IDOT HMA Update

57th Annual Bituminous Conference

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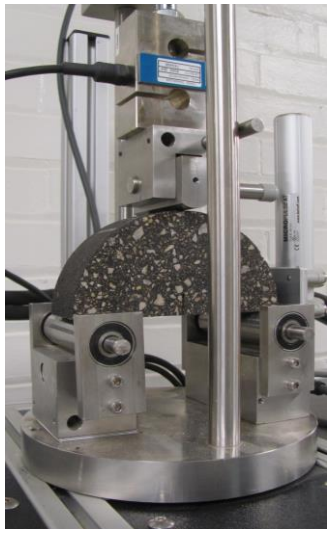
Illinois Department of Transportation

Topics

- I-FIT
- Spec Revisions for 2017
- Thicker Level Binder
- LJS
- Tack Coat
- PG Binder Usage

I-FIT

- Findings to Date
- 2016 Pilot Projects
- Spec Revisions for 2017
- Training Classes
- 2017 Round Robins
- Implementation Goals

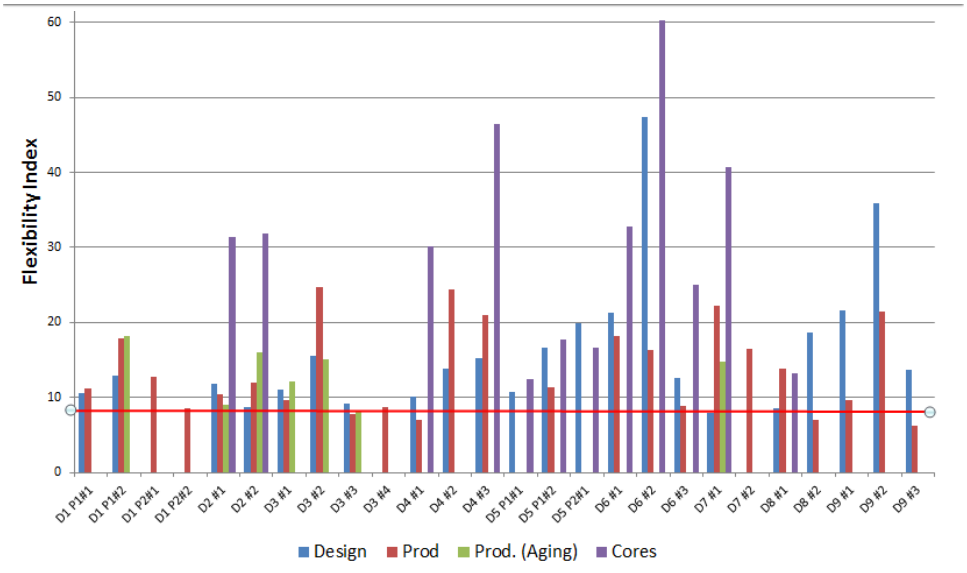


Findings to Date: (> 500 mixes)

- Grade bumping makes a significant impact in terms of FI improvement
  - > 20% ABR results demonstrate need for bumping
  - > 35% ABR results demonstrate need for second bump
- Poly mod => significant improvement in FI
- Smaller NMAS => increased FI
- Increases in VMA => increased FI
- Increases in Total AC => increased FI
- Increases in Virgin AC => increased FI

4

FI Results for All Pilot Project Mixes

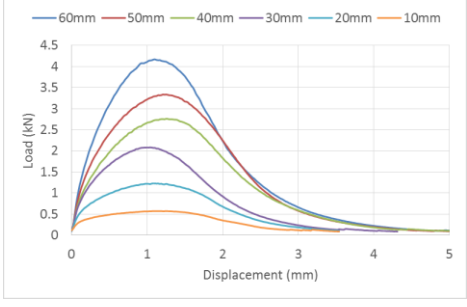


2016 Pilot Projects

- Observations
  - Most everything passed except 4 production tests
  - Some production FI increase from Design
    - Moisture blocking absorption of AC
  - FI from cores typically much higher
    - Due to being thin

$$FI_{Adjusted\ for\ Thickness} = FI * (Thickness / 50)$$

Where: Thickness ≥ 2.5 * NMAS (recommended)



I-FIT Spec Changes for 2017

- Eliminated DCT testing requirement
- Clarify best 3 out of 4 results
- Reduced Production Sample Size
- RAP/RAS Incentives Remain for I-FIT Projects

Training Classes

- CTL ½ day Classes
  - 11/29 : 2 Classes @ CTL in Chicago
  - 12/1 : 1 Class @ LL College in Mattoon
- Course Content
  - Sample Prep
  - Running Test
  - Use of Software
- Future Training – HMA Level I @ LL

2017 I-FIT Round Robins

- All I-FIT's (State & Industry)
- 3 Round Robins - Same Mix
  1. Perform Test
  2. Make All Necessary Cuts / Perform Test
  3. Compact Gyratory Spec / Make Cuts / Perform Test

Implementation Goals

- 2017
  - 2 – I-FIT Projects / District
  - 3- I-FIT Round Robins
  - ICT Phase 2 Research – Develop Long Term Aging Protocol (LTA)
- 2018 & 2019
  - Increase # of I-FIT Projects
  - Implement LTA Protocol
  - ICT Phase 3 Research - Develop Precision & Bias for AASHTO TP-124

Spec Revisions for 2017

Quality Management Programs

- PFP - ≥ 8,000* tons
  - No Temp pavements, incidental, shoulders*
  - No Apps where Thickness < 3 X NMAS
  - No Level binder applications
- QCP – 1,200 → 8,000 tons
- QC/QA (modified)
  - < 1,200 tons
  - Shoulders placed w/ Road Widener
  - Patching & Incidental

Leveling Binder

- 9.5 CG – 100% for Density Pay Factor
- 9.5 FG & IL-4.75 – QCP Pay Adj Apply
  - Thin Cores < 3/4 inch excluded from Pay Adj
  - Contractor marks longitudinal offsets along shoulder for defects such as punchouts, patches, scabs etc..

Variable Depth Leveling Binder

- QCP Pay Adjustments Apply or
  - Thin Cores < 3/4 inch excluded from Pay Adj
- Intelligent Compaction to monitor passes/temp/speed prescribed in Mix Reqmnts Table

BDE Chap 53 - Draft Wording

The following HMA mixture requirements are applicable for this project:

Location(s):	
Mixture Use(s):	
PG:	
Design Air Voids:	
Mixture Composition: (Mixture Gradation)	
Friction Aggregate:	
Mixture Weight:	
Quality Management Program:	
Roller Type / Number of Passes / Compaction Temperature Range[1/]	
Sublot Size:	

1/ When this field is filled out the contractor may use intelligent compaction according to the Procedure for Intelligent Compaction in the Department's Manual of Test Procedures to receive 100% pay for density.

HMA MIXTURE REQUIREMENTS TABLE

Figure 53-4.M

Moving Random Core Locations

- For Obstacles
- When Paving over Distressed Areas

PFP and QCP Random Density Procedure - Appendix E3 MTP

C) Moving Core Locations.

There are two scenarios in which random core locations may be moved longitudinally using the same random transverse offset. The first scenario is to avoid only the obstacles listed under Case 1 below. The second scenario is to avoid pavement defects in the surface being overlaid as described in Case 2 below.

1) Case 1. In the event the random core location will not allow the necessary compactive effort to be applied, the Engineer will adjust the longitudinal location of the core in order to avoid the obstacle. Using the same random transverse offset, the core location will be moved longitudinally, ± 15 feet to avoid the following obstacles only:

   a) Structures or Bridge Decks
   b) Detection loop or other pavement sensors
   c) Manholes or other utility ~~structures~~appurtenances

2) Case 2. In the event there are pavement defects in the surface being overlaid, the Contractor may place temporary markings on the shoulder to represent longitudinal locations where a defect is present. These pavement defect locations ~~sha~~will be approved by the Engineer. If a random core location lands at the same longitudinal location as the temporary mark, the core will be moved 5 feet in the direction toward the paver at the same transverse offset. In the case of an asphalt scab (i.e. thin layer of less than 0.5 inches of asphalt pavement remaining after milling) the temporary markings shall ~~be connected to~~ show the extent or length of the defect. The core location will then be moved to a longitudinal distance 5 feet past the end of the defect toward the paver.

Leveling Binder Thickness

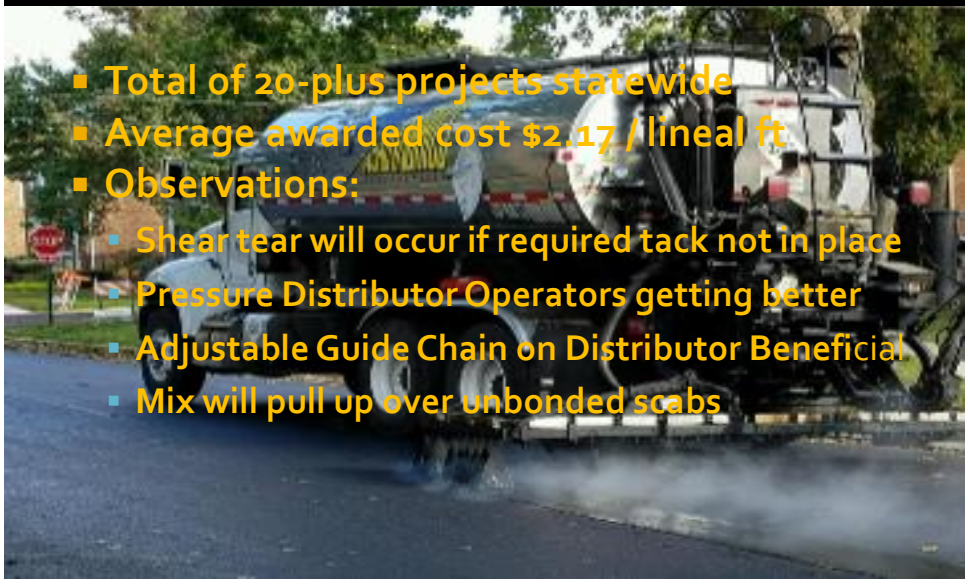
- Pursuing 1 inch Lev Binder for Policy Overlay (Off Int.)
  - If successful, eliminate 9.5 CG Lev Binder
  - Adopt 9.5 FG or IL 4.75 w/ Density Reqmnt for Lev Binder
- Why Thicker?
  - 3P overlay (non-interstate): ¾" LB and 1.5" surface course.
  - ¾" IL-9.5 LB does not meet 3 times nominal maximum aggregate size (NMAS) and therefore is difficult to get compaction => No Density Requirement
  - Increasing LB to 1" will bring the lift much closer to 3 times NMAS.

Longitudinal Joint Seal (LJS)

Longitudinal Joint Spec

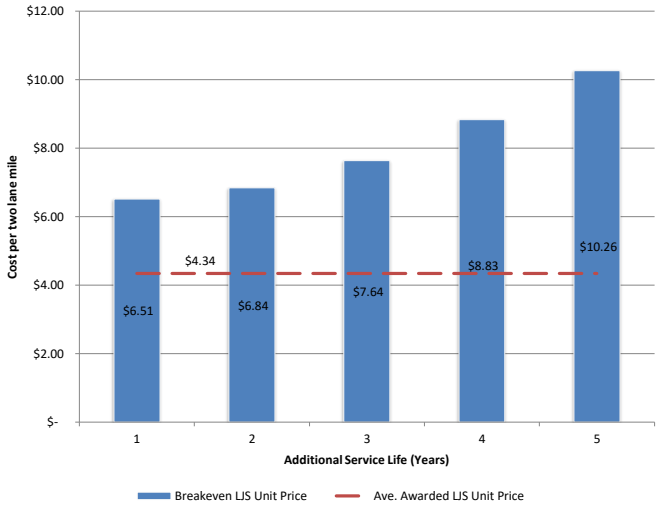
- Implementation Goals:
  - 2016 – 2 Projects per District
  - 2017 – 50% of Projects per District
  - 2018 – Full Implementation

2016 - LJS Projects



- Total of 20-plus projects statewide
- Average awarded cost $2.17 / lineal ft
- Observations:
  - Shear tear will occur if required tack not in place
  - Pressure Distributor Operators getting better
  - Adjustable Guide Chain on Distributor Beneficial
  - Mix will pull up over unbonded scabs

LJS - Life Cycle Cost Analysis



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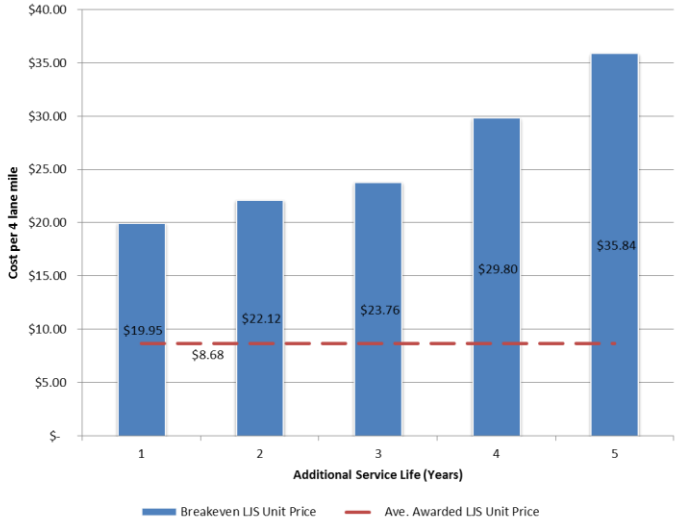

LJS - Spec changes for 2017

- No longer exclude IL-4.75 mixes
- Increase Dynamic Shear test temp from 82° C to 88° C
- Increase Elastic Rec. Min. from 58 to 65%
- Ash Content range 1.0 to 4.0% instead of 0.0 to 6.0%
- Add max LJS temp of 330°
- Remove reqmnt of sandwiching LJS in NWJ
- One LJS sample per job from Applicator

Longitudinal Joint Spec

- Implementation Goals:
  - 2016 – 2 Projects per District
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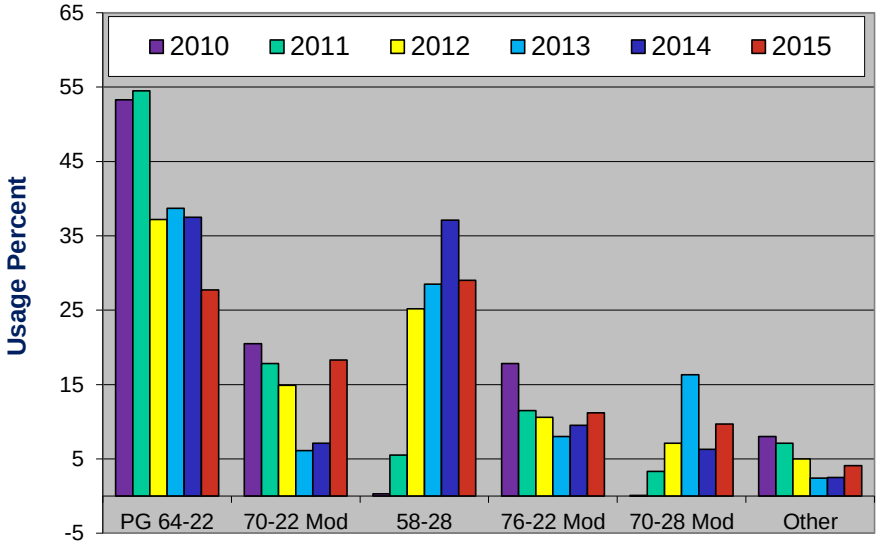
New Tack Coat Products

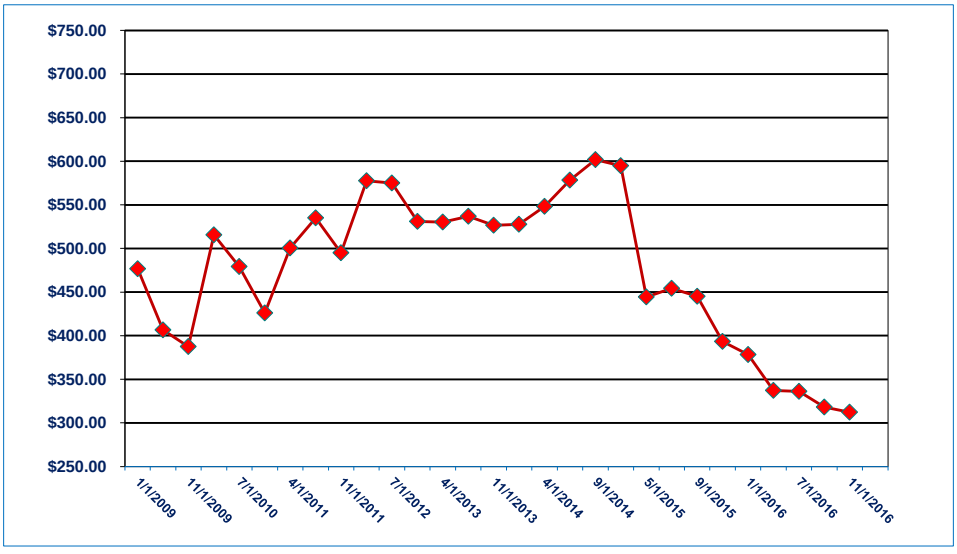
- Evaluate Bond Strength of New Products
  - Bond Strength ≥ SS-1h
    - Lab Shear Test using ATREL Device Lab Specimens
  - Products to be Evaluated:
    - PG64-22
    - LJS at 0.10 #/ft² (gal/yd²)
    - Tri-State QS
    - Tri-State QST

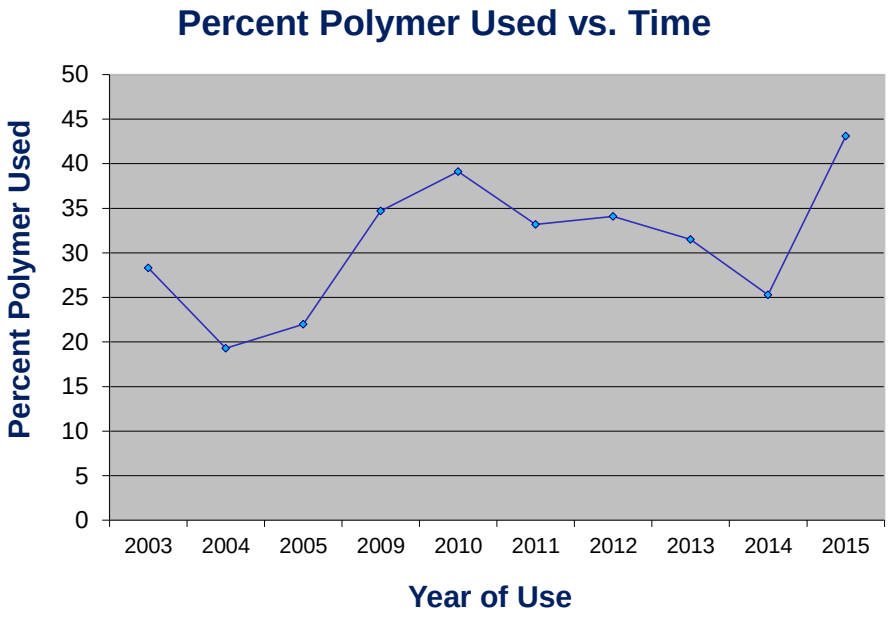
PG Binder Usage

2010 to 2015 Grade Usage



Bituminous Price Index





Questions

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