

Peter Taylor

- **Dr. Peter C. Taylor P.E. (IL) FACI** is the Director of the National Concrete Pavement Technology Center at Iowa State University.
- He spends time helping agencies ask for better concrete and helping contractors deliver it.



Geotextile Interlayer for Overlays

Peter Taylor, Yifeng Ling

IOWA STATE UNIVERSITY
Institute for Transportation

National Concrete Pavement
Technology Center



Background

- How does the geotextile influence vertical deflections in the system?
- Does this tendency change over time?
- Does the thickness of the textile matter?
- Is the risk of slab migration changed?
- Are there any other impacts of reduced friction between layers?
- Are the layers effective at providing drainage and does it change over time?
- Does the risk of cracking change?
- Does the color of the textile affect thermal performance of the slab?

3

Lab work

- **Variables**
- Fabric thickness – 5-7 oz. (1 mm) and 13-15 oz. (3-3.5 mm)
- Black and white fabric



4

Lab work

- Measure temperature rise behind sample exposed to a heat lamp
- Investigate thermal mass of the interlayer
- Load deflection plot for bare textile
- Load deflection test on composite sample



5

Results

	Exposed face, °F	Shadowed face, °F
Thick Black	105	112
Thick White	105	98
Thin Black	110	115

- Black material does get hotter
- Mass is so low, effect on concrete is small

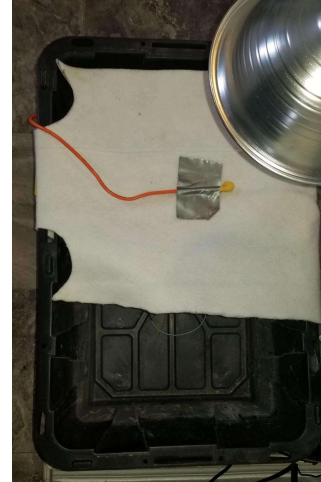


6

Results

	Exposed face, °F	Shadowed face, °F
Thick Black	111	87
Thick White	102	90
Thin Black	105	104

- Black material surface does get hotter
- Both colors insulate about the same
- Increasing thickness = better insulation



7

Results

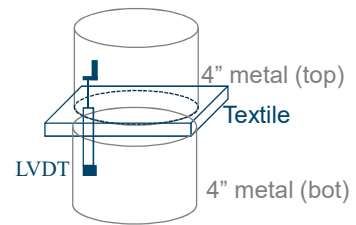
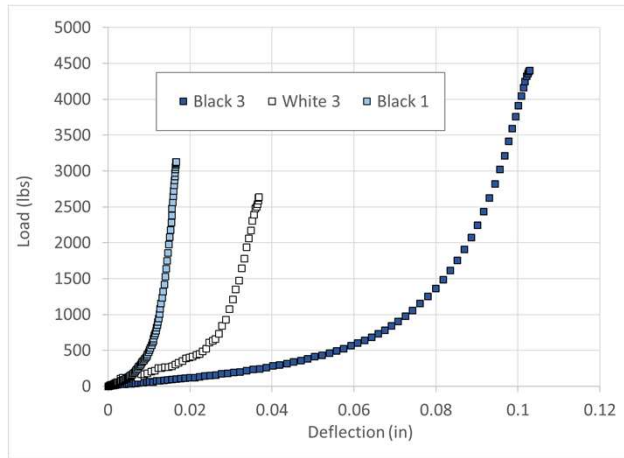
- Using specific heat capacity from published data
 - For 6" concrete overlay
 - Start with separator layer at 120°F and concrete at 70°F
 - Concrete temperature increase
 - 1" Asphalt – 8.0°F
 - 3 mm Textile – 0.3°F
- Still need to account for base temperature



8

Results

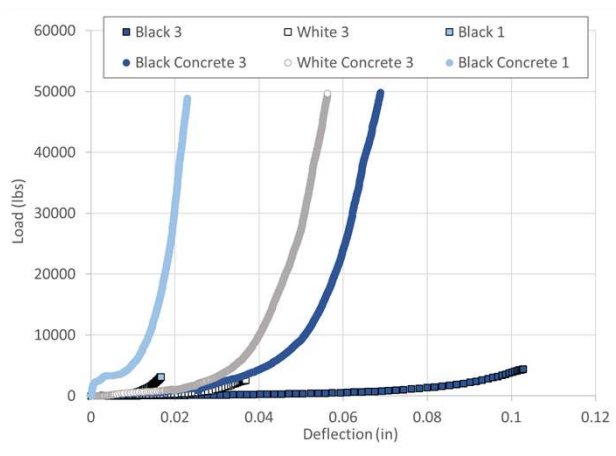
- Load deflection plot for bare textile between metal plattens



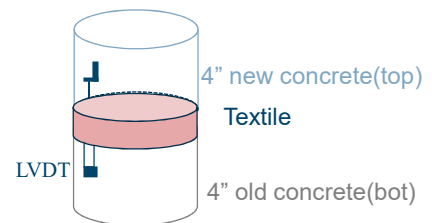
9

Results

- Load deflection plot in concrete



	Concrete Modulus of Elasticity, ksi
Black Concrete 3	1,739
White Concrete 3	1,889
Black Concrete 1	3,467



10

Results

- Textile vertical movement <math><0.05''</math> (~1 mm)
- System stiffness is reduced with thicker textile



11

Field Work

- ...

12

