



Importance of Proper Emulsified Asphalt Sampling and Testing

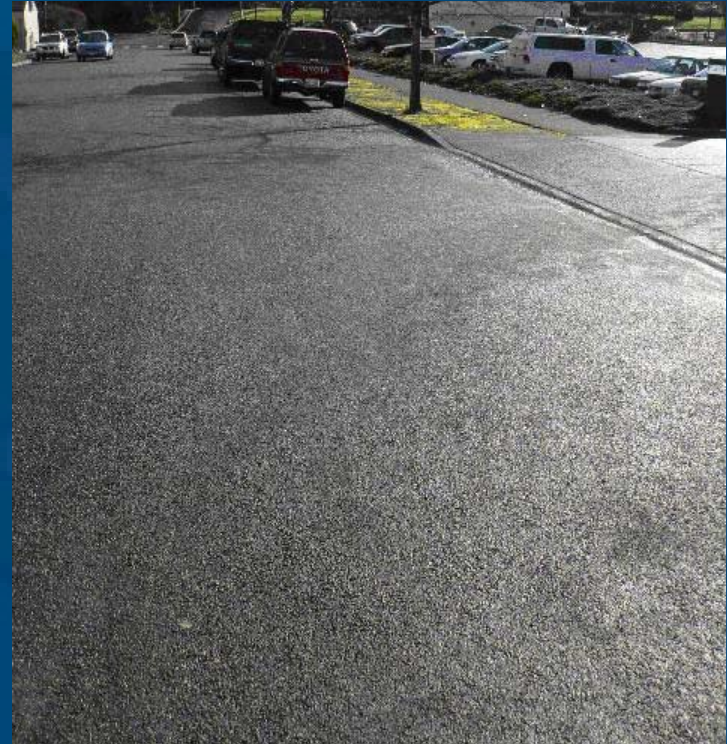
A State's Perspective

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LTRC Emulsion Design, Construction, and Performance Conference

Sampling and Testing

- Why sample and test?
- Want to get...



Sampling and Testing

- Why sample and test?
- ...Not

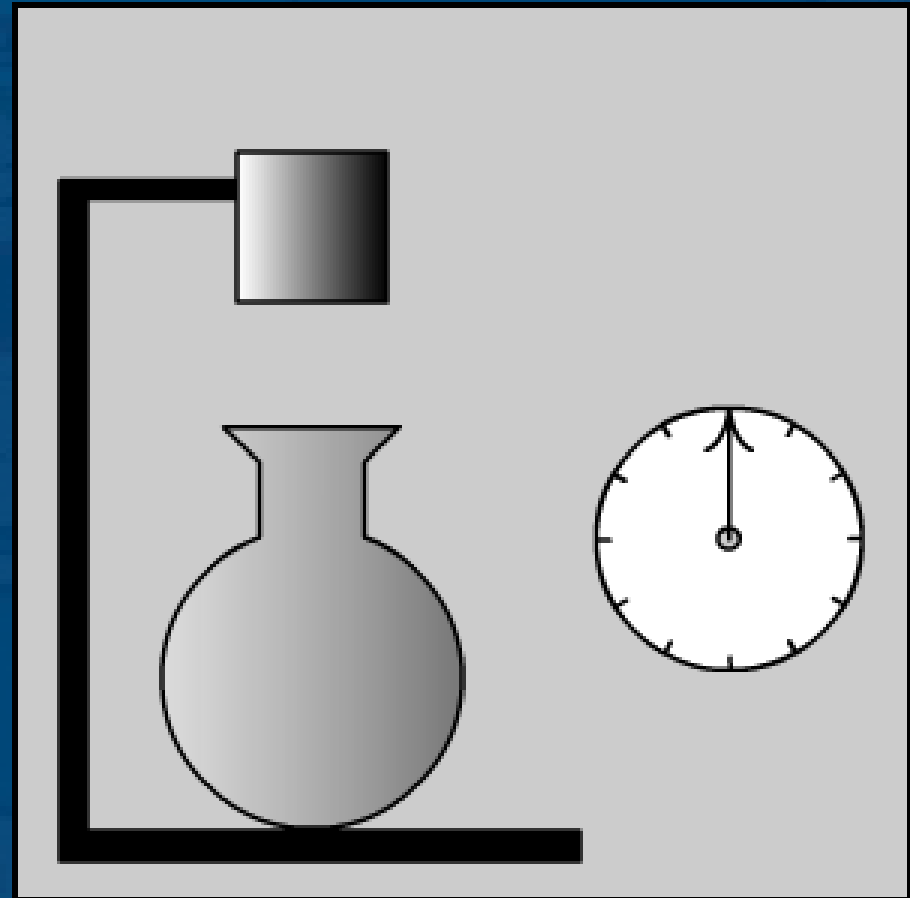


Sampling and Testing

- **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**

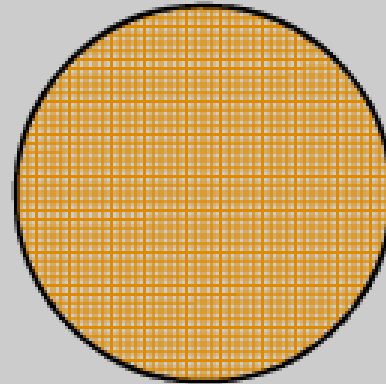
- **Only Viscosity? – Assumptions?**

Materials Lab Testing

- **Saybolt Viscosity**
- **Sieve**

Materials Lab Testing

- **Sieve**
- **Check for contamination**
- **Stability**
- **Consistency**

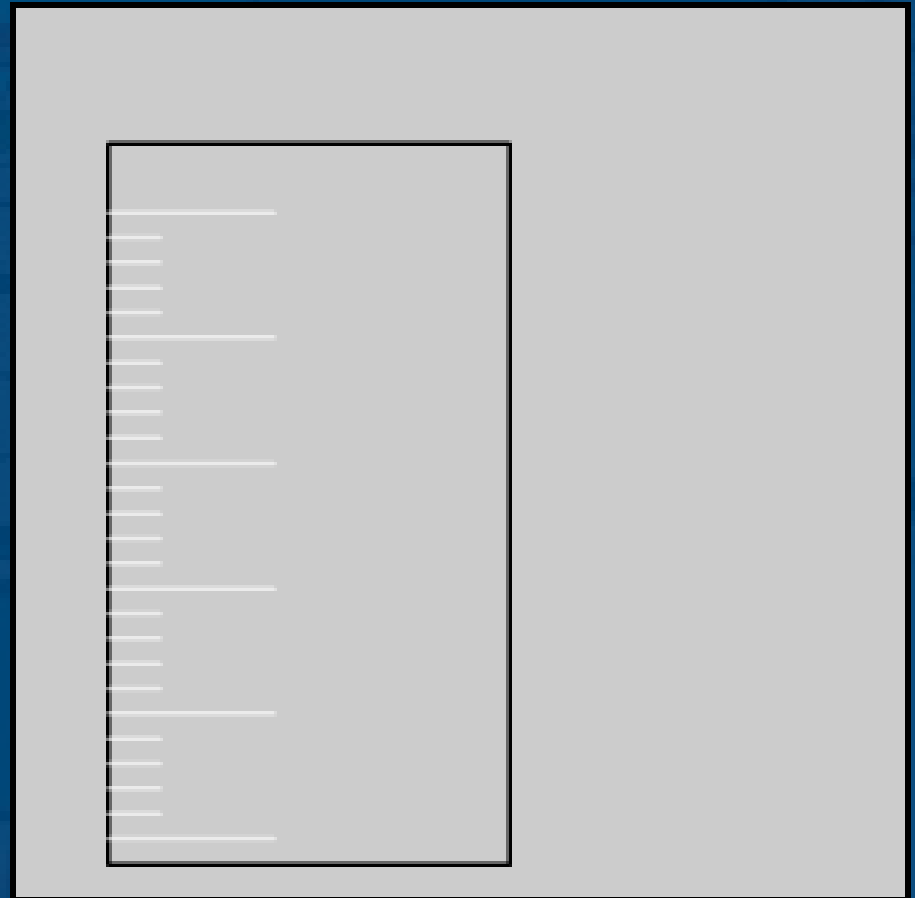


Materials Lab Testing

- **Saybolt Viscosity**
- **Sieve**
- **Settlement**

Materials Lab Testing

- **Settlement**
- **Storage issues**
- **Stability**

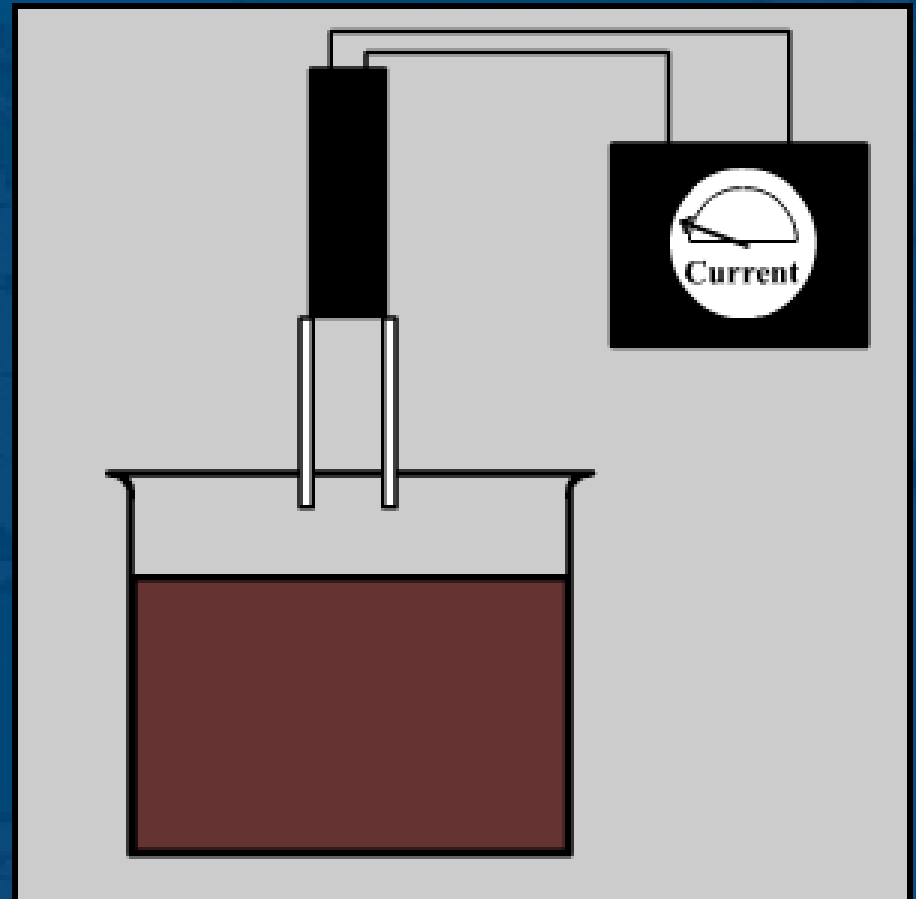


Materials Lab Testing

- **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



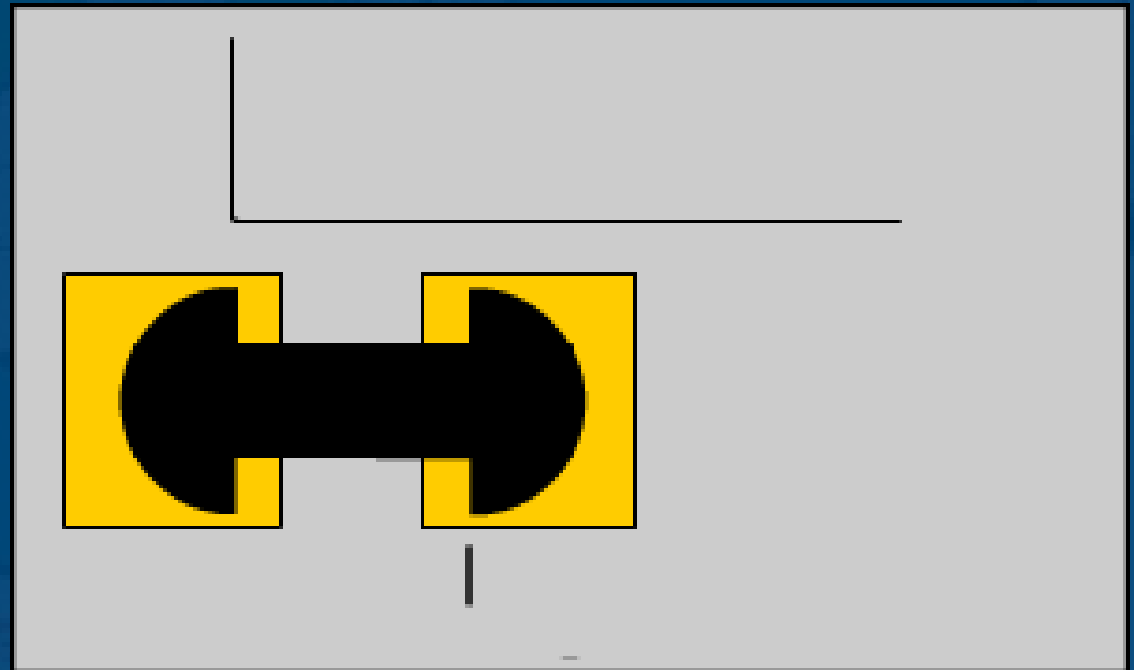
Materials Lab Testing

- **Saybolt Viscosity**
- **Sieve**
- **Settlement**
- **Particle Charge**
- **Percent Residue**
- **Ductility / Force Ductility**
- **Elastic Recovery**

Materials Lab Testing

- **Ductility / Force**
Ductility

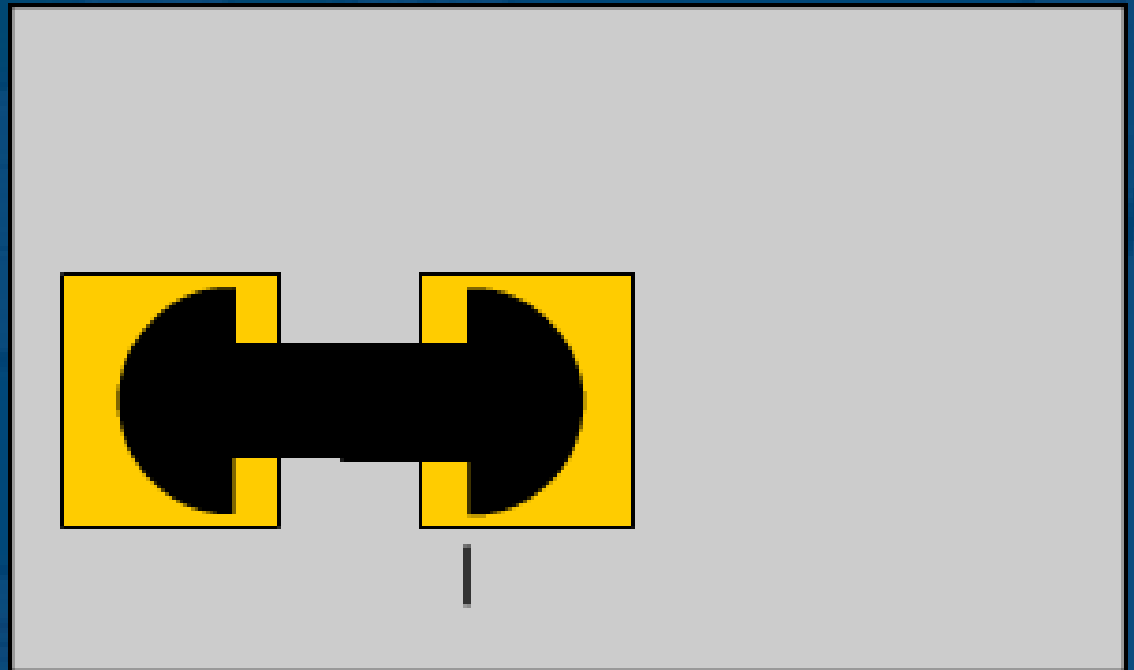
- **Durability**
- **Aggregate retention**



Materials Lab Testing

- Elastic Recovery

- Durability
- Aggregate retention

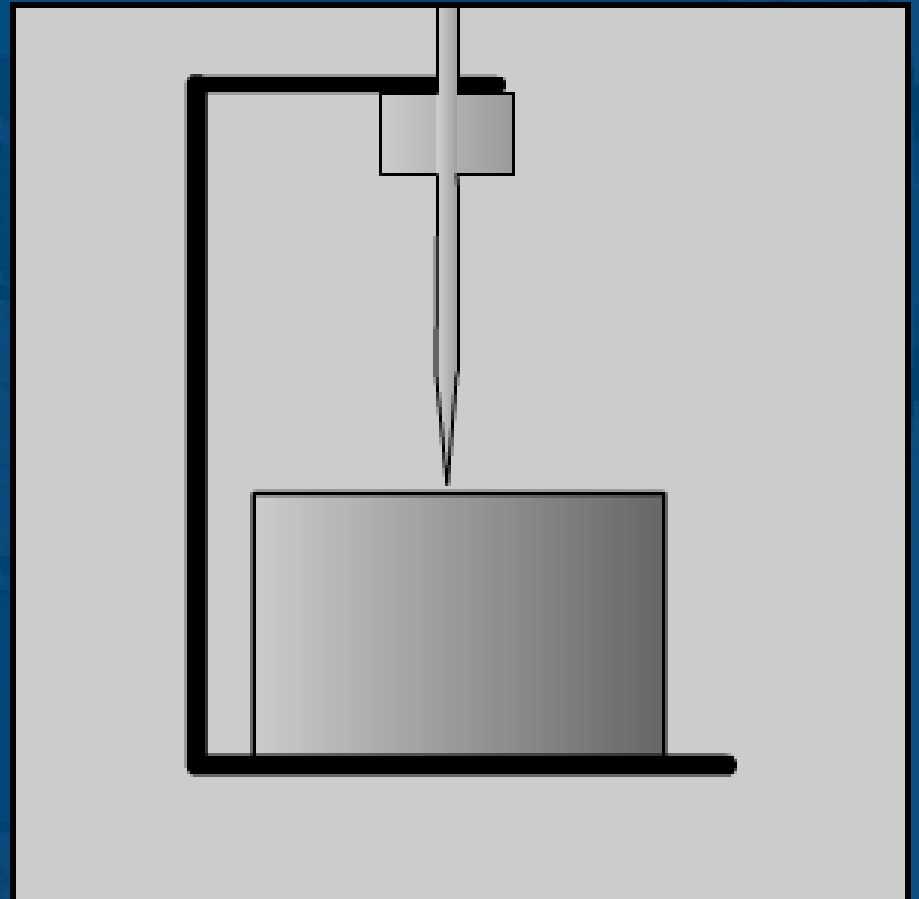


Materials Lab Testing

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

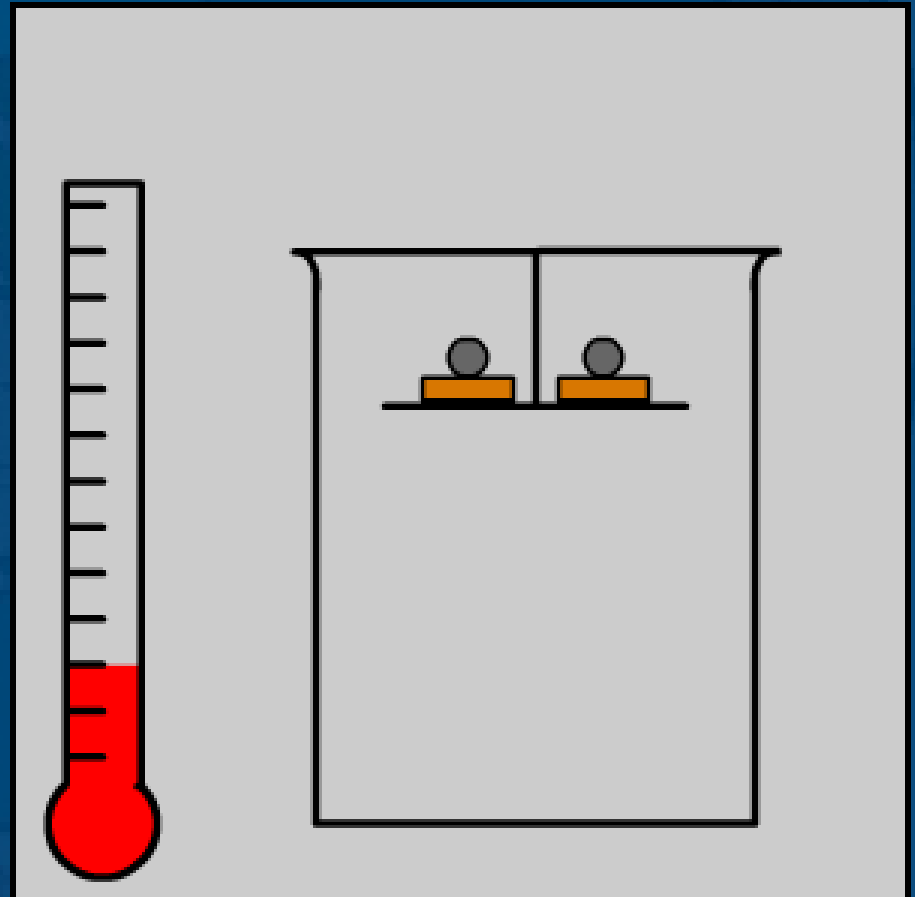
Materials Lab Testing

- Penetration
- Index Test
- Some relation to climate



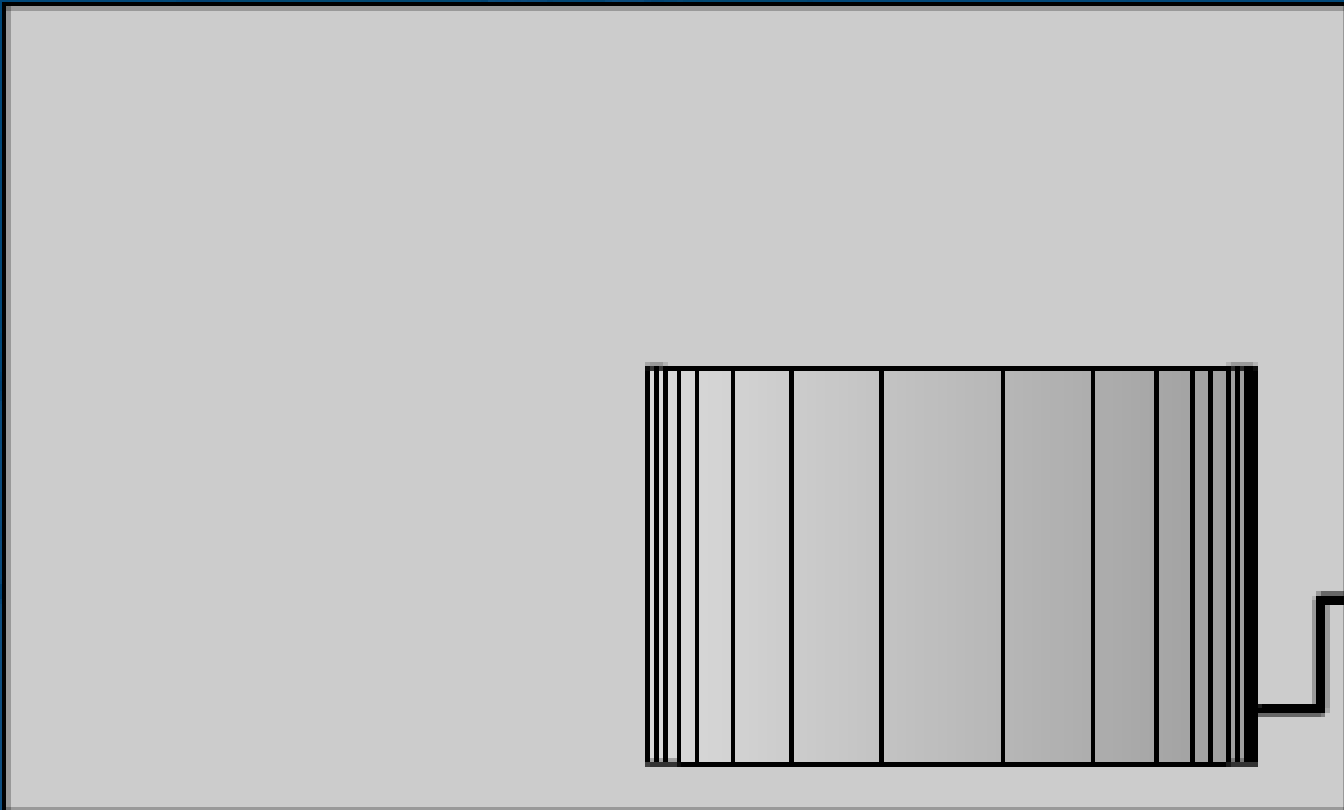
Materials Lab Testing

- **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 !!
 - 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?
- 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?