Indian Reservation Roads Program

Pre-filled Supplementary Bridge Maintenance Inspection Report

A028

Date: 03/15/2018

Inspectors: J. Schroeder

Firm Name: KLJ Inspection Date: 11/01/2017 Report Due: MAR 2018

STRUCTURE IDENTIFICATION AND LOCATION

Structure Name: Potato Creek State: 46 - South Dal

Location: 8.9 km west of SD Hwy 44

Feature Crossed: Potato Creek

ADT: 388 ADT Year: 2006 Percent Trucks: 6.1% State Load Limit: HS20

Region: A - Gr. Plains Community (if applicable):

Agency: A06 - Pine Ridge Reservation: A06344 - Pine Ridge

A vehicular bypass exists at the site: ○ Yes ◉ No The bypass is adequate for all vehicles: ○ Yes ◉ No

The length of the detour is: 32 km *(max 199 km)*

BIA Route Number: 2 The area beside the bridge is: ○ Urban ◉ Rural

Number of traffic lanes on route: 2 Number of traffic lanes on bridge: 2

Flooding has occurred since last inspection: ○ Yes ◉ No If yes, when (month/year):

The highest water ever was Below the deck by 2.5 m

BRIDGE APPROACHES

Approach Direction: W

Surface Material: AC Pavement

Surface Condition: Smooth

Description:
(required for other)

Vertical Alignment Description: 2% positive grade beginning at bridge.

Horizontal Alignment Description: Straight at bridge, curves 45 degrees north at 150m.

Sight Distance: 150 m

Greatest distance in approach and bridge deck elevation: 0 mm

Obstruction to Sight Distance: Horizontal curve

Comment about Affect to Speed: No speed reduction required.

Opposite Alignment: S

Surface Material: AC Pavement

Surface Condition: Smooth

Description:
(required for other)

Vertical Alignment Description: Flat at bridge, 4% positive grade at 25m

Horizontal Alignment Description: Straight

Sight Distance: 500m

Greatest distance in approach and bridge deck elevation: 0 mm

Obstruction to Sight Distance: Crest of curve.

Comment about Affect to Speed: No speed reduction required.

PREVIOUSLY NOTED DEFICIENCIES

1007 Description: Pier 2 column 1, vertical/diagonal cracks, all faces, up to 0.8mm wide and an impending spall w/ delamination, north face, 1m high x 0.4m wide. Columns 2 and 3 have vertical cracks up to 0.4mmx7mm. No action required.

Date Discovered: 10/15/2003 There is a stored image: (•) Yes ( ) No Is Corrected: ( ) Yes (•) No

Worse Comment: Is Worse: ( ) Yes (•) No

Estimated Cost: $0

Is Urgent: ( ) Yes (•) No

1008 Description: Pier 3, columns 1 & 2 have pattern cracks. Column 2 has vertical cracks, S and W faces up to 0.8mm wide x 400mm high. Column 3 has vertical cracks, all faces, up to 0.8mm wide x 1m high and a spall at SW corner, 300mm long x

Date Discovered: 10/15/2003 There is a stored image: (•) Yes ( ) No Is Corrected: ( ) Yes (•) No

Worse Comment: Is Worse: ( ) Yes (•) No

Estimated Cost: $0

Is Urgent: ( ) Yes (•) No

1009 Description: Pier Caps 3 and 4 have vertical cracks up to 0.4mm wide x full height. Monitor for changes.

Date Discovered: 10/15/2003 There is a stored image: (•) Yes ( ) No Is Corrected: ( ) Yes (•) No

Worse Comment: Is Worse: ( ) Yes (•) No

Estimated Cost: $0

Is Urgent: ( ) Yes (•) No

1011 Description: Abutment 2 has several superficial vertical cracks up to 0.4m wide x full height. Patch is failing, exposing 50mm of one rebar. No action required.

Date Discovered: 10/15/2003 There is a stored image: (•) Yes ( ) No Is Corrected: ( ) Yes (•) No

Worse Comment: Is Worse: ( ) Yes (•) No

Estimated Cost: $0

Is Urgent: ( ) Yes (•) No

1101 Description: NE guardrial radius in missing bolt. Recommend realign post and installing bolt.

Date Discovered: 10/4/2011 There is a stored image: (•) Yes ( ) No Is Corrected: ( ) Yes (•) No

Worse Comment: Is Worse: ( ) Yes (•) No

Estimated Cost: $100

Is Urgent: ( ) Yes (•) No

PREVIOUSLY NOTED DEFICIENCIES

1003 Description: Longitudinal and diagonal cracks on deck underside in Spans 1 & 2 with very minor efflorescence full length of spans. No action required.

Date Discovered: 10/3/2001 There is a stored image: (●) Yes ( ) No Is Corrected: ( ) Yes (●) No

Worse Comment: Is Worse: ( ) Yes (●) No

Estimated Cost: $0

Is Urgent: ( ) Yes (●) No

P8A Description: Moderate timber debris accumulated on south side of bridge along channel. More concentrated between Piers 1 and 2. Recommend removing timber debris.

Date Discovered: 8/1/1995 There is a stored image: (●) Yes ( ) No Is Corrected: ( ) Yes (●) No

Worse Comment: Is Worse: ( ) Yes (●) No

Estimated Cost: $1,000

Is Urgent: ( ) Yes (●) No

1501 Description: Vertical cracks at regular 2' intervals throughout barrier interior. Surface finish failure. No action required.

Date Discovered: 11/1/2017 There is a stored image: (●) Yes ( ) No Is Corrected: ( ) Yes (●) No

Worse Comment: Is Worse: ( ) Yes (●) No

Estimated Cost: $0

Is Urgent: ( ) Yes (●) No

1502 Description: Surface finish failing on barrier. No action required.

Date Discovered: 11/1/2017 There is a stored image: (●) Yes ( ) No Is Corrected: ( ) Yes (●) No

Worse Comment: Is Worse: ( ) Yes (●) No

Estimated Cost: $0

Is Urgent: ( ) Yes (●) No

Description:

Date Discovered: There is a stored image: ( ) Yes ( ) No Is Corrected: ( ) Yes ( ) No

Worse Comment: Is Worse: ( ) Yes ( ) No

Estimated Cost:

Is Urgent: ( ) Yes ( ) No

Total estimated urgent maintenance costs for previous deficiencies: $0

Total estimated non-urgent maintenance costs for previous deficiencies: $1,100

NEW DEFICIENCIES FOUND AT THIS TIME

Description:

Is Urgent: ◯ Yes ◯ No There is a stored image: ◯ Yes ◯ No Estimated Cost: $

Description:

Is Urgent: ◯ Yes ◯ No There is a stored image: ◯ Yes ◯ No Estimated Cost: $

Description:

Is Urgent: ◯ Yes ◯ No There is a stored image: ◯ Yes ◯ No Estimated Cost: $

Description:

Is Urgent: ◉ Yes ◯ No There is a stored image: ◉ Yes ◯ No Estimated Cost: $

Total estimated urgent maintenance costs for new deficiencies: $0

Total estimated non-urgent maintenance costs for new deficiencies: $1100

EXISTING SIGNS

	#Signs	Statement	Up to Date	Condition	Comments	Cost to Correct ($)
CLEARANCE	2	Black & yellow stri	No	Fair	Missing on westbound la	$500
SPEED						
LOAD						
OTHER (specify)	2	Creek name	No	Fair	Missing on eastbound lan	$500
OTHER (specify)						

Total sign costs (urgent maintenance item): $1,000

Total urgent maintenance or safety-related costs: $1,000

Total routine maintenance costs: $1,100

MAINTENANCE/REPAIRS PERFORMED SINCE LAST INSPECTION

Date Performed: Deficiency Correction: Cost: $

Description:

Date Performed: Deficiency Correction: Cost: $

Description:

Date Performed: Deficiency Correction: Cost: $

Description:

Date Performed: Deficiency Correction: Cost: $

Description:

Total maintenance work costs since last inspection: $ 0

Have all previously reported deficiencies been corrected? ○ Yes ◉ No (223)

Have accidents occurred on this structure since its last inspection? ○ Yes ◉ No (222)

BRIDGE SAFETY FEATURES

Bridge railing exists: ○ Yes ○ No

Bridge railing height: 0.91m

Bridge railing meets AASHTO standards: ◉ Yes ○ No

Bridge railing not to AASHTO standards remark:

Transition railing exists: ◉ Yes ○ No

The transition railing is firmly attached to both the bridge rails and the approach rails: ◉ Yes ○ No

The transition railing is gradually stiffened/stronger prior to the bridge rail attachment: ◉ Yes ○ No

All curb and sidewalk ends are either tapered or shielded by the transition rails: ◉ Yes ○ No

Pockets exist along the transition rail that create a hazard: ○ Yes ◉ No

Approach guardrail exists: ◉ Yes ○ No

Approach guardrail height: 0.71m

The approach guardrails are compatible with the constrution/shape of the transition rails: ◉ Yes ○ No

The approach guardrails have adequate length for current traffic speeds: ◉ Yes ○ No

The approach guardrails are effective in funneling traffic to the bridge lanes: ◉ Yes ○ No

The approach guardrails meet current AASHTO design criteria: ◉ Yes ○ No

The most appropriate description: Flared

Comments about the rail system's adequacy:

System is adequate for ADT and speed.

ESTIMATE IMPROVEMENT COSTS

Type of Estimate: Neither

Description:

Improvement Length: m (76)
(include one decimal place of precision)

Replacement

	COST ($1000)
Design/Construction Engineering	
Demolition	
Substructure (94)	
Superstructure (94)	
Approaches (95)	
Other	
TOTAL (96)	

Description of other replacement cost:

Rehabilitation

DEFICIENCY FIXED	COST ($1000)
TOTAL	

SUPERSTRUCTURE CONDITION

If no superstructure, as with a culvert, check and do not use this section. ☐

Item	Material	Condition Description	Deformation	Defects	Deterioration	Cracks	Rating
RAIL SYSTEM	C	Reinforced concrete Jersey barrier with vertical cracking at 0.3-0.6m intervals.				C	8
CURBS OR BARRIERS	C	Reinforced concrete Jersey barrier with vertical cracking at 0.3-0.6m intervals.				C	8
DECK OVERLAY	AS	Asphalt overlay 102mm thick.					7
DECK	C	Reinforced concrete with superficial transverse map cracks and efflorescense.				C	7
DRAINAGE SYSTEM	S	Through deck scuppers that are blocked.					6
EXPANSION JOINTS	N	None					N
STRINGERS OR GIRDERS	N	None					N
DIAPHRAGM	N	None					N
EXPANSION BEARINGS	N	None					N
FIXED BEARINGS	N	None					N

Deck Overlay Thickness: 102 mm

Deck Thickness: 305 mm

This structure has a continuous drainage system: ○ Yes ◉ No

When not continuous, the number of drainage systems is: 8

When not continuous, the sizes of drainage systems are: 102mm x 102mm

Expansion Joint Type: None

Expansion Joint Average Gap: mm

Expansion Joint Amount Movement: mm

Expansion Joint Inspection Temperature: deg F

Stringers or Girders Number of Members:

Stringers or Girders Spacing: m

Stringers or Girders Size of Each:

Expansion Bearings Amount Movement:

MATERIAL: Prestressed Concrete = PC; Concrete = C; Timber = T; Asphalt = AS; Aluminum = AL; Masonry = M; Dirt = D; Rock = R; Sand = S, Wire = W; Elastometric = EL; Other = O
DEFORMATION; Sheared = S; Permanent Deflection = D; Buckled = B; Bent = BN; Crushed = C; Ruptured = R; Traffic Damage = T
DETERIORATION: Decay = D; Insect Attack = I; Chemical Attack (Rust) = C; Uneven or Excessive Wear = W; Seasoning of Timber (Checks, Splits, Shakes) = S
CRACKS: Cracks in Concrete (Not Overstress) = C; Concrete Overstreass - Shear = CS; Concrete Overstress - Flexure = CF; Concrete Overstress - Compression = CC; Weld Crack = CW; Steel Crack - Fatigue or Other = SC

SUBSTRUCTURE CONDITION (60)

Abutments

Item	Material	Condition Description	Deformation	Defects	Deterioration	Cracks	Rating
ABUTMENT TYPE	C	Reinforced concrete full height abutments with superficial vertical cracks, spalls and exposed reba				C	7
MOVEMENT		None observed.					8
BACKWALL BEAM SEATS	C	Reinforced concrete backwall.				C	7
WINGWALL	C	45 degree reinforced concrete integral with backwall.					7
FOUNDATION		Not visible. No problems noted.					8

Abutment Type: Full Height Other Description:

Abutment Foundation Type: Other Other Description: Piling

Abutment Pile Type: Unknown Abutment Pile Size: Unknown

Abutment Spread Footing Size:

Abutment Bearing Material: Mix
(circle all that apply)

Piers

Item	Material	Condition Description	Deformation	Defects	Deterioration	Cracks	Rating
TYPE OF PIER(S)	C	4 column reinforced concrete bents with minor cracking and spalling.				C	6
PIER CAP	C	Reinforced concrete 41cm wide x 61cm deep cap with superficial cracks.				C	7
SHAFT BELOW PIER CAP	C	Reinforced concrete columns with minor cracks, spalls and delamination.					6
MOVEMENT		None observed.					8
FOUNDATION	C	Concrete piling with spalls, cracks and delamination.				C	6

Pier Foundation Type: Piers Other Description: Piling

Pier Piles Type: Concrete Pier Pile Size: 405mm x 405mm

Pier Spread Footing Size:

Pier Bearing Material: Mix
(circle all that apply)

CHANNEL (61) AND WATERWAY CONDITION (71)

Waterway

Item	Material	Condition Description	Rating
BRIDGE SLOPES BY ABUTMENTS	D	Bare dirt with moderate amounts of debris (timber and trash)	7
SLOPE PROTECTION		None provided.	N
WATERWAY ADEQUACY		Slight chance of overtopping bridge deck and approach roadway.	7

Approximate Bridge Slope Ratio: 2:1

Channel

Item	Material	Condition Description	Rating
DIKES		None	N
CHAN + BANK PROT	NV	Heavy vegetation and mature trees in dry channel.	7
CHANNEL ALIGNMENT		Straight at bridge aligned towards east side, curves 15 degrees west at 23m upstream and curves 15 degrees east at 25m downstream.	6

Has Scour or Erosion: ○ Yes ◉ No

Scour Location:

Estimated Maximum Scour Depth:

Estimated Scour Area:

Angle of Attack:

Attack Location: Right

PROFILE ELEVATIONS

Streambed cross-section measurements start at: 0.0m from the SE end of the bridge

The measurements where taken on: 11/1/2017 The reference elevation is: Top of barrier

Station (m)	0.0	1.5	3.1	4.6	6.1	7.6	9.1	10.7	12.2	13.7	15.2	16.8	18.3	19.8	21.3
Vertical (m)	3.1	3.0	3.3	3.4	3.5	3.5	3.6	3.7	4.2	4.5	3.7	4.1	4.1	4.1	4.0

Station (m)															
Vertical (m)															

These elevations have been used to create an updated profile that has been stored in a scanned image. ◉ Yes ○ No

A revised Load Rating Analysis is required: ○ Yes ◉ No

Comments about bridge load capacity deterioration: No change in condition to warrant analysis.

I. LOAD LIMITING (CRITICAL) MEMBER(S) BEING RATED:

Beam(s), Girder(s), Deck(s), Other:

Location of this Member(s):

Size of this Member and % Reduced (if applicable):

Condition of this Member:

II. BRIDGE HS TRUCK LOAD CAPACITY AND HS RATING:

OPERATING LEVEL		INVENTORY LEVEL	
Gross Weight of HS Truck:	49	Gross Weight of HS Truck:	36
HS Rating:	HS-27	HS Rating:	HS-20

(HS Rating = HS Load x 0.556)

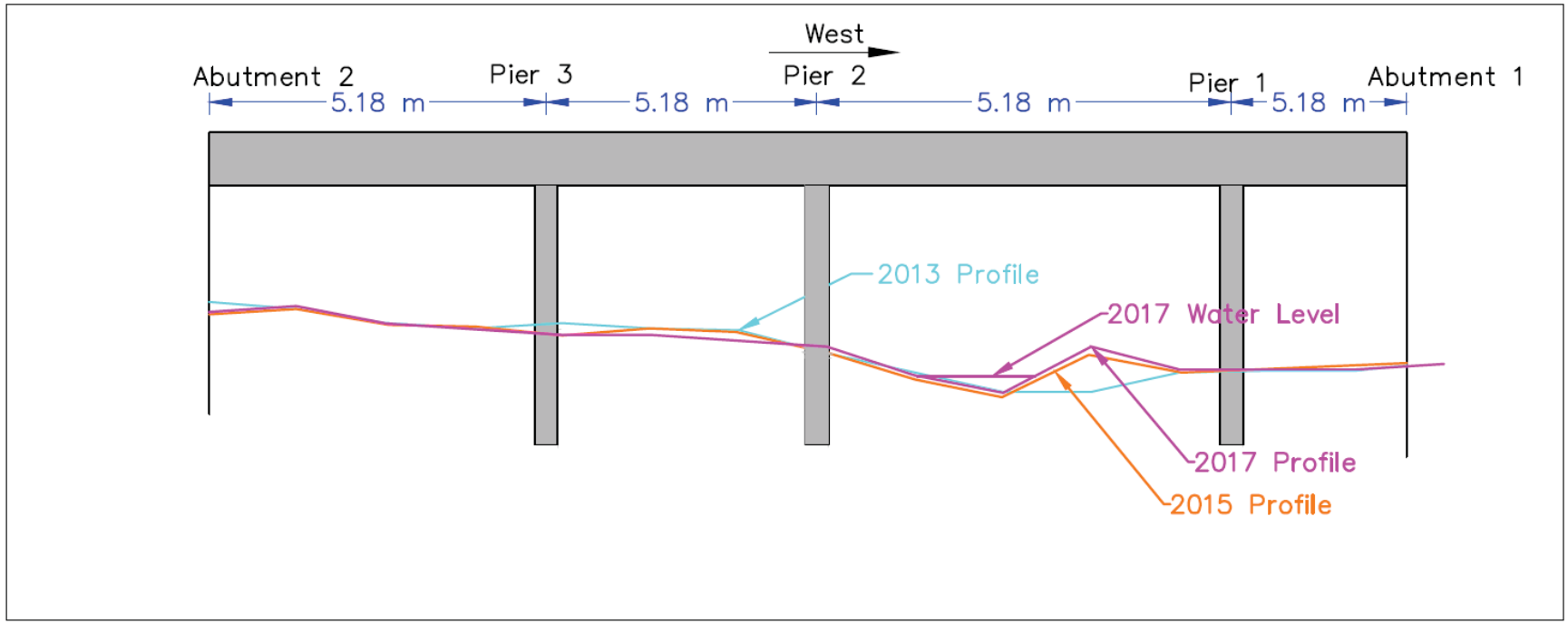
III: REQUIRED SIGNS:

No required signs.

IV: REMARKS:

PE Stamp

Quality Review Signature Date: 3/15/2018
Contractor's Quality Review Signature: Brian O Hutchinson
PE Signature Date: 3/15/2018
PE Signature: Joshua R. Schroeder



A028 CHANNEL PROFILE

View of bridge looking west

View South Through Bridge Looking Upstream

View North Through Bridge Looking Downstream

Missing bolt in guardrail

Channel Debris

Cracking on S abutment

Exposed reinforcement on north end of east abutment

Bottom of slab water damage from drains

Typical pier column condition

Pier cap cracking

Hole in Beam

Surface finish peeling on bridge rail

Cracks on guardrail

Asphalt overlay failing.