The Institute of Asphalt Technology
Irish Branch

HRA- A Suppliers and Contractors View

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Roadstone Ltd.

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HRA Suppliers

- Specification & Guidelines

  - IS EN13108-4 HRA

  - SR 28

  - NRA 900 Series Cl.910 & 911

    TII Series 900 (Performance Design) Cl. 4: 2017

TII requirements

Design HRA with a minimum Binder Content?

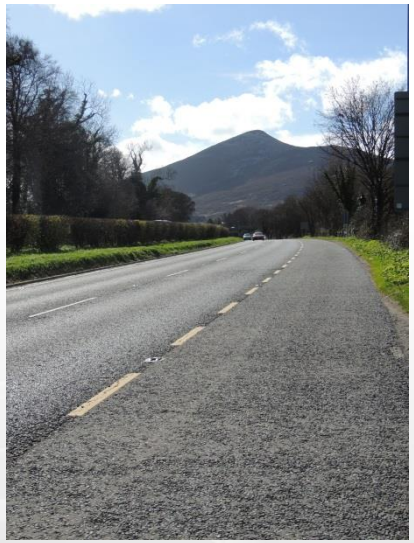
Permanent Deformation Testing to EN Method (previously BS method)

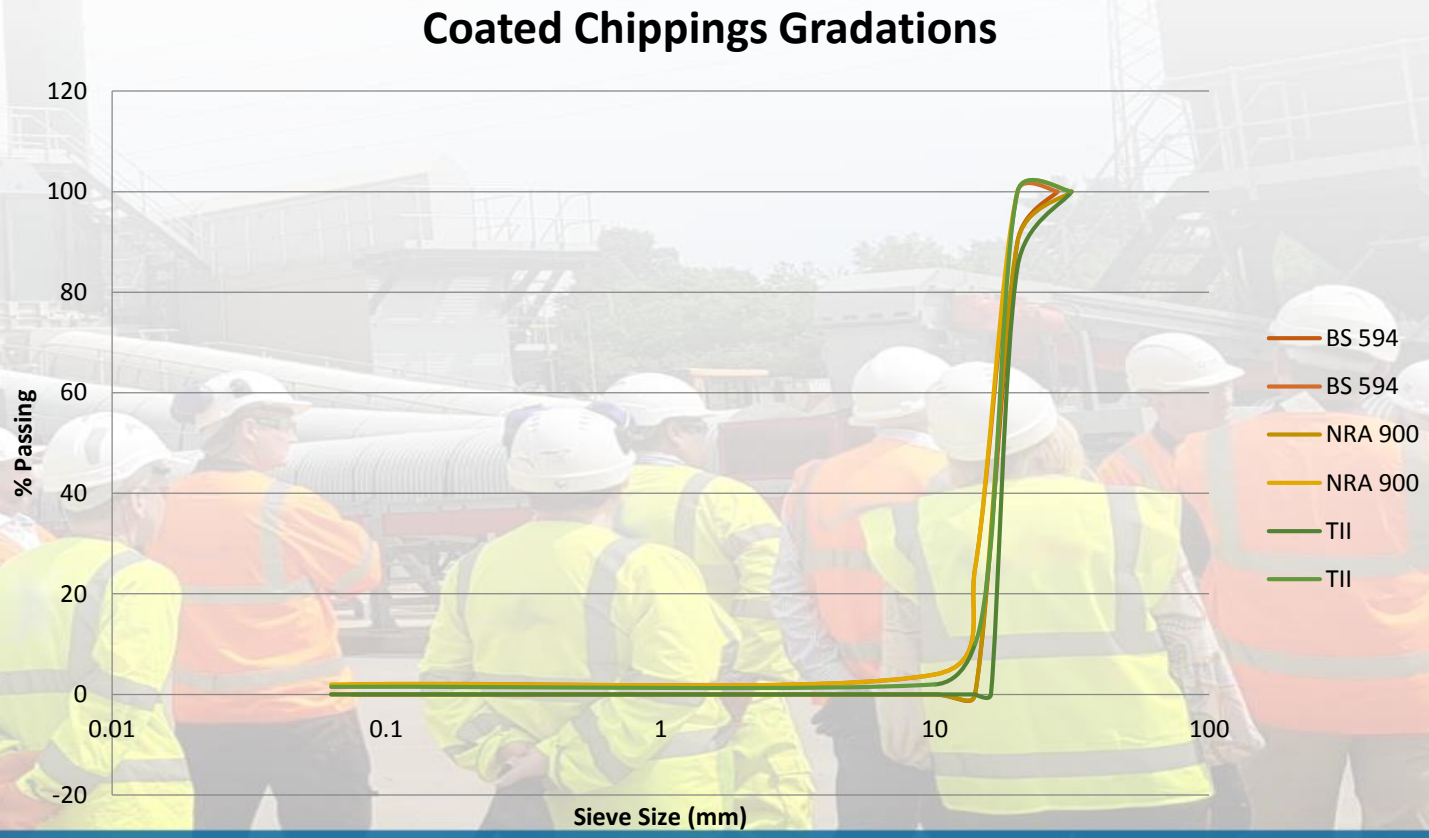
EN Method Load (700±10N) vs BS Method Load (520 ± 5N)

		NRA 900 BS Method		TII EN Method	
	Test Temperature	Max Rut rate (mm/hr)	Max Rut Depth (mm)	W_{TR}	RD_{Air}
Very Heavily Stressed sites requiring very high rut resistance	60°C	5	7	5	9

HRA Suppliers

- PCC Specification
  - Change to Gradation (more single size)
  - Flakiness Index (FI_{20} to FI_{10} in last ten years)





HRA Suppliers

- PCC Specification
  - Gradation
  - Flakiness Index (FI_{20} to FI_{10} in last ten years)

- PSV Requirements
  - Testing Regime (HD36)
  - 65+

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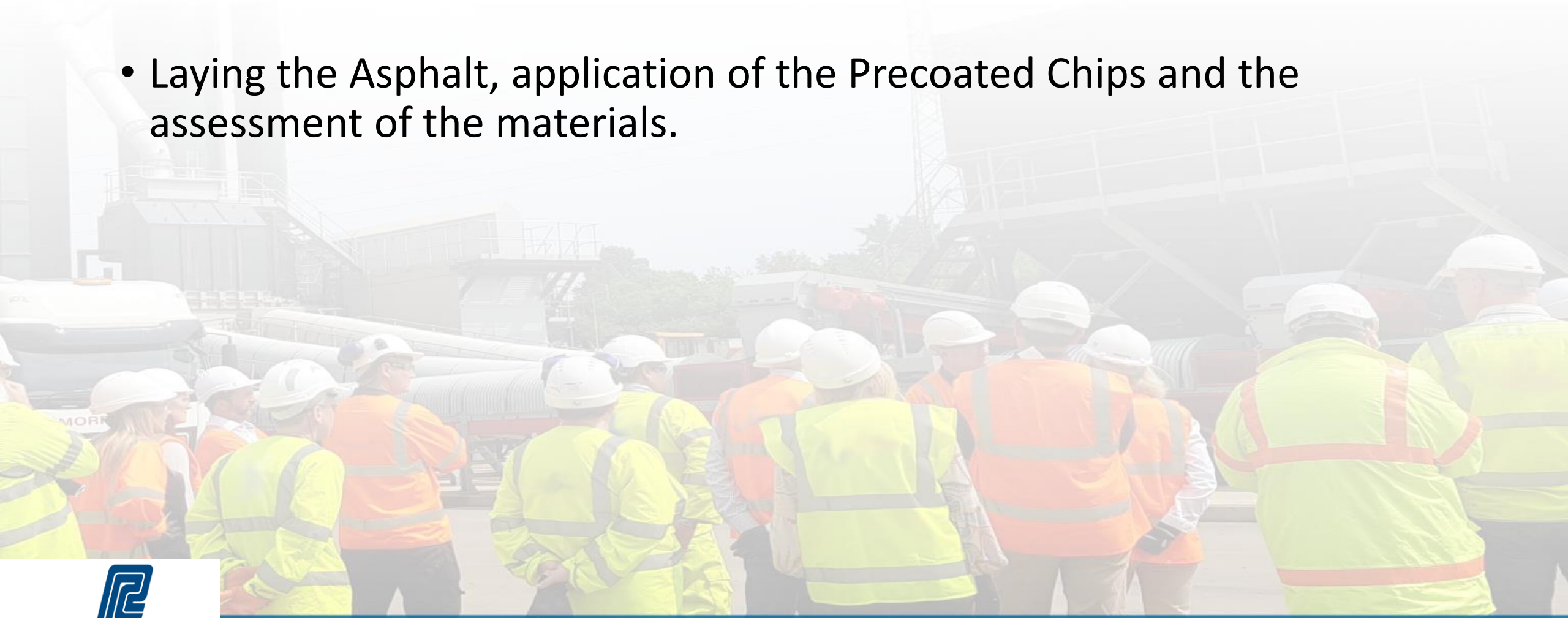
HRA Contractors

- Laying the Asphalt, application of the Precoated Chips and the assessment of the materials.



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Weather Conditions

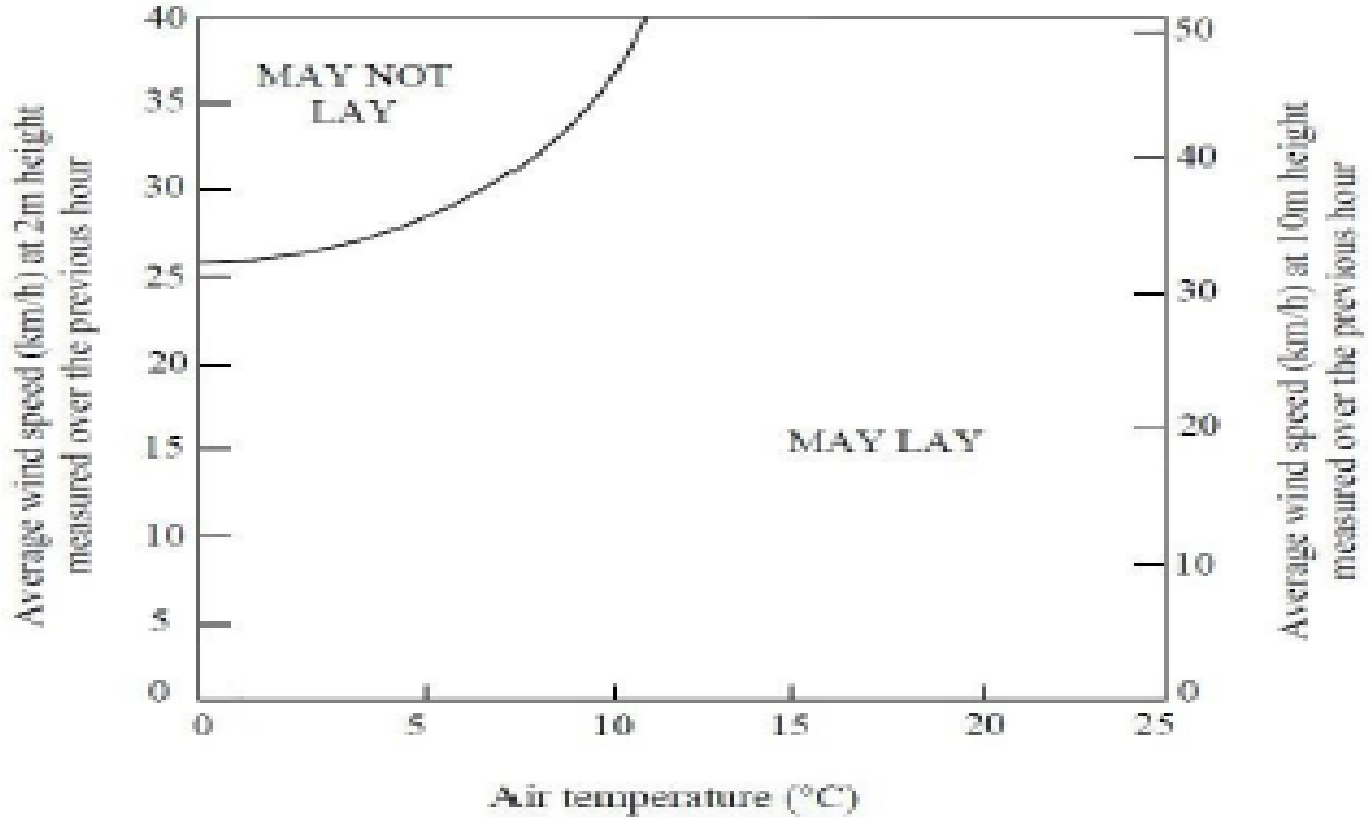

Figure 10.1.5.a

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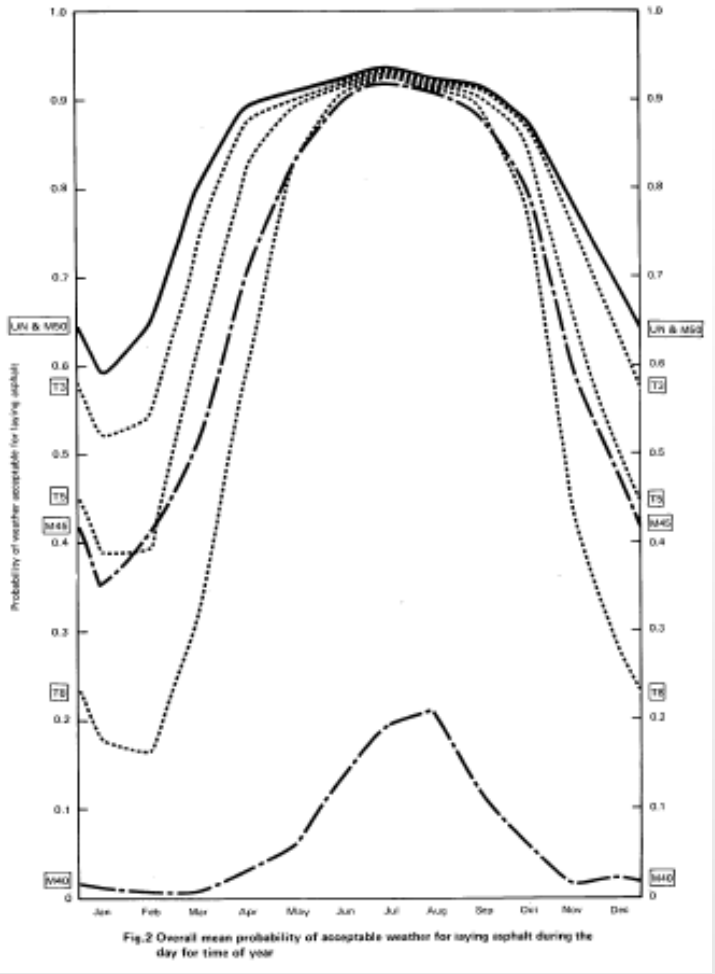

Fig.2 Overall mean probability of acceptable weather for laying asphalt during the day for time of year

Day

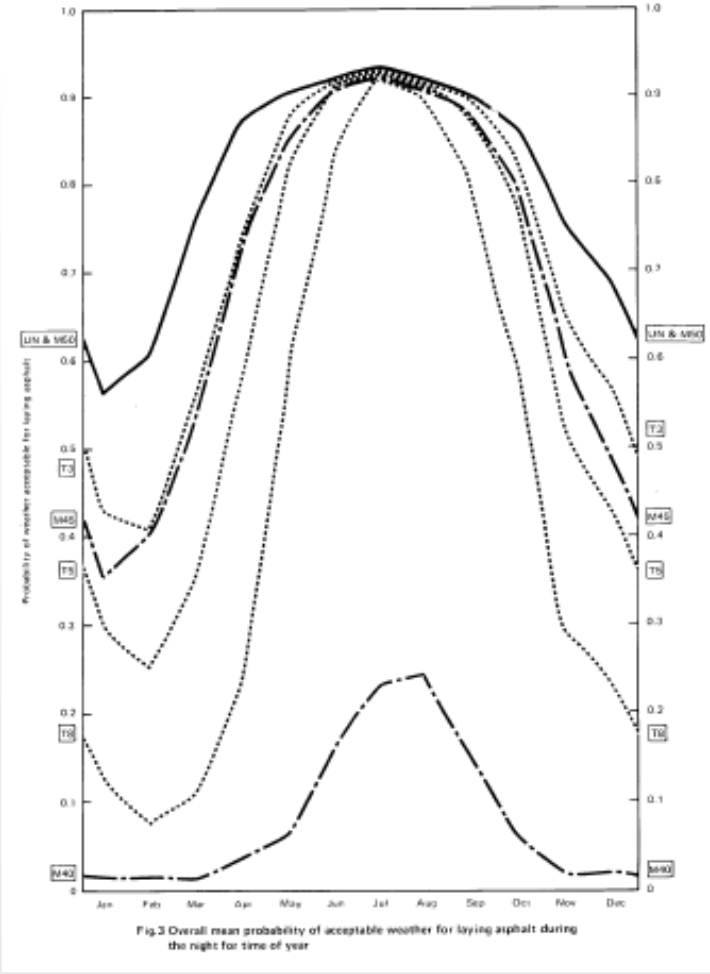

Fig.3 Overall mean probability of acceptable weather for laying asphalt during the night for time of year

Night

TRL Report 280: Probability of acceptable weather for laying of asphalt

Suggestions

- Reintroduce a laying season for HRA (April to September)
- Or the polymer modified binder chart could be used

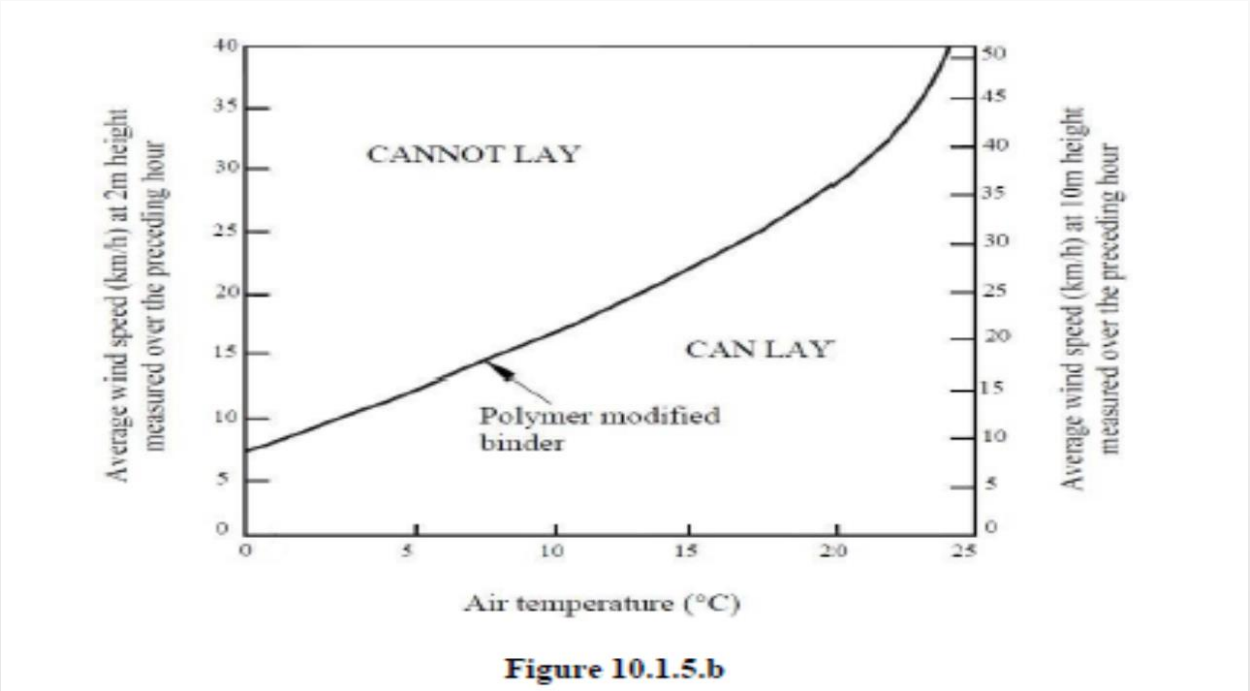

Figure 10.1.5.b

Chipping Process

- Mechanical Process
- Chip are transferred horizontally by an auger (screw) from a hopper
- These then fall onto a rotating drum which drops these onto the HRA surface.
- Amount of chip falling onto the rotating drum is controlled by gates which can be opened and closed

Chipping Rate (TII Series NG 900 Cl. 10.1.7.1)

Chipping Rate guideline ±1kg from the mean
Typical ± 2 to 3 kg

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HRA with Pre Coated Chippings

Surface Texture

hEN reference	EN 13108 – 4 Hot Rolled Asphalt			
Table column reference	**1**	**2**	**3**	**4**
Layer	Surface	Surface	Surface	Surface
Mixture designation	HRA 35/14F surf des	HRA 35/14C surf des	HRA 30/14F surf des	HRA 30/14C surf des
Mandatory speed of traffic > 60km/hr				
Average per 400m – minimum	1.5	1.5	1.5	1.5
Average per 400m – maximum	2.0	2.0	2.0	2.0
Average per set of 10 measurements – minimum	1.2	1.2	1.2	1.2
Minimum individual value per set of 10 measurements	1.0	1.0	1.0	1.0
Maximum individual value per set of 10 measurements	2.3	2.3	2.3	2.3
Number of individual values <1.2mm per set of 10 measurements	no more than three individual values < 1.2	no more than three individual values < 1.2	no more than three individual values < 1.2	no more than three individual values < 1.2
Mandatory speed of traffic ≤ 60km/hr and all roundabouts				
Average per 400m – minimum	1.2	1.2	1.2	1.2
Average per 400m – maximum	1.7	1.7	1.7	1.7
Average per set of 10 measurements – minimum	1.0	1.0	1.0	1.0
Minimum individual value per set of 10 measurements	0.8	0.8	0.8	0.8
Maximum individual value per set of 10 measurements	2.0	2.0	2.0	2.0
Number of individual values < 1.0mm per set of 10 measurements	no more than three individual values < 1.0	no more than three individual values < 1.0	no more than three individual values < 1.0	no more than three individual values < 1.0

TII Series 900 Table 6: HRA Works Requirements

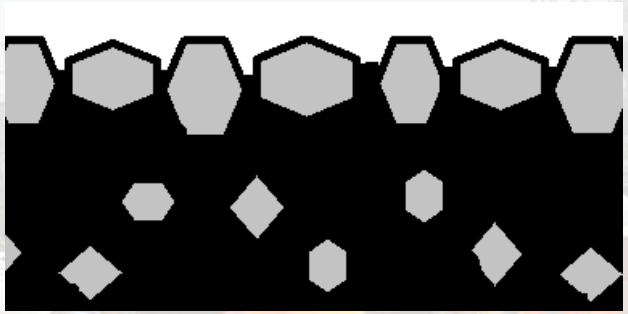
Surface Assessment

- Initial visual assessment while carrying out Texture Depth Test
  (Volumetric Patch Technique – "Sand Patch")

Location (lane/carriageway					
Chainage from			**Chainage to**		
Chip embedment				**evident**	**%**
Positive - chippings are above the level of the material mastic					
Non Positive - chippings are at the same level or below the material mastic					
Mixture of above - state what combination					
Chip distribution	**evident**	**% estimate**		**evident**	**%**
Uniform transverse			Irregular transverse		
Uniform longitudinal			Irregular longitudinal		
Excessive rate of			Insufficient rate of		

Taken from: TII Series NG 900 NGA 10.1.11

HRA Surface



Positive

Non Positive

Taken from TII Series NG 900: NGA 10.1.11

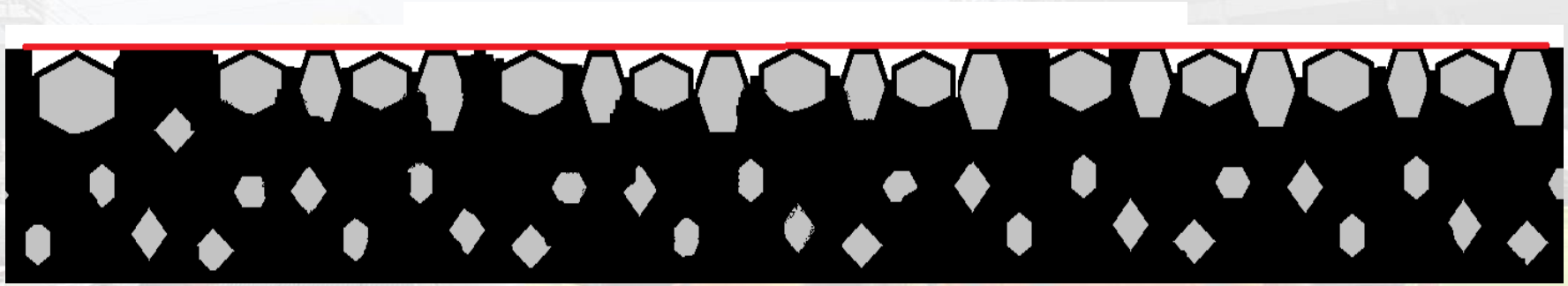
Uniform

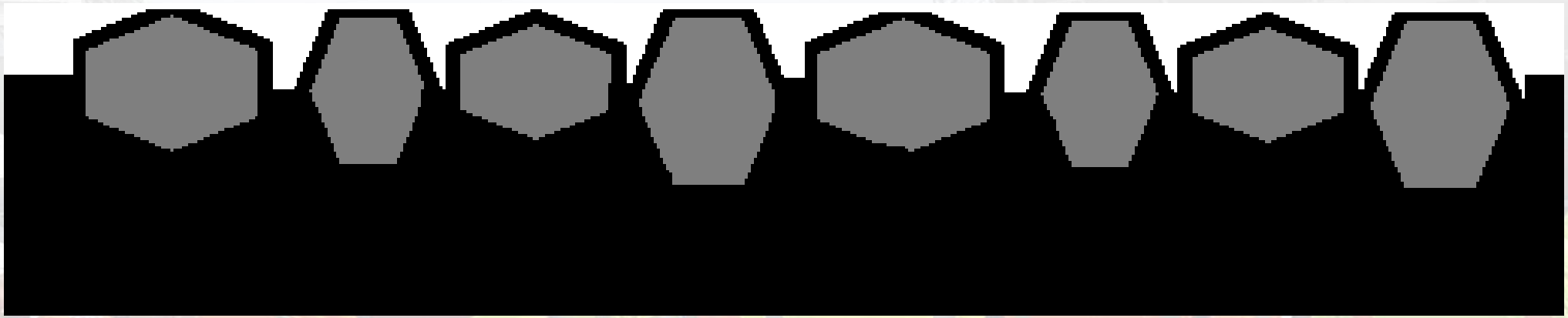
Irregular

Excessive

Insufficient

HRA Surface





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Uniform longitudinal			Irregular longitudinal		
Excessive rate of			Insufficient rate of		

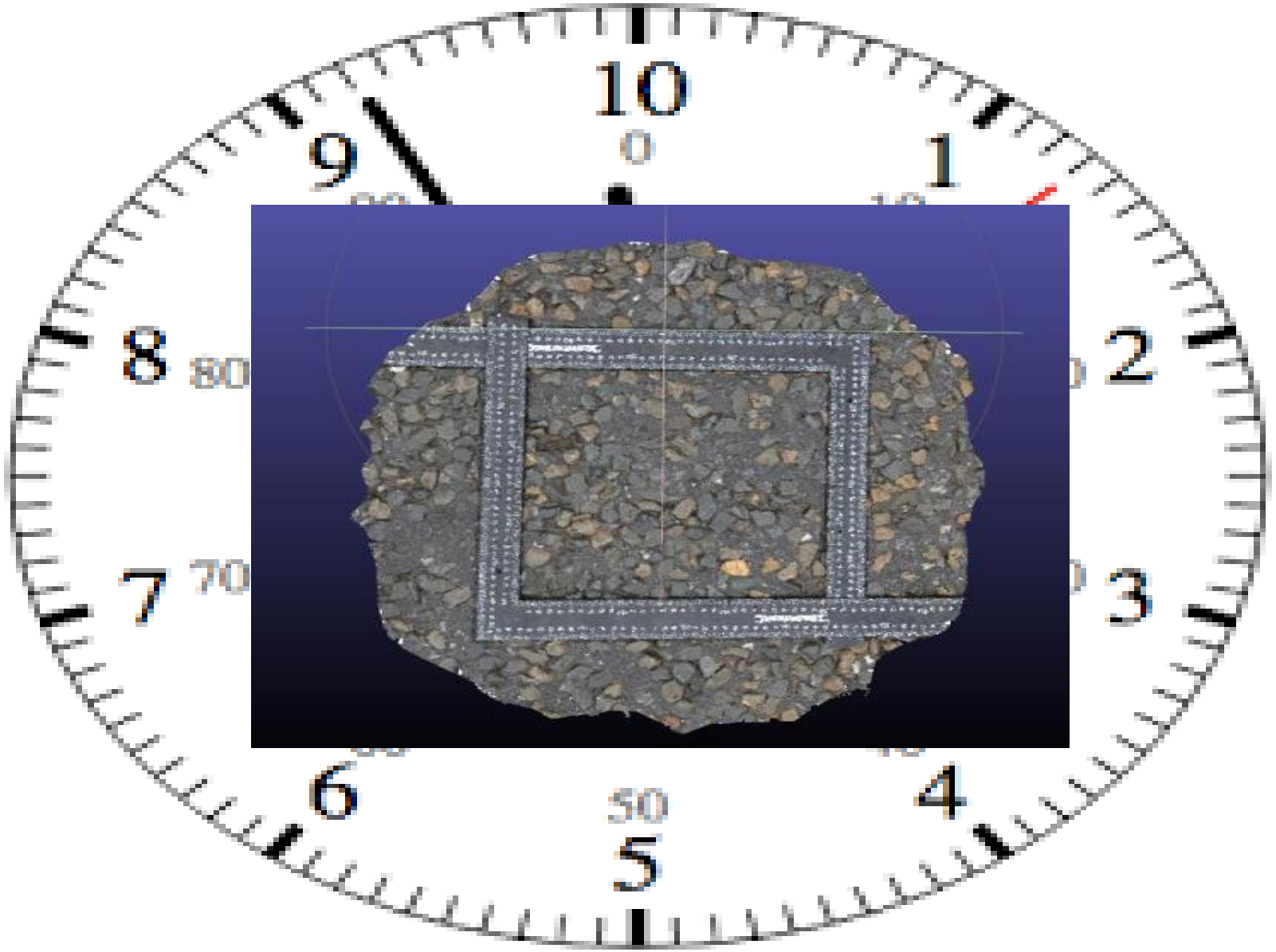
Photogrammetry

- In the event that the visual assessment does not result in agreement between the Contractor and Employer's Representative that positive macrotexture has been achieved, a 3D photogrammetry survey shall be undertaken.

10.1.11.1 Surface Macrotexture Specific to Hot Rolled Asphalt

- "shall be undertaken at similar locations to the macrotexture and visual assessment

10.1.11.1 Surface Macrotexture Specific to Hot Rolled Asphalt


10
0
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8
80
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70
3
6
50
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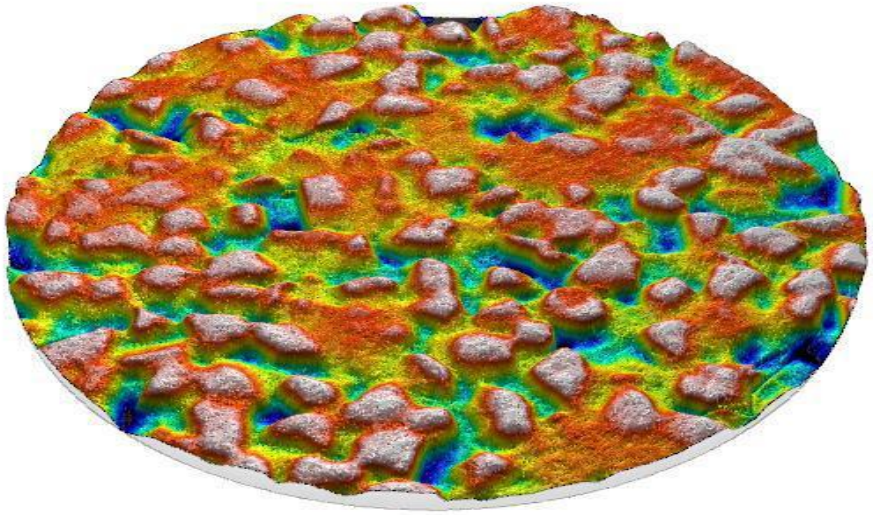
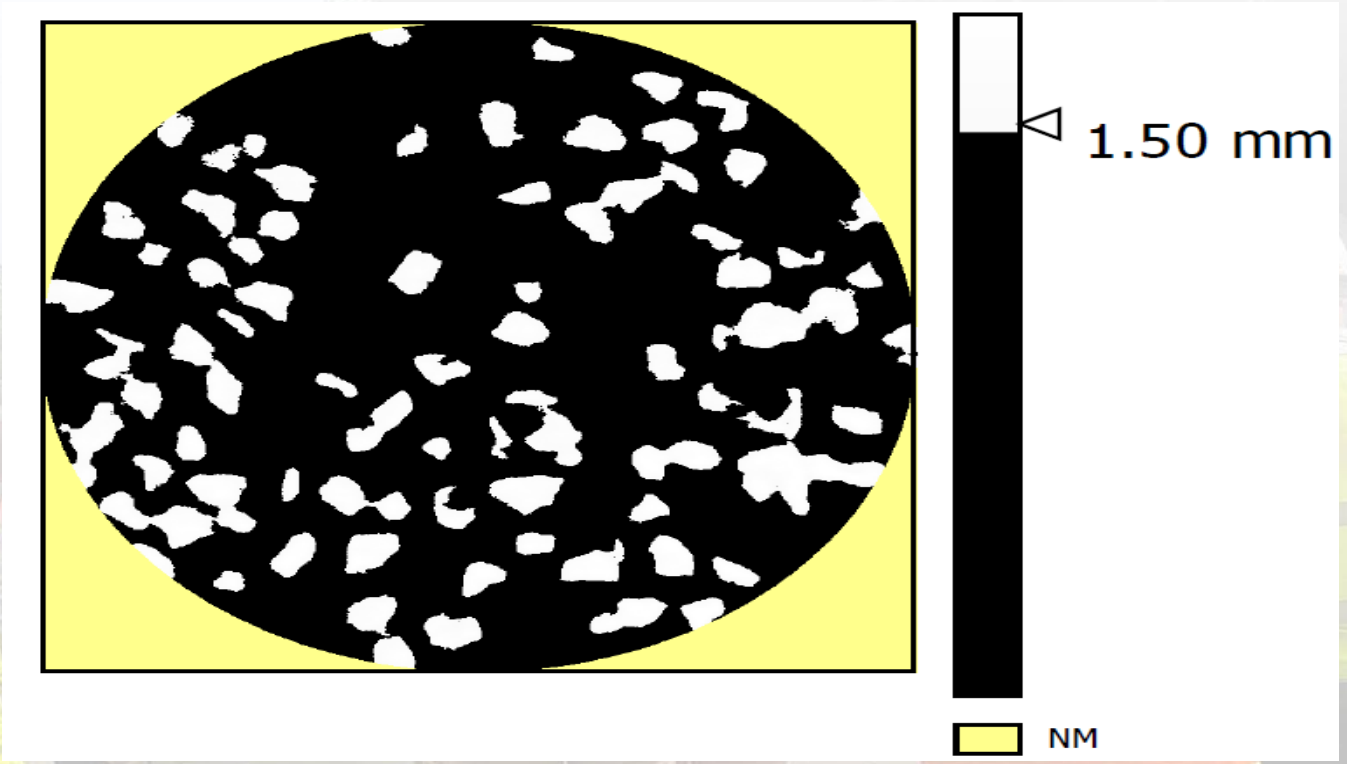
5

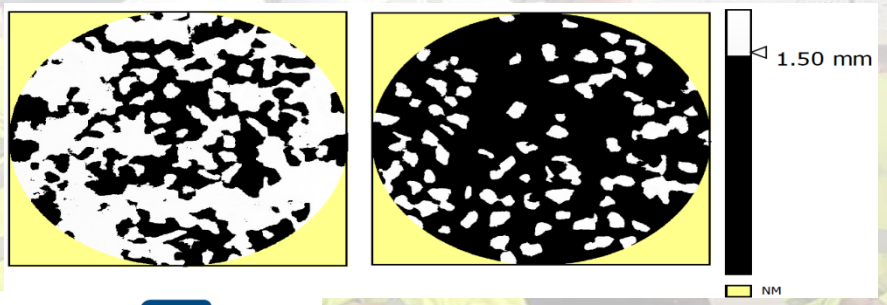



1.50 mm
NM

$$\sum_{i=1}^{N} (Area\ (i)/Total\ Island\ Area) \times 100 \geq 50$$

- where Area(1) = area of largest Island, Area(2) = area of second largest island, etc. Thus Count50 is the minimum number of islands require to make up at least 50% of the total island area for a given test location.

- Count50,
- is greater or equal to 4.



- The result of the 3D photogrammetry shall be deemed the definitive assessment of positive macrotexture

10.1.11.1 Surface Macrotexture Specific to Hot Rolled Asphalt

Coring the surface!!!

- Compaction verification
  - A pair of cores taken for each km (150mm)
- Permanent Deformation
  - Six Cores from the first km, 1/km thereafter (200mm)
- For each mixing plant

Suggestions

- Take a bulk sample and prepare wheel track specimens from this, this is already in place for Water Sensitivity Testing

or

- Take cores from trial strip and use these, trial strip is in use for surface characteristic, why not use this for the cores.

In conclusion

- HRA in 2018 is a different beast going forward
- Significant increases in design and verification
- How site assessment will progress remains to be seen
- Learning curve for all involved

Thanks for your attention!

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