



Missouri Department of Transportation

STRUCTURAL REHABILITATION CHECKLIST

Bridge No.: **A3097**

Job No.: **J6P3288**

Route: **MO 21S**

Over: **Outer Road 21**

County: **JEFFERSON**

Date of Field Check: **1/15/2020**

* * * Please include photographs for all items that apply. * * *

1

OVERLAY

* Type of existing overlay: ☐ None ☒ Asphalt ☐ Low Slump ☐ Silica Fume ☐ Latex ☐ Epoxy ☐ Other: _____

* Existing overlay thickness: **3/4** "

* Year overlay was applied: **2012** ☐ Unknown

* % of overlay repaired or patched: **1** %

* Replace overlay: ☒ Yes ☐ No

* Notes: **Repalce with Latex Modified Concrete wearing surface including approach slabs.**

Small patches present on approach slab.

Picture # **2-4, 6-11**

2A

DECK REPAIRS

(Deck repair quantities are required even if a Deck Test request has been ordered for this structure.)

* Half-sole repairs: **250** sq. ft.
(round up to the nearest 50 sq. ft.)

* Full-depth repairs: **150** sq. ft.
(round up to the nearest 25 sq. ft.)

* Slab edge repairs: **0** lin. ft.
(covers the outer 4" of the slab edge)

* Superstructure repair (Unformed): **30** sq. ft.
(covers the remaining slab cantilever beyond the outer 4")

* Clean & seal slab edge: **0** lin. ft.
(in lieu of edge repairs)

* Existing Deck Patching: **0** sq. ft.
(round up to the nearest 25 sq. ft.)

* Total surface hydro demolition bridge deck: ☒ Yes ☐ No
(half-sole and full depth repair quantities still required)

* Full deck replacement (redeck): ☐ Yes ☒ No ☐ Optional

* Superstructure replacement: ☐ Yes ☒ No ☐ Optional

* Deck repairs with voided tube replacement: ☐ Yes ☒ No
(if applicable)
_____ sq. ft.

* Full bridge replacement: ☐ Yes ☒ No ☐ Optional
(Deck repair quantities required for cost comparison of alternatives)

* How were the quantities obtained? ☒ Visual ☐ Bridge Inspection Report ☐ Sounded ☐ Other _____

* Notes: **Half-sole repairs estimated at 2% of bridge deck and approach slab area. Superstructure repair is at EB1 above left curtain wall, as well as the end bent diaphragms. Not necessary if converting to semi-integral.**
Full-depth repair is assumed based on the quantity of efflorescence and cracking seen on the underside of the bridge deck.

Picture # **16, 21, 22, 25, 28, 29, 33, 34, 35, 41-44, 46, 47**

DECK REPAIRS CONT.

* ISSUES \ PROBLEMS WITH PRECAST PRESTRESSED DECK PANELS

Spans	Location in Span						Deterioration		Describe
	At Panel Jt.	Btwn (mid) Panel Jt.	End		Mid		End	Type	
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		sq. ft.
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		sq. ft.
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		sq. ft.
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		sq. ft.
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		sq. ft.
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		sq. ft.

* Notes: **Cast-in-place slab. Cracking with efflorescence seen throughout. Observed defects assumed to require full-depth repairs as quantified in section 2A.**

(Deterioration may include water saturation, efflorescence, rust staining, cracking, spalling, exposed steel, disintegration of panel edges at joints, etc. Typically observed at or near panel joints. The location and "Type" of deterioration should be recorded.)

Picture # 16, 21, 22

APPROACH SLABS

* Is there a bridge approach slab in place? ☒ Yes ☐ No * Type: ☒ Concrete ☐ Asphalt ☐ Other **Asphalt overlay**

* Is there a rdwy. approach pavement in place? ☒ Yes ☐ No * Type: ☒ Concrete ☐ Asphalt ☐ Other **Asphalt overlay**

* Is the approach slab sinking at the end bent? ☐ N/A ☐ Yes ☒ No

* Are repairs needed to the bridge approach slab driving surface? ☒ Yes ☐ No
(Typically a roadway item but will be reported to district on the Bridge Memorandum.)

* Full Replacment of Approach Slab? ☐ Yes ☒ No

* Notes: **Replace with latex modified concrete wearing surface.**

Picture # 2, 3, 4, 7-11

4

SLAB DRAINS

* Is the drainage system working adequately? ☒ Yes ☐ No

* Recommendations: _____

* Notes: **No deck drains, water drains onto slope protection at both ends.**

No signs that the draining water is causing a problem.

Picture #

5

CURBS & RAILS

* Existing curb (left side): ☐ Safety Barrier Curb ☒ Curb/parapet ☐ Blockouts ☐ Thrie Beam ☐ Baluster ☐ Steel Channel

☐ Other _____ ☐ Handrail ☐ Fence _____

* Does curb need repair ☐ Yes ☒ No * Curb repair _____ lin. ft.

* Remove hand rail ☐ Yes ☐ No * Add curb blockout ☐ Yes ☐ No

* Existing curb (right side): ☐ Safety Barrier Curb ☒ Curb/parapet ☐ Blockouts ☐ Thrie Beam ☐ Baluster ☐ Steel Channel

☐ Other _____ ☐ Handrail ☐ Fence _____

* Does curb need repair ☐ Yes ☒ No * Curb repair _____ lin. ft.

* Remove hand rail ☐ Yes ☐ No * Add curb blockout ☐ Yes ☐ No

* Existing median curb: Type: **N/A** Width _____ " Height _____ "

* Does curb need repair ☐ Yes ☐ No * Curb repair _____ lin. ft.

* Approach rail attachment: ☒ None ☐ Not attached ☒ 4 Hole ☐ 5 Hole ☐ Turn-down ☐ Other _____

* If the existing handrails will be removed, does the local maintenance supervisor wish to keep them? ☐ Yes ☐ No

Storage address: location: _____

address: _____

city: _____ state: _____ zip: _____

* Notes: **No guardrail connection at EB 4.**

4 hole guardrail at EB 1.

Picture # 5

6

EXPANSION DEVICES

Bent	Type	Recommendations			Gap Left	Gap Right	Temperature & Other Info
1	Sliding slab	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	"	"	59°
4	Wabo-crete	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	"	"	59°
		USE-IN-PLACE REPAIR REPLACE	<input type="checkbox"/>	<input type="checkbox"/>	"	"	
			<input type="checkbox"/>	<input type="checkbox"/>	"	"	
			<input type="checkbox"/>	<input type="checkbox"/>	"	"	
			<input type="checkbox"/>	<input type="checkbox"/>	"	"	
			<input type="checkbox"/>	<input type="checkbox"/>	"	"	

* Notes: **convert bents to semi-integral**

Picture # 4, 7, 11

7

BEARINGS

Bent	Coating		Recommendations				Notes (indicate which bearings at each bent)	
1	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
2	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
3	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
4	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

* Notes: **Convert bents to semi-integral. End bent bearings show signs of bulging. Given the condition and age of the bearings, replace all end bent bearings as part of semi-integral conversion.**

Picture # (Provide Pictures of Each Bearing)

26, 27, 29, 30, 32, 33, 35, 36, 38, 39, 42, 43, 44, 45, 47, 48, 50, 51, 53-55

8

COATING SYSTEM (PAINT)

* Existing coating system: N/A ☐ green ☐ gray ☐ other _____

* Date last coated: _____

* Is existing coating peeling? ☐ Yes (Overcoat is not an option) ☐ No

* Coating recommendation:

☐ Blast clean & recoat all steel

☐ Clean & overcoat all steel

☐ Blast clean & recoat only at joint locations

☐ Blast & recoat at joint locations and clean & overcoat all other steel

Note: Pull off test required for overcoat (Calcium Sulfonate) option. Bridge Division will request pull off tests.

* Notes: _____

Picture #

SUPERSTRUCTURE REPAIRS

(Repairs needed not previously stated.)

Concrete Slab Superstructure or Girder: (above the bearings)(Example: Deck solid slabs, voided slabs, box girder,
deck girders & prestressed girders)**Prestressed girders****EB1, G2, G3, G4, G5: exposed strands at end****EB4, G1, G2, G5: exposed strands and delaminations at end****Mid-span 2: G1 & G2, collision damage and exposed strands.****Steel:** (Example: Beams, stringers, girders, diaphragms, cross-frames, misc. steel)**Member** (Check all that apply) (Attach pictures)**Describe & Locate**

_____	<input type="checkbox"/>	Section Loss	_____ %	<input type="checkbox"/>	Cracks	_____ in.	_____
_____	<input type="checkbox"/>	Section Loss	_____ %	<input type="checkbox"/>	Cracks	_____ in.	_____
_____	<input type="checkbox"/>	Section Loss	_____ %	<input type="checkbox"/>	Cracks	_____ in.	_____
_____	<input type="checkbox"/>	Section Loss	_____ %	<input type="checkbox"/>	Cracks	_____ in.	_____

Notes: **Remove loose concrete from girder ends and encase in new concrete diaphragm. Seal the end 10' of all girders at the****end bents as part of the conversion to semi-integral end bents.****Picture #** 18-20, 26, 29, 32, 35, 38, 45, 54**SUBSTRUCTURE REPAIR**

Bent	Formed Repair	Unformed Repair	Seal Concrete Beam Cap Bts.	Coat Exposed Pile @ Int. Pile Cap Bts.	Describe (Beam, Backwall, Wing, etc.)
1	0 sq. ft.	0 sq. ft.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	9 LF epoxy crack inject in backwall.
2	_____ sq. ft.	_____ sq. ft.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	_____
3	_____ sq. ft.	_____ sq. ft.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	_____
4	10 sq. ft.	20 sq. ft.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	Backwall and Beam cap.
	_____ sq. ft.	_____ sq. ft.	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	2 LF epoxy crack inject.

* Does the structure need graffiti protection? ☒ No ☐ Bottom 8' of Concrete ☐ End Bents ☐ Other _____* **Notes:** **Unformed repairs to diaphragm are included in Superstructure repair (Unformed) in section 2A.****Picture #** 31, 46, 47, 49, 51-55

11

SIGNS, SIGNALS &/OR LIGHTING ATTACHED TO STRUCTURE

* Are there signs attached directly to this structure? ☐ Yes ☒ No quantity _____ location _____

* Describe proposed work to be done to signs. _____

* Are there signals attached directly to this structure? ☐ Yes ☒ No quantity _____ location _____

* Describe proposed work to be done to signals. _____

* Is there aviation lighting attached to this structure? ☐ Yes ☒ No ☐ N/A ☐ Red _____ ☐ Green _____
qnty. qnty.

* Is there navigational lighting attached to this structure? ☐ Yes ☒ No ☐ N/A ☐ Red _____ ☐ Green _____
qnty. qnty.

* Is there roadway lighting attached to this structure? ☐ Yes ☒ No ☐ N/A

* Describe proposed work to be done to lighting. _____

* Notes: **No signals attached.** _____

Picture #

12

UTILITIES ATTACHED TO STRUCTURE

Type	Qty.	Size	Owner	Condition
<input type="checkbox"/> Conduit <input type="checkbox"/> Pipeline <input type="checkbox"/> Other	_____	_____	_____	<input type="checkbox"/> Repaint <input type="checkbox"/> Repair <input type="checkbox"/> Replace <input type="checkbox"/> Remove
<input type="checkbox"/> Conduit <input type="checkbox"/> Pipeline <input type="checkbox"/> Other	_____	_____	_____	<input type="checkbox"/> Repaint <input type="checkbox"/> Repair <input type="checkbox"/> Replace <input type="checkbox"/> Remove
<input type="checkbox"/> Conduit <input type="checkbox"/> Pipeline <input type="checkbox"/> Other	_____	_____	_____	<input type="checkbox"/> Repaint <input type="checkbox"/> Repair <input type="checkbox"/> Replace <input type="checkbox"/> Remove
<input type="checkbox"/> Conduit <input type="checkbox"/> Pipeline <input type="checkbox"/> Other	_____	_____	_____	<input type="checkbox"/> Repaint <input type="checkbox"/> Repair <input type="checkbox"/> Replace <input type="checkbox"/> Remove

* Notes: **No utilities attached.** _____

Picture #

13

CATHODIC PROTECTION SYSTEM

* Is there a cathodic system on this structure? ☐ Yes ☒ No ☐ Remove ☐ Do not alter ☐ Abandon in place (grooved system)

* Is it on and working? ☐ Yes ☐ No ☒ Unknown _____

* Notes: _____

Picture #

14

CHANNEL ALIGNMENT, SLOPE PROTECTION & SCOUR

* Is channel aligned to bridge opening? ☐ Yes ☐ No Describe _____

* Is drift a continual problem? ☐ Yes ☐ No Describe & Locate _____

* Is erosion a problem? ☒ Yes ☐ No Describe & Locate **Erosion under right wing at EB4.**

* Describe slope protection in place. **Concrete panels**

* Scour	At Footing	At Piling	Depth	Bent	Recommendation
	<input type="checkbox"/>	<input type="checkbox"/>	_____	_____	_____
	<input type="checkbox"/>	<input type="checkbox"/>	_____	_____	_____

* Describe needed work. **Erosion at EB4-right wing wall, underming approx 3' wide. Assume 5 cubic yards of flowable fill.**

Approx 3600 LF of joint sealing.

Picture # **14, 15, 24, 56**

15

TRAFFIC LANES

* Number of lanes striped: on structure **2** under structure **1**

* Shoulder width: ☐ None on structure **6** **10** under structure **5** **6**
 (left) (right) (left) (right)

* Sidewalk widths: on structure _____ under structure _____
 (left) (right) (left) (right)

* Median width: on structure _____ under structure _____

* Proposed improvements for lanes/shoulders/sidewalks: _____

Picture #

16

GENERAL AREA CONDITIONS

* Primary area: ☐ Commercial ☐ Industrial ☐ Residential ☐ Agricultural ☐ Military ☒ Other Rural

* Posted speed limit on structure: 65 mph

* Posted load on structure: _____ tons @ _____ mph ☒ NA

Single Unit: _____ tons @ _____ mph ☒ NA

Semi (tractor/trailer): _____ tons @ _____ mph ☒ NA

* Are both signs in place?

☐ Yes ☐ No

* Do pedestrians and/or bicyclists regularly use this structure? ☐ Yes ☒ No ☐ Undetermined

* Notes: _____

Picture # 1, 2

17

MAINTENANCE

* What work has been done to this structure that may not be reflected on existing bridge plans? _____

2012-Clean and seal abutment caps

2016-Seal approach slab joints. Repair end bent 4 expansion device.

2018-Epoxy inject girder cracks. Repair spalled girder ends. Repair erosion on slope wall.

Picture # _____

18

ADDITIONAL FIELD NOTES

Picture # _____

19

STAGING / DETOUR

* **Traffic Control:** ☐ Close structure ☒ Stage construction on structure ☐ Cross over traffic to adjacent structure ☐ Detour

☐ Other option _____

* Define probable detour route. _____

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PERSONS ASSISTING WITH CHECKLIST

Name	<u>Martin A. Chorkey, Horner & Shifrin</u>	Title	<u>Senior Project Engineer</u>	Ph.	<u>(314) 335 - 8631</u>
Name	<u>J. Donovan Herpel, Horner & Shifrin</u>	Title	<u>Engineer</u>	Ph.	<u>(314) 335 - 8602</u>
Name	_____	Title	_____	Ph.	<u>() -</u>
Name	_____	Title	_____	Ph.	<u>() -</u>
Name	_____	Title	_____	Ph.	<u>() -</u>

21

REQUIRED SIGNATURES

I have reviewed the information on this checklist and believe it to be as accurate as possible.

Name	_____	Date	_____
	<i>Transportation Project Manager</i>		
Name	_____	Date	<u>1/31/2020</u>
	<i>District Bridge Engineer</i>		

The structural rehabilitation checklist indicates how the bridge is functioning and aging.

All deterioration should be noted, even if it is known that the work will not be completed under the proposed project.

Send **NEW** Structural Rehabilitation Checklist by email

To: "Bridge Survey Processor"

Cc: Structural Project Manager or Structural Resource Manager