Part I: High Polymer Asphalt: What should we know?

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Outline

• What is it?
• Why are we using it?
• Where should we use it?
• How do we specify it?
• Lessons learned / Usage guidelines
• Ongoing research
• *Part II: Field Perspective: David Shiells, NOVA*
What is High Polymer Asphalt

- Often referred to in Virginia as “HP”
- Styrene-butadiene-styrene (SBS) co-polymer
- Contains approximately 7.5% polymer
  - This is 2-3 times typical polymer loading!
- Both stiff and elastic
- Uses a PG58-28 base binder
- Polymer increases it to a PG82-28
  - PG76E-28 MSCR grading
Why are we using it?

• This material is highly elastic:
  – Can be used over cracked pavements
  – Can be used over jointed concrete pavement

• The material is also stiff but not brittle:
  – Can be used in thin-overlays
  – Can be used to make thick pavement sections thin
    • NCAT: 5.75 inch high polymer = 7 inch traditional

• Can be used in almost any mix – just replace the binder!
Where should we use it?

- Jointed Concrete Pavements
- Fatigued pavements where other options aren’t viable (i.e., in-place recycling)
- Thin overlays in subdivisions and secondary roads
How do we specify it?

• No more than 15% RAP
  – More binder replacement = less HP binder

• Binder specification:
  – Multiple Stress Creep and Recovery (MSCR) test
  – Must have a 90% recovery at 76ºC
  – Preferred viscosity is less than or equal to 3.0 Pa-s, may reach 5.0 Pa-s if supplier and contractor agree on suitable workability

• PG76E-28 (HP) binder grading
  – Test is run at 76ºC not 64ºC like other binders
Usage Guidelines

• “Keep it hot”, >300ºF *behind the screed*
• Use warm mix additives as a compaction-aid and for improved workability
• Logistics: Try to limit truck queue
Usage Guidelines

• Stone Matrix Asphalt:
  – Avoid using on shoulders and ramps
  – Tough handwork
  – When possible place in hot weather

• Lab work: It’s sticky! Can be tough to work with
Ongoing HP Projects

• HP Phase I project
  – Subdivision project to trial HP, SM-9.5 mix
  – Results promising
  – Report nearing completion

• Implementable outcomes of Phase I
  – Development of official state specification for HP binders
  – Development of mix-use guidelines
Ongoing HP Projects

• HP Phase II project – Overlay Jointed Concrete
  – Comparing different HP mix types to each other
    • SM-9.0 – NOVA District (I-95)
    • SMA-9.5 – NOVA District (I-95)
    • Richmond District (I-95)
    • SM-12.5 – NOVA District (I-95, I-495)
  – Many lessons learned
  – Material is performing very well
• What mix type is most effective?
• Experimenting with new crack test, the semi-circular bend test (SCB)
What’s next? High Polymer asphalt is coming to a project near you!

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