

# 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

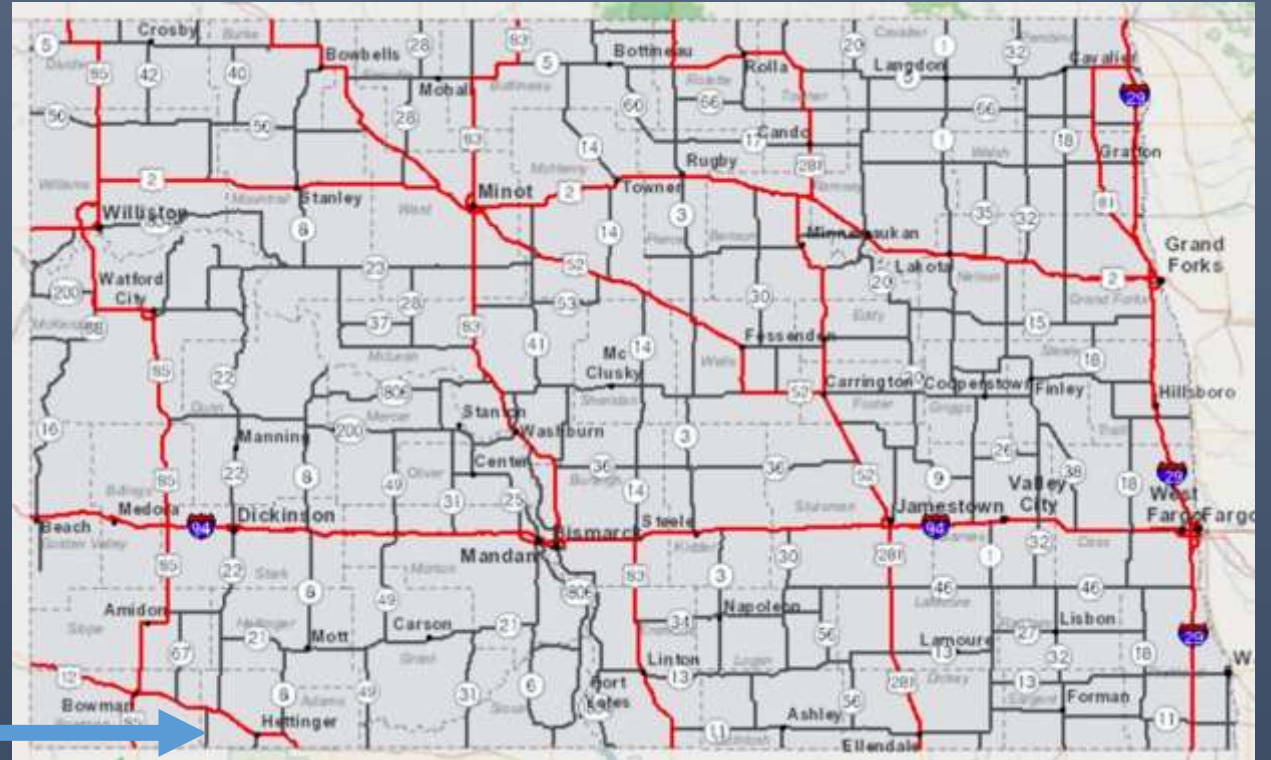
# What?

- “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 2<sup>nd</sup> 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
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Actual application rate	CRS2P = 0.343 GAL/SY	CL 41 = 17.2 LBS/SY
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➤ 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

Mile	Before	After	2017
0	241	41	61
1	220	40	61
2	209	33	54
3	203	34	52
4	181	34	52
5	203	32	54
6	298	33	50
7	200	30	59
8	197	28	47
9	268	29	48
10	262	29	58
11	197	47	57



# 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?

