

APPENDIX 7/1: Permitted Pavement Options

1. Permitted Pavement Options – Schedule 1

Area	Permitted Pavement Option			
	Surface course only	Surface course and binder course	Surface course, binder course and base course	New road construction
A: Principal roads, classified A roads, urban classified B roads and industrial estate roads.	A1	A2	A3	A4
B: Urban distributor roads and urban bus routes.	B1	B2	B3	B4
C: Rural classified B roads, classified C roads and unclassified roads.	C1	C2	C3	C4
D: Bituminous general residential streets and car parks.	D1	D2	D3	D4
E: Block paved general residential streets, shared space roads and car parks.	Refer to Appendix 11/1			
F: Road humps and cushions.	-	F2	-	-
G: Site specific / special scenarios.	G - Site specific options including CI 942 or proprietary mixes to be submitted to the Overseeing Organisation for approval.			

Note, for general requirements refer to Schedule 2.

2. General Requirements – Schedule 2

Area		A	B	C	D	E	F
Grid for checking surface levels of pavement courses (<i>Clause 702.4</i>)*	Longitudinal dimension (m)	10	10	10	10	10	0.1
	Transverse dimension (m)	2	2	2	2	2	0.1
Surface regularity (<i>Clause 702.5, Table 7/2</i>)	Category of road	A	A	B	B	B	N/A
Interval for measurement of longitudinal regularity (<i>Clause 702.7</i>)		Entire length**					N/A
Interval for measurement of transverse regularity (<i>Clause 702.8</i>)		Entire length**					N/A

* Overseeing Organisation can request copies of dipping records at any time.

** Rolling straight edge measurements to be taken on entire length of carriageway in each trafficked lane and pro-rated as per Clause 702.4. Not required for maintenance works unless otherwise instructed by the Overseeing Organisation.

3. Permitted Construction Materials – Schedule 3

Note, regulating will only be permitted in surface course materials on surface course only works, as laying tolerances should be achieved in the base and binder course layers.

Pavement Options Area A	A1		A2		A3		A4	
Pavement layer	Material	Thickness (mm)	Material	Thickness (mm)	Material	Thickness (mm)	Material	Thickness (mm)
Surface course	HRA 35/14	50	HRA 35/14	50	HRA 35/14	50	HRA 35/14	50
Binder course	-	-	AC20 HDM	60	AC20 HDM	60	AC20 HDM	60
Base	-	-	-	-	AC32 HDM	150*	AC32 HDM	150*
Sub base	-	-	-	-	-	-	Type 1	450**
Total thickness	-	50	-	110	-	260	-	710

Pavement Options Area B	B1		B2		B3		B4	
Pavement layer	Material	Thickness (mm)	Material	Thickness (mm)	Material	Thickness (mm)	Material	Thickness (mm)
Surface course	HRA 55/14	45	HRA 55/14	45	HRA 55/14	45	HRA 55/14	45
Binder course	-	-	AC20	60	AC20	60	AC20	60
Base	-	-	-	-	AC32	150*	AC32	150*
Sub base	-	-	-	-	-	-	Type 1	450**
Total thickness	-	45	-	105	-	255	-	705



Pavement Options Area C	C1		C2		C3		C4	
Pavement layer	Material	Thickness (mm)	Material	Thickness (mm)	Material	Thickness (mm)	Material	Thickness (mm)
Surface course	AC14	40	AC14	40	AC14	40	AC14	40
Binder course	-	-	AC20	60	AC20	60	AC20	60
Base	-	-	-	-	AC32	150*	AC32	150*
Sub base	-	-	-	-	-	-	Type 1	450**
Total thickness	-	40	-	100	-	250	-	700

Pavement Options Area D	D1		D2		D3		D4	
Pavement layer	Material	Thickness (mm)	Material	Thickness (mm)	Material	Thickness (mm)	Material	Thickness (mm)
Surface course	AC10	30	AC10	30	AC10	30	AC10	30
Binder course	-	-	AC20	60	AC20	60	AC20	60
Base	-	-	-	-	AC32	150*	AC32	150*
Sub base	-	-	-	-	-	-	Type 1	450**
Total thickness	-	30	-	90	-	240	-	690

Pavement Options Area F	F2	
Pavement layer	Material	Thickness (mm)
Surface course	SMA10	30
Binder course	AC20	Varies
Total thickness	-	Varies

* For new roads with traffic loading >2msa a pavement design must be submitted to the Overseeing Organisation for approval. AC32 may be substituted for C20/25 concrete in haunching or small areas where compaction is a concern. AC32 may substituted for equivalent thickness in AC20 in small scale patching works.

** Sub base thickness assumes in-situ CBR of 2.5%. Where in-situ CBRs are <2.5% these areas are to be treated as soft spots and an engineered fill or reinforced sub base solution may be required. Sub base thickness is to be varied based on equilibrium CBR at formation level in accordance with IAN 73/06 Revision 1 (2009) Figure 3.1 (sub base only) or Figure 3.2 (sub base on capping). See below for summary of requirements. Overall subgrade type and condition will be considered, e.g. dried clay may achieve CBRs >15% but is likely to require sub base at the thickness required for 4% CBR. All designs to be submitted to the Overseeing Organisation for approval before construction commences.

Summary of Sub base and Capping Requirements in accordance with IAN 73/06 Revision 1
(2009)

Figure 3.1 (sub base only) or Figure 3.2 (sub base on capping)

CBR %	Subbase Only Figure 3.1 (mm)	Subbase on Capping Figure 3.2 (mm)	
		Sub Base	Capping
2.5	450	350	250
3	420	320	240
4	370	270	220
5	320	240	210
10	250	180	180

4. Requirements for Construction materials – Schedule 4

Material	Clause	Description	British Standard	General Requirements
HRA 35/14	910	HRA 35/14 F surf 40/60 rec	EN13108-4 / PD 6691 Annex C	60 PSV / AAV 12 *
HRA 55/14	911	HRA 55/14 F surf 40/60 des	EN13108-4 / PD 6691 Annex C	60 PSV / AAV 14 *
AC14	912	AC 14 close surf 70/100 rec	EN13108-1 / PD 6691 Annex B	60 PSV / AAV 14 *
AC10	912	AC 10 close surf 70/100 rec	EN13108-1 / PD 6691 Annex B	55 PSV / AAV 16 *
SMA10	912	SMA 10 surf 40/60	EN13108-5 / PD 6691 Annex D	55 PSV / AAV 16 *
AC20 HDM	906	AC20 HDM bin 40/60 rec	EN13108-1 / PD 6691 Annex B	
AC20	906	AC20 dense bin 40/60 rec	EN13108-1 / PD 6691 Annex B	
AC32 HDM	906	AC32 HDM base 40/60 rec	EN13108-1 / PD 6691 Annex B	
AC32	906	AC32 dense base 40/60 rec	EN13108-1 / PD 6691 Annex B	
20mm pre-coated chippings for HRA 35/14	915	20/14mm pre-coated chippings	BS EN 13108-4 / BSI PD 6691 Annex C	- 20/14mm aggregate size - PSV should not be less than 60 - AAV 12 max
High friction surfacing	924	High friction surfacing (colour to be specified).		- Minimum PSV 70 - Permitted colours buff / grey / black / green / red - Maximum AAV 5 - Minimum specific gravity 3 - Type 1 - Cold applied

* PSV may be adjusted in accordance with HD36/06; proposals are to be submitted to the Overseeing Organisation for approval.

5. General requirements for Construction materials:

i. Surface Macrotexture

Surface macrotexture shall be measured for area A as per the requirements of Clause 921 of the Specification and BS EN 13036-1. The texture depth shall be as per Table 9/3.

ii. Compaction

All materials should be compacted as per the requirements of the Specification Clause 903 and BS 594987. Compaction shall be measured for all new roads by use of the Indirect Density Gauge as per the requirements of Clause 929 and Appendix 1/5.

iii. Polished Stone Value

Refer to Schedule 4 for general PSV requirements. In addition to the above, a high PSV aggregate (68+PSV) is required at roundabouts, mini-roundabouts, signal controlled junctions or any other feature the Overseeing Organisation deems appropriate. The high PSV material is to be used on the approaches to the feature and the feature itself. Refer to HD36/06 for further guidance.

iv. Skid Resistance

Other than the surface macrotexture requirements listed above, skid resistance testing is not required on structural maintenance works. Skid resistance testing is required for all new roads (including S278 works), as per the requirements of the Specification and Appendix 1/5.

v. All materials are to be transported, laid, compacted and tested in accordance with BS594987.

vi. Any reinstatements to footways or cycleways to be in accordance with Appendix 11/1.

vii. All bituminous mixtures used in the works shall be produced in plants that are registered to BS EN ISO 9001 and National Sector Scheme 14 "Production of Asphalt Mixtures" and shall be laid by contractors registered to and operating in accordance "Sector Scheme 16 for the Laying of Asphalt Mixes". All non-proprietary asphalt mixtures shall be CE marked and comply with BS EN 13043 and the relevant annex of BSI PD 6691.

**6. Thin Surface Course Systems: Information to be Provided by the Contractor –
Schedule 6 (Applicable to Permitted Pavement Option G)**

The following shall be provided to the Overseeing Organisation for approval:

- (i) The declaration of performance for the thin surface course system.
- (ii) The declaration of performance for the aggregate(s) used in the thin surface course system.
- (iii) The Installation Method Statement as required in sub-Clause 942.13.
- (iv) SIPT documentation as required in sub-Clause 942.29.
- (v) If regulating material is to be used, evidence of its deformation resistance either independently or in combination with the Thin Surface Course System [942.12].