Update:
Nebraska's Asphalt Mixes and Applications

Presented by

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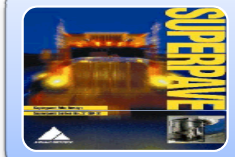
Topics of Discussion



Updated Superpave Mixes

Leveling Courses

Superpave Updates and Urban Superpave

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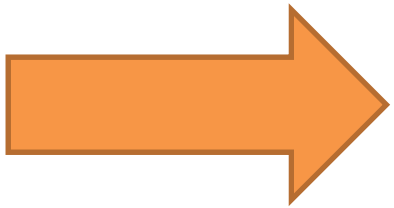
Update of Superpave Mixes

SP1
SP2
SP3
SP4
SP4 Special
SP5
SPR
SPS



SPR
SPH
SPS

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SPR

- Replaces SP4 Special and most SP4 designs
- High Recycle Mix (Up to 50% RAP)
- Been in use for 12 years (SPL)
- High strength modulus for increased structural value and rut resistance
- Allows for improved in-place density, especially at joints

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SPR: Keys to the Mix

- 64-34 Grade Binders

64+34 = 98 = Polymer Modified!

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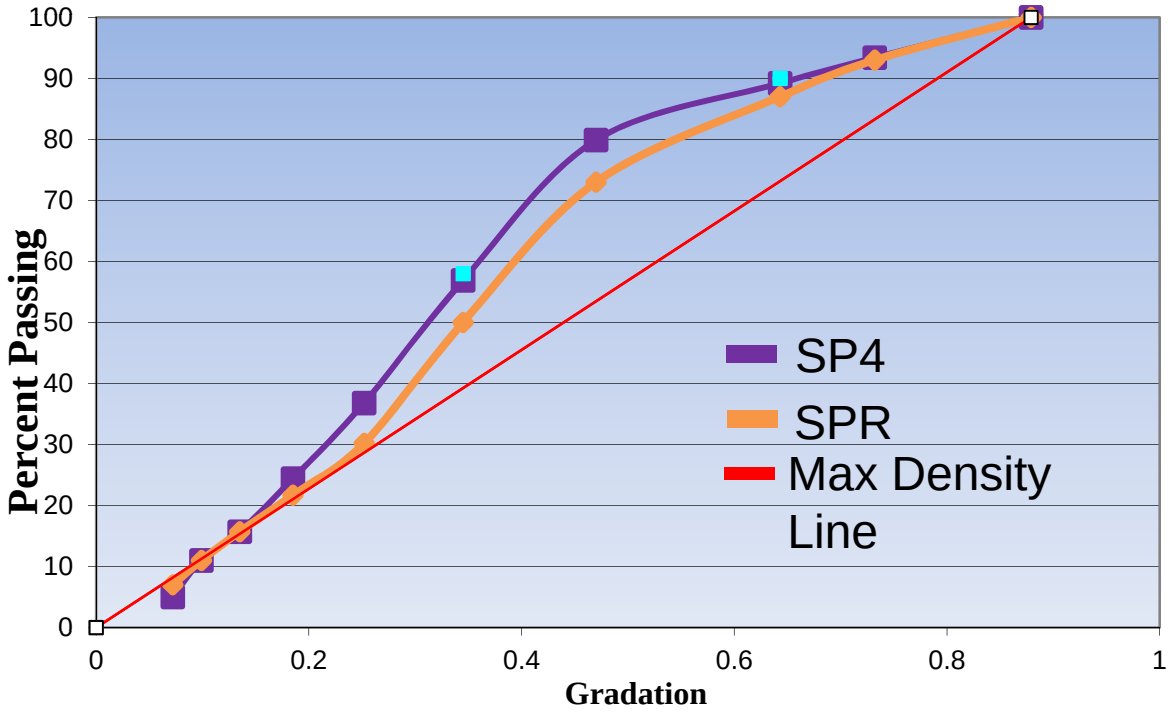
SPR: Keys to the Mix

- 64-34 Grade Binders
- Tighter Gradation Band



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SPR: Keys to the Mix

- 64-34 Grade Binders
- Tighter Gradation Band
- Lower Gyrations (Ndes=65)
- 3.0% Target Air Void Content

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SPR: Keys to the Mix

- 64-34 Grade Binders
- Tighter Gradation Band
- Lower Gyrations (Ndes=65)
- 3.0% Target Air Void Content
- 83% CAA, 43% FAA

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SPR: Keys to the Mix

- 64-34 Grade Binders
- Tighter Gradation Band
- Lower Gyrations (Ndes=65)
- 3.0% Target Air Void Content
- 83% CAA, 43% FAA
- Minimum AC of 5.0%
- VMA dropped to 12 (soon to be eliminated)
- Higher Dust Content (Around 6%)

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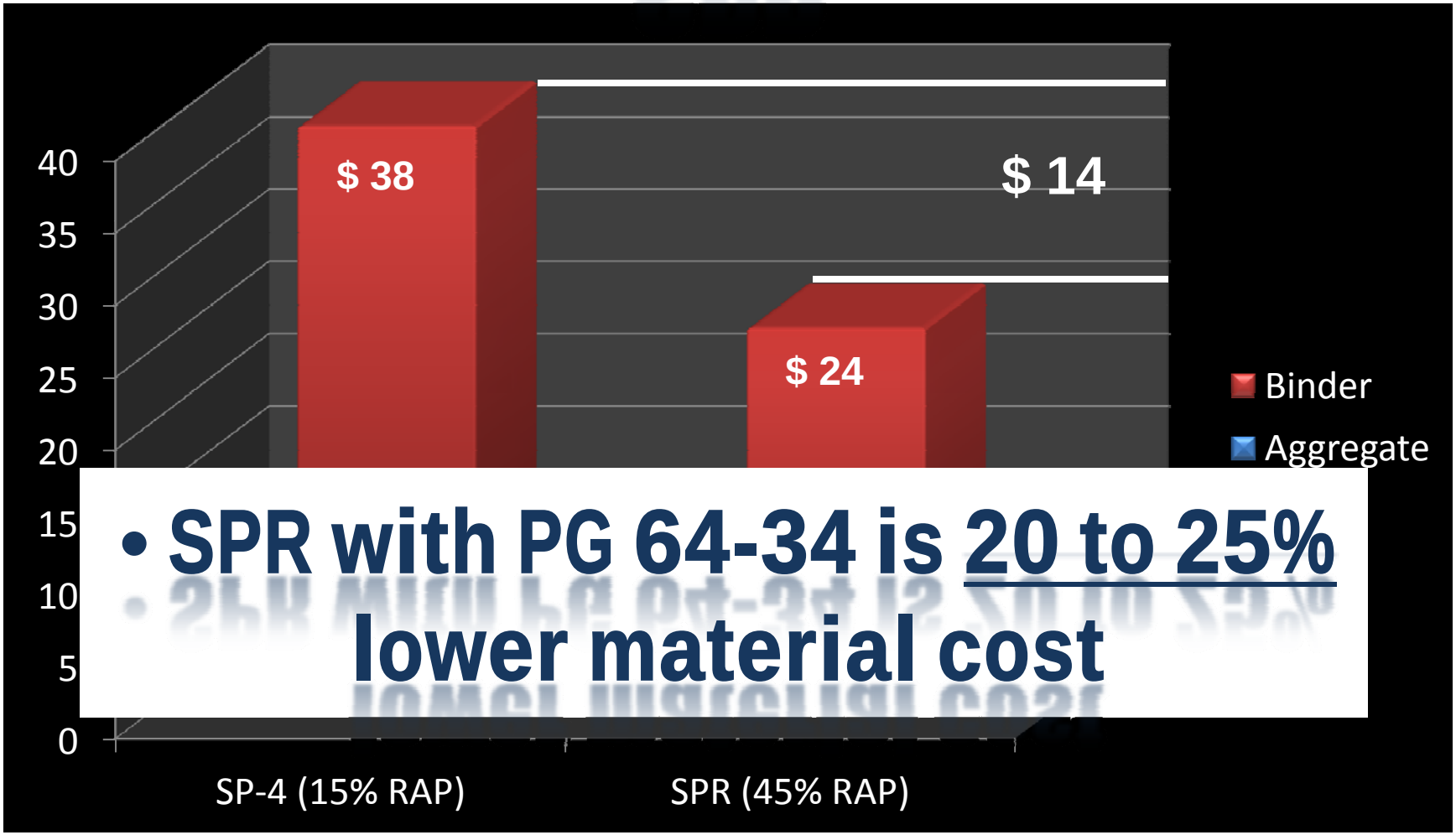
SPR



- SPR with PG 64-34 is 20 to 25% lower material cost

- **SPR with PG 64-34 is 20 to 25% lower material cost**

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SPH

- Heavy truck applications – Interstate, Expressways, and large volume urban corridors
- Same as SP-5 mix design except lower gyrations
  - Ndes now 95, was 109
  - Will allow improved binder and dust contents, should correct main drawbacks we have seen.
- Utilizing 70-34 and 64-34 binder

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SPS

- Shoulder Mix
- Very Economical
- Designed to allow high RAP (50% max)
- Wider gradation band
- 52-34 Grade Binder

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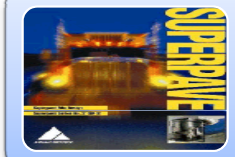
Topics of Discussion



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LC and RLC

Used on:

Concrete

Heavily Patched Asphalt
or Composite Pavements

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Overlay of Bare Concrete
Pavement without LC (Bottom lift)
2010/05/11 12:14

Overlay of Heavily Patched Pavement with LC (Bottom Lift)

LC and RLC

- Keys to the mix:
  - 64-34 & 70-34 Grade Binders
  - High Binder Content (6-7%)
  - Lower Gyrations (Ndes=50)
  - 2.5% Target Air Void Content
  - Fine Gradation Band
    - 70% Crushed Aggregate
    - 30% Natural Sand
  - 45% FAA on Crushed Aggregate

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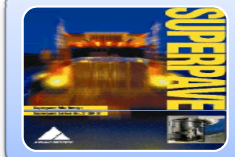
Topics of Discussion



Updated Superpave Mixes

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Superpave Updates:

- Removal of VMA as a pay factor.
  - Bulk Specific Gravity will be 2.585 (Information only)
- Removal of option to exceed maximum RAP percentages by lowering bottom end of PG Binder temperature grade.
- Allowance of 80% limestone aggregate on surface lift
- No coal sand or chat aggregate allowed in any mix
- Removed CAA requirement for SPS
- SPR CAA only tested on verification test

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Superpave Updates:

- Addition of SPR (fine) mix gradation:

	0.375 Inch (9.5 mm) Control Points (percent passing)		SPR Control Points (percent passing)		SPR (Fine) Control Points (percent passing)	
English Sieve (Metric)	Minimum	Maximum	Minimum	Maximum	Minimum	Maximum
3/4 inch (19 mm)			98.0	100.0		
1/2 inch (12.5 mm)	100.0					
3/8 inch (9.5 mm)	90.0	100.0	81.0	89.0	81.0	96.0
No. 4 (4.75 mm)		90.0				
No. 8 (2.36 mm)	32.0	67.0	46.0	56.0	46.0	56.0
No. 16 (1.18 mm)						
No. 30 (600 μm)						
No. 50 (300 μm)			12.0	21.0	12.0	21.0
*No. 200 (75 μm)	2.0	10.0	4.0	9.0	4.0	9.0

- Narrowed mixes down to SPS, SPR, SPH
- Required compaction temperatures:

Table 1028.11
Gyratory Compaction Temperatures

Mix Type	% RAP	Compaction Temp °F
SPS	0-25	270 ± 5
	26-50	280 ± 5
SPR	0-35	280 ± 5
	36-50	290 ± 5
SPH	0-25	300 ± 5

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Superpave Updates:

- Updated Minimum Binder Contents:

Table 1028.12
Minimum Binder Content

Mix Type (Metric)	Minimum Binder Content, Percent
SPS	4.8
SPR	5.0
3/8 inch (9.5 mm)	5.5
1/2 inch (12.5 mm)	5.1
3/4 inch (19 mm)	5.0

- Update to aggregate adjustment table:

Table 1028.15

Aggregate Adjustments	
Sieve Size	**Adjustments**
1 inch (25 mm), 3/4 inch (19 mm), 1/2 inch (12.5 mm), 3/8 inch (9.5 mm), No. 4 (4.75 mm)	± 6%
No. 8 (2.36 mm), No. 16 (1.18 mm), No. 30 (600 µm), No. 50 (300 µm)	± 5%
No. 200 (75 µm)	± 2%

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Superpave Updates:

- Pour time for FAA AASHTO T304 Method A decreased from max. 6 seconds to 5±1 seconds.
- Recommended sample size for FAA cold feeds is now 6000 grams instead of 4000 grams if referee testing may be desired.
- Updated Gradation Testing Tolerance table to specify tolerance for specific sieve sizes:

Table 1028.18
Blended Aggregate Gradation
Testing Tolerances

Sieve Size	Tolerance
3/4 inch (19 mm), 1/2 inch (12.5 mm), 3/8 inch (9.5 mm), No. 4 (12.5 mm), No. 8 (2.36 mm)	5%
No. 16 (1.18 mm), No. 30 (600 µm), No. 50 (300 µm)	4%
No. 200 (75 µm)	2%

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Superpave Updates:

- Removed wording on sampling after 100 tons produced.
- Stair Stepped FAA Penalty for SPH:

Table 1028.20
FAA Penalty Scale

Percentage outside of allowable deviation given in Table 1028.19	Penalty for SPR	Penalty for SPH
0.1%	20% or reject	5% or reject
0.2%	20% or reject	10% or reject
0.3%	20% or reject	15% or reject
0.4% or greater	20% or reject	20% or reject

- The Air Void Table now states “50% or Reject” for pay factors that were previously “Reject” only.

Superpave Updates:

- Other updates include minor changes to specification language, significant digits, and movement of items within the specification to improve flow and arrangement of the specification.

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"Urban" Superpave Spec.

- Additional Updates
  - Includes latest Superpave updates
  - Smaller Sublot/Lot Sizes
  - Pay cannot exceed 100% at end of project, but still incentive before final 100% pay is reached.

Table 1028.21

Acceptance Schedule Air Voids - N_{des}			
Air voids test results for Asphaltic Concrete Type SPR	Air voids test results for SPH Asphaltic Concrete	Pay Factor	
		Moving average of four	Single test
Less than 0.5%	Less than 1.5%	50% or Reject	50% or Reject
0.5% to 0.9%	1.5% to 1.9%	50% or Reject	50%
1.0% to 1.4%	2.0% to 2.4%	50% or Reject	95%
1.5% to 1.9%	2.5% to 2.9%	90%	95%
2.0% to 2.4%	3.0% to 3.4%	100%	100%
2.5% to 3.5%	3.5% to 4.5%	102%	104%
3.6% to 4.0%	4.6% to 5.0%	100%	100%
4.1% to 4.5%	5.1% to 5.5%	95%	95%
4.6% to 5.0%	5.6% to 6.0%	90%	95%
5.1% to 5.5%	6.1% to 6.5%	50% or Reject	90%
5.6% to 6.0%	6.6% to 7.0%	50% or Reject	50%
6.1% and over	7.1% and over	50% or Reject	50% or Reject

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"Urban" Superpave Spec.

- "Upon completion of all of the sublots and pay factors for the entire project, the final pay factor calculated for quality incentive/disincentive shall not exceed 100%." (1028.03.7.c.)

Discussion....