FHWA
Asphalt Mixture ETG
2006

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Asphalt Expert Task Groups Update.....

- Initially created by FHWA in 1994
- ETGs Role focused on Superpave
- ETGs on Mixture & Binder Issues
- ETGs reformed 2006 (this week)
  - Asphalt Binder Properties
  - Asphalt Mix Design & Construction
  - Advanced Asphalt Modeling

Role of Asphalt Mix ETG

- Provide a forum for government and industry discussion of emerging issues;
- Review research and technology activities;
- Identify potential improvements to mixture & aggregate specification/standard test methods;
- Identify needed technology improvements.

Open meetings/public access to all records

Mixture Issues

Superpave Gyratory Compactor Calibration

Making Superpave Mixtures Consistent

AASHTO Designation: T 312-03 Preparing ... Specimens by ... SGC

4.1

Superpave Gyratory Compactor – ... The compactor shall tilt the specimen molds at an external angle of 1.25° ±0.02° **or** an average internal angle of 1.16° ± 0.02° in accordance with AASHTO.

Internal Angle of Gyration

- Internal Angle of Gyration
  - Validate Differences in SGCs
    - Demonstrated that internal angle of gyration could be different even though external angle was the same.
  - Calibration
    - Potentially time-intensive
      - Up to 1 day for a calibration
    - Affected by mixture stiffness
      - Requiring recalibration for different mix types
    - Mixless measuring devices

Performance Tester

9-29: *Simple Performance Tester for Superpave Mix Design*

- Evaluation of 1st-article SPTs from Shedworks/IPC and Interlaken complete
- Ruggedness Underway

Advanced Asphalt Technologies

Performance Tests

- **Dynamic Modulus E***

  σ_0 = dynamic stress

  ε_0 = recoverable axial strain

$$|E^*| = \frac{\sigma_0}{\varepsilon_0}$$

- **Flow Number Test (Fn)**

  Number of load repetitions at which shear deformation occurs under constant volume

Applied Stress (kPa)	600 (87 psi)
Temperature (°C)	54
Failure limits	10,000 cycles or 5% strain

RAP Criteria

Binder Grade	RAP Percentage
No change in binder selection	< 15%
One grade softer than normal	15–25%
Blending charts	> 25%

9-33: *A Mix Design Manual for Hot Mix Asphalt*

Update method in AI Manual SP-02:

- New volumetric criteria.
- N-design
- Simple performance test(s).
- Criteria developed with M-E design guide performance models and software.
- Framework for integrated mix and structural design.

Advanced Asphalt Technologies (August 2006)

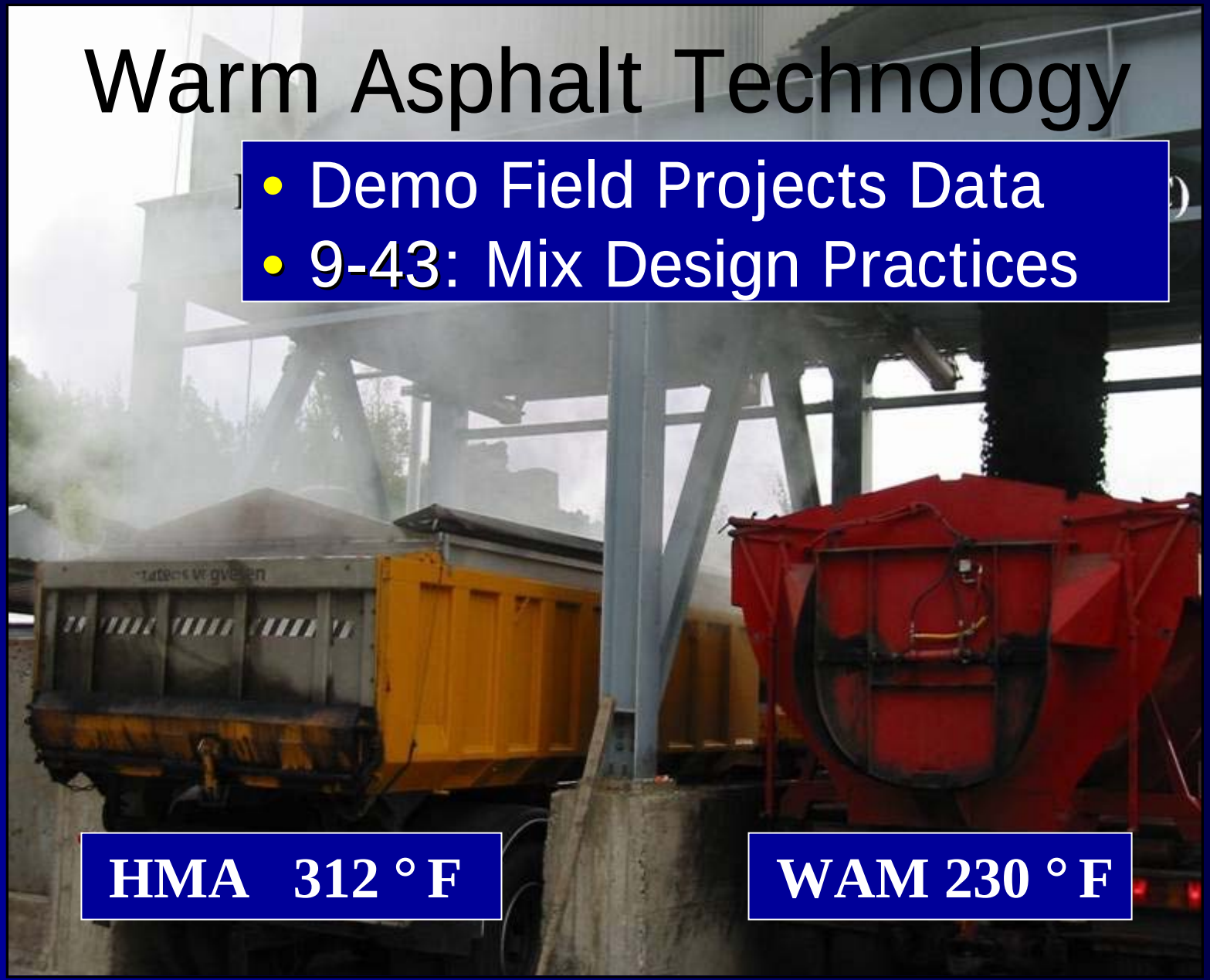
Other NCHRP Projects

- 9-34: Improved Conditioning Procedure for Moisture Susceptibility
- 9-38: Endurance Limit of HMA Mixtures to Prevent Fatigue Cracking
- 9-39: Determining Mixing and Compaction Temperatures of PG Binders in HMA
- 9-45: Development of Specification Criteria for Mineral Fines Used in HMA


Construction Technologies

Warm Asphalt Technology

- Demo Field Projects Data
- 9-43: Mix Design Practices



Potential process at the HMA plant as part of a QA system?

In-line Viscometer

Computer recordation

Moisture Content

Intelligent Compaction

- Automatic adjustable compaction equipment
- Usage of Continuous Compaction Control
- Selection of the most suitable equipment

Surface Characteristics

- Noise Reducing HMA Mixes
- Improved Friction Characteristics

Micro-Texture

Macro-Texture

Air Voids

Thank You.....

http://www.fhwa.dot.gov/