Ohio Bridge Inspection Summary Report — CUY-00176-1334 (1805436)

2: District	12	16000 - CLEVELAND (CUY county)
21: Major Maint A/B	01 - State Highway Agency	/
225 Routine Main A/B	01 - State Highway Agency	/
221 Inspection A/B	01 - State Highway Agency	/
220: Inv. Location	DISTRICT 12	

5A: Inventory Route	1	00176
7: Facility On	SR 176 NB	
6: Feature Ints	IR-71NB (CUY-71-1791R)	
9: Location	APPROX 1 MI S I-90	
Lat, Lon	41.461319	,-81.693992

Condition

58: Deck	**5 - Fair Condition**
58.01 Wearing Surface	6 - Satisfactory (1-10% distress)
58.02 Joint	4- Poor (heavy leaking, offset)
59: Superstructure	**5 - Fair Condition**
59.01 Paint & PCS	7 - Good (1-5% corr.)
60: Substructure	**6 - Satisfactory Condition**
61: Channel	**N**
61.01 Scour	**N - Not Applicable**
62: Culverts	**N - Not Applicable**
67.01 GA	**5**

Appraisal

Sufficiency Rating	77.6	SD/FO	0 - ND	
36: Rail, Tr, Gd, Term Std	1	1	1	1
72: Approach Alignment	8 - Equal to present desirable criteria			
113: Scour Critical	N - Not over waterway			
71: Waterway Adequacy	N - Not Applicable			

Geometric

48: Max Span Length (ft)	79.0
49: Structure Length (ft)	1073.0
52: Deck Width, Out-To-Out (ft)	54.0
424: Deck Area (sf)	57942
32: Appr Roadway Width (ft)	50.0
51: Road Width, Curb-Curb (ft)	50.0
50A: Curb/SW Width: Left (ft)	0
50A: Curb/SW Width: Right (ft)	0
34: Skew (deg)	0
33: Bridge Median	0 - No median
54B: Min Vert Underclearance (ft)	16.25
336A: Min Vert Clrnce IR Cardinal (ft)	99
336B: Min V Clr IR Non-Cardinal (ft)	0
578: Culvert Length (ft)	0

Load Posting

41: Op/Post/Closed	A - Open
70: Posting	5 - Equal to or above legal loads
70.01: Date	
70.02: Sign Type	
734: Percent Legal (%)	150
704: Analysis Date	07/01/2013
63: Analysis Method	6 - Load Factor (LF) rating reported by rating factor (RF) method using MS18 loading.

Structure Type

43: Bridge Type	4 - Steel continuous
	02 - Stringer/Multi-beam or Girder
	N- Not Applicable
45: Spans Main / Approach	18 / 0
107: Deck Type	1 - Concrete Cast-in-Place
408: Composite Deck	N - Non-composite Construction
414A Joint Type 1	8 - Elastomeric Strip Seal
414B: Joint Type 2	N - None
108A: Wearing Surface	1 - Monolithic Concrete (concurrently placed with structural deck)
	N- Not Applicable
422: WS Date	
423: WS Thick (in)	1.2
482: Protective Coating	0 - Other Paint
483: PCS Date	01/01/1991
453: Bearing Type 1	2 - Rockers & Bolsters
455: Bearing Type 2	N - None
528: Foundn: Abut Fwd	1 - Steel H Piles (Other size)
533: Foundn: Abut Rear	1 - Steel H Piles (Other Size)
536: Foundn: Pier 1	1 - Steel H Piles (Other size)
539: Foundn: Pier 2	0 - Other

Age and Service

27: Year Built/ 106 Rehab	1968 / 0000
42A: Service On	1 - Highway
42B: Service Under	0 - Other
28A: Lanes on	03
28B: Lanes Under	00
19: Bypass Length	1
29: ADT	75259
109: % Trucks (%)	3

Inspections

		Months	
90: Routine Insp.		12	09/07/2021
92A: FCM Insp.	N	24	
92B: Dive Insp.	N	0	
92C: Special Insp.	N	0	
92D: UBIT Insp.	Y	24	05/08/2020
92E: Drone Insp.			

Inspector Banaszak,Ken

Inspector: Ken Banaszak **Structure Number:** 1805436

Inspection Date: 09/07/2021 **Facility Carried:** SR 176 NB

Bridge Inspection Report

Element Inspection

	Environment	Total Quantity	Units	Condition State 1	Condition State 2	Condition State 3	Condition State 4
12 - Reinforced Concrete Deck	3 - Mod.	67032	sq. ft.	42482	23100	1230	220
	Note; Deck is rated a "5" because of ramp issues. CS2 - Cracks, some leaching, Some mottled areas. CS3 - Spalls and delams. The off ramp is worst for these issues. CS4 - Spalled areas with 360 degree rebar exposer where there are 4 or more rebars exposed. Off ramp is worst for these issues.						
805 - Wearing Surface - Monolithic Concrete		68951	sq. ft.	57763	10641	257	290
	CS2 - All kinds of cracks, map, transverse and longitudinal. CS3 - Spalled and delam areas, mostly to lane #2 mainline and areas of the off ramp. CS4 - Asphalt patches some are large.						
107 - Steel Open Girder/Beam	3 - Mod.	11371	ft.	10914	450	7	0
	CS2 - Areas of pitting or section loss, mostly at beam ends at the abuts and hinges. CS3 - heavier rusting section loss to some hinge areas.						
515 - Steel Protective Coating		127657	sq. ft.	118595	8457	580	25
	CS2 - Faded or light rust areas. CS3 - Areas that show heavier rusting. CS4 - Minor rusted areas where paint has completely failed.						
205 - Reinforced Concrete Column	3 - Mod.	47	each	43	1	3	0
	CS2 - P6C2 spalls and delams <10SF. CS3 - P4C2, P7C2, P8C2 spalls and delams >10SF.						
210 - Reinforced Concrete Pier Wall	3 - Mod.	157	ft.	142	15	0	0
	CS2 - Cracks, mostly vertical.						
215 - Reinforced Concrete Abutment	3 - Mod.	126	ft.	69	35	22	0
	CS2 - Cracks, mostly vertical. CS3 - Spalls and delams.						
234 - Reinforced Concrete Pier Cap	3 - Mod.	771	ft.	514	90	147	20
	CS2 - Cracks. CS3 - Spall and delams. CS4 - Spalls with 360 degree rebars exposed. P6 has some broken stirrups.						
300 - Strip Seal Expansion Joint	3 - Mod.	267	ft.	0	199	45	23
	CS2 - Areas of dirt in joint. Some rusting to areas. CS3 - Areas of seal bulging up into traffic. Some gouges. CS4 - Joint leaks at several areas.						
311 - Movable Bearing	3 - Mod.	121	each	64	48	9	0
	CS2 - Some bearing have start of rusting section loss and pack rust starting in between the rocker and masonry plate. CS3 - Some bearings do not agree with ambient temp averaging between 68 and 72 degrees.						

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Bridge Inspection Report

Element Inspection

313 - Fixed Bearing	3 - Mod.	33	each	23	10	0	0
	CS2- Areas of rusting section loss, mostly to fascia bearings.						
321 - Reinforced Concrete Approach Slab	3 - Mod.	2259	sq. ft.	2161	20	78	0
	Note; Approach slabs are asphalt paved over. CS2 - based on the asphalt, cracks near the expansion joints. CS3 - Asphalt patches near exjoints.						
331 - Reinforced Concrete Bridge Railing	3 - Mod.	3838	ft.	2583	729	526	0
	CS2 - Many cracks, most are vertical. CS3 - Spalled or delam areas.						
815 - Drainage	3 - Mod.	18	each	1	12	0	5
	Note; some downspouts below deck have areas of rusting section loss or rusted thru holes. Rating is based off of the scupper at wearing surface. CS2 - most scuppers are partially plugged with dirt. CS4 - a few scuppers are completely plugged.						
820 - Steel Seated-Hinge Assembly	3 - Mod.	21	each	1	19	1	0
	CS2 - Most hinges have areas of rusting section loss. CS3 - Hinge at exjoint 2BW has hinge tooth chipped.						
830 - Abutment Backwall	3 - Mod.	126	ft.	86	30	10	0
	CS2 -Cracks. CS3 - A few spalls and delams.						

Inspector Comments - Deck and Approach

Deck

Floor/Slab

The floor exhibits widespread transverse cracking, some with efflorescence. Full Width x 2' L spalling along joints headers were noted over Pier 13. Other areas of spalling were noted between beams. In Unit 4BE, widespread areas of poor consolidation, some with efflorescence are common. Some areas have exposed reinforcement chairs, others have exposed reinforcement. In span 21BE, the floor exhibits a 16'x12' deep spall with 27 exposed and deteriorated rebar located south of Pier 21BE. In span 27BE, the concrete floor exhibits is a large 20'x8' damp area.

Edge of Floor/Slab

The edge of the floor typically exhibits spalling at the expansion joints. Poor consolidation noted along the floor also expands out towards the edge the floor as well.

Bridge Wearing Surface

The wearing surface is in overall good condition. A few small potholes were noted at random locations. In span 19BW, there are multiple areas of abrasion on the wearing surface. In span 24BE, there is a 3'x8' partial patch with map cracks and settlement.

Expansion Joint

At all of the expansion joints, the metal is rusting and the joints are completely filled with debris for most of the joint on the shoulders. At Expansion Joint 1B, the joint seal is broken and coming out of the joint on the left shoulder. At Expansion Joint 2BW, the seal is coming out of the joint on both shoulders and cars driving in the right lane make a sound when driving over the joint. At Expansion Joint 2BE, the joint seal is broken and coming out of the joint on the left side and the metal is sticking above the wearing surface on the left side. At Expansion Joint 3BE, the entire joint seal is wavy.

Bridge Railing

Longitudinal, vertical, and areas of map cracking are common throughout the entire length of the bridge parapets. Discoloration along the cracks is evidence of water infiltration into the concrete parapet. At some of the joints, spalling at the bottom portions of the parapet were noted.

Deck Drainage

Most scupper grates on the bridge are 25-75% filled with dirt and debris, but the downspouts are visible and are not clogged. There are a total of 5 clogged scuppers with grates that are completely filled with dirt and debris and are located on the right side of spans 8, 14, and 16. Multiple scupper downspouts exhibit minor section loss and are located on the right side of spans 14 and 25BE and the left side of span 27BE. There are scuppers with downspouts missing on the left side of span 19BW and the right side of span 25BE.

Signs

A small director sign is mounted on the east side of the east parapet on the north side of Pier 12. One exit sign is mounted within the divide of the West 14th Street exit. In Unit 3BE, there are roundabout warning signs mounted on the parapets. In Unit 4BE, there are yield warning signs mounted on the parapets. The

existing overhead signs are mounted to pier caps supporting the overhead bridge CUY-71-1791.

Sign Supports

No deficiencies were noted along the sign mounts.

Utilities

The conduit running along the bridge runs up the columns for I-71 (CUY-71-1791) to provide lighting along Jennings Highway. Multiple lights were not working during the inspection. Due to spalling along the columns for I-71 (CUY-71-1791) the conduit has become detached.

Approach

Approach Wearing Surface

The north approach for ramp BE exhibits longitudinal cracking along the pavement seams. Bituminous patch work along the steel joint header were also noted. Along the right shoulder, a 5' W x 3' L area of dense map cracking is evidence of minor settlement. The north approach for BW appears to be fairly new bituminous with minor cracks and minor debris accumulations along the shoulders. At the joint header, a 1' W x 1' L x 4" D pothole exists in the right wheel path of the right lane. Also, a 2' L x 2' W patch exists in the left wheel path. In the left lane, a 4' L x 2' W patch exists in the left wheel path, just north of the joint. The south approach wearing surface has a 3' W x 1' L depressed area along the joint header.

Approach Slab

The approach slabs are covered in a bituminous wearing surface and therefore not visible. The deterioration in the wearing surface is assumed to be reflected into the concrete approach slabs. The north approach slab BW has map cracks along the entire expansion joint, a large patch, and a wide crack on the left shoulder. The north approach slab BE has wide map cracks on the right shoulder and the middle lane line, minor map cracks in the right lane, and a 2'x6'x4" deep pothole near the left edge line.

Approach Relief Joint

The approach relief joints are covered in a bituminous wearing surface and therefore not visible. Any deterioration in the wearing surface is assumed to be reflected into the approach relief joints. The north approach BE relief joint has minor potholes in the left lane.

Approach Embankment

The south embankment is fairly level on the west side, and steep on the east. Both are in good condition. At the North Abutment BW, the embankment is fairly level and in good condition. At the North Abutment BE, the west side is moderately level, and the east side is steep but well vegetated.

Approach Guardrail

The guardrails are in overall good condition. There is no guardrail on the northwest of the BE approach due to slow speeds and right hand turns only into the roundabout.

Inspector Comments - General Appraisal

Superstructure

Superstructure Alignment

The alignment of the primary superstructure members is Good. The superstructure elements were aligned as intended at the time of inspection.

Beams/Girders

Steel beams typically exhibit freckling and surface corrosion at random. Due to failed expansion joints and improper drainage, the beam ends below exhibit more significant corrosion and section loss. In span 13, there is bottom flange deterioration on beam 7. In spans 18BW and 19BW, beam 6 exhibits minor section loss on each side of Expansion Joint 2BW. In span 24BE, there is minor section loss on all four beams for 2' on both sides of Expansion Joint 3BE.

Fatigue

Other fatigue prone details are the welded cover plate ends along the beam bottom flanges. No significant deficiencies were noted at these locations. No significant deficiencies were noted along the bolted splice connections.

Protective Coating System

Freckling corrosion is prevalent throughout the beams and steel pier caps. Below the leaking joints, beams exhibit increasing deterioration of the protective coating system. Overspray from past painting is evident along the concrete soffit.

Diaphragms/X-Frames

Steel cross diaphragms between the steel beams exhibit light surface corrosion. Due to failed deck joints and improper drainage, the cross frames below exhibit more significant corrosion and section loss. Bottom bracing struts in spans 13, 18BW, 18BE, 19BW, and 24BE were noted to have holes or become detached due to section loss.

Bearing Devices

The steel fixed and rocker bearings atop the concrete piers are in overall good condition. Multiple bearing measurements did not agree with the ambient temperature averaging around 68 to 72 degrees Fahrenheit. Other bearings exhibited significant rotation, almost beyond the limits of expansion. The fascia bearings typically exhibit the heaviest corrosion and deterioration. Pack rust at multiple bearings, including at the North Abutment BW, is limiting the movement of the bearings.

Pins/Hangers/Hinges

Due to failed joint material and debris filled troughs, the hinges are constantly exposed to water and deicers. Some of the rolling hinge bearings exhibit excessive rotation compared to the ambient temperature at the time of the inspection. At Expansion Joint 2BW, the bottom hinge tooth is chipped.

Substructure

Note: Piers 7,8 & 9 have pier walls, pier caps & pier columns.

Pier Columns/Bents

The reinforce concrete pier column exhibit cracking, or delamination and spalled areas. The north face of the east column at Pier 11 has a combination of delaminated and spalling concrete along the full length. Pier 13, 14, and 16 have similar spalling with exposed stirrups. The east column at Pier 15 is spalled at the top 10' H x 6' W x up to 4" D with exposed reinforcing. This deterioration was noted on the north and south faces.

Pier Walls

The reinforced concrete pier walls exhibit widespread cracking, spalls, and delaminations. Pier 14 has three diagonal cracks that cover the full length of the south face of the wall. These same cracks are reflected onto the north face as well. Piers 15 and 16 exhibited similar diagonal cracks. Pier 15 also has a full length longitudinal crack along the interface of the wall and the top cap.

Abutment Walls

The South Abutment has a couple of minor spalls and is rust stained from the expansion joint. The North Abutment BW wall has a large 6’ L x 2’ H x 4” D spall below bay 1 and longitudinal cracks that are wider near the middle bays. The North Abutment BE has a few superficial spalls and vertical cracks is rust stained from the expansion joint. All three abutments have minor to significant debris on the beam seats.

Pier Caps

The reinforced concrete pier caps typically exhibit spalling along the ends and above the reinforced concrete columns. Pier 8 has spalling on both ends and also has vertical cracking along the mid-span. Very similar spalling and cracking was noted along Pier 9. At Pier 11, cracking along the south face appears to be mirrored onto the north face. On the south face of Pier 13, the full height of the end is spalled with exposed reinforcing. The spalling continues under the cap and up the north face as well. Pier 18BW has map cracks and deep delamination.

Backwalls

The North Abutment BW backwall has multiple vertical cracks with associated diagonal cracking up to 1/8” wide. Both North Abutment backwalls exhibit staining and discoloration due to the leaking/failing expansion joint above. The South Abutment backwall has minor vertical cracks. The erosion ditch below the east corner of the abutment does not appear to be affecting the foundation at this time.

Wingwalls

No significant deficiencies were noted during the inspection.

Slope Protection

The slope protection at the north abutments are in overall good condition. The South Abutment slope protection is in good for the most part aside from below the east corner is a 10'W x 5' deep erosion rut.

Culvert

Inspector Comments - Waterway

Waterway Adequacy

Channel

Scour Critical

Pictures