

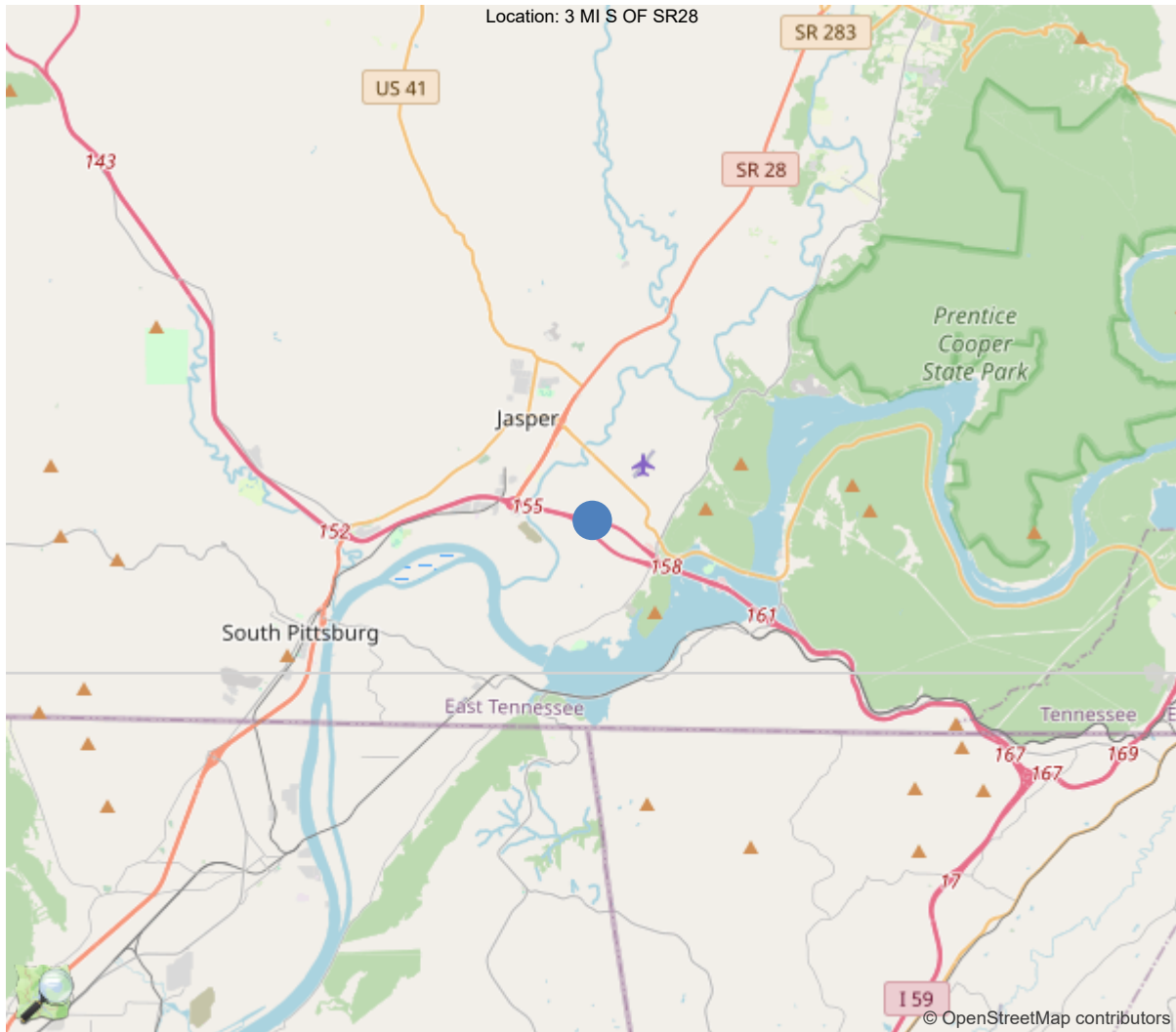


Latitude:35.04398, Longitude:-85.60290

Region 02, 58 - Marion County

Team Leader: Derek Yates

Inspectors: Anthony Pack



I-24 Crossing I-24 WB / SHELLMOUND RD.

35.04398, -85.60290

Routine Bridge Inspection Report

Marion County	
Federal ID	58I00240069
Location	58-I0024-22.65
Description	Interstate 24 Westbound Lanes over Shellmound Road, I-24 Milepost 157.16
GPS Coordinates	35.043983, -85.602900
Date	7/16/2024
Overall Condition	Fair



Maintenance Recommendations

525 - Repair List # 2

523 - Repair List Add Date 9/13/2013

524 - Repair List Revise Date 7/13/2022

Date Added	Recommendation	Priority
08/26/2008	APPROACH GUARDRAILS ARE SUBSTANDARD	
08/26/2008	APPROACH GUARDRAIL TERMINALS ARE SUBSTANDARD	
09/17/2002	UNDERPASS SUBSTRUCTURE PROTECTION GUARDRAILS ARE NON-EXISTENT	
07/13/2022	REPAIR CONCRETE GIRDERS "A", "B" AND "C" IN SPAN #2	2

90 - LAST INSPECTION DATE 07/16/2024

10 - MIN. V.C. OVER DECK 99.99 FT.
(ROADWAY + SHOULDERS)

520 - MIN. V.C. OVER DECK 99.99 FT.
(EXCLUDES SHOULDERS)

36 - TRAFFIC SAFETY FEATURES

Br. Rail	Trans.	Appr. Rail	Terminal	SPEED LIM.
1	0	0	N	70

41 - STRC OPEN/CLOSED/POSTED A

58 - DECK 6

59 - SUPERSTRUCTURE 5

60 - SUBSTRUCTURE 7

61 - CHANL/CHANL PROTECTION N

62 - CULVERT AND RETAIN WALL N

71 - WATERWAY ADEQUACY N

72 - APPROACH RDWY ALIGNMENT 8

521 - OVERALL CONDITION 2 - Fair

16 - LATITUDE	17 - LONGITUDE
35.043983	-85.602900



TEAM LEADER SIGNATURE

N NOT APPLICABLE

9 EXCELLENT CONDITION

8 VERY GOOD CONDITION - NO PROBLEMS NOTED.

7 GOOD CONDITION - SOME MINOR PROBLEMS.

6 SATISFACTORY CONDITION - MINOR DETERIORATION OF STRUCTURAL ELEMENTS.

5 FAIR CONDITION - ALL PRIMARY STRUCTURAL ELEMENTS ARE SOUND BUT MAY HAVE MINOR SECTION LOSS, CRACKING, SPALLING OR SCOUR.

4 POOR CONDITION - ADVANCED SECTION LOSS, DETERIORATION, SPALLING OR SCOUR.

3 SERIOUS CONDITION - LOSS OF SECTION, DETERIORATION, SPALLING OR SCOUR HAVE SERIOUSLY AFFECTED PRIMARY STRUCTURAL COMPONENTS. LOCAL FAILURES ARE POSSIBLE. FATIGUE CRACKS IN STEEL OR SHEAR CRACKS IN CONCRETE MAY BE PRESENT.

2 CRITICAL CONDITION - ADVANCED DETERIORATION OF PRIMARY STRUCTURAL ELEMENTS. FATIGUE CRACKS IN STEEL OR SHEAR CRACKS IN CONCRETE MAY BE PRESENT OR SCOUR MAY HAVE REMOVED SUBSTRUCTURE SUPPORT. UNLESS CLOSELY MONITORED IT MAY BE NECESSARY TO CLOSE THE BRIDGE UNTIL CORRECTIVE ACTION IS TAKEN.

1 "IMMINENT" FAILURE CONDITION - MAJOR DETERIORATION OR SECTION LOSS PRESENT IN CRITICAL STRUCTURAL COMPONENTS OR OBVIOUS VERTICAL OR HORIZONTAL MOVEMENT AFFECTING STRUCTURAL STABILITY. BRIDGE IS CLOSED TO TRAFFIC BUT CORRECTIVE ACTION MAY PUT IT BACK IN LIGHT SERVICE.

0 FAILED CONDITION - OUT OF SERVICE AND BEYOND CORREC

IDENTIFICATION	
(1) State Names	47 - Tennessee
(8) Structure Number	58100240069
(5) Inventory Route	1
(2) Highway Agency District	Region 2
(3) County Code	58 - Marion
(4) Place Code	00000
(6) Features Intersected	I-24 WB / SHELLMOUND RD.
(7) Facility Carried	I24 WBL
(9) Location	3 MI S OF SR28
(11) Mile Point	22.650 mi
(12) Base Highway Network	Yes
(13) LRS Inventory Rte & Subrte	5810024001
(16) Latitude	35.043983
(17) Longitude	-85.602900
(98) Border Bridge State Code	
(99) Border Bridge Structure No.	
STRUCTURE TYPE AND MATERIAL	
(43) Main Structure Type	24
Material	2 - Concrete continuous
Type	4 - Tee beam
(44) Approach Structure Type	00
Material	0 - Other / None
Type	0 - Other / None
(45) No. of Spans in Main Unit	3
(46) No. of Approach Spans	0
(107) Deck Structure Type	1 - Concrete Cast-in-Place
(108) Wearing Surface/Protective System	
Type of Wearing Surface	6 - Bituminous
Type of Membrane	0 - None
Type of Deck Protection	0 - None
AGE AND SERVICE	
(27) Year Built	1965
(106) Year Reconstructed	0
(42) Type of Service	11
On	1 - Highway
Under	1 - Highway, with or without pedestrian
(28) Lane	
On	2
Under	2
(29) Average Daily Traffic	52102
(30) Year of ADT	2021
(109) Truck ADT	7 %
(19) Bypass, Detour Length	1 mi
GEOMETRIC DATA	
(48) Length of Maximum Span	42.0 ft
(49) Structure Length	106.0 ft
(50) Curb or Sidewalk Width	
Left	0.0 ft
Right	0.0 ft
(51) Bridge Roadway Width Curb to Curb	36.2 ft
(52) Deck Width Out to Out	40.3 ft
(32) Approach Roadway Width (W/Shoulders)	24.0 ft
(33) Bridge Median	1 - Open median
(34) Skew	84 Deg
(35) Structure Flared	0 - No flare
(10) Inventory Route Min Vert Clear	99.99 ft
(47) Inventory Route Total Horiz Clear	36.3 ft
(53) Min Vert Clear Over Bridge Rdwy	99.99 ft
(54) Min Vert Underclear	15.40 ft
Ref:	
(55) Min Lat Underclear RT	10.0 ft
Ref:	
(56) Min Lat Underclear LT	9.0 ft
NAVIGATION DATA	
(38) Navigation Control	N - Not applicable, no waterwa
(111) Pier Protection	
(39) Navigation Vertical Clearance	0.0 ft
(116) Vert-Lift Bridge Nav Min Vert Clear	ft
(40) Navigation Horizontal Clearance	0.0 ft

CLASSIFICATION	
(112) NBIS Bridge Length	Y
(104) Highway System	1
(26) Functional Class	1 - Rural Principal Arterial -
(100) Defense Highway	1 - The inventory route is on
(101) Parallel Structure	N - No parallel structure exis
(102) Direction of Traffic	1 - way traffic
(103) Temporary Structure	
(105) Federal Lands Highways	0 - N/A
(110) Designated National Network	1 - The inventory route is par
(20) Toll	3 - On free road. The structu
(21) Maintain	1 - State Highway Agency
(22) Owner	1 - State Highway Agency
(37) Historical Significance	4 - Historical significance is
CONDITION	
(58) Deck	6
(59) Superstructure	5
(60) Substructure	7
(61) Channel & Channel Protection	N
(62) Culverts	N
LOAD RATING AND POSTING	
(31) Design Load	5 - MS 18 / HS 20
(63) Operating Rating Method	8
(64) Operating Rating	
Type	8 - Load and Resistance Factor Rating (LRF
Rating	33.70
(65) Inventory Rating Method	8 - Load and Resistance Factor
(66) Inventory Rating	
Type	
Rating	25.92
(70) Bridge Posting	5 - Equal to or above legal loads
(41) Structure Open/Posted/Closed	A - Open, no restriction
APPRAISAL	
(67) Structural Evaluation	5
(68) Deck Geometry	8
(69) Clearances, Vertical/Horizontal	5
(71) Waterway Adequacy	N
(72) Approach Roadway Alignment	8
(36A) Bridge Railings	1 - Inspected feature meets current
(36B) Transitions	0 - Inspected feature does not meet
(36C) Approach Guardrail	0 - Inspected feature does not meet
(36D) Approach Guardrail Ends	N - Not applicable or a safety feat
(113) Scour Critical Bridges	N - Bridge not over waterway.
PROPOSED IMPROVEMENTS	
(75) Type of Work	35 - Bridge rehabilitation bec
(76) Length of Structure Improvement	106.0 ft
(94) Bridge Improvement Cost	\$ 601
(95) Roadway Improvement Cost	\$ 61
(96) Total Project Cost	\$ 902
(97) Year of Improvement Cost Estimate	2021
(114) Future ADT	77918
(115) Year of Future ADT	2041

INSPECTIONS *			
(90) Inspection Date	07/16/2024		
(91) Frequency	24		
(92) Critical Feature Inspection	Done	Freq. (Mon)	Date
A: Fracture Critical Detail	No		
B: Underwater Inspection	No		
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.			



Looking ahead on route



Top of deck



Looking back on route



Typical bottom of deck



Left side view of structure



Right side view of structure



Underclearance looking ahead on underpass route



Underclearance looking back on underpass route



Bridge number and underpass number



Typical abutment



Typical bent



Typical spall in overhang



Collision damage to beams in span #2



Broken steel reinforcing in beam "A" in span #2



Vegetation growth between cracks in slope paving

PERFORMANCE EVALUATION

Time of Day Inspected 8:33 A.M.

Weather Conditions Clear, 90°F

Vehicles Observed All types

LIVE LOAD BEHAVIOR

Sub Horiz./ Vert. Defl (No)

Sub Vibration (No)

Super Horiz./ Vert. Defl (No)

Super Vibration (No)

APPROACH

Alignment (Good)

Slab (NA)

Joints (Good)

Pavement (Good)

Embankment (Good)

Approach Drains (NA)

TRAFFIC SAFETY FEATURES

Bridge Railing Rating (Good) Some minor cracks

Transitions Rating (Good)

Guardrail Rating (Good)

Guardrail Terminal Rating (Good)

SIGNS POSTED ON ROUTE

Paddleboards	No	Weight Limit Posted	Not Needed
Vertical Clearance (<14'-6")	No	Gross	Tons
Posted Height		Single-unit Vehicle	Tons
Narrow Bridge Signs	No	Multi-unit Vehicle	Tons
One Lane Bridge Signs	No	564 Assigned Bridge Name	
Other Signs or Plaques			

ATTACHED SIGNS

Sign No	Location	Text on Sign	Noted Defects
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DECK

Wearing Surface Type		Asphalt	Wearing Surface Depth	6
Wearing Surface	(Good)			
Deck - Structural Condition	(Fair)	Isolated minor and moderate spalls with exposed rebar in overhangs		
Curbs	(NA)			
Median	(NA)			
Sidewalks	(NA)			
Parapet	(Good)	Some minor cracks		
Railing	(NA)			
Rail Paint	(NA)			
Deck Drains	(NA)			
Lighting Standards	(NA)			
Utilities	(NA)			
Expansion Joints	(NA)			

SUPERSTRUCTURE

Bearing Devices	(Good)			
Girders	(Fair)	Beams "A", "B", and "C" in span #2 have moderate collision damage; beam "A" in span #2 has severed reinforcing steel due to collision damage		
Beams	(NA)			
Floor Beams	(NA)			
Stringers	(NA)			
Diaphragms	(Good)	Isolated minor cracks and delaminated areas		
Superstructure Bracing	(NA)			
Trusses - General	(NA)			
Trusses - Portals	(NA)			
Trusses - Bracing	(NA)			
Superstructure Paint	(Good)			
Alignment of Members	(Good)			

TEXTURE COAT

ABUTMENTS

Abutment Caps	(Good)	Some minor cracking
Abutment Breastwall	(NA)	
Abutment Wings	(Good)	Minor spall at #2 right
Abutment Backwall	(Good)	
Abutment Plumb	(Good)	
Abutment Footing	(NA)	
Abutment Piles	(Not Visible)	
Abutment Embankment	(Good)	
Abutment Bearing Surface	(Good)	
Abutment Slope Paving	(Good)	Vegetation growing between slabs
Abutment Rip Rap	(NA)	

PIERS

Pier Caps	(NA)	
Pier Columns I Walls	(NA)	
Pier Plumb	(NA)	
Pier Footing	(NA)	
Pier Piles	(NA)	
Pier Bearing Surface	(NA)	

BENTS

Bent Caps	(NA)	
Bent Columns	(Good)	Some minor rebar pop-outs and delaminated areas
Bent Plumb	(NA)	
Bent Footing	(Not Visible)	
Bent Piles	(Not Visible)	
Bent Bearing Surface	(Good)	
Piles Need Replacement	(No)	

Inspection Team's Summary

This bridge consists of three continuous concrete deck girder spans with an asphalt wearing surface which has a total length of 106 feet and a maximum span length of 42 feet. It is situated on a 84° left skew and crosses over Shell Mound Road. This structure was constructed in 1965. The bridge was inspected on July 16, 2024, by a Region 2 bridge inspection team from Tullahoma and was found to be in overall fair condition.

The approach roadway alignment is rated good. The approach pavement is rated good. The approach safety features are rated good but do not meet the current safety standards except for the terminal ends which do meet the current safety standards. The approach drains and embankments are rated good.

The deck is rated fair. The top of the deck is not visible due to the asphalt wearing surface. The bottom of the deck has isolated minor and moderate spalls in the overhangs. The concrete parapets are rated good and meet the current safety standards.

The superstructure is rated fair. All three concrete girders in span #2 have moderate spalled areas. Beam "A" has one severed reinforcing bar due to collision damage.

The substructure is rated good. The abutment caps have some minor cracking. The backwall of abutment #1 and a few bent columns have minor delaminated areas. The concrete slope pavement is rated good but has vegetation growth between the slabs. The bent columns have some minor rebar pop-outs and delaminated areas.

The underpass roadway is rated fair. There are currently no underpass safety protection features in place.

General Inspection Comment

HQ notes to TL

Deck Elevation

Benchmark height 644.59 Benchmark location Elevation "1" on top of curb, Edge location _____
on right side of abutment 1.

Comment

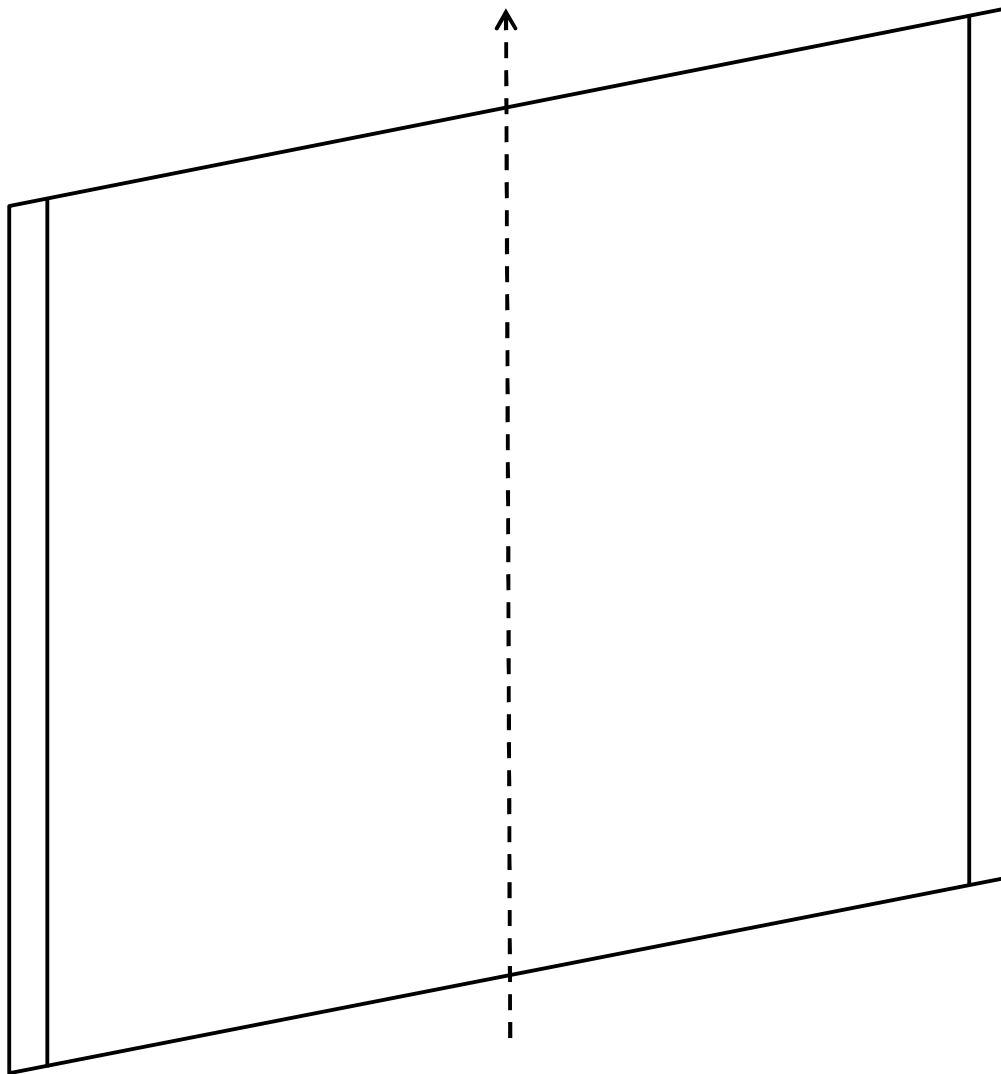
Location	Top Lt. Curb	Left Gutter	Center Line	Right Gutter	Top Rt. Curb
ABUTMENT 1	644.6	644.23		643.77	644.22
PIER 1	644.74	644.75		643.06	644.41
PIER 2	645.08	644.75		644.36	644.7
ABUTMENT 2	645.38	644.02		644.36	644.85

Top of Deck Span No. 1

Date 07/16/24

Bridge Location No. 58 I-24 22.65 L
County Route Log Mile

Legend:	Cracking		Repairs		(light vertical)
	Spalling		Voids		(large checker board)
	Scaling		Dimensions are noted as		
	Delamination				
		(confetti)			
		(10% dots)			
		(40% gray)			
			← X ↑ X	depth	



Bottom of Deck Span No. 1

Date 07/16/24

Bridge Location No. 58 County I-24 Route 22.65 L Log Mile

Legend:

Cracking



Repairs



(light vertical)

Spalling



(confetti)

Voids



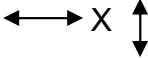
(large checker board)

Scaling



(10% dots)

Dimensions are noted as

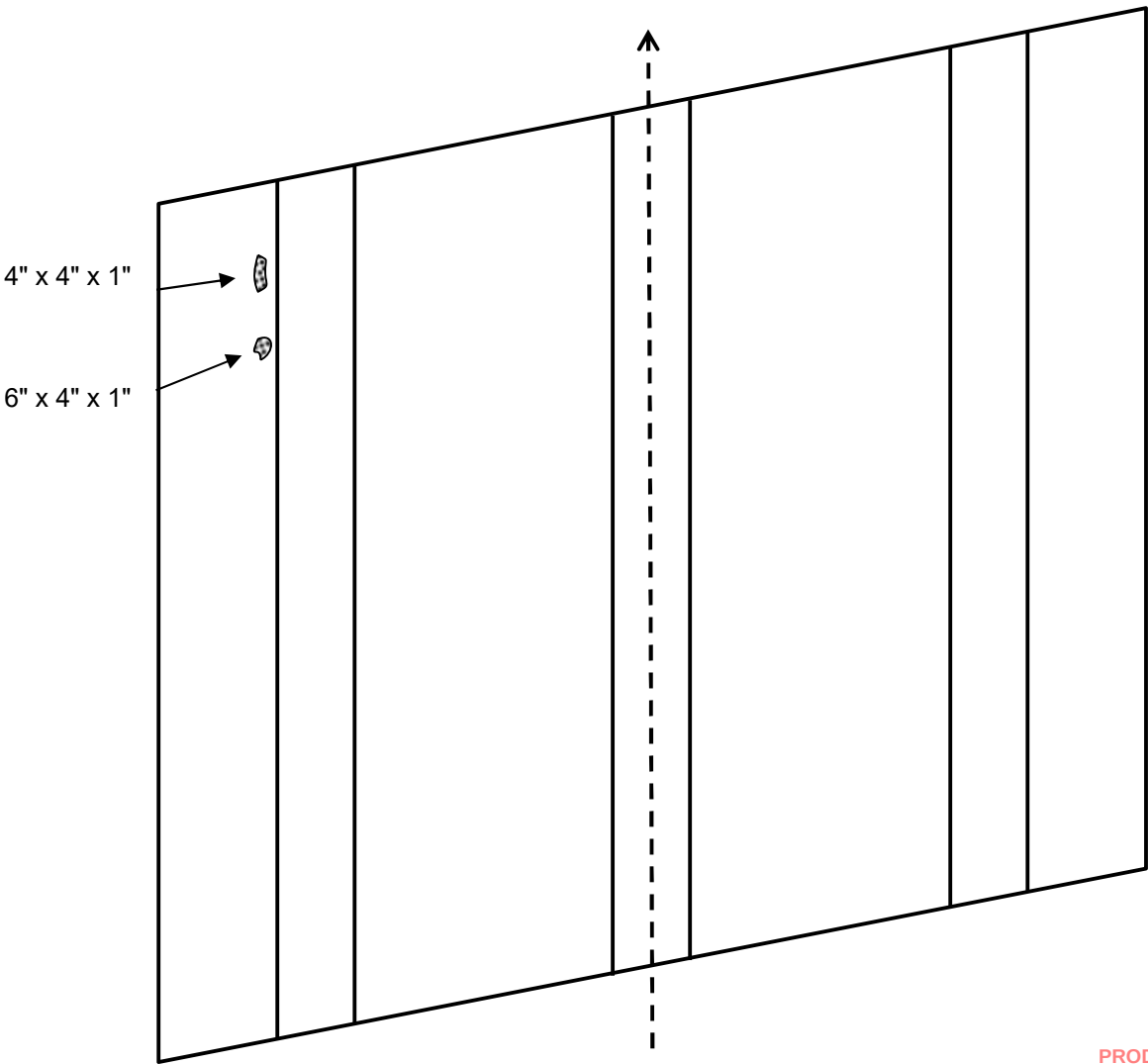
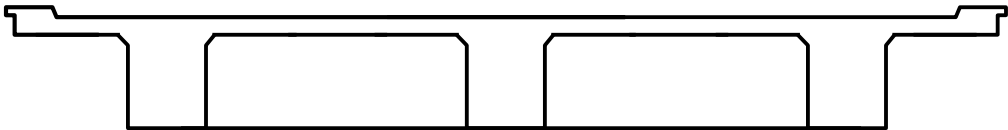


X X depth

Delamination



(40% gray)

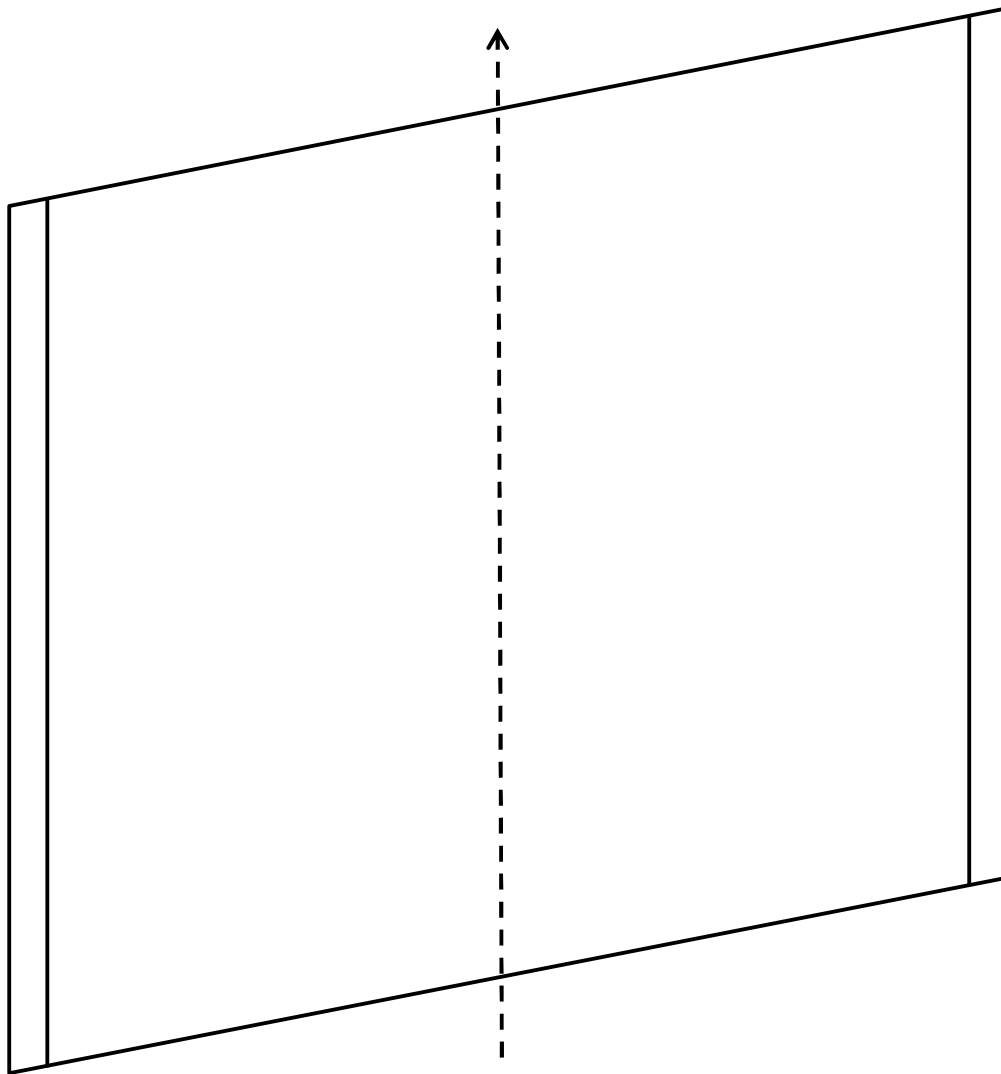


Top of Deck Span No. 2

Date 07/16/24

Bridge Location No. 58 I-24 22.65 L
County Route Log Mile

Legend:	Cracking			Repairs		(light vertical)
	Spalling		(confetti)	Voids		(large checker board)
	Scaling		(10% dots)	Dimensions are noted as		
	Delamination		(40% gray)		 X  X depth	



Bottom of Deck Span No. 2

Date 07/16/24

Bridge Location No. 58 County I-24 Route 22.65 L Log Mile

Legend:

Cracking

Repairs

(light vertical)

Spalling

(confetti)

Voids

(large checker board)

Scaling

(10% dots)

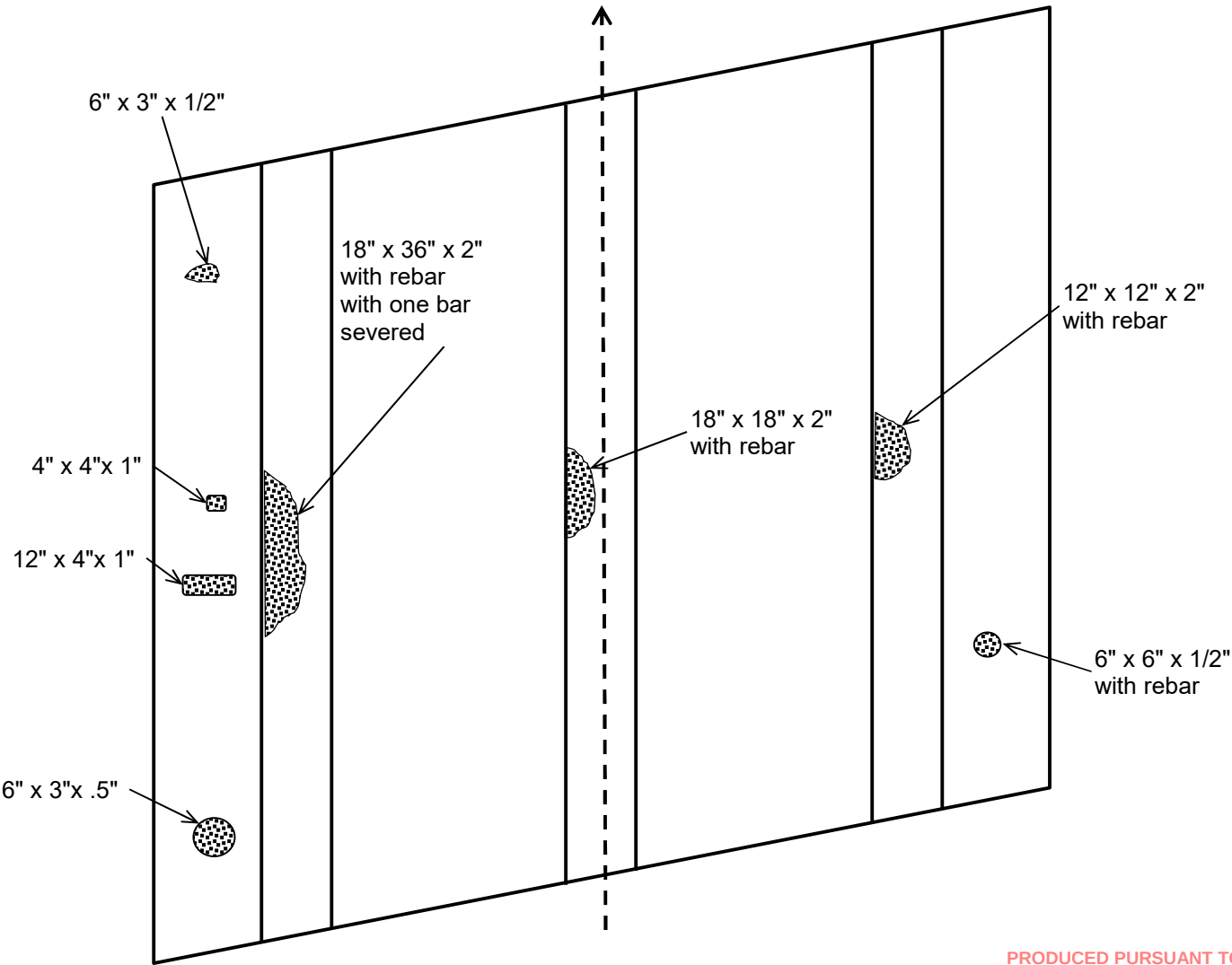
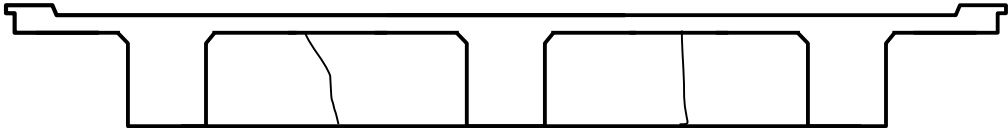
Dimensions are noted as

X X depth

Delamination

(40% gray)

cracks are small

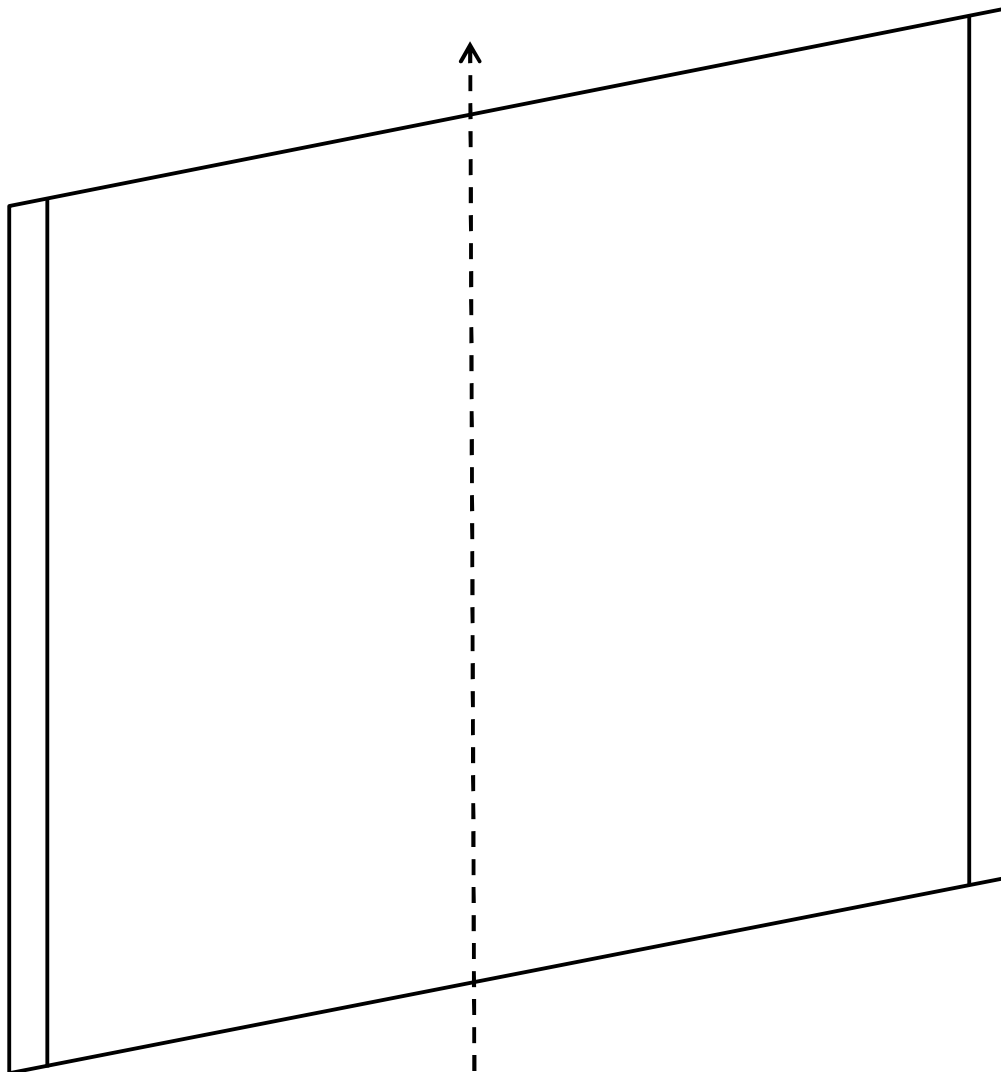


Top of Deck Span No. 3

Date 07/16/24

Bridge Location No. 58 I-24 22.65 L
County Route Log Mile

Legend:	Cracking			Repairs		(light vertical)
	Spalling		(confetti)	Voids		(large checker board)
	Scaling		(10% dots)	Dimensions are noted as		
	Delamination		(40% gray)		 X  X depth	



Bottom of Deck Span No. 3

Date 07/16/24

Bridge Location No. 58 County I-24 Route 22.65 L Log Mile

Legend:

Cracking

Spalling

(confetti)

Scaling

(10% dots)

Delamination

(40% gray)

Repairs

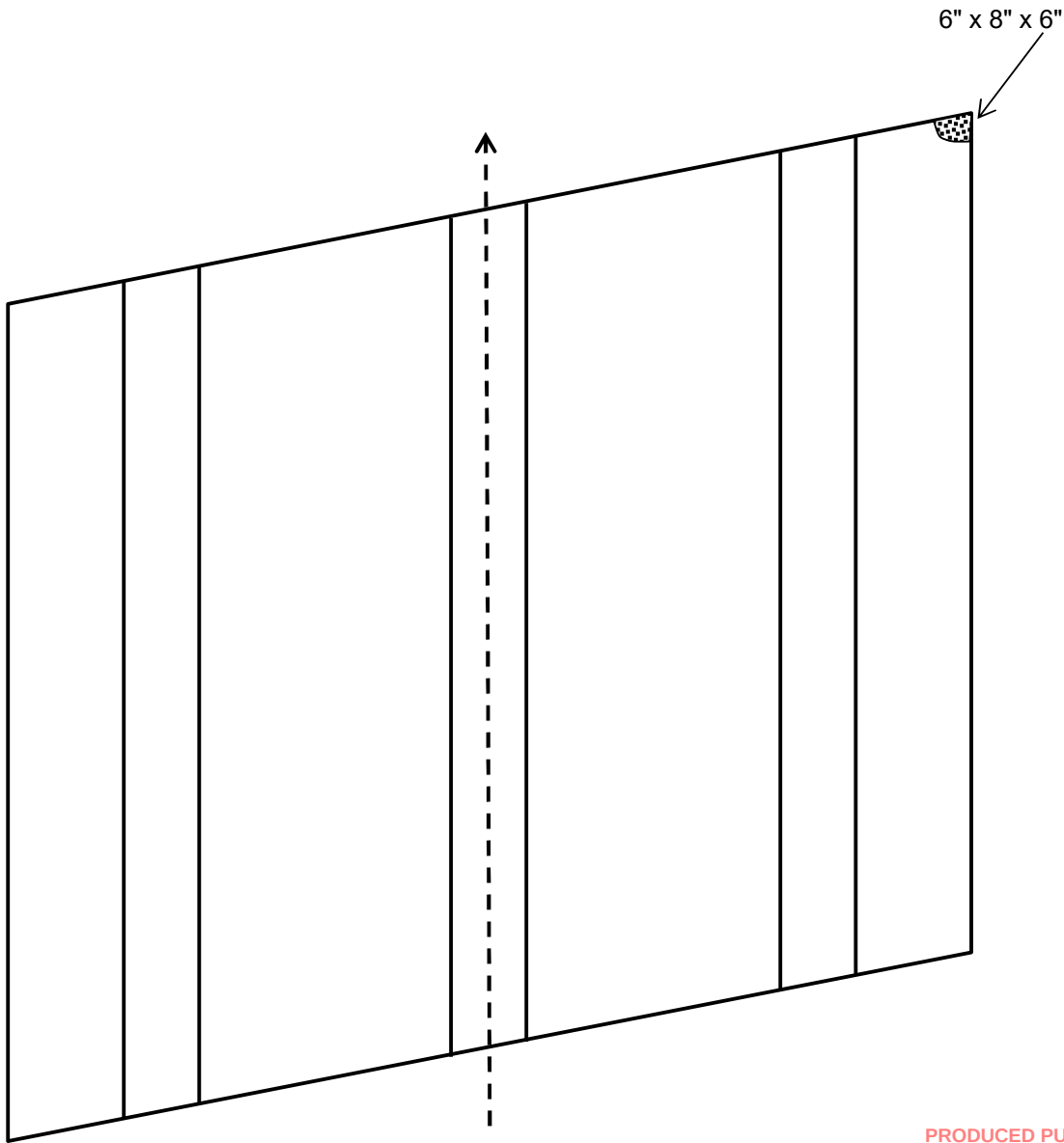
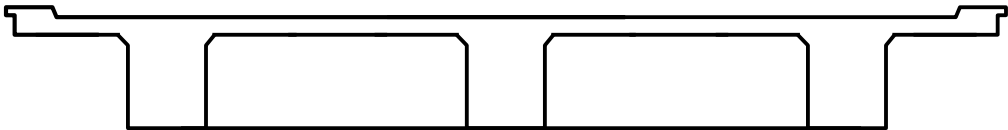
(light vertical)

Voids

(large checker board)

Dimensions are noted as

X depth

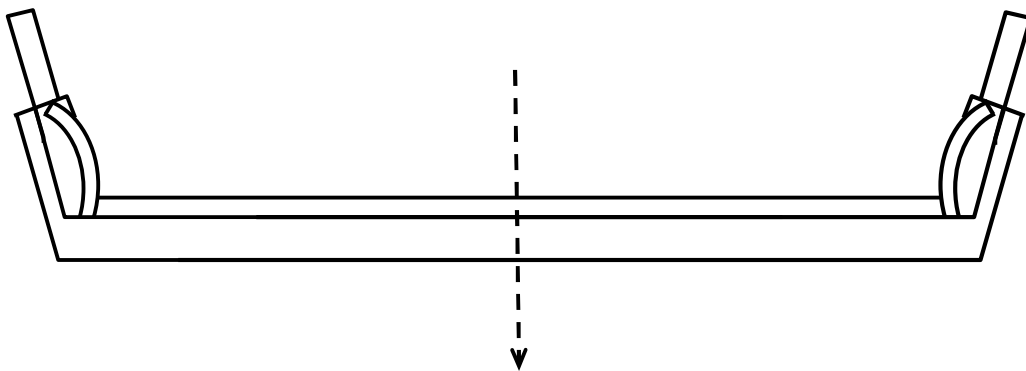


Abutment No. 1

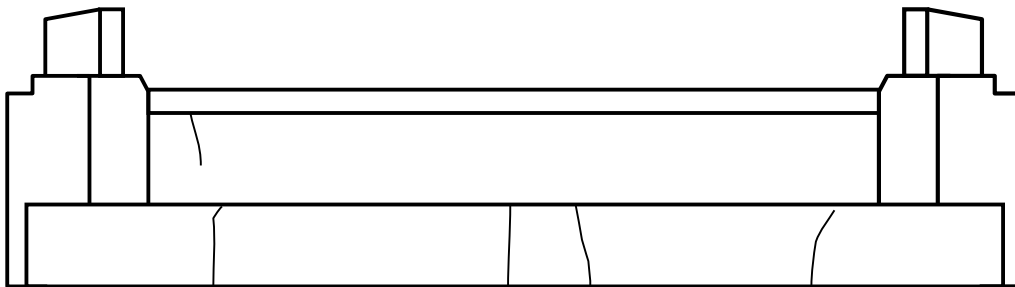
Date 07/16/24

Bridge Location No. 58 I-24 22.65 L
County Route Log Mile

Legend:	Cracking			Repairs		(light vertical)
	Spalling		(confetti)	Bearings		(light upward diagonal)
	Scaling		(10% dots)	Voids		(large checker board)
	Delamination		(40% gray)	Dimensions are noted as		
				 X  X depth		



cracks are hairline

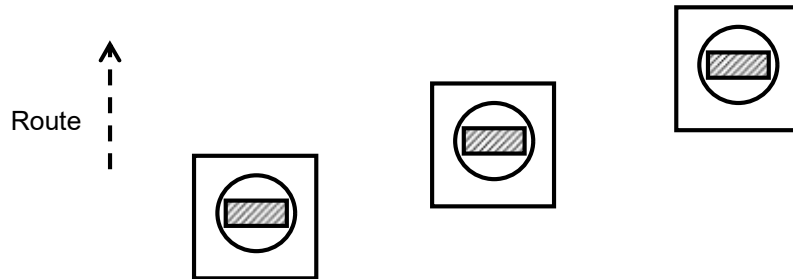


Bent No. 1

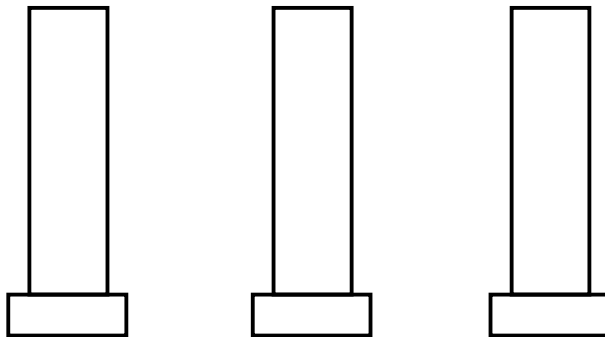
Date 07/16/24

Bridge Location No. 58 I-24 22.65 L
County Route Log Mile

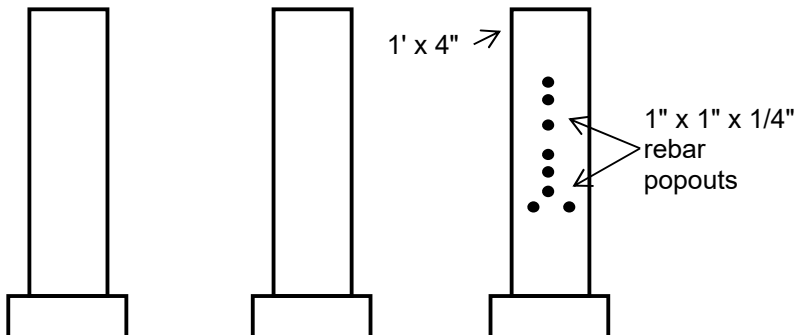
Legend:	Cracking		Repairs		(light vertical)
	Spalling		Bearings		(light upward diagonal)
	Scaling		Voids		(large checker board)
	Delamination		Dimensions are noted as		
			 X  X depth		



Front Side



Back Side

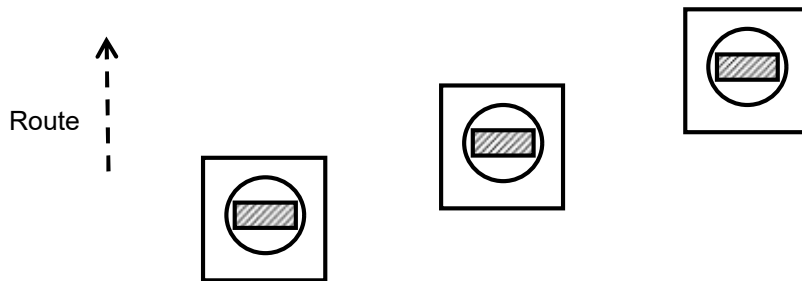


Bent No. 2

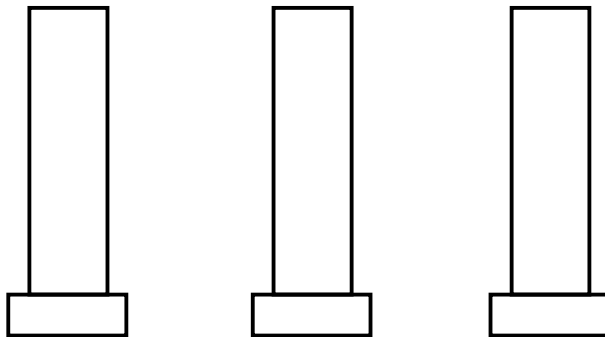
Date 07/16/24

Bridge Location No. 58 I-24 22.65 L
County Route Log Mile

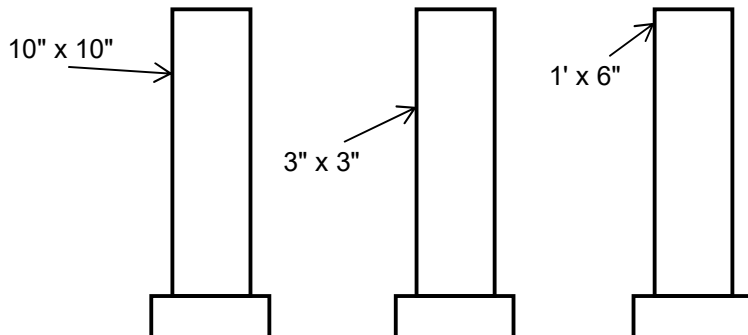
Legend:	Cracking			Repairs		(light vertical)
	Spalling		(confetti)	Bearings		(light upward diagonal)
	Scaling		(10% dots)	Voids		(large checker board)
	Delamination		(40% gray)	Dimensions are noted as		
						X depth



Front Side



Back Side

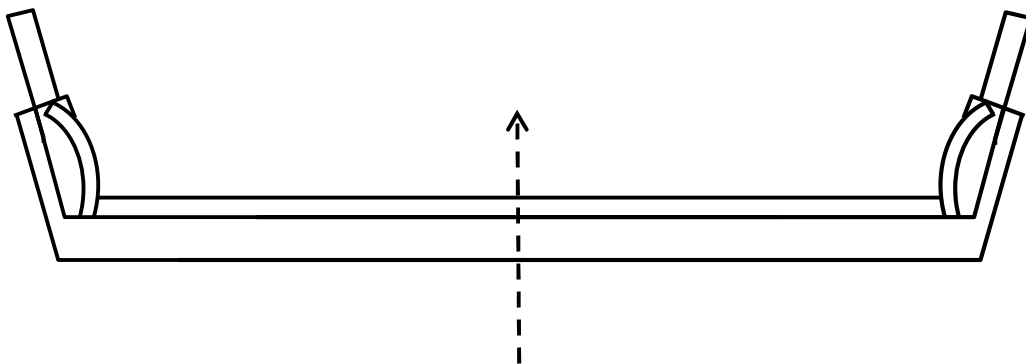


Abutment No. 2

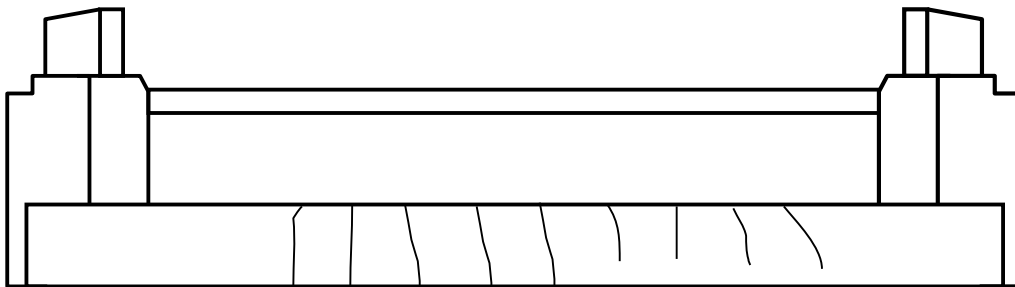
Date 07/16/24

Bridge Location No. 58 I-24 22.65 L
County Route Log Mile

Legend:	Cracking			Repairs		(light vertical)
	Spalling		(confetti)	Bearings		(light upward diagonal)
	Scaling		(10% dots)	Voids		(large checker board)
	Delamination		(40% gray)	Dimensions are noted as		
					X	 X depth



cracks are hairline



Form BIR 3.10

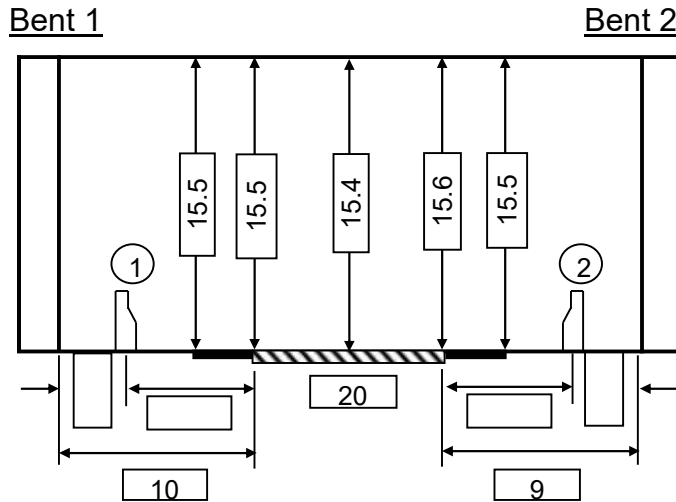
REVISED 6-9-92

Date 07/16/24

Bridge Location No. 58 I-24 22.65 L
County Route Log Mile

NOTE: ALL DISTANCES AND ELEVATIONS ARE IN FEET.

Lateral and Vertical Clearances for One Lane Highway



1. Rail / Barrier Type:

W-Shape

☐
☐

Conc. Barrier

☐
☐

None

☒
☐

2. Rail / Barrier Type:

W-Shape

☐
☐

Conc. Barrier

☐
☐

None

☒
☐

Equipment List

General Inspection

☒ Yes Pocket knife
☒ Yes Sounding/chipping hammer
☐ Chain drag
☒ Yes Range pole
☐ 25' rod - depth and clearance

Visual Aid

☐ Binoculars
☐ Flashlight
☐ Magnifying glass
☐ Hand mirror

Cleaning

☐ Wisk broom
☐ Wire brush
☐ Flat bladed screwdriver
☐ Hand shovel
☐ Penetrating oil (WD-40, etc.)

Tools For Access

☐ Ladders
☐ Rope
☐ Waders
☐ Machete or bush axe

Comment

Tools For Measuring

☐ Masonry/Wood Ruler
☒ Yes 6' Pocket Tape
☐ 25' and 100' Tape
☐ Calipers
☐ Thermometer
☐ Carpenter's Level
☐ String and Weighted line (plumb bob)

Special Purpose Equipment

☐ Reach All
☐ Bucket Truck
☐ Traffic control
☐ Boat
☐ Sonar depth finder
☐ Increment borer
☐ Survey equipment
☐ Safety Harness
☐ Climbing equipment
☐ Dye penetrant
☐ Drone
☐ Air Meter

Special Purpose Equipment

Reach-All Approval and Comments

ELEMENTS	DESCRIPTION	UNITS	TOTAL	CS1	CS2	CS3	CS4
16	Re Conc Top Flange	SF	4311	4303	6	2	0
1080	Delamination/Spall/Patched Area	SF	8	0	6	2	0
510	Wearing Surfaces	SF	3842.5	3842.5	0	0	0
(16) Element record added 2016-07-25.							
(1080-16) Element record added 7/20/2020							
(510-16) Element record added 2016-07-25.							
110	Re Conc Opn Girder/Beam	LF	318	311	1	6	0
1080	Delamination/Spall/Patched Area	LF	4	0	1	3	0
1090	Exposed Rebar	LF	3	0	0	3	0
1130	Cracking (RC and Other)	LF	19	19	0	0	0
(110) Element record added 2016-07-25.							
(1080-110) Element record added 7/20/2020							
(1090-110) Element record added 7/20/2020							
205	Re Conc Column	EA	6	2	4	0	0
1080	Delamination/Spall/Patched Area	EA	3	0	3	0	0
1090	Exposed Rebar	EA	1	0	1	0	0
(205) Element record added 2016-07-25.							
(1080-205) Element record added 7/20/2020							
(1090-205) Element record added 7/20/2022							
215	Re Conc Abutment	LF	83	83	0	0	0
(215) Element record added 2016-07-25.							
310	Elastomeric Bearing	EA	6	6	0	0	0
(310) Element record added 2016-07-25.							
331	Re Conc Bridge Railing	LF	212	212	0	0	0
1130	Cracking (RC and Other)	LF	15	15	0	0	0
(331) Element record added 2016-07-25.							