

Topic 1 - Nebraska Outdoor Bridge Laboratory

Topic 2 - Evaluation of 50 Year Service Life Preservation Effects of Waterproofing Membrane



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Nebraska Outdoor Bridge Laboratory

Nebraska Outdoor Bridge Laboratory

- A national research and education shared-use facility for studies related to bridge health
- Two 1960 welded plate girder bridges near Yutan, NE were bypassed by a new alignment of Hwy 92 in 2005.
 - S092 46256R – 900 foot 8-spans
 - S092 46282R – 400 foot 4-spans
- A 1976 Prestressed concrete girder bridge. Built as a parallel structure, but parallel alignment was not built. Has carried traffic as a shoofly
 - S036 02040L – 160 foot 3-spans
- Access is jointly administered by NDOT and University of Nebraska – Lincoln and proposals are welcome.

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Bridge locations



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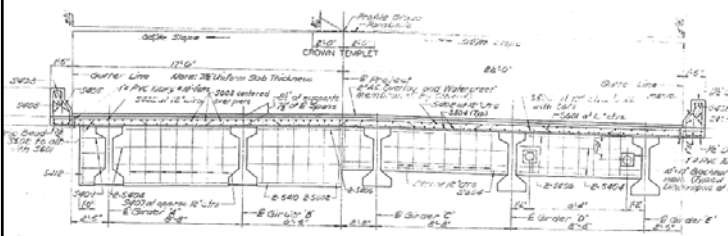
The bridge near Omaha



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The bridge near Omaha

- A plan excerpt from the Hwy 36 bridge and some inspection photos.



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The bridges near Yutan



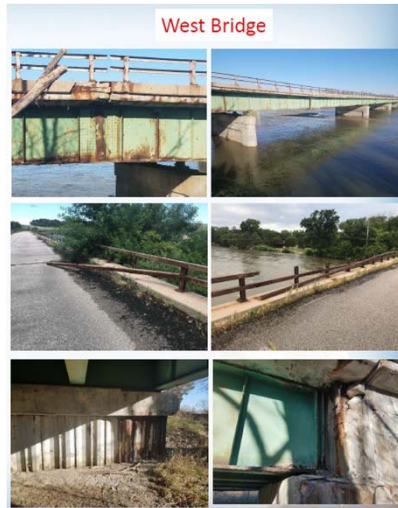
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The bridges near Yutan



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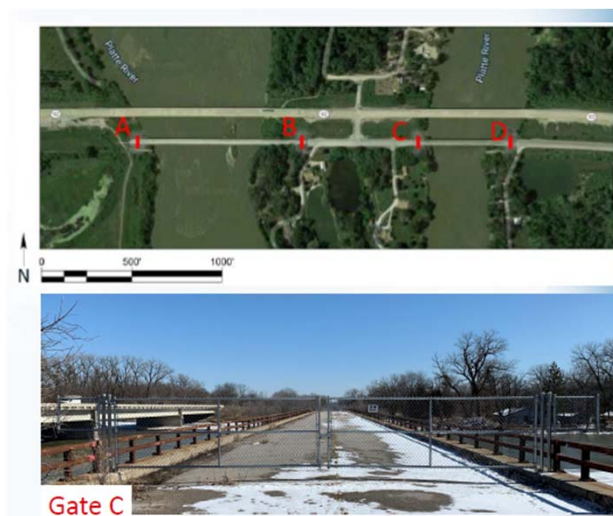
The bridges near Yutan



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Request for Proposals to Study Bridge Health

- A website is being created
 - <https://engineering.unl.edu/outdoorbridgelab/>
- For more information contact:
 - Dr. Richard Wood – UN-L
 - rwood@unl.edu
 - Fouad Jaber – NDOT
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Evaluation of 50 Year Service Life Preservation Effects of Waterproofing Membrane

An in-situ study to be conducted in summer of 2020

Background

- Between 1973 and 1975 there were 24 Nebraska bridges that are known to have received asphalt and waterproofing membrane prior to opening for traffic.
 - We call them AMODs – Asphalt and Membrane on Original Deck
- Little to no deterioration has been observed in these bridge decks
- The discovery of this effective deck preservation method eventually changed NDOT deck policy

Multiple zones of chloride exposure

- Three of these bridges received the membranes at the time of widening – the AMOD part was in the added deck area.
 - Interior deck concrete dates from 1930s and was exposed to chlorides from 1950s (?) to the time membranes were placed in 1972.
 - Widened part of deck has been protected from chlorides by membrane since it was built
 - No membrane could be placed under the open concrete rail
 - Three distinct zones of chloride exposure

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The project this summer

- This summer two of these three bridges, with multiple zones of chloride exposure, will have the overlays removed providing an opportunity to evaluate the performance of the waterproofing membrane for deck preservation.
 - New membranes will be placed
- NDOT has contracted with an investigation team to perform deck surveys of defects and test for corrosion rate on the three zones of chloride exposure

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Comparable bridges

S020 40702 – 1935 bridge re-decked in 1974. No waterproofing membrane



S075 17596 - 1934 bridge widened and received asphalt on membrane in 1972



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Questions?



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