WAPA
WISCONSIN ASPHALT PAVEMENT ASSOCIATION

WAPA Lunch & Learn

Spring 2016

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Who is WAPA?

- Wisconsin Asphalt Pavement Association
  - Established in 1948
  - Statewide, non-profit representing the interests of the asphalt paving industry in Wisconsin including:
    - Asphalt Design
    - Construction
    - Maintenance
    - Specifications
    - Costs
    - Marketing
    - Policy (local, state, and federal levels)

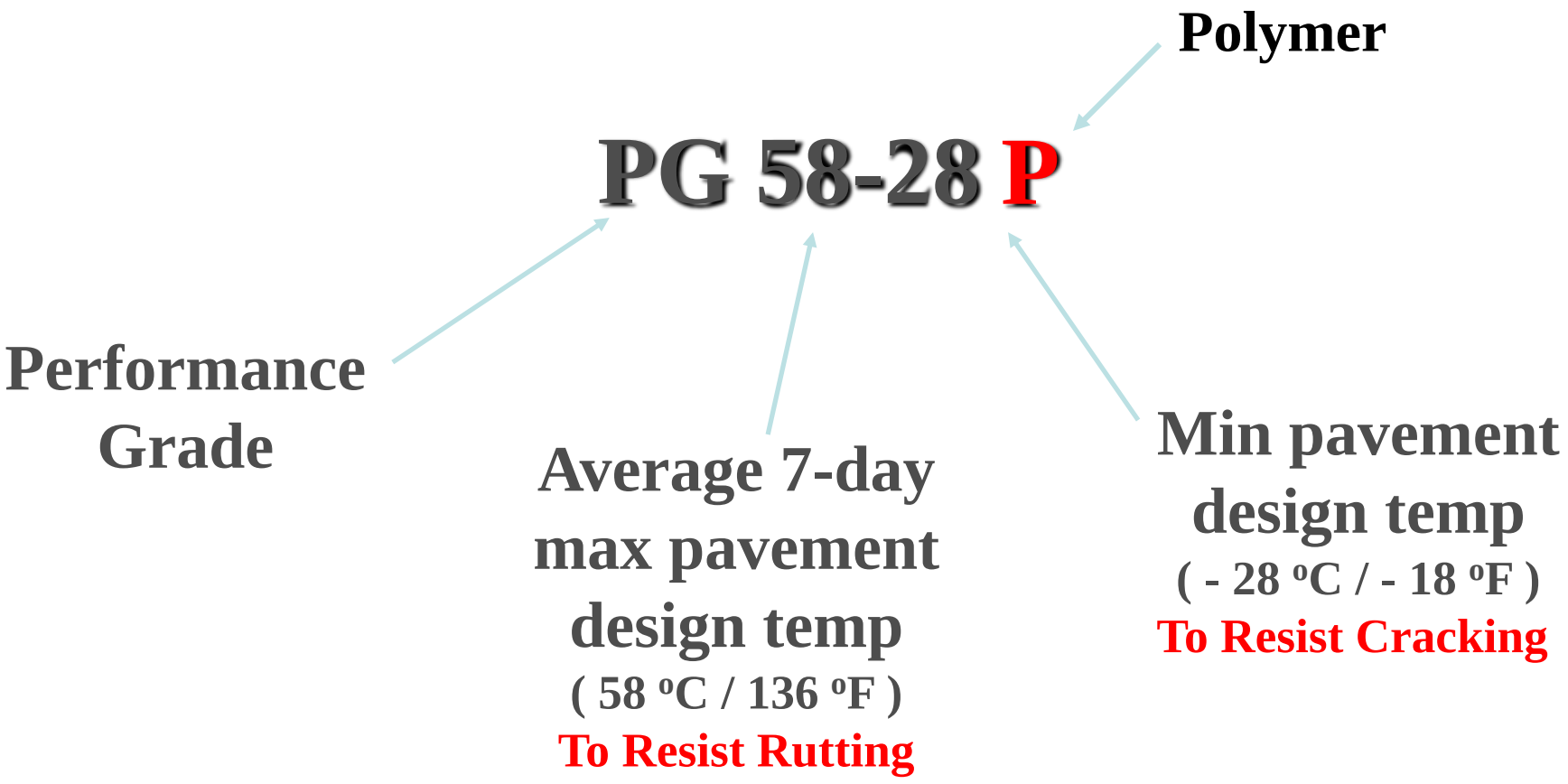
Our Industry

- Wisconsin Asphalt Pavement Businesses (WAPA Members)
  - Asphalt Pavement Producers
    - 75 facilities
    - 3,600 employees
  - Aggregate Resource Provider (Pits & Quarries)
    - 275 locations
    - Distributed throughout the state (facility in every county)
  - Others
    - Equipment suppliers, engineering consultants, etc.

WisDOT Specification Updates

- Combined Bid
- Tack Coat Changes
- High Recycle Pilot Projects

2015 Updates – PG Binder Designation



2015 Updates – Binder Grade Change

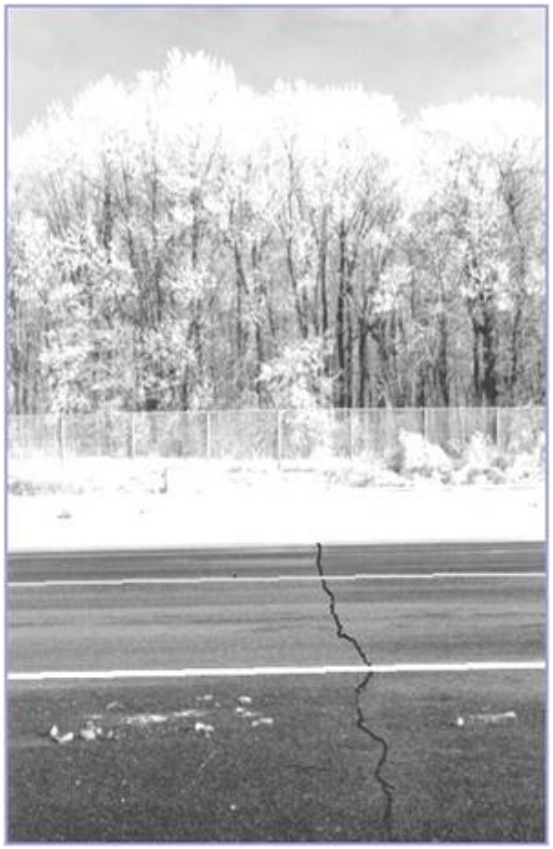
PG = Performance Graded

Eliminated the use of PG 64-22 in 2015

Why…

-22 C = -8 F

Not the proper binder for Wisconsin Climate



2016 Combining HMA Bid Items

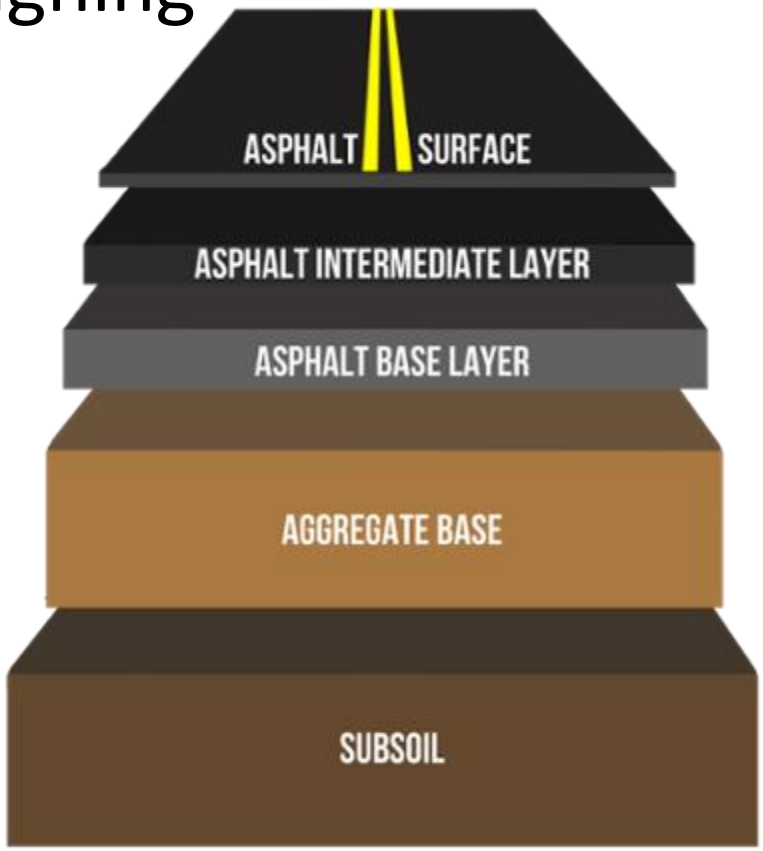
- When…
  - 2017 Standard Specification
  - Available by STSP in February (April/May Lettings)
- Why…
  - Streamline the bidding and estimating processes
  - Aid design/development staff in preparing estimates
  - Simplify the choice of PG Binders for the marketplace

Mix Selection System

- Steps: Pavement Selection
  - Step 1: Aggregate Gradation (Nmas)
  - Step 2: Traffic Category
  - Step 3: PG Binder
  - Step 4: PG Binder Traffic Designation
- Result – Mix bid item

Step 1: Gradation (Nmas)

- Know what layer you are designing
- Old SS 460
  - 12.5 mm Upper Layer
  - 19.0 mm Lower Layer



Step 1: Gradation (Nmas)

- New System
  - 1 - 37.5 mm
  - 2 - 25.0 mm
  - 3 - 19.0 mm
  - 4 - 12.5 mm
  - 5 - 9.5 mm
  - 6 - 4.75 mm

- Upper Layer Options
  - 4 - 12.5 mm
  - 5 - 9.5 mm
  - 6 - 4.75 mm

- Lower Layer Options
  - 2 - 25.0 mm
  - 3 - 19.0 mm
  - 4 - 12.5 mm

Step 2: Traffic Level

Existing		New	
Load Category	ESALs	Category	ESALs
E0.3	<300,000	LT	< 2 million
E1	300,000 to < 1 million		
E3	1 million to <3 million	MT	2 million to <8 million
E10	3 million to <10 million		
E30	10 million to <30 million	HT	≥8 million
E30X	>30 million		
SMA	Not Rated	SMA	consider for ≥5 million

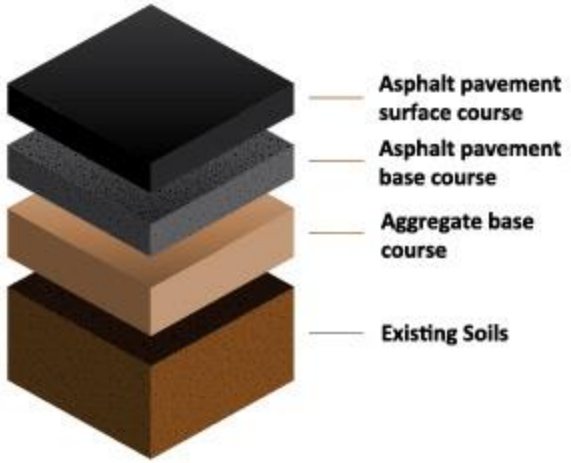
Step 2: Traffic Level

Existing		New	
Load Category	ESALs	Category	ESALs
E0.3	<300,000	LT	< 2 million
E1	300,000 to < 1 million		
E3	1 million to <3 million	MT	2 million to <8 million
E10	3 million to <10 million		
E30	10 million to <30 million	HT	≥8 million
E30X	>30 million		
SMA	Not Rated	SMA	consider for ≥5 million

Reduces 7 mix categories to 4 – Fewer mix designs!

Step 3: Binder Grades

- What is my location?
  - Northern or Southern Asphalt Zone
- Which layer am I designing?
  - Lower or Upper
  - Type of Construction
    - New construction
    - Reconstruction/Replacement
    - Overlay
    - Etc.



Step 3: Wisconsin Climate Zones

- Before: PG Line designation Hwy 29
- Current: Region/County Line Based

Step 3: Binder Grades

- Northern Asphalt Zone
  - New construction, reconstruction or pavement replacement
    - Upper Layers: PG 58-34
    - Lower Layers: PG 58-28
  - Other projects (Overlay, rehab, etc.)
    - All Layers: PG 58-28

Step 3: Binder Grades

- Southern Asphalt Zone
  - All Layers, all types of construction (replacement, overlays, reconstructs, etc.)
    - PG 58-28

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Step 4: Binder Traffic Designation

- Based on Multiple Stress Creep Recovery (MSCR) testing at the climatic high temperature at the design location (AASHTO M332 Testing)
- Grade bumping to be adjusted using MSCR designation, not E-mix or PG Grade
  - Ex: Moving from an E-1 to an E-3
  - Ex: Moving from a PG 58-28 to a PG 64-28

Step 4: Binder Traffic Designation

- Binder grades to be based on expected traffic level:
  - S – Standard (Normal projects)
  - H – Heavy (Higher truck movements, roundabouts, turn lanes, etc.)
  - V – Very Heavy (Extreme traffic, starting & stopping)
  - E – Extremely Heavy (Toll Booths, Port Facilities-not part of the WI matrix)
- Example (old to new): PG 64-28P → PG 58-28 H
  - H & V replace the "P" Grades

Step 4: Binder Traffic Designation

Specified Binders for Wisconsin

Old System	New System
58-28	58-28 S
64-28	58-28 H
70-28	58-28 V
58-34	58-34 S
64-34	58-34 H
70-34	58-34 V

Let's put it all together!

Step 1	
Gradations (Nmas)	
1	37.5 mm
2	25.0 mm
3	19.0 mm
4	12.5 mm
5	9.5 mm
6	4.75 mm

Step 2	
Traffic Level	
LT	Low Traffic Vol. (40 gyrations)
MT	Medium Traffic Vol. (75 gyrations)
HT	High Traffic Vol. (100 gyrations)

Step 3
Asphalt Binder
58-34
58-28

Step 4	
Designation Level	
S	Standard
H	Heavy
V	Very Heavy
E	Extremely Heavy

4 LT 58-34 S

Gradation

Traffic Level

Binder Grade

Binder Designation

So, for this example:

- Gradation = 12.5 mm
- Traffic Level = < 2 mil ESALs
- Binder Grade = 58-34
- Binder Designation = Standard

< 2 Mil ESALs			
Low Volume			
3	LT	58-34	S
4	LT	58-34	S
5	LT	58-34	S
3	LT	58-28	S
4	LT	58-28	S
5	LT	58-28	S

2 to <8 Mil ESALs			
Med Volume			
2	MT	58-34	S
3	MT	58-34	S
4	MT	58-34	S
5	MT	58-34	S
2	MT	58-28	S
3	MT	58-28	S
4	MT	58-28	S
5	MT	58-28	S
4	MT	58-34	H
5	MT	58-34	H
4	MT	58-28	H
5	MT	58-28	H

≥8 Mil ESALs			
High Volume			
2	HT	58-34	S
3	HT	58-34	S
4	HT	58-34	S
5	HT	58-34	S
2	HT	58-28	S
3	HT	58-28	S
4	HT	58-28	S
5	HT	58-28	S
2	HT	58-34	H
3	HT	58-34	H
4	HT	58-34	H
5	HT	58-34	H
2	HT	58-28	H
3	HT	58-28	H
4	HT	58-28	H
5	HT	58-28	H
4	HT	58-34	V
5	HT	58-34	V
4	HT	58-28	V
5	HT	58-28	V

≥5 Mil ESALs			
SMA			
4	SMA	58-34	H
5	SMA	58-34	H
4	SMA	58-28	H
5	SMA	58-28	H
4	SMA	58-34	V
5	SMA	58-34	V
4	SMA	58-28	V
5	SMA	58-28	V

Total of 46 bid combinations

System easily amendable as changes are needed

< 2 Mil ESALs			
Low Volume			
3	LT	58-34	S
4	LT	58-34	S
5	LT	58-34	S
3	LT	58-28	S
4	LT	58-28	S
5	LT	58-28	S

2 to <8 Mil ESALs			
Med Volume			
2	MT	58-34	S
3	MT	58-34	S
4	MT	58-34	S
5	MT	58-34	S
2	MT	58-28	S
3	MT	58-28	S
4	MT	58-28	S
5	MT	58-28	S
4	MT	58-34	H
5	MT	58-34	H
4	MT	58-28	H
5	MT	58-28	H

≥8 Mil ESALs			
High Volume			
2	HT	58-34	S
3	HT	58-34	S
4	HT	58-34	S
5	HT	58-34	S
2	HT	58-28	S
3	HT	58-28	S
4	HT	58-28	S
5	HT	58-28	S
2	HT	58-34	H
3	HT	58-34	H
4	HT	58-34	H
5	HT	58-34	H
2	HT	58-28	H
3	HT	58-28	H
4	HT	58-28	H
5	HT	58-28	H
4	HT	58-34	V
5	HT	58-34	V
4	HT	58-28	V
5	HT	58-28	V

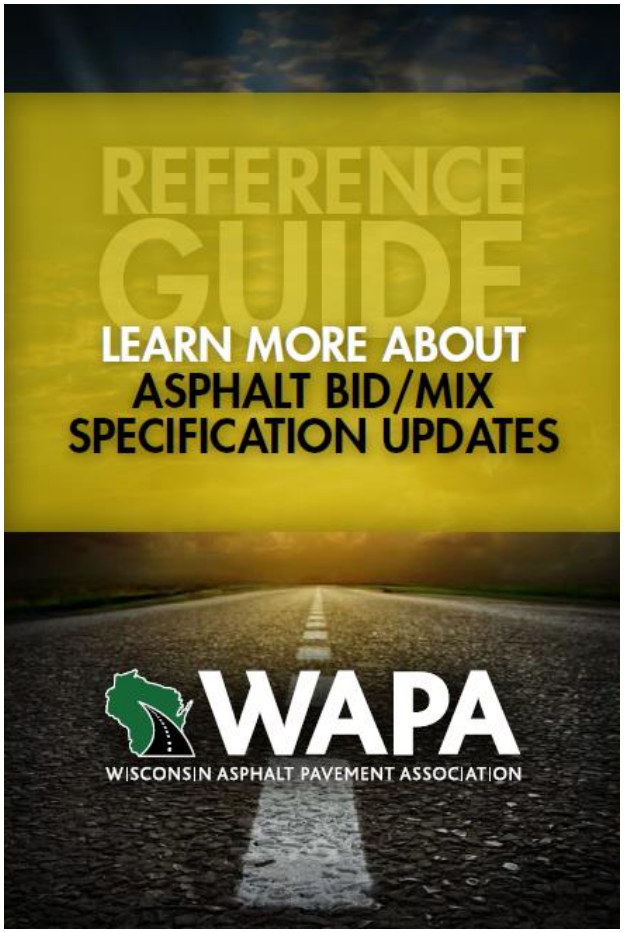
≥5 Mil ESALs			
SMA			
4	SMA	58-34	H
5	SMA	58-34	H
4	SMA	58-28	H
5	SMA	58-28	H
4	SMA	58-34	V
5	SMA	58-34	V
4	SMA	58-28	V
5	SMA	58-28	V

18 common bid combinations

Key mixes highlighted in yellow

Guidance Tools

- FDM Chapter 14-10.5
  - Updated to provide guidance
  - Step through the process
- Examples to be inserted in Pavement Design Manual (WisPAVE Manual)
- WAPA
  - Handout Guide
  - Website Selection Tool
    - www.wispave.org



What is tack?

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Tack Coat Changes

- Specification application rates increased
  - Obtain engineer's approval for application rate (0.050 to 0.070 gallons per square yard after dilution)
  - Contractor must show that as-placed material has 50% or more residual asphalt content
- More work will continue to be done for upcoming construction seasons
- Utilize best practices

High RAP/RAS Pilot Projects

- Four projects were piloted in 2014 & 2015
  - 100% recyclable
  - Most recycled product in America
    - Saving taxpayers over $2 billion annually
  - Reduce landfill/conserve natural resources
    - Cost-effective without sacrificing pavement performance

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Questions/Comments