Texas Underseal

Tyler Wollmuth, P.E.
NDDOT – Bismarck District
Who?

- 2015 North Dakota Asphalt Conference – April 1, 2015
  Tom Wood, MNDOT Research Project Supervisor gave a presentation

- NDDOT Transportation Innovation Program (TRIP)
  Steph Weigel, NDDOT submitted the idea in April 2015

- Added to ND 22 project by addendum prior to May 2015 bid opening
More Who?

- Prime Contractor: Knife River Corp.
- Chip Seal Contractor: Asphalt Surface Technologies
- Project Designer: Jason Fischer, Dickinson District
- Project Engineer: Dan Schneider, AECOM
- Consultant Oversight: Tyler Wollmuth, Bismarck District
What?

- “Underseal” is an application of a chip seal coat prior to overlaying the pavement to provide an impervious membrane to stop the intrusion of moisture.

- In Texas, the #1 usage is to prevent intrusion of surface water into underlying layers of asphalt. While using the underseal they found a 2nd benefit which was delayed reflection cracking.

Credit: Report FHWA/TX-06/0-4391-1 - Guidelines for the use of underseals as a pavement moisture barrier published in November 2006
Where?

- Project SOIB-5-022(092)000
  RP 0.00 to RP 11.918

- Underseal Test Section
  RP 1.497 to RP 6.171

- Control Section
  Remainder of Project
Why?

- MNDOT started using this process and found the delayed reflective cracking beneficial.

- 5-6 years before thermal cracks reflected thru the pavement when undersealed as compared to 1-2 years on a typical HMA overlay.

- “We don’t know why it works, but it just does” - Tom Wood, MNDOT
How?

Mill  ➔  Chip Seal  ➔  Overlay
Project Specifics

- Milling 1” Depth

- Chip Seal
  - Design application rate: CRS2P = 0.35 GAL/SY, CL 41 = 18 LBS/SY
  - Actual application rate: CRS2P = 0.343 GAL/SY, CL 41 = 17.2 LBS/SY

- Additional Cost of Underseal: $29,027 / Mile

- 3” HMA Overlay
  - 2 equal lifts of RAP Superpave FAA 45 with PG 64-28 Asphalt Cement
## Ride (IRI) Results

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<th>Mile</th>
<th>Before</th>
<th>After</th>
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What we have learned

- NDDOT will monitor for 5-6 years

- Field Review on February 25, 2016 showed that no cracks had reflected thru the new pavement, but there was a noticeable difference in ride from underseal to control.

- Field Review on March 16, 2017 showed that the transverse cracks have reflected thru the pavement but the number and severity of cracks is less in the underseal section.
Questions?