



- ▣ National Center for Asphalt Technology @ Auburn since 1986
- ▣ Innovative, relevant, and implementable research projects
- ▣ Advancement of safe and sustainable asphalt pavements
- ▣ Mix/materials₈₆, structural pavement design₀₃, and preservation₁₂
- ▣ 1.7-mile nonprofit Track since 2000 with rebuild/rezero every 3-years.

Thick Rapid Rebuild Overview

- ▣ Minimum lift thickness 3_{fine} to 4_{coarse} x NMAS needed for density, but
- ▣ Concerns with density profile with lift thickness over 5 x NMAS
- ▣ Paving is “thick” when lift thickness significantly exceeds 5 x NMAS
- ▣ For example, a 5-inch lift of ½-inch NMAS surface mix has a ratio of 10
- ▣ 3 sections at the NCAT Pavement Test Track with ratios as high as 16!
- ▣ No issues with placement, compaction, or performance.

Motivation for South Carolina

- ▣ Isolated full depth patching in a single pass
- ▣ Rehabilitation as an alternate to cold recycling
- ▣ Strong, fast shoulders for temporary alignment
- ▣ Full depth reconstruction on primary routes/interstates
- ▣ Avoidance of big drop offs in long-term staged construction.

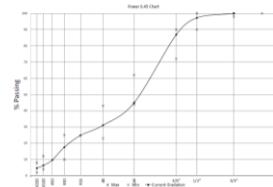


2018 NCAT Pavement Test Track

- ▣ 6-8 inches as single lift inlay on crushed aggregate base
- ▣ Deep mill and fill in an interstate simulation
- ▣ South Carolina “B” mix with local aggregates
- ▣ Off-Track trial mix section for thickness & density
- ▣ Diamond grinding option for smoothness
- ▣ Much interest from other Track sponsor states!

South Carolina “D” Mix

- “Type B Intermediate Special”
 - Rehabilitation Repairs, Interstates, High Volume Primary Routes
- 12.5 NMAS
- PG 64-22 with 25% RAP
- WMA (Evotherm M1 @ 0.5%)
 - Mixing @ 275-280F
 - Compaction @ 245-250F
- Design Air Voids = 2.5%
- $N_{\text{des}} = 75$
- Asphalt Content = 5.75%
 - 4.37% Virgin
 - 1.38% RAP



2018 NCAT Pavement Test Track



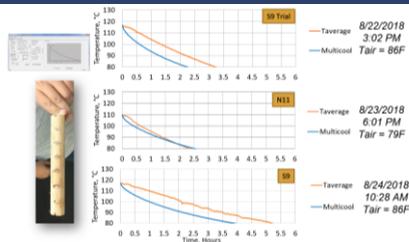
2021 (Eighth) NCAT Research Cycle **NCAT Pavement Test Track** MHRoad

2018 NCAT Pavement Test Track



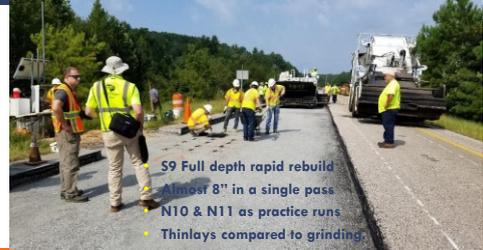
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Modeling Mid Depth Temperatures



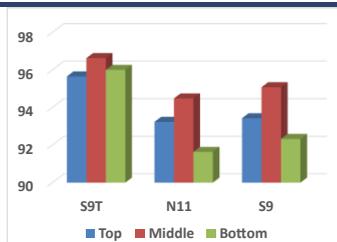
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Density of Core Slices



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Thick Lift Section S9 on 11/14/22



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2018 NCAT Pavement Test Track

- ▢ HiMA version of S9 mix in a single pass at 7¾ inch (avg)_{N10,N11}
- ▢ Percent passing the #4 sieve during SMA production_{N10}, but
- ▢ Willingness to produce #9 stone by aggregate industry
- ▢ "Foreign object" drag in screed during DGA placement_{N11}
- ▢ 350 inches/mile reduced to 150 by thinlays (100 in S9)
- ▢ Both N10 & N11 stable with flat roughness measurements
- ▢ Watched closely for "reflection" of original roughness.

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2021 NCAT Pavement Test Track



2021 (Eighth) NCAT Pavement Test Track MYROAD

Thick Rapid Rebuild Takeaways

- ▢ NCAT Pavement Test Track from 5½ to 8 inches thick
- ▢ Screed mistakes are magnified in thick paving
- ▢ Best to shim, set screws, pave with automatic grade control
- ▢ Need for high number of haul trucks with good, reliable flow
- ▢ Success in South Carolina without diamond grinding
- ▢ Track below 100 inches/mile, SCDOT below 50 inches/mile
- ▢ No concerns about density profile with healthy plant mix
- ▢ More states are trying this method on ramps, in trials, etc.

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5½" I-59 Rebuild in Gadsden, AL_{10/17/22}



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Questions and Answers

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Dr. R. Buzz Powell, PE
Associate Director and Research Professor
277 Technology Parkway
Auburn, AL 36830
Phone: (334) 844-6857
Cell: (334) 750-4293
Email: buzz@auburn.edu
Web: www.pavetrack.com
Twitter: www.twitter.com/rpowell

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