



Missouri Department of Transportation

STRUCTURAL REHABILITATION CHECKLIST

Bridge No.: **A2956**

Job No.: **J6P3288**

Route: **Rte. 21 NB**

Over: **Old Rte. 21**

County: **Jefferson**

Date of Field Check: **12/11/2019**

* * * 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: _____ %

* Replace overlay: ☒ Yes ☐ No

* Notes: **Moderate deterioration and moderate cracking throughout.**

Replace with Latex Modified Concrete wearing surface including approach slabs.

Picture # **1-4**

2A

DECK REPAIRS

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

* Half-sole repairs: **300** 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: **2** lin. ft.
(covers the outer 4" of the slab edge)

* Superstructure repair (Unformed): **0** 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: **100** 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: **Southwest outside corner of bridge deck is delaminated and spalling, approximately 2 lin. ft.. Full depth repairs were based on saturated/delaminated pavement joints as seen from under the bridge deck, approximately 14 joints. Half-sole repairs estimated at 2% of bridge deck and approach slab area.**

Picture # **12, 21-23**

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		Type	Amount	
1	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Saturation	27 sq. ft.	3 joints observed
2	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Saturation	45 sq. ft.	5 joints observed
3	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Saturation	54 sq. ft.	6 joints observed
	<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"/>		sq. ft.	
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		sq. ft.	

* Notes: Above quantities were viewed from underneath the bridge deck. The saturation of the joints noted spanned the width of the girder spacing, see photos.

(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 # 21-23

APPROACH SLABS

- * Is there a bridge approach slab in place? ☒ Yes ☐ No * Type: ☒ Concrete ☐ Asphalt ☐ Other _____
- * Is there a rdwy. approach pavement in place? ☒ Yes ☐ No * Type: ☒ Concrete ☐ Asphalt ☐ Other _____
- * 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: Existing patching present on approach slabs. Joints meeting the bridge deck are both deteriorating, see photos.

Approach slabs have an asphalt overlay.

Picture # 1-4

SLAB DRAINS

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

* Recommendations: Clean drain basins at south end of bridge.

* Notes: Southwest drainage basin is cracked on outer rim.

Picture #

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: Northeast end of barrier has a 1.5' long by 3' tall section of missing concrete

Guardrail at northeast end is still intact. East departure guardrail is 4 hole, west departure guardrail is 5 hole.

Right side approach safety barrier curb is missing the slide plate. See photos for defects.

Picture # **5, 6**

6

EXPANSION DEVICES

Bent	Type	Recommendations			Gap Left	Gap Right	Temperature & Other Info
1	Compression Seal	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	1.25 "	1.25 "	40° F, Sunny
4	Silicon sealed	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	N/A "	N/A "	40° F, Sunny
		<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"/>	<input type="checkbox"/>	"	"	

* Notes: **Convert both end bents to semi-integral.**

Picture # 2, 3

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BEARINGS

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

* Notes: **Light rust on anchor bolts and top plates at end bents. See photos.**

clean and recoat all bearings at the end bents as part of the semi-integral conversion.

Picture # (Provide Pictures of Each Bearing)

7, 11, 19, 20

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COATING SYSTEM (PAINT)

* Existing coating system: **Calcium Sulfonate** ☐ green ☒ gray ☐ other _____

* Date last coated: **2014** * 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: **Minor peeling at discrete locations along bottom flange of Girder 1, 2, & 5.**

Minor rust on girder ends and diaphragms at end bents. Paint end 10' of all girders as part of semi-integral conversion

Picture # 24, 25

SUPERSTRUCTURE REPAIRS

(Repairs needed not previously stated.)

Concrete Slab Superstructure or Girder: (above the bearings) N/A(Example: Deck solid slabs, voided slabs, box girder,
deck girders & prestressed girders)**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: No section loss or cracks observed.

Picture #

SUBSTRUCTURE REPAIR

Bent	Formed Repair	Unformed Repair	Seal Concrete Beam Cap Bts.	Coat Exposed Pile @ Int. Pile Cap Bts.	Describe (Beam, Backwall, Wing, etc.)
<u>1</u>	<u>54</u> sq. ft.	<u>64</u> sq. ft.	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<u>backwall & beamseat.</u> <u>12 LF epoxy inject cracks.</u>
<u>2</u>	_____ sq. ft.	_____ sq. ft.	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	_____
<u>3</u>	_____ sq. ft.	_____ sq. ft.	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	_____
<u>4</u>	<u>11</u> sq. ft.	<u>26</u> sq. ft.	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<u>backwall & beamseat.</u> <u>12 LF epoxy inject cracks.</u>
_____	_____ sq. ft.	_____ sq. ft.	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	_____

* Does the structure need graffiti protection? ☐ No ☒ Bottom 8' of Concrete ☒ End Bents ☐ Other _____* Notes: See photos of beamseat, backwall, and curtain wall delamination areas and vertical cracks.Picture # 7-18, 20

SIGNS, SIGNALS &/OR LIGHTING ATTACHED TO STRUCTURE

Picture #

UTILITIES ATTACHED TO STRUCTURE

Picture #

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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: N/A

Picture #

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CHANNEL ALIGNMENT, SLOPE PROTECTION & SCOUR

* Is channel aligned to bridge opening? ☐ Yes ☐ No Describe N/A

* Is drift a continual problem? ☐ Yes ☐ No Describe & Locate N/A

* Is erosion a problem? ☐ Yes ☐ No Describe & Locate N/A

* Describe slope protection in place. Concrete slope wall

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

* Describe needed work. Re-seal joints in slope wall.

Picture #

15

TRAFFIC LANES

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

* Shoulder width: ☐ None on structure 6 10 under structure 10 10
(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 #

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GENERAL AREA CONDITIONS

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

* Posted speed limit on structure: 65 mph

* Posted load on structure: 65 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: See photos of general elevation and general roadway surface.

Picture # 1, 26

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MAINTENANCE

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

2010-Mud jack under drain basins, and wing corners. Seal Expansion joint.

2011-Repair concrete on deck, greater than 100 SF.

2014-Calcium Sulfonate Overcoat

Picture # _____

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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. **N/A**

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PERSONS ASSISTING WITH CHECKLIST

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

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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	1/31/2020
	<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