Technical Data Sheet

Bridge Identification:	1560210000000R01
Facility Carried:	M 20
Feature(s) Intersected:	Tittabawassee River and C & O Railway
Location:	City of Midland
County:	Midland
Region:	Bay
Year Built:	1955
Year(s) Reconstructed:	1985
Bridge Type:	Two-Girder System
No. of Spans:	10
Deck Area:	45,585 S.F.
Paint System:	Type 1 (Joint Area, Type 4)
Paint Area:	96,500 S.F.

Plan View Looking North (1)

East Elevation (2)

Fracture-Critical Members
1. Pin and Hanger Assemblies 2. Tension Areas of Main Girders

Fatigue-Sensitive Details
1. Tack Welds 2. Small Web Gaps 3. Floorbeam-to-Girder Connections 4. Lateral Bracing-to-Girder Connections 5. Ends of Cover Plates

General Bridge Description

Bridge R01 of 56021 is a ten-span, steel, multi-beam and two-girder-system bridge carrying Michigan State Route 20 over the Tittabawassee River and the Chesapeake and Ohio Railway in the city of Midland in Midland County. The spans measure 57'-0", 57'-0", 75'-0", 110'-0", 75'-0", 63'-0", 59'-3", 70'-0", 51'-0", and 54'-9" from west to east, and the overall length of the bridge is 672'-0". The out-to-out width of the deck is 67'-10". A 1" open longitudinal joint along the centerline of the bridge separates the superstructure into two halves, each providing for two 12'-0" travel lanes with narrow shoulders. The bridge is supported by reinforced concrete abutments and rigid frame piers.

Spans 1, 2, and 6 through 10 consist of steel multi-beam construction. Spans 3 through 5 consist of steel two-girder-system construction. The floor system in these spans is comprised of longitudinal stringers and transverse floorbeams that frame into the two main riveted girders along either edge of the superstructure. Span 4 contains a 70'-0" suspended span supported by pin and hanger assemblies at the end of the girders cantilevered from Spans 3 and 5.

The bridge was built in 1955 and was rehabilitated in 1985, when the pins and hangers for the non-redundant suspended spans were replaced. The superstructure was zone-painted in 1985 and 1991 and the deck received a latex overlay in 1979.

East Elevation (3)

Plan View Looking North (4)

Inspection Checklists

For additional information and detailed inspection procedures, refer to the Inspection and Maintenance Program section of this manual.

Fracture-Critical Members/Fatigue-Sensitive Details

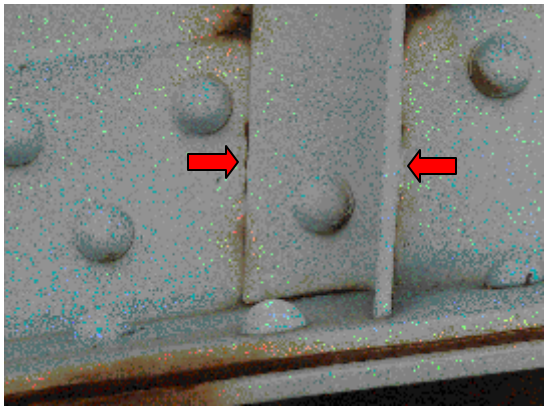
! **Pin and hanger assemblies.** The pins and hanger plates should be carefully inspected, and any wear or section loss should be measured and compared to that documented in previous inspections. The assemblies should be inspected to ensure they are free to move as intended.

Typical Pin and Hanger Assembly (5)

! **Tension areas of main girders.** See Figure 1 in the Inspection and Maintenance Program section of this manual for tension areas.

! **Spot/tack welds.** Temporary or erection welds exist at the following locations and should be carefully inspected for cracks:

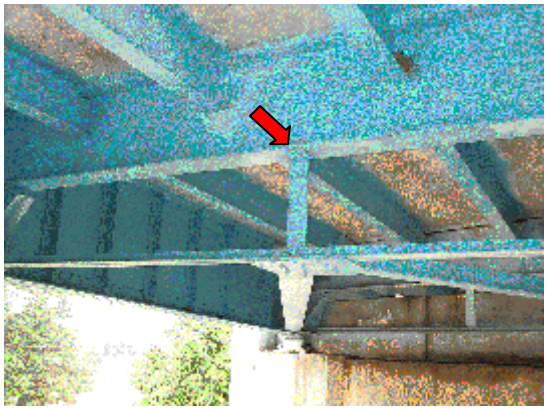
-- Bottom of stiffener angles to bottom flange angles (Photo 6)



Typical Connection of Stiffener Angle to Girder Bottom Flange Angle (Note Cracked Tack Welds) (6)

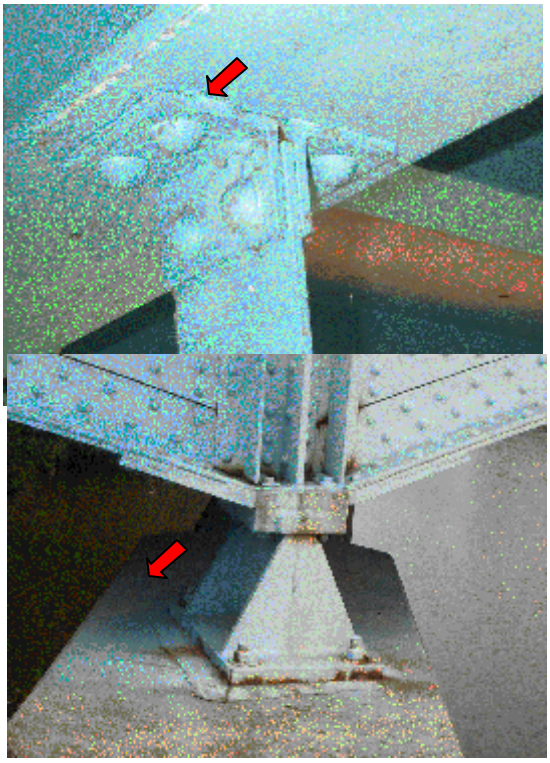
-- Lateral bracing gusset plates to lateral bracing members

-- Lateral bracing hanger connections to floorbeam bottom flanges (Photos 7 and 8)



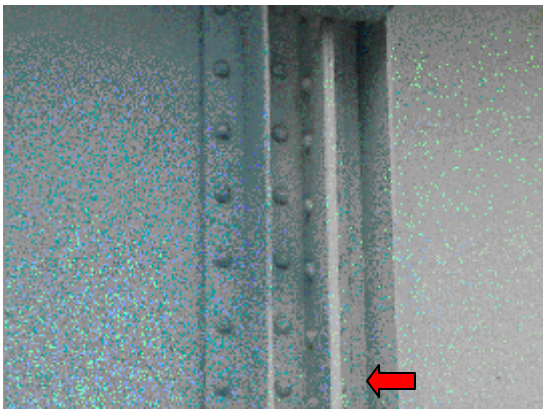
Lateral Brace Connection to Floorbeam (7)

-- Bearings (Photo 9)



Girder Bearing at Pier (Note Spot Welds) (9)

-- Stiffener angles to girder webs

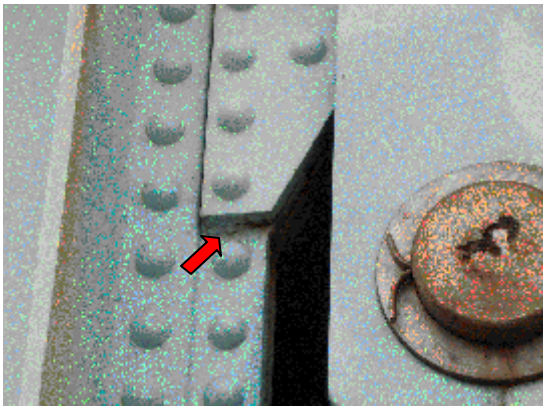


Typical Connection of Bearing Stiffener Angle to Girder Web (Note Tack Welds) (10)

-- Ends of bottom flange plates

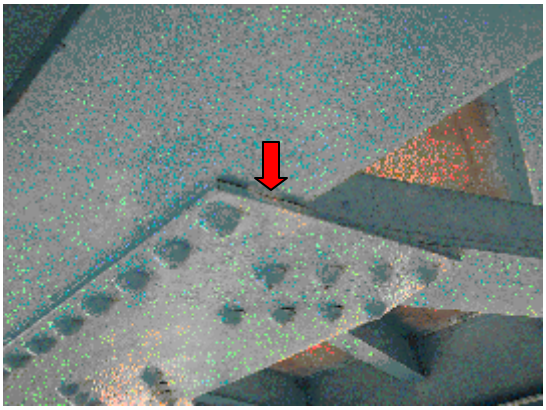
Tack Welds at Bottom Flange Cover Plate (Below the Pin and Hanger Assembly) (11)

-- Ends of girder webs at pin and hanger assemblies



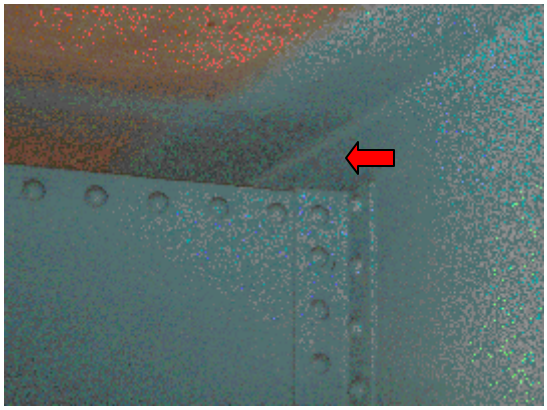
Typical Tack Weld adjacent to Pin and Hanger Assembly (12)

– Lateral bracing gusset plates to centerline floorbeam bottom flanges

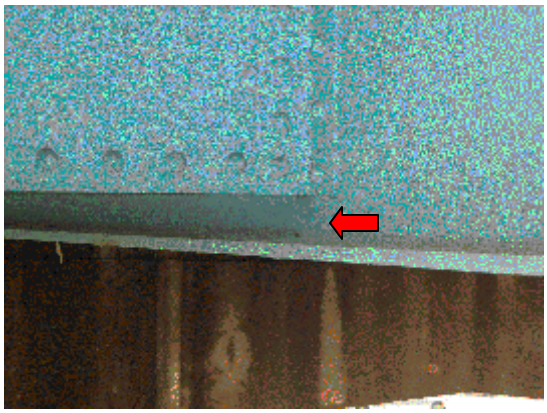


Typical Connection of Lateral Bracing to Bottom Flange of Centerline Floorbeam (Note Cracked Tack Weld) (13)

! **Small web gaps.**



Typical Web Gap in Multi-beam Approach Span (14)

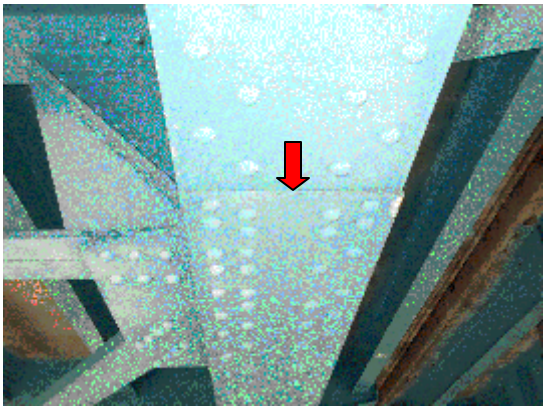


Typical Web Gap in Multi-beam Approach Span (15)

! **Girder webs and lateral bracing gusset plates at floorbeam connections.**

! **Ends of cover plates.** (Photo 16) The ends of the cover plates should be inspected for cracks, especially around the rivet or connector holes.

! **Floorbeam-to-girder connections.**



Typical End of Cover Plate (16)

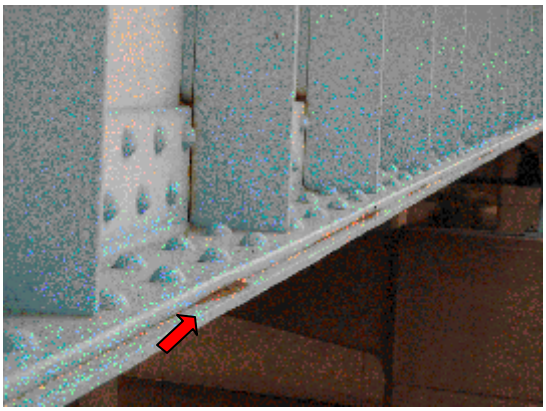
Other

! **Deck.** The cold joints in the deck above the floorbeams are susceptible to leaks, allowing corrosion to develop on the top flanges of the floorbeams.

! **Bearings.** The fixed and rocker bearings can become frozen due to buildups of pack rust between the curved surfaces.

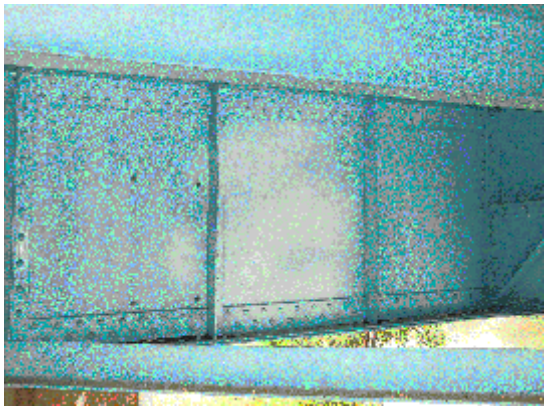
Rust Buildup at Rocker Bearing (17)

! **Bottom flanges of girders.** Development of pack rust can occur between the plates where sealant has not been applied.



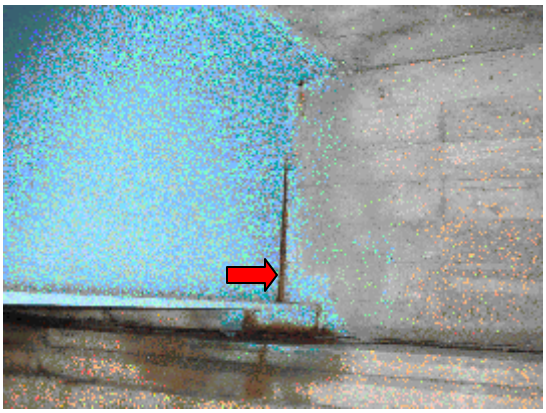
Pack Rust between Girder Flange Angle and Cover Plate (18)

! **Paint system.** The finish coat is susceptible to chalking.



Typical Paint Chalking at Girder Web (19)

! **Beam ends at abutments.** The ends of the beams are encased by the concrete backwall at the abutments. The steel is susceptible to development of corrosion at the concrete interface.



Typical Beam Bearing Encased in Abutment Backwall (20)

Maintenance Recommendations

Regularly Scheduled Maintenance Items

Recommendation	Schedule
Clean bridge drainage system components (deck drains and downspouts).	6 to 12 months
Flush bridge deck joints and check for leaks.	12 months
Powerwash bridge superstructure.	12 months
Powerwash bearings and pin and hanger assemblies.	12 months