

Dodge County CSAH 15: Fiber Reinforced Whitetopping

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Where is Dodge County?



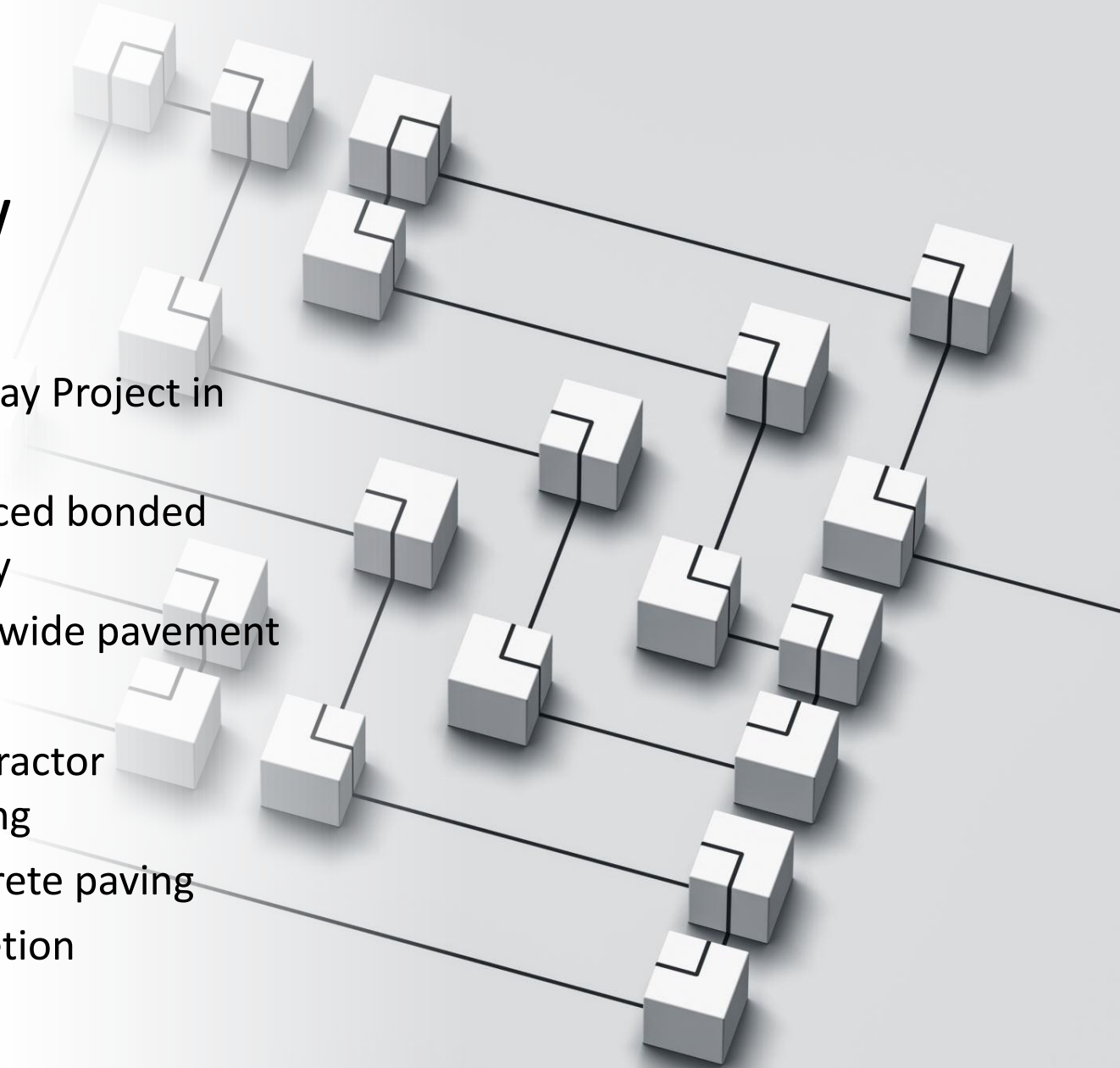
Existing Pavement Conditions

- Graded in 1979
- Bituminous Overlay in 1991
 - 11" aggregate and 5" total bituminous
- Existing distress of cracking, faulting, spalling
 - Ride Quality IRI 240
 - Traffic Volume AADT 610
- Rutting
 - ½" - 1"



Project Overview

- First Concrete Overlay Project in Dodge County
 - 5" Fiber-reinforced bonded concrete overlay
 - 5.2 miles of 26' wide pavement
 - 6/2/25 start
 - 2 weeks of contractor surveying/staking
 - 10 days of concrete paving
 - 8/12/25 completion



Project Constraints & Considerations



Concrete Overlay vs FDR and Bituminous Overlay

\$2.7 million vs \$3.2 million



Agricultural Area

Access to fields and grain elevators



Sand Pits/ Aggregate Quarries

7 sand pits and 4 aggregate quarries within 10 miles radius of project

Design Approach



- University of Pittsburgh BCOA-ME
 - Design life of 50 years
 - ESALS 113000
 - Overlay thickness 5" with synthetic fibers
 - 6x6 panels

Materials & Mix Design

- Concrete mix design per MnDOT 2461
 - Cementitious materials and Trenhale Aggregates
 - MAPEI fibers 4lb/cy
 - W/C average .39
 - Curing methods per MnDOT Standard Specifications



MAPEFIRRE ST 50 Twisted

- 4 lb/cy
- Macro-synthetic fiber composed of a blend of polypropylene and polyethylene resins

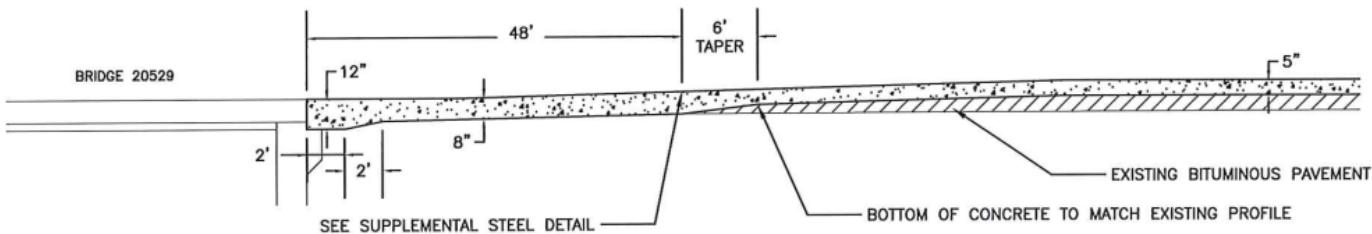
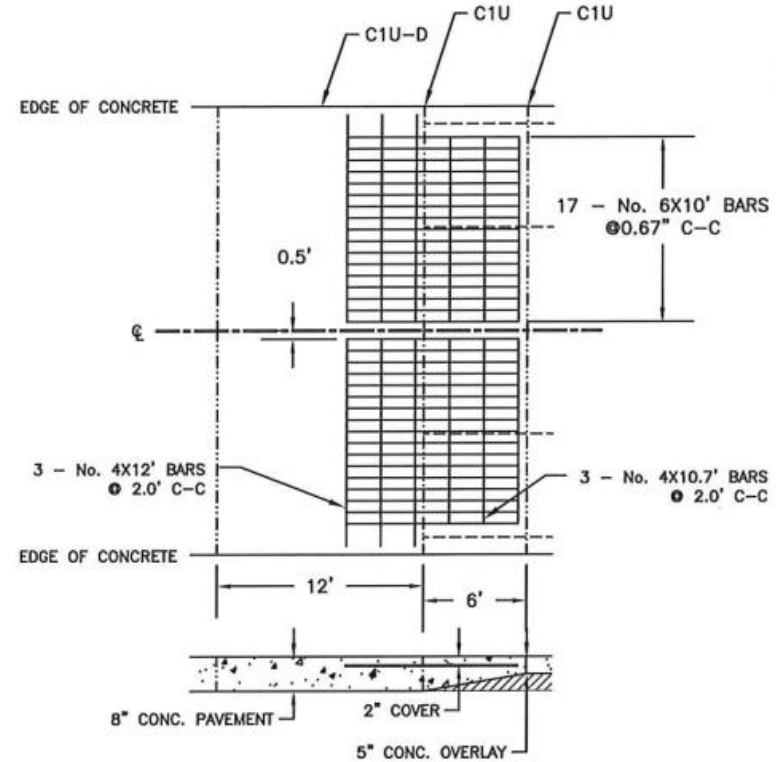


Bridge Approach Detail



PAVING TRANSITION AT BRIDGE ENDS
STA. 192+10.23 & 194+37.55

SUPPLEMENTAL STEEL DETAIL
TRANSITION FROM PAVING ON GRADE TO BONDED OVERLAY



Construction Process

- Surface preparation
 - No milling, just cleaning
 - Paving method and equipment (slipform paving)
 - 6' x 6' Joint construction and saw cutting
 - 12,475 CY placed
 - Curing to opening-to-traffic duration – 24-26 hours
 - Final IRI 48.6







Texture Close Up

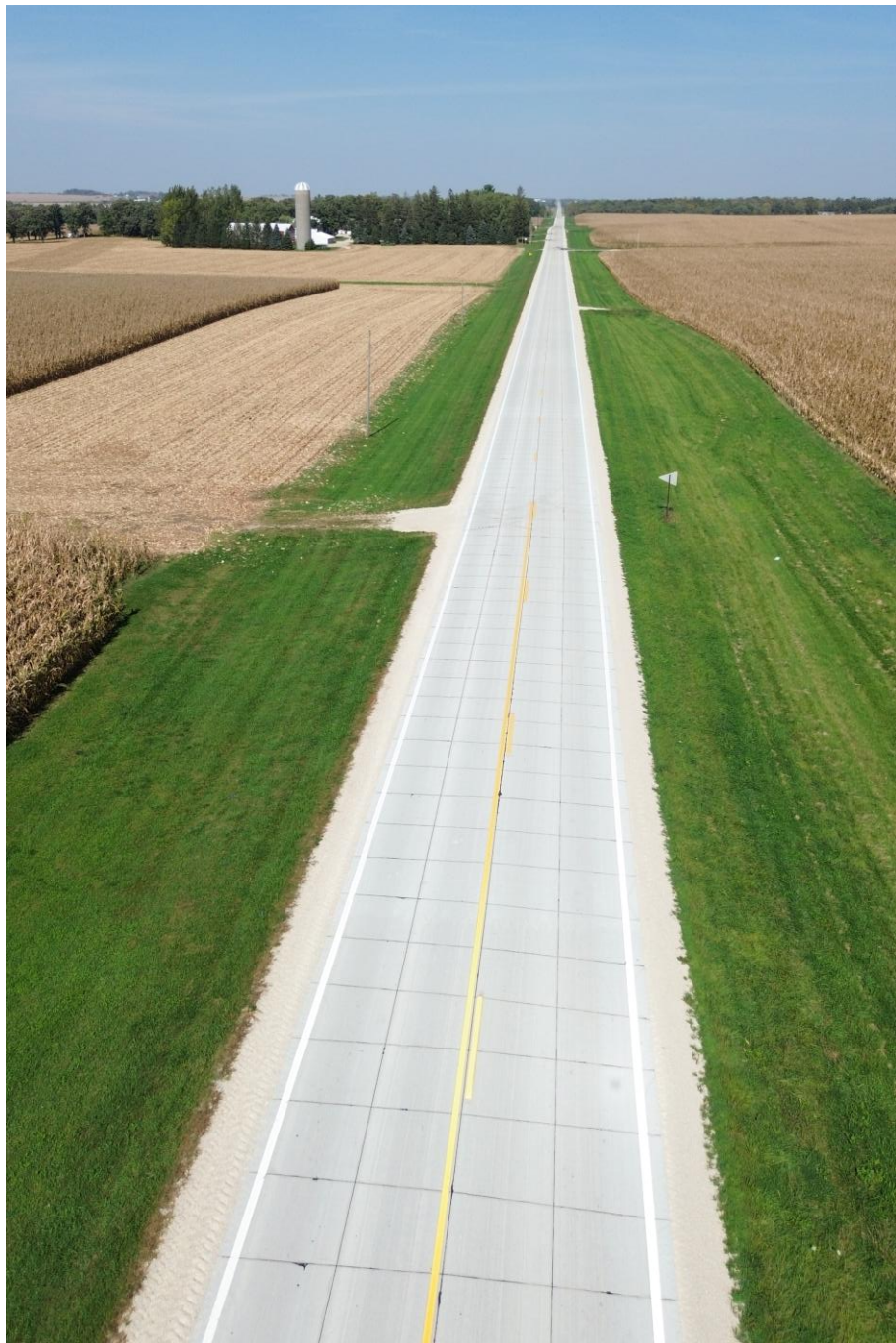




Saw Cutting





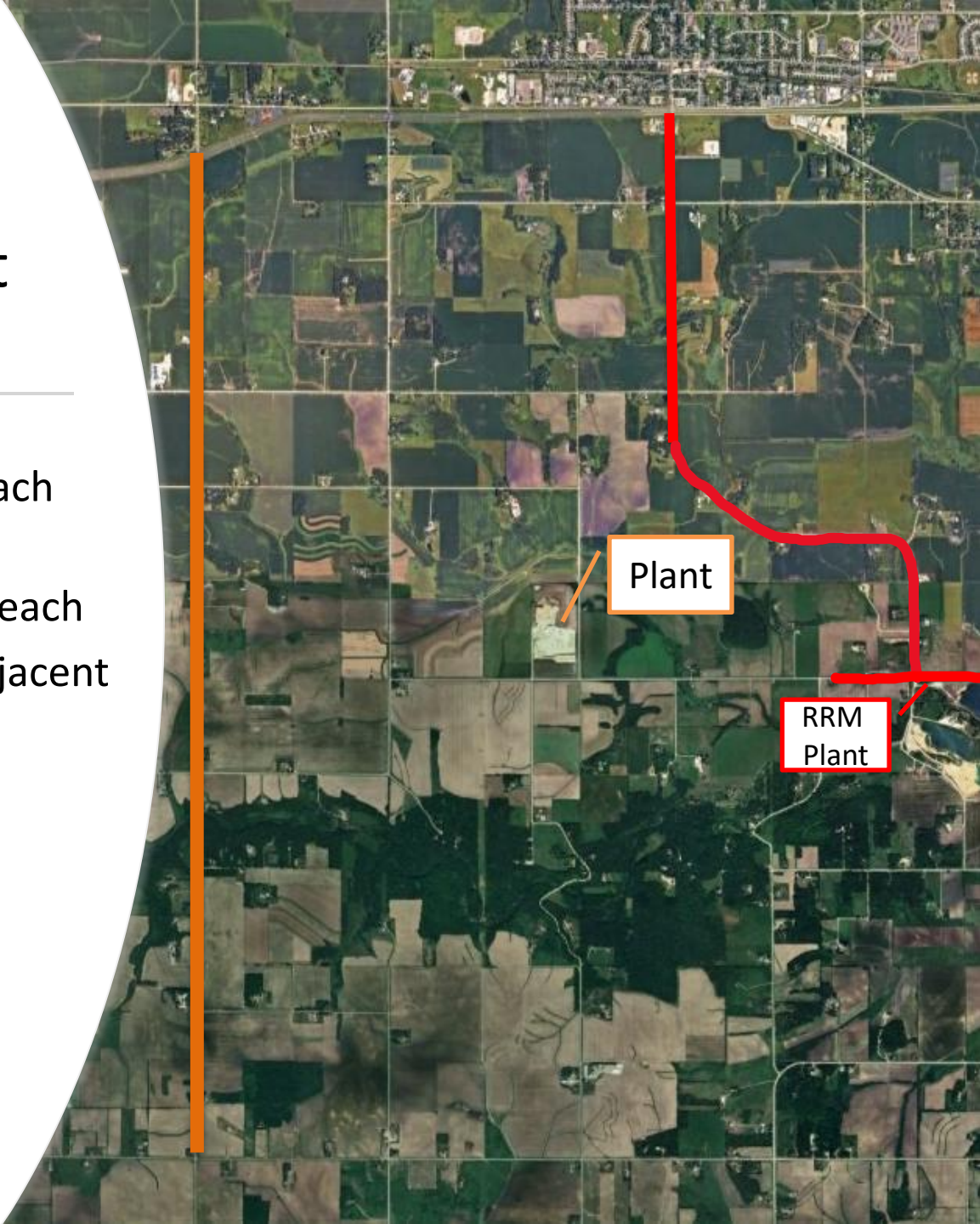


Lessons Learned

- Traffic Management
- Joint Activation

Traffic Management

- Traffic control staging approach
 - Coordination with local agencies and public outreach
 - Impacts to traffic and adjacent businesses



Random Cracking

- Two Cracks within 300 ft
- Day of higher W/C
- Over 30 joints before joints were activated
- Use of Water Truck



Acknowledgements



PCi Roads

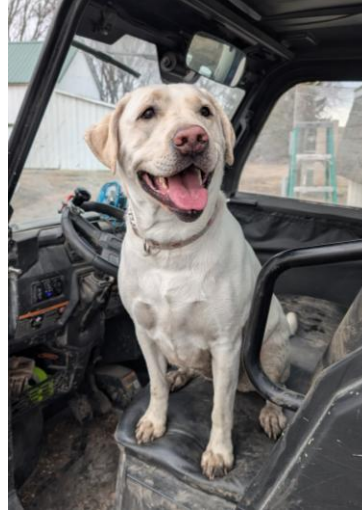


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Questions



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