



Performance of -34 Asphalt Binders

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Why - Cracking

- NEW CONSTRUCTION
 - Superpave binder selection has reduced thermal cracking on new construction by ~ 90%, after seven years.
- OVERLAYS
 - Reflective cracks allow water into the pavement structure.

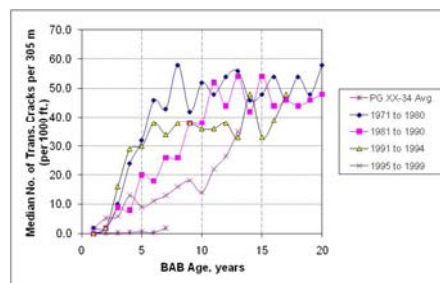


Projects

- MnDOT data summary
- MnROAD cells 32,33,34
- MnROAD other cells
- Olmsted County Rd 112
- St Louis County Rd
- I-35 shoulder
- TH 100
- Pooled funds
- Permeability



MnDOT Crack spacing



MnROAD 33, 34, 35

- Constructed in 1999. 4" of HMA over 12" class 6 sp. No RAP.
 - Results after 8 years
- Cell 33, 58-28. Typical thermal cracks.
- Cell 34, 58-34. Virtually no cracks.
- Cell 35, 58-40. Fatigue ? Cracks, but no "thermal cracks"



MnROAD newer cells

- ***Almost*** no thermal cracking.
- 2006. Cells 27, 28, 1. 52-34 surface, 58-34 bottom.
- 2007. 8 cells, 58-34, PPA, PPA+SBS, SBS, PPA+Elvaloy
- 2008. 12 cells. WMA, taconite mix, UTBWC



Olmsted CR 112

- Western Research Institute (WRI) Asphalt binder study
- Constructed in Aug. 2006.
- Oct. 2007, no distress.
- 5 test sections.

Olmsted CR 112

Binder	% RAP	Normalized crack length
58-34 Elvaloy	20	112.9
58-34 Elvaloy	0	22.2
58-28 Marathon	0	114.1
58-28 Valero	0	219.7
58-28 Citgo	0	126.1

St. Louis CR 4 & 16

- CR 4. 58-28, 30% RAP. Cracked every 50' during the 1st winter.
- CR 16. 58-34, 20% RAP. No cracking during the 1st winter.

I-35

- NB for RP 14-20
- 1998 PCC overlay.
- 4" HMA shoulders
- 52-34 AC
- Minimal cracking during the 1st 10 years. More cracking now, after 13 years.

TH 100

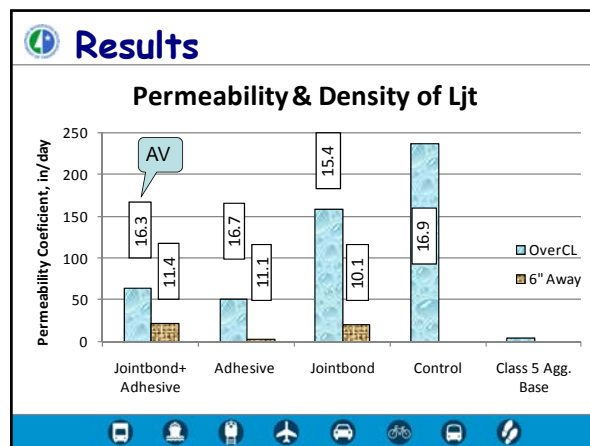
- 1.5" and 2" mill and fill.
- Attempt to slow severe reflective cracks.
- Testing HiMA 76-34 and 64-28.
- Prof. Walla Mogawer
 - Hired by Kraton, 7.5% SBS

Commercial Asphalt Co.

- 64-28, 25% RAP, 5.3% total AC
 - ~ 4.0% new AC
- Straight binder substitution, 76-34
- Started at 315F, 295-300 production
- ~1370 tons of HiMA

Low Temp Cracking

- TPF-5(132) fracture energy testing, final report due now.
- TPF-5(153) Aging study, testing cores.



Thank You!

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Permeability Testing

- Measure Time for water to "fall" a certain distance:
- 7% AV ~20 min
- 15% AV ~1.5 min

