



Missouri Department of Transportation

# STRUCTURAL REHABILITATION CHECKLIST

Bridge No.: **A2944**

Job No.: **J6P3288**

Route: **MO 21S**

Over: **CRD HEADS CREEK RD**

County: **JEFFERSON**

Date of Field Check: **11/19/2019**

\* \* \* 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: **0** %

\* Replace overlay: ☒ Yes ☐ No

\* Notes: **Moderate deterioration and minor cracking throughout.**

**Replace with Latex Modified Concrete wearing surface, including approach slabs.**

Picture # **1-4, 7, 8, 12**

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: **0** 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): **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: **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 were estimated at 2% of bridge deck plus approach slabs.**

Picture #

## DECK REPAIRS CONT.

## \* ISSUES \ PROBLEMS WITH PRECAST PRESTRESSED DECK PANELS

| Spans | Location in Span         |                          |                          |                          |                          |                          | Deterioration            |      | Describe |
|-------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|------|----------|
|       | At<br>Panel Jt.          | Btwn (mid)<br>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: **moderate efflorescence at joint near IB4.**

(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**

## 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: **Replace overlay on approach pavement and bridge deck.**

**Repair approach slab adjacent to end of slab at EB 1 and EB 5.**

Picture # **2, 12**

## SLAB DRAINS

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

\* Recommendations: UIP

\* Notes: No drains on bridge, but both inlets adjacent to the end of barrier curbs on the south approach need to be cleaned  
of debris.

Picture #

## CURBS &amp; 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 17 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 30 lin. ft.

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

\* Existing median curb: Type: NONE 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: A few locations are delaminated on West and East barrier curb. Overall in good condition.

Missing bolts at right barrier curb at EB 5.

Cracks and delaminations: Right SBC, Span (1-2), 12 lf, approx. 20' from IB 2.

Right SBC, Span (3-4), 18 lf, approx. 30' from IB 4.

Left SBC, Span (2-3), 9 lf, approx. 10' from IB 2.

Left SBC, Span (1-2), 8 lf, approx. 30' from EB 1.

Picture # 5, 6, 9-11

6

## EXPANSION DEVICES

| Bent | Type | Recommendations          |                          |                          | Gap Left | Gap Right | Temperature & Other Info |
|------|------|--------------------------|--------------------------|--------------------------|----------|-----------|--------------------------|
|      |      | <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"/> | "        | "         |                          |
|      |      | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | "        | "         |                          |

\* Notes: **all bents are integral**

Picture #

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"/> |  |
| 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 type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |  |
| 5    | <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"/> |  |

\* Notes: **all bents are integral.**

Picture # (Provide Pictures of Each Bearing)

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: **None**

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)Several spalls approximately 1/2 SF in size along both facesof all girders. No exposed steel, no action required.**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: See photos of girder spallsPicture # **17, 25****SUBSTRUCTURE REPAIR**

| Bent     | Formed Repair    | Unformed Repair   | Seal Concrete<br>Beam Cap Bts.                           | Coat Exposed Pile<br>@ Int. Pile Cap Bts.                | Describe (Beam, Backwall, Wing, etc.) |
|----------|------------------|-------------------|--|--|---------------------------------------|
| <u>1</u> | <u>0</u> sq. ft. | <u>0</u> sq. ft.  | <input type="checkbox"/> Yes <input type="checkbox"/> No | <input type="checkbox"/> Yes <input type="checkbox"/> No | <u>15 LF epoxy inject cracks.</u>     |
| <u>2</u> | <u>0</u> sq. ft. | <u>0</u> sq. ft.  | <input type="checkbox"/> Yes <input type="checkbox"/> No | <input type="checkbox"/> Yes <input type="checkbox"/> No | _____                                 |
| <u>3</u> | <u>0</u> sq. ft. | <u>0</u> sq. ft.  | <input type="checkbox"/> Yes <input type="checkbox"/> No | <input type="checkbox"/> Yes <input type="checkbox"/> No | _____                                 |
| <u>4</u> | <u>0</u> sq. ft. | <u>0</u> sq. ft.  | <input type="checkbox"/> Yes <input type="checkbox"/> No | <input type="checkbox"/> Yes <input type="checkbox"/> No | _____                                 |
| <u>5</u> | <u>0</u> sq. ft. | <u>12</u> sq. ft. | <input type="checkbox"/> Yes <input type="checkbox"/> No | <input type="checkbox"/> Yes <input type="checkbox"/> No | <u>15 LF epoxy inject cracks.</u>     |

\* Does the structure need graffiti protection? ☒ No ☐ Bottom 8' of Concrete ☐ End Bents ☐ Other \_\_\_\_\_\* Notes: Minor horizontal cracking adjacent to previously epoxy injected vertical cracking in diaphragms at end bents.Picture # **13-16, 18, 21-24, 26**

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: \_\_\_\_\_

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: **None**  
\_\_\_\_\_  
\_\_\_\_\_

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 **Slope protection undermined around columns at IB 2.**

\* Describe slope protection in place. **Concrete pavement-panels.**

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

\* Describe needed work. **Seal joints in concrete slope walls.**

**Replace 15 SY of slope protection around columns at IB 2.**

**1400 LF of joint sealing of paved slope.**

Picture # **19, 20**

15

**TRAFFIC LANES**

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

\* Shoulder width: ☐ None on structure **4** **10** under structure **2** **2**  
(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: **None**  
\_\_\_\_\_  
\_\_\_\_\_

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 #

17

**MAINTENANCE**

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

2012-Repaired 120 SF of approach roadway

2001-Rail: Update end treatments, bring up to standard

2010-Mud-jack north and south approach pavement .

2012- Repair girder ends and epoxy inject v-cracks.

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. **N/A**

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

20

**PERSONS ASSISTING WITH CHECKLIST**

|      |  |       |                                |     |   |
|------|--|-------|--------------------------------|-----|---|
| Name | <b>Martin A. Chorkey, Horner &amp; Shifrin</b> | Title | <b>Senior Project Engineer</b> | Ph. | ( <b>314</b> ) <b>335</b> - <b>8631</b> |
| Name | <b>J. Donovan Herpel, Horner &amp; Shifrin</b> | Title | <b>Engineer</b>                | Ph. | ( <b>314</b> ) <b>335</b> - <b>8602</b> |
| 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 | <b>1/30/2020</b> |
|      | <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