

Inspector: Schmitz,Joseph

Inspection Date: 06/27/2024

Structure Number: 5765145

Facility Carried: S CASSEL ROAD

## Ohio Bridge Inspection Summary Report

**MOT-T0067-0060 (5765145)**

2: District 79492 - VANDALIA (MOT county)  
ict  
07

5A: Inventory Route 1 T0067

21: Major Maint A/B 04 - City or Municipal Highway /  
Agency

7: Facility On S CASSEL ROAD

225 Routine Main A/B 04 - City or Municipal Highway /  
Agency

6: Feature Ints POPLAR CREEK

221 Inspection A/B 04 - City or Municipal Highway /  
Agency

9: Location .6 MI N OF LITTLE YORK RD

220: Inv. Location CITY OF VANDALIA

Lat, Lon 39.864499448 , -84.171168738

| Condition             |                                                                                                                                 | Structure Type            |                                                                                         |
|-----------------------|---------------------------------------------------------------------------------------------------------------------------------|---------------------------|-----------------------------------------------------------------------------------------|
| 58: Deck              | 6 - Satisfactory Condition                                                                                                      | 43: Bridge Type           | 3 - Steel                                                                               |
| 58.01 Wearing Surface | 6 - Satisfactory (1-10% distress)                                                                                               |                           | 02 - Stringer/Multi-beam or Girder                                                      |
| 58.02 Joint           | N- Not Applicable                                                                                                               |                           | N- Not Applicable                                                                       |
| 59: Superstructure    | 4 - Poor Condition                                                                                                              | 45: Spans Main / Approach | 1 / 0                                                                                   |
| 59.01 Paint & PCS     | 3 - Serious PCS (20-30% corr.)                                                                                                  | 107: Deck Type            | 1 - Concrete Cast-in-Place                                                              |
| 60: Substructure      | 3 - Serious Condition                                                                                                           | 408: Composite Deck       | N - Non-composite Construction                                                          |
| 61: Channel           | 5                                                                                                                               | 414A Joint Type 1         | N - None                                                                                |
| 61.01 Scour           | 5 - Fair or problems noted but they are stable or unchanged scour (Spread: no undermining, Deep: A couple piles may be visible) | 414B: Joint Type 2        | N - None                                                                                |
| 62: Culverts          | N - Not Applicable                                                                                                              | 108A: Wearing Surface     | 1 - Monolithic Concrete (concurrently placed with structural deck)<br>N- Not Applicable |

67.01 GA 3

| Appraisal                              |                                                       |       |        | 422: WS Date              | 07/01/1979                       |
|----------------------------------------|-------------------------------------------------------|-------|--------|---------------------------|----------------------------------|
| Sufficiency Rating                     | 22.8                                                  | SD/FO | 1 - SD | 423: WS Thick (in)        | 2.50                             |
| 36: Rail, Tr, Gd, Term Std             | 0                                                     | N     | 0 0    | 482: Protective Coating   | 5 - Paint System OZEU            |
| 72: Approach Alignment                 | 6 - Equal to present minimum criteria                 |       |        | 483: PCS Date             | 08/01/2000                       |
| 113: Scour Critical                    | 4 - Action is required to protect exposed foundations |       |        | 453: Bearing Type 1       | 3 - Sliding (Bronze)             |
| 71: Waterway Adequacy                  | 6 - Occasional Overtopping of Approaches              |       |        | 455: Bearing Type 2       | N - None                         |
| Geometric                              |                                                       |       |        | 528: Foundn: Abut Fwd     | U - Unknown                      |
| 48: Max Span Length (ft)               | 42.3                                                  |       |        | 533: Foundn: Abut Rear    | U - Unknown                      |
| 49: Structure Length (ft)              | 45.5                                                  |       |        | 536: Foundn: Pier 1       | N - None (Such as most Culverts) |
| 52: Deck Width, Out-To-Out (ft)        | 22.0                                                  |       |        | 539: Foundn: Pier 2       | N - None (Such as most Culverts) |
| 424: Deck Area (sf)                    | 1001                                                  |       |        | Age and Service           |                                  |
| 32: Appr Roadway Width (ft)            | 18.0                                                  |       |        | 27: Year Built/ 106 Rehab | 1915 / 1979                      |
| 51: Road Width, Curb-Curb (ft)         | 22.0                                                  |       |        | 42A: Service On           | 1 - Highway                      |
| 50A: Curb/SW Width: Left (ft)          | 0                                                     |       |        | 42B: Service Under        | 5 - Waterway                     |
| 50A: Curb/SW Width: Right (ft)         | 0                                                     |       |        | 28A: Lanes on             | 02                               |
| 34: Skew (deg)                         | 0                                                     |       |        | 28B: Lanes Under          | 00                               |
| 33: Bridge Median                      | 0 - No median                                         |       |        | 19: Bypass Length         | 99                               |
| 54B: Min Vert Underclearance (ft)      | 0                                                     |       |        | 29: ADT                   | 452                              |
| 336A: Min Vert Clrnce IR Cardinal (ft) | 99                                                    |       |        | 109: % Trucks (%)         | 5                                |
| 336B: Min V Clr IR Non-Cardinal (ft)   | 0                                                     |       |        | Inspections               |                                  |
| 578: Culvert Length (ft)               | 0                                                     |       |        |                           |                                  |

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| 578: Culvert Length (ft)               | 0             |  |  |                           |              |

| Load Posting           |                                   |  |  | 90: Routine Insp.  | 12 | Months | 06/27/2024 |
|------------------------|-----------------------------------|--|--|--------------------|----|--------|------------|
| 41: Op/Post/Closed     | A - Open                          |  |  | 92A: FCM Insp.     | N  | 0      |            |
| 70: Posting            | 5 - Equal to or above legal loads |  |  | 92B: Dive Insp.    | N  | 0      |            |
| 70.01: Date            |                                   |  |  | 92C: Special Insp. | N  | 0      |            |
| 70.02: Sign Type       |                                   |  |  | 92D: UBIT Insp.    | N  | 0      |            |
| 734: Percent Legal (%) | 118                               |  |  | 92E: Drone Insp.   | N  | 0      |            |

|                         |                                                                                                               |                          |                |
|-------------------------|---------------------------------------------------------------------------------------------------------------|--------------------------|----------------|
| <b>Inspector:</b>       | Schmitz,Joseph                                                                                                | <b>Structure Number:</b> | 5765145        |
| <b>Inspection Date:</b> | 06/27/2024                                                                                                    | <b>Facility Carried:</b> | S CASSEL ROAD  |
| 704: Analysis Date      | 05/26/2023                                                                                                    | Inspector                | Schmitz,Joseph |
| 63: Analysis Method     | 8 - Load and Resistance Factor Rating (LRFR) rating report by rating factor (RF) method using HL-93 loadings. |                          |                |

**Inspector:** Schmitz,Joseph

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ODOT District: District 07

**MOT-T0067-0060\_(5765145)**

Date Built: 07/01/1915

Major Maint: 04 - City or Municipal Highway  
Agency

Facility Carried: S CASSEL ROAD

Traffic On: 1 - Highway

Rehab Date: 01/01/1979

Routine Maint: 04 - City or Municipal Highway  
Agency

Feature Inters: POPLAR CREEK

Traffic Under: 5 - Waterway

Insp. 04 - City or Municipal  
Resp A: Highway Agency

FIPS Code: 79492 - VANDALIA (MOT county)

Location: CITY OF VANDALIA

.6 MI N OF LITTLE YORK RD

Insp  
Resp B:

Inspector

Schmitz,Joseph

Inspection Date

06/27/2024

Reviewer

Schmitz,Joseph

## **Inspector Comments - Deck and Approach**

### **Deck**

#### **Floor/Slab**

Spalling along the haunches typical with exposed rebar at Beams 3 and 4. Heavy saturation on underside of beams at bays 1 and 3, isolated locations in bay 2.

#### **Edge of Floor/Slab**

Spalling along both fascias, up to 2 reinforcement bars exposed. Spalling along the haunches (typ) partially exposing the top flange in some areas. Top flange laminar corrosion along fascias.

#### **Bridge Wearing Surface**

Hairline transverse cracks; hairline longitudinal and diagonal cracks at the South; Spalls along East and West edges with previous asphalt patches. Patch along West edge failed and spall for half of bridge length. Full-length spall on East edge.

#### **Deck Drainage**

Drip strip heavily damaged on both sides throughout. Drip strip failed in northwest and southwest corner. Drainage from deck is infiltrating along drip strips down the fascia accelerating the deterioration of flanges and other bridge components.

#### **Railing**

Detached rail post at southeast and southwest corners. Multiple posts along both fascias have section loss at top of web and connection I-beam extension.

### **Approach**

#### **Approach Wearing Surface**

Wide map cracking in the wearing surface throughout both approaches. Most severe at north approach. Voids and previous patches have failed at the North approach, potholes forming.

#### **Approach Embankment**

Vegetation from the embankment is encompassing the West fascia. Steep embankments and erosion at southeast and southwest corner of structure.

#### **Approach Guardrail**

Missing post and impact damage at the Southeast. Posts not tall enough and disconnected from rail at Northeast. I beam at southwest termination does not meet requirements.

#### **Signs**

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Bridge end markers. Vegetation obstructing the view of the southwest marker. Southeast marker is twisted away from roadway.

## **Inspector Comments - General Appraisal**

### **Superstructure**

#### **Beams/Girders**

Fascia girders have laminar corrosion with section loss to the bottom flange and the top flange, severe bottom flange section loss near beam ends. Bottom plate of built-up exterior girders near midspan note section loss; 1/8" painted over pitting to the webs. 75-100% loss to numerous rivet heads, most severe at exterior girder fascias. Half the length of G4 up to 30% section loss to bottom flange.

Webs have holes and section loss at locations:

- Girder 1, north end, 3.75" corrosion hole in web
- Girder 1, 18" from centerline of bearing, 2" diameter hole surrounded by 1/8" loss (2" x 18").
- Girder 4, near midspan, (3) 2" corrosion holes in the web

Transverse stiffeners have 100% section loss to the bottom 4" at locations:

- Girder 1, 10 stiffeners at exterior
- Girder 4, all stiffeners at exterior face
- Girder 4, 5 stiffeners at interior face

Beam condition at bearings:

- Girder 1: bottom 6-8" of stiffener and 2-4" of top flange and bottom flange at interior face with 100% section loss. Hole (3" x 3") in web near north abutment bearing.
- Girder 4: 3' length from each abutment knife edge corrosion at bottom flange, both sides up to 50% section loss. Missing 3" x 9" portion of bottom flange, interior side. Bearing stiffeners at south abutment 100% loss. 2-4" of top flange and bottom flange at interior face with 100% section loss.

#### **Bearing Devices**

Bearings appear to be frozen. Heavy laminar corrosion to masonry plates with section loss.

#### **Protective Coating System**

Paint failure along the girder ends and along the top and bottom flanges of the exterior Girders 1 & 4.

### **Substructure**

#### **Abutment Walls**

There is progressive disintegration of concrete exposing aggregate along the face of abutments, at abutment caps, and beam seats. Severe spalling and cracking under Girder 4 beam seat. Spalling under Girder 1 beam seat at North abutment (negligible loss of bearing, avg 3 ft wide and 4.75 ft tall). Full height spall under Girder 1 on North abutment face, with scaling and unsound concrete surround. Spalling under Girder 4 beam seat on North abutment. Spalling below beam seats in abutment wall typical.

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Abutment condition at bearings:

Loss of bearing under the masonry plate at both ends of G1, ~25% at South end (14" x 20.5"), ~20% at North end with cracking and spalling extending to lower ledge of abut of Girder 4. Spalling under North end of Girder 1 up to masonry plate. Concrete at bearings is disintegrating, exposing aggregate.

### **Backwalls**

Minor voids/spalls at the top of the backwalls. Full height vertical crack between interior girders at both abutments.

### **Wingwalls**

Spalling and cracking typical. Footing exposed at Southwest and Northeast corners. Heavy spalling on backside of southwest wingwall at erosion area.

### **Substructure Scour**

See Scour Critical portion of this report for detailed scour information.

## **Culvert**

## **Inspector Comments - Waterway**

### **Waterway Adequacy**

### **Channel**

#### **Channel Alignment**

For the purposes of this report it is assumed that S Cassel Rd. runs north/south and Poplar Creek flows West to East.

Channel poorly aligned with bridge, water flows into the southwest wingwall.

#### **Channel Protection**

Sparse/minimal channel protection upstream and downstream. Some protection near bridge at base of wingwalls.

### **Scour Critical**

Northeast wingwall is abraded and undermined 20" for a length of about 18' along the north abutment face. Flow impacts southwest wingwall with 2' scour hole adjacent and up to 30" of undermining at footing. South footing exposed over 12' length.

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**Summary Recommendations**

Following parameters incorporated into 2017 load rating analysis:

Girder 1:

-10% LOS to bottom cover plate width full length, 0' to 42.33'

-50% LOS to bottom cover plate width and thickness, 0' to 5'

-15% LOS to bottom cover plate width and 50% LOS to bottom cover plate thickness, 12' to 15'

-15% LOS to bottom cover plate width and 50% LOS to bottom cover plate thickness, 27.33' to 30.33'

-40% LOS to bottom cover plate width and thickness, 39.33' to 42.33'

Girder 4:

-10% LOS to bottom cover plate width full length, 0' to 42.33'

-10% LOS to bottom cover plate width and 25% LOS to bottom cover plate thickness, 0' to 7'

-25% LOS to bottom cover plate width and thickness, 38.33' to 42.33'

No deterioration on interior girders included in analysis

2021 Inspection: Due to steady corrosion to fascia Girders G1 & G4 and continue disintegration of concrete around the area of the bearing seats, it is advised to make repairs to the deck pavement, abutment seat/cap areas or determine if the legal loading need revising.

2023 Inspection and Load Rating Review: LOS incorporated in load rating is still reasonable, along with the additional factor for poor condition. Corrosion is progressing, but not at an accelerated rate. Biggest concern is the loss of bearing area at the seats.

2024: Immediate recommendation: Restore bearing below G1 and G4. Protect abutments and wingwalls with large diameter rock channel protection. It is recommended to program structure for replacement. Replace/repair compromised rail connections.

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### Bridge Inspection Report

## Pictures



PHOTO 1

Description Upstream elevation



PHOTO 2

Description Downstream elevation

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### Bridge Inspection Report

## Pictures



PHOTO 3

Description End view looking north



PHOTO 4

Description South bridge limit

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### Bridge Inspection Report

## Pictures



PHOTO 5

Description North bridge limit



PHOTO 6

Description Wearing surface

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### Bridge Inspection Report

## Pictures



PHOTO 7

Description West deck edge and railing



PHOTO 8

Description Impact damage at southeast

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### Bridge Inspection Report

## Pictures



PHOTO 9

Description East rail at north detached post



PHOTO 10

Description Rail extension, I beam connection section loss at northeast

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### Bridge Inspection Report

## Pictures



PHOTO 11

Description Typical underside



PHOTO 12

Description South abutment

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### Bridge Inspection Report

## Pictures



PHOTO 13

Description North abutment



PHOTO 14

Description First post from south abutment, west fascia, note compromised rail post attachment

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### Bridge Inspection Report

## Pictures



PHOTO 15

Description G1 at south abutment, 2" diameter hole in bottom of web, 18" from centerline of bearing



PHOTO 16

Description G1, section loss at bottom of transverse stiffeners

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### Bridge Inspection Report

## Pictures



PHOTO 17

Description G4 at south abutment, note 100% section loss of bottom flange and bearing stiffener



PHOTO 18

Description Undermined bearings at G4, south abutment

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### Bridge Inspection Report

## Pictures



PHOTO 19

Description Undermined bearings at G4, south abutment



PHOTO 20

Description Undermined bearings at G4, south abutment

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### Bridge Inspection Report

## Pictures



PHOTO 21

Description G4 at south abutment, bottom flange deterioration of end 4', up to 50% loss



PHOTO 22

Description G4, loss of bearing

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### Bridge Inspection Report

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PHOTO 23

Description G1, section loss at midspan



PHOTO 24

Description G1 near north abutment, 3" diameter hole in web

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### Bridge Inspection Report

## Pictures



PHOTO 25

Description North abutment, spall under G1



PHOTO 26

Description Upstream channel

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### Bridge Inspection Report

## Pictures



PHOTO 27

Description Southwest embankment erosion



PHOTO 28

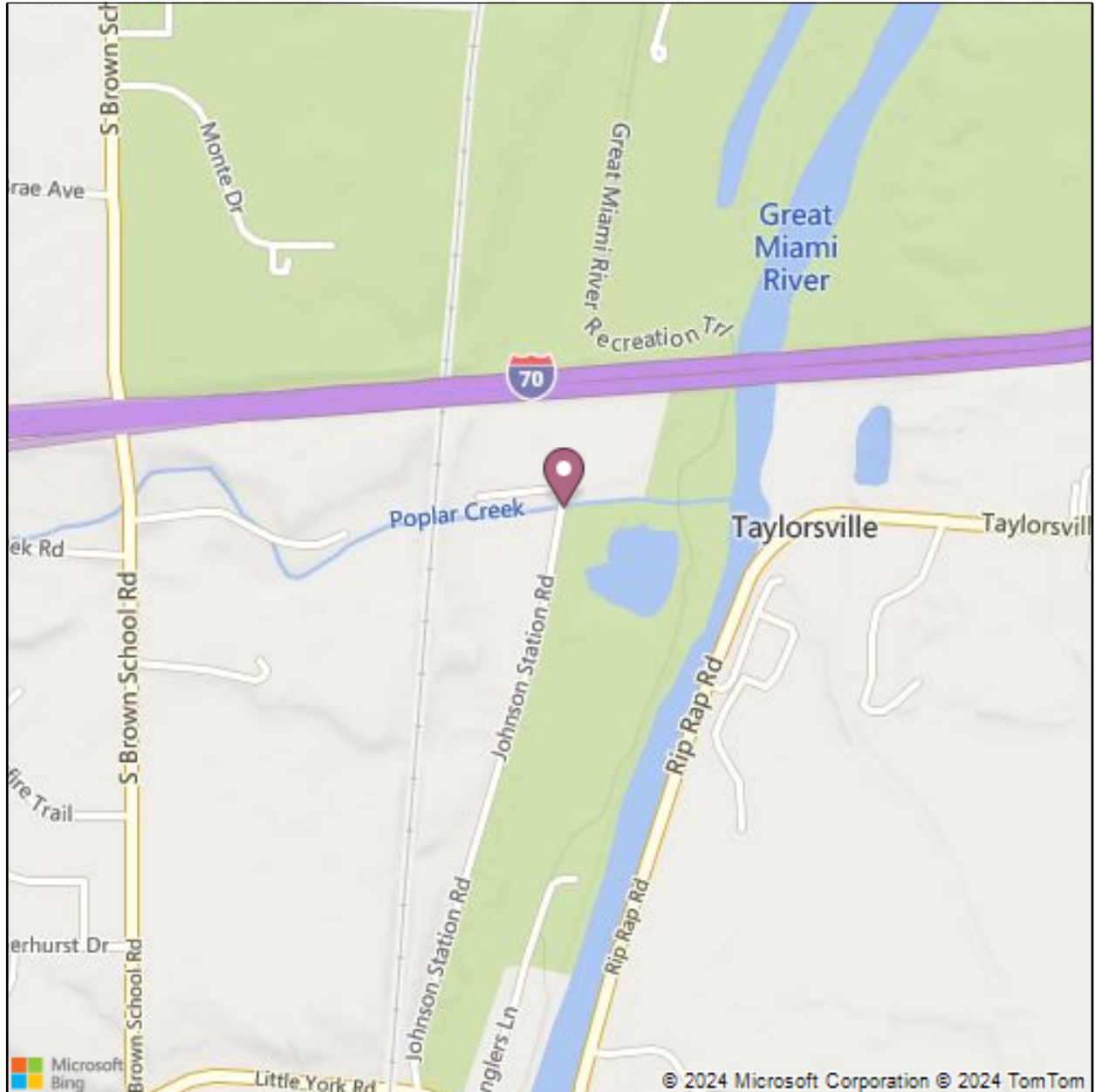
Description Downstream channel

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Latitude: 39.86450

Longitude: -84.17117

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