STATE OF OHIO DEPARTMENT OF TRANSPORTATION
BRIDGE INSPECTION FIELD REPORT

Structure File Number: 1800930 Inventory Bridge Number: CUY 00006 14.560 Bridge Type: 3 - STEEL/5 - ARCH/4 - THRU

Sufficiency Rating: 65.2 Date Built: 7/1/1917

District: 12 Place Code (FIPS): CLEVELAND USR 6 over CUY. RIVER & RTA Type of Service on: HIGHWAY-PEDESTRIAN

APPROACH ITEMS

	QTY.	condition state 1	2	3	4	cr TR
c1. Approach Wearing Surface (EA)	2	0	2			2.00
c2. Approach Slabs (SF)						
c3. Relief Joint (LF)	168	168				1.00
c4. Embankment (EA) d	4	3		1		2.50
c5. Guardrail (EA)	4	3	1			1.33

N36. Safety Features: Tr, Gr, Tm

36)B N 36)C 1 36)D 0

c6. Approach Summary (9-0) 6

DECK ITEMS

	QTY.	condition state 1	2	3	4	cr TR
c7.1 Floor/Slab (SF)	332900	300988	30962	950		1.18
c7.2 Edge of Floor/Slab (LF)	5312	5312				1.00
c8. Wearing Surface (SF)	191232	186717	2785	1730	0	1.17
c9. Curb/Sidewalk/Walkway (LF)	5312.00	3872	1062	378		1.95
c10. Median (LF)	674	635	39		0	1.08
c11. Railing (LF)	5312	5308	4	0		1.00

N36. Safety Features: Rail

36)A 1

c12. Drainage (EA) d	28	22	1	1	4	3.25
c13. Expansion Joint (LF) d	2579	1	2538	40		2.09

N58. Deck Summary (9-0) 6

SUPERSTRUCTURE ITEMS

	QTY.	condition state 1	2	3	4	cr TR
c14. Alignment (EA) d	40	40				1.00
c15.1 Beams/Girders (LF)	7394	3698	1848	1848		2.56
c15.2 Slab (SF)						
c16. Diaphragm/X-Frames (EA)	0.00	0				
c17. Stringers (LF)	10638	10615	1	2	20	1.10
c18. Floorbeams (LF)	37468	139211	16547	7000		2.48
c19. Truss Verticals (EA)	50	38	12			1.32
c20. Truss Diagonals (EA)	268	253	4	11		1.57
c21. Truss Upper Chord (EA)	48	47			1	1.83
c22. Truss Lower Chord (EA)	48	36	12			1.33
c23. Truss Gusset Plate (EA) d	104	75	25	4		1.74
c24. Lateral Bracing (EA)	36	30		6		2.29
c25. Sway Bracing (EA)	28	21	2	5		2.35
c26. Bearing Devices (EA) d	4	0	4			2.00
c27. Arch (LF)	8040	6540	1475	25		1.30
c28. Arch Column/Hanger (EA)	747	672	50	25		1.54
c29. Arch Spandrel Walls (LF)						
c30. Prot. Coating System (LF) d	14469	128691	1200	400		1.49
c31. Pins/Hangers/Hinges (EA) d	30	28	2			1.10
c32. Fatigue (LF) d	14469.0	14469				1.00

N59. Superstructure Summary (9-0) 5

SUBSTRUCTURE ITEMS

	QTY.	condition state 1	2	3	4	cr TR
c33. Abutment Walls (LF)	3459.0	1689	1600	170		1.97
c34. Abutment Caps (LF)	0	0				
c35. Abut. Columns/Bents (EA)	0.00	0				
c36. Pier Walls (LF)	200	100	50	50		2.56
c37. Pier Caps (LF)	1022.00	0	1022.00			2.00
c38. Pier Columns/Bents (EA)	40	25	5	10		2.53
c39. Backwalls (LF)	263	263	0			1.00
c40. Wingwalls (EA)	12	0	0	12		3.00
c42. Scour (EA) d	2	2	0			1.00
c43. Slope Protection (EA) d	2	2	0.00			1.00

N60. Substructure Summary (9-0) 6

CULVERT ITEMS

	QTY.	condition state 1	2	3	4	cr TR
c44. General (LF)						
c45. Alignment (LF) d						
c46. Shape (LF) d						
c47. Seams (LF) d						
c48. Headwall/Endwall (LF)						
c49. Scour (LF) d						
c50. Abutments (LF)						

N62. Culvert Summary (9-0) N

CHANNEL ITEMS

	QTY.	condition state 1	2	3	4	cr TR
c51. Alignment (LF) d	200.00	200.00	.0			2.00
c52. Protection (LF) d	200.00		200.00			2.00
c53. Hydraulic Opening (EA) d	1	1				1.00
c54. Navigation Lights (EA) d	0.00	0	6			2.00

N61. Channel Summary (9-0) 6

SIGN/UTILITY ITEMS

	QTY.	condition state 1	2	3	4	cr TR
c55. Signs (EA) d	0.00	0	0.00	0.00		
c56. Sign Supports (EA) d	4	4	0.00			1.00
c57. Utilities (LF) d	4553	0	4553	0.00		2.00

General Appraisal (9-0) 5

N41. Operating Status A

Inspector Name Noel, Dustin

Inspection Date/Type 10/25/2018 Routine and Fracture Critical

PE Number 78296

Reviewer Name Noel, Dustin

Review Date 01/24/2019

PE Number 78296

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Key: "Qty" = Quantity for Element Level inspection; "(LF)" = Linear Feet; "(SF)" = Square Feet; "(EA)" = Each or count; "CR" = 1-4 Condition Rating or average of worst span unless Summary item 9-0, then the average of entire bridge influenced by the bold boxes; "TR" = Transition Rating or weighted average of condition states; "d" = dedicated or specific chart and guidance, all others use Material specific chart/guidance; "c" = condition prefix; "N" = NBIS rating

Inspection Procedures

SMS Quantities have been revised.
2017 QA Insp was to update Interim Insp from Y to N.

Comments

APPROACH

c1. Approach Wearing Surface

This bridge lacks conventional approach slabs so the asphalt area the width of the tunnels and extending 30' beyond the tunnel bulkhead was rated. Though the approach tunnels on the west end of the bridge diverge to the south, only the approach surfaces on the main route US 6 were considered in the rating of this item. These regions lie just west of the intersection with West 28th and east of the intersection with West Huron Road. Overall, these areas are in fair condition. The east and west approaches exhibit moderate map cracking throughout and the west approach exhibits isolated spalls.

c4. Embankment

The embankment under Span 3 exhibits several slope depressions. This embankment was primarily loose soil placed over demolition debris. Beneath this fill is a concrete strut between piers 2 and 3 used as a means of structure stability during construction. This strut is preventing portions of the fill from sliding into the Cuyahoga River.
The following are previous 2016 notes that may still apply: the SE embankment has been shored at its interface with the parking lot below where some erosion has occurred. No settlement along the south wall of the East Station is present. At the NE embankment, where the bridge shares the embankment with the old Superior Viaduct there are some sink holes possibly due to a faulty water or sewer line below. These sinkholes do not affect the performance of the embankment. The NW embankment is the County bridge garage parking lot and in good condition. The SW embankment adjacent to the abandoned Riverbed Road is experiencing slope movement and is being monitored. This failure has led to the movement and cracks of the south west approach wingwall between Tower A and Tower B.

c5. Guardrail

The previous report only rated the portion at the SE end of the bridge adjacent to the parking lot was considered. The guardrail is composed of a concrete parapet topped with an aluminum picket. The guardrail is in good condition with only very minor shrinkage cracks noted. (Note median impact attenuator is rated with the median) The guardrails are in overall good condition.

DECK

c7.1 Floor/Slab

This item includes the floor slab of the Detroit Avenue Tunnel, the West 25th Street Tunnel, the West Station, Upper deck floor in Spans 1A, 1B and 1 through 13, and the East Station. The top of floor is covered by wearing surface, curb, walk, or railing, thus this rating is governed primarily by the underside inspection.
Detroit Avenue Tunnel: The Detroit Avenue tunnel slab was retrofitted during the

1995-1997 rehabilitation; a new reinforced concrete slab was placed on top of the original slab. The new slab was designed for HS20 live load with the original slab offering no structural support. The top and bottom surfaces for the new slab is not visible and assumed to be in good condition despite the poor and critical conditions of the original tunnel slab beneath.

West 25th Street Tunnel: The West 25th Street tunnel floor is in good condition and exhibits isolated delaminated areas and shallow spalling.

West Station: The West Station Floor exhibits areas of spalling, cracking and efflorescence, active water infiltration, and exposed reinforcing steel. The most significant areas of deterioration are adjacent to the restored floor joints and in Bays A and B.

Spans 1A, 1B, and 1 through 13: The upper deck floor in the main spans is in fair condition with isolated cracks with and without efflorescence. There are numerous sound and unsound patches and spalls, some with exposed reinforcing. During the inspection, cold patches were performed, however, in a very poor manner which will likely not be sufficient.

East Station: The East Station floor is in good condition with no significant deficiencies.

Lower Deck: Not considered in this quantity was the lower deck floor. The lower deck is in good condition. The lower deck is reinforced concrete with stay in place (SIP) forms in Spans 1 through 3, and Spans 5 through 13. In Span 4 the lower deck is a combination of an interior vehicular steel grid deck and exterior pedestrian fiberglass grating. In the center bay of Panel 15 in Span 2 the SIP forms exhibit severe corrosion that is staining the west face of Pier 2. The South Bay in Span 1B has spalling up to 4-inches deep that exposed the top mat of reinforcing in the 12-inch thick slab.

See inspection report for additional details.

c7.2 Edge of Floor/Slab

The edge of floor is in satisfactory condition.

See inspection report for additional details.

c8. Wearing Surface

The asphalt wearing surface above the West Station exhibits heavy cracking and patching throughout. The deterioration above the West Station is more prominent in the eastbound lanes. The concrete wearing surface exhibits delaminations, large asphalt patches, and deteriorating asphalt patches. The bike lane along the south side of the bridge in Span 4 has multiple asphalt and concrete patches throughout with wide spread map cracking. Not considered in this quantity was the lower deck wearing surface.

See inspection report for additional details.

c9. Curb/Sidewalk/Walkway

The curbs and sidewalks exhibit random cracking, isolated spalls, and delaminations.

See inspection report for additional details.

c10. Median

The median exhibits shallow spalls. In Span 5 the south railing aluminum fence has a 2-foot long damaged section. The southwest impact attenuator in Span 3 exhibits minor impact damage.

See inspection report for additional details.

c11. Railing

The entire length of concrete railing on the bridge was considered in this item. There was also Type 5 railing on the north side of Span 4 protecting the bridge truss and hangers. All concrete railing was in good condition with minor cracking, staining, and isolated distress. In Span 5 the south railing aluminum fence has a 2-foot long damaged section. The south railing at Tower A is misaligned 7/8-inch vertically. The south railing at Tower B is vertically misaligned 1/4-inch vertically.

See inspection report for additional details.

c12. Drainage

The West Abutment, south downspout is completely clogged at the base of the catch basin. At Pier 1 there is a 15-foot section of PVC pipe missing from the south drain on the east face of the pier. The north catch basin at Pier 1 is missing the catch basin grate. At Piers 8 and 9, the south catch basin is clogged. The Pier 9 south catch basin concrete frame has shifted to the west. The north sidewalk longitudinal trench drains are filled with debris and not functioning.

See inspection report for additional details.

c13. Expansion Joint

The Tower B expansion joint in the westbound lane exhibits broken fillet welds attaching the joint extrusion to the joint armor due to the formation of pack rust between the components. Snow plow damage is also present on the Tower B expansion joint in the westbound lane due to the west armor sitting 1/2-inch higher than the east armor. Joints are typically filled with debris and have edge spalls along the joint armor.

See inspection report for additional details.

SUPERSTRUCTURE

c14. Alignment

ISMS does not permit activation of spandrel columns. Since they are not piers. the columns of the West Station, East Station and tunnels would be included in this category.

Three columns require replacement in the East Station, and are in Condition State 4. One column, M22, has an estimated 40% remaining. The adjacent north tunnel wall supports a portion of the tributary load. One column in the West Station, A2, is delaminated over 50% of its surface.

c15.1 Beams/Girders

This item is the concrete beams between the columns in the tunnels, West Station, and UD and LD jack arches. Overall these are in fair condition. Few have been patched as part of the 2014-16 rehab project.

Ten jack arch beams in the West Station are delaminated or spalled over 50% of their surface areas, are will require partila or full replacement. Many jack arch beams in Line A, B and C have delaminated surfaces.

The concrete beams in the West Station, Detroit Tunnel, and West 25th Street Tunnel are in poor condition due to extensive spalling with and without exposed reinforcing, delaminations, and efflorescence. The previous report mentioned these spalls were to be replaced at the conclusion of the current rehabilitation in Spring 2016, however these spalls still exist. See the attached drawings showing all the concrete beam deficiencies.

See inspection report for additional details.

c17. Stringers

The upper deck stringers are in good condition. The original curb stringers of Lines 5 and 14 exhibit light pitting on the bottom flanges. The stringers supporting the outer pedestrian fiber glass grid deck are also in good condition.

The lower deck stringers supporting the steel grid deck are in good condition. Lower deck stringers supporting only their own dead weight often exhibit advanced corrosion at the saddle bearings.

See inspection report for additional details.

c18. Floorbeams

Element level floor beam quantities includes all concrete and steel floorbeams in both the upper and lower decks. Concrete floorbeams are supported by columns in the spans approaching the central steel arch. Floorbeams in the steel section are supported from hangers from the lower arch chord.

The concrete floorbeams in Spans 1A, 1B, 1 through 3, and Spans 5 through 13 are in Satisfactory condition. The floorbeams exhibit isolated spalls with exposed reinforcing, cracking, and delaminations. See the attached structural drawings showing all he concrete floorbeam deficiencies.

The lower deck floorbeams in the East Station have the bottom mat of reinforcing steel exposed. This deterioration has changed little since the 1980's and with no live load carried by these floorbeams, no repairs are recommended.

The lower deck corbels appear to be architectural elements however they are actually cantilevered ends to the floor beams, directly supporting the exterior upper deck column loads above. Many of the corbels were patched or replaced in the 1995 and 2014 rehabilitations. Additional cracks, delaminations, and spalls where present on multiple lower deck corbels due to the corrosion of the compressive diagonal reinforcing steel in the corbel.

Random upper deck floorbeams have painted over perforations at the ends, some of which have repair plates welded in place. See attached deficiencies table and drawings for specific locations.

The lower deck floorbeams exhibit light active corrosion below the truss lines. Knife edging on lower deck Floorbeams 5 and 5' was removed during the 1995 rehabilitation.

See inspection report for additional details.

c19. Truss Verticals

Local perforations are present on diaphragm plates located between the upper and lower decks and minor corrosion of the lacing bars below the lower deck.

See inspection report for additional details.

c20. Truss Diagonals

The truss diagonal stay plates below the lower deck exhibit minor pitting. Random lacing bars above the upper deck exhibit painted over corrosion holes.

See inspection report for additional details.

c21. Truss Upper Chord

The truss upper chord members exhibit isolated rust staining with negligible section loss. North U12U11' exhibits pack rust between the hinge cover plate and the truss top flange resulting in a 1/8-inch Diameter corrosion hole in the cover plate.

See inspection report for additional details.

c22. Truss Lower Chord

The truss lower chords are in Satisfactory condition with isolated areas of pack rust and pitting.

See inspection report for additional details.

c23. Truss Gusset Plate

The lower chord gusset plates exhibit minor corrosion above the top of the lower chord members. The south face of the south gusset plate at North L2 and both gusset plates at L3 exhibit pitting up to 1/4-inch deep with reactivating corrosion along the interior face of the gussets above the lower chord. The rest of the gusset plates below the lower deck exhibit areas of surface corrosion on the interior faces of the gusset plates.

See inspection report for additional details.

c24. Lateral Bracing

The lateral bracing is in Good condition with isolated areas of minor surface corrosion present below the lower deck.

See inspection report for additional details.

c25. Sway Bracing

The sway bracing is in Good condition with isolated areas of pack rust and pitting. Isolated perforations were noted at the connections to the truss vertical members below the lower deck.

See inspection report for additional details.

c26. Bearing Devices

The bearings are in Fair condition with surface corrosion noted on the interior faces of all four bearing castings. The non-structural bearing pin cover plates exhibit

cracks up to 7-inches long at L0 and L0' on both trusses. These cracks have not significantly propagated. Steel shot blasting material from the 1997 painting operation has piled within the casting chambers.

See inspection report for additional details.

c27. Arch

The concrete arches typically exhibit cracking, spalls with and without exposed reinforcing, and delaminations throughout. Some of the previous spalling has been repaired particularly over public areas and parking lots. The repairs appear to be sound. See the attached drawings showing all concrete arch deficiencies.

See inspection report for additional details.

c28. Arch Column/Hanger

See c31 Pins/Hangers/Hinges for steel hangers in Span 4..

The concrete arch columns exhibit up to full height corner cracking and up to full height shallow spalls with exposed reinforcing steel. Previously patched columns exhibit delaminated areas adjacent to the patched concrete. Concrete arches connecting the columns just below the upper deck exhibit spalls with exposed reinforcing steel, cracks, and delaminated areas. See the attached drawings showing all concrete arch column deficiencies.

See inspection report for additional details.

c30. Protective Coating System

Areas of corrosion and failed paint were present on the main truss members below the lower deck. The structural steel between the upper and lower decks were repainted in 2014-2015 and is in very good condition. Blast material not contained during the 2014-2015 painting operation has accumulated on bracing and gusset connections. The top coat of the protective coating system above the upper deck has oxidized with minor rust staining.

See inspection report for additional details.

c31. Pins/Hangers/Hinges

The pins, hangers and hinges are in Good condition with no significant deficiencies noted. Minor painted over pitting was noted on random eye-bars below the upper deck.

See inspection report for additional details.

c32. Fatigue

The fatigue prone details are in Good condition. See inspection report for additional details.

SUBSTRUCTURE

c33. Abutment Walls

The abutment walls are in Satisfactory condition. The abutment walls consist of the West and East Abutments and the walls of the Detroit Avenue and West 25th Street Tunnels. The abutments exhibit map cracking throughout with minor moisture

staining. Some staining appears to be superficial due to leaking deck joints above. At the East end, the tunnel continues to the east and is flooded with water. The pedestrian stairwell along the south wall is visible, but holds water up to the second step from the top. The West Abutment walls typically exhibit deep spalling and delaminations throughout with a 1/4" W vertical crack below the south exterior arch.

See inspection report for additional details.

c38. Pier Columns/Bents

The reinforced concrete pier columns exhibit map cracking with moisture staining throughout. Below leaking joints or faulty downspouts, superficial staining it common on the surfaces as well. Deep spalling, up to 10" D with exposed reinforcement was noted throughout. Some of these instances exist over areas that are accessible to the public. The South wall at Tower B, 5, 6, and 7 are all rotated to the south. Towers 5, 6, and 7 were measure from the inside face of the south exterior tower wall to the vertical concrete edge of the adjacent span on both the east and west side of the towers. Tower B was measured from the inside face of the south exterior tower wall to the south face of the tower core wall. The "Tower Rotation Measurements" table below shows the measurements for each tower.

See inspection report for additional details.

c36. Pier Walls

The west face of Pier 1 is primarily covered by fill. The exposed portions of the pier walls exhibit map cracking with minor corrosion staining as well as graffiti.

The East face of Pier 3 is covered with painted murals which hides surface flaws. The areas around the murals exhibit map cracking with corrosion staining. The west face of Pier 3 also exhibits map cracking and corrosion staining throughout.

The West face of Pier 4 is on the edge of the Cuyahoga River with sloped fill along the North end. The bottom quarter of the pier exhibits map cracking. Near the water surface, the edge of the sealant was visible. An underwater inspection was not performed during this inspection. The West face of the pier wall is against higher fill while the exposed portion exhibits minor map cracking.

See inspection report for additional details.

c39. Backwalls

The abutment backwalls do not exist at the West and East Abutments due to the continuation of the tunnels. At the East tunnel, the backwall acts as a closure panel.

See inspection report for additional details.

c40. Wingwalls

The wingwalls along Spans 1A and 1B and the East Station exhibit cracking and spalling with exposed reinforcement throughout.

The South wall at Tower B continues to exhibit movement spanning over the past 10 years. The tower currently resides with an outward measurement of 4-3/4" at the lower deck level. On the interior, the top of the tower is spalled and cracked due to contact with the soffit of the upper level sidewalk.

See inspection report for additional details.

c42. Scour

The scour is in Good condition. Sea walls are present along both river banks, providing protection for Pier 8 and 9. No underwater inspection is required for this structure.

See inspection report for additional details.

c43. Slope Protection

Stone in some areas along West Side.

See inspection report for additional details.

CHANNEL

c51. Alignment

Bridge has navigation lights, but SMS will not allow this item to be rated. All 6 navigation lights are very dimly lit., and thus not effictively working. See inspection report for additional details.

c52. Protection

Sheet Pile walls at Pier 4. Small sink hole behind sheet pile wall.

There is no collision protection present at Pier 3. Former sheet pile sea wall that defined the west dock line downstream Pier 3 is mostly missing, remaining section is just visible above the water.

See inspection report for additional details.

c53. Hydraulic Opening

Span 4 has 96-ft minimum navigation clearance. See inspection report for additional details.