Missouri Department of Transportation

STRUCTURAL REHABILITATION CHECKLIST

Bridge No.:	A4294	*Job No.:*	J6P3548
Route:	MO 79	*Over:*	I-70
County:	St. Charles	*Date of Field Check:*	12-27-2019

*** * * 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:** 0.25 "

* **Year overlay was applied:** 2010 ☐ Unknown

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

* **Replace overlay:** ☐ Yes ☐ No

* **Notes:** Recommend remove EPO and replace with Latex Modified Concrete Overlay on deck, semi-deep slabs

Picture #

2A

DECK REPAIRS

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

* **Half-sole repairs:** 1100 sq. ft.
(round up to the nearest 50 sq. ft.)

* **Full-depth repairs:** 220 sq. ft.
(round up to the nearest 25 sq. ft.)

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

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

* **Clean & seal slab edge:** 40 lin. ft.
(in lieu of edge repairs)

* **Existing Deck Patching:** _____ 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:** Consider on-call deck survey contract for GPR/IR deck sounding to supplement visual repair estimate

*Estimated 5% half-sole/monolithic repairs. **Estimated 1% Full Depth at few saturated P/C panel joints

Picture #

2B

DECK REPAIRS CONT.

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

Spans	At Panel Jt.	Btwn (mid) Panel Jt.	Location in Span: End		Mid		End	Deterioration: Type	Amount	Describe
1 & 2	☑	☐	☐	☐	☐	☐	☐	Saturation	sq. ft.	Random panel joint locations
1	☑	☐	☐	☐	☑	☐	☐	delamination	200 sq. ft.	Random panel joint locations
	☐	☐	☐	☐	☐	☐	☐		sq. ft.	
	☐	☐	☐	☐	☐	☐	☐		sq. ft.	
	☐	☐	☐	☐	☐	☐	☐		sq. ft.	
	☐	☐	☐	☐	☐	☐	☐		sq. ft.	

* **Notes:** Estimated 1% of deck for potential Full depth repair at panel joints and 1% of deck area for clean & seal at other panel joints

(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 #

3

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 Minor

* **Are repairs needed to the bridge approach slab driving surface?** ☑ Yes ☐ No if budget doesn't allow for replacement then hydro & latex overlay with deck.
(Typically a roadway item but will be reported to district on the Bridge Memorandum.)

* **Full Replacment of Approach Slab?** ☑ Yes ☐ No Large patches, many cracks, some additional spalling and moderate wear Tie approach to semi-deep slab

* **Notes:** Roadway appr. pavement needs repairs on north end (mill & fill from BAS to intersection). South end SB lanes need approx. 42'x37' concrete replacement in addition to new concrete pavement for shorter new bridge approaches. Also 100 LF of concrete joint repairs in South pavement. Traffic signal loops installed in approach pave. Asphalt shoulder will need replacement if used as traffic lane for staged construction.

Picture #

4

SLAB DRAINS

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

* **Recommendations:** shoulder asphalt wedging to make sure drainage off of bridge gets to inlets

* **Notes:** _____

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: _____ 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:** curb repair/replace at joint replacement locations. GR at all 4 quadrants need updated to MASH standard height and end treatments.

Picture #

6

EXPANSION DEVICES

Bent	Type	Recommendations			Gap Left	Gap Right	Temperature & Other Info
		USE-IN-PLACE	REPAIR	REPLACE			
1	Compression	☐	☐	☑	"	"	
3	Compression	☐	☐	☑	"	"	
		☐	☐	☐	"	"	
		☐	☐	☐	"	"	
		☐	☐	☐	"	"	
		☐	☐	☐	"	"	

* **Notes:** Replace existing with strip seals

Picture #

7

BEARINGS

Bent	Coating		Recommendations						Notes (indicate which bearings at each bent)
	CLEAN & OVERCOAT	BLAST CLEAN & RECOAT	USE-IN-PLACE	REPAIR	RESET	REPLACE	MAKE END BENT SLIDING SLAB	MAKE END BENT INTEGRAL	
1	☐	☑	☐	☐	☐	☑	☐	☐	Neoprene bulged/shifted
2	☐	☑	☑	☐	☐	☐	☐	☐	
3	☐	☑	☐	☐	☐	☐	☐	☐	Neoprene bulged/shifted
	☐	☐	☐	☐	☐	☑	☐	☐	
	☐	☐	☐	☐	☐	☐	☐	☐	
	☐	☐	☐	☐	☐	☐	☐	☐	

* **Notes:** Jack girders, strip neoprene off of sole plates and glue in new neoprene pads

Picture # (Provide Pictures of Each Bearing)

8

COATING SYSTEM (PAINT)

* **Existing coating system:** System U over System B ☐ green ☑ gray ☐ other _____
Calcium Sulfonate over Lead Chromium

* **Date last coated:** 2010

* **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:** Flanges and Webs peeling & rusting over traffic lanes from salt spray. New expansion joints will required new paint as well, most practical to blast & repaint entire structure.

Picture #

9

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) _____

Steel: *(Example: Beams, stringers, girders, diaphragms, cross-frames, misc. steel)*

Member *(Check all that apply) (Attach pictures)*							**Describe & Locate**
	☐	Section Loss	%	☐	Cracks	in.	
	☐	Section Loss	%	☐	Cracks	in.	
	☐	Section Loss	%	☐	Cracks	in.	
	☐	Section Loss	%	☐	Cracks	in.	

Notes: **Re-weld abut diaphgram cross brace connections prior to re-paint.**

Picture #

10

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	sq. ft.	600 sq. ft.	☑ Yes ☐ No	☐ Yes ☐ No	Beamcap/stem wall and backwalls
2	sq. ft.	36 sq. ft.	☑ Yes ☐ No	☐ Yes ☐ No	repair and seal cap & columns
3	30 sq. ft.	452 sq. ft.	☑ Yes ☐ No	☐ Yes ☐ No	Beamcap/stem wall and backwalls
	sq. ft.	sq. ft.	☐ Yes ☐ No	☐ Yes ☐ No	
	sq. ft.	sq. ft.	☐ Yes ☐ No	☐ Yes ☐ No	

* **Does the structure need graffiti protection?** ☑ No ☐ Bottom 8' of Concrete ☐ End Bents ☐ Other _____

* **Notes:** **Unformed repairs - require shotcrete method to perform repairs. May require temporary removal & reinstall of diaphgrams to perform backwall repairs (put note as incidental to substructure repairs on plans)**

Picture #

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 _____ *qnty.* ☐ Green _____ *qnty.*

* **Is there navigational lighting attached to this structure?** ☐ Yes ☐ No ☑ N/A ☐ Red _____ *qnty.* ☐ Green _____ *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
☐ Conduit ☐ Pipeline ☐ Other				☐ Repaint ☐ Repair ☐ Replace ☐ Remove
☐ Conduit ☐ Pipeline ☐ Other				☐ Repaint ☐ Repair ☐ Replace ☐ Remove
☐ Conduit ☐ Pipeline ☐ Other				☐ Repaint ☐ Repair ☐ Replace ☐ Remove
☐ Conduit ☐ Pipeline ☐ Other				☐ Repaint ☐ Repair ☐ Replace ☐ Remove

* **Notes:** _____

_____

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 N/A
* **Is drift a continual problem?** ☐ Yes ☐ No Describe & Locate N/A
* **Is erosion a problem?** ☐ Yes ☐ No Describe & Locate
* **Describe slope protection in place.** Concrete Paved Slope
* **Scour**

At Footing	At Piling	Depth	Bent	Recommendation
☐	☐			
☐	☐			

* **Describe needed work.**

1100 LF of joint sealing of concrete paved slope protection

Picture #

15

TRAFFIC LANES

* **Number of lanes striped:** on structure 5 under structure 8
* **Shoulder width:** ☐ None on structure 8 (left) 8 (right) under structure 4 (left) 10 (right)
* **Sidewalk widths:** on structure 0 (left) 0 (right) under structure 0 (left) 0 (right)
* **Median width:** on structure 0 under structure 2.5
* **Proposed improvements for lanes/shoulders/sidewalks:** None

Picture #

16

GENERAL AREA CONDITIONS

* **Primary area:** ☑ Commercial ☐ Industrial ☑ Residential ☐ Agricultural ☐ Military ☐ Other _____

* **Posted speed limit on structure:** 45 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:** Commercial on north end. Residential on South end

Picture #

17

MAINTENANCE

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

2003 - abut wall repairs,

2004 - abut caps sealed

2009 - level approach roadway with foam

2011 - level approach roadway with foam

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 **Could close bridge, but leave exit ramps open and detour traffic to outer roads and TR Hughes Blvd.**

* **Define probable detour route.** _____

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PERSONS ASSISTING WITH CHECKLIST

Name	**Joe Molinaro**	Title	**District Bridge Eng.**	Ph.	(**314**) **453** - **1760**
Name	**Zach Evans**	Title	**Sr. Construction Insp**	Ph.	(**314**) **453** - **5080**
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** _____

Transportation Project Manager

Name *Joseph Molinaro* **Date** *4/3/2020*

District Bridge Engineer

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

A4294: MO 79 over I-70
Abut. 3. - Typ. Bearing and
Girder end condition
12/27/2019

A4294: MO 79 over I-70
Typ. Backwall delamination
12/27/2019

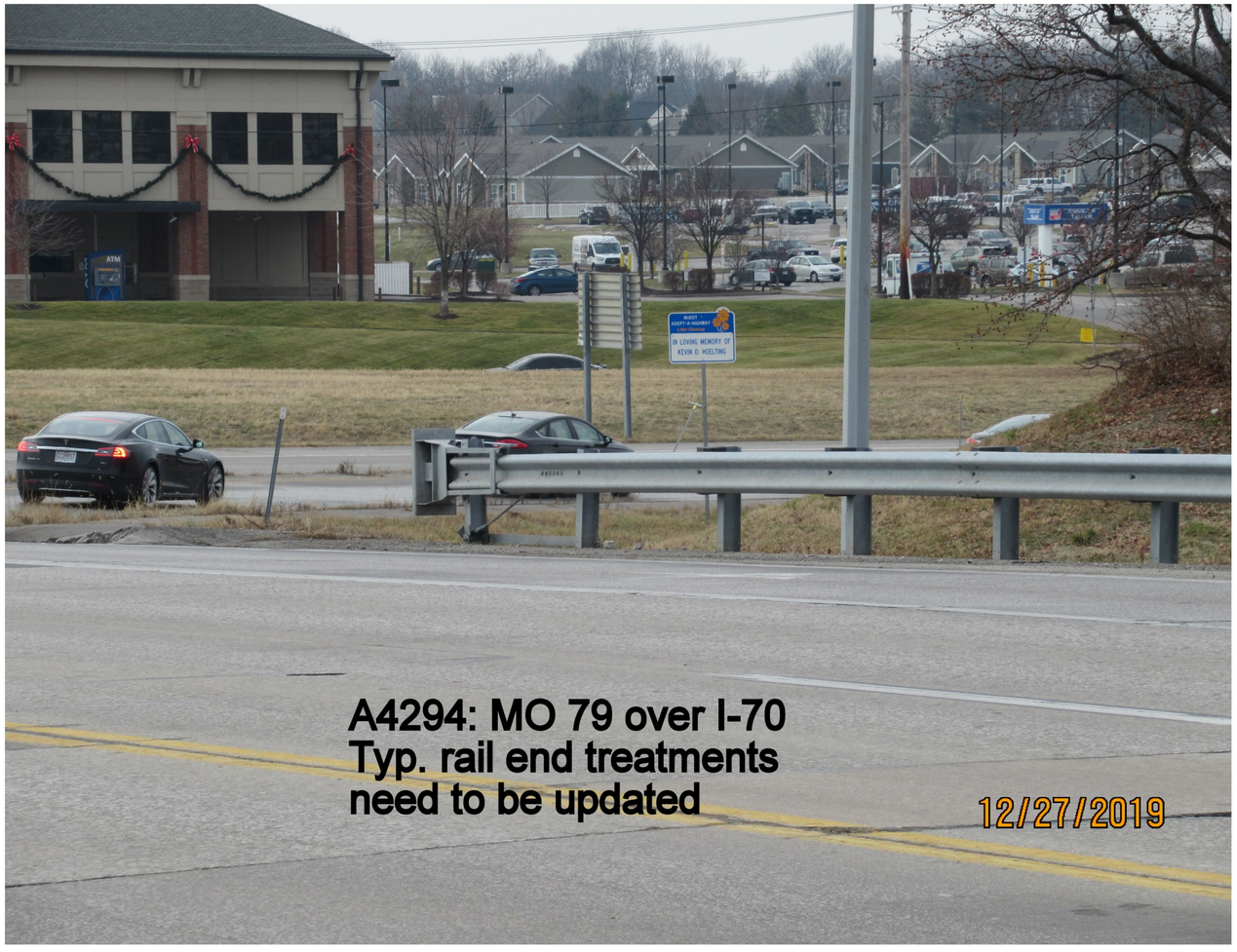
A4294: MO 79 over I-70
Abut. 3. - Typ. Bearing
and Girder end condition
12/27/2019

A4294: MO 79 over I-70
Abut. 3. - Typ. Bearing
and Girder end condition
12/27/2019

A4294: MO 79 over I-70
Span 2 paint peeling &
girder rust over traffic lanes
12/27/2019

A4294: MO 79 over I-70
Abut. 3. - Substructure delams
backwall delams present too
12/27/2019

A4294: MO 79 over I-70
Abut. 3. - Substructure delams
backwall delams present too
12/27/2019


A4294: MO 79 over I-70
Typ. rail end treatments
need to be updated
12/27/2019

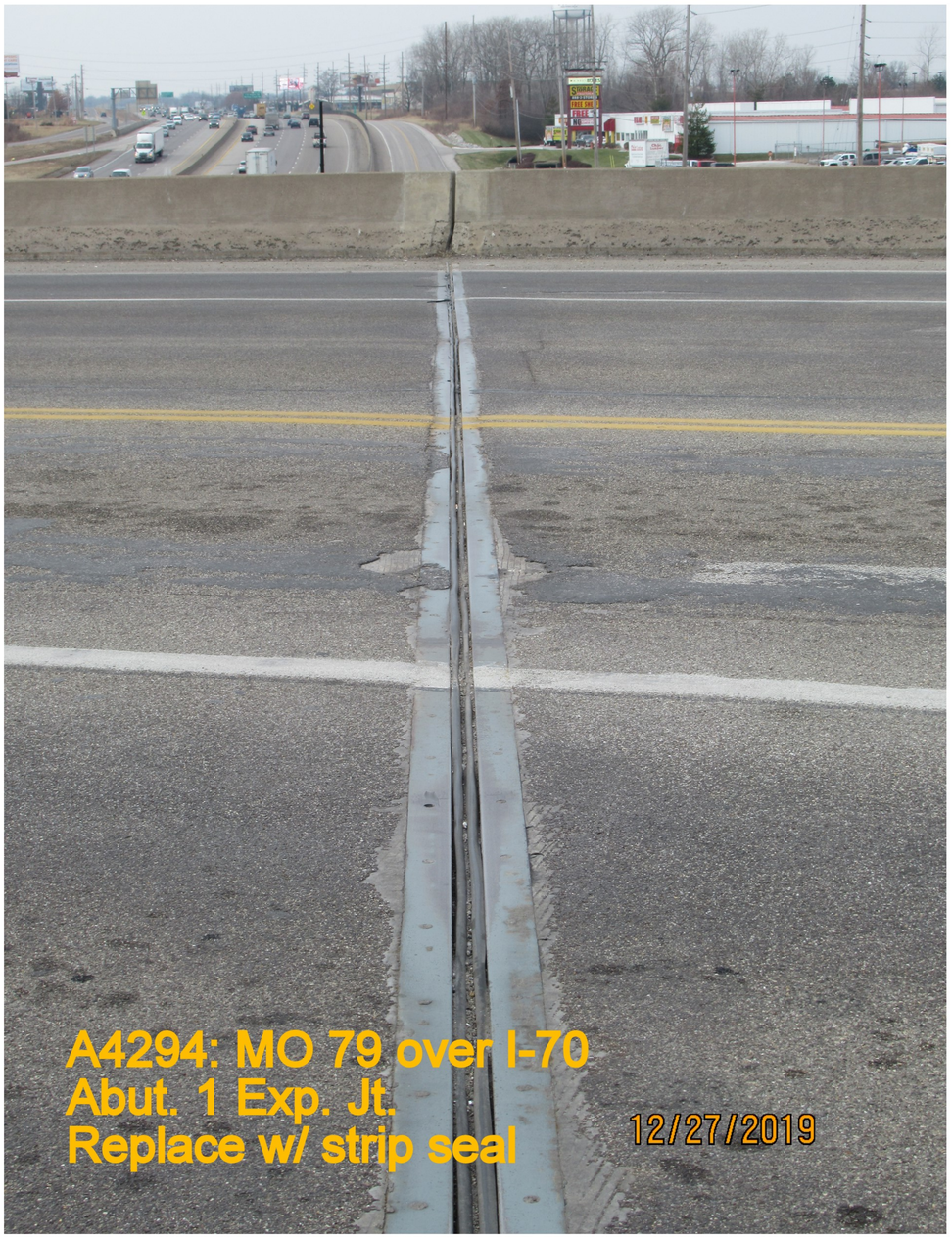
A4294: MO 79 over I-70
NB shoulder condition @ SE
quad. May need replacment if
used for traffic staging
12/27/2019

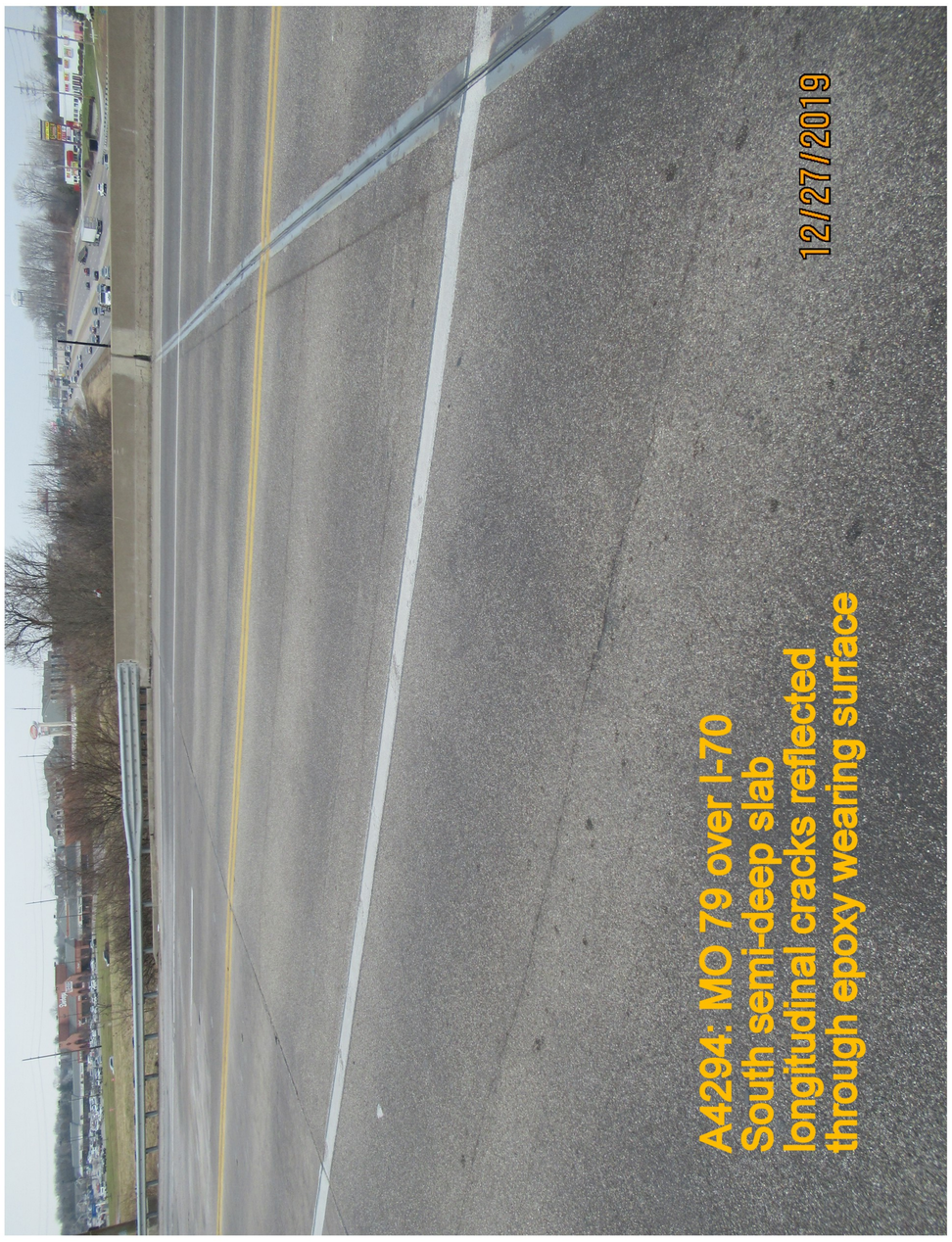
A4294: MO 79 over I-70
NB lanes south bridge approach
with patches
12/27/2019

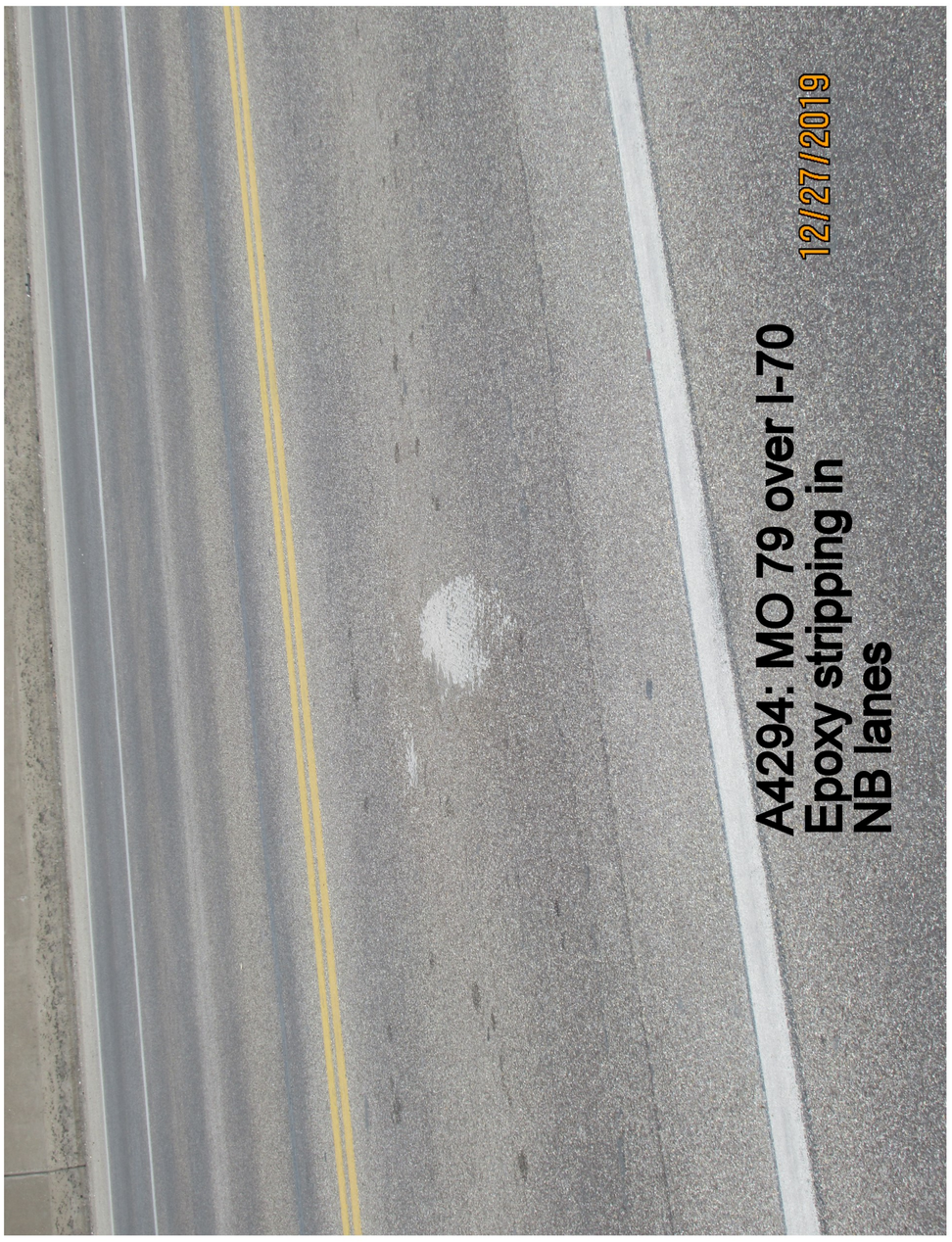
A4294: MO 79 over I-70
SB lanes south bridge approach
with patches & delams
12/27/2019

A4294: MO 79 over I-70
General view looking North
12/27/2019

A4294: MO 79 over I-70
Abut. 3 Exp. Jt.
Replace w/ strip seal
12/27/2019


A4294: MO 79 over I-70
Abut. 1 Exp. Jt.
Replace w/ strip seal
12/27/2019


A4294: MO 79 over I-70
South semi-deep slab
longitudinal cracks reflected
through epoxy wearing surface
12/27/2019


A4294: MO 79 over I-70
Epoxy stripping in
NB lanes
12/27/2019

A4294: MO 79 over I-70
NB lanes north bridge approach
with patches
12/27/2019

Harassed At Work?
WEST 70
Columbia
ONE WAY
A4294: MO 79 over I-70
NB lanes north approach
pavement & shoulder condition
12/27/2019

WEST 70
Columbia
A4294: MO 79 over I-70
Approach pavement condition
SB lanes north end
12/27/2019

WEST 70
Columbia
Vertiv
A4294: MO 79 over I-70
Approach pavement condition
SB lanes north end
12/27/2019

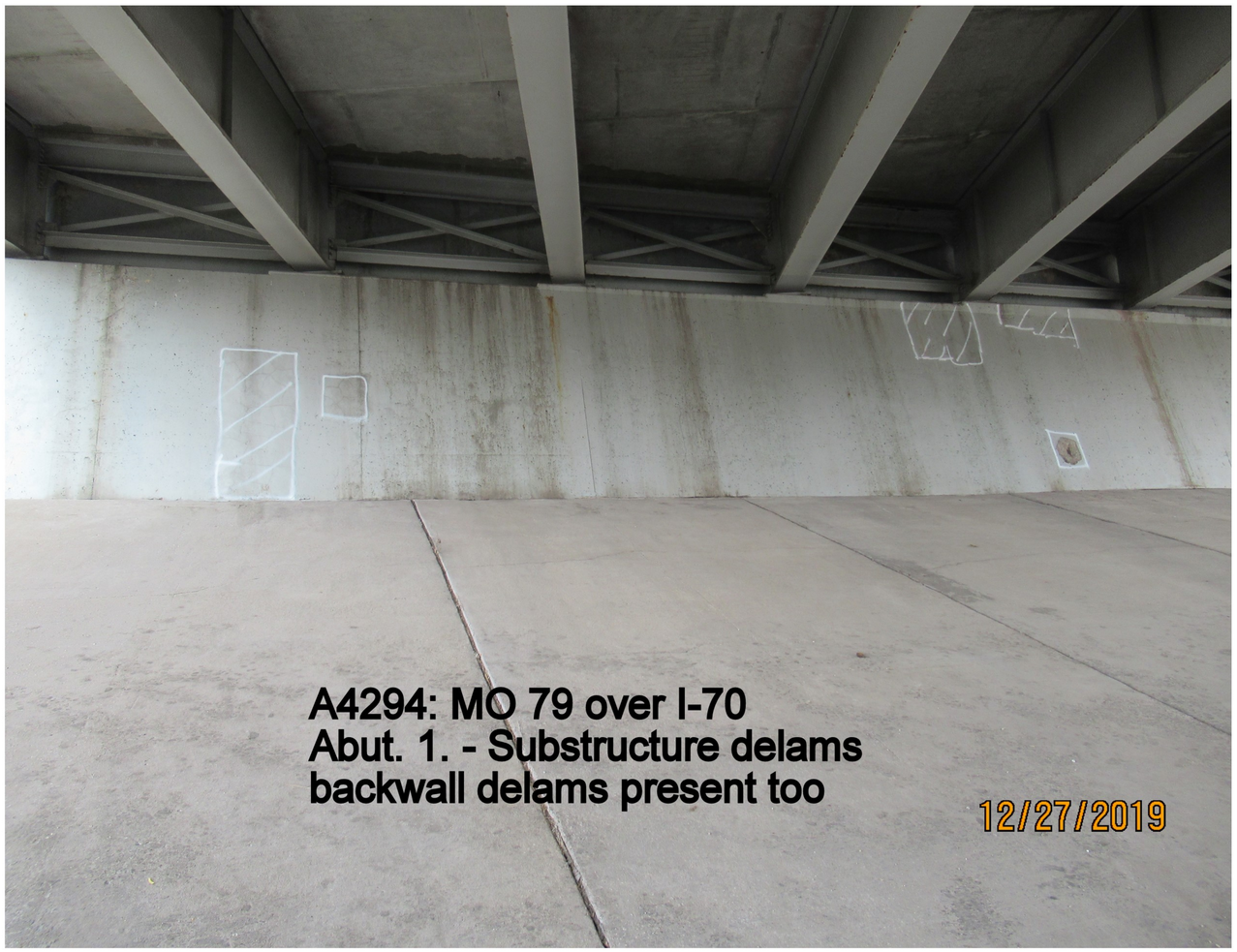
A4294: MO 79 over I-70
Epoxy wearing surface
stripping - SB lanes
12/27/2019

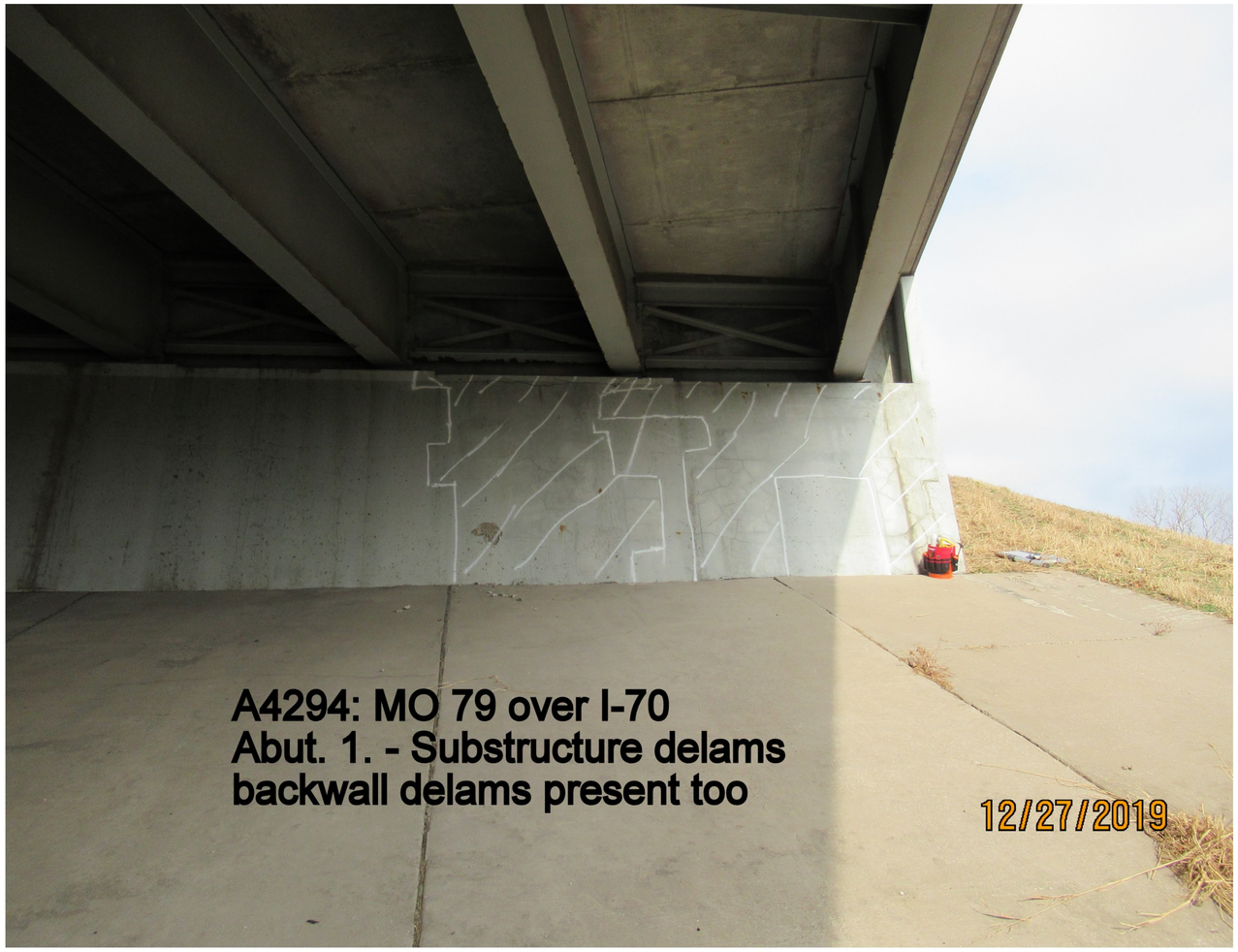
A4294: MO 79 over I-70
Epoxy wearing surface
stripping - SB lanes
12/27/2019

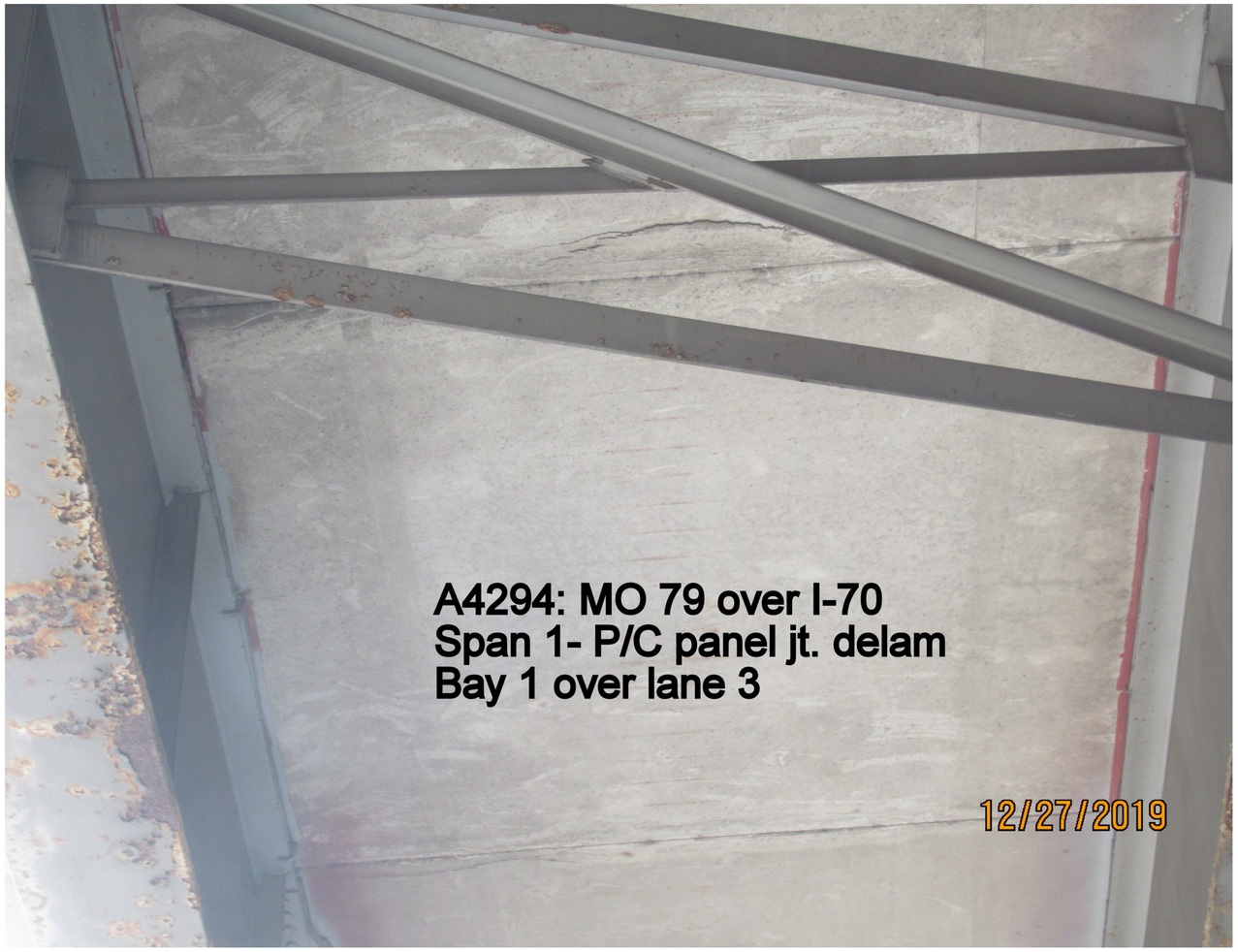
A4294: MO 79 over I-70
Approach pavement condition
SB lanes south end
12/27/2019

A4294: MO 79 over I-70
Approach pavement condition
SB lanes south end
12/27/2019

A4294: MO 79 over I-70
Span 1 - Paint peeling &
girder rust over traffic lanes
12/27/2019
SHAFFER


A4294: MO 79 over I-70
Abut. 1. - Substructure delams
backwall delams present too
12/27/2019


A4294: MO 79 over I-70
Abut. 1. - Substructure delams
backwall delams present too
12/27/2019


A4294: MO 79 over I-70
Span 1- P/C panel jt. delam
Bay 1 over lane 3
12/27/2019