

Planned Performance; a Contractor's Experience with Modified Asphalt

A photograph of an industrial facility, likely an asphalt plant. In the foreground, a worker wearing a yellow hard hat and a white polo shirt stands on the left. A large, yellow metal staircase with railings leads up to a platform. In the background, there are several large, white, cylindrical storage tanks. To the right, a tall blue structure, possibly a conveyor or part of a machine, is visible. The sky is blue with some clouds.

Association of Modified Asphalt Producers
Austin, TX February 13, 2008

Outline

- ❖ Performance
- ❖ Sampling
- ❖ Polymer Agglomeration
- ❖ Construction

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Performance



Strengths

- ❖ Open-graded mixes
- ❖ Temperature susceptibility
- ❖ Rutting resistance
- ❖ Fatigue cracking
- ❖ Water susceptibility
- ❖ Low temperature cracking

Weaknesses

- ❖ Comparative performance studies
- ❖ Agglomeration
- ❖ Raveling
- ❖ Slippage (tensile strength)
- ❖ Construction

Polymer Agglomeration



Polymer Agglomeration



Severe Raveling



Slippage Failure



Troubleshooting



Outline

- ❖ Performance issues
- ❖ Sampling
- ❖ Polymer Agglomeration
- ❖ Construction

Sampling

- ❖ Location
- ❖ Method
- ❖ Quality of Sample

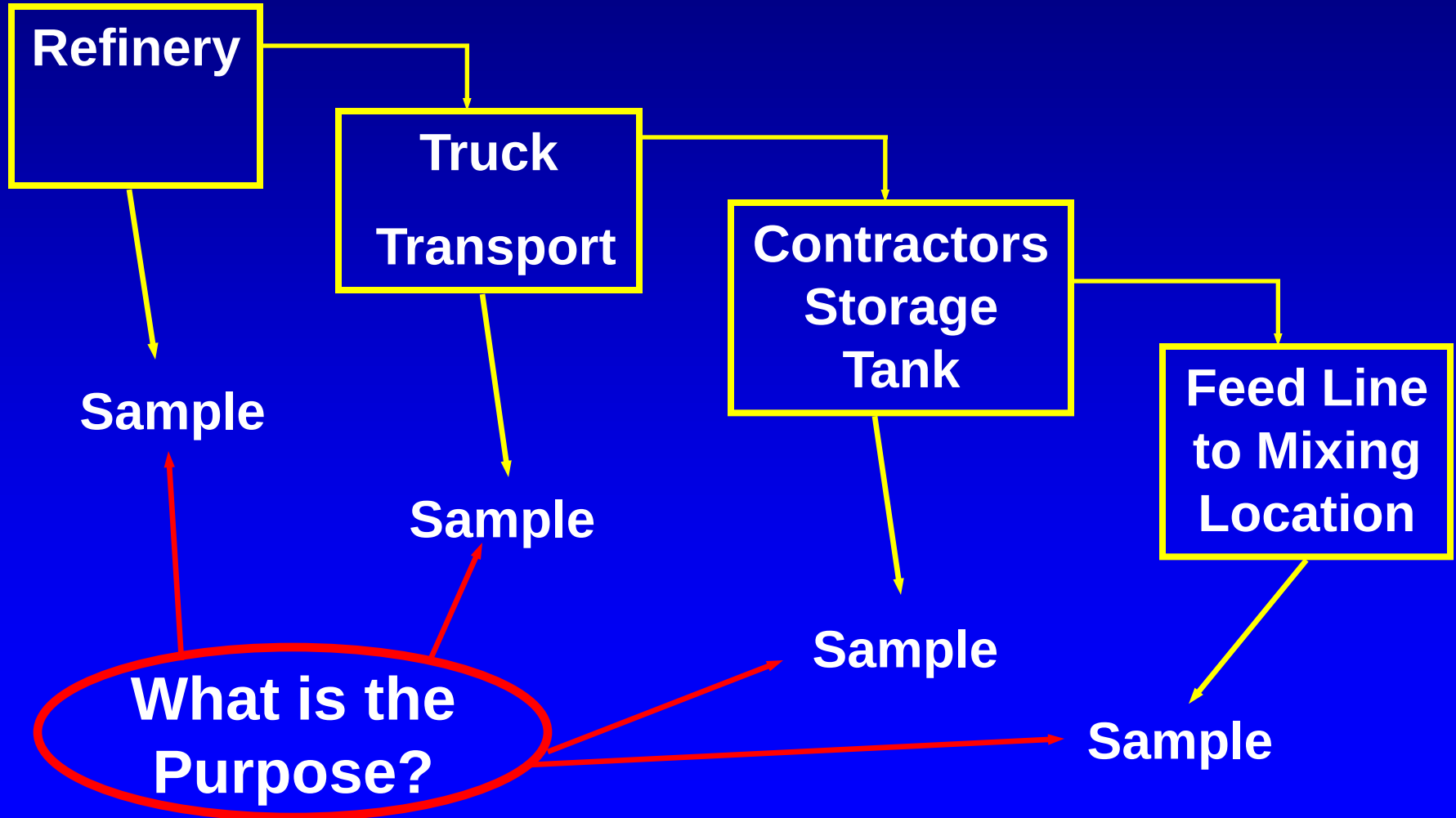


Asphalt Binder Sampling Location

- ❖ Refinery
- ❖ Rail Car
- ❖ Terminal
- ❖ Transfer Truck
- ❖ Contractors Storage Tank
- ❖ Feed Line from Storage Tank to Drum or Pug mill



Asphalt Binder Sampling Location



Outline

- ❖ Performance issues
- ❖ Sampling
- ❖ **Polymer Agglomeration**
- ❖ Construction

Short-Term Storage

- ❖ Up to 1 Week
 - ❖ *“Green for a Couple of Days”*
- ❖ 300-350°F
- ❖ Agitation Suggested
- ❖ Circulation Required



Proper Agitation and Circulation

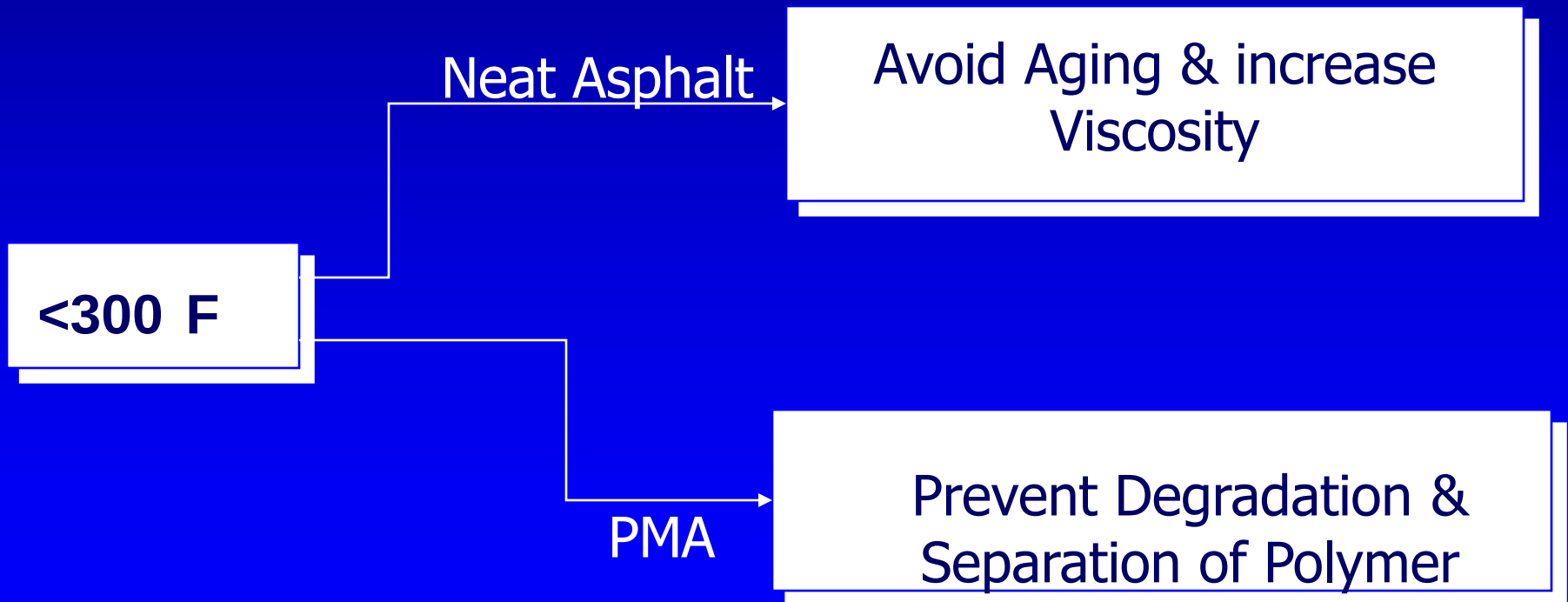
❖ Separation without it

Tank Stirrer

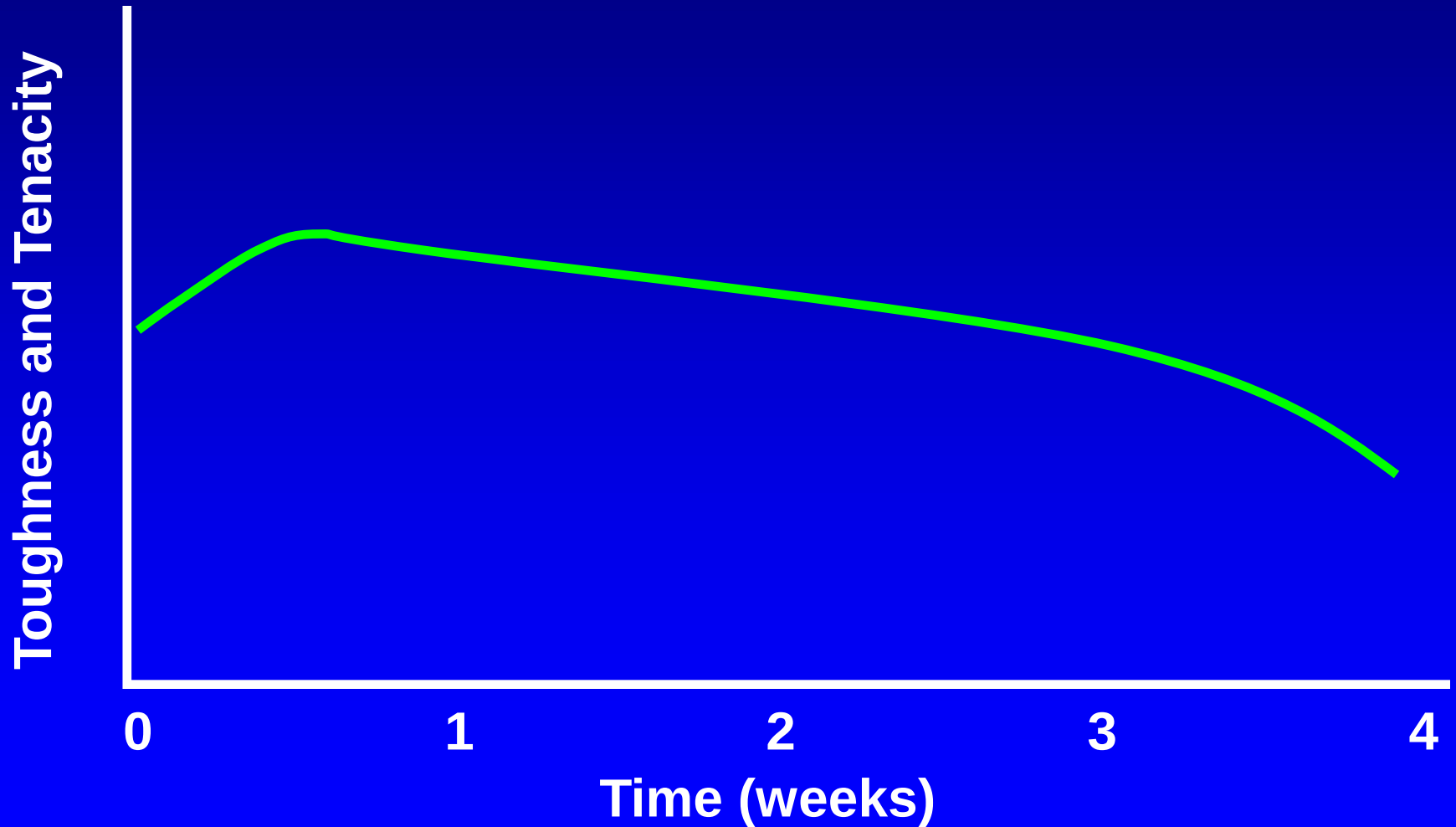


Long-Term Storage

❖ Up to 3+ Weeks



Storage



"Shelf Life"

- ❖ **Approximately 3⁺ Weeks**
- ❖ **Add Approximately 1% SBS**
 - ❖ **Extend Life Approximately 1 Week**
- ❖ **SBS, SBR, EVA etc. Storage Lives**

Extended Storage

❖ Over 3⁺ Weeks

❖ Neat Asphalt

- ❖ <50°F or No Heat

❖ Polymer Modified Asphalt

- ❖ No Heat

- ❖ Thermal Degradation of Polymer

- ❖ Polymer Agglomeration (Vulcanization)

Outline

- ❖ Performance issues
- ❖ Sampling
- ❖ Polymer Agglomeration
- ❖ Construction

Construction Issues

- ❖ **Stiffer Mixtures**

- ❖ **Temperatures**

- ❖ **Compactability**

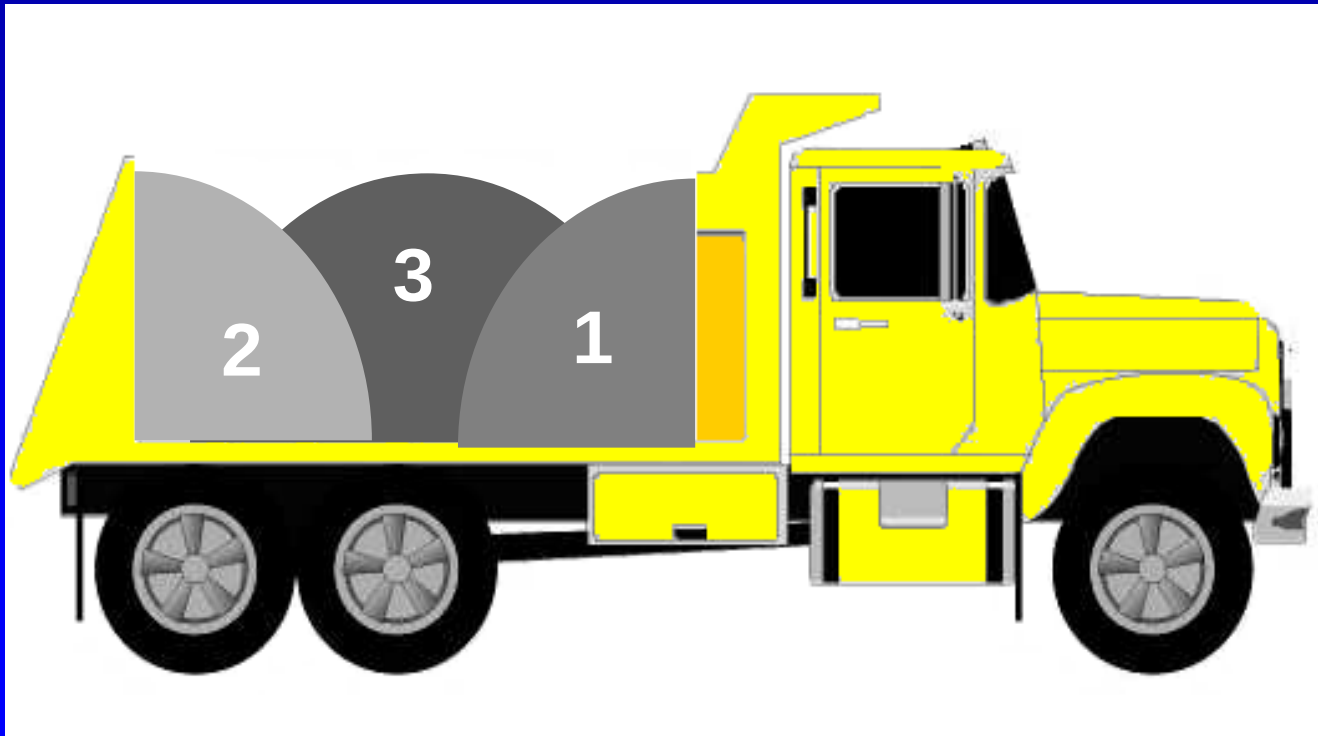
- ❖ **Joints**

- ❖ **Handwork**

- ❖ **Maintain & Retain Temperature**

Proper Truck Loading

- ❖ Proper Clean Out
- ❖ Release Agents - **No Diesel**
- ❖ Multiple Drops



Transportation

- ❖ Right Haul Unit for Job
- ❖ Loading and Unloading
- ❖ Retaining Mix Temperature
 - ❖ Tarp Loads
 - ❖ Minimize Hauls/Standby Time



Dumping of Trucks

- ❖ Segregation
- ❖ Calibrate Windrow Size to Laydown Demand
 - ❖ Under Filling Hopper
 - ❖ Over Filling Hopper



Proper Dumping

- ❖ **Lapping Loads**
 - ❖ **Uniformity**
 - ❖ **End-of-Load Segregation**
 - ❖ **Minimize Temperature Segregation**



Pickup Machine

- ❖ Proper Consistent Delivery to Pickup
- ❖ Machine Setup
 - ❖ Thorough Pickup
 - ❖ Drop Height



Laydown

- ❖ Stiffer Mixtures
- ❖ Conventional Techniques with Care
- ❖ Cool Weather Compaction
- ❖ Temperature Segregation
- ❖ Tender Zone



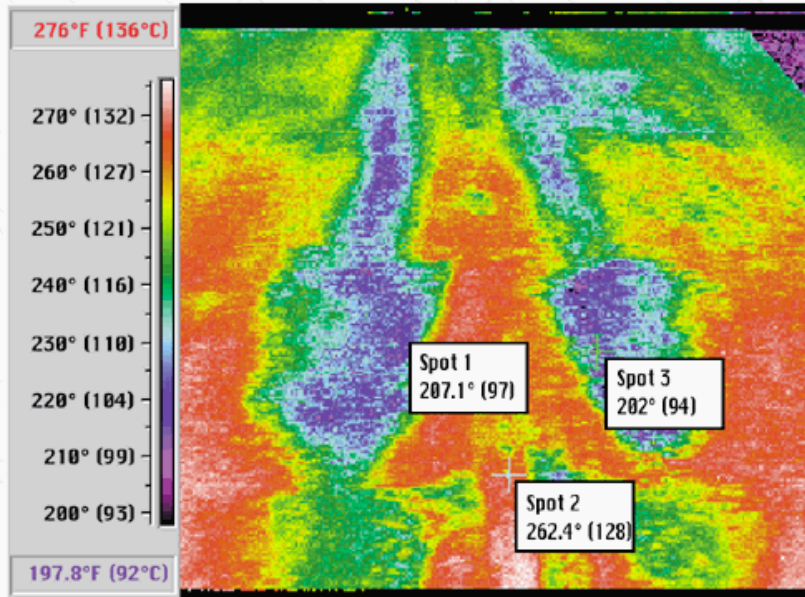
Cool Weather Compaction

- ❖ Time to Achieve Compaction
 - ❖ HMA Stiffness
 - ❖ Environmental Conditions
 - ❖ Haul Time
 - ❖ Size and Amount of Compaction Equipment
- ❖ HMA Production Temperature
 - ❖ DON'T Over Do It!



Temperature Segregation

Non-Uniform Density



MAT USING BLAW-KNOX MC-30



Compaction of Tender (Superpave) Mixtures

Approximate Density Measurement	91% - 92% of M.T.D.	92% - 92.5% of M.T.D.	94% - 97% of M.T.D.
		TENDER ZONE	
Temperature Zones	300°F - 285°F (149°C - 141°C)	240°F - 200°F (116°C - 93°C)	170°F - 150°F (77°C - 150°C)
Distance	 200 feet (61m)	 200 feet (61m)	 150 feet (46m)

COMPACTION OF SUPERPAVE MIXES

Handwork



Questions

