

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 76°C
 - 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 76°C not 64°C like other binders



Usage Guidelines

- “Keep it hot”, $>300^{\circ}\text{F}$ *behind the screed*
- Use warm mix additives as a compaction-aid and for improved workability
- Logistics: Try to limit truck queue



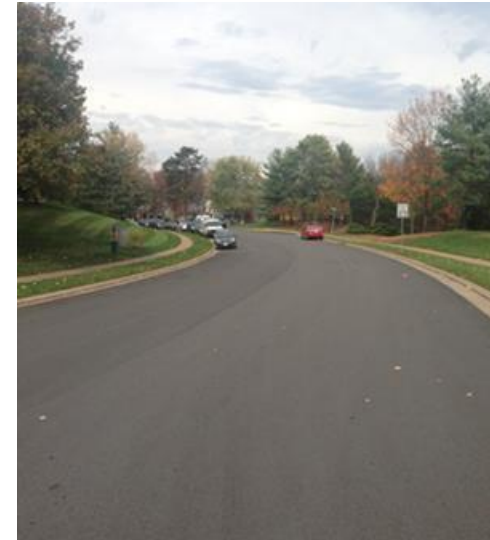
Usage Guidelines

- 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



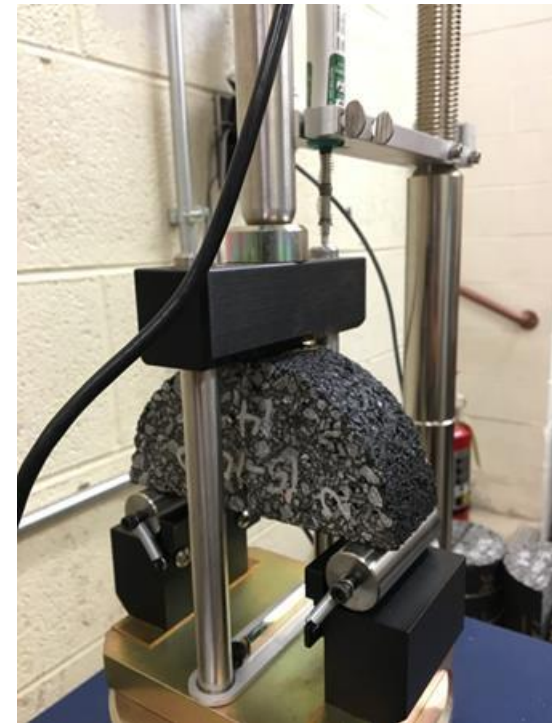
Ongoing HP Projects

- 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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