		
900.09	ST10 PSV 60 Macrottexture level 3, 2 or 1 Thickness 25mm		m ²		
900.10	ST10 Red Macrottexture level 3, 2 or 1 Thickness 25mm				
900.11	EO for 0/4 SAG		m ²		
900.12	S1H Thickness 50mm		m ²		
900.13	S2H Thickness 50mm		m ²		
900.14	S2H red				
900.15	S3H Thickness 40mm		m ²		
900.16	EO for 14/20 PCC 65PSV Macrottexture level 3, 2 or 1		m ²		
900.17	EO for 14/20 PCC 60PSV Macrottexture level 3, 2 or 1		m ²		
900.18	EO for red chippings				
900.19	S3A Thickness 35mm		m ²		
900.20	S3A Thickness 30mm		m ²		

Item No.	Description	Qty	Unit	Rate	Amount
900.21	S3A Thickness 25mm		m ²		
900.22	SFA Thickness 25mm		m ²		
900.23	EO 900.18 for ±5mm thickness		m ²		
	Binder courses				
901.01	Bi1S Thickness 35mm		m ²		
901.02	Bi1S Thickness 50mm		m ²		
901.03	EO 901.02 for ±5mm thickness		m ²		
901.04	Bi2S Thickness 35mm		m ²		
901.05	Bi2S Thickness 50mm		m ²		
901.06	EO 901.05 for ±5mm thickness		m ²		
901.07	Bi3S Thickness 25mm		m ²		
901.08	Bi3S Thickness 40mm		m ²		
901.09	EO 901.02 for ±5mm thickness		m ²		
901.10	EO for 0/4 SAG		m ²		
901.11	Bi1H Thickness 45mm		m ²		
901.12	Bi1H Thickness 60mm		m ²		
901.13	EO 901.12 for ±5mm thickness		m ²		
901.14	Bi2H Thickness 45mm		m ²		
901.15	Bi2H Thickness 60mm		m ²		
901.16	EO 901.15 per 5mm thickness change		m ²		
901.17	Bi3H Thickness 45mm		m ²		
901.18	Bi1H Thickness 60mm		m ²		
901.19	EO 901.12 per 5mm thickness change ±		m ²		
901.20	Bi2A Thickness 60mm		m ²		
901.21	EO 901.12 per 5mm thickness change ±		m ²		
901.22	Bi2A Thickness 90mm		m ²		
901.23	EO 901.22 per 5mm thickness change ±		m ²		
901.24	Bi3A Thickness 60mm		m ²		
901.25	EO 901.24 per 5mm thickness change ±		m ²		
901.26	Bi3A Thickness 90mm		m ²		
901.27	EO 901.26 per 5mm thickness change ±		m ²		
901.28	BiRH		tonnes		
	Base Course				
902.01	Ba2A Thickness 80mm		m ²		
902.02	EO 902.02 per 10mm thickness change ±		m ²		
902.03	Ba2H Thickness 65mm		m ²		

Item No.	Description	Qty	Unit	Rate	Amount
902.04	EO 902.03 per 5 mm thickness change ±		m ²		
902.05	Ba2A Thickness 65mm		m ²		
902.06	EO 902.05 per 5 mm thickness change ±		m ²		
902.07	Ba2A Thickness 90mm		m ²		
902.08	EO 902.07 per 5 mm thickness change ±		m ²		
902.09	Ba3A Thickness 65mm		m ²		
902.10	EO 902.09 per 5 mm thickness change ±		m ²		
902.11	Ba3A Thickness 90mm		m ²		
902.12	EO 902.11 per 5 mm thickness change ±		m ²		
902.13	Ba2C Thickness 65mm		m ²		
902.14	EO 902.13 per 5 mm thickness change ±		m ²		
902.15	Ba2C Thickness 90mm		m ²		
902.16	EO 902.15 per 5 mm thickness change ±		m ²		
902.17	BaFC Thickness 55mm		m ²		
902.18	EO 902.17 per 5 mm thickness change ±		m ²		
902.19	BaFA Thickness 90mm		m ²		
902.20	BaFA Thickness 55mm		m ²		
902.21	EO 902.20 per 5 mm thickness change ±		m ²		

Appendix 1: Translations of all mixes notified from BS to EN Standards

SURFACE COURSE

Current Name

BS594 -1

35%0/14 HRA F 4-8
30%0/14 HRAF 6kn (6-10kN)
30% 0/14 HRA des
30% 0/14 HRA 50
30% 0/14 HRA red
55% 0/14 HRA design
55% 0/14 HRA 50
50% 0/10 HRA
30% HRA PMB
0/2 Sand Carpet

European name

BS EN 13108- 4

HRA 35/14 F surf 40/60 des WTR 1
HRA 35/14 F surf PMB des WTR 2
HRA 30/14 F surf 40/60 des WTR 1
HRA 30/14 F surf 40/60 rec
HRA 30/14 F surf 40/60 red
HRA 55/14 F surf 40/60 des WTR
HRA 55 /14 F surf 40/60 rec
HRA 50 /10 F surf 40/60 rec
HRA 30/14 F surf PMB des WTR 2
HRA 0/2 C 40/60 rec

BS4987 -1

0/32 Close graded Surface Course
0/20 Close graded Surface Course
0/14 Close graded Surface Course
0/10 Close graded Surface Course 125
0/6 Close graded Surface Course 125
0/4 Fine graded Surface Course 125
0/10 Close graded Surface Course
0/6 Close graded Surface Course 190/300
0/10 Open graded Surface Course
0/6 Dense s/c
0/10 Medium graded Surface Course
0/6 Medium graded Surface Course
0/6 Medium graded Surface Course RED

BS EN 13018 -1

none
none
AC14 close surf 100/150
AC10 close surf 100/150
AC10 close surf 100/150
AC10 close surf 100/150
A pen grade has to be put
AC 6 dense surf 160/220
AC10 open surf 100/150
AC 6 dense surf 100/150
AC10 medium surf 100/150
AC6 medium surf 100/150
AC6 medium surf 100/150 red

0/6 Thin Surface Course system [TSCS]
PSV 55

0/10 TSCS PSV 65 /55/45
0/14 TSCS PSV 68+/65 /60/55
RED TSCS

6 HAPAS TSCS PSV 55

10 HAPAS TSCS PSV 65/55/45
14 HAPAS TSCS PSV 68+/65/60/55
14 HAPAS TSCS all red

RED SMA

0/10 Gen SMA PSV 68+/65/55
0/14 Gen SMA PSV 65
0/6 Gen SMA PSV 55

EN 13108-5

SMA 14 surf 40/60 red
SMA 10 surf 40/60 PSV 68+/65/55
SMA 14 surf 40/60 PSV 65
SMA 6 surf 40/60 PSV 55

Mastic Asphalt
6mm Red macamit
Coarse Cold Asphalt (1973)
Fine Cold Asphalt
TSCS Red/Green Clear Binder

EN13108-6
Proprietary
Obsolete
AC10 close surf 100/150
Proprietary

Only those in **bold** are recommended

WTR refers to wheel tracking Class in accordance with SHW Clause 952

APPENDIX 1

BINDER COURSE

Current Name

European name

BS594 -1

60% 0/32 HRA 35
60% 0/32HRA 50
50% 0/20HRA

60% 0/20 HRA

50% 0/14 HRA 35
50% 0/14 HRA
50% 0/10 HRA
35% 0/14 HRA
0/2 Sand Carpet

BS EN 13108- 4

HRA 60/32 bin 30/45
HRA 60/32 bin 40/60
HRA 50/20 bin 30/45
**HRA 60/20 bin 40/60 des
WTR 1 or 2**
HRA 60/20 bin 40/60
HRA 50/14 bin 30/45
HRA 50/14 bin 40/60
HRA 50/10 bin 40/60
Not available
HRA 0/2 C 40/60 rec

BS4987 -1

EME2
0/32 HMB35
0/20 HMB35
0/20 HDM50

0/20 HDM50 929
0/32 HDM50
0/32 DBM50
0/20 DBM50

0/20 DBM50 929
0/32 DBM125
0/20 DBM125
0/14 DBM125
0/10 DBM 125
0/6 DBM 125
0/20 DBM 190
0/10 DBM 190
0/20 Open Graded 200
0/14 Open Graded
0/10 Close Graded Surface Course

BS EN 13108- 1

AC 14 EME2 bin 15/25
AC 32 HMB bin 30/45
AC 32 HMB bin 30/45
AC 20 HDM bin 40/60
AC 20 HDM bin 40/60 des
WTR 1
AC 32 HDM bin 40/60
AC 32 dense bin 40/60
AC 20 dense bin 40/60
AC 20 dense bin 40/60 des
WTR 1
AC 32 dense bin 100/150
AC 20 dense bin 100/150
AC 14 close surf 100/150
AC 10 close surf 100/150
AC 6 close surf 100/150
AC 20 dense bin160/220
AC 10 close surf 160/220
AC 20 open bin 160/220
AC 14 open surf 160/220
AC 10 close surf 100/150

BS EN13108- 5

SMA 937 45C

0/14 SMA 937

0/10 SMA 937
cold lay macadam

See below
**SMA 14 bin 40/60 des
WTR 1 or 2**
**SMA 14 bin 40/60 des
WTR 1 or 2**
proprietary

Mastic Asphalt
Superflex

BS EN13108-6
Proprietary

Only those in **bold** are recommended

WTR refers to wheel tracking Class in accordance with SHW Clause 952 WTR Class 2 may require the use of PMB.

APPENDIX 1

BASE	
Current Name	European name
<hr/>	
BS594 -1	BS EN 13108- 4
60% 0/32 HRA	HRA 60/32 base 40/60
60% 0/32 HRA 35	HRA 60/32 base 30/45
60% 0/20 HRA	HRA 60/20 base 40/60
50% 0/14 HRA	HRA 50/14 reg 40/60
0/32 HRA china clay	Proprietary
<hr/>	
BS4987 -1	BS EN 13108- 1
40mm DBM/HDM	Obsolete
0/32 DBM 190	AC 32 dense base 160/220
0/32 DBM 125	AC 32 dense base 100/150
0/32 HDM50	AC 32 HDM base 40/60
0/32 DBM50	AC 32 dense base 40/60
0/20 DBM50	AC 20 dense base 40/60
0/20 HDM50	AC 20 HDM base 40/60
0/32 HMB35	AC 32 HMB base 30/45
Cold mix 948	Proprietary

Only those in **bold** are recommended