10-Year FDR Retrospective
Ramsey Road
Jacksonville, NC

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Slurry Pavers

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Ramsey Road, Jacksonville, NC
Ramsey Road, Before FDR
Jacksonville, NC
January 2008
Ramsey Road, Jacksonville, NC

- Reclaimed in January 2008
- 12 inches deep
- 5 percent cement
- Widened 4 feet using pulverized material
- Overlaid with 4 inches asphalt
Reflective cracking

Caused by chemical shrinkage during curing.

- $1 + 1 \neq 2$
- Friction between FDR and underlying material causes tensile stress.
- If tensile stress exceeds tensile strength at a given point in time, cracking will occur.
SC-311, Dorchester Co, SC
Age: 8 years
Reflective cracking

Is it bad? – Yes and no...
- Not a “working” crack.
- Research from Texas indicates no long-term loss of load transfer efficiency.
- Asphalt surface is often environmentally distressed before cracks deteriorate.
- It’s ugly and nobody wants a newly paved pavement with cracks.
Reflective cracking

• What can be done about it?
  - Good mix design.
  - More cement is not more better.
  - Less cement means less shrinkage.
  - Target mix design 7-day compressive strengths in the 250 psi to 400 psi range.
  - Deeper is better than stronger.

  - Good construction technique.
  - Careful control of cement spread rate.
  - Field check spread rate.
Reflective cracking

What else can be done about it?
  - **Microcracking** is a technique to reduce visible cracking.
  - Goal is to induce a network of fine cracks and relieve the tensile stress due to chemical shrinkage.
  - Fine cracks too small to induce reflective cracking.
Microcracking

• How is it done?
  - Moist cure the base for:
    48 to 72 hours if temperatures are above 60° F
    96 hours if temperatures are below 60° F
  - Make three passes (down and back) using the same vibratory steel wheel roller (or equivalent) used for compaction (minimum 12 tons) at maximum amplitude moving at 2 to 3 mph.
Microcracking

- Will temporarily reduce the strength of the base.
- Research indicates the base will recover its strength by 28 days.
Crack Sealing?