



Latitude:35.39032, Longitude:-93.53016

Route:109 Section:03 Log:7.849

Arnold Road ID:42x109x3xA, Arnold Log mile:7.785

District 08, 83 - Logan County

Owner: 1 - State Highway Agency

Inspection Direction: 2 - S to N

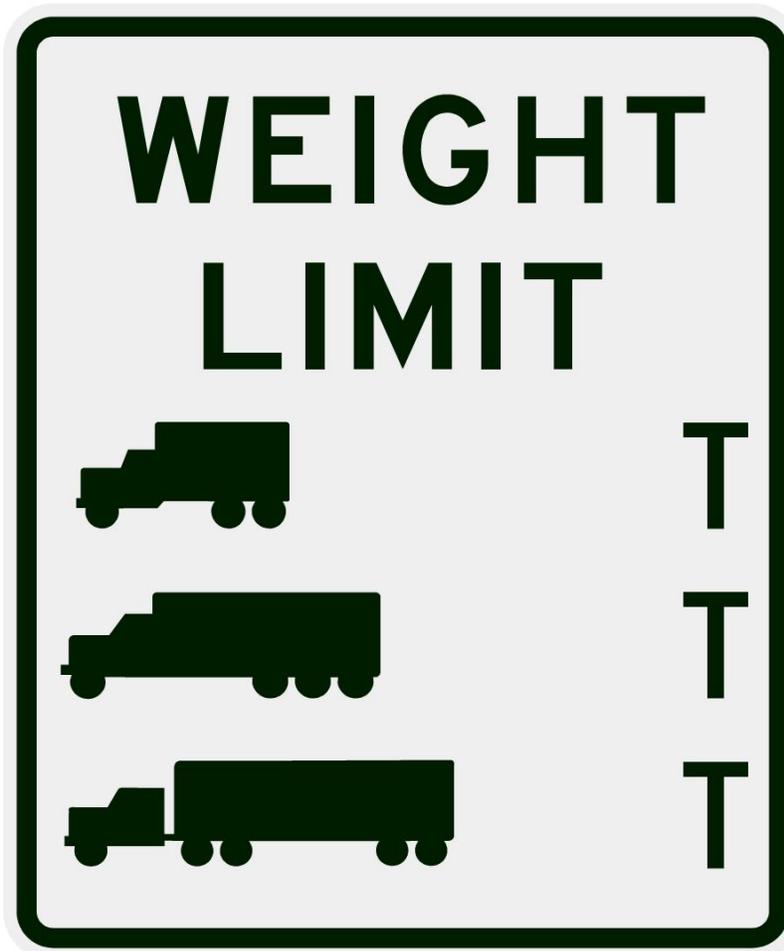
**Bridge Posting Information**

41 - Structure Open/Posted/Closed: A - Open, no restriction

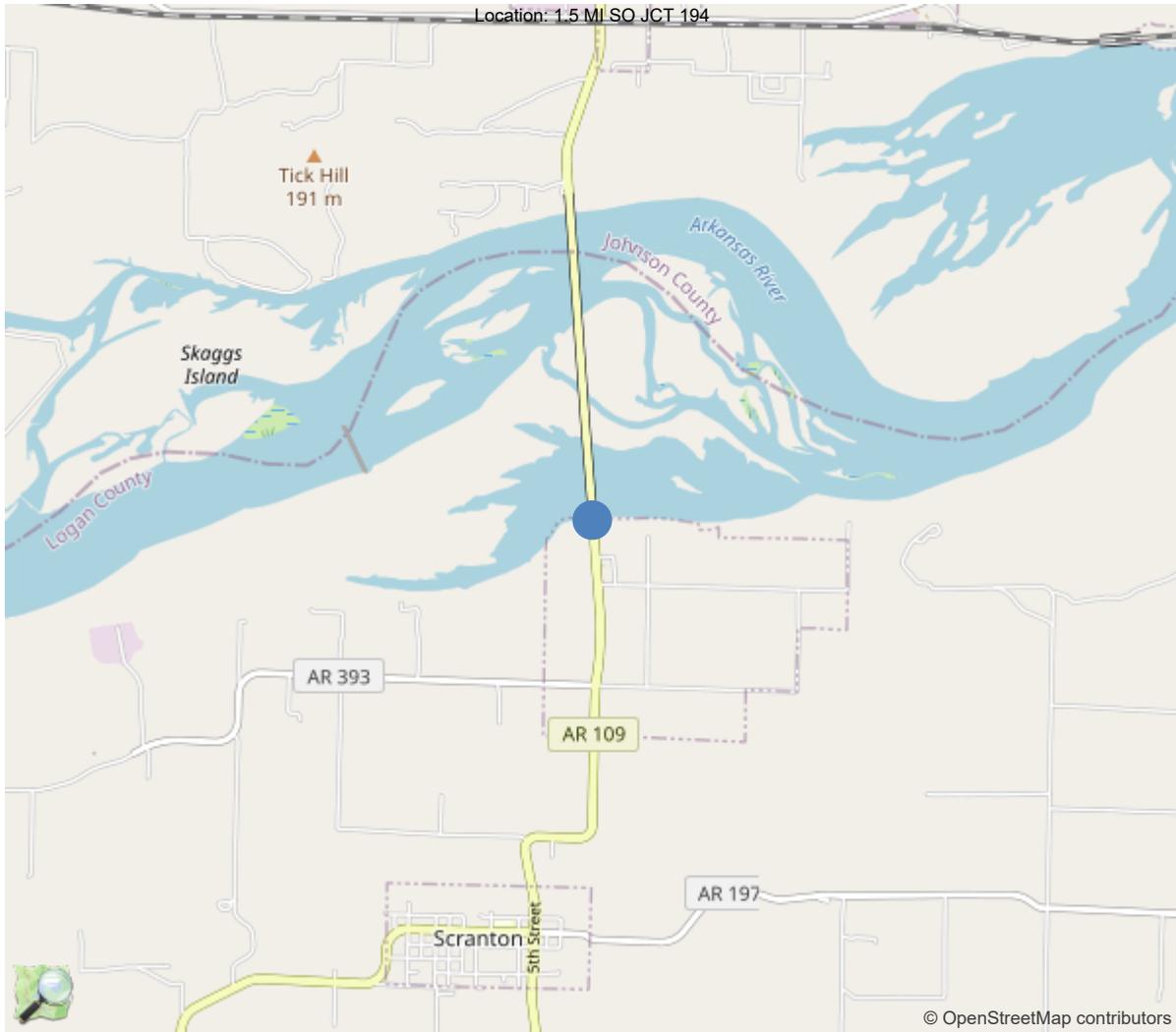
70 - Bridge Posting: 5 - Equal to or above legal loads

Legal Load	Calculated Capacity	Beginning of Bridge Sign Current Value	End of Bridge Sign Current Value
Code 4 (22 Tons)	40		
Code 9 (31 Tons)	50		
Code 5 (40 Tons)	60		

If calculated Capacity is less than the Legal Load Listed, the Bridge Legally Requires Posting Signs to be installed by the Bridge Owner



30"x36" AR



35.39032, -93.53016



**Asset #05600**(Routine, NSTM)  
**SH 109 over ARKANSAS RIVER**  
**Location: 1.5 MI SO JCT 194**

**Team Lead: Casey Pratt Inspection Date: 04/15/2024**

IDENTIFICATION	
(1) State Names	5 - Arkansas
(8) Structure Number	05600
(5) Inventory Route	1
(2) Highway Agency District	08 - District 08
(3) County Code	83 - Logan County
(4) Place Code	14140
(6) Features Intersected	ARKANSAS RIVER
(7) Facility Carried	SH 109
(9) Location	1.5 MI SO JCT 194
(11) Mile Point	7.849 mi
(12) Base Highway Network	No
(13) LRS Inventory Rte & Subrte	00000000
(16) Latitude	35.3903163023167
(17) Longitude	-93.5301648452301
(98) Border Bridge State Code	
(99) Border Bridge Structure No.	
STRUCTURE TYPE AND MATERIAL	
(43) Main Structure Type	43
Material	4 - Steel continuous
Type	3 - Girder and floorbeam system
(44) Approach Structure Type	42
Material	4 - Steel continuous
Type	2 - Stringer/Multi-beam or girder
(45) No. of Spans in Main Unit	3
(46) No. of Approach Spans	57
(107) Deck Structure Type	1 - Concrete Cast-in-Place
(108) Wearing Surface/Protective System	
Type of Wearing Surface	5 - Epoxy Overlay
Type of Membrane	0 - None
Type of Deck Protection	0 - None
AGE AND SERVICE	
(27) Year Built	1980
(106) Year Reconstructed	0
(42) Type of Service	15
On	1 - Highway
Under	5 - Waterway
(28) Lane	
On	2
Under	0
(29) Average Daily Traffic	3800
(30) Year of ADT	2018
(109) Truck ADT	17 %
(19) Bypass, Detour Length	40 mi
GEOMETRIC DATA	
(48) Length of Maximum Span	410 ft
(49) Structure Length	8537 ft
(50) Curb or Sidewalk Width	
Left	0 ft
Right	0 ft
(51) Bridge Roadway Width Curb to Curb	30 ft
(52) Deck Width Out to Out	32.7 ft
(32) Approach Roadway Width (W/Shoulders)	40 ft
(33) Bridge Median	0 - No median
(34) Skew	0 Deg
(35) Structure Flared	0 - No flare
(10) Inventory Route Min Vert Clear	99.99 ft
(47) Inventory Route Total Horiz Clear	31.5 ft
(53) Min Vert Clear Over Bridge Rdwy	99.99 ft
(54) Min Vert Underclear	0 ft
Ref:	
(55) Min Lat Underclear RT	0 ft
Ref:	
(56) Min Lat Underclear LT	0 ft
NAVIGATION DATA	
(38) Navigation Control	1 - Navigation control on water
(111) Pier Protection	5 - None present but re-evalua
(39) Navigation Vertical Clearance	51.8 ft
(116) Vert-Lift Bridge Nav Min Vert Clear	0 ft
(40) Navigation Horizontal Clearance	250 ft

CLASSIFICATION	
(112) NBIS Bridge Length	Y
(104) Highway System	0
(26) Functional Class	6 - Rural Minor Arterial
(100) Defense Highway	0 - The inventory route is not
(101) Parallel Structure	N - No parallel structure exis
(102) Direction of Traffic	2 - way traffic
(103) Temporary Structure	
(105) Federal Lands Highways	0 - N/A
(110) Designated National Network	0 - The inventory route is not
(20) Toll	3 - On free road. The structu
(21) Maintain	1 - State Highway Agency
(22) Owner	1 - State Highway Agency
(37) Historical Significance	5 - Bridge is not eligible for
CONDITION	
(58) Deck	7
(59) Superstructure	6
(60) Substructure	7
(61) Channel & Channel Protection	7
(62) Culverts	N
LOAD RATING AND POSTING	
(31) Design Load	5 - MS 18 / HS 20
(63) Operating Rating Method	1
(64) Operating Rating	
Type	1 - Load Factor(LF)
Rating	60
(65) Inventory Rating Method	1 - Load Factor(LF)
(66) Inventory Rating	
Type	
Rating	36
(70) Bridge Posting	5 - Equal to or above legal loads
(41) Structure Open/Posted/Closed	A - Open, no restriction
APPRAISAL	
(67) Structural Evaluation	
(68) Deck Geometry	4
(69) Clearances, Vertical/Horizontal	N
(71) Waterway Adequacy	8
(72) Approach Roadway Alignment	8
(36A) Bridge Railings	1 - Inspected feature meets current
(36B) Transitions	1 - Inspected feature meets current
(36C) Approach Guardrail	1 - Inspected feature meets current
(36D) Approach Guardrail Ends	1 - Inspected feature meets current
(113) Scour Critical Bridges	5 - Bridge foundations determined t
PROPOSED IMPROVEMENTS	
(75) Type of Work	
(76) Length of Structure Improvement	0 ft
(94) Bridge Improvement Cost	\$ 0
(95) Roadway Improvement Cost	\$ 0
(96) Total Project Cost	\$ 0
(97) Year of Improvement Cost Estimate	
(114) Future ADT	5101
(115) Year of Future ADT	2028

INSPECTIONS *			
(90) Inspection Date			04/15/2024
(91) Frequency			24
(92) Critical Feature Inspection	Done	Freq. (Mon)	Date
A: Fracture Critical Detail	Yes	12	04/15/2024
B: Underwater Inspection	Yes	60	11/17/2023
C: Other Special Inspection	No		
* The inspection date and frequency information in this box contains the current NBI date and frequency information. Please refer to the report header for the date this inspection was conducted.			

### General Observation

4/15-17/2024 - CCP and ZBA

Routine and NSTM inspections of 05600 were conducted on these dates from South to North utilizing the Aspen A 62-t under bridge inspection unit. All spans were inspected using the UBI unit except for 29-40. Due to the bridge's low clearance and heavy vegetation in these spans, the snooper's access was limited, and the inspection was conducted on foot from the ground. All defects were noted and quantified in the "elements" section of the report, and all components were rated according to their condition at the time of this inspection.

Walked to inspect spans 29 - 40 due to vegetation growth restricting access to the Aspen 75.

Traffic control is handled by signs and cones, a flagger on both ends of the bridge, and a pilot truck. The radio signal does not reach from flagger to flagger so a pilot truck is required for communication between flaggers. The lane closure method used for this inspection is attached to the asset.

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### 58 - Deck (7 - GOOD CONDITION - some minor problems.)

Overall, the deck was found to be in good condition. Driving surface defects are virtually absent due to the polymer overlay. The undersurface has transverse cracking throughout with CS2 efflorescence, but no structural defects were uncovered. As a result, the deck was rated a 7.

Undersurface:

Span 56, left, Overhang: has cracking at 3' spacing with heavy spalls. 2 SF CS3

Approach spans: have an average of 7' spacing for efflorescence. 17226 SF CS2

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### 59 - Superstructure (6 - SATISFACTORY CONDITION - structural elements show some minor deterioration.)

Overall, the superstructure was found to be in satisfactory condition. Minor surface corrosion is common throughout, and isolated instances of section loss up to 1/4" are present. Out-of-plane bending is also present in girders 1 and 2 in span 56. Due to these findings, the superstructure was rated 6.

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### 60 - Substructure (7 - GOOD CONDITION - some minor problems.)

Overall, the substructure was found to be in good condition. Minor spalls are present in isolated locations and hairline cracks are common, but no structural defects were identified. The substructure was rated a 7 as a result.

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### 61 - Channel/Channel Protection (7 - Bank protection is in need of minor repairs. River control devices and embankment protection have a little minor damage. Banks and/or channel have minor amounts of drift.)

Overall, the channel was found to be in good condition. The channel is well aligned and vegetated, with a few scour holes on the islands in the approach spans, and some minor scour at the abutments.

Span 20: Has a large scour hole.

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### A-55 - Deck Washing Needed (Y)

Bridge Rail Drains: The drains have debris in them, allowing for water to pond in the gutters

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### A-60 - Full Girder Painting Needed (Y)

Surface rust on the webs and bottom flanges of the exterior girders. Pack rust has formed at the field splices. The paint system is failing. Primer coat and bare metal are exposed in many areas. The paint has failed at the expansion joints.

Debris and pigeon dung on bottom flanges. This condition is typical in the approach spans.

Span 24, 25: Girders have smoke stains.

Span 32, Girder 2, 1st Field splice: The bottom flange of the girder is bent. (Minor)

Span 44, Girder 1: The bottom flange of the girder is bent. (Minor)

Span 52, Girder 4: The bottom flange of the girder is bent.

Bent 61: (North Abutment) Girders have graffiti.

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**A-64 - Vegetation Removal Requested (Y)**

Spans 29 - 40: Have overgrowth, limiting the access of the snooper.  
Span 41: Has debris and cutting of the channel bank.

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**A-114 - Underwater Inspection General Observation**

Engineer of Record: Samuel Williams, PE  
Team Leader: Samuel Williams, PE  
Team Members: KD, CD, AC  
Total Substructure Units: 61  
Substructure Units in Water: Bents 25-28, 42-58  
Inventory Direction: S to N  
Direction of Flow: W to E  
Deepest Water Depth: 35.5 ft  
Water Velocity: 0.0 FPS  
Attachments: Channel Profile/Contour Map, Soundings Table, Inspection Procedures, Stamped Final Report.

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**A-115 - Underwater Inspection Channel/Channel Protection (7 - Bank protection is in need of minor repairs. River control devices and embankment protection have a little minor damage. Banks and/or channel have minor amounts of drift.)**

Overall, the channel is in good condition. The main channel is on the north end of the bridge and is well aligned with the substructure units. There is timber debris scattered throughout the waterway that does not significantly affect flow through the channel. The banks are stable and well vegetated.

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**A-116 - Underwater Inspection Substructure Condition (B.C.15) (6 - SATISFACTORY CONDITION - structural elements show some minor deterioration.)**

Overall, the substructure units are in satisfactory condition. There are minor to moderate spalls on many of the columns and there is significant scour at Bents 25 through 28. These defects are quantified in the element level portion of this report.

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**A-117 - Underwater Scour Condition (5 - Bridge foundations determined to be stable for assessed or calculated scour condition. Scour is determined to be within the limits of footing or piles (Example B) by assessment (i.e., bridge foundations are on rock formations that have been determined to resist scour within the service life of the bridge), by calculations or by installation of properly designed countermeasures (see HEC 23).)**

According to the available drawings (Drawing No. 18941-18947 and 18954-18956) dated 1974, Bents 25 through 28 and Bent 42 are supported by steel H-piles, and Bents 43 through 58 are supported by spread footings. Based on a comparison to the drawings to the inspection findings, up to 22 ft of scour has occurred at Bents 26 and 28 that has undermined the seals and exposed the steel piles up to 9 ft high. At Bents 25, 27, and 42, there has been up to 13 ft of scour that has exposed the pile caps and seals, with no undermining of the seals. It is recommended to install engineered scour countermeasures at Bents 25 through 28 to mitigate additional scour and to monitor these locations after high flow events until the countermeasures are in place. It is also recommended to perform a structural analysis to determine if the scour has affected the overall load bearing capacity of the structure.

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**B.ID.02 Bridge Name (MILLS - AHNE Bridge)**

Bridge name is, Mills - AHNE Bridge.

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**B.IR.02 - Fatigue Prone Details (Y)**

E details were identified at the welded lateral brace to girder connections and at the termination of all longitudinal stiffeners. Longitudinal stiffener terminations near vertical stiffeners were checked to ensure adequate distance between the welds was maintained during construction to eliminate these details as CIF susceptible. No CIF-susceptible details were identified at this inspection.

E details main span. Lateral brace to girder welds. Main spans. These details were checked for CIF susceptibility. They are fully welded all the way around, eliminating the crack-like detail that would put them in a CIF category.

E details on the Main span.

E details. Longitudinal stiffener terminations. Sufficient gap between the longitudinal and vertical stiffeners.

E details: lateral bracing to girder web welds approach spans.

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**B.C.05 Bridge Railing Condition Rating (6 - SATISFACTORY - Widespread minor or isolated moderate defects.)**

Vertical cracks throughout with exposed rebar are typical.

Span 48, left side: large spall. CS3

Span 53, right side: large spall. CS3

Span 57, left side: large spall. CS3

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**B.C.06 Bridge Railing Transitions Condition Rating (4 - POOR - Widespread moderate or isolated major defects; strength and/or performance of the component is affected. )**

Approach Railing, right side, beginning of structure: has minor collision damage. CS2

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**B.C.07 Bridge Bearings Condition Rating (7 - GOOD - Some minor defects.)**

Abutments: Have corrosion in bearings. CS3

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**B.C.08 Bridge Joints Condition Rating (4 - POOR - Widespread moderate or isolated major defects. )**

Joints have debris build up and impaction.

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**B.C.14 - NSTM Inspection Condition (6 - SATISFACTORY - Widespread minor or isolated moderate defects.)**

Overall, the NSTM members were found to be in satisfactory to good condition. The steel girders have minor surface corrosion and diminishingly effective paint throughout. The main factor determining the rating of these members is out-of-plane bending in span 56. The girders were rated a 6 as a result. The floor beams have similar corrosion and paint as the girders and were rated a 7

Steel girders - 6

Steel floor beams - 7

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**B.C.15 Underwater Inspection Condition (6 - SATISFACTORY - Widespread minor or isolated moderate defects.)**

Underwater bridge inspection report dated 10/4/2018.

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**A-B.C.11 - B.C.11 Scour Condition Rating (New NBIS) (6 - Widespread minor or isolated moderate scour.)**

Abutment 1, left: Scour exposing 3' of the cap face vertically. Scour begins at the left edge and travels toward the center for 8'.

Abutment 1: has a scour hole on the right side that exposes the entire abutment face for 10', beginning at the right edge and traveling toward the center.

Abutment 2: has minor erosion. No exposure of the face.

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ELEMENTS	DESCRIPTION	UNITS	TOTAL	CS1	CS2	CS3	CS4
12	Reinforced Concrete Deck	SF	278803	260495	18305	3	0
1080	Delamination/Spall/Patched Area	SF	329	0	329	0	0
1090	Exposed Rebar	SF	3	0	0	3	0
1120	Efflorescence/Rust Staining	SF	17976	0	17976	0	0
1130	Cracking (RC and Other)	SF	9757	9757	0	0	0
<p>(12) A polymer overlay has been completed, and all driving surface cracks and spalls have been repaired/sealed. Cracks with efflorescence are present in the undersurface overhangs, spaced 5 feet apart, for a total of 750SF CS2. A polymer overlay has been applied since the last inspection. All driving surface cracks and spalls have been repaired and sealed. Cracks with efflorescence are present throughout the undersurface overhangs at a spacing of 2' apart. A total of 17226SF CS2 is present.</p> <p>Span 33, bay 1, Diaphragm 4: There is a spall to the undersurface with exposed rebar. 1LF CS3</p> <p>Span 39, bay 1, 1st splice: Has spalls with exposed rebar. 2SF CS3 There are delaminations adjacent to it. 2SF CS2</p>							
107	Steel Open Girder/Beam	LF	32279	13317	18919	43	0
1000	Corrosion	LF	18943	0	18902	41	0
1020	Connection	LF	2	0	0	2	0
1900	Distortion	LF	16	0	16	0	0
7000	Damage	LF	1	0	1	0	0
515	Steel Protective Coating	SF	496360	72941	275669	145101	2649
3410	Chalking (Steel Protective Coatings)	LF	83536	0	49158	34378	0
3440	Effectiveness (Steel Protective Coatings)	LF	339883	0	226511	110723	2649
<p>(107) Minor surface corrosion throughout due to failing paint. 651LF CS2.</p> <p>Span 56, girder 1, right, 3rd splice: Has minor section loss at splice connection up to 1/8". 2LF CS3</p> <p>Span 56, girder 1, right, splice 1: Has active corrosion with up to 1/8th of section loss for the length of the splice. 6LF CS3</p> <p>Span 56, girder 1, back of 1st splice: Out of plane bending of web. The middle section of the web measures 3/4" out and increases to 1" at the bottom. 6LF CS2</p> <p>Span 56, girder 1, left, between stiffeners 6 and 7: Laminating rust to top flange, approximately 1/16" section loss. 6LF CS3.</p> <p>Span 56, girder 1, right side, 3rd splice: Has old section loss up to 1/4" in the bottom of the web below the splice plate. 3LF CS3.</p> <p>Span 56, Bent 56, girder 2, left: The bearing connections have section loss around the anchor bolt hole. 1/8" typical. Girder 1 at this bent is similarly deteriorated. 2LF CS3</p> <p>Span 56, girder 2, left, splice 1: Has up to 1.5" of out-of-plane bending to web. 5LF CS2</p> <p>Span 56, girder 2, splice 2: Has up to 1/2" out-of-plane bending at the top of the web. 2LF CS2</p> <p>Span 57, girder 2 left, 3rd splice: Has a bulge at the bottom of web splice plate. 1LF CS3</p> <p>Span 58, girder 1, right, splice 1: Has 1/16" x 28" section loss to the lower web between the web and bottom flange splice plate. 3LF CS3</p> <p>Girders have minor corrosion throughout.</p> <p>Minor pack rust is present at isolated splice connections. 17LF CS3</p> <p>Abutment 1, girder 2, right: Has section loss over the bearing at the diaphragm connection, up to 1/16". Girder 3: Has a similar defect. 2LF CS3.</p> <p>Span 21, girder 2, right, first connection back of bent 22: The weld to the lateral bracing is cracked.</p> <p>Span 25, girder 3, ahead of diaphragm 4: out of plane bending up to 3/4". 2LF CS2</p> <p>Span 46, girder 4, splice 1: Has distortion and pack rust between the splice plates. 1LF CS3</p> <p>Span 60, bay 2, diaphragm 5, back, right: has distortion. 1LF CS2</p> <p>(515-107) The paint system is losing effectiveness, causing surface corrosion and minor section loss throughout the girders, CS 2-CS</p>							



ELEMENTS	DESCRIPTION	UNITS	TOTAL	CS1	CS2	CS3	CS4
<p>4 (paint condition state).            Span 57, pier 58, girder 1, right: paint system failure and surface corrosion. CS3 typical condition throughout.            The paint system is failing.            Spans 23-26 have what appears to be black mold (previously noted as smoke damage) on the girders.</p>							
113	Steel Stringer	LF	1860	839	1021	0	0
1000	Corrosion	LF	1021	0	1021	0	0
515	Steel Protective Coating	SF	11271	0	8453	2315	503
3440	Effectiveness (Steel Protective Coatings)	LF	11271	0	8453	2315	503
<p>(113) Stringers have active corrosion along top flanges and surface corrosion throughout.            (515-113) The paint system on the stringers is losing effectiveness and is failing in many areas.</p>							
152	Steel Floor Beam	LF	990	738	252	0	0
1000	Corrosion	LF	248	0	248	0	0
1010	Cracking	LF	4	0	4	0	0
515	Steel Protective Coating	SF	5485	0	5237	0	248
3410	Chalking (Steel Protective Coatings)	LF	4415	0	4415	0	0
3440	Effectiveness (Steel Protective Coatings)	LF	1070	0	822	0	248
<p>(152) The floor beams have active corrosion, with minor pitting scattered throughout the structure along the web, top flange, and bottom flange. CS2            Previously reported cracks in the lateral bracing have been repaired. CS2            Span 56, girder 1, floor beam 1: 1" crack in base plate at lateral brace connection has been arrested. 1LF CS2            Span 56, floor beam 2: typical surface corrosion to floor beams. CS2            (515-152) The paint system is losing its effectiveness. The surface of the floor beams is chalking, and surface corrosion is forming on all elements, CS2 and CS3.</p>							
205	Reinforced Concrete Column	EA	53	37	7	9	0
1080	Delamination/Spall/Patched Area	EA	15	0	7	8	0
1090	Exposed Rebar	EA	1	0	0	1	0
<p>(205) Spalls in the columns at the following locations:            Bent 11: has a small spall.            Bent 19: has a small spall.            Bents 43-47: each has a spall.            Bent 49: has a small spall.            Bent 50: has a spall.</p>							
210	Reinforced Concrete Pier Wall	LF	67	66	0	1	0
1080	Delamination/Spall/Patched Area	LF	1	0	0	1	0
<p>(210) Bents 56 through 59 are pier walls. Minor cracking and isolated minor spalls are present.            Bent 56, column 2: Spall with exposed rebar on the northeast corner, 25% section loss to the reinforcing steel. 2SF CS3            Bent 56, column 2: Spall on the southeast corner 2SF CS3            Bents 55 and 60 are pier walls. Minor cracking and isolated minor spalls are present.</p>							
215	Reinforced Concrete Abutment	LF	104	79	6	19	0
1130	Cracking (RC and Other)	LF	7	0	6	1	0



ELEMENTS	DESCRIPTION	UNITS	TOTAL	CS1	CS2	CS3	CS4
6000	Scour	LF	18	0	0	18	0
<p>(215) Abutment 1, left: Scour exposing 3' of the cap face vertically. Scour begins at the left edge and travels toward the center for 8'.</p> <p>Abutment 1, Right: has a scour hole that exposes the entire abutment face for 10', beginning at the right edge and traveling toward the center.</p> <p>No undermining was identified at either abutment at this time.</p> <p>Abutment 2: has minor erosion. No exposure of the face.</p> <p>Hairline cracks are found in isolated locations in both abutments.</p>							
220	Reinforced Concrete Pile Cap/Footing	LF	68	6	41	21	0
1080	Delamination/Spall/Patched Area	LF	2	0	0	2	0
6000	Scour	LF	60	0	41	19	0
<p>(220) 2023 Underwater: (1080) -Bent 42: Spall, 5"H x 10"W x 1"D, on the northeast corner at the top of the footing. (1LF, CS3) -Bent 42: Spall, 4"H x 12"W x 2"D, on the northwest corner at the top of the footing. (1LF, CS3)</p> <p>(6000) -Bent 25: Since construction, up to 13' of scour has occurred that has exposed the southeast corner of the pile cap and seal. The seal is exposed up to 2'H, with no undermining. (4LF, CS2) -Bent 26: Since construction, up to 20' of scour has occurred that has undermined 100% of the seal up to 9'H and exposed 8 steel piles. (10LF, CS3) -Bent 27: Since construction, up to 11' of scour has occurred that has fully exposed the pile cap and exposed the seal up to 3'H on the west, south and east faces. (15LF, CS2) -Bent 28: Since construction, up to 22' of scour has occurred that has undermined east/downstream half of the seal up to 7'H and exposed 6 steel piles. (9LF, CS3; 9LF, CS2) -Bent 42: Since construction, up to 8' of scour has occurred that has exposed the pile cap up to 3'H around the full perimeter. (13LF, CS2)</p> <p>(INCIDENTAL) -Bent 26: Spalls, up to 3'Dia x 1.5'D, at all four corners on the bottom of the seal.</p>							
225	Steel Pile	EA	14	0	0	14	0
1000	Corrosion	EA	14	0	0	14	0
<p>(225) 2023 Underwater: (1000) -Bent 26: Corrosion with pitting up to 1/8"D. (8EA, CS3) -Bent 28: Corrosion with pitting up to 1/8"D. (6EA, CS3)</p>							
234	Reinforced Concrete Pier Cap	LF	1654	1378	272	4	0
1080	Delamination/Spall/Patched Area	LF	10	0	8	2	0
1120	Efflorescence/Rust Staining	LF	2	0	0	2	0
1130	Cracking (RC and Other)	LF	264	0	264	0	0
<p>(234) Cracks with efflorescence in bents 57. Cracks in all caps. Bent 59: Has a small spall. Cracks common in all caps. Spalls, delamination and patches at various locations.</p>							
301	Pourable Joint Seal	LF	64	29	17	12	6



Asset #05600(Routine, NSTM)

SH 109 over ARKANSAS RIVER

Location: 1.5 MI SO JCT 194

Team Lead: Casey Pratt Inspection Date: 04/15/2024

ELEMENTS	DESCRIPTION	UNITS	TOTAL	CS1	CS2	CS3	CS4
2310	Leakage	LF	9	0	0	3	6
2320	Seal Adhesion	LF	18	0	9	9	0
2350	Debris Impaction	LF	8	0	8	0	0
(301) 04/18/2022 - RLS & ADC The joints at both abutments have holes, debris impaction and loss of adhesion.							
303	Assembly Joint with Seal	LF	300	125	175	0	0
2350	Debris Impaction	LF	175	0	175	0	0
(303) Joints have debris impaction, and most are filled with dirt and debris.							
305	Assembly Joint without Seal	LF	60	15	45	0	0
2350	Debris Impaction	LF	45	0	45	0	0
(305) Joints have debris impaction.							
311	Movable Bearing	EA	188	147	34	7	0
1000	Corrosion	EA	35	0	34	1	0
1020	Connection	EA	2	0	0	2	0
2220	Alignment	EA	4	0	0	4	0
(311) Bearings: have minor corrosion. Bent 52, girder 3, bearing 3, right: The east anchor nut is missing. 1EA CS3 Bent 50, bearing 1: Is near full rotation at 69 degrees. 1EA CS3 Bent 1, bearing 1: has severe corrosion; otherwise, minor corrosion at the expansion joints. Bent 12, bearings 1 and 2: are leaning in the opposite direction. Bent 52, girder 3: has a missing nut. Bent 46 bearing 1 on the ahead side has a sheared anchor bolt. Bent 61: all bearings are at full expansion. Abutment 1, bearings: Corrosion is present at the sole plate and in the rocker area at all bearings at this abutment. 4EA CS3 Abutment 2: All bearings fully extended to the north. 4EA CS3							
313	Fixed Bearing	EA	96	92	4	0	0
1000	Corrosion	EA	4	0	4	0	0
(313) Bearings have minor corrosion. Span 28, bent 29, back: Bearing 2 has its right nut missing. 1EA CS3							
331	Reinforced Concrete Bridge Railing	LF	17074	12609	4461	4	0
1080	Delamination/Spall/Patched Area	LF	3	0	0	3	0
1090	Exposed Rebar	LF	3330	0	3330	0	0
1130	Cracking (RC and Other)	LF	1131	0	1131	0	0
7000	Damage	LF	1	0	0	1	0
(331) Vertical cracks and exposed rebar are typical throughout. Span 57, left rail, outside by green navigation light: has a large spall. Vertical cracks throughout with exposed rebar are typical. Spans 48, Left, and Span 53, Right, Have large spalls. Bent 61: Has collision damage on the left side where the approach guardrail attaches to the bridge.							



Elevation view.



Overall view.



Walked to inspect spans 29 - 40 due to vegetation growth restricting access to the Aspen 75.



Typical under-surface main spans.



Typical undersurface main spans.



Span 56, left, Overhang: has cracking at 3' spacing with heavy spalls. 2SF CS3



Typical deck.



Approach spans: have an average of 7' spacing for efflorescence. 17226SF CS2



Typical undersurface approach spans.



Typical pier.



North channel bank view.



Upstream channel view.



Downstream channel view.



Span 20: Has a large scour hole.



Span 41: Has debris and cutting of the channel bank.



Typical under-surface main spans.



NSTM Typical 2-girder.



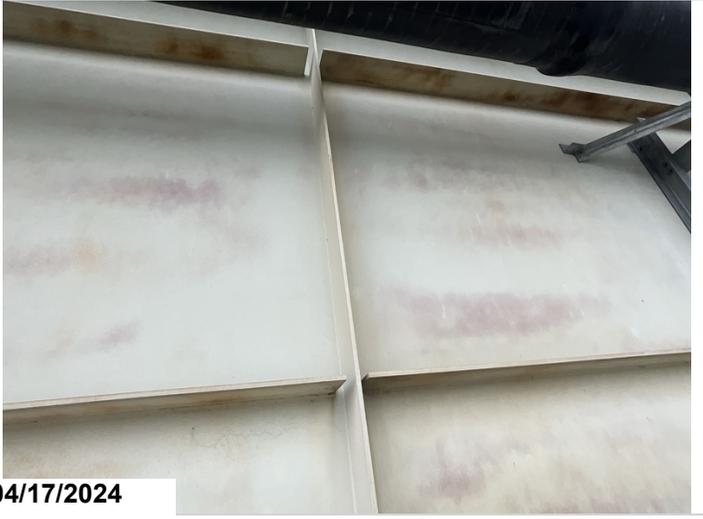
Bridge name is, Mills - AHNE Bridge.



E details main span. Lateral brace to girder welds. Main spans. These details were checked for CIF susceptibility. They are fully welded all the way around, eliminating the crack-like detail that would put them in a CIF category.



E details on the Main span.



E details. Longitudinal stiffener terminations. Sufficient gap between the longitudinal and vertical stiffeners.



E details: lateral bracing to girder web welds approach spans.



Typical bridge railing.



Approach Railing, right side, beginning of structure: has minor collision damage. CS2



Typical corrosion in bearings at the abutments. CS3



Typical joint condition over abutments.



Abutment 1: has a scour hole on the right side that exposes the entire abutment face for 10', beginning at the right edge and traveling toward the center.



Abutment 1, left: Scour exposing 3' of the cap face vertically. Scour begins at the left edge and travels toward the center for 8'.



Abutment 2: has minor erosion. No exposure of the face.



Abutment 2.



Span 39, bay 1, 1st splice: Has spalls with exposed rebar. 2SF CS3 There are delaminations adjacent to this area. 2SF CS2



Span 33, bay 1, Diaphragm 4: There is a spall to the undersurface with exposed rebar. 1LF CS3



Abutment 1, girder 2, right: Has section loss over the bearing at the diaphragm connection, up to 1/16". Girder 3: Has a similar defect. 2LF CS3



Span 60, bay 2, diaphragm 5, back, right: has distortion.



Span 46, girder 4, splice 1: Has distortion and pack rust between the splice plates. 1LF CS3



Span 21, girder 2, right, first connection back of bent 22: The weld to the lateral bracing is cracked.



Minor pack rust at several splice locations.



Typical paint condition approach span girders.



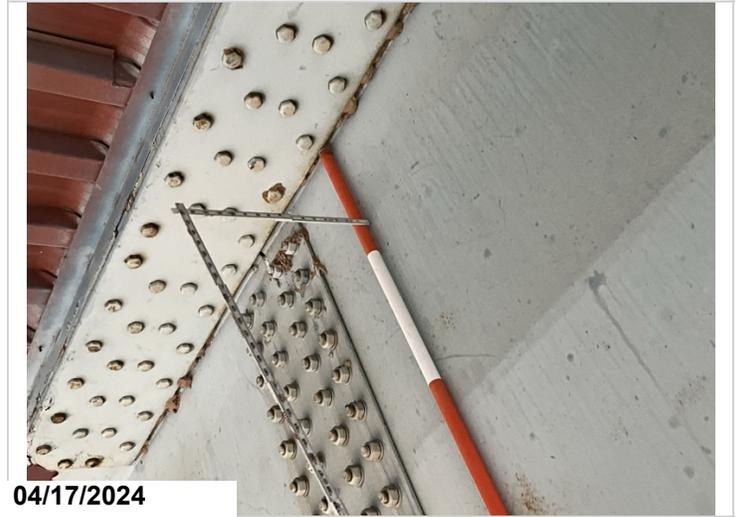
Span 57, girder 2 left, 3rd splice: Has a bulge at the bottom of web splice plate. 1LF CS2



Span 58, girder 1, right, splice 1: Has 1/16" x 28" section loss to the lower web between the web and bottom flange splice plate. 3LF CS3



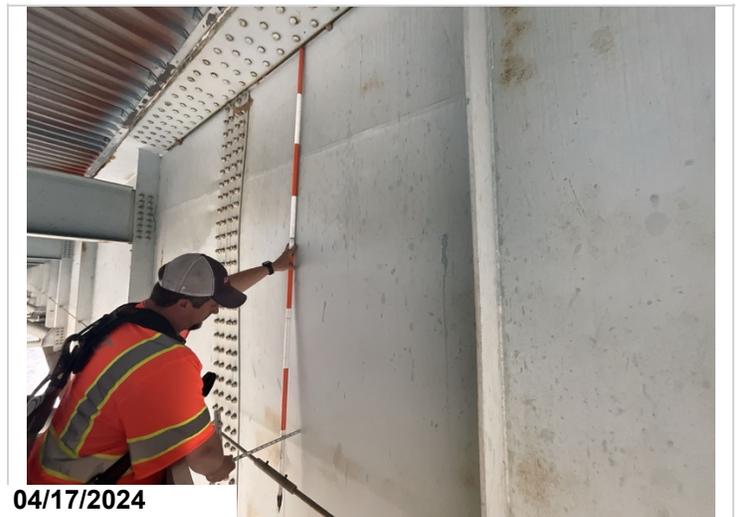
Span 56, girder 1, right, 3rd splice: Has minor section loss at splice connection up to 1/8". 1LF CS3



Span 56, girder 3, splice 2: Has up to 1/2" out-of-plane bending at the top of the web. CS2



Typical corrosion along the top flange of girders. CS3



Span 56, girder 2, left, splice 1: Has up to 1.5" of out-of-plane bending to web. 5LF CS2



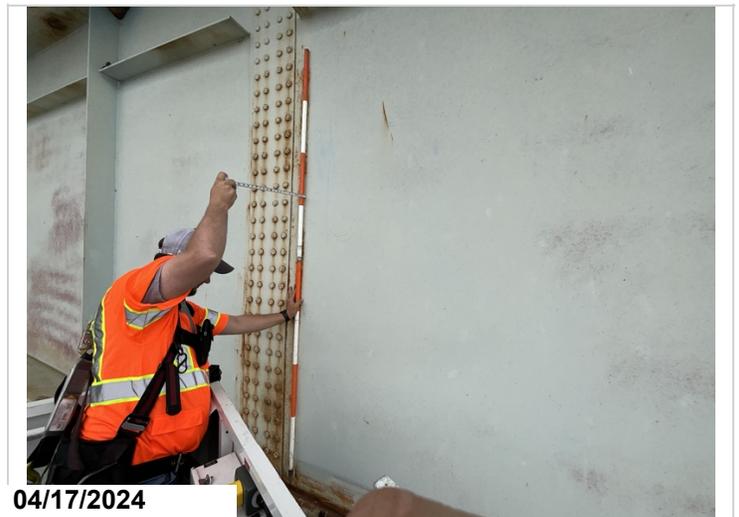
Span 56, girder 2, left, 1st splice: 1.5" out of plane bending to girder web. 5 LFCS2



Span 56, girder 1, 1st splice: Out of plane bending of web. The middle section of the web measures 3/4" out and increases to 1" at the bottom. 6LF CS2



Span 56, girder 1, 1st splice: Out of plane bending of web. The middle section of the web measures 3/4" out and increases to 1" at the bottom. 6LF CS2



Span 56, girder 1, 1st splice: Out of plane bending of web. The middle section of the web measures 3/4" out and increases to 1" at the bottom. 6LF CS2



04/17/2024

Span 56, girder 1, right, splice 1: Has active corrosion with up to 1/8th of section loss for the length of the splice. 6LF CS3



04/17/2024

Span 56, Bent 56, girder 2, left: The bearing connections have section loss around the bolt hole. 1/8" typical. Girder 1 at this bent is similarly deteriorated. 2LF CS3



04/17/2024

Span 56, Bent 56, girder 2, left: The bearing connections have section loss around the bolt hole. 1/8" typical. Girder 1 at this bent is similarly deteriorated. 2LF CS3



04/17/2024

Span 57, pier 58, girder 1, right: Typical paint system failure and surface corrosion. CS3



Typical stringers



Span 56, floor beam 2: typical surface corrosion to floor beams. CS2



Span 56, girder 1, floor beam 1: 1" crack in base plate at lateral brace connection has been arrested. 1LF CS2



Span 57, lower chord of floor beam 8: typical failing paint and corrosion. CS2



12/05/2023

Bent 56, column 2: Spall with exposed rebar on the northeast corner, 25% section loss to the reinforcing steel. 2SF CS3



12/05/2023

Bent 56, column 2: Spall on the southeast corner. 2SF CS3



04/17/2024

Abutment 1, left: Scour exposing 3' of the cap face vertically. Scour begins at the left edge and travels toward the center for 8'.



04/17/2024

Abutment 1: has a scour hole on the right side that exposes the entire abutment face for 10', beginning at the right edge and traveling toward the center.



Abutment 2 view.



Abutment 1 view.



Typical bents on approach spans.



Typical joints are full of dirt and debris throughout.



Abutment 1, bearings: Corrosion is present at the sole plate and in the rocker area at all bearings at this abutment. 4EA CS3



Abutment 2: All bearings fully extended to the north. 4EA CS3



Typical bearings approach spans.



Bent 52, girder 3, bearing 3, right: The east anchor nut is missing. 1EA CS3



04/17/2024

Bent 50, bearing 1: Is near full rotation at 69 degrees. 1EA CS3



04/17/2024

Span 28, bent 29, back: Bearing 2 has its right nut missing. 1EA CS3



04/17/2024

Right rail.



**Asset #05600**(Routine, NSTM)

**SH 109 over ARKANSAS RIVER**

**Location: 1.5 MI SO JCT 194**

**Team Lead: Casey Pratt Inspection Date: 04/15/2024**

### Maintenance Needs

**Date Reported:** 11/17/2023

**Priority:** B - Pressing

**Type of Work:** Channel Work/Drift Removal

**Status:** Assigned

**Component:** Substructure

---

### Deficiency Description

It is recommended to install engineered scour countermeasures at Bents 25 through 28 to mitigate additional scour and to monitor these locations after high flow events until the countermeasures are in place. It is also recommended to perform a structural analysis to determine if the scour has affected the overall load bearing capacity of the structure.

### Remarks

Working on getting this incorporated into Scour Repair Project 2024. KAW 12/19/2023

Garver has been assigned to repair scour issue January 2024. Will be included in scour repair job to let in 2024.

---

**Maintenance Needs**

**Date Reported:** 05/10/2023

**Priority:** C - Important

**Type of Work:** Approach Leveling/Maintenance

**Status:** Open

**Component:** Approach

---

**Deficiency Description**

Approach Railing left side beginning of structure has collision damage first 25'. Railing is torn apart and detached in this area with missing, and bent post.

**Remarks**

null

Approach Railing left side beginning of structure has collision damage first 25'. Railing is torn apart and detached in this area with missing, and bent post.

---



05/10/2023

Approach Railing left side beginning of structure has collision damage first 25'. Railing is torn apart and detached in this area with missing, and bent post.

**Maintenance Needs**

**Date Reported:** 04/19/2012

**Priority:** D- Routine

**Type of Work:** Repair (General)

**Status:** Open

**Component:** Miscellaneous

---

**Deficiency Description**

Catwalk

Span 52, Girder 4: Two Inspection handrail brackets are loose. The bolts are missing.

**Remarks**

Span 51 girder 4.





## Routine Maintenance

### Check Box Maintenance Items

Type of Maintenance	Is recommended?
A-54 - Sealable Deck Cracks	No
A-55 - Deck Washing Needed	Yes
A-56 - Joint Cleaning/Flushing Needed	Yes
A-57 - Beam End and Bearing Paint Needed	Yes
A-58 - Cap Cleaning/Flushing Needed	No
A-59 - Joint Repair Needed	Yes
A-60 - Full Beam Painting Needed	Yes
A-61 - Polymer Overlay Advised	No
A-62 - Hydro and LMC Advised	No
A-63 - Missing/Incorrect Log Mile Signage	No
A-64 - Vegetation Removal Requested	Yes

**A-54 - Sealable Deck Cracks (No)**

**A-55 - Deck Washing Needed (Yes)**

Bridge Rail Drains: The drains have debris in them, allowing for water to pond in the gutters

**A-56 - Joint Cleaning/Flushing Needed (Yes)**



Asset #05600(Routine, NSTM)

SH 109 over ARKANSAS RIVER

Location: 1.5 MI SO JCT 194

Team Lead: Casey Pratt Inspection Date: 04/15/2024

**A-57 - Girder End and Bearing Painting Needed (Yes)**

**A-58 - Cap Cleaning/Flushing Needed (No)**

**A-59 - Joint Repair Needed (Yes)**

**A-60 - Full Girder Painting Needed (Yes)**

Surface rust on the webs and bottom flanges of the exterior girders. Pack rust has formed at the field splices. The paint system is failing. Primer coat and bare metal are exposed in many areas. The paint has failed at the expansion joints. Debris and pigeon dung on bottom flanges. This condition is typical in the approach spans.

Span 24, 25: Girders have smoke stains.

Span 32, Girder 2, 1st Field splice: The bottom flange of the girder is bent. (Minor)

Span 44, Girder 1: The bottom flange of the girder is bent. (Minor)

Span 52, Girder 4: The bottom flange of the girder is bent.

Bent 61: (North Abutment) Girders have graffiti.

**A-61 - Polymer Overlay Advised (No)**

**A-62 - Hydro and LMC Advised (No)**

**A-63 - Missing/Incorrect Log Mile Signage (No)**

**A-64 - Vegetation Removal Requested (Yes)**

Spans 29 - 40: Have overgrowth, limiting the access of the snoopers.

Span 41: Has debris and cutting of the channel bank.



Span 41: Has debris and cutting of the channel bank.



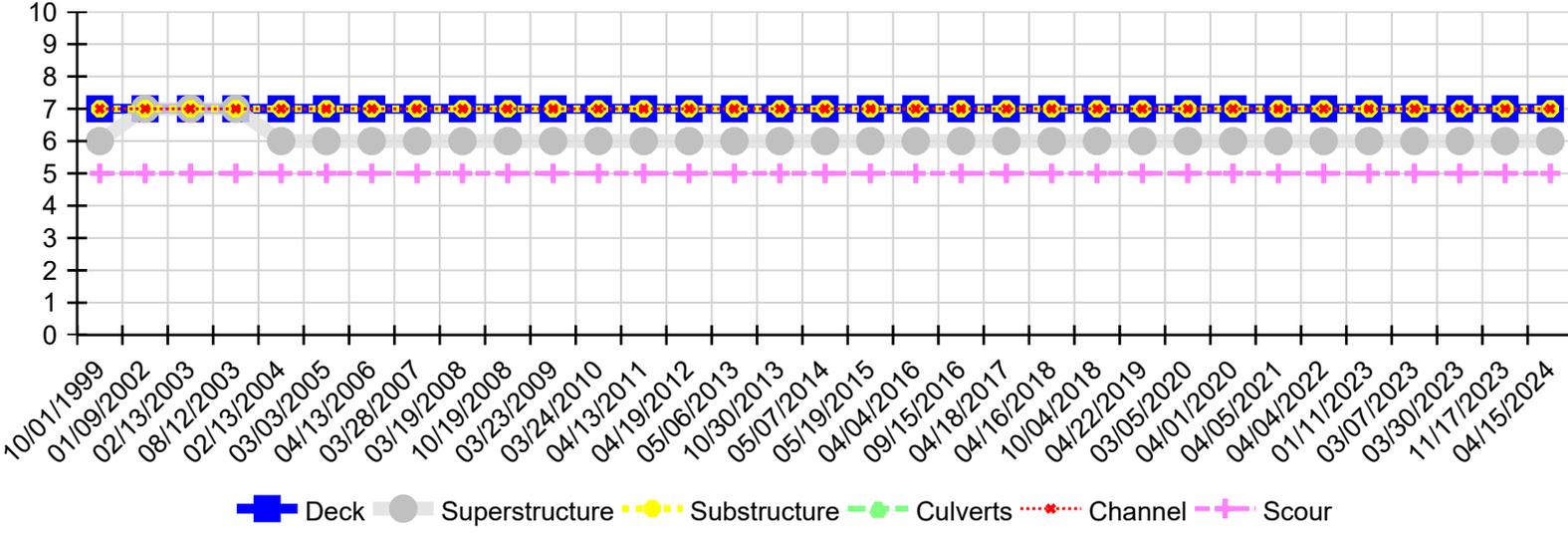
Asset #05600(Routine, NSTM)

SH 109 over ARKANSAS RIVER

Location: 1.5 MI SO JCT 194

Team Lead: Casey Pratt Inspection Date: 04/15/2024

Condition History



Inspection Date	Deck	Superstructure	Substructure	Culverts	Channel	Scour
04/15/2024	7	6	7	N	7	5
11/17/2023	7	6	7	N	7	5
03/30/2023	7	6	7	N	7	5
03/07/2023	7	6	7	N	7	5
01/11/2023	7	6	7	N	7	5
04/04/2022	7	6	7	N	7	5
04/05/2021	7	6	7	N	7	5
04/01/2020	7	6	7	N	7	5
03/05/2020	7	6	7	N	7	5
04/22/2019	7	6	7	N	7	5
10/04/2018	7	6	7	N	7	5
04/16/2018	7	6	7	N	7	5
04/18/2017	7	6	7	N	7	5
09/15/2016	7	6	7	N	7	5
04/04/2016	7	6	7	N	7	5
05/19/2015	7	6	7	N	7	5
05/07/2014	7	6	7	N	7	5
10/30/2013	7	6	7	N	7	5
05/06/2013	7	6	7	N	7	5
04/19/2012	7	6	7	N	7	5
04/13/2011	7	6	7	N	7	5
03/24/2010	7	6	7	N	7	5
03/23/2009	7	6	7	N	7	5
10/19/2008	7	6	7	N	7	5
03/19/2008	7	6	7	N	7	5
03/28/2007	7	6	7	N	7	5
04/13/2006	7	6	7	N	7	5



**Asset #05600**(Routine, NSTM)  
**SH 109 over ARKANSAS RIVER**  
**Location: 1.5 MI SO JCT 194**

**Team Lead: Casey Pratt Inspection Date: 04/15/2024**

<b>Inspection Date</b>	<b>Deck</b>	<b>Superstructure</b>	<b>Substructure</b>	<b>Culverts</b>	<b>Channel</b>	<b>Scour</b>
03/03/2005	7	6	7	N	7	5
02/13/2004	7	6	7	N	7	5
08/12/2003	7	7	7	N	7	5
02/13/2003	7	7	7	N	7	5
01/09/2002	7	7	7	N	7	5
10/01/1999	7	6	7	N	7	5



**NSTM Inspection Report and Procedure**  
**Bridge No. 05600 1.5 MI SO JCT 194**

**A-128 - Description of Structure**

Bridge 05600 was built in 1980 and carries Highway 109 over the Arkansas River. The plans indicate that the structure is laid out from south to north. The structure's total length is 8,537' with an out-to-out width of 32.7'. The approach spans 1-55 and 59-60 are made of a concrete deck cast over continuous welded plate girders with 4 beamlines. The main spans 56-58 are made of a concrete deck cast over continuous welded plate girders with only 2 beamlines and a floor beam system. The main spans are considered NSTM due to having only 2 beamlines. The girders and floor beams in these spans are all considered NSTM and are inspected hands-on within arms reach during each inspection.

**A-129 - Range Of Dates, Personnel and Responsibilities**

4/15/2024 - 4/17/2024

Casey Pratt - Team lead

Zachary Adams - Assitant

All NSTMs were inspected hands-on and within arms' reach by both members of the inspection team.

**A-130 - Access Equipment**

05600 was inspected using the Aspen A 62-t under-bridge inspection unit for all spans except 29-40. Due to the low height of the structure and heavy vegetation in these spans, the inspection was conducted from the ground on foot.

Traffic control is handled by signs and cones, a flagger on both ends of the bridge, and a pilot truck. The radio signal does not reach from flagger to flagger so a pilot truck is required for communication between flaggers. The lane closure method used for this inspection is attached to the asset.

**B.IR.02 - Fatigue Prone Details**

Y - E/E' details are present

E details were identified at the welded lateral brace to girder connections and at the termination of all longitudinal stiffeners. Longitudinal stiffener terminations near vertical stiffeners were checked to ensure adequate distance between the welds was maintained during construction to eliminate these details as CIF susceptible. No CIF-susceptible details were identified at this inspection.

E details main span. Lateral brace to girder welds. Main spans. These details were checked for CIF susceptibility. They are fully welded all the way around, eliminating the crack-like detail that would put them in a CIF category.

E details on the Main span.

E details. Longitudinal stiffener terminations. Sufficient gap between the longitudinal and vertical stiffeners.

E details: lateral bracing to girder web welds approach spans.

**B.C.14 - NSTM Inspection Condition**

6 - SATISFACTORY - Widespread minor or isolated moderate defects.

Overall, the NSTM members were found to be in satisfactory to good condition. The steel girders have minor surface corrosion and diminishingly effective paint throughout. The main factor determining the rating of these members is out-of-plane bending in span 56. The girders were rated a 6 as a result. The floor beams have similar corrosion and paint as the girders and were rated a 7

Steel girders - 6

Steel floor beams - 7

**B.IR.04 - Complex Feature**

N - Bridge does not have complex feature

Reference Photos:



Typical under-surface main spans.



NSTM Typical 2-girder.



Bridge #05600 NSTM Member Inspection Log			
Member or Element (NSTM)	Access Equipment	Condition Rating	General Condition Notes
107 Steel Open Girder/Beam	Aspen A 62-t	6	Overall, the steel girders have minor surface corrosion and diminishingly effective paint throughout. The main factor determining the rating of these members is out-of-plane bending in span 56. As a result, the girders were rated a 6.
152 Steel Floor Beam	Aspen A 62-t	7	Overall, The floor beams have minor surface corrosion throughout and were rated a 7

**NSTM specific defect notes**

ELEMENTS	DESCRIPTION	UNITS	TOTAL	CS1	CS2	CS3	CS4
107	Steel Open Girder/Beam	LF	32279	13317	18919	43	0
<p>(107) Minor surface corrosion throughout due to failing paint. 651LF CS2.            Span 56, girder 1, right, 3rd splice: Has minor section loss at splice connection up to 1/8". 2LF CS3            Span 56, girder 1, right, splice 1: Has active corrosion with up to 1/8th of section loss for the length of the splice. 6LF CS3            Span 56, girder 1, back of 1st splice: Out of plane bending of web. The middle section of the web measures 3/4" out and increases to 1" at the bottom. 6LF CS2            Span 56, girder 1, left, between stiffeners 6 and 7: Laminating rust to top flange, approximately 1/16" section loss. 6LF CS3.            Span 56, girder 1, right side, 3rd splice: Has old section loss up to 1/4" in the bottom of the web below the splice plate. 3LF CS3.            Span 56, Bent 56, girder 2, left: The bearing connections have section loss around the anchor bolt hole. 1/8" typical. Girder 1 at this bent is similarly deteriorated. 2LF CS3            Span 56, girder 2, left, splice 1: Has up to 1.5" of out-of-plane bending to web. 5LF CS2            Span 56, girder 2, splice 2: Has up to 1/2" out-of-plane bending at the top of the web. 2LF CS2            Span 57, girder 2 left, 3rd splice: Has a bulge at the bottom of web splice plate. 1LF CS3            Span 58, girder 1, right, splice 1: Has 1/16" x 28" section loss to the lower web between the web and bottom flange splice plate. 3LF CS3            Girders have minor corrosion throughout.            Minor pack rust is present at isolated splice connections. 17LF CS3            Abutment 1, girder 2, right: Has section loss over the bearing at the diaphragm connection, up to 1/16". Girder 3: Has a similar defect. 2LF CS3.            Span 21, girder 2, right, first connection back of bent 22: The weld to the lateral bracing is cracked.            Span 25, girder 3, ahead of diaphragm 4: out of plane bending up to 3/4". 2LF CS2            Span 46, girder 4, splice 1: Has distortion and pack rust between the splice plates. 1LF CS3            Span 60, bay 2, diaphragm 5, back, right: has distortion. 1LF CS2</p>							
152	Steel Floor Beam	LF	990	738	252	0	0
<p>(152) The floor beams have active corrosion, with minor pitting scattered throughout the structure along the web, top flange, and bottom flange. CS2            Previously reported cracks in the lateral bracing have been repaired. CS2            Span 56, girder 1, floor beam 1: 1" crack in base plate at lateral brace connection has been arrested. 1LF CS2            Span 56, floor beam 2: typical surface corrosion to floor beams. CS2</p>							



Asset #05600(Routine, NSTM)

SH 109 over ARKANSAS RIVER

Location: 1.5 MI SO JCT 194

Team Lead: Casey Pratt Inspection Date: 04/15/2024

### Signatures

Signature

Printed Name

Date

*Casey C Pratt*

(Team Lead) Casey Pratt

05/22/2024

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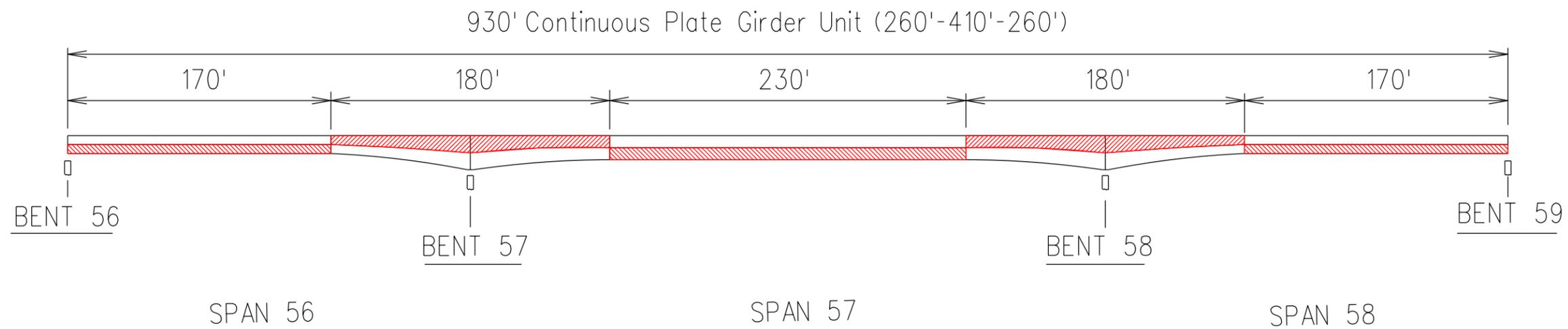
*Zac Adams*

Zachary Adams

05/22/2024

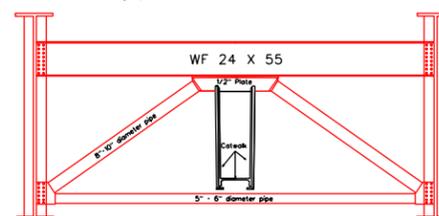
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# NSTM TENSION AREAS SHADED IN RED

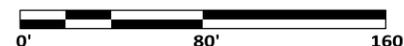


Main span girders are inspected as NSTM.  
ARKANSAS RIVER BRIDGE NO. 05600

Typical Floorbeam



The spacing between floorbeams 1 and 2 in span 56 and floorbeams 11 and 12 in span 58 is 24'0".  
 The spacing for all other floorbeams in spans 56 and 58 is 23' 6".  
 The spacing for all floorbeams in span 57 is 24' 1.5".



ARKANSAS STATE HIGHWAY COMMISSION  
 Little Rock, ARK.

Scale: 1"=160'

Inspection Dir: S to N

Channel Flow: W to E

BRIDGE NO.

**05600**

Drawn By: CCP

Project: NSTM Plans

Checked By: Edit

Date: 5/13/2024

