









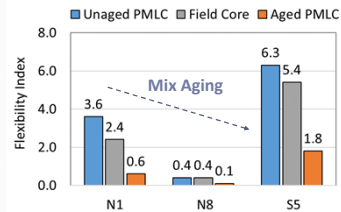
### Top-Down Cracking Experiment

- LMLC specimen: 4 hours at 135°C + 8 hours at 135°C
- PMLC specimen: reheating + 8 hours at 135°C
- Validation of selected aging protocol (3 mixes)
  - Unaged plant mix I-FIT
  - Critically aged plant mix ⇒ DSR
  - Field cores (2 to 4 years) BBR FTIR



### Preliminary Validation Results

- I-FIT results
  - Unaged PMLC > 2-year field core > critically aged PMLC (0 CDD) (31,000 CDD) (70,000 CDD)



- Similar trends observed for DSR, BBR, FTIR results



### Summary

- Preliminary critical field aging: 70,000 CDD
  - Top-down cracking starts to develop
- Representative loose mix aging protocols
  - 5 days at 95°C
  - 8 hours at 135°C (more practical)
- NCAT top-down cracking experiment
  - LMLC specimen: 4 hours at 135°C + 8 hours at 135°C
  - PMLC specimen: reheating + 8 hours at 135°C
  - Validated by preliminary field aging data



### Questions?

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$$C_d = C_{d0} + k_d t + M(1 - e^{-k_d t}) \quad (5)$$

Where:  
 $C_{d0}$  = CA of asphalt binder extracted from the reheated mix;  
 $t$  = aging time at 135°C;  
 $k_d$ ,  $k_d'$ , and  $M$  = model coefficients.

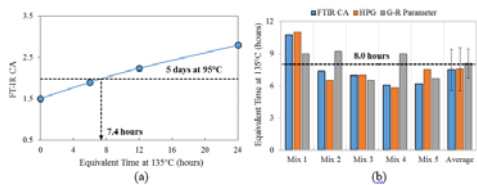


FIGURE 10 Determination of Equivalent Aging Time at 135°C; (a) Example of Mix 2 FTIR C4 Results, (b) Summary of All Results

