Morgan County Engineer's Office

Stevan Hook, P.E., P.S.

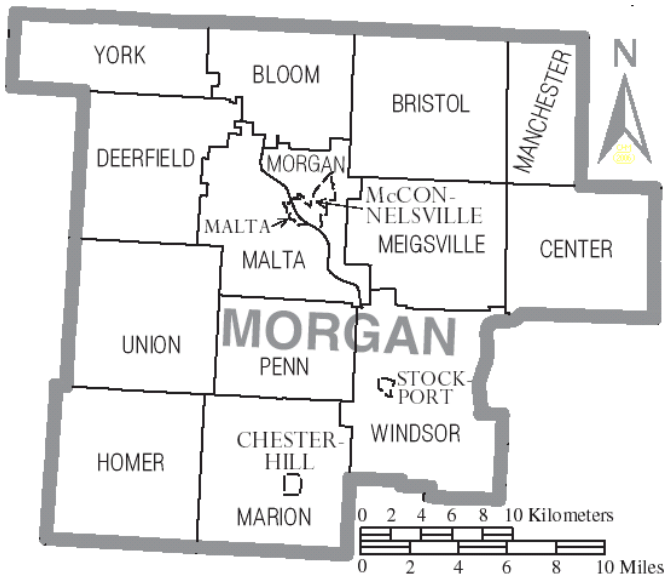
Presented by

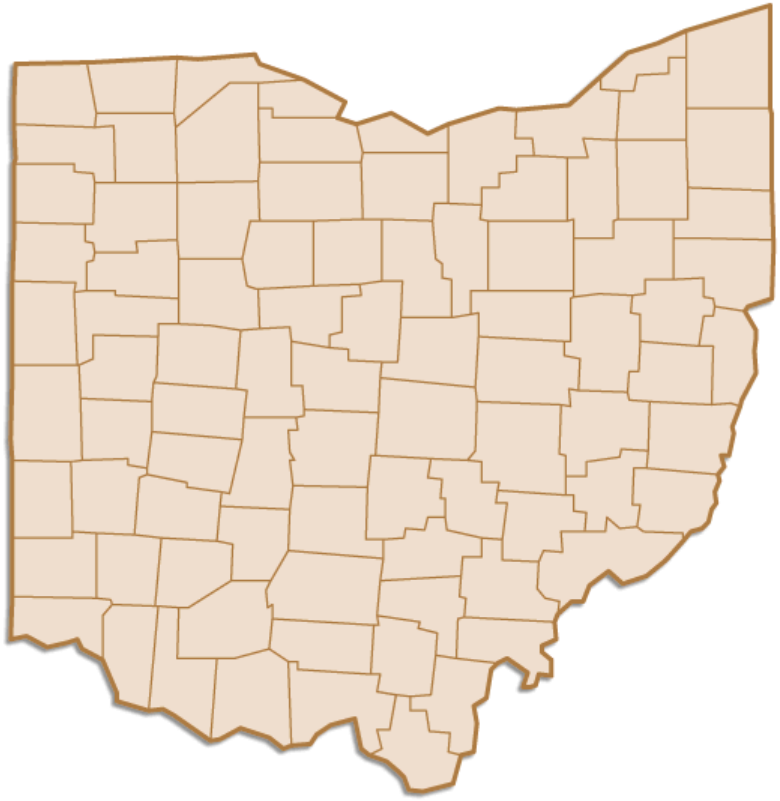
Stevan Hook, P.E., P.S.

County Engineer

Morgan County

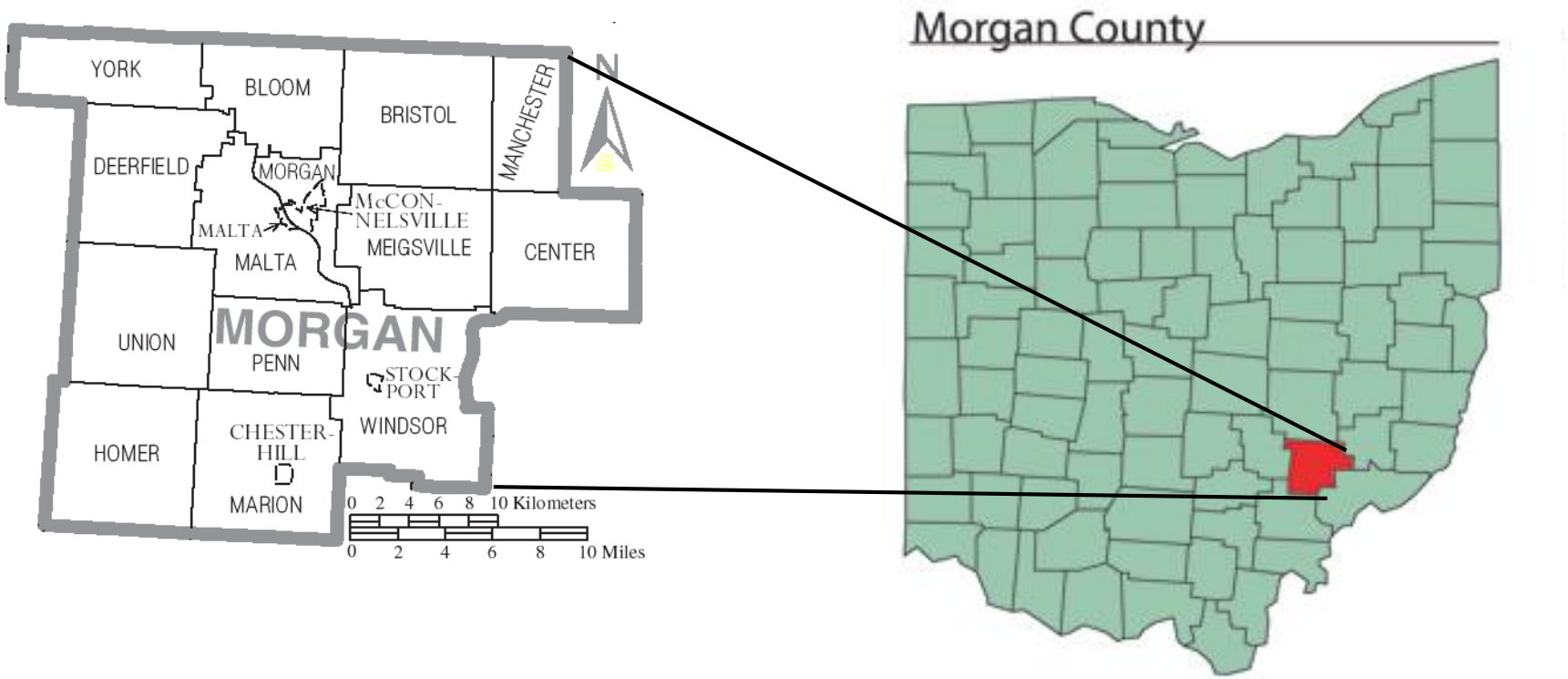
McConnelsville, Ohio





Morgan County

McConnelsville, Ohio



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- Rural – 421 Square Miles

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- Population: County - 14,827

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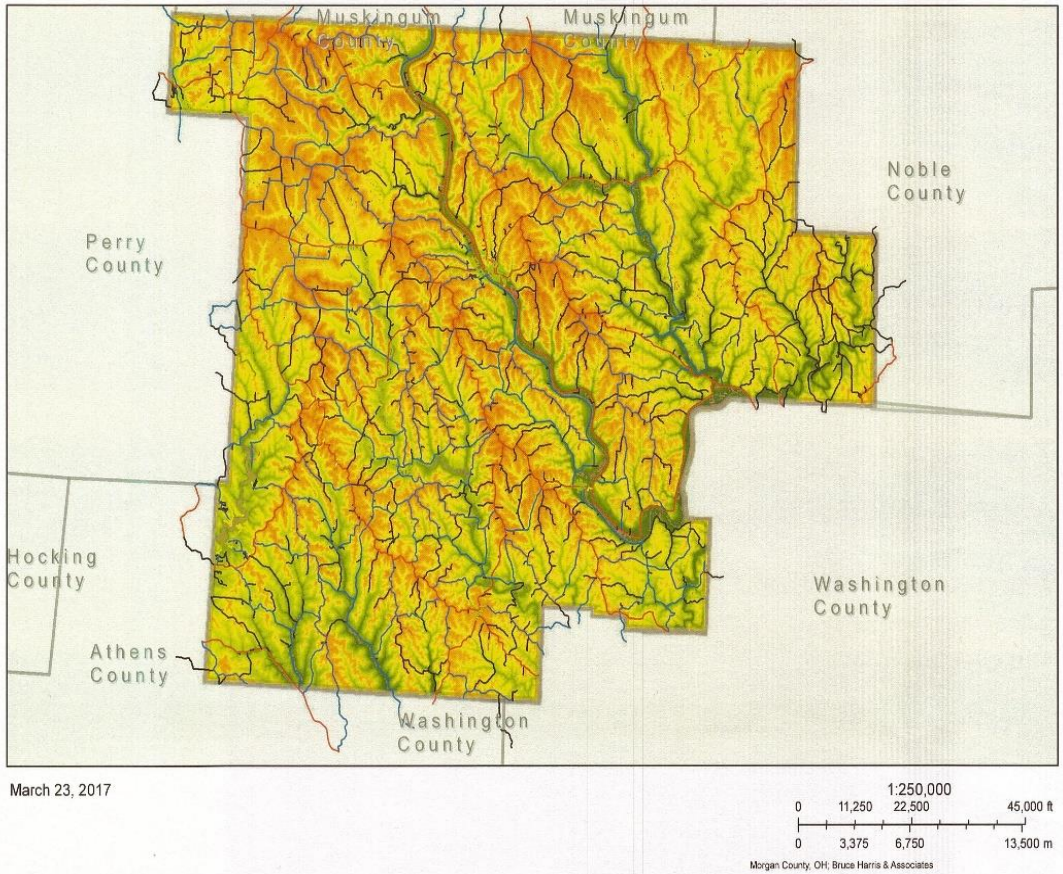
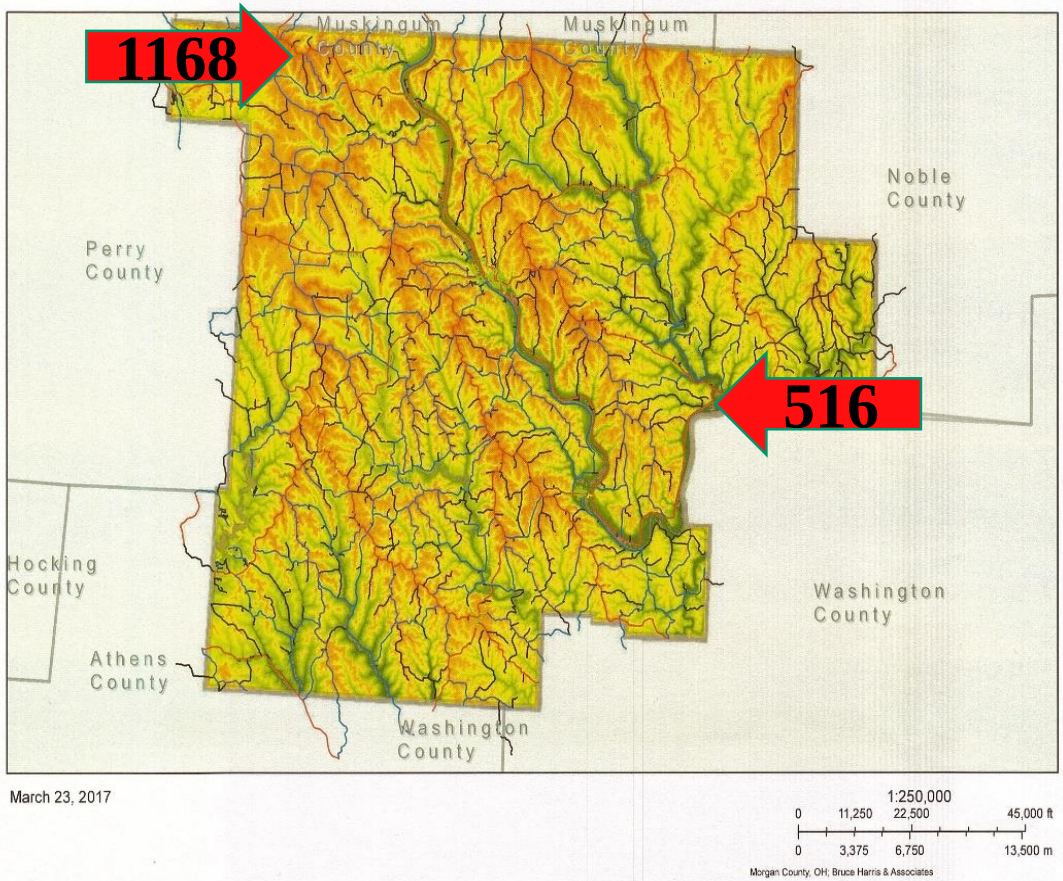
- 203 bridges & 448 culverts



Morgan County

McConnelsville, Ohio

- Rural – 421 Square Miles
- Population: County - 14,827
- 344 Miles of County Roads
- 365 Miles of Township Roads
- 203 bridges & 448 culverts
- Elevation Difference 552ft.
- 1168 elev. to 516 elev.



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- Population: County - 14,827
- 344 Miles of County Roads
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- Elevation Difference 552ft.
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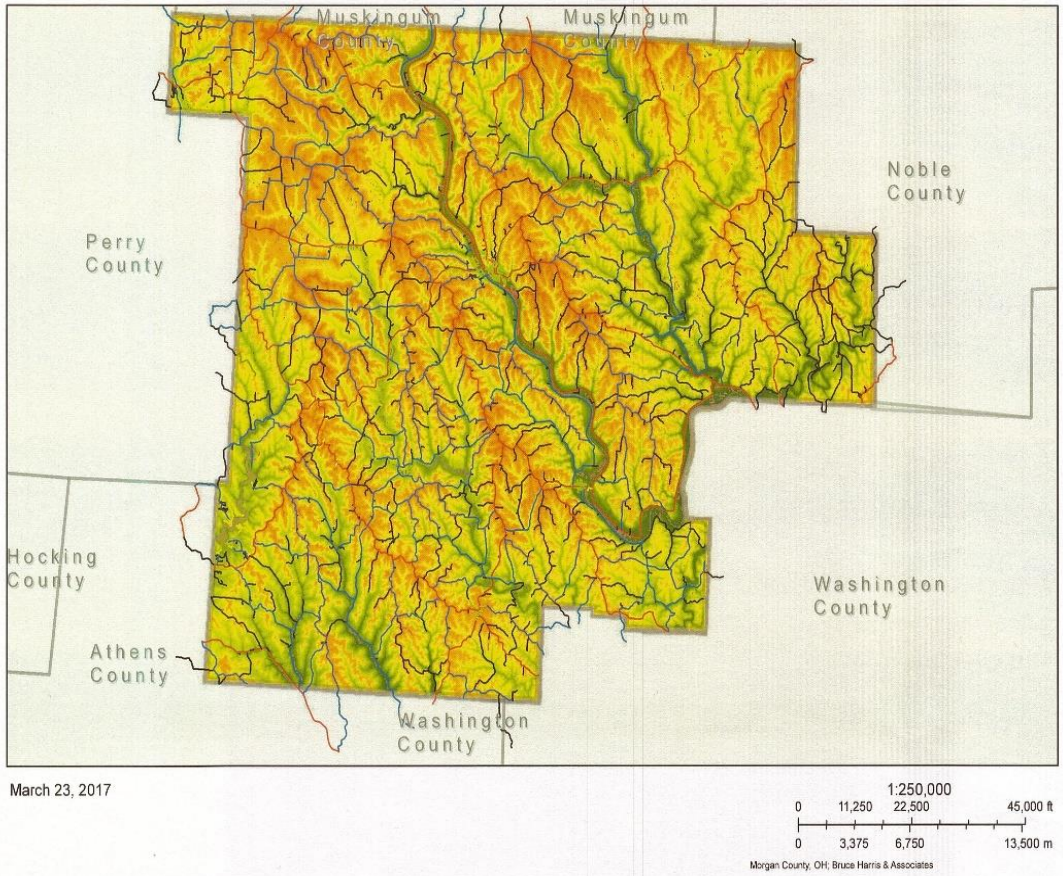
- Budget: $3.28 Million



Morgan County

McConnelsville, Ohio

Making our bridge dollars go further,

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- 2 - GRS Abutment Projects

Morgan County

McConnelsville, Ohio

Making our bridge dollars go further, and extend the life of our bridges

- 11 – New bridges
- 42 – rehabbed bridges
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- Used Steel

Morgan County

McConnelsville, Ohio

Making our bridge dollars go further, and extend the life of our bridges

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- Used Steel
- Wash lose materials from steel

Morgan County

McConnelsville, Ohio

Making our dollars go further,
and extend the life of our bridges

- 11 – New bridges
- 42 – rehabbed bridges
- 7 - Used Railroad Tanker Cars
- 2 - GRS abutment Projects
- Used Steel
- Wash lose materials from steel
- Rip/rap for scour protection

Used Railroad Tank Cars

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- Cost? - $25,700.

Used Railroad Tank Cars

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- Relatively easy & quick to install.
- Headwall is for washout protection.
- Job was completed in 2008.
- How long? – 7 days.
- Cost? - $20,700.
- Problems? – Getting pipe to site location

Used Railroad Tank Cars

Tanker cars laying in the yard

Used Railroad Tank Cars

Before in 2009

Used Railroad Tank Cars

The barrow area was used to fill over pipe & create sight distance.

Used Railroad Tank Cars

Downstream headwall is 12” thick and 3’ below bottom of pipe.

Used Railroad Tank Cars

Upstream is the same but wider for erosion protection.

Used Railroad Tank Cars

Finished project

Used Railroad Tank Cars

Old concrete abutments were utilized as rock slope protection.

Used Railroad Tank Cars

How it looks 9 years later

Used Railroad Tank Cars

What not to do!! –with acid water

Used Railroad Tank Cars

This will have to be replaced, not sure with what!!!

GRS - Abutment Replacement

View prior to abutment failure due to scour.
5,000 acre drainage & on an outside bend of creek.

GRS Abutment Repair

Completed in the fall of 2008

GRS - Abutment Replacement

We raised bridge above old abutment & anchored back

GRS - Abutment Replacement

Poured footer to get a level surface, would not do this next time. Would just use a compacted stone base & lay block directly on it.

GRS - Abutment Replacement

First course of block and fabric

GRS - Abutment Replacement

At the 4th tier

GRS - Abutment Replacement

At the 10th tier

GRS - Abutment Replacement

After Completion in November 2008

GRS - Abutment Replacement

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GRS - Abutment Replacement

Topside view & finish work

GRS - Abutment Replacement

April 2009 – Following spring

GRS - Abutment Replacement

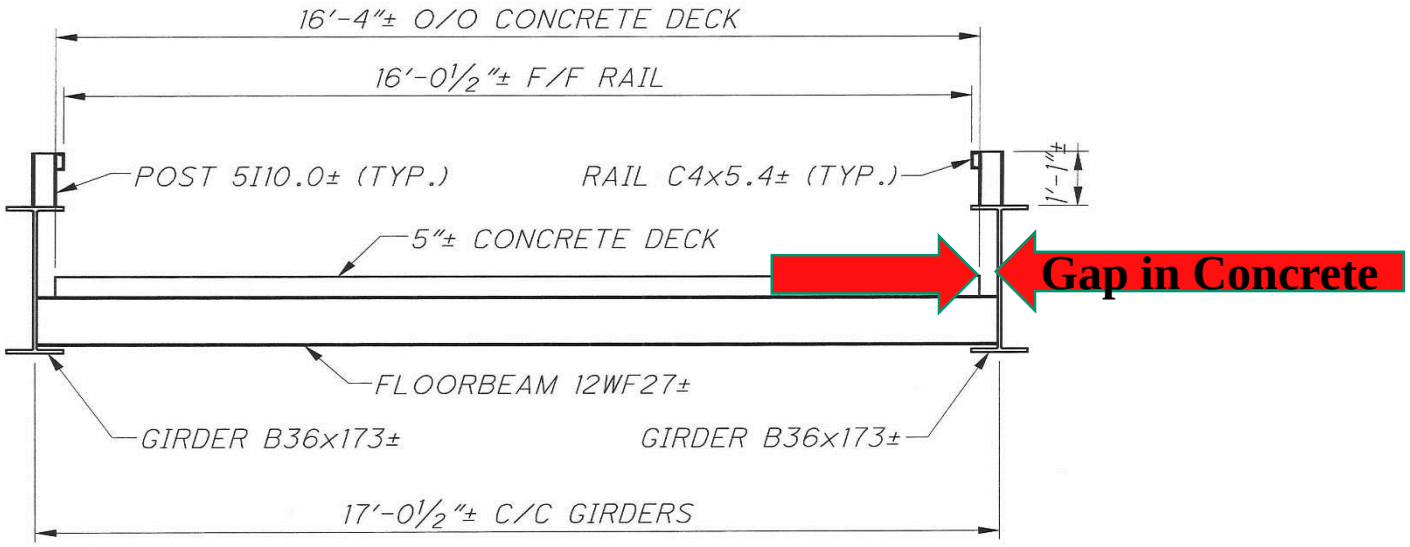
April 2017 - Wall still straight

Twin Girder Bridge Repair

Typical Design

BRIDGE #340 - CR 58 SFN 5837340

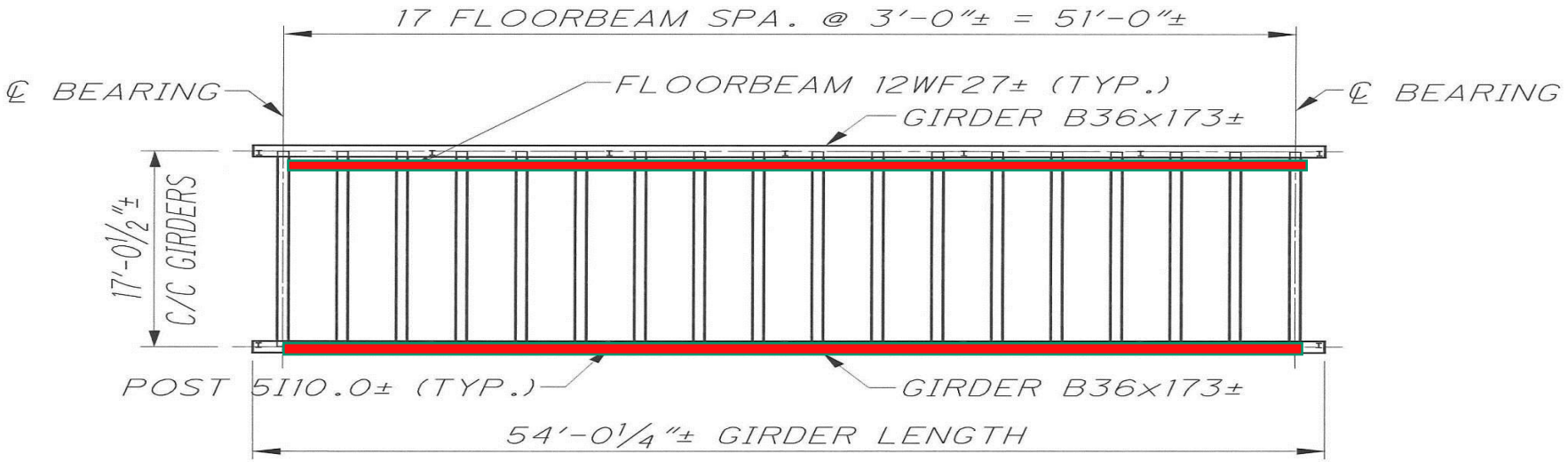
YEAR BUILT: 1951



TRANSVERSE SECTION

BRIDGE #340 - CR 58

SFN 5837340



FRAMING PLAN

Twin Girder Bridges

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- Were built after the war 40’s & 50’s, were easy and cheap, & as late as 2001.
- Girders control on only two of the bridges, it is the stringers that are the weak point.
- With our deck design we have made that problem worse.

Twin Girder Bridge Repair

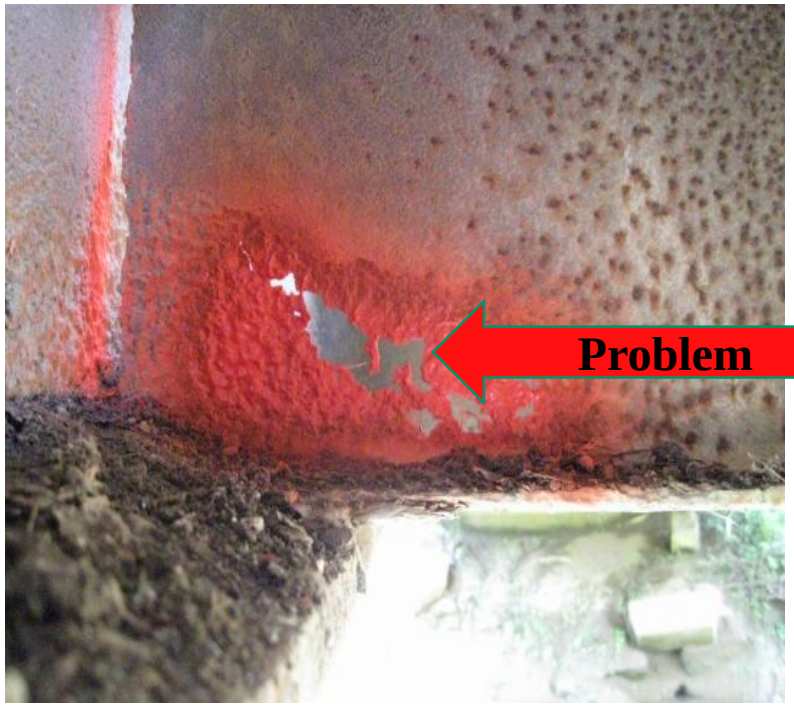
Bridge has a load limit due to stringer section loss at the girders.

Twin Girder Bridge Repair

Sun light shining thru gap.

Twin Girder Bridge Repair

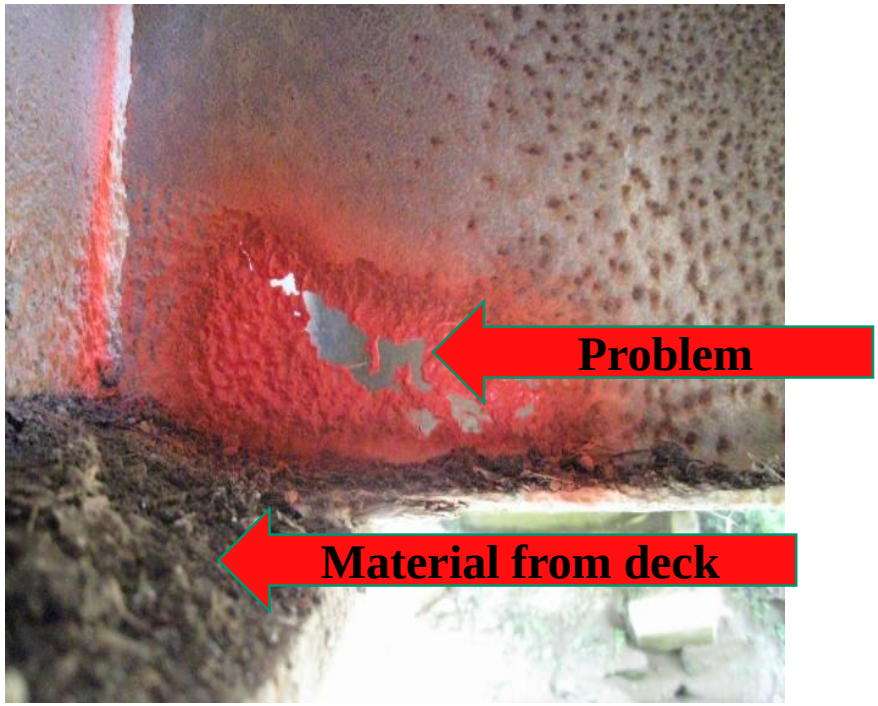
Here is the result.



- Section loss in web of stringer as a result of,

Twin Girder Bridge Repair

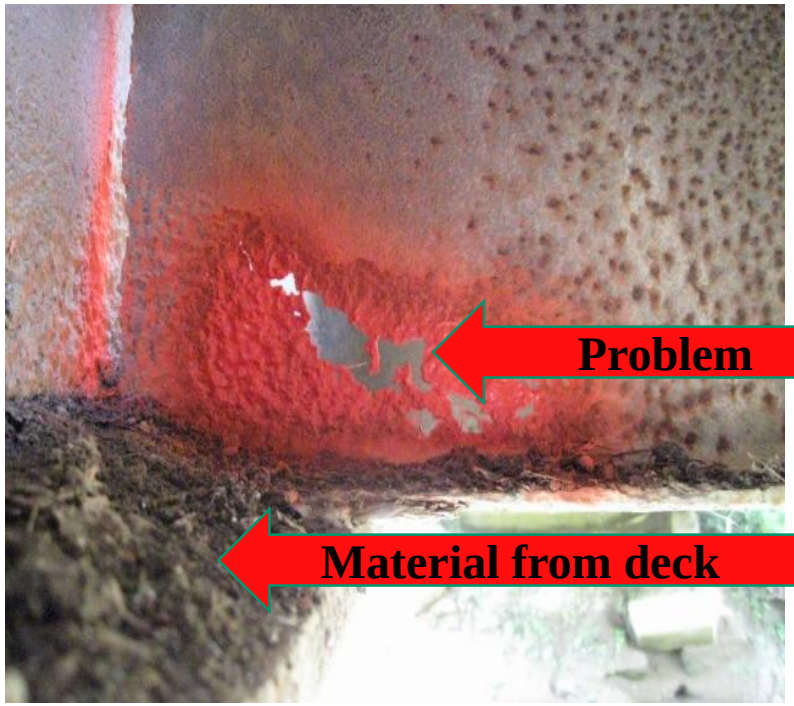
This is the controlling condition for the load rating problems.



- Section loss in web of stringer as a result of,
- Material build-up on bottom girder flange.

Twin Girder Bridge Repair

Here is the main load rating problem & cause.



- Section loss in web of stringer
- Material build-up on bottom girder flange.
- Began a bridge washing program to buy time.

Twin Girder Bridge Repair

Access to work area under the bridge was a big problem. This was the bridge crew's solution.

Twin Girder Bridge Repair

Plating added to the web and bottom flange to improve shear strength.

Twin Girder Bridge Repair

Plating added to the web and bottom flange to improve shear strength. However this is just a Band-Aid; until the bridge can replaced in 2023.

Questions ?