Raft Island Improvement Association

2008 ANNUAL BRIDGE INSPECTION REPORT FOR RAFT ISLAND BRIDGE

Pierce County, Washington

September 2008

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1. STATEMENT OF PURPOSE

Exeltech Consulting, Inc. was retained by the Raft Island Improvement Association to provide services to evaluate the Raft Island Bridge as part of its annual routine inspection.

Figure 1 below shows the location of Raft Island Bridge.

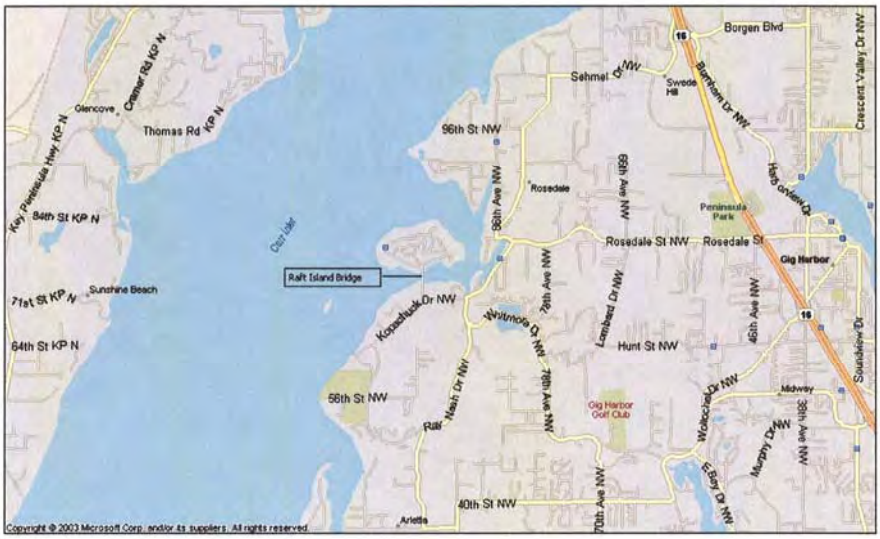


Figure 1 – Location Map

The scope of work as proposed by the Raft Island Improvement Association is to determine the current condition of the existing structure and then provide maintenance recommendations for repair, as necessary. These services include completing an on-site visit to visually inspect the existing bridge structure and provide a written assessment report of the current condition of the bridge structure. The assessment report will include maintenance recommendations.

The following assumptions were made for this project:

1. The inspection will be a visual inspection and observation of the bridge superstructure and substructure, not requiring special equipment, other than a ladder or kayak.

2. No non-destructive or destructive testing will be conducted during the inspection of the bridge superstructure and substructure, except hammer soundings will be made near the mud line on all timber piling, and borings will be taken where indicated by the soundings. All borings will be plugged with treated timber dowels.

3. Inspection around heavily-vegetated areas will be conducted without major disturbance to the existing vegetation.

4. A chemical composition evaluation will not be conducted on the existing bridge superstructure or substructure.

5. Inspection of the structure will be conducted over a three day period, during low tide the first two days and high tide the third day.

The scope of services agreed to for this project is as follows:

1. Existing Plans and Reports: The previous inspection reports as well as the as-built drawings will be reviewed prior to the on-site visit. Review of the previous inspection reports and plans will provide the inspector with a baseline condition of the structure, for which an assessment can be made of the current condition of the bridge. See **Appendix A** for as-built drawings.

2. Field Visit Inspection: A visual field inspection will be conducted, at a mutually-agreeable time.

3. Inspection Report: A written assessment report document will be provided, which summarizes the results of the visual inspection conducted during the on-site visit. It will include a bridge management format for the members, which give the quantities of the members and the condition state of the members.

2. INSPECTION LOG

Date:	August 28, 2008 (inspection started at 10:00am finishing at 3:00pm)
Weather:	Clear, 65° in the morning, warming to 80° in the afternoon
Tides:	Low -1.4 at 9:17am and high 12.8 at 5:06pm
Inspector:	Ron Smith, James Collin and Casey Minnick
Date:	August 29, 2008 (inspection started at 10:00am finishing at 1:00pm)
Weather:	Clear, 65° in the morning, warming to 80° in the afternoon
Tides:	Low -1.5 at 10:14am and high 13.1 at 5:40pm
Inspector:	Ron Smith, James Collin and Casey Minnick
Date:	September 9, 2008 (inspection started at 12:00am finishing at 3:00pm)
Weather:	Clear, 80° in the afternoon
Tides:	Low 1.1 at 7:33am and high 11.6 at 3:57pm
Inspector:	Ron Smith

3. GENERAL DESCRIPTION

Bridge Name: ***Raft Island Bridge***
Location: *Pierce County, WA*
Over: Existing inlet
Type: Prestressed concrete channel girders supported by timber bents

Superstructure:
45 - ~17 ft. prestressed concrete channel girders
(7 channel girders for each span)
1 - ~23 ft. prestressed concrete channel girders
(7 channel girders for each span)

Substructure:
47 – 4 Timber Pile Bents

Number of Lanes: 2 lane structure

Orientation: Longitudinal axis of bridge is oriented North-South as indicated per the design plans. For conformity and inspection designation purposes, Bent 1 is the South Abutment and Span 1 is designated as the first span adjacent to the mainland. The piles and channel girders are numbered left to right with "A" furthest left while looking North towards Raft Island. This sign convention follows the recommendations of the WSDOT Bridge Inspection Manual.

Posting: The bridge is posted for 16 Tons for a Type 3 load, 28 Tons for a Type 3S2 and 28 Tons for a Type 3-3. The speed posting is 15 mph.

4. HISTORICAL PERSPECTIVE OF THE STRUCTURES

The Raft Island Bridge serves as the main access to Raft Island and its residents from the mainland. The bridge consists of 46 prestressed concrete channel girders supported on 4-pile timber bents. The bridge measures 788 feet and consists of 45, 17 foot spans and one 23 foot span, per the as-built plans. The bridge spans across a waterway that serves as a major thruway for boats anchored in the inlet. Most of the boat traffic utilizes the opening under the 23 foot span. At high tide, the water is 10 feet to 20 feet deep under the 23 foot span. At low tides of approximately –2 feet and lower, the entire substructure above the mud line is exposed and accessible.

The original drawings indicate that bridge was built in the 1957 with a H15-44 design live load. The clear width of the structure between curbs is 20 feet, while the out-to-out width of the structure is 21 feet. The bridge railing system

consists of a painted metal “W” beam attached to the inside face of 8” x 8” treated timber posts. The posts are attached to the sides of the exterior channel girders and to 6” x 9” cast-in-place curbs. Expansion joints are present at the south abutments and at bent 16 and bent 32. The existing deck is composed of an asphalt concrete overlay over a waterproof membrane.

Based on the review of previous reports, a major rehabilitation project was conducted on the bridge in 1992. The work consisted of splicing in ten new piles, replacing approximately 12 braces and the placement of 2” of new asphalt over a new membrane. In 1994 some minor work was conducted, consisting of encapsulating a couple of decaying piles and the replacement of some bracing members. Additional maintenance work has also been completed over the years including the last recorded maintenance work performed in 2008 where expansion joints were repaired and areas of spalled concrete and exposed reinforcement were patched.

5. INSPECTION RESULTS

The 2008 inspection focused on the substructure, which has been noted in previous reports to exhibit varying degrees of deterioration. During the course of this annual inspection all piles were sounded at the ground line and to a height of approximately seven feet. In addition, a ladder was used to access a few piles and caps where visual conditions suggested further investigation. A visual inspection was performed of the girders from the ground during low tide and from a kayak during high tide.

The following is a summary of the findings from the field inspection.

5.1 Superstructure

5.1.1 Prestressed Concrete Channel Girders

The following, Table 1, is a summary of the concrete spalls with exposed steel reinforcement or prestress strand, and cracks in the concrete found during the field inspection of the prestressed concrete channel girders:

Summary of Results

Description	Location
Spalled concrete on soffit with exposed steel reinforcement	Span 13: Girder A soffit, two spalls 4" and 2" with exposed rebar Span 13: Girder G soffit, two spalls 4" and 2" with exposed rebar – **see photo 3 below**. Span 16: Girder A soffit, three 3" diameter spalls with exposed rebar (2007). Span 23: Girder B soffit, 12" long shallow spall and delamination along centerline (no exposed rebar). Span 34: Girder A, two spalls with 2" long exposed rebar. – **see photo 8 below**. Span 42: Girder G, spall 5" exposed rebar. – **see photo 10 below**.
Spalled concrete on web with exposed prestress strand	Span 22: Girder G – East web has two shallow spalls 8" long and 6" long with exposed prestress strands – **see photo 6 below**.
Crack formation (non-superficial surface cracking)	Span 13: Girder F – soffit has 5' long leaching rust stained crack along centerline.

Table 1 – Summary of Results


PHOTO 3 – GIRDER 13G – SOFFIT SPALLS

PHOTO 6 – GIRDER 22G – SPALL WITH EXPOSED PRESTRESS IN EAST WEB

PHOTO 8 – GIRDER 34A – SOFFIT SPALLS

PHOTO 10 – GIRDER 42G – SOFFIT SPALL

During the 2007 inspection it was noted that the diaphragms at the north end of span 15 at bent 16 were spalling with poor concrete consolidation along the top. In 2008 closer examination revealed that the diaphragms were cracked and displaced. **See photo 4 below**. The location is over an interior pier where there is an expansion joint and longitudinal restrainers. This prompted a closer inspection of pier 32 at the location of the other interior expansion joint. It was found that the diaphragms had been removed from the north end of span 31. **See photo 7 below**.

PHOTO 4 – SPAN 15 AT BENT 16 SHOWING CRACKED AND DISPLACED DIAPHRAGMS

PHOTO 7 – SPAN 31 AT BENT 32 SHOWING MISSING DIAPHRAGMS

See **Appendix B** for a more detailed list of channel girder defects and **Appendix D** for additional photos.

5.1.2 Deck Overlay

The asphalt depth is approximately 2 inches. The majority of the distresses were located near the expansion joints, which consists of alligator cracks and visible signs of deterioration of the existing asphalt patches. At the repaired expansion joints at the south abutment and bent 16, the asphalt has been patched.

At the north abutment there is cracking full width with some smaller “D” cracking. **See photo 25 below**. It is anticipated that this cracking will worsen as the rotten timber cap deteriorates.

5.1.3 Expansion Joints

The expansion joint at the south abutment is an armored compression seal. The opening measured 2¼” between the steel armor at a temperature of 80 degrees. There are new concrete repair patches at centerline and in the northbound lane. The patch at centerline measures 4” wide x 52” long and is cracked and loose. **See photo 22 below**.

The expansion joints at bents 16 and 32 are strip seals with a measured opening of approximately ½" between the steel extrusions at a temperature of 80 degrees. At bent 16 there is a new concrete repair patch on the south side of the joint. **See photo 23 below**.

At bent 32 there is an old concrete patch at centerline that is cracked and starting to break up. **See photo 24 below**.

5.1.4 Bridge Rail

The rail on the structure is a “W” beam mounted on 8” x 8” timber posts. The top of the “W” beam is approximately 28” above the asphalt overlay. There is no approach rail. The east rail in span 17 is bent out 2” over the 5’–8” post spacing due to traffic impact.

5.1.5 Approach Roadway

The south approach has several patches but is not causing traffic to impact the bridge. The north approach has several large patches and is approximately ¾” higher than the bridge, which is causing moderate impact to the bridge. **See photo 25 below**.

5.2 Substructure

5.2.1 Piles

All of the piles that were near the center spans of the bridge were encased or buried in a heavy marine growth and silt buildup. The heavy marine growth was removed on two sides of each pile at three heights; ground line, 3' to 4' and 6' to 7'. This provided access for soundings with a rock hammer and for visual inspection for marine borers.

The sounding results indicated some audible signs of rot and marine borer damage at six piles. At piles 8D, 22A, 22D, 27D, 38A and 38D, holes from marine borers were found. Pile 22D also has a surface rot pocket 12" high x 3" wide x 1" deep at the ground line and a small pocket of center rot. These piles were YELLOW TAGGED with flagging indicating that they should be MONITORED for additional damage during the next inspection. **See photos 12, 13, 15, 17 and 18 below**.

PHOTO 12 – PILE 22A – YELLOW TAGGED DUE TO MARINE BORER DAMAGE

PHOTO 13 – PILE 22D – YELLOW TAGGED DUE TO MARINE BORER DAMAGE

PHOTO 15 – PILE 27D – YELLOW TAGGED DUE TO MARINE BORER DAMAGE

PHOTO 17 – PILE 38A – YELLOW TAGGED DUE TO MARINE BORER DAMAGE

At several bent locations, there were checks, also referred to as "splits," present that typically extends from the top of the timber pile to around mid-length of the timber pile. The checks were approximately ½" wide at the maximum width and tapers down to 0". At pile 44A the split is ½" wide at the top of the pile and extends through the full diameter. **See photo 19 below**. The pile was RED TAGGED with flagging indicating that it should be repaired. No rot was found at the checks.

Some substructure repairs have been made over the years as part of the routine maintenance of the bridge. At several locations there are pile repairs that consist of placing a metal "sleeve" or barrel around the spliced area of the timber pile and encasing the area with concrete to create a "splint" for the

timber pile. At the top of the new section of timber piling the timber is secured to the pile cap with metal straps and lag screws or bolts. No noticeable deterioration of the splice, other than layer of rust is present on the surface of the metal sleeve.

5.2.2 Pile Caps

Pile caps were sounded at end bents and a few of the interior bents where timber checks indicated the possibility of rot. The north abutment cap has end rot at the east end. There is a 5" shell over pile 47E and a 2" shell near the end. **See photo 20 below**.

The west end had similar rot with a 5" shell over pile 47A. **See photo 21 below**. The cap was YELLOW TAGGED indicating it should be MONITORED for additional damage during the next inspection.

5.2.3 Bracing

In addition to the timber pile repairs, some lateral bracing had been replaced over the years. Most of the bracing members are in fair condition with a few members exhibiting varying degrees of rot at the ends of the members. This is particularly true at the upper ends of the diagonals. **See photos 14 and 16 below**.

PHOTO 14 – DIAGONAL BRACE BENT 24 - END ROT AND MISSING CORNER

PHOTO 16 – DIAGONAL BRACE BENT 31 - END ROT AND MISSING CORNER

See **Appendix C** for a more detailed list of substructure defects.

5.3 Utilities

5.3.1 Gas

On the west side there is a newer 4½ inch diameter steel gas line on hangers mounted on the exterior face of the girders.

5.3.2 Other

On the east side there are 2½" and 3" diameter steel conduits mounted on the inside of the rail posts and a 4½" diameter PVC conduit mounted outside of the rail posts.

6. REPAIR RECOMMENDATIONS

The recommendations made here are to stabilize and slow down the deterioration of the bridge. The recommended repairs will not fully arrest the effects of the highly chlorinated environment causing the exposed steel reinforcement and prestressed strands from corroding. It is known from the previous inspection reports that lab tests conducted on samples of the concrete indicate that the levels of chloride contamination in the concrete is far above the acceptable limits outlined in the Washington State Department of Transportation.

During the 2007 inspection damage from marine borers were found in three of the pilings. In 2008 damage was found in three more of the pilings. Also the timber pile cap at the north abutment has end rot at both ends, which extends over the 1st pile on each side. Although repairs are not required at this time, it does indicate that many timber members will require replacement in the future.

During the 2007 inspection it was noted that the diaphragms at the north end of span 15 at bent 16 were spalling. In 2008 closer examination revealed that the diaphragms were cracked and displaced. The location is at an interior pier where there is an expansion joint and longitudinal restrainers. This prompted a closer inspection of pier 32 at the location of the other interior expansion joint. It was found that the diaphragms had been removed from the north end of span 31. These diaphragms act as edge support for the deck under the expansion joints. The damaged and missing diaphragms could be part of the cause of the loose expansion joints at these locations.

The following is a list of proposed repair recommendations that should be performed within the next year to preserve the condition of the bridge:

Raft Island Bridge Repair Recommendations	
Item	**Description**
Timber pile banding	Bent 44: Pile 44A has a ½" wide split starting at the top extending down 2/3 of the pile length. The split is through the full diameter at the top. A metal band should be installed at the top.
Epoxy Patch Spalls	Span 13: Girder A soffit, two spalls 4" and 2" with exposed rebar Span 13: Girder G soffit, two spalls 4" and 2" with exposed rebar Span 16: Girder A soffit, three 3" diameter spalls with exposed rebar (2007) Span 22: Girder G East web, 8" long and 6" long spalls with exposed prestress (2007) Span 23: Girder B soffit, 12" long shallow spall and delamination along centerline Span 34: Girder A, two spalls with 2" long exposed rebar
Replace Damaged and Missing Concrete Diaphragms	Bent 16 Span 15 Girders: Remove and replace the diaphragms which are cracked and displaced. Bent 32 Span 31 Girders: Replace the missing diaphragms at the bent.

Future inspections should include cleaning each piling at the ground line and conducting a visual and sounding inspection. In particular the YELLOW TAGGED piles 8D, 22A, 22D, 27D, 38A and 38D should be monitored for damage. Also the YELLOW TAGGED timber cap at the north abutment should be monitored for damage. The bracing with rot should also be monitored for damage.

The bridge inspection cycle should be maintained at 12 months due to the condition of the channel girders and timber pilings.

7. VERIFICATION OF RECOMMENDED REPAIRS

The repair recommendations from the 2007 inspection were verified as complete with the following exceptions:

1. Girder A in span 16 has three 3" diameter spalls with exposed rebar that were not patched.

2. Girder G in span 22 had two exposed prestress strands in the east web that were not patched.

3. Girder A in span 29 had several small spalls with exposed rebar that were not patched.

None of these conditions are of significant structural concern.

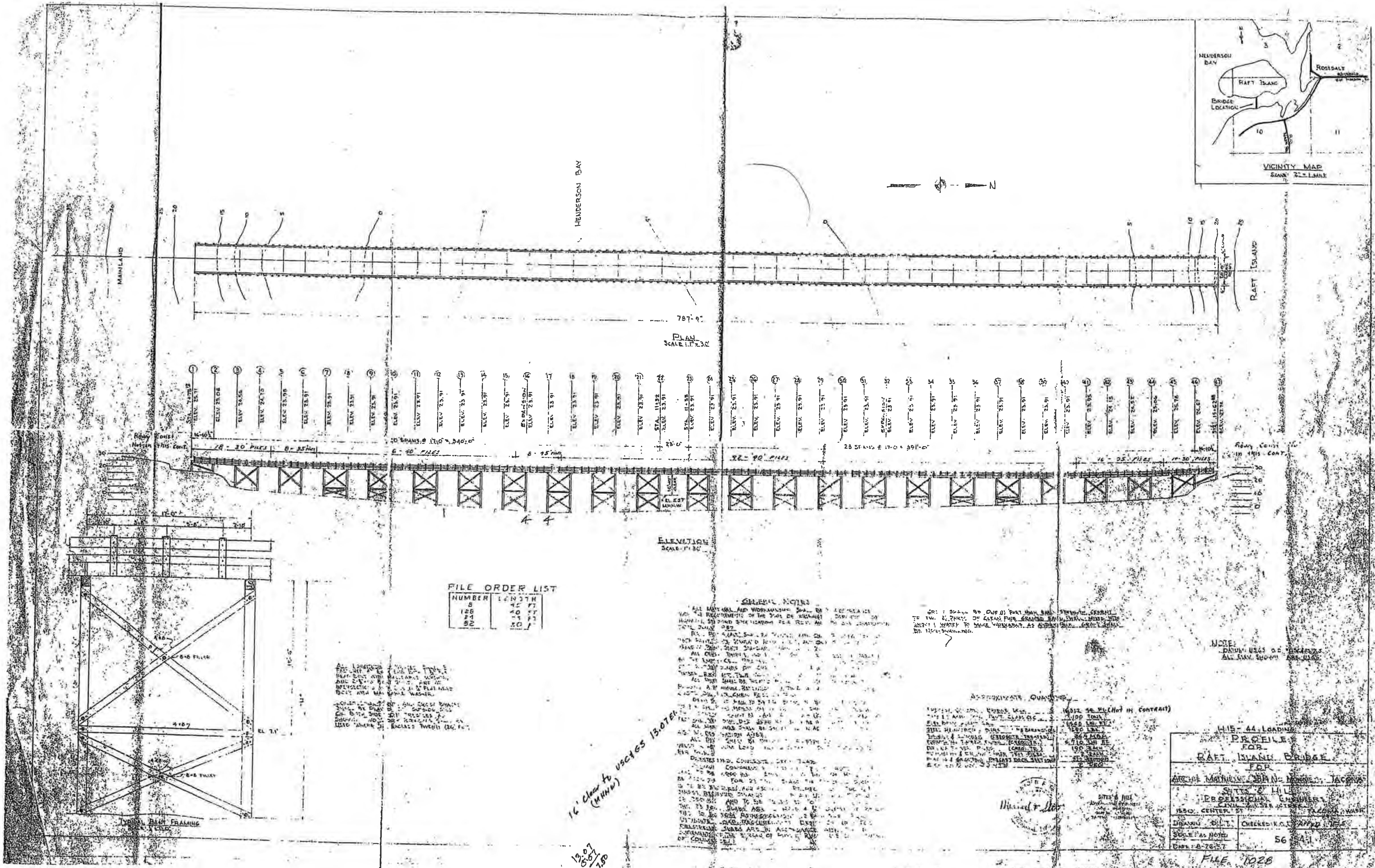
APPENDICES

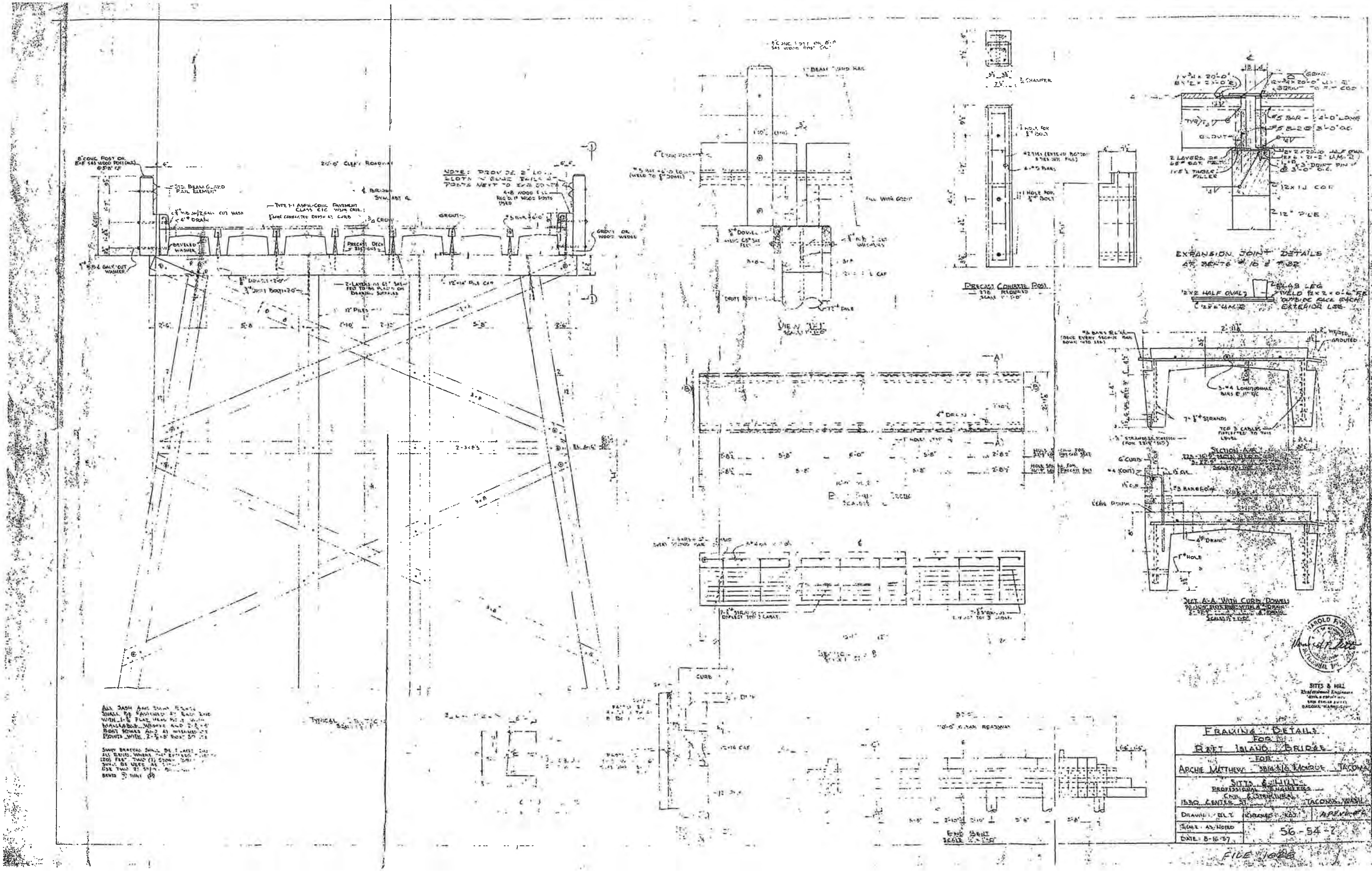
2008 Annual Bridge Inspection Report

September 2008

Appendix A

As-built Drawings


VICINITY MAP
HENDERSON BAY
RAFT ISLAND
ROSEDALE
BRIDGE LOCATION
MAINLAND
787'-9"
PLAN
ELEVATION
PILE ORDER LIST
TYPICAL BENT FRAMING
GENERAL NOTES
APPROXIMATE QUANTITIES
NOTE:
H15-44 LOADING
PROFILE
FOR
RAFT ISLAND BRIDGE
FOR
ARCHIE MATHEWS
SITTS & HILL
PROFESSIONAL ENGINEERS
1530 CENTER ST
TACOMA, WASH.
DRAWN D.L.T.
SCALE AS NOTED
DATE 8-26-57
56
SA-1
FILE 1028
16' clear to USC&GS 13.07 EL (MHHW)



EXPANSION JOINT DETAILS
PRECAST CONCRETE POST
VIEW "1-1"
SECT. A-A
SECT. A-A WITH CURB DOWELS
END BENT
TYPICAL SECTION
12" PILE
12x12 CAP
NOTE: PROVIDE 2" LONG SLOTS IN GUARD RAILS AT POSTS NEXT TO EXP. JOINTS
SITTS & HILL
Professional Engineers
FRAMING DETAILS
FOR
RAFT ISLAND BRIDGE
FOR
ARCHIE MATTHEWS 3814 N. MONROE TACOMA
SITTS & HILL
PROFESSIONAL ENGINEERS
CIVIL & STRUCTURAL
1530 CENTER ST. TACOMA, WASH.
DRAWN: R.L.T.
CHECKED: K.D.J.
SCALE: AS NOTED
DATE: 8-16-57
56-54-2
FILE 1028

Appendix B

Summary of Channel Girder Defects

SUMMARY OF CHANNEL GIRDER DEFECTS

SPAN	DESCRIPTION
1	Girder A has epoxy patches along soffit centerline.
2	Girder A has epoxy patches along soffit centerline.
3	Girders A and G have epoxy patches along soffit centerline. Efflorescence present at various locations along the bottom edge of the webs.
4	Efflorescence present at various locations along the bottom edge of the webs. Between Girders D and E there is presence of moisture and some minor rust stains visible.
5	Girders A and G have epoxy patches along soffit centerline. Efflorescence present at various locations along the bottom edge of the webs.
6	Girder A has epoxy patches along soffit centerline and some efflorescence is present along the bottom edge of the webs at various locations.The spalls identified in 2007 have been patched. Photo 2. (2008). Cracks are present along the corners of the south end diaphragms of Girders A, B and C.
7	Girders A and G have epoxy patches along soffit centerline. Efflorescence present at various locations along the bottom edge of the webs. East web of Girder G has 5" delamination along lower corner (2008).
8	Girder G has 3" diameter delamination near drain. Moisture and efflorescence present at various locations along the bottom edge of the webs. End diaphragm at north end of Girder B has 4" diameter spall.
9	Girder A and G have epoxy patches along soffit centerline. Moisture and some efflorescence is present along the bottom edge of the webs at various locations.
10	Girders A and G have epoxy patches along soffit centerline. Efflorescence present at various locations along the bottom edge of the webs.
11	Girders A and G have epoxy patches along soffit centerline. Girder A East web has 8" x 4" x 1" spall. Efflorescence present at various locations along the bottom edge of the webs.
12	Girders A, C and D have small spalls along bottom of webs. Girder G has epoxy patches along soffit centerline. Moisture and some efflorescence is present along the bottom edge of the webs at various locations.

13	Girder A has two spalls with exposed rebar 4" and 2" long and two 4" delaminations (2008). Girder F has a 5' long rust stained leaching crack. Girder G has two spalls with exposed rebar 4" and 2" long and two 4" delaminations.Photo 3. (2008). Moisture, efflorescence and rust stains present at various locations along the bottom edge of the webs.
14	Girder F has hairline leaching cracking along soffit. Moisture and some efflorescence is present along the bottom edge of the webs at various locations.
15	The girder diaphragms at the North end over Bent 16 have poor concrete consolidation along the top and sides with some spalling. The diaphragms are cracked and displaced. This is not a new development as the condition existed in the photos from 2006. Longitudinal restrainers are present at this bent. Photo 4. (2008). Moisture, efflorescence and rust stains present at various locations along the bottom edge of the webs.
16	Three 3" diameter shallow spalls with exposed rebar in soffit of Girder A.(No change 2008). Girder G East web has been repaired (2008). Photo 5. Moisture, efflorescence and rust stains present at various locations along the bottom edge of the webs.
17	Girder A has epoxy patches along soffit centerline. Moisture, efflorescence and rust stains present at various locations along the bottom edge of the webs. Girders A, B and C have rust stains from the transverse bars leaching through the concrete cover. Girder C shows early signs of concrete delamination at some of these locations.
18	Girder A has epoxy patches along soffit centerline. Efflorescence present at various locations along the bottom edge of the webs.
19	Girder A has epoxy patches along soffit centerline. Efflorescence present at various locations along the bottom edge of the webs.
20	Girder G has epoxy patches along soffit centerline. Efflorescence present at various locations along the bottom edge of the webs.
21	Girder A has epoxy patches along soffit centerline. Efflorescence present at various locations along the bottom edge of the webs.
22	Girder A has epoxy patches along bottom west web. Girder G East web has two shallow spalls 8” long and 6” long with exposed prestress strands.(No change 2008). Photo 6. Efflorescence present at various locations along the bottom edge of the webs.

23	Girder B has 12" long shallow spall and delamination along centerline. (2008) Girder G has epoxy patches along soffit centerline. Girder B has exposed steel plate on bottom of West web. Efflorescence present at various locations along the bottom edge of the webs.
24	Girder A spalls identified in 2007 have been patched. (2008). The West web of Girder E has been patched where there had been exposed prestress strands. Moisture, efflorescence and rust stains present at various locations along the bottom edge of the webs.
25	The west web and soffit of Girder G has been patched. Moisture, efflorescence and rust stains present at various locations along the bottom edge of the webs.
26	Girder A spalls identified in 2007 have been patched. (2008). The East web of Girder C has been patched where there had been exposed prestress strands. The patch has hairline cracks. Moisture, efflorescence and rust stains present at various locations along the bottom edge of the webs.
27	Girders A and G have epoxy patches along soffit centerline. Efflorescence present at various locations along the bottom edge of the webs.
28	Girder A spalls identified in 2007 have been patched. (2008). Girder G has epoxy patches along soffit centerline. Moisture and some efflorescence is present along the bottom edge of the webs at various locations.
29	A 3" diameter shallow spalls with exposed rebar in soffit of Girder A. This was identified for repair in 2007 but the spall is small and repair is not necessary. Girder A has epoxy patches along soffit centerline. Moisture and some efflorescence is present along the bottom edge of the webs at various locations.
30	Girders A and G have epoxy patches along soffit centerline. Efflorescence present at various locations along the bottom edge of the webs.
31	The girder diaphragms at the North end over Bent 32 are missing. There is staining and spalling along the edge of the girders where there was a diaphragm. See photo 7. This is not a new development as the condition existed in the photos from 2006. (2008). Longitudinal restrainers are present at this bent.Girder A spalls identified in 2007 have been patched. (2008). Girder G has epoxy patches along soffit centerline. The web cracks of Girders A and G have been patched at the expansion joint at Bent 32. Moisture and some efflorescence is present along the bottom edge of the webs at various locations.

32	The webs of Girders C, D and G have been patched where there had been exposed prestress strands. There are steel girders under the soffit of Girders A and G to strengthen the girders. There is light rust on the steel girders. Photos 11 and 12.
33	Girder G has epoxy patches along soffit centerline. Efflorescence present at various locations along the bottom edge of the webs.
34	Girder A has two spalls with exposed rebar 2" long in soffit. Photo 8. (2008). Girder G has a small delamination. Moisture, efflorescence and rust stains present at various locations along the bottom edge of the webs.
35	Girder G has epoxy patches along soffit centerline. Efflorescence present at various locations along the bottom edge of the webs.
36	Girder A crack in bottom of east web identified in 2007 has been patched. Photo 9 (2008). The west web of Girder G has been patched. It now has an 8" long spall on the bottom of the web. There is no exposed rebar. There is a steel girder under the soffit of Girder A to strengthen the girder. There is light rust on the steel girder. Moisture, efflorescence and rust stains present at various locations along the bottom edge of the webs.
37	Girder A has epoxy patches along soffit centerline. Efflorescence present at various locations along the bottom edge of the webs.
38	Girders A and G have epoxy patches along soffit centerline. Efflorescence present at various locations along the bottom edge of the webs.
39	Girders A and G have epoxy patches along soffit centerline. Efflorescence present at various locations along the bottom edge of the webs.
40	Girders A and G have epoxy patches along soffit centerline.Girder G also has patches on both webs (2008). Efflorescence present at various locations along the bottom edge of the webs.
41	Girder A has epoxy patches along soffit centerline. The west web of Girder A has been patched. The East web of Girder G has been patched. Girder G soffit has several small spalls (2008). Moisture, efflorescence and rust stains present at various locations along the bottom edge of the webs.

42	The west web of Girder A has been patched. There is a steel girder under the soffit of Girder A to strengthen the girder. The girder appears to be coated with a rust inhibitor paint. Girder G has a spall in the soffit near the drain with 5" of exposed rebar. Photo 10 (2008). Moisture, efflorescence and rust stains present at various locations along the bottom edge of the webs.
43	Girder G west web has a 6" x 3" x 1" deep spall. Moisture, efflorescence and rust stains present at various locations along the bottom edge of the webs.
44	Girder A spalls identified in 2007 have been patched. (2008). Girder A has epoxy patches along soffit centerline. Moisture and some efflorescence is present along the bottom edge of the webs at various locations.
45	Girder A has epoxy patches along soffit centerline. The west web of Girder D has been patched. Moisture, efflorescence and rust stains present at various locations along the bottom edge of the webs.
46	Moisture and some efflorescence is present along the bottom edge of the webs at various locations.

Appendix C

Summary of Substructure Defects

SUMMARY OF SUBSTRUCTURE DEFECTS

BENT	DESCRIPTION
#2	Longitudinal brace is split at connection to Pile 2A.
#5	Pile 5A has check open to 1/4" at top.
#8	Pile 8D has many checks. Pile has 3" of center rot with 4" shell near ground. Pile was YELLOW TAGGED (2008).
#9	Cap has full length check along bottom.
#11	Pile 11D has concrete filled splice at ground line with metal straps at cap.
#12	Pile 12A has soft surface at bottom. No rot found.
#13	Pile 13C has metal strap at cap indicating pile is a replacement.
#15	Pile 15B has timber splice 5' below cap.
#15	Pile 15C has marine borer holes near ground. No rot found.
#16	Pile 16A has steel colar at cap connection.
#17	Pile 17D has 1/4" wide split from ground 10' long. No rot found. Photo 11.
#18	Pile 18C has metal strap at cap indicating pile is a replacement.
#20	Pile 20A has concrete filled splice at ground line with metal straps at cap.
#20	Pile 20B has 3/16" wide split from ground 10' long. No rot found.
#20	Pile 20C has concrete filled splice at ground line with metal straps at cap.
#21	Pile 21A has concrete filled splice at ground line.
#22	Pile 22A has marine borer damage at groundline. Pile was YELLOW TAGGED (2007). Photo 12.
#22	Pile 22D has marine borer damage at groundline. Also surface rot 12" x 3" x 1" deep and minor center rot, less than 1" rot pocket, and a 3" shell. Pile was YELLOW TAGGED (2007). Photo 13.
#23	Pile 23A has concrete filled splice at ground line with metal straps at cap.
#24	Pile 24C has 3/16" wide split from ground 15' long. No rot found.
#24	Diagonal brace at top west end has end rot and corner is missing. Photo 14.
#25	Pile 25B has metal strap at cap indicating pile is a replacement.
#25	Pile 25D has concrete filled splice at ground line.
#27	Pile 27B has 1/2" wide split from top 20' long.

#27	Pile 27D has full height 1/2" wide check. Photo 15. There is marine borer damage at groundline. Pile was YELLOW TAGGED (2007).
#27	Diagonal brace at top east end is split with rot.
#28	Pile 28C has concrete filled splice at ground line with metal straps at cap.
#28	Diagonal brace at top west end has rot and is split at the lower connection to Pile 28D.
#30	Pile 30C has concrete filled splice at ground line with metal straps at cap.
#31	Pile 31A has 3/16" wide split from ground 15' long. No rot found.
#31	Pile 31B has a fiberglass wrap at the groundline.
#31	Diagonal brace at top west end has rot. Photo 16.
#32	Pile 32A has metal strap at cap indicating pile is a replacement.
#32	Pile 32B has metal strap at cap indicating pile is a replacement.
#32	Pile 32C has concrete filled splice at ground line with metal straps at cap.
#32	Pile 32D has metal strap at cap indicating pile is a replacement.
#32	Longitudinal brace has rot at the lower connection to Pile 32C.
#34	Pile 34B has concrete filled splice at ground line with metal straps at cap.
#35	Rotten diagonal west end top.
#36	Pile 36C has concrete filled splice at ground line with metal straps at cap.
#38	Pile 38A has marine borer damage at groundline. There is a 3" x 1" hole and there is center rot with a 4" shell. Pile was YELLOW TAGGED (2008). Photo 17.
#38	Pile 38D has marine borer damage at groundline. There is a 3" x 1" hole. No rot was found. Pile was YELLOW TAGGED (2008). Photo 18.
#38	Diagonal brace at top west end has end rot.
#39	Pile 39C has concrete filled splice at ground line with metal straps at cap.
#40	Pile 40B has concrete filled splice at ground line with metal straps at cap.
#41	Pile 41B has concrete filled splice at ground line with metal straps at cap.
#42	Diagonal brace at top west end has rot.
#43	Rotten diagonal end at both the west top and east top.
#44	Pile 44A has 1/2" wide split starting at top extending down 2/3 the length. The split extends through the full diameter at the top. The pile was RED TAGGED (2008). Photo 19.
#45	Rotten diagonal east end top.

#47	North abutment cap has end rot at east end. There is a 5" shell over Pile 47E and a 2" shell near the end. Photo 20. The west end had similar rot with a 5" shell over Pile 47A. Photo 21. Cap was YELLOW TAGGED (2008).

Appendix D

Photographs

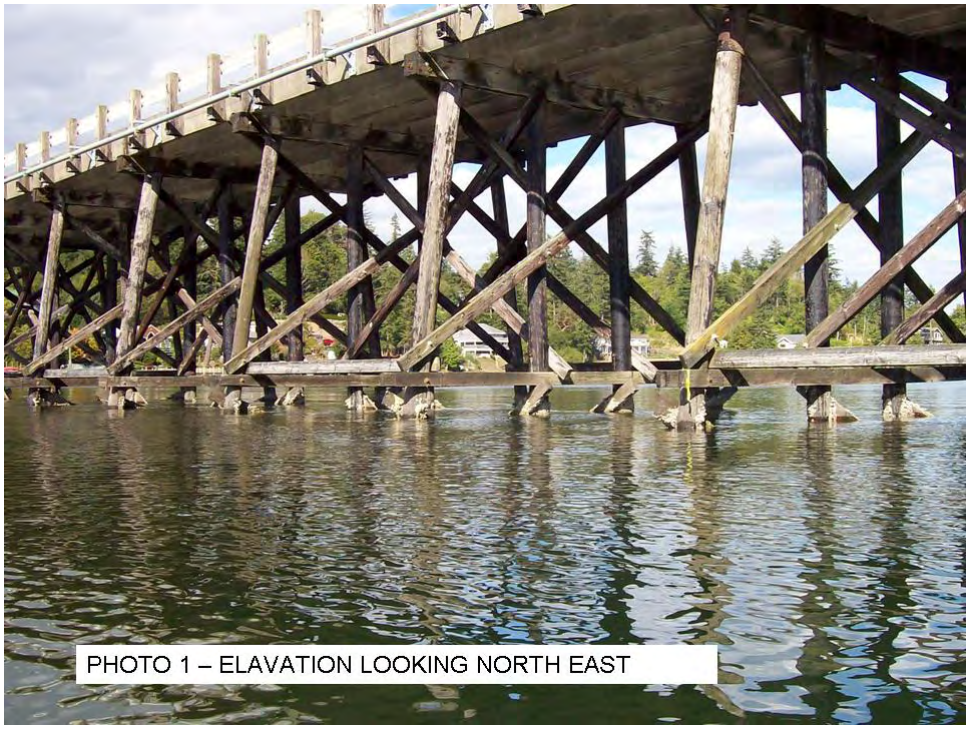


PHOTO 1 – ELAVATION LOOKING NORTH EAST

PHOTO 2 – GIRDER 6A – PATCHED SOFFIT SPALLS

PHOTO 3 – GIRDER 13G – SOFFIT SPALLS

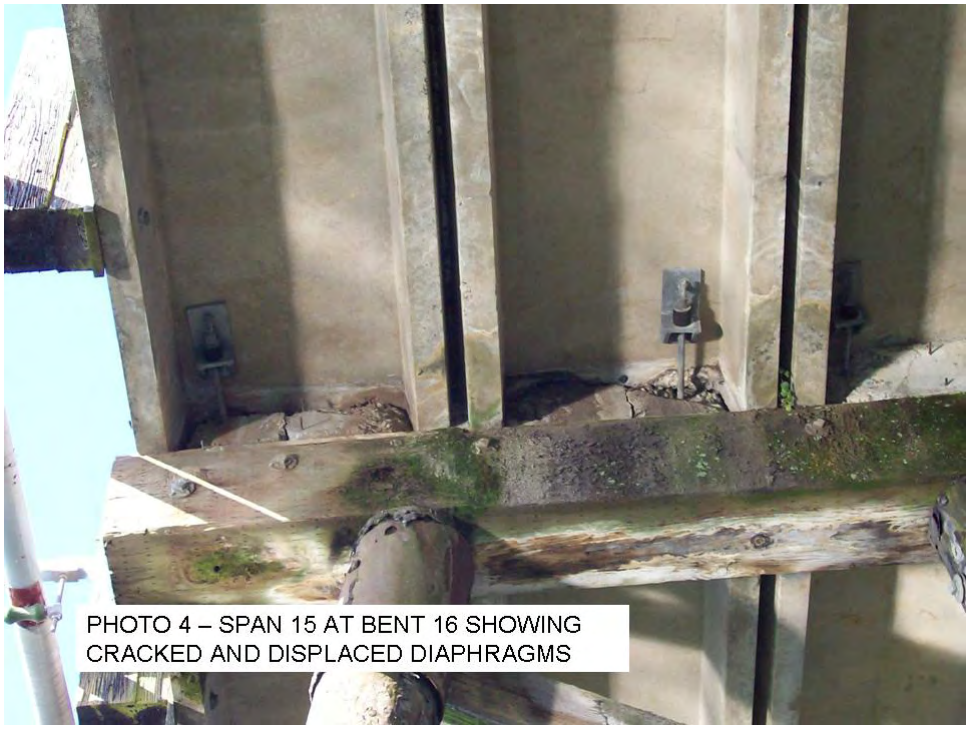


PHOTO 4 – SPAN 15 AT BENT 16 SHOWING CRACKED AND DISPLACED DIAPHRAGMS

PHOTO 5 – GIRDER 16G – PATCHED CRACK IN EAST WEB

PHOTO 6 – GIRDER 22G – SPALL WITH EXPOSED PRESTRESS IN EAST WEB

PHOTO 7 – SPAN 31 AT BENT 32 SHOWING MISSING DIAPHRAGMS

PHOTO 8 – GIRDER 34A – SOFFIT SPALLS

PHOTO 9 – GIRDER 36A – PATCHED EAST WEB

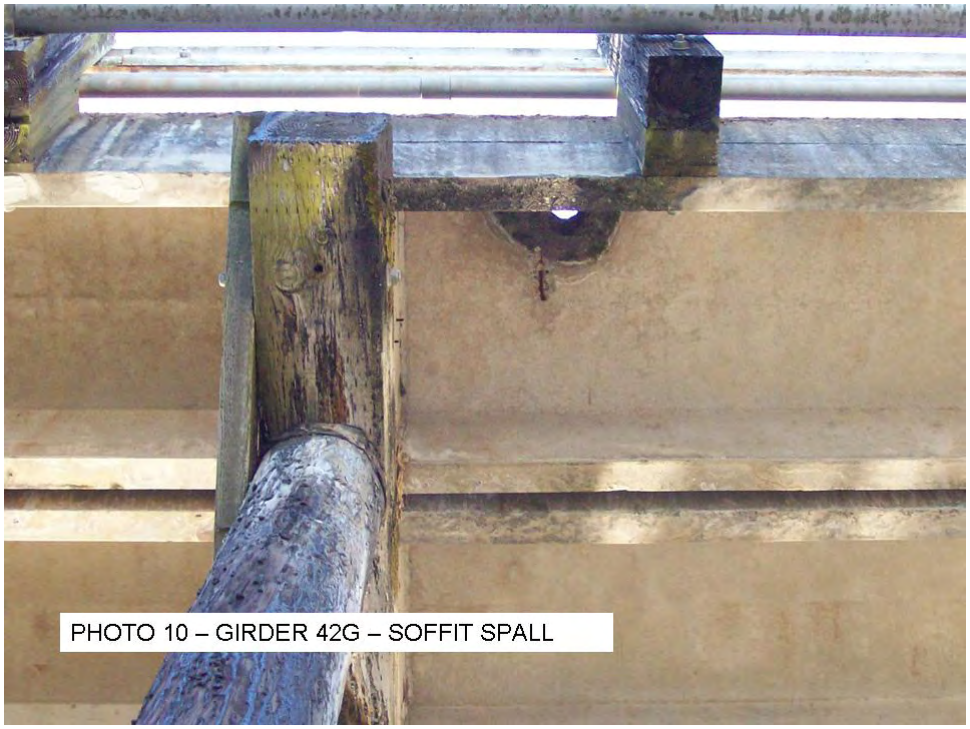


PHOTO 10 – GIRDER 42G – SOFFIT SPALL

PHOTO 11 – PILE 17D – ¼" WIDE SPLIT

PHOTO 12 – PILE 22A – YELLOW TAGGED DUE TO MARINE BORER DAMAGE

PHOTO 13 – PILE 22D – YELLOW TAGGED DUE TO MARINE BORER DAMAGE

PHOTO 14 – DIAGONAL BRACE BENT 24 - END ROT AND MISSING CORNER

PHOTO 15 – PILE 27D – YELLOW TAGGED DUE TO MARINE BORER DAMAGE

PHOTO 16 – DIAGONAL BRACE BENT 31 - END ROT AND MISSING CORNER

PHOTO 17 – PILE 38A – YELLOW TAGGED DUE TO MARINE BORER DAMAGE

PHOTO 18 – PILE 38D – YELLOW TAGGED DUE TO MARINE BORER DAMAGE

PHOTO 19 – PILE 44A – RED TAGGED DUE TO ½" WIDE SPLIT

PHOTO 20– PILE CAP NORTH ABUTMENT EAST END – YELLOW TAGGED DUE TO END ROT

PHOTO 21– PILE CAP NORTH ABUTMENT WEST END – YELLOW TAGGED DUE TO END ROT

PHOTO 22– SOUTH ABUTMENT – EXPANSION JOINT REPAIR

PHOTO 23– BENT 16 – EXPANSION JOINT REPAIR

PHOTO 24– BENT 32 – EXPANSION JOINT


PHOTO 25– NORTH ABUTMENT
08/27/20

Appendix E

Inspection Report

Structure Identifier	Bridge Number	Owner Code	County Number	City Number	Update
XA104400	1	26	27	0000	0

Washington State Department of Transportation

WSBIS Inventory Report

11/19/2008

WB71	Bridge Name	Location	Section	Township	Range	Latitude	Longtitude
	RAFT ISLAND BRIDGE	RAFT ISLAND DR NW	10	20	02W	47°19'35.00	122°40'07.00

WB72	Feature Intersected	Facilities Carried	Region	FIPS Place Code	Legis District (1)	Legis District (2)	Toll	Custodian	Parallel Structure	Temporary Structure	Critical Facility	Median	Hist Sig	Open Closed	Program Year
											☒				
	CARR INLET	RAFT ISLAND DRIVE	OL	00000	26		3	26	N		☒	0	4	P	0

WB73	Year Built	Year ReBuilt	Bridge Length	NBIS Length	Maximum Span Length	Lanes On	Lanes Under	Curb to Curb Deck Width	Out to Out Deck Width	Sidewalk Curb Left	Sidewalk Curb Right	Min Vert Clearance Over Deck	Min Vert Clearance Under Bridge	Code	Min Lat UnderClr Right	Code	Min Lat UnderClr Left	Navigation Control	Navigation Vertical Clearance	Navigation Horizontal Clrnce	Vert Lift Min Clrnce	Appr Roadway Width	Skew Angle	Flare
	1957	0	788		23	2	0	20.0	21.0	0.5	0.5	99'99	0	N	0.0	N	0.0	0	0	0		20	0	N

WB74	On Under	High way Class	Service Level	Route Number	Mile Post	ADT on Inventory Route	Truck ADT PCT	ADT Year	Future ADT	Future ADT Year	Linear Referencing System Route	LRS Sub Route	Fed Aid Route	Nat Hwy System	Base Hwy Network	Strahnet	Fed Lands Highway	Fed Funct Class	National Truck Net	Lane Use Direction	Horizontal Clearance Route Dir	Horizontal Clearance Reverse Dir	Max Vertical Clearance Route Dir	Detour Length
	1	8	0	00001	1.00	50	1	2007	100	2020			0000	0	0	0	0	08	N	2	20'00			99

WB75	Main Span Material	Main Span Design	Appr Span Material	Appr Span Design	Number of Main Spans	Number of Appr Spans	Service On	Service Under	Deck Type	Wearing Surface	Membrance	Fed Deck Protection	Design Load	Oper Rtng Method	Oper Rtng Tons	Invt Rtng Method	Invt Rtng Tons	Design Exception Date	Federal Aid Project	Border State Code	Border State PCT	Border State Structure Identifier
	5	22			46	0	1	5	B	6	2	0	2	L	23	L	14	/ /				

Routine Inspection

WB76	Freq	Last Inspection Date	Hours On Site	Inspector	Inspection Identification No	Co-Inspector
	12	09/09/2008	11.0	RLS	A1044	JC

WB76	Structural Adequacy	Deck Geometry	Underclrnce Adequacy	Operating Level	Alignment Adequacy	Waterway Adequacy	Deck Overall	Deck Cond	Drain Cond	Drains	Scaling Severity	Scaling Percent	Deck Rutting	Exposed Reinf Steel	Superstruct Overall	Curb	Sidewalks	Paint	Number of Utilities	Substruct Overall	Channel Protection	Culvert	Pier Abutment	Scour	Approach Roadway	Retaining Walls	Pier Protection	Traffic Safety Bridge Rail	Traffic Safety Trans	Traffic Safety Guard Rail	Traffic Safety Term	Revise Rating	Repair Status	Card Check	Photos	Season	Soundings	Clearances	Monitor Structure
	☒	☒	☒	1	8	8	6	8	1						5				4	4	8	9	N	6	6	9	9	0	0	0	0	N	Y			L	N		

Sufficiency Rating: 41.93

SD

WB77	Fracture Critical / UBIT Inspection Type	Freq	Last Inspection Date	Hours On Site	Inspector	Inspection Identification No	Co-Inspector
			/ /				

WB77	Underwater Inspection Type	Freq	Last Inspection Date	Hours On Site	Inspector	Inspection Identification No	Co-Inspector
			/ /				

WB77	Other Special Inspections Type	Freq	Last Inspection Date	Hours On Site	Inspector	Inspection Identification No	Co-Inspector
			/ /				

WB78	Water Type	Flood Plain Intrusion	Flood Control	Scour History	Streambed Material	Substruct Stability	Waterway Obstruction	Streambed Stability	Streambed Anabranch	Piers in Water	Service On	Service Under	Work Type	Work
	S	A	N	N	4	3	N	G	N	M	1	5	31	1

Proposed Improvements

WB78	Structure Improve Length	Roadway Width	Lanes On	Lanes Under	Total Costs In Thousands	Structure Cost In Thousands	Roadway Cost In Thousands	Estimate Year	Calc	Inspecting Agency Code	Inspecting Agency Number	Seismic Status-Superstruct Main Biennium	Seismic Status-Superstruct Approach Biennium	Seismic Status-Substruct Main Biennium	Seismic Status-Substruct Approach Biennium
	788		2	0	5000	4000	1000	2032	N	26					

BRIDGE INSPECTION REPORT

	WO	CC	WE	PD			
BAM					Status: Work	Ver Date 11/19/2008 Printed on: 11/19/2008	Agency: Private (Consultant) Program Mgr: Harvey L. Coffman

Bridge No. 1 — Page 1 of 3 — **Structure Type** PSG

Bridge Name RAFT ISLAND BRIDGE — **Route** 00001 — **Intersecting** CARR INLET

Structure ID XA104400 — **MilePost** 1.00 — **Location** RAFT ISLAND DR NW

Inspector's Signature RLS — IDent# A1044 — Co-Inspector's Signature JC

4	Structural Adqcy	(657)	N	Pier/Abut/Protect	(679)	1957		Year Built	(332)	**Inspections Performed:**				
5	Deck Geometry	(658)	6	Scour	(680)	0		Year Rebuilt	(336)	**IT**	**NT**	**HRS**	**Date**	**Rep Type**
9	Underclearance	(659)	6	Approach Rdwy	(681)		L 23	Oper Rating	(551)	Y	12	11.0	9/9/2008	Routine
1	Operating Level	(660)	9	Retaining Walls	(682)		L 14	Inv Rating	(554)					Fract Crit
8	Alignment Adqcy	(661)	9	Pier Protection	(683)		P	Open Close	(293)					Underwater
8	Waterway Adqcy	(662)	0	Bridge Rails	(684)		9999	Vert Over Deck	(360)					Special
6	Deck Overall	(663)	0	Transition	(685)		0000	Vert Under	(374)					Interim
8	Drains Condition	(664)	0	Guardrails	(686)		N	Vert Und Code	(374)					Equipment
5	Superstructure	(671)	0	Terminals	(687)		2.00	Asphalt Depth						Damage
4	Number Utilities	(675)	N	Revise Rating	(688)		15	Speed Limit						Safety
4	Substructure	(676)		Photos Flag	(691)									Short Span
8	Chan/Protection	(677)	N	Soundings Flag	(693)					**Total:** 11.0				
9	Culvert	(678)		Measure Clearance	(694)					**Suff Rating:**				41.93 SD

BMS Elements 13 to 801

Element	Element Description	Total	Units	Env	State 1	State 2	State 3	State 4
13	Bridge Deck Surface	15,760	SF		15,760	0	0	0
109	Prestressed Concrete Multiple Web Girder Units	5,516	LF		4,418	996	102	0
206	Timber Pile/Column	8	EA		8	0	0	0
216	Timber Abutment	60	LF		30	0	30	0
228	Timber Submerged Pile/Column	180	EA		150	23	6	1
235	Timber Pier Cap	1,034	LF		814	198	22	0
330	Metal Bridge Railing	1,576	LF		1,570	6	0	0
406	Compression Seal / Steel Header	20	LF		0	20	0	0
412	Strip Seal - Anchored	40	LF		20	20	0	0
801	AC Overlay with Waterproofing Membrane	15,760	SF		15,730	30	0	0

Notes 0 to 801

0 Bridge is oriented south to north. Bridge is posted 16T - 28T - 30T. This is a private bridge that is not open to public traffic.

13 Spans are concrete channel girders with no topping.

BRIDGE INSPECTION REPORT

WO	CC	WE	PD		Ver Date 11/19/2008	Agency: Private (Consultant)
BAM				Status: Work	Printed on: 11/19/2008	Program Mgr: Harvey L. Coffman

Bridge No.	1			**Structure Type**	PSG
Bridge Name	RAFT ISLAND BRIDGE	**Route**	00001	**Intersecting**	CARR INLET
Structure ID	XA104400	**MilePost**	1.00	**Location**	RAFT ISLAND DR NW

Notes 0 to 801

109	The following are girders with spalls and exposed rebar on the soffit: 13A, 13G, 16A, 23B, 34A and 42G. The spalls were typically 4" or less in diameter and less than 1" deep. See photo 10. REPAIR 10001. The following girder had a crack that was significant: 13F had a 5' long soffit crack along centerline that was leaching and rust stained. Girder 22G had spalls 8" long and 6" long on the east web that exposed a prestress strand. See photo 5. REPAIR 10001. 58 girders had patches to the soffit or web. Girders 32A, 32G, 36A and 42A have been strengthened by the addition of steel girders below the soffit. The diaphragms at the north end of Span 15 at Bent 16 are cracked and displaced. At the north end of Span 31 over Bent 32 the diaphragms are missing. Both locations are at an expansion joint where longitudinal restrainers were added. See photos 4 and 6. REPAIR 10002.
216	See item 235.
228	All piles were sounded at the ground line and to height of approx. 7'. Piles 8D, 22A, 22D 27D, 38A and 38D were YELLOW TAGGED due to marine borer damage. See photo 7. 22D had some minor rot. REPAIR 4. Several of the piles had checks or splits that were up to 1/2" wide. At Pile 44A the split was 1/2" wide at the top and extended through the full diameter. The pile was RED TAGGED. See photo 8. REPAIR 10000. The following piles have been repaired by using a concrete filled splice at ground line and adding a new section of pile that has a metal strap connection to the cap: 11D, 20A, 20C, 21A, 23A, 25D, 28C, 30C, 32C, 34B, 36C, 39C, 40B, and 41B. The following piles have been replaced as indicated by a metal strap connection at the cap: 13C, 16A (steel collar), 18C, 25B, 32A, 32B and 32D. Pile 31B has a fiberglass wrap at the ground line. The diagonal transverse bracing had end rot at top connection at many bents.
235	A few of the caps had checks but appear to be in good condition. The cap at Bent 9 had a full length check along the bottom. The cap at the north abutment has end rot at both ends. At the west end there is a 5" shell over Pile 47A. At the east end there is a 5" shell over Pile 47E and a 2" shell near the end. The pile was YELLOW TAGGED. See photo 9. REPAIR 10003.
330	Bridge rail is metal W beam on timber posts. There is impact damage to the east rail in Span 17. It is bent out 2" over 5' 8".
406	The compression seal header at the south abutment has been repaired. There is new concrete Set 45 at centerline and in the northbound lane on the south side of the joint. The new header at the centerline is cracked and loose.
412	The loose strip seal steel extrusion at Bent 16 has been repaired. A new header has been installed on the south side of the joint. At Bent 32 there is old concrete patch on the south side of the joint that is cracked and starting to breakup. Both joints measured approx. 1/2" between the steel extrusions at 80 degrees.
671	Superstructure coded down to 5 due to the 58 girders that have patches and the continuing spalls and exposed rebar.
676	Substructure coded down to 4 due to the 23 piles that were either replaced or spliced and the continuing marine borer damage.
801	There is a 2" thick ACP overlay. There is patching and crack sealing along the centerline and at the expansion joints. At Bent 32 the overlay is delaminating along a 3' long strip. At the north abutment there is cracking full width with some smaller "D" cracking.

Repairs 1 to 10003

Repair No	Pr	R	Repair Description	Date Noted	Verified
1	1	B	Patch the spalls on the following girders: 6G, 16A, 22G, 24A, 26A, 28A, 29A, 31A and 44A.	7/18/2007	8/27/2008
2	1	B	Epoxy crack inject the cracks in Girders 16G and 36A.	7/18/2007	8/27/2008
3	1	B	Patch the overlay at the South Abutment and Bent 32. Tighten the expansion joint hold down bolts before patching.	7/18/2007	8/27/2008
10000	1	B	Install a metal band at the top of RED TAGGED Pile 44A where there is a 1/2" wide split.	9/9/2008	
10002	1	B	Replace damaged and missing diaphragms at Bent 16 Span 15 and Bent 32 Span 31.	9/9/2008	
10001	2	B	Patch the spalls on the following girders: 13A, 13G, 16G, 22G and 23B.	9/9/2008	
4	M	B	Monitor YELLOW TAGGED PILES 8D, 22A, 22D, 27D, 38A and 38D which have marine borer damage.	7/18/2007	
10003	M		Monitor the YELLOW TAGGED cap at the north abutment which has end rot and a 5" shell over the 1st pile at each end.	9/9/2008	

BRIDGE INSPECTION REPORT

	WO	CC	WE	PD			
BAM					Status: Work	Ver Date 11/19/2008 Printed on: 11/19/2008	Agency: Private (Consultant) Program Mgr: Harvey L. Coffman

Bridge No.	1			**Structure Type**	PSG
Bridge Name	RAFT ISLAND BRIDGE	**Route**	00001	**Intersecting**	CARR INLET
Structure ID	XA104400	**MilePost**	1.00	**Location**	RAFT ISLAND DR NW

Inspections Performed and Resources Required

Report Type	Date	IT	Frq	Hrs	Insp	CertNo	Coinsp	Note
Routine	9/9/2008		12	11.0	RLS	A1044	JC	

Resources	Use	Hours	Min	Req	Max	Notes
Boat						
Tides						Need -1.0 or lower.
Access Issues						Ladder.

Sticky Notes

Creator	Created	Table Reference	Notes
			(No sticky notes for this structure)

BRIDGE INSPECTION REPORT

WO	CC	WE	PD			
BAM						

Status: Work

Ver Date 11/19/2008

Printed on: 11/19/2008

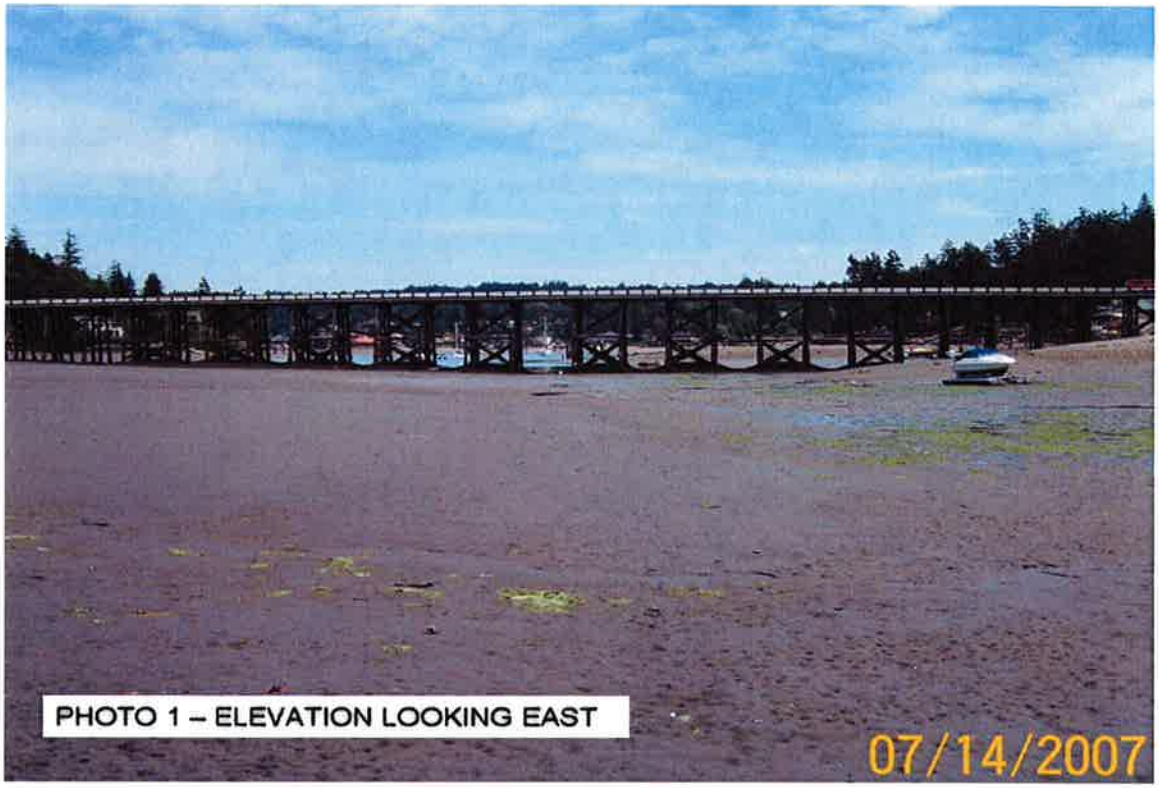
Agency: Private (Consultant)

Program Mgr: Harvey L. Coffman

Bridge No.	1			**Structure Type**	PSG
Bridge Name	RAFT ISLAND BRIDGE	**Route**	00001	**Intersecting**	CARR INLET
Structure ID	XA104400	**MilePost**	1.00	**Location**	RAFT ISLAND DR NW

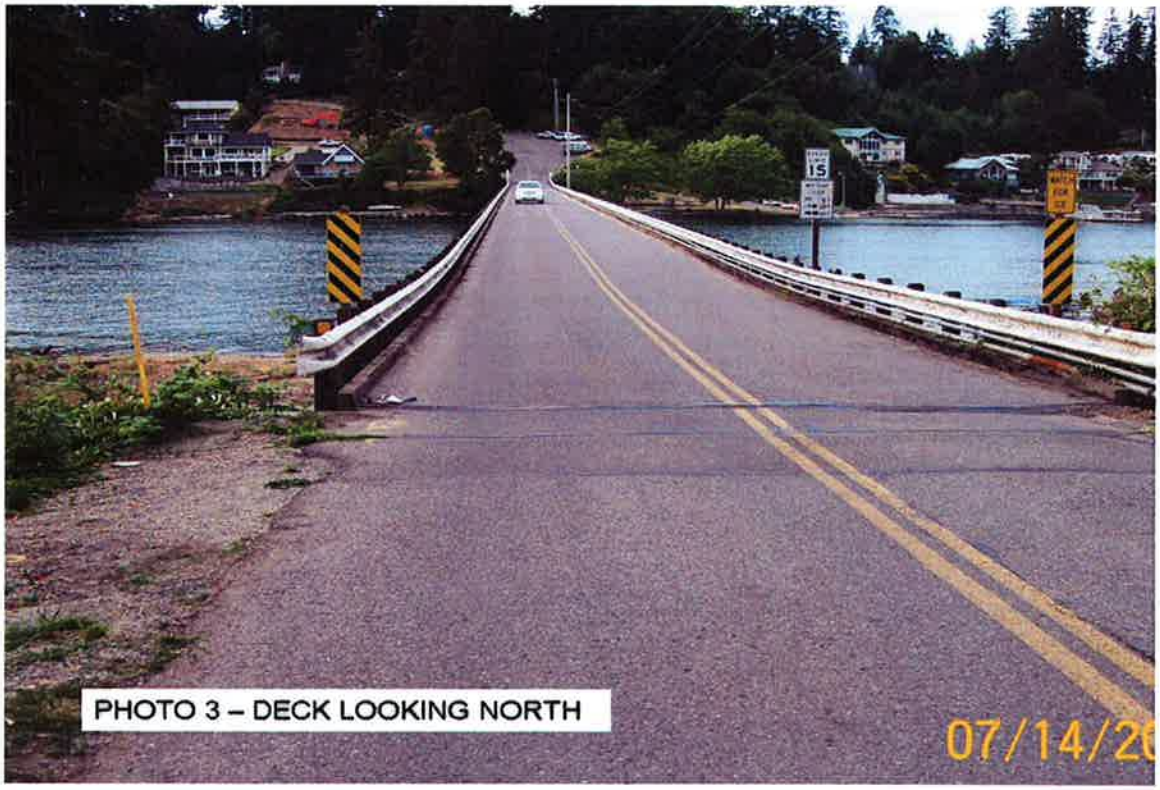
SI-1

2007
Photo type: E - Elevation
Orientation: E
Dates: 7/14/2007
Repairs: 0
ELEVATION



SI-2

2007
Photo type: D - Deck
Orientation: N
Dates: 7/14/2007
Repairs: 0
DECK



BRIDGE INSPECTION REPORT

	WO	CC	WE	PD			
BAM					Status: Work	Ver Date 11/19/2008 Printed on: 11/19/2008	Agency: Private (Consultant) Program Mgr: Harvey L. Coffman

Bridge No.	1			**Structure Type**	PSG
Bridge Name	RAFT ISLAND BRIDGE	**Route**	00001	**Intersecting**	CARR INLET
Structure ID	XA104400	**MilePost**	1.00	**Location**	RAFT ISLAND DR NW

SI-10

2008
Photo type: R - Repair
Orientation: UP
Dates: 9/9/2008
Repairs: 1
GIRDER 42G SOFFIT SPALL

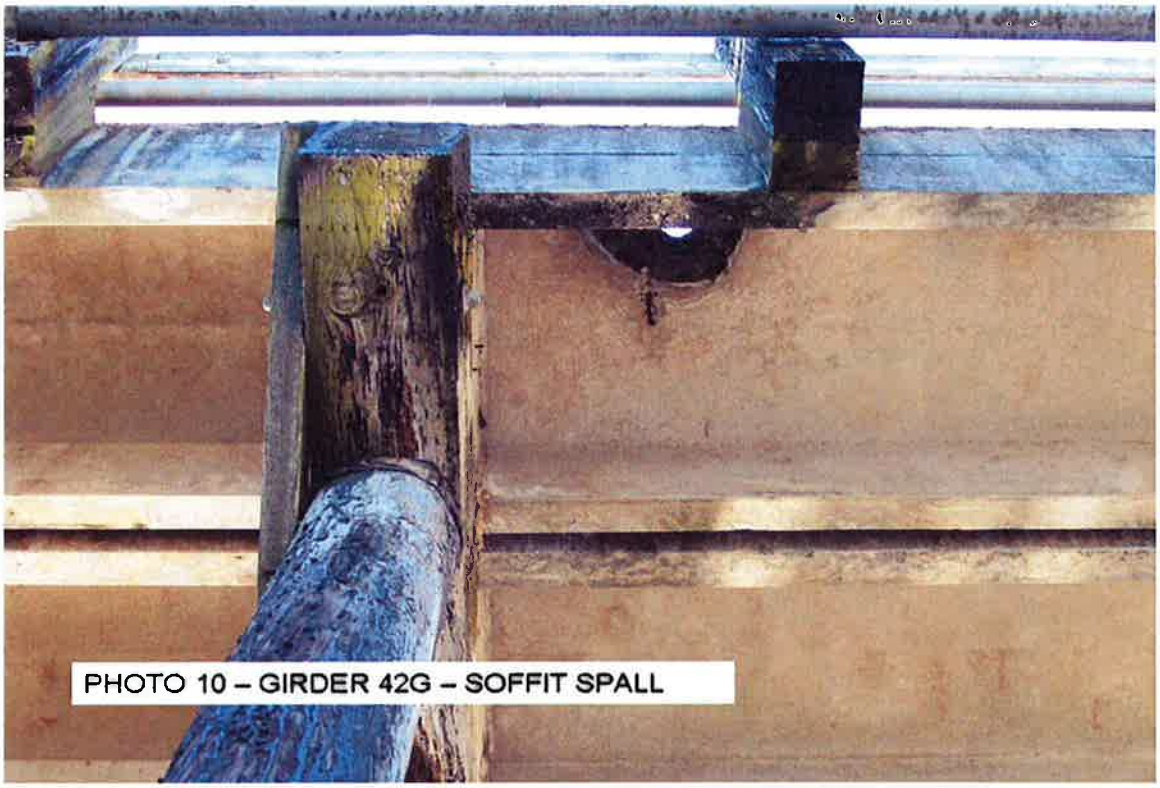


PHOTO 10 – GIRDER 42G – SOFFIT SPALL

SI-3

2008
Photo type: R - Repair
Orientation: UP
Dates: 9/9/2008
Repairs: 1
GIRDER 6A PATCHED SOFFIT SPALLS

PHOTO 2 – GIRDER 6A – PATCHED SOFFIT SPALLS

SI-4

2008
Photo type: R - Repair
Orientation: N
Dates: 9/9/2008
Repairs: 1
DIAPHRAGMS BENT 16

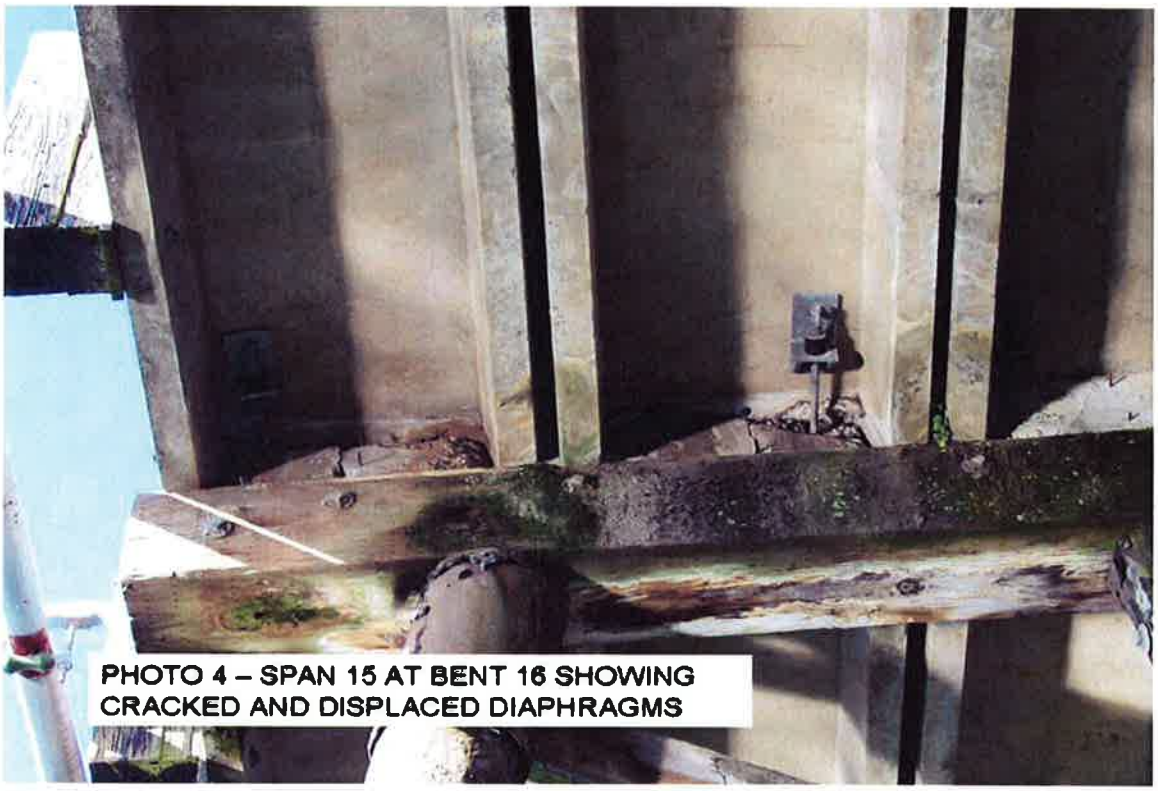


PHOTO 4 – SPAN 15 AT BENT 16 SHOWING CRACKED AND DISPLACED DIAPHRAGMS

SI-5

2008
Photo type: R - Repair
Orientation: W
Dates: 9/9/2008
Repairs: 0
GIRDER 22G EXPOSED PRESTRESS STRANDS

PHOTO 6 – GIRDER 22G – SPALL WITH EXPOSED PRESTRESS IN EAST WEB

Bridge No.	1			**Structure Type**	PSG
Bridge Name	RAFT ISLAND BRIDGE	**Route**	00001	**Intersecting**	CARR INLET
Structure ID	XA104400	**MilePost**	1.00	**Location**	RAFT ISLAND DR NW

SI-6

2008
Photo type: R - Repair
Orientation: N
Dates: 9/9/2008
Repairs: 1
DIAPHRAGMS BENT 32

PHOTO 7 – SPAN 31 AT BENT 32 SHOWING MISSING DIAPHRAGMS

SI-7

2008
Photo type: M - Monitor
Orientation: SW
Dates: 8/27/2008
Repairs: 1
PILE 27D MARINE BORER DAMAGE

PHOTO 15 – PILE 27D – YELLOW TAGGED DUE TO MARINE BORER DAMAGE

Bridge No. 1 **Structure Type** PSG

Bridge Name RAFT ISLAND BRIDGE **Route** 00001 **Intersecting** CARR INLET

Structure ID XA104400 **MilePost** 1.00 **Location** RAFT ISLAND DR NW

SI-8

2008
Photo type: R - Repair
Orientation: N
Dates: 8/27/2008
Repairs: 1
PILE 44A

PHOTO 19 – PILE 44A – RED TAGGED DUE TO ½" WIDE SPLIT

SI-9

2008
Photo type: M - Monitor
Orientation: NE
Dates: 8/27/2008
Repairs: 1
PILE CAP AT NORTH ABUTMENT

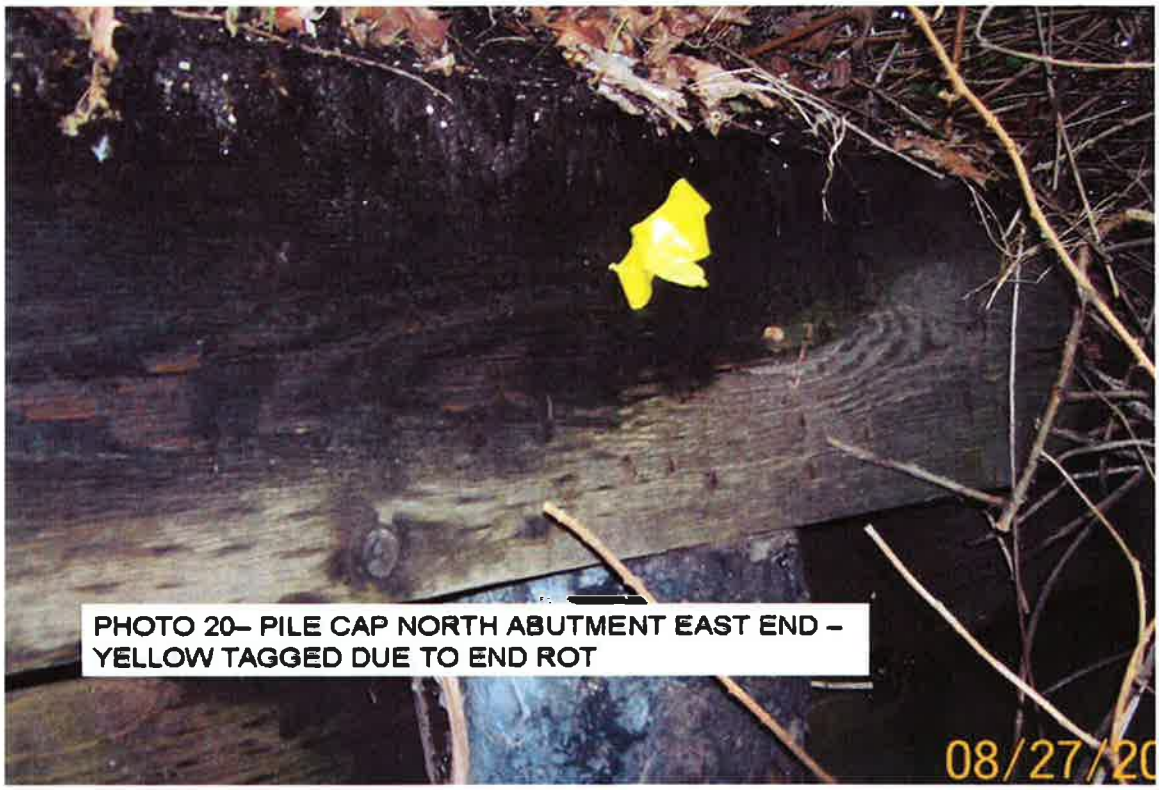


PHOTO 20– PILE CAP NORTH ABUTMENT EAST END – YELLOW TAGGED DUE TO END ROT

BRIDGE INSPECTION REPORT

Bridge No. 1 | Page 6 of 6 | **Structure Type** PSG

Bridge Name RAFT ISLAND BRIDGE | **Route** 00001 | **Intersecting** CARR INLET

Structure ID XA104400 | **MilePost** 1.00 | **Location** RAFT ISLAND DR NW

Entry Name	Type	Repairs	Page
2007\SI-1	E	0	1
2007\SI-2	D	0	1
2008\SI-10	R	1	2
2008\SI-3	R	1	2
2008\SI-4	R	1	3
2008\SI-5	R	0	3
2008\SI-6	R	1	4
2008\SI-7	M	1	4
2008\SI-8	R	1	5
2008\SI-9	M	1	5