



**“Concrete Pavement Materials  
Testing and Petrography –  
Rehab/Repair or Replace?”**

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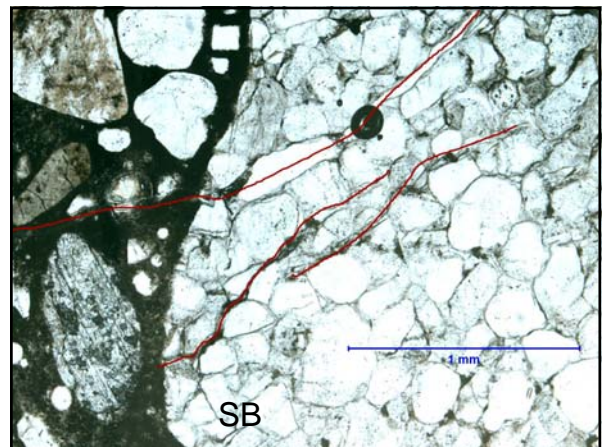
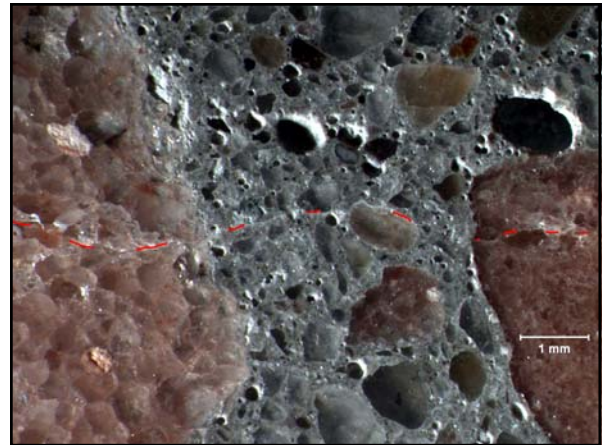
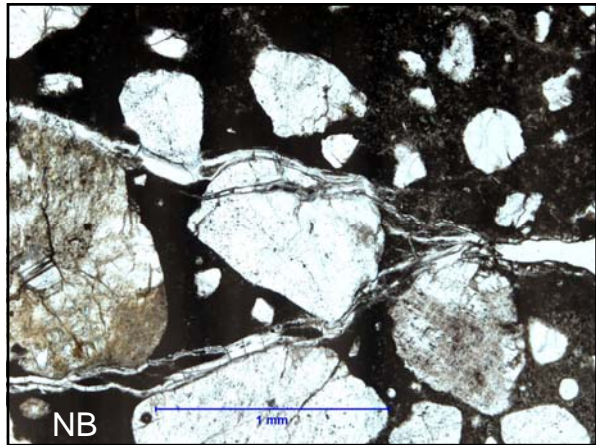


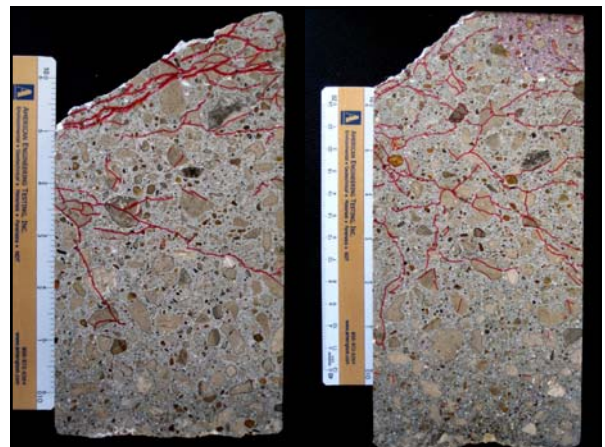
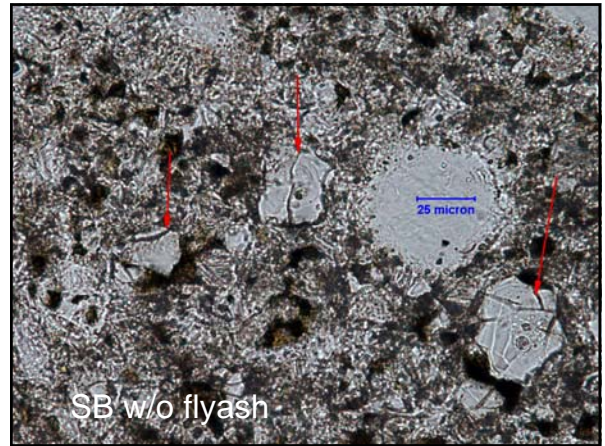
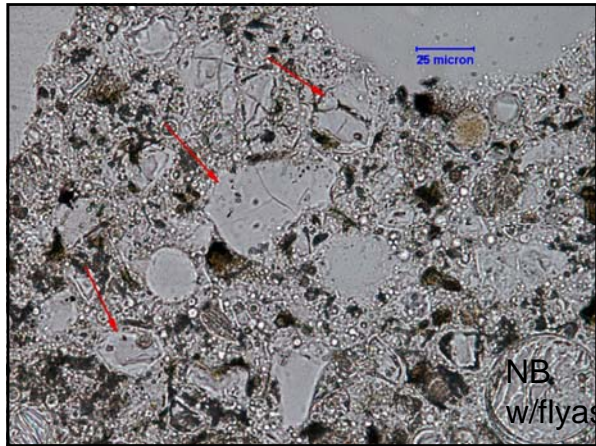
### Pavement Rehab Decisions

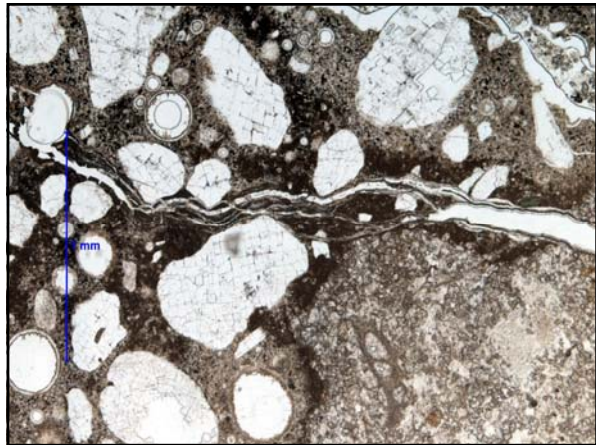
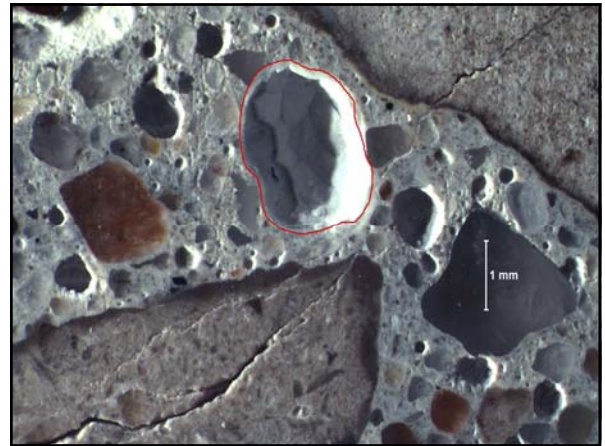
- Materials Issues
  - Marginal Air Void System
  - Aggregate Durability
  - Deicer Exposure
  - General Concrete Quality

Coring  
Petrography









### Pavement Rehab Decisions

- Structural Problems
  - Faulting
  - Subgrade Settlement
  - Fatigue
  - Dowel Corrosion/Failure

Falling Weight Deflectometer and Ground Penetrating Radar

- Subgrade Strength
- Load Transfer
- Voids Under Slabs

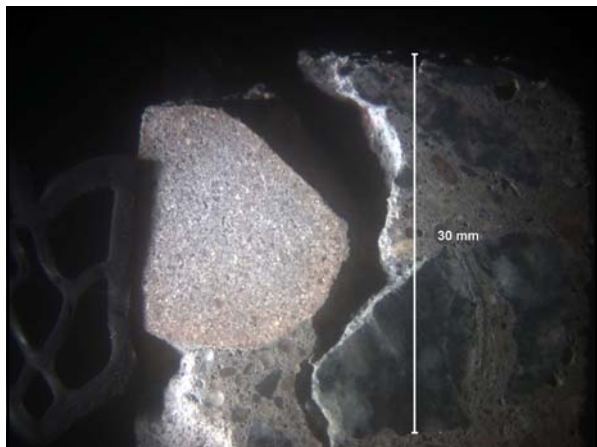
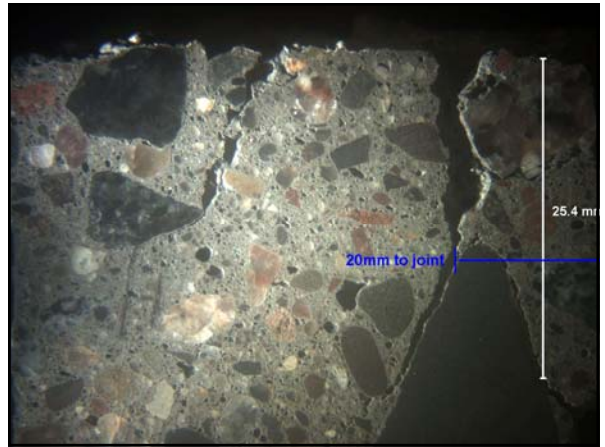
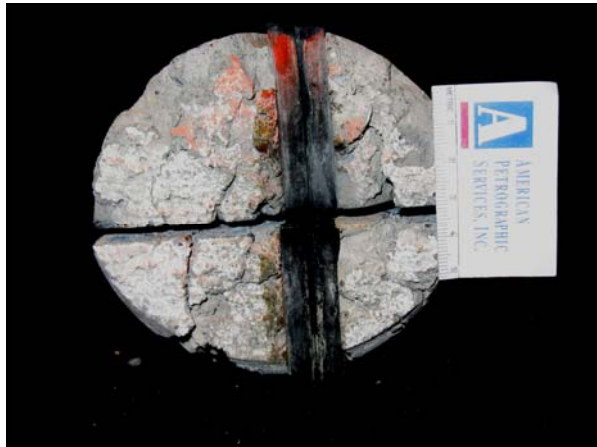


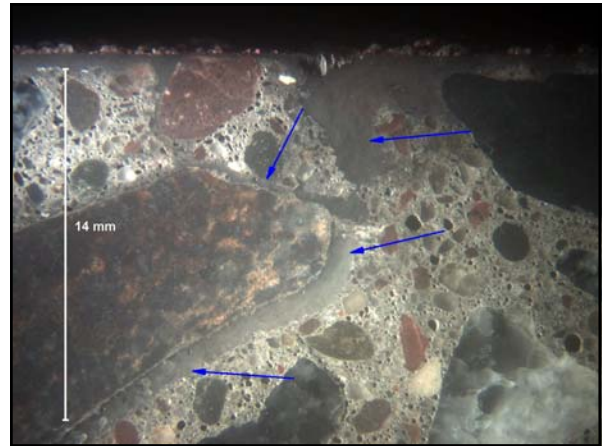
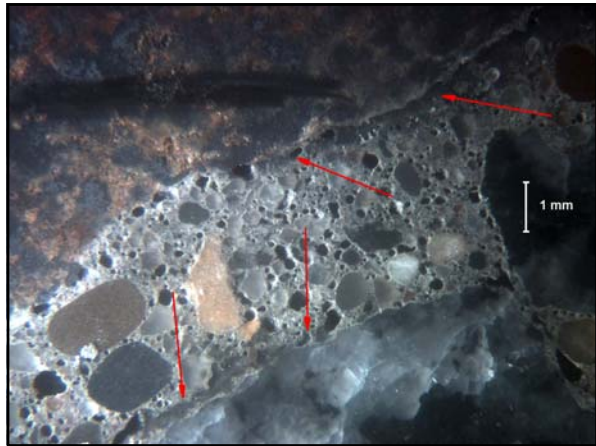


## Pavement Rehab Decisions

- Construction Defects
  - Dowel Basket Alignment
  - Steel Placement
- Ground Penetrating Radar
- Coring







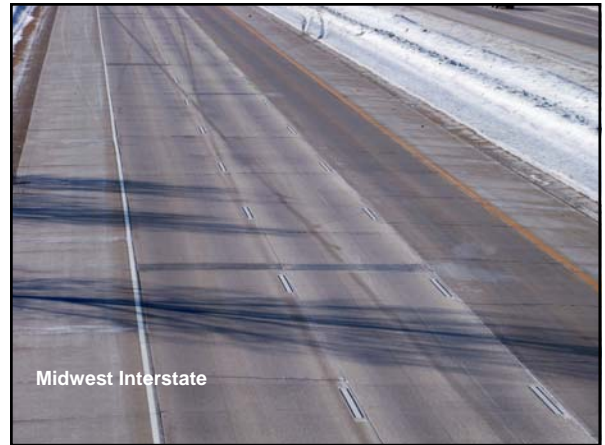




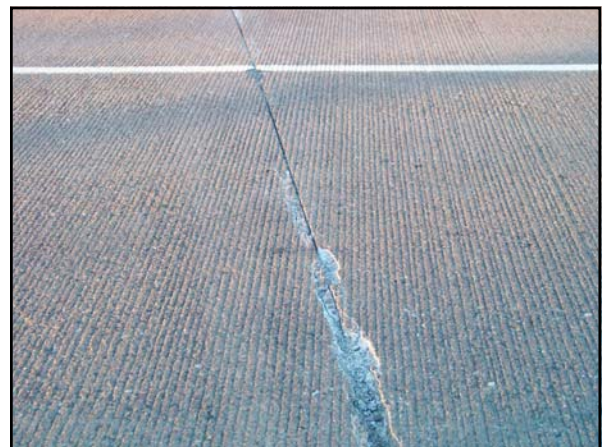
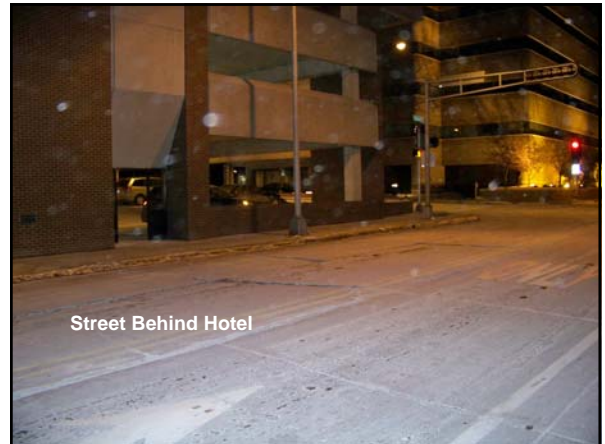
## Pavement Rehab Decisions

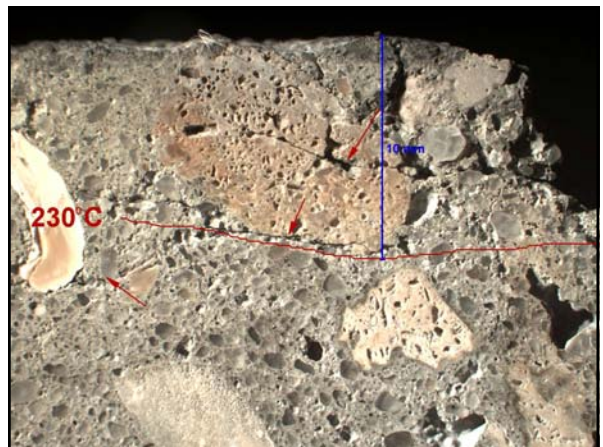
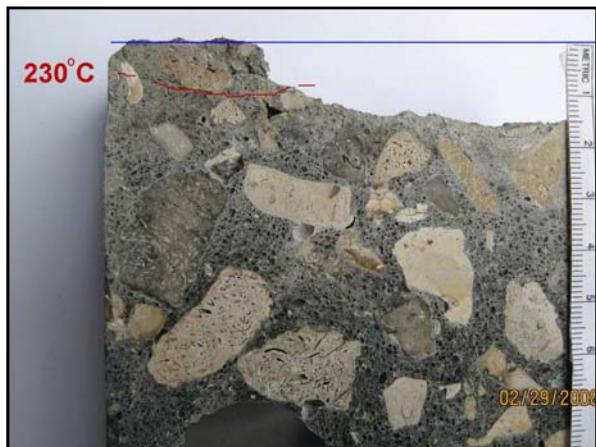
- Design Issues
  - Joint Spacing
  - Undoweled

Falling Weight Deflectometer  
Coring



# A Few Hypotheticals







## Degradation of Cement Paste by Fire/Heat

- 100°C (212°F) concrete loses free water
- 250-350°C (480°F+) cement hydrates lose water  
-desiccation, cracking
- 350°C (660°F) compressive strength is approx. half
- 400°C (752°F) calcium hydroxide to CaO
- 573°C (1063°F) steel yield-strength is 50% of original
- 800°C (1470°F) complete decomposition (dehydration is complete)
- 1200°C (2200°F) melting



Thank You