Preparation of Rumble Strips Before Overlayment

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- Rumble strips have been used in NH since the early-mid 1990s.
- In 2003 it was time to overlay our first.
- Found no guidelines for preparing the surface.
- Could we minimize the process and still get a durable product?

Estimated Statewide Inventory

◆ I-93	530 Miles
◆ I-89	225 Miles
◆ Rte. 101	150 Miles
◆ F.E.Everett Turnpike	100 Miles
◆ Spaulding Turnpike	75 Miles
Estimated Total	1,080 Miles

Early New Hampshire Experience

- 2003 – F. E. Everett Tpk. from MA to Exit 2.
- One-inch overlay with Type F 3/8-inch top; roller pushed mix on downhill segments.
- One-inch overlay with Type D ½-inch top; application results were better.
- Both mixes resulted in reflected rumble strip in new surface. But did it matter?

Preparation Techniques Used by Other States

A survey of 17 responding states gave a broad range of opinions:

- No special treatment for overlays greater than two inches.
- Mill out rumble strip, shim and overlay.
- Shim with fine mix, then overlay.
- Overlay travel lanes, and taper to avoid filling rumble strip.

The Survey Says….

There is no apparent standard for preparing rumble strips for overlayment.

Remaining Questions

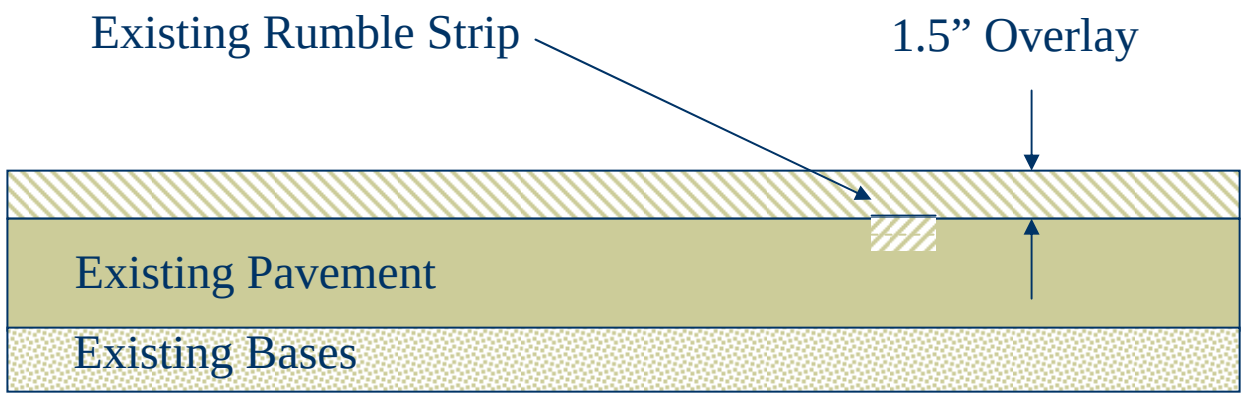
- Is reflection a problem? It was a rumble strip!
- Do we need to mill out rumble strips for uniform compaction of a thin overlay?
- Will varying or lower densities cause the pavement to deteriorate? Probably not without traffic.
- Will differential densities over the old rumble cause raveling or other problems when new rumble strips are installed?

2005 Research Project Scope

- Develop four preparation scenarios.
- Construct a test section using each scenario.
- Apply a 1.5-inch HMA overlay.
- Observe for two winters before re-milling rumbles.
- Monitor for performance after re-milling.

Scenario A

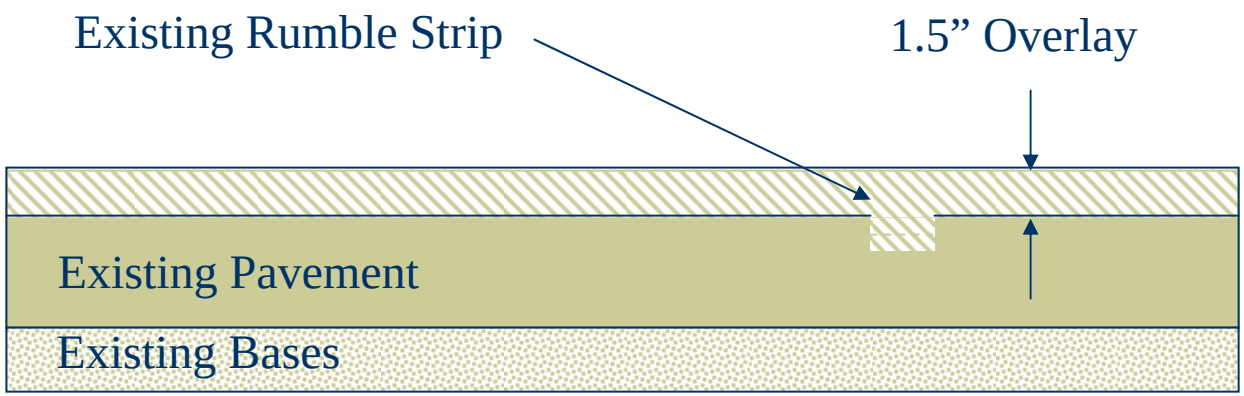
- Apply tack coat to rumble
- Shim to fill rumble
- Tack and overlay full width



Scenario A – 2007

Scenario B

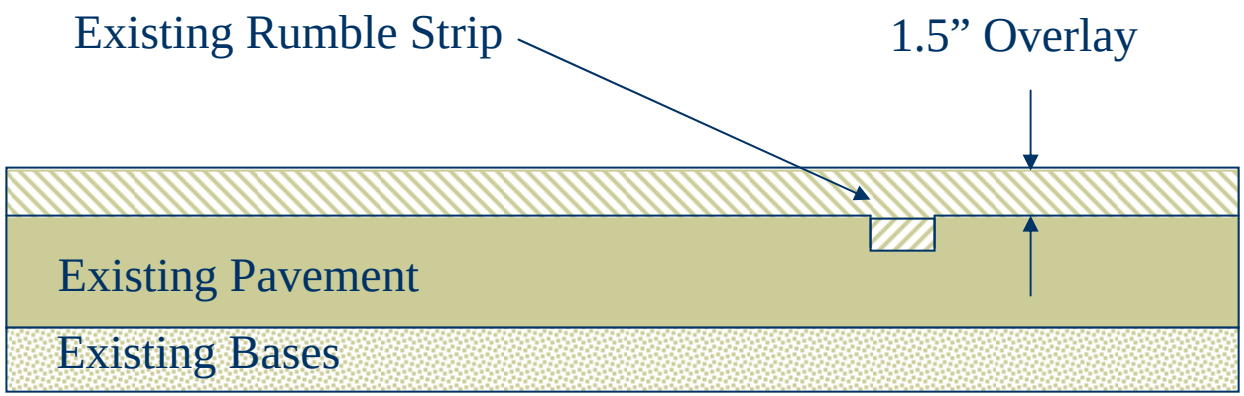
- Apply tack coat
- Overlay full width



Scenario B – 2007

Scenario C

- Remove rumble by milling .5” x 20”
- Apply tack coat to rumble area, and inlay
- Tack and overlay full width



Scenario C

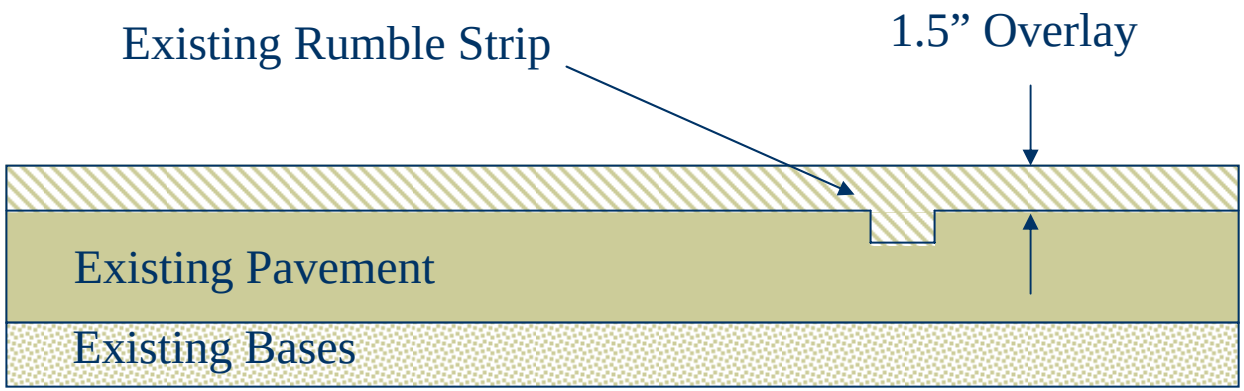
Requires the most steps to complete.

More hand labor than other scenarios.

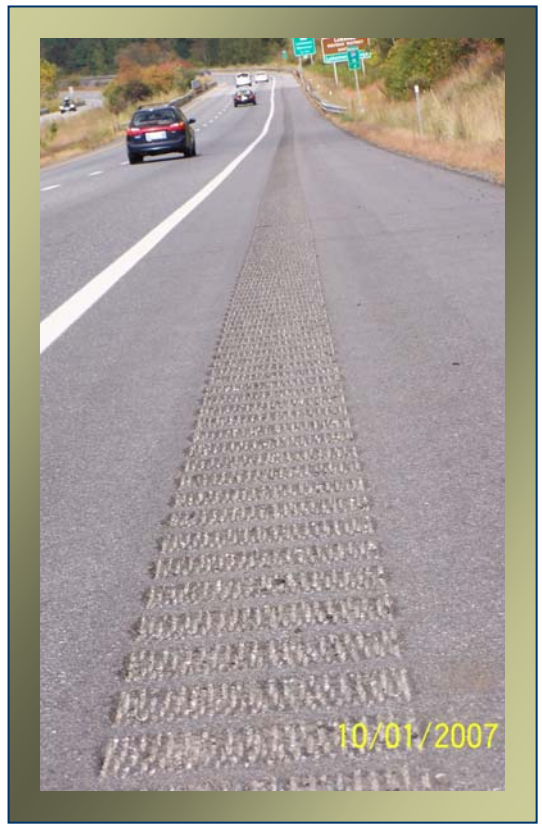
Scenario C – 2007

Scenario D

- Remove rumble by milling .5” x 20”
- Apply tack coat
- Tack and overlay full width



Scenario D – 2007



Current Conclusions

- All 4 preparation scenarios perform after overlay paving in 2005.
- All 4 survived re-milling in 2007 without damage.
- Will new rumbles be affected by winter maintenance and the environment?
  Stay tuned…

Your Questions?

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