ASSOCIATION of MODIFIED ASPHALT PRODUCERS 8th ANNUAL MEETING

Feb. 12th to Feb. 14th 2007 Fairmont Copley Plaza Hotel BOSTON, MA.

Pennsylvania's Experience with

MODIFIED ASPHALTS

Pre – Superpave to Now

RESEARCH PROJECT # 87-50C

POLYMER MODIFIED ASPHALTS

Transportation Research Record #1661 (1999)

WHY the RESEARCH? Premature Rutting had been Increasing in recent years (Mid 1980's) due to:

Increased Traffic Loads Increased Truck Tire Pressures Duration & Frequency of High Temps. Inadequate Mix Properties

OBJECTIVE

To evaluate the effectiveness of various polymer modifiers or other types of bituminous modifiers to reduce rutting and deformation

Research Project 87 – 50C



Interstate 80 **TRAFFIC DATA** 8,284 ADT (36% Trucks) 1989 12,885 ADT (49% Trucks) 2006 **TEST SECTIONS** 3% Grade ¹/₂-mile long **Traffic lane**

PLACEMENT DATESEastboundApril 1989

Westbound August 1989

Completed Project September 1989

Modifiers and Additives Used

TYPE

AC-20 (Control) LDPE EVA SB SBS AC-40 (Stiff Neat) Powdered Rock Asphalt Polyester Fibers ID-3W & Special Binder (Large Stone Mix)

Project Layout



Typical Pavement Cross-Section

WEARING 12.5 mm NMAS (ID-2 WEARING)	Modifier	1½ in.
BINDER 37.5 mm NMAS (ID-2 Binder)	Modifier	21/2 in.
BASE 37.5 mm NMAS (BCBC)	AC-20	3 in.
JOINTED RCCP		10 in.

Other Pavement Cross-Sections

WEARING 12.5 mm NMAS (ID-2 Wearing)	AC-20	1½ in.	WEARING 19 mm NMAS (ID-3 Wearing)	AC-20	2 in.
BINDER 37.5 mm NMAS (ID-2 Binder)	AC-40	2½ in.	BINDER 50 mm NMAS (Special	AC-20	
BASE 37.5mm NMAS (BCBC)	AC-40	3 in.	Binder)		5 in.
JOINTED		10 in.	JOINTED RCCP		10 in.



Rut Depths After 5 Years





Limiting Stiffness Temp.



Overall Best Performance Modified Asphalt Systems





Polyester – Fibers (MIX)

Some of the Modified Asphalts Appear To have Contributed to Accelerated Cracking (Fatigue or Reflective)

POWDERED ROCK ASPHALT

EVA



RESEARCH PROJECT No. 91-58

ANTI-RUTTING MATERIALS for INTERSECTIONS

Research Project 91 - 58



Route 11 Mechanicsburg, PA

- 1000

Route 11 Mechanicsburg, PA

EVA AC-40 AC-20 SBS ID-3 ID-3





Wheel Tracking Results Penn Rt 11 (ID-2 BC)



Wheel Tracking Results Part 11 ID-3-WC



Wheel Passes, thousands

Route 30 Pittsburgh, PA

Route 30 Pittsburgh, PA

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Real Property Property





OTHER EXPERIMENTS

EARLY SUPERPAVE IMPLEMENTATION

Allentown PA 6th & Linden

Pa's. 1st Superpave

19mm PG 76-22





Superpave Rt. 15 Amity Hall, PA

19mm PG 76-22

19mm PG 76-22

Flying "J" Left Turn Lane Carlisle, PA

SUPERPAVE BINDERS -NEW SPECIFICATION (1998)

PG 76-22 + (E.R./SB/SBS) SBR BATCH PERMITTED



MORE EXPERIMENTS NEW MODIFIERS OTHER ISSUES (COMPATIBILITY / SEPARATION)

All PG 76-22 SB / OXIDIZED / TERPOLYMER / POLYESTER FIBERS (2000)

Route 11 Chambersburg, PA.

Both Lab Testing & Field Verification Suggest:

Elastomeric Modified Asphalts Can Contribute to Improved Rut Resistance Without Compromising Cracking Resistance (Fatigue & Low Temp. Related)

CURRENT PENNDOT SPEC (PG+)

SB or SBS POLYMERS R & B SEPARATION (2C MAX.) ELASTIC RECOVERY - ASTM (60% MIN.) • INTERMEDIATE TEMP. (25C) • PLAN on REPLACING E.R. w/ M.S.C.R. * Published by AASHTO * Purchase new D.S.R.s

PLANNED FUTURE EVALUATIONS

P.P.A. (PG 64-28) * Neat Control
Rubberized Asphalt Seal Coat (RASC) * PG Binders w/ CRM
S.M.A. w/ CRM
* 12.5mm (2003) * 4.75mm (2006) THANK YOU ! QUESTIONS ?

