




Characterization of Hot-Mix Asphalt for ME Design

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Outline

- A Trip Through the Mechanistic-Empirical Pavement Design Guide (MEPDG)
- Other ME Examples: PerRoad
- Final Thoughts / Your Turn



MEPDG

- NCHRP 1-37a, 1-40
- Analysis Tool:
 - Predict Distress Over Time
 - Flexible Distresses
 - Thermal Cracking
 - Fatigue (bottom up)
 - Top-Down Cracking
 - Rutting
 - Roughness (IRI)
- Materials Inputs in “Levels”
 - Level 1: I know a LOT about this input
 - Level 2: I know SOME about this input
 - Level 3: I know LITTLE about this input

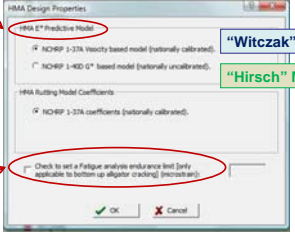




MEPDG HMA Design Properties

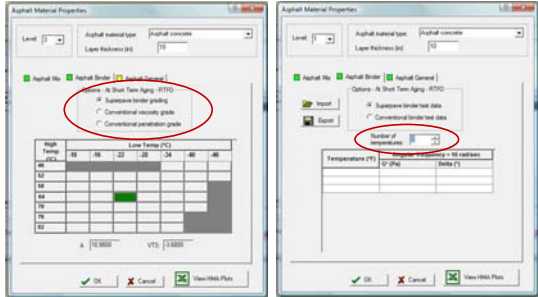

E* (Dynamic Modulus) prediction method for Level 3

CALIBRATION!

Endurance Limit

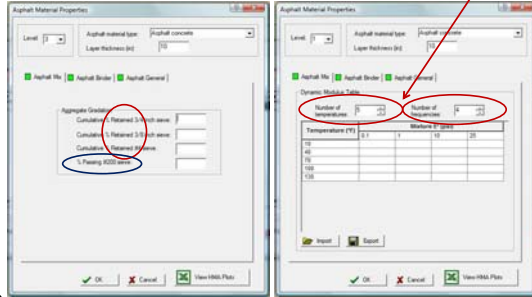




MEPDG HMA Binder

MEPDG HMA Mix

Dynamic Modulus AASHTO TP-62

MEPDG HMA General

Mix Design (future)

Construction

Non-typical Material Properties

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MEPDG HMA Thermal Cracking

Indirect Tensile Strength

Time (min)	Low Temp (14°F)	High Temp (70°F)
1	1.405e-007	1.874e-007
2	1.547e-007	1.857e-007
5	1.882e-007	2.031e-007
10	1.776e-007	2.214e-007
20	1.857e-007	2.302e-007
100	1.941e-007	2.887e-007
1000	2.126e-007	2.730e-007

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PerRoad HMA Materials Inputs

Inputs: Modulus Poisson's Ratio (min/avg/max)

Material Variability

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Final Thoughts

- Marriage of Materials, Design, Construction, and Pavement Management
- "New" Tests for Characterizing HMA
 - Sensitivity is Key! Put \$\$ where most effective
- Stay Informed – Change is a Constant

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QUESTIONS?

Thank you.

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