Ohio Bridge Inspection Summary Report — CUY-00071-1791R_(1805371)

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 CUY

5A: Inventory Route 1 00071
7: Facility On IR 71 N.B.
6: Feature Ints SR 176(1328)JENNINGS FWY
9: Location .40 MI. N. OF JCT. US-42

Condition

58: Deck	**7 - Good 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

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)	121.0
49: Structure Length (ft)	1811.0
52: Deck Width, Out-To-Out (ft)	64.0
424: Deck Area (sf)	115904.0
32: Appr Roadway Width (ft)	62.0
51: Road Width, Curb-Curb (ft)	62.0
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)	14.5
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	07/01/2011
63: Analysis Method	7 - Allowable Stress (AS) 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	28 / 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	2 - Integral Concrete (separate non-modified layer of concrete added to structural deck) 2- MicroSilica
422: WS Date	07/01/2017
423: WS Thick (in)	2.75
482: Protective Coating	5 - Paint System OZEU
483: PCS Date	01/01/1991
453: Bearing Type 1	2 - Rockers & Bolsters
455: Bearing Type 2	N - None
528: Foundn: Abut Fwd	2 - Cast-in-Place Reinforced Concrete Piles (Other diameter)
533: Foundn: Abut Rear	2 - Cast-in-Place reinforced Concrete Piles (Other diameter)
536: Foundn: Pier 1	2 - Cast-in-Place Reinforced Concrete Piles (Other diameter)
539: Foundn: Pier 2	0 - Other

Age and Service

27: Year Built/ 106 Rehab	1969 / 0000
42A: Service On	6 - Overpass structure at an interchange or second level of a multilevel interchange
42B: Service Under	1 - Highway, with or w/out pedestrian
28A: Lanes on	03
28B: Lanes Under	03
19: Bypass Length	1
29: ADT	36593
109: % Trucks (%)	3

Inspections

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

Inspector Miller,Jeff

Inspector: Jeff Miller

Structure Number: 1805371

Inspection Date: 05/08/2020

Facility Carried: IR 71 N.B.

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.	116611	sq. ft.	113663	2438	510	0
510 - Wearing Surfaces		118915	sq. ft.	56305	62553	57	0
107 - Steel Open Girder/Beam	3 - Mod.	18835	ft.	17080	1755	0	0
515 - Steel Protective Coating		233929	sq. ft.	192903	21701	19312	13
205 - Reinforced Concrete Column	3 - Mod.	59	each	46	7	6	0
215 - Reinforced Concrete Abutment	3 - Mod.	171	ft.	164	7	0	0
231 - Steel Pier Cap	3 - Mod.	322	ft.	304	18	0	0
234 - Reinforced Concrete Pier Cap	3 - Mod.	1145	ft.	741	125	279	0
300 - Strip Seal Expansion Joint	3 - Mod.	374	ft.	0	265	101	8
311 - Movable Bearing	3 - Mod.	207	each	104	92	11	0
321 - Reinforced Concrete Approach Slab	3 - Mod.	3181	sq. ft.	2646	124	411	0
331 - Reinforced Concrete Bridge Railing	3 - Mod.	4606	ft.	2803	626	1177	0
815 - Drainage	3 - Mod.	39	each	9	27	3	0
820 - Steel Seated-Hinge Assembly	3 - Mod.	30	each	9	17	4	0
830 - Abutment Backwall	3 - Mod.	171	ft.	155	6	10	0

ODOT District:	12	**CUY-00071-1791R_(1805371)**				Date Built:	07/01/1969
Major Maint:	01 - State Highway Agency	Facility Carried:	IR 71 N.B.	Traffic On:	6 - Overpass structure at an interchange or second level of a multilevel interchange	Rehab Date:	
Routine Maint:	01 - State Highway Agency	Feature Inters:	SR 176(1328)JENNINGS FWY	Traffic Under:	1 - Highway, with or w/out pedestrian	Insp. Resp A:	01 - State Highway Agency
FIPS Code:	16000 - CLEVELAND (CUY county)	Location:	CUY .40 MI. N. OF JCT. US-42			Insp Resp B:	
Inspector	Miller,Jeff	Inspection Date	05/08/2020 12:00:00 AM	Reviewer	Lawler,Matthew		

Inspector Comments - Deck and Approach

Deck

Floor/Slab (SF)

Transverse cracking between beams, with and without efflorescence, is typical throughout most spans. A few locations, including spans 9 and 20AW, exhibit large spalls, up to 3-inches deep with exposed reinforcement. In Span 18 over Pier 17, 3’ W x 2’L x 6” D haunch spalling was noted.

Edge of Floor/Slab (LF)

The majority of the edge of floor is in good condition. Deep corner spalls are typical at joint locations.

Bridge Wearing Surface (SF)

Hairline map cracking is typical throughout most spans. In span 11, the wearing surface has a 6’x6’ pothole. On ramp AE, there are three 1’x1’ potholes that are 1”-2” deep.

Expansion Joint (LF)

Joint exhibit numerous areas of leakage based on the condition of the steel below. At all of the expansion joints, the metal is rusting and the joints are completely filled for most of the joint on the shoulders. At all of the expansion joints, except South Abutment A, the deck on the south side of the joint was higher than the deck on the north side of the joint at the time of the inspection. At Expansion Joint 1A, there is minor joint armor section loss below the deck at the ends of the joint. At Expansion Joint 2A, there are two locations where the seal is broken and is coming out of the joint and the trough fell down on the left side.

Bridge Railing (LF)

The reinforced concrete parapet exhibits vertical cracking with efflorescence and rust staining along the majority of the structure. Longitudinal cracking, along the lower chamfer is also common. At deck joints, spalls up to 6" D were noted. There is a deep railing spall on the right side of span 22AE. Due to freeze/thaw cycles, the added top portion of the parapet exhibits spalling along the outboard faces along almost the entire length. In areas that cross over traffic below, loose and suspect portions of the parapet have been removed.

Deck Drainage (EA)

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 two clogged scuppers with grates that are completely filled with dirt and debris on the right side of span 14 and one clogged scupper on the right side of span 19AE. Multiple scupper downspouts exhibit minor section loss and are located on both sides of span 1 and on the left side of span 22AW. The steel V-channel toughs below the expansion joints are typically full of water and debris. Due to the lack of drainage, the joints are leaking onto the steel superstructure below.

Signs (EA)

No deficiencies were noted for the signs.

Sign Supports (EA)

Corrosion is prevalent along the connection hardware at the bases of the overhead sign posts.

Utilities (LF)

Conduit secured to the columns for lighting of Jennings highway. Multiple locations exhibit loose/disconnected conduit. Other locations exhibited extinguished lights. The utility conduit is broken at Expansion Joints 2A and 3AE of the right railing.

Approach

Approach Wearing Surface (EA)

The south approach wearing surface exhibits map cracking along the centerlines of the lanes. Minor rutting with associated map cracking was noted in the wheel paths at the north approach AE.

Approach Slab (SF)

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 south approach slab has map cracks and wide cracks mainly near the expansion joint. The north approach slab AE has map cracks along the entire expansion joint and on the east half of the slab.

Approach Relief Joint (LF)

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, but no deterioration was noted.

Approach Embankment (EA)

The south embankment is steep, but in good condition. Roadway debris has accumulated along side of the wingwalls. The concrete slope protection is acting as intended. At the North Abutment AW, the embankment is supported by MSE walls. At the North Abutment AE, the Northwest embankment is also supported by an MSE wall. The northeast embankment is fairly flat except for in front of the wingwall.

Approach Guardrail (EA)

The impact attenuator at the fork in the ramp is in good condition but is missing the reflective shielding. The southeast approach parapet exhibits multiple impact scrapes along the inboard face. At the south approach, the east guardrail has impact damage approximately 15’ from the end of the bridge.

Inspector Comments - General Appraisal

Superstructure

Superstructure Alignment (EA)

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

Beams/Girders (LF)

Steel beams typically exhibit freckling and surface corrosion at random locations. Due to failed deck joints and improper drainage, the beam ends below exhibit more significant corrosion and section loss.In span 1, there is minor section loss on the exterior beams near the south abutment. In span 6, beams 4-8 exhibit minor bottom flange deterioration. In span 16, beam 5 is missing a fill plate on the bottom flange beam splice. In span 17, beam 1 has pack rust on the bottom flange splice plate.

Fatigue (LF)

The most significant fatigue prone details are the fracture critical pier cap at Pier 17 as well as the steel pier caps at Piers 18AE through 22AE. Dog bone retrofits have been implemented at the bottom edges of the lateral gusset plate for the lateral bracing. Due to the offset of the beams on either side of the pier cap, the retrofits do not line up. An average of ten retrofits exist on each of the steel pier caps. No cracking was during the inspection. No significant deficiencies were noted at the welded cover plate ends along the beam bottom flanges. Bolted splice connections also exist along the spans. No significant deficiencies were noted along these splices.

Protective Coating System (SF)

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 (EA)

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 11 and 18AW were noted to have holes or become detached due to section loss. Steel diaphragms exist when new beams are introduced in Spans 14, 15, 16 and 21AE due to widening of the deck. Diaphragms are typically in good condition with minimal surface corrosion.

Lateral Bracing (EA)

The lateral bracing at Piers 18AE through 22AE exist on either sides of the fracture critical pier caps. A few loose bolts were noted at the connections. Overall, the lateral bracing is in good condition.

Bearing Devices (EA)

The steel fixed and rocker bearings atop the concrete piers are in overall fair condition. Multiple bearing measurements did not agree with the ambient temperature averaging around 32 degrees Fahrenheit. Other bearings exhibited significant rotation, almost beyond the limits of expansion. The fascia bearings typically exhibit the heaviest corrosion and deterioration. The bearing for Beam G at the North Abutment AE is covered in gravel and debris and most likely prohibited from moving. The nested rockers below the steel box pier cap are in fair condition. Flaking paint and surface corrosion is prevalent along the bearing and masonry plates.

Pins/Hangers/Hinges (EA)

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 2A, there is a bolt sheared off at the hinge on beam 2.

Substructure

Pier Columns/Bents (EA)

The pier columns are in overall fair condition with the majority of the deficiencies noted within the splash zone. Evidence of past repairs on some columns were noted as well as new deterioration of the patched areas. Both columns of Pier 13 exhibited widespread delaminations and spalls within the splash zone and behind the parapet. Multiple deep spalls with deteriorated rebar are also located on the columns of Piers 14-16.

Abutment Walls (LF)

The South Abutment wall has five vertical cracks between the bearing pedestals. The North Abutment AW wall exhibits widespread cracking with shallow edge spalls and peeling epoxy-urethane sealer.

Pier Caps (LF)

The reinforced concrete pier caps are in over all good condition. Some hairline cracking with light discoloration was noted on multiple caps. Areas of maps cracking and associated spalling were also common along the pier caps. Certain areas of the pier caps were noted to have been wrapped in FRP. The FRP appears to be in good condition and acting as intended. There are cracks and spalls located on the bearing pedestals for beam 3 on Pier 10, beam 2 on Pier 12, and beam 3 on Pier 14. The bearing pedestal of beam 3 on Pier 11 is undermined 1" deep x 2" under x 5" wide. The bearing pedestal of beam 5 on Pier 15 is undermined by a 1" deep x 1.5" under x 15" long depression. Piers 6, 7, 11, and 14 have large spalls with deteriorated rebar or map cracks. The interior of the steel box pier cap was inspected on May 30 in accordance with FHWA requirements. The exterior of the steel box pier cap exhibited areas of peeling and flaking paint. No cracks were noted at the intersection of the steel beams with the webs of the cap. The fracture critical steel pier caps at Piers 18-22 are in over all good condition.

Backwalls (LF)

The south abutment backwall exhibits minor spalls and a rust stain in bay 4. The North Abutment AW backwall exhibits full length staining from joint leakage, minor vertical cracks, and a patch near the left end with foam board still present. The North Abutment AE is in good condition with minor rust staining along the backwall due to the leaking deck joint above.

Wingwalls (EA)

The wingwalls at the south abutment and the North Abutment AE exhibited no significant deficiencies. At the North Abutment AW, the northwest wingwall exhibited a 1-1/2' H x 1-1/2' W x 3" D spall at the cheekwall interface. The Northeast wingwall continues into a MSE wall.

Slope Protection (EA)

The slope in front of the South Abutment is covered with an erosion control concrete blanket. At each corner of the abutment, splash pads exist underneath the deck drains. The slope protection at the North Abutment AW consists of large splash pads beneath the deck drains. Both pads are heaped with roadway debris and do not efficiently direct runoff. The slope protection at the North Abutment AE consists of stone and random riprap. The slope is steep here but does not appear to experience much runoff from the roadway above.

Culvert

Inspector Comments - Waterway

Waterway Adequacy

Channel

Scour Critical