

HMA IL 19.0 BINDER FINE GRADED

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POLYMER HMA IL 19.0 CG

- ✕ In mid 1990's D-5 elected to remove all non-polymer binder lifts in the D.L. and replace with Polymer HMA IL 19.0 CG mixes
- ✕ In 2009/10 District evaluated performance of the Polymer HMA IL 19.0 CG mixes using the Hamburg Wheel and volumetric testing.
- ✕ Time under traffic varied from 6–10 years. Testing indicated that the mixes are performing well in lab as well as in place with no rutting.
- ✕ Based on Hamburg Wheel testing, surface mix more stable than CG binder mixes.

IS THERE A BETTER OPTION?

POLYMER HMA IL 19.0 FG

- ✕ In November 2009, District 5, BMPR & Industry developed a special provision for HMA Binder Course IL 19.0 FG.
- ✕ Steve Robinson, District 5 Mixtures Control Engineer
- ✕ Scott Lackey, District 5 Materials Engineer
- ✕ Jim Trepanier, BMPR HMA Operations Engineer
- ✕ Bill Pine, Heritage Research Group Research Engineer
- ✕ First project: Both FG and CG IL 19.0 mixes
- ✕ In addition, the mix designs would be tested in the Hamburg Wheel to insure the FG was as stable as the CG mix.

HMA BINDER COURSE, IL 19.0 FG				
High ESAL, MIXTURE COMPOSITION (% PASSING)				
Sieve Size	IL 19.0 mm (Coarse Graded)		IL 19.0 mm (Fine Graded)	
	min	max	min	max
1 1/2 in (37.5 mm)				
1 in (25 mm)		100		100
3/4 in (19 mm)	82	100	90	100
1/2 in (12.5 mm)	50	85	69	89
3/8 in (9.5 mm)				
# 4 (4.75 mm)	24	40	45	60
# 8 (2.36 mm)	20	36	30	45
# 16 (1.18 mm)	10	25	20	35
# 50 (300 µm)	4	12	8	15
# 100 (150 µm)	3	9	6	9
# 200 (75 µm)	3	6	3.5	5.5
Ratio Dust/Asphalt Binder		1.0		1.0
VMA	13.0		13.5	
Density Ndesign ≥ 90	93.0 - 96.0 %		93.0 - 96.0 %	
	50 % Manufactured Sand FA 20		67 % Manufactured Sand FA 20, 21 or 22	

IS THERE A BETTER OPTION?

POLYMER HMA IL 19.0 FG

DISTRICT 5 EXPERIENCE

- ✖ In 2010: District included both a CG & FG Polymer HMA, IL 19.0 mix on I-57 north of Tuscola. (17,000 tons FG)
- ✖ Conclusions:
 - + Cost comparison – FG \$1.10/ton > CG; FG \$2.65/ton < Surf
 - + Density – CG - SJT 93.4%; Mat 93.5%; CLJT 93.0%
 - ✖ FG – SJT 95.1%; Mat 95.3%; CLJT 94.7%
 - + + +
 - ✖ F.G. AVG 1.5 -1.8% higher density with fewer passes
 - + Stability – Hamburg Wheel, production

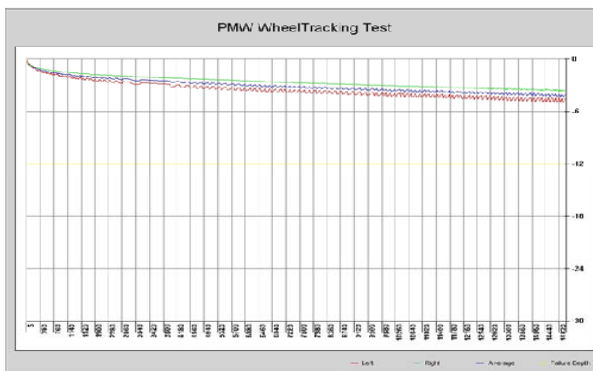
WheelTracker Report

URB COARSE GRADED
85BIT4726

Project Name: HW10-050	Date: 5/17/2010
Project Number: 85BIT4726	Date Sampled: 5/14/2010
Job Number:	Lab Number: P10-15
Project Engineer:	Mix Type: HMA BC N105 19.0R
Submitted By:	Asphalt Grade: SBS 70-22
Temperature: 50	Pit Source:
Comments: Left: D-5, GYROS 1, 2 Right: D-5, GYROS 3, 4 No anti-strip	

Left Max Impression: -5.00 mm Pass #: 14920 / PL 8 PASS	Right Max Impression: -3.68 mm Pass #: 14900 / PL 11 PASS	Average Max Impression: -4.34 mm PASS
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Fail Depth: 12.5mm



CC:

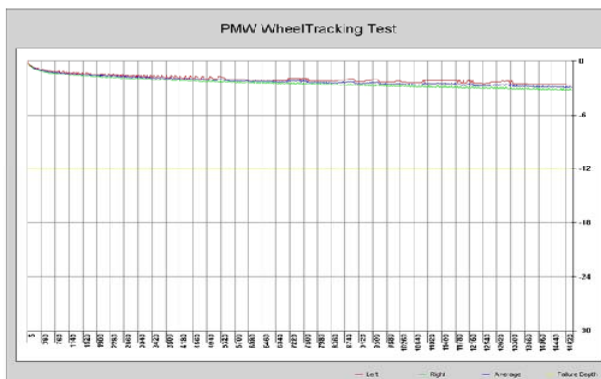
WheelTracker Report

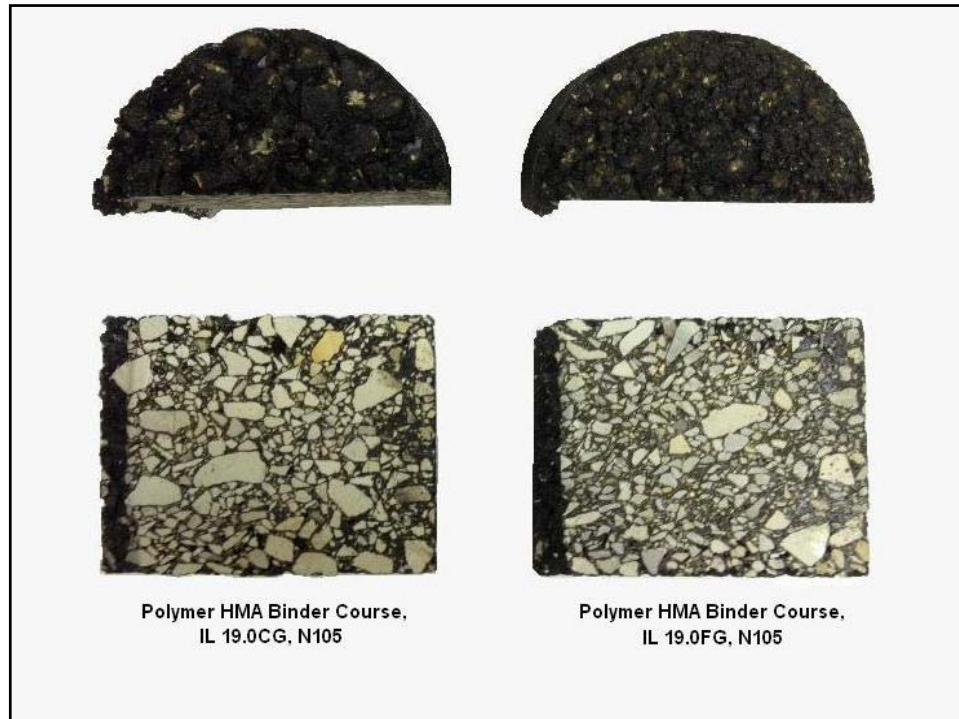
URB FINE GRADED
85BIT4746

Project Name: HW10-049	Date: 5/17/2010
Project Number: 85BIT4746	Date Sampled: 5/13/2010
Job Number:	Lab Number: P10-14
Project Engineer:	Mix Type: HMA BC N105 19.0R F.G.
Submitted By:	Asphalt Grade: SBS 70-22
Temperature: 50	Pit Source:
Comments: Left: GYROS 1, 2 Right: GYROS 3, 4 No anti-strip	

Left Max Impression: -2.96 mm Pass #: 14920 / PL 9 PASS	Right Max Impression: -3.21 mm Pass #: 14940 / PL 11 PASS	Average Max Impression: -2.91 mm PASS
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Fail Depth: 12.5mm





IS THERE A BETTER OPTION?

POLYMER HMA IL 19.0 FG

DISTRICT 5 EXPERIENCE

- ✕ In 2011: Substituted for CG mix originally included in the contract.
- ✕ I-72 from Macon County line to White Heath Road. (49,000 tons FG)
- ✕ Conclusions:
 - + Cost comparison – FG = CG; FG \$4.00/ton < Surf
 - + Density – FG easier to achieve than adjacent CG section
 - + Stability – Hamburg Wheel production
 - + Permeability – Illinois Center for Transportation
 - + Constructability – Reduced rolling pattern; higher mat and joint density

WheelTracker Report

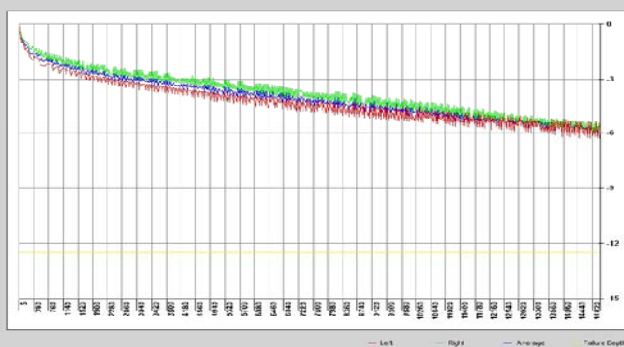
85BIT4753
IL 19.0 N90 R
SBS70-22

Project Name: HW11-018	Date: 4/25/2011
Project Number: D-5; 85BIT4753	Date Sampled: 4/22/2011
Job Number:	Lab Number: P11-22
Project Engineer:	Mix Type: IL 19.0 N90 REC
Submitted By:	Asphalt Grade: 70-22; 15,000 passes
Temperature: 50	Pit Source:
Comments: D-5; GYROS 1, 2, 3, & 4	

Left Max Impression: -6.32 mm Pass #: 15000 / PT: 8 PASS	Right Max Impression: -6.99 mm Pass #: 14980 / PT: 7 PASS	Average Max Impression: -6.16 mm PASS
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Fail Depth: 12.5mm

PMW WheelTracking Test



WheelTracker Report

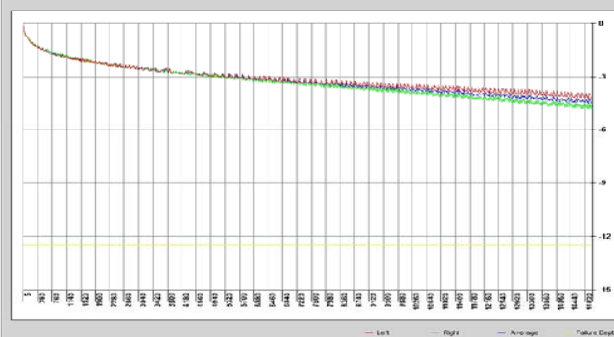
85BIT4755
IL 19.0 FG N90 R
SBS PG 70-22

Project Name: HW11-018	Date: 4/22/2011
Project Number: D-5; 85BIT4755	Date Sampled: 4/21/2011
Job Number:	Lab Number: P11-20
Project Engineer:	Mix Type: IL 19.0 F.G. N90 REC
Submitted By:	Asphalt Grade: 70-22; 15,000 passes
Temperature: 50	Pit Source:
Comments: D-5; GYROS 1, 2, 3, & 4	

Left Max Impression: -4.21 mm Pass #: 15000 / PT: 7 PASS	Right Max Impression: -4.81 mm Pass #: 14900 / PT: 6 PASS	Average Max Impression: -4.51 mm PASS
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Fail Depth: 12.5mm

PMW WheelTracking Test



IS THERE A BETTER OPTION?

POLYMER HMA IL 19.0 FG

DISTRICT 5 EXPERIENCE

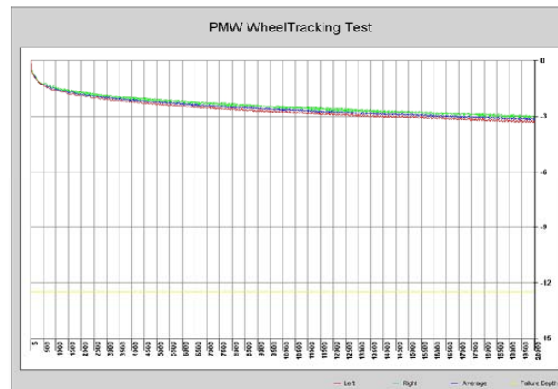
- ✦ In 2011: FG Polymer HMA, IL 19.0 mix on I-74 in McLean County from US 51 to Downs. (19,000 tons FG) Pay for Performance Spec.
- ✦ Conclusions:
 - ✦ Cost comparison – FG \$2.23/ton > CG; FG \$2.54/ ton < Surf
 - ✦ Density – PFP vs QC/QA Testing, 100.7% Pay
 - ✦ Stability – Hamburg proven in design and production

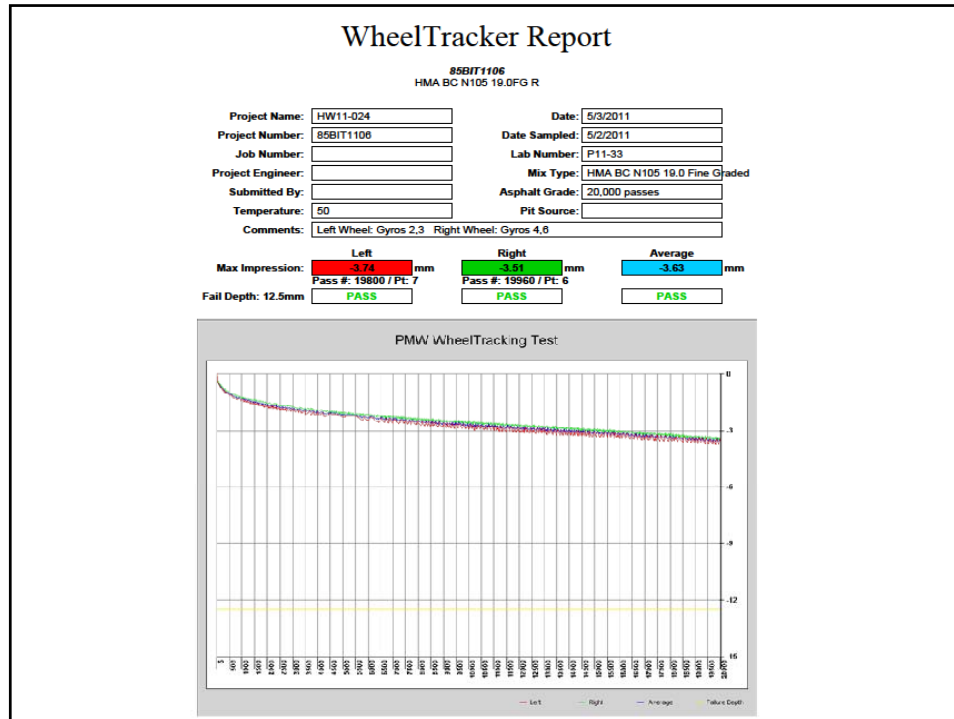
WheelTracker Report

85BIT4370
HMA BC 19.0 R

Project Name:	HW11-025	Date:	5/3/2011
Project Number:	85BIT4370	Date Sampled:	5/2/2011
Job Number:		Lab Number:	P11-34
Project Engineer:		Mix Type:	HMA BC N105 19.0R
Submitted By:		Asphalt Grade:	20,000 passes
Temperature:	50	Pit Source:	
Comments:	10542R; Left Wheel: Gyros 2.3; Right Wheel: Gyros 4.5		

	Left	Right	Average
Max Impression:	3.34 mm	3.10 mm	3.22 mm
Pass #:	19520 / PL: 10	Pass #: 19980 / PL: 8	
Fail Depth: 12.5mm	PASS	PASS	PASS





IS THERE A BETTER OPTION? POLYMER HMA IL 19.0 FG

- ✧ District 5 plans to solely use HMA Binder Course, IL 19.0 FG .

Our experience (~85,000 tons) with the FG IL 19.0 mix has shown:

- Segregation is minimized and basically a non issue
- Density is easier to achieve
- Less permeable
- Requires less compactive effort
- Increase production and improve smoothness
- Less expensive than a surface mix
- More durable than CG Binder, may be the “perpetual binder”

QUESTIONS

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