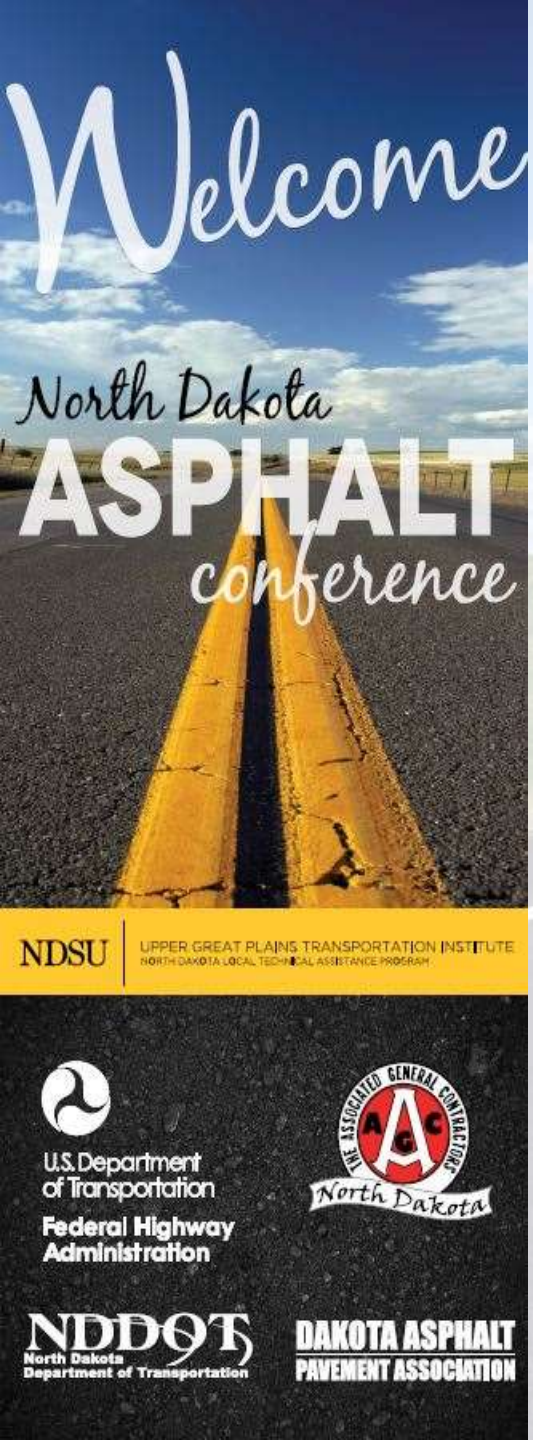


Micro-mill & Micro-surfacing

Tyler Wollmuth, PE
NDDOT Bismarck District

North Dakota Asphalt Conference

Bismarck, ND - April 10-11-2018

Project Background

- H Funds became available in April, about $1.25 Million per District
- Chose ND 34 from Hazelton to Napoleon - 26 mile segment
- Original plan was to do 10 miles of 2” HMA contract patching on the roughest portions

Existing Conditions ND 34

Thermal Reflective Cracking

Rumble Strip Degradation

Project Development

- Find an innovative solution that would fix the entire 26 mile segment
- TRIP submission for micro-mill & micro-surface was selected for a project in the Dickinson District with a 3/8” micro-mill depth
- Measured the rumble strip depth and the thermal cracking depth and found that a 3/4” milling would eliminate both

Project Development

- Talked to a milling contractor to find out the cost and capability of micro-milling
- Talked to a micro-surfacing contractor to find out if they have placed it on micro-milled surface and what the results were
- Chose 3/4” Micro-mill with one application of Micro-surfacing Type III

Project Development

- Plans were due before we even had a Project #. Plans were turned in on April 27, 2017.

- Project Designers: Tyler Wollmuth & Loren Lee, Bismarck District

Project Bid – June 9, 2017 bid opening

- Engineer's Estimate: $1,217,385.44
- Bid Amount: $1,110,808.12
- Prime Contractor: Mayo Construction Co., Cavalier, ND
- Milling Contractor: Industrial Builders Inc., Fargo, ND
- Project Engineer: Tyler Wollmuth, Bismarck District

Cost Summary – About 1/3 of the Price!

- Bid Amount: $1,110,808.12
- Total Length of Project: 26.073 Miles
- Bid Cost per Mile: $42,603.77
- We typically estimate $120,000 per mile for 2” HMA Overlay

So what is a Micro-mill???

Regular Milling Head

Micro milling head – more than 3x the number of teeth

Micro-milling

12 foot Micro-Mill – rumble strips are gone

After Sweeping – transverse cracks barely noticeable

Micro-milling

7 foot Micro-mill

Production Rate: 20-25 Ft/Min

Micro-milling

- Millings were hauled to NDDOT Maintenance yards
- Contractor and NDDOT inspectors were badgered by the locals to sell the millings for graveling approaches and roads.
- Much finer material than regular millings

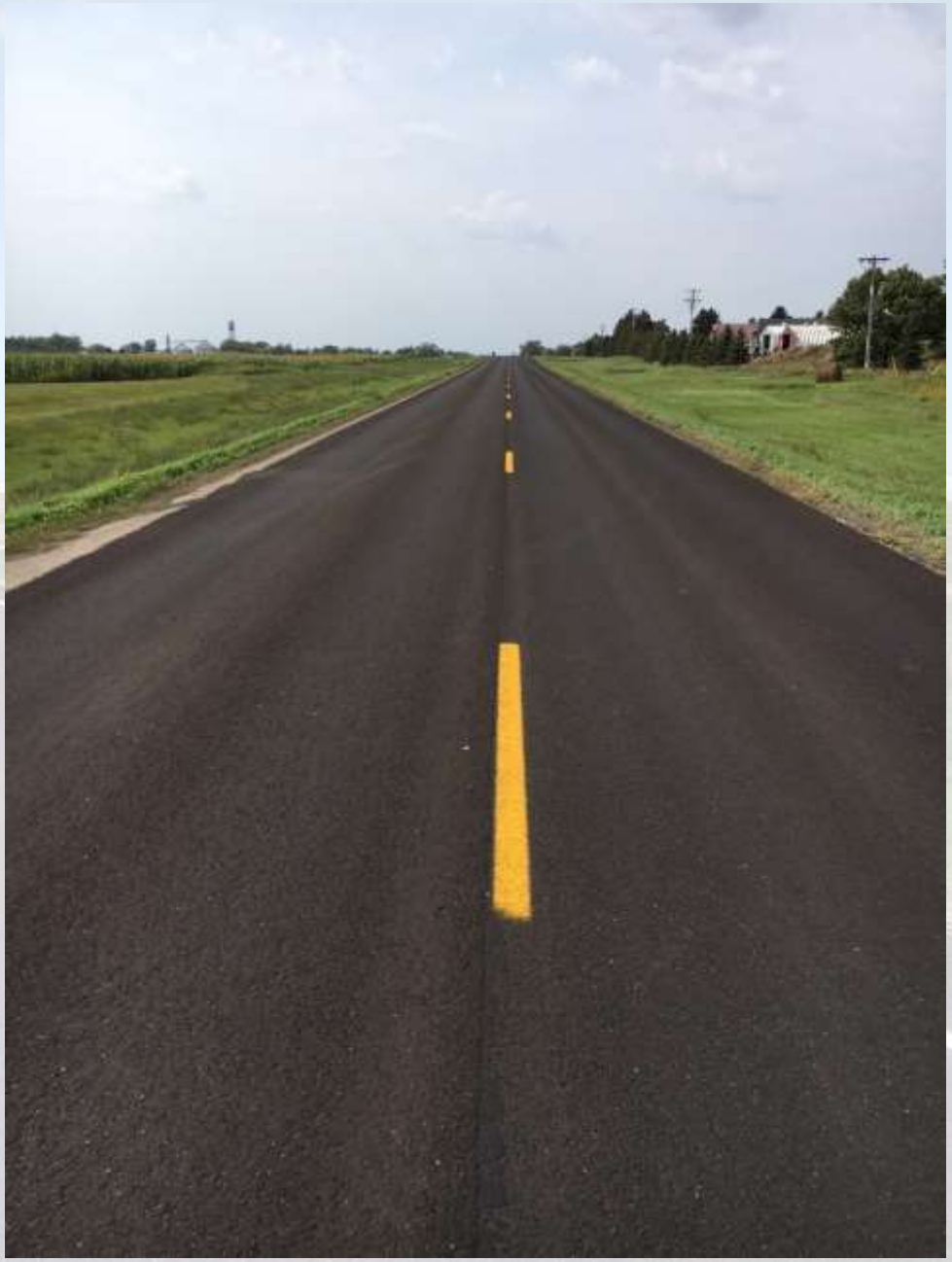
Micro-millings on the left and regular millings on the right

Micro-surfacing Type III

Milling made the road smooth and Micro-surfacing sealed the surface.

Micro-surfacing

- Type III Aggregate
- Design Emulsion was 14% of total mix
- Mix Design came back at about 12%

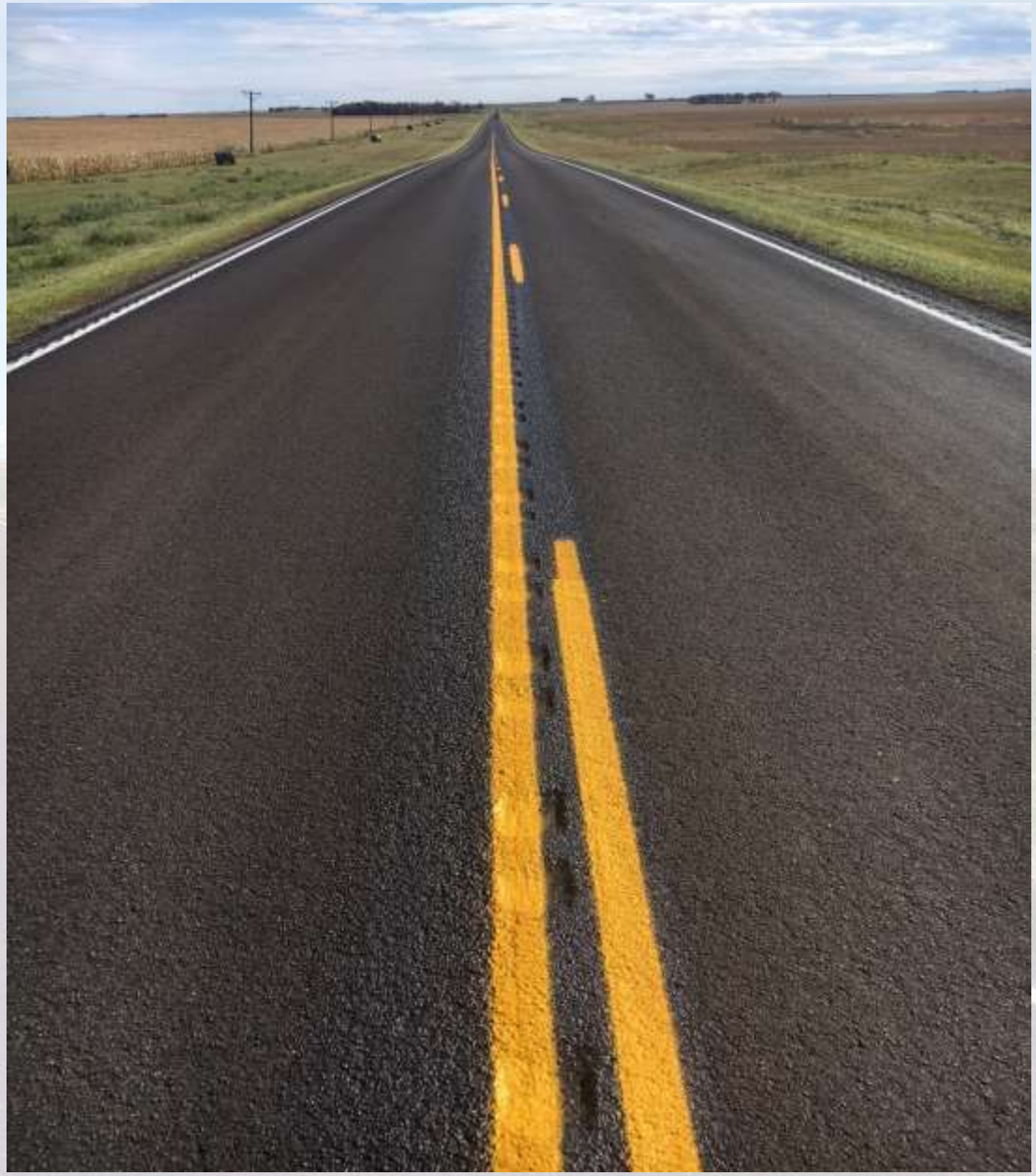


Project Timeline

- Micro-milling took 10 working days
- Micro-surfacing took 6 working days
- Rumbles strips were cut after a 2 week cure period and then permanent striping was placed.

Finished Product

- Bid Amount: $1,110,808.12
- Final Amount: $1,070,203.74
- Design Life: 7-10 Years



By-Product of Micro-milling

- Use the millings to try a RAP Chip Seal in 2018 on ND 3 north of Napoleon

- Contractor will process the stockpile to make RAP Cl-41 Chips

Any Questions?

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