

BRIDGE INSPECTION REPORT

Status: Released
 CD Guid: 85f9992d-48a3-421e-a293-20769ad4b300

Printed On: 3/24/2020
 Release Date: 1/7/2020

Agency: SEATTLE
 Program Mgr: Roman G. Peralta

Br. No. BRG-131M	SID 08530200	Br. Name WS FREEWAY MAINSPAN
Carrying SW SPOKANE ST		Route On 01140 Mile Post 131.30
Intersecting DUWAMISH RIVER W WATERWY		Route Under Mile Post

Inspector's Signature AM Cert # B1169 Cert Exp Date 5/11/2022 Co-Inspector's Signature MD

				Inspections Performed:					
No.	Item	No.	Item	No.	Item	Freq	Hrs	Date	Rep Type
5	Structural Eval (1657)	64	Operating Tons (1552)	2	No Utilities (2675)				
8	Deck Geometry (1658)		Op RF (1553)	1	Bridge Rails (1684)	24	1.5	5/30/2019	Routine
9	Underclearance (1659)	39	Inventory Tons (1555)	N	Transition (1685)				Fract Crit
8	Alignment (1661)		Inv RF (1556)	N	Guardrails (1686)	60	3.0	7/12/2017	UW
6	Deck Overall (1663)	5	Operating Level (1660)	N	Terminals (1687)	24	5.0	5/30/2019	Special
5	Superstructure (1671)	A	Open/Closed (1293)	0.00	Asphalt Depth (2610)	24	5.0	11/19/2019	Interim
7	Substructure (1676)	8	Waterway (1662)		Design Curb Ht (2611)				UWI
9	Culvert (1678)	8	Scour (1680)		Bridge Rail Ht (2612)				Damage
8	Chan/Protection (1677)		Soundings Flag (2693)	1983	Year Built (1332)				PRM Safety
1	Pier/Abut/Prot (1679)		Revise Rating (2688)	0	Year Rebuilt (1336)				SEC Safety
7	Drain Cond (7664)		Photos Flag (2691)	Y	Subj to NBIS (2614)				Condition
1	Drain Status (7665)		Measure Clrnc (2694)						Short Span
N	Deck Scaling (7666)	9	Sdwk Cond (7673)						In Depth
0	Scaling Pct (7667)	9	Paint Cond (7674)						Geometric
8	Deck Rutting (7669)	9	Approach Cond (7681)						
8	Exposed Rebar (7670)	9	Retaining Wall (7682)						
9	Curb Cond (7672)	9	Pier Prot (7683)						
				Alpha Span Type: <div style="border: 1px solid black; height: 20px; width: 100%;"></div>					
				Sufficiency Rating 69.00 <div style="border: 1px solid black; padding: 2px;">Low Risk</div>					

BMS Elements							
Element	Element Description	Total	Units	State 1	State 2	State 3	State 4
12	Concrete Deck	142040	SF	142040	0	0	0
105	Concrete Box Girder	2680	LF	1500	0	1180	0
205	Concrete Pile/Column	8	EA	8	0	0	0
234	Concrete Pier Cap/Crossbeam	212	LF	212	0	0	0
314	Pot Bearing	4	EA	4	0	0	0
331	Concrete Bridge Railing	2680	LF	2680	0	0	0
371	Seismic - Transverse Restrainer	4	EA	4	0	0	0
414	Bolt Down - Sliding Plate w/Springs	212	LF	212	0	0	0

Notes

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Intersecting DUWAMISH RIVER W WATERWY		Route Under	Mile Post

Notes (Continued)

0 Orientation 05/30/2019 Routine & Special-UBIT Inspection of the Exterior of the box girder from South Edge, AM & KL, 10:00 A.M., Clear, 60° .
 UBIT from North edge 2015 (west bound)
 UBIT from South edge 2017, 2019 (east bound)
 . * Do not use existing ladder fall protection. Call crew to use the green fall protection system. * Pier 15 is west end of 131M. Pier 18 is east end of 131M. There are 35 segments in the main span, including the pier tables. * At Pier 15 and 16, the fence around the pier is damaged from truck trailers. Continue to observe (CTO).
 .
 Falcon nest on pier 15. The falcons were hovering over during the 2019 inspection to protect their next. It probably shows there were babies in the next. . * See 131WA and WR for west approaches and ramps. * See 131EA and ER for east approaches and ramps.

3 11/14/19 - Interim Inspection by MD & AM
 The scope of this interim inspection was mainly focused on checking recently epoxy injected cracks for any signs of re-racking. Box girder segments 37 and 38 were the main area for this inspection. UBIT was used for access starting in the west bound direction for the north box and eastbound direction for the south box. Tools for inspection included flash light, camera, magnifying glass, tape and crayon. See also pictures in the O drive for this inspection.
 * All injected cracks on both boxes were checked and no apparent re-cracking was found.
 * There was a smudged surface with epoxy that looked to have leaked through the sealed cracks at a small area of the east side of north box. The area covers about 3' long 10"+/- wide. The epoxy felt tacky to touch. No apparent cause except to assume the mixer was not working right. It is marked with a crayon to be checked later in the next inspection.
 * The spacing of the crack injection ports varied along one line of injected crack. Perhaps the crews hit rebar and had to relocate the port position. This may indicate that at some locations injected epoxy was limited to a shallow depth.
 * At the bottom of the north face of the south box at about the mid line of the navigation canal, there is a long but narrow stretch of rock pocket that is filled with loose sand. It is about 5 feet long and about 1"+/- wide. See work order # 788109
 * There are also few smaller, less significant cracks that were not epoxy injected.

Special Inspection Notes from 2019 inspection

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 Bridge Name: WSF High Level Bridge File No.: 131M
 Inspector: Ainalem Molla along with equipment operation
 Co-Inspector: Kit Loo
 Used: Flashlight, marking chalk,
 UBIT Hours on Site: 5.0
 Weather: Clear
 Date: 05/30/2019

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 Scope of Inspection: An Inspection of the segmentally cast in place, post tensioned, box girder from the exterior side.

Findings, Location of Defects, and Recommendations

General - This inspection was scheduled to check and monitor the transverse cracks on the outside of the bottom of the main span at the 11th and 12th panels East of Pier 16 and the 11th panel West of Pier 17 in both south and north boxes. The cracks at the west side of the north span were sealed along with injection ports and ready for crack injection. The cracks are not getting wider but the number has increased. The cracks are remotely monitored in real time and there is no big change in the size except for a small fluctuations. The cracks that are greater than 0.005" were marked for epoxy injection in the south box at both west and east sides of the span.

The fire suppression system supply pipe has vertical hangars and horizontal brace rods with turnbuckles. Typical in all box sections: The vertical hangars do not appear to be vertical. The horizontal braces are mostly bent and there is at least one that is broken. See Work Order #160505.

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 South Box, West End

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 1. Pier 16, west diaphragm, there are four longitudinal cracks with efflorescence visible in the top deck soffit. Continue to Observe (CTO)

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 2. Pier 15, end diaphragm, the earthquake restrainers indicated approximately 3 1/2 inch of movement between anchor rod and restrainer plate. This is visible by looking at the rods for evidence of movement. (CTO)

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Notes (Continued)

3. Minor Transverse Leaching Cracks in box top soffit, located approx. 40 feet east of the end diaphragm.

4. Nine longitudinal cracks approximately 80 feet east of the west end diaphragm. Each crack is approx. 3 feet long. They are located in the box top deck soffit and within a closure pour. (CTO)

5. Typical throughout, small cold joint crack like openings occurred during construction and were filled by epoxy injection. These areas did not show any signs of recent cracking. (CTO)

The watermain pipe hangers and supports have been damaged through out the box girder. The damage is most prominent at pipe hangers and supports near the wye fittings, which feed the fire hydrant runs. The vertical pipe hangers (Type I on plan sheet 20 of 100) are bent and show signs of stress, while the horizontal pipe hangers (Type II on plan sheet 20 of 100) show signs of stress and some have buckled. This has resulted in several water leaks at the victaulic groove joint fittings. The most prominent leak is at the west most fire hydrant wye and at a pipe joint 50 linear feet to the east.

South Box, Main Span

6. Typical, there is an intermittent crack or cold fissure located in the re-entrant corner between the box web and box top deck. It appears to be construction related. (CTO)

At all tendon anchorage steps there are hair line cracks from the box girder walls toward the center of the box at approximately a 45° angle. The cracks vary in width from 1/64" to 1/8". The visible cracks were traced with red or yellow marker for tracking. Continue to observe.

The watermain pipe hangers and supports have been damaged through out the box girder. The damage is most prominent at pipe hangers and supports near the wye fittings, which feed the fire hydrant runs.

The vertical pipe hangers (Type I on plan sheet 20 of 100) are bent and show signs of stress, while the horizontal pipe hangers (Type II on plan sheet 20 of 100) show signs of stress and some have buckled.

Typical, minor Transverse Leaching Cracks located in the box top deck soffit. (CTO)

The watermain pipe hangers and supports have been damaged through out the box girder. The damage is most prominent at pipe hangers and supports near the wye fittings, which feed the fire hydrant runs.

The vertical pipe hangers (Type I on plan sheet 20 of 100) are bent and show signs of stress, while the horizontal pipe hangers (Type II on plan sheet 20 of 100) show signs of stress and some have buckled. North Box, East Span 9. Typical, minor Transverse Leaching Cracks located in the box top deck soffit. (CTO)

North Box, Main Span 10. Typical, minor Transverse Leaching Cracks located in the box top deck soffit. (CTO)

At all tendon anchorage steps there are hair line cracks from the box girder walls toward the center of the box at approximately a 45° angle. The cracks vary in width from 1/64" to 1/8". The visible cracks were traced with red or yellow marker for tracking. Continue to observe.

The watermain pipe hangers and supports have been damaged through out the box girder. The damage is most prominent at pipe hangers and supports near the wye fittings, which feed the fire hydrant runs.

The vertical pipe hangers (Type I on plan sheet 20 of 100) are bent and show signs of stress, while the horizontal pipe hangers (Type II on plan sheet 20 of 100) show signs of stress and some have buckled.

North Box, West Span 11. Typical, minor Transverse Leaching Cracks located in the box top deck soffit. (CTO)

The watermain pipe hangers and supports have been damaged through out the box girder. The damage is most prominent at pipe hangers and supports near the wye fittings, which feed the fire hydrant runs. The vertical pipe hangers (Type I on plan sheet 20 of 100) are bent and show signs of stress, while the horizontal pipe hangers (Type II on plan sheet 20 of 100) show signs of stress and some have buckled.

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Notes (Continued)

9 Underwater Inspection, 7/12/2017, Echelon Engineering. 3 Hrs (on-site) + 2.5 hrs (mob/demob)

Based on the observed conditions, the inspected piers are sound below water. Although very minor localized areas of spalling and velocity abrasion were noted on the concrete surfaces typically submerged, no evidence of any significant spalling, cracking, rust bleeding or other deterioration was identified. No significant general or localized scour patterns were identified within the channel or around the piers.

12 Concrete Deck

Exposed aggregate on wearing surface.

South box, south face, 150' from bent 15th, cold joint crack. CTO

Between Pier 16 and Pier 17 the deck soffit between the box girders has longitudinal cracks with efflorescence. The number of cracks varies depending upon the box segment being observed but number between zero and eight. Continue to observe.

Between Pier 16 and Pier 17, on the North soffit, there are two deep scrapes from a high-load hit. Continue to observe.

105 Concrete Box Girder

11/14/19, Interim Inspection of epoxy injected cracks, by MD & AM, 9:30:00 A.M., overcast, 47°F/-
 Exterior of Box Girder Notes:

Diagonal cracks typical throughout all boxes. Traced south box cracks in 2017 with red crayon. CTO

At Pier 15 the lateral restrainers have extruded the PTFE sliding surface. Continue to observe.

PIER 16 IS AT WATER'S EDGE.

West of pier 16 on south box, the bondo has not cracked in 2017. CTO

Bent 16 spall at joint with box and column. CTO.

Between Pier 15 & 16, between the third and fourth box sections from the West the joint has cracked about 1/16 of one inch. The cracks start about three or four feet from the bottom of the box and run vertically up and bend diagonally about one foot below the top flange of the box. These cracks are typical throughout the box section. See Work Order #182935.

Between Pier 15 & 16, on the fourth, fifth, and sixth sections from the West there are diagonal hairline cracks on the South face of the South box. Similar cracks also appear on the North face of the South box. The cracks measure 0.2 mm wide. Continue to observe.

Between Pier 15 & 16, more severe close to Pier 16, longitudinal and diagonal cracks on the bottom of the box, typical throughout. Continue to observe.

Between Pier 16 & 17, about mid-span between the two piers, on the soffit of the North box, there is poorly consolidated concrete with many cracks. Continue to observe.

Between Pier 16 & 17 at the bottom of the edge of the guardrail at south side of east bound bridge, there is about 2' by 1' wide spall with exposed rebar. See work order #761097

Between Pier 16 & 17, on the North side of the North box, there is minor damage due to a high-load hit. Continue to observe.

Between Pier 16 & 17, diagonal hairline cracks on the South face of the South. The number of cracks varies from two to eight. Continue to observe.

Between Pier 16 & 17, the cracks at the joint are limited to the center part of each joint. The cracks are vertical along the joint and are about four feet long. The cracks are between 1/32 and 1/64 of an inch wide. See Work Order #182935.

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Notes (Continued)

Between Pier 15 & 16, the cracks at the joint are limited to the center part of each joint. The cracks are vertical along the joint and are about four feet long. The cracks are between 1/32 and 1/64 of an inch wide. See Work Order #182935.

At the 11th panel West of Pier 17 there are transverse cracks on the bottom of the North and South boxes. See Work Order #208983.

At the 3rd segment West of Pier 17, on the South face of the South box, there is an area of delamination. Continue to observe.

Just West of Pier 17, in the North face of the North box, there is a crack in the box. There was bondo applied on 06/09/98. On 08/23/06 it was noted that it has re-cracked. Continue to observe.

Between Pier 17 & 18, there are one or two hairline cracks on the soffit of the box. Continue to observe.

Between Pier 17 & 18, at the 9th joint between box sections West from Pier 18, the joint is open about 1/8" at the deck-box interface. The opening is about 2' long and 1/2" deep. Continue to observe.

Between Pier 17 & 18, at the 10th joint between box sections West from Pier 18, the joint is open about 3/16" at the deck-box interface. The opening is about 2' long and 1/2" deep. Continue to observe.

At Pier 18 the lateral restrainers have extruded the PTFE sliding surface. Continue to observe.

205 Concrete Column / Pile

234 Concrete Pier Cap / Crossbeam

At Pier 15, at the Northwest corner at the top of the pier cap there is a spall with exposed rebar, 3" x 3" x 1/2". See WO #6112.

314 Pot Bearing

At Pier 15 The pot bearings for the box girders have oil stains. Continue to observe.
 At Pier 18 the South pot bearing for the box girder is leaking oil. Continue to observe.

331 Concrete Bridge Railing

On the inside of the North barrier there is corroded rebar due to insufficient cover. This is typical. Continue to observe.

414 Bolt Down Panel - Metal

At Pier 15 water leaks through the joint. The bearing seat area is wet. Continue to observe.

Repairs

Repair No	Pr	R	Repair Descriptions	Noted	Maint	Verified
			(No repairs for this structure)			

Inspections Performed and Resources Required

Report Type	Date	Freq	Hrs	Insp	CertNo	Coinsp	Note
Routine	5/30/2019	24	1.5	AM	B1169	KL	05/30/2019 Routine & Special-UBIT Inspection of the Exterior of the box girder from South Edge, AM & KL, 10:00 A.M., Clear, 60°
Underwater	7/12/2017	60	3.0	SDS	G9912	EBV	Dive Inspection, 7/12/2017, Echelon Engineering. 3 Hrs (on-site) + 2.5 hrs (mob/demob)

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Inspections Performed and Resources Required (Continued)

Report Type	Date	Freq	Hrs	Insp	CertNo	Coinsp	Note		
Special Feature	5/30/2019	24	5.0	AM	B1169	KL	05/30/2019 Routine & Special-UBIT Inspection of the Exterior of the box girder from South Edge, AM & KL, 10:00 A.M., Clear, 60°		
Interim	11/19/2019	24	5.0	AM	B1169	MD	11/14/19, Interim Inspection of epoxy injected cracks, by MD & AM, 9:30:00 A.M., overcast, 47°F*/-		
Equipment	5/30/2019	24	5.0	AM	B1169	KL	05/30/2019 Routine & Special-UBIT Inspection of the Exterior of the box girder from South Edge, AM & KL, 10:00 A.M., Clear, 60°		
Resources	Hours	Min	Pref	Max	Freq	Date	Need Date	Override	Notes
UBIT			ANY	ANY					