Importance of Proper Emulsified Asphalt Sampling and Testing

A State’s Perspective

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Sampling and Testing

• Why sample and test?
• Want to get…
Sampling and Testing

- Why sample and test?
- …Not
Sampling and Testing

• What do we do?
• 2 layers of protection
• Source testing (Materials Lab)
  – Verify supplier testing
• Job testing (District Lab)
  – Check consistency with source
District Lab Testing

- Saybolt Viscosity
- Sprayability
- Pumpability
District Lab Testing

- Saybolt Viscosity
- Sprayability
- Pumpability

- Only Viscosity? – Assumptions?
Materials Lab Testing

- Saybolt Viscosity
- Sieve
Materials Lab Testing

- Sieve
- Check for contamination
- Stability
- Consistency
Materials Lab Testing

- Saybolt Viscosity
- Sieve
- Settlement
Materials Lab Testing

- Settlement
- Storage issues
- Stability
Materials Lab Testing

- Saybolt Viscosity
- Sieve
- Settlement
- Particle Charge
Materials Lab Testing

- Particle Charge
- Compatibility with aggregate
Materials Lab Testing

- Saybolt Viscosity
- Sieve
- Settlement
- Particle Charge
- Percent Residue
Materials Lab Testing

- Percent Residue
- Sufficient amount of asphalt binder
- Film thickness
Materials Lab Testing

- Saybolt Viscosity
- Sieve
- Settlement
- Particle Charge
- Percent Residue
- Ductility / Force Ductility
- Elastic Recovery
Materials Lab Testing

- Ductility / Force
- Ductility
- Durability
- Aggregate retention
Materials Lab Testing

• Elastic Recovery
• Durability
• Aggregate retention
Materials Lab Testing

- Saybolt Viscosity
- Sieve
- Settlement
- Particle Charge
- Percent Residue
- Ductility / Force Ductility
- Elastic Recovery
- Penetration
- Softening Point
Materials Lab Testing

- Penetration
- Index Test
- Some relation to climate
Materials Lab Testing

- Softening Point
- Index Test
- Some relation to climate
Roadway Relevance

- How does it fit together?
- Testing reflected in construction
Sampling and Handling

- Factors affecting emulsions
- Temperature changes
- Rough handling
- Air
- Contamination
- Mixing materials (i.e. cationic and anionic)
Sampling and Handling

• Samples *must* be representative
Sampling and Handling

• **Sampling Do List**

• Clean plastic gallon jugs
• Sample from proper location
  – Between pump and spigot
  – 1/3 down from top of tank
• Allow some material to drain first
  – Sample truck during middle third of unloading
• Fill jug completely
Sampling and Handling

- Sampling Do List
- Properly identify on jug, not cap
- Ship to lab quickly
- Mix slowly before testing
  - Over-mixing -> entrained air / unstable
- Heat gently for testing
- Clean stirring rods, beakers
Sampling and Handling

• Sampling Don’t List

• Sample from improper location
  – Between tank and pump
  – Sample surface from top of tank

• Start filling jug immediately

• Re-use jugs
Sampling and Handling

• Sampling Don’t List
• Partially fill jugs
• Shake / handle roughly
• Transfer to another container
• Use solvents
Sampling and Handling

• Is the sample representative?
• Inspection Is Critical!!
  – Proper heating / circulation in tank
  – No significant residue in storage tank
  – Material too thick / clogging spray bars?
  – Material black (broken) or uniform brown?
  – Material running off road or puddling?
Sampling and Handling
Sampling and Handling

• Is the sample representative?
• Inspection Is Critical !!
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  – Material too thick / clogging spray bars?
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  – Material running off road or puddling?

• Does it LOOK right?
Can We Do Better?

• Saybolt Viscosity variations
• Possible field tests (i.e. Sieve)
• Residue in Districts
  – Closer to the sampling point
• New residue tests
• PG Grading
Perfect System?

• No perfect tests
• Good tests = good product?
• Bad tests = bad product?
• Sampling and testing = good assurance
• *Nothing replaces good eyes!!*
Thank you

Questions?