SR 28 – An Introduction

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What is SR 28?

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EN 13108

Contract Specifications

S.R 28

Additional Standards:

- Test Standards: I.S. EN 12697
- Additional laying guidelines and test protocols – BS 594987
- New I.S. 844 – Requirements for Transport, Laying & Compaction of Bituminous Materials.

Why is it not here now?

- European Commission
- OJEU
- CEN
- Show example of changes to tables that caused problems
- New EN13108's can be used but you can't CE mark to them!

NSAI Working Group TC227 Asphalt WG

- Who's involved
  - NSAI Secretary
  - Industry, government bodies, TII, DAA, LA's, DOT, Academia, IAT, IAPA, Consultants, Test Houses
  - Work commenced in 2015
    - Almost complete????
  - Public consultation – 1 or 3 months comments

Why update SR 28?

- EN13108 is a ‘menu’ standard (tables of values, specifier chooses)
- Which properties are relevant?
- What levels to choose?
- Existing SR28 an introduction to EN standards
- Existing SR28 more aimed towards producers and FPC

SR28 Blank Canvas

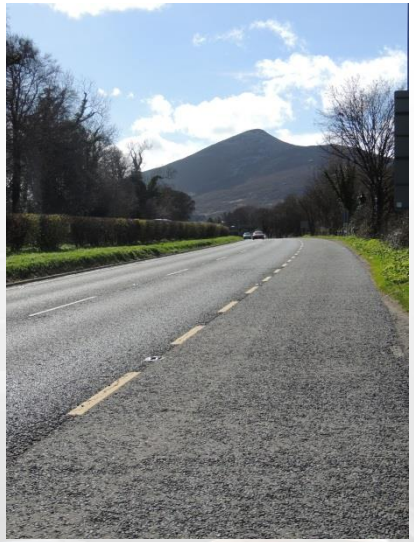
- Start from scratch rather than update existing SR28
- Gap in the market for specifiers with no bituminous mixture experience
- Tendency to specify TII 900 series for all applications
- Bringing as much as possible into 1 document (one stop shop as much as possible!) – Transport, Laying, Compaction outside scope to be covered in I.S.844
- SR28 highlights end use applications and material selection

Overview of layout of SR28

- **Annex A End use applications for mixture**
  - Bus Lanes & Stops
  - Housing Estate Roads
  - Industrial Estate Roads
  - Industrial Estate Areas
  - Car Parks
  - Private Driveways
  - Sustainable Urban Drainage systems (SUDs)
  - Ports & Heavy Duty Storage Areas
  - Airfield Movement Areas
  - Airfield Aprons
  - Ironwork Surrounds/Car park decks/Bridge decks
  - Footpaths/Cycle ways/Recreational Areas

- **Annex B Mix Design Properties**
  - Voids, Water Sensitivity, Stiffness, Fatigue, Binder Drainage,
  - Resistance to Permanent Deformation, Marshall Stability & Flow.

Overview of layout of SR28 CHECK ANNEX



- **Annex C** - Composition , grading, binder content, binder type, binder grade and mixture temperature
- **Annex D** - Conflicting Requirements
- **Annex E** - This annex provides information to assist and guide the user in determining the appropriate mixture for a particular end use
- **Annex F** - Pre-coated chippings
- **Annex G** - Test Methods End Use Public Roads

Other information still in SR28

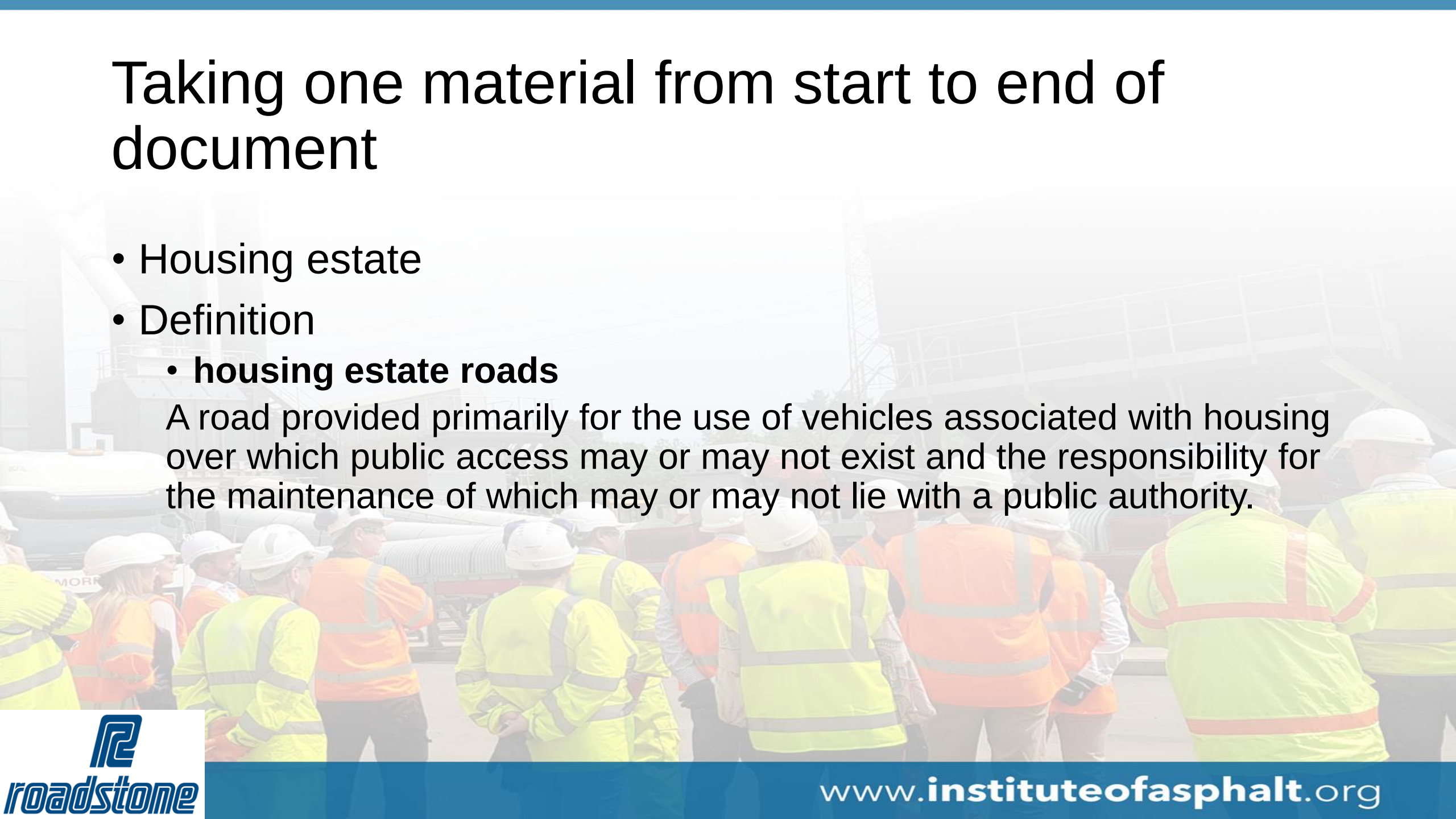
- AVCP
- Type Testing
- Factory Production Control
- Tolerances and frequencies of testing (OCL)
- Constituents – binder, aggs, reclaimed asphalt
- Mixture requirements – Bmin
- Identification – delivery ticket

Annex A	*Annex B*	*Annex C*	*Annex D*	*Annex E*	*Annex F*
Application **End Use**	**Properties**	**Composition**	**Conflicting Requirements**	**Guidance on uses, particular end uses and maintenance considerations**	**Guidance on bituminous mixtures test methods**
Table A1	*Table No.*	*Table No.*	*Table No.*	*Annex E*	*Table No.*
Public Roads	B1	C1	D1	Annex E	F1
Bus lanes and Stops	B2	C2			
Housing Estate roads	B3	C3			
Industrial Estate roads	B4	C4			
Industrial Areas	B5	C5			
Car Parks	B6	C6			
Private Driveways	B7	C7			
Sustainable Urban Drainage (SUDs)	B8	C8			
Ports & Heavy Duty Storage Areas	B9	C9a, C9b			
Airfield Movement Areas	B10	C10a, C10b			
Airfield Aprons	B11	C11a, C11b			
Ironwork Surrounds / Cark park decks / Bridgedecks	B12	C12			
Footpaths / Cycle ways / Recreational areas	B13	C13			

Taking one material from start to end of document

- Housing estate
- Definition
  - **housing estate roads**

  A road provided primarily for the use of vehicles associated with housing over which public access may or may not exist and the responsibility for the maintenance of which may or may not lie with a public authority.



Which table?

- Table B.1 End Use Public Roads
- Table B.2 End use Bus Lanes & Stops
- Table B.3 End use Housing Estate Roads
- Table B.4 End use Industrial Estate Roads
- Table B.5 End use Industrial Estate Areas
- Table B.6 End use Car Parks
- Table B.7 End use Private Driveways
- Table B.8 End use Sustainable Urban Drainage systems (SUDs)
- Table B.9 Ports & Heavy Duty Storage Areas
- Table B.10 End use Airfield Movement Areas
- Table B.11 End use Airfield Aprons
- Table B.12 End use Ironwork Surrounds/Car park decks/Bridgedecks
- Table B.13 End use Footpaths/Cycleways/Recreational Areas

Application: Housing Estate Roads	**Table reference**	Binder content & Grading– See table	Void content	Water sensitivity	Binder drainage
Mixture type		**BASE**			
AC 32 dense base	B3/1-1	C3 / 1-1	$V_{min\ 2,0}$, $V_{max\ 10,0}$	$ITSR_{min70}$	-
		BINDER COURSE			
AC 32 dense bin	B3/2-1	C3 / 2-1	$V_{min\ 2,0}$, $V_{max\ 10,0}$	$ITSR_{min70}$	-
AC 20 dense bin	B3/2-2	C3 / 2-2	$V_{min\ 2,0}$, $V_{max\ 8,0}$	$ITSR_{min70}$	-
SMA 14 bin	B3/2-3	C3 / 2-3	$V_{min\ 2,0}$, $V_{max\ 8,0}$	$ITSR_{min80}$	$BD_{max0,3}$
SMA 10 bin	B3/2-4	C3 / 2-4	$V_{min\ 2,0}$, $V_{max\ 8,0}$	$ITSR_{min80}$	$BD_{max0,3}$
SMA 6 bin	B3/2-5	C3 / 2-5	$V_{min\ 2,0}$, $V_{max\ 8,0}$	$ITSR_{min80}$	$BD_{max0,3}$
		SURFACE COURSE			
AC 14 close	B3/3-1	C3 / 3-1	$V_{min\ 3,0}$, $V_{max\ 11,0}$	$ITSR_{min80}$	-
AC 10 close	B3/3-2	C3 / 3-2	$V_{min\ 3,0}$, $V_{max\ 11,0}$	$ITSR_{min80}$	-
SMA 14 surf	B3/3-3	C3 / 3-3	$V_{min\ 2,0}$, $V_{max\ 5,0}$	$ITSR_{min80}$	$BD_{max0,3}$
SMA 10 surf	B3/3-4	C3 / 3-4	$V_{min\ 2,0}$, $V_{max\ 5,0}$	$ITSR_{min80}$	$BD_{max0,3}$
SMA 6 surf	B3/3-5	C3 / 3-5	$V_{min\ 2,0}$, $V_{max\ 5,0}$	$ITSR_{min80}$	$BD_{max0,3}$

EN 13108 reference	1	1	1	4	5	5	5	1	5	5	5
Table column reference	C3/1-1	C3/2-1	C3/2-2	C3/2-3	C3/2-4	C3/2-5	C3/3-1	C3/3-2	C3/3-3	C3/3-4	C3/3-5
Layer	Base	Binder	Binder	Binder	Binder	Binder	Surface	Surface	Surface	Surface	Surface
Mixture designation	AC 32 dense base	AC 32 dense bin	AC 20 dense bin	SMA 14 bin	SMA 10 bin	SMA 6 bin	AC 14 close surf	AC 10 close surf	SMA 14 surf	SMA 10 surf	SMA 6 surf
Sieve Size	% by mass passing										
40	100	100									
31,5	90 to 100	90 to 100	100								
20	71 to 95	71 to 95	90 to 100	100			100		100		
14				90 to 100	100		90 to 100	100	90 to 100	100	
10			52 to 72	35 to 60	90 to 100	100	70 to 90	90 to 100	35 to 60	90 to 100	100
6,3	44 to 60	44 to 60	38 to 56	20 to 45	30 to 55	90 to 100	45 to 65	55 to 75	20 to 45	30 to 55	90 to 100
4						25 to 45					25 to 45
2	20 to 40	20 to 40	20 to 40	15 to 30	20 to 35	25 to 40	19 to 33	19 to 33	15 to 30	20 to 35	25 to 40
1							15 to 30	15 to 30			
0,500											
0,250	6 to 20	6 to 20	6 to 20								
0,125											
0,063	2 to 9	2 to 9	2 to 9	6 to 12	6 to 12	8 to 14	3 to 8	3 to 8	6 to 12	6 to 12	8 to 14
Minimum B_{MIN}											
10/20; 15/25											
40/60	3,9	4,3	4,4	5,3[1]	5,5[1]	5,8[1]			5,5[1]	5,7[1]	6,0[1]
70/100	3,9	4,3	4,4	5,3[1]	5,5[1]	5,8[1]	5,0	5,2			
Polymer Modified				5,1	5,3	5,6			5,3	5,5	5,8

[1] When Paving grade binder is used in SMA the mixture shall include a minimum of 0,3% by mass of Fibres

Appendix D

- Conflicting requirements
- All in the SR is not conflicting and conforms to Annex D
- Ensures users don't over-specify

	EN13108 Series	Asphalt Concrete	Hot Rolled Asphalt	Stone Mastic Asphalt	Porous Asphalt
Combination		**1**	**4**	**5**	**7**
Requirements for Marshall values, voids filled with binder, voids in mineral aggregate and void content at 10 gyrations should not be combined with the requirements for resistance to permanent deformation		☒			
Requirements for fatigue and/or stiffness and/or resistance to permanent deformation in tri-axial compression should not be combined with requirements for binder content with a percentage above **3,0** and/or additional grading requirements and/or requirements for stiffness properties for filler and the angularity of fine aggregates		☒			☒

Easy to use tables

- Definition
- End Use
- Performance Categories
- Composition

Application: Airfield Movement Areas	**Table reference**	Binder content & Grading– See table	Void content	Water sensitivity	Voids filled with binder	Marshall flow	Marshall stability	Resistance to permanent deformation	Stiffness	Fatigue [1]	Binder drainage	Strain for fracture toughness	Resistance to fuel	Resistance to de-icing fluid
Mixture type		**BASE**												
AC 32 dense base	B10/1-1	C10b / 1-1	$V_{min\ 2,0}$, $V_{max\ 10,0}$	$ITSR_{min70}$	-	-	-	-	-	-	-			
		BINDER COURSE												
AC 32 dense bin	B10/2-1	C10b / 2-1	$V_{min\ 2,0}$, $V_{max\ 10,0}$	$ITSR_{min70}$	-	-	-	-	-	-	-			
AC 20 dense bin	B10/2-2	C10b / 2-2	$V_{min\ 2,0}$, $V_{max\ 8,0}$	$ITSR_{min80}$	-	-	-	-	-	-	-			
AC 20 EME 2 bin	B10/2-3	C10b / 2-3	$V_{max\ 6,0}$ (120 gyrations)	$ITSR_{min75}$	-	-	-	$P_{max7,5}$ ($V_{min3,0}$ to $V_{max6,0}$)	$S_{min\ 5\ 500}$	$\varepsilon_{6\text{-}min\ 130}$ ($V_{min3,0}$ to $V_{max5,0}$)	-			
AC 14 EME 2 bin	B10/2-4	C10b / 2-4	$V_{max\ 6,0}$ (100 gyrations)	$ITSR_{min75}$	-	-	-	$P_{max7,5}$ ($V_{min3,0}$ to $V_{max6,0}$)	$S_{min\ 5\ 500}$	$\varepsilon_{6\text{-}min\ 130}$ ($V_{min3,0}$ to $V_{max5,0}$)	-			
AC 10 EME 2 bin	B10/2-5	C10b / 2-5	$V_{max\ 6,0}$ (80 gyrations)	$ITSR_{min75}$	-	-	-	$P_{max7,5}$ ($V_{min3,0}$ to $V_{max6,0}$)	$S_{min\ 5\ 500}$	$\varepsilon_{6\text{-}min\ 130}$ ($V_{min3,0}$ to $V_{max5,0}$)	-			
AC 32 Marshall bin	B10/2-6	C10b / 2-6	$V_{min\ 3,0}$, $V_{max\ 5,0}$	$ITSR_{min70}$	VFB_{min65}, VFB_{max77}	$F_{4,0}$	$MS_{min\ 10,0}$	-	-	-	-	$\varepsilon_{max,\ i}$ ≥ 2.0%		
AC 20 Marshall bin	B10/2-7	C10b / 2-7	$V_{min\ 3,0}$, $V_{max\ 5,0}$	$ITSR_{min70}$	VFB_{min65}, VFB_{max77}	$F_{4,0}$	$MS_{min\ 10,0}$	-	-	-	-	$\varepsilon_{max,\ i}$ ≥ 2.0%		
SMA 14 bin	B10/2-8	C10b / 2-8	$V_{min\ 2,0}$, $V_{max\ 4,0}$	$ITSR_{min80}$	-	-	-	-	-	-	$BD_{max\ 0,3}$			
SMA 10 bin	B10/2-9	C10b / 2-9	$V_{min\ 2,0}$, $V_{max\ 4,0}$	$ITSR_{min80}$	-	-	-	-	-	-	$BD_{max\ 0,3}$			
SMA 6 bin	B10/2-10	C10b / 2-10	$V_{min\ 2,0}$, $V_{max\ 4,0}$	$ITSR_{min80}$	-	-	-	-	-	-	$BD_{max\ 0,3}$			

Annex E - Informative

- Information on Pavement Layers – surf, bin, base
- Explaining Mix Types – HRA, SMA, AC
- Additives & Special Mixtures – Warm Mix, Fuel Resisting
- Specific Considerations – binder grade, filler, reclaim asphalt
- Particular End Uses

Annex F

- Pre Coated Chippings for HRA
- Different to TII
- Information on identification
- CE marking

Annex G

- Protocol for Design of HRA mixtures
- Lab Design
- Marshall values

Annex H

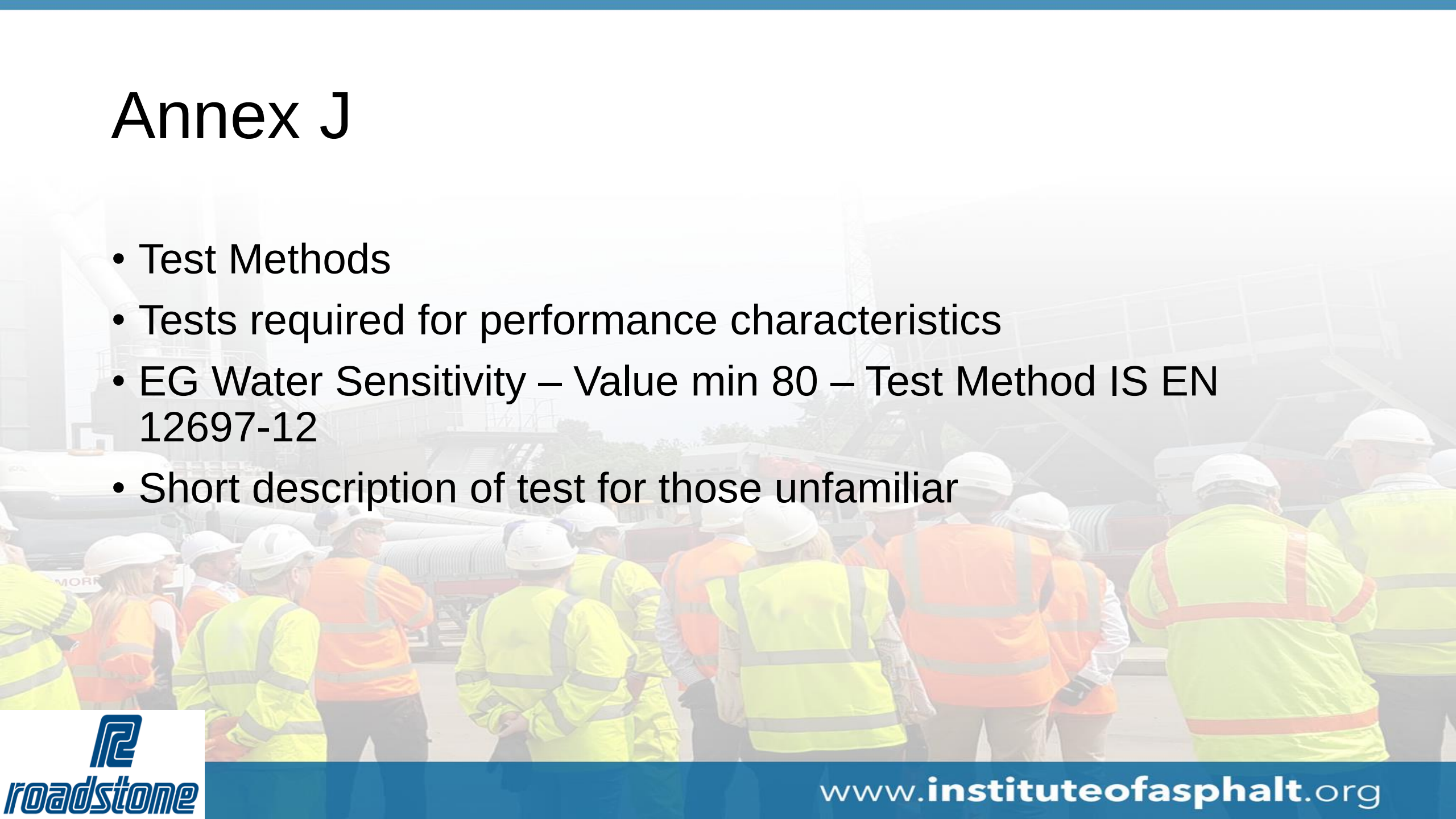
- Marshall Design for Airfields
- Marshall values, different to HRA design

Annex I

- Required Paperwork
- DOP (Declaration Of Performance)
- Type Test Report – Requirements
- CE Mark

Annex J

- Test Methods
- Tests required for performance characteristics
- EG Water Sensitivity – Value min 80 – Test Method IS EN 12697-12
- Short description of test for those unfamiliar



Summary/Conclusions

- New EN 13108 hopefully 2018
- SR28 to follow
- IS 844 about to start

Thanks for your attention!

Questions??