

2016 UNDERWATER BRIDGE INSPECTION REPORT



BRIDGE # 7097 CSAH 7 over RED RIVER OF THE NORTH

DISTRICT: District 2 COUNTY: Polk CITY/TOWNSHIP: VINELAND

STATE: Minnesota

Date of Inspection: 10/19/2016

Equipment Used:

Owner: County Highway Agency

Inspected By: Schroeder, Brian

Report Written By: Brian Schroeder

Report Reviewed By:

Final Report Date:



TABLE OF CONTENTS

	PAGE NUMBER
UNDERWATER SUMMARY	3
UNDERWATER INSPECTION	4
UNDERWATER INSPECTION PROCEDURES	6
STRUCTURE INVENTORY	7
ELEMENTS	8
PICTURES	14
DRAWINGS	19

UNDERWATER INSPECTION

REPORT SUMMARY

The substructure unit inspected at Bridge No. 7097, Pier 2, was in good condition with no defects of structural significance observed. The channel bottom appeared to be stable with no evidence of significant scour.

INSPECTION FINDINGS

(A) Moderate to heavy timber debris consisting of logs and branches 2 feet diameter and smaller was observed at the south (upstream) end and along the entire east face of Pier 2. The debris extended from the channel bottom to just below the waterline, 6 feet off the east face and 4 feet off the upstream nose towards the west.

(B) Vertical crack up to 1/8 inch wide was located on east and west faces of Pier 2 extending from the strut to the channel bottom at midpoint of the pier.

(C) The previously reported footing exposure was not observed at the east side of the north column.

RECOMMENDATIONS

(A) Monitor the timber debris, and if found to be increasing in the future, removal operations may become warranted.

(B) Reinspect the submerged substructure units at the normal maximum recommended (NBIS) interval of sixty (60) months.

Contractor: Ayres Associates & Collins Engineers, Inc.

Contractor Job Number: 9687

UNDERWATER INSPECTION

1. BRIDGE DATA

Bridge #: 7097
Feature Intersected: RED RIVER OF THE NORTH
Facility Carried: CSAH 7
District: District 2
County: 060 - Polk
Bridge Description:

The superstructure consists of two steel through truss spans and five steel beam approach span. The superstructure is supported by two reinforced concrete abutments, three steel pile framed bents, and three reinforced concrete piers. The abutments are supported by treated timber piles. The piers are supported by untreated timber piles. The substructure units are designated West Abutment, Piers 1, 2 and 3, Bents 1, 2, and 3, and East Abutment. The piers support the two truss spans over the river and are numbered from west to east.

2. INSPECTION DATA

Professional Engineer/Team Leader: Brian K. Schroeder, P.E.
Inspection Diver: Brian K. Schroeder, P.E.
Date of Underwater Inspection: 10/19/2016
Weather Conditions: Cloudy, 40°F
Underwater Visibility (feet): None/Negligible
Waterway Velocity (ft/sec): 2.0

3. SUBSTRUCTURE INSPECTION DATA

Substructure(s) Inspected: Pier 2
General Shape:

The pier consists of a reinforced concrete cap supported by two multi-sided columns connected by a slender diaphragm wall braced with an integral horizontal strut. The pier is founded on a rectangular footing supported by timber piles.

Maximum Water Depth at Substructure(s) Inspected (feet): 8.0

4. WATERLINE DATUM

Water Level Reference: The top of the pier cap at the downstream end of Pier 2
Waterline Elevation (feet): 802.8
Description: The waterline was approximately 50.9 below reference.

5. NBIS CODING INFORMATION

(Minnesota specific codes are used for 92B and 113)

Item 60: Substructure: Code: 7
Item 61: Channel and Channel Protection: Code: 6
Item 62: Culvert: Code:

Item 92B: Underwater Inspection: Code: Y 48 10/2016

Item 113: Scour Critical Bridge: Code: I

Bridge is scour critical because abutment or pier foundation is rated as unstable due to observed scour at bridge site.

Yes No (Mark your selection with an X)

6. STRUCTURAL ELEMENT CONDITION RATING

ELEM #	Element Description	Quantity	Unit	Conditions			
				CS1	CS2	CS3	CS4
210	Reinforced Concrete Pier Wall	26	LF		26		
885	Scour	1	EA	1			

UNDERWATER INSPECTION

INSPECTION PROCEDURES

The routine underwater inspection of Bridge 7097 (CR No. 7 over the Red River of the North) was completed on October 19, 2016. The underwater inspection was conducted from shore. The inspection was conducted by a team consisting of a PE-Diver with a valid MnDOT Team leader certification, a backup diver and a dive tender. The inspection utilized commercial dive equipment and techniques (SSA and/or SCUBA) in accordance with OSHA regulations. Profiles were taken along the upstream and downstream faces of the bridge and around the periphery of substructure units to determine the presence, location and area of scour.

The bridge elements inspected consisted of one reinforced concrete pier. According to the bridge inventory or design drawings, the pier is founded on a rectangular footing supported by timber piles. Inspection procedures followed FHWA guidance and the MnDOT Bridge and Structure Inspection Program Manual with channel bottom probing to search for foundations. The routine underwater inspection frequency is recommended to remain at 60 months based on those findings and risk factors. Also, inspection procedures should continue to follow the above approach and standard guidance with 100% Level I and 10% Level II intensity efforts.

Minnesota Structure Inventory Report

Bridge ID: 7097

CSAH 7 over RED RIVER OF THE NORTH

Date: 01/26/2017

+ GENERAL +	+ ROADWAY +	+ INSPECTION +		
Agency Br. No. 722 Crew District 02 Maint. Area County 060 - Polk City Township 60057 - VINELAND Desc. Loc. 0.2 MI W OF JCT TH 220 Sect., Twp., Range 25 - 148N - 49W Latitude 47° 36' 28.19" Longitude 96° 51' 18.78" Custodian 02 - County Highway Agency Owner 02 - County Highway Agency BMU Agreement Year Built 1957 MN Year Reconstructed FHWA Year Reconstructed MN Temporary Status Bridge Plan Location 3 - COUNTY Date Opened to Traffic On - Off System 1 - ON Legislative District 01B Potential ABC 2 - N/A	Bridge Match ID (TIS) 0 Roadway O/U Key Route On Structure Route Sys 04 - CSAH Number 7 Roadway Name or Description CSAH 7 Level of Service 1 - MAINLINE Roadway Type 2 - 2-way traffic Control Section (TH Only) Reference Point 000+00.000 Detour Length 16.0 mi. Lanes ON 2 UNDER 0 ADT 468 YEAR 2008 HCADT ADTT % Functional Class 07 - Rural - Major Collector	Userkey 100 Structurally Deficient N Functionally Obsolete N Sufficiency Rating 58.2 Routine Inspection Date 10/31/2016 Routine Inspection Frequency 12 Inspector Name Schroeder, Brian Status A - Open		
		+ NBI	CONDITION	RATINGS +
		Deck	6	Unsound Deck % 02
		Superstructure	5	
		Substructure	5	
		Channel	6	
		Culvert	N	
		+ NBI	APPRAISAL	RATINGS +
		Structure Evaluation	5	
		Deck Geometry	4	
		Underclearances	N	
		Waterway Adequacy	5	
		Approach Alignment	6	
		+ SAFETY FEATURES +		
		Bridge Railing	0 - SUBSTANDARD	
		GR Transition	1 - MEETS STANDARDS	
		Appr. Guardrail	1 - MEETS STANDARDS	
		GR Termini	1 - MEETS STANDARDS	
		+ IN	DEPTH	INSP. +
			Y/N	Freq Date
		Frac. Critical	24	09/03/2015
		Underwater	60	10/19/2016
		Pinned Asbly.		
		Spec. Feat.		
		+ WATERWAY +		
		Drainage Area (sq. mi.)		
		Waterway Opening (sf.)	49075	
		Navigation Control	0 - No nav. control on	
		Pier Protection	1 - Not required	
		Nav. Clr. (ft.)	Vert. 0.0	Horiz. 0.0
		Nav. Vert. Lift Bridge Clear. (ft.)		
		MN Scour Code	1 - LOW RISK Year 1991	
		+ CAPACITY	RATINGS +	
		Design Load	2 - H 15	
		Operating Rating	2 - HS TRUCK	24.6
		Inventory Rating	2 - HS TRUCK	14.8
		Posting VEH:	SEMI:	DBL:
		Rating Date	1/9/2009	
		Overweight Permit Codes		
		A N - N/A	B N - N/A	C N - N/A
+ STRUCTURE +	+ RDWY DIMENSIONS +			
Service On 1 - Highway Service Under 5 - Waterway Main Span Type 3 - Steel Main Span Design 03 - High Truss Main Span Detail F - WARR W/POLY TC Appr. Span Type 3 - Steel Appr. Span Design 01 - Beam Span Appr. Span Detail Skew 0 Culvert Type Barrel Length Cantilever ID F - Friction Hinge Number of Spans MAIN: 2 APPR: 5 TOTAL: Main Span Length 220.0 ft. Structure Length 757.0 ft. Deck Width (Out-to-Out) 26.0 ft. Deck Material 1 - Concrete Cast-in-Place Wear Surf Type 1 - Monolithic Concrete Wear Surf Install Year Wear Course/Fill Depth 0.00 ft. Deck Membrane 0 - None Deck Rebars 0 - None Deck Rebars Install Year Structure Area (Out-to-Out) 19682 sq. ft. Roadway Area (Curb-to-Curb) 18169 sq. ft. Sidewalk Width 50A. Lt 0.00 ft. 50B. Rt 0.00 ft. Curb Height Lt 0.00 ft. Rt 0.00 ft. Rail Type Lt 02 Rt 02	If Divided NB-EB SB-WB Roadway Width 24.00 ft. ft. Vertical Clearance 16 ft. ft. Max. Vert. Clear. 16 ft. ft. Horizontal Clear. ft. ft. Lateral Clearance ft. ft. Appr. Surface Width 37.0 ft. Bridge Roadway Width 24.0 ft. Median Width On Bridge ft.			
		+ MISC. BRIDGE DATA +		
		Structure Flared	0 - No flare	
		Parallel Structure	N - No parallel structure	
		Field Conn. ID	2 - Riveted	
		Abutment Foundation (Material/Type)	1 - CONC	
		Pier Foundation (Material/Type)	3 - FTG PILE	
		Pier Foundation (Material/Type)	7 - DIFF	
		Historic Status	3 - FTG PILE	
		Historic Status	5 - Not eligible	
		+ PAINT +		
		Year Painted	1957	
		Unsound Paint %	30	
		Painted Area	sq. ft.	
		Primer Type	2 - Lead, Iron Oxide - non	
		Finish Type	F - - Phenolic Resin Alum	
		+ BRIDGE SIGNS +		
		Posted Load	0 - Not Required	
		Traffic	0 - Not Required	
		Horizontal	1 - Object Markers	
		Vertical	0 - Not Required	

MINNESOTA BRIDGE INSPECTION REPORT

02/06/2017

BRIDGE 7097 CSAH 7 OVER RED RIVER OF THE NORTH

County: Polk Location: 0.2 MI W OF JCT TH 220 Length: 757.0 ft.
 City: Route: 04 - CSAH 7 Ref. Pt.: 000+00.000 Deck Width: 26.0 ft.
 Township: 60057 - VINELAND Control Section: Rdwy. Area/ Pct. Unsnd: 18169 sq. ft. / 02%
 Section: 25 Township: 148N Range: 49W Maint. Area: Paint Area/ Pct. Unsnd: sq. ft. / 30%
 Span Type: 3 - Steel 10 - Truss - Thru Local Agency Bridge Nbr.: 722 Culvert: N/A
 List: Postings:
 NBI Deck: 6 Super: 5 Sub: 5 Chan: 6 Culv: N
 Open, Posted, Closed: A - Open
 MN Scour Code: 1 - LOW RISK

Appraisal Ratings - Approach: 6 Waterway: 5 Unofficial Structurally Deficient N
 Required Bridge Signs - Load Posting: 0 - Not Required Traffic: 0 - Not Required Unofficial Functionally Obsolete N
 Horizontal: 1 - Object Markers Vertical: 0 - Not Required Unofficial Sufficiency Rating 58.2

ELEM NBR	ELEMENT NAME	REPORT TYPE	INSP. DATE	QUANTITY	QTY CS 1	QTY CS 2	QTY CS 3	QTY CS 4
12	Reinforced Concrete Deck	Underwater	10/19/2016	19682 SF	0	19682	0	0
		Routine	10/31/2016	19682 SF	0	19682	0	0
Notes: Minor transverse cracks. [2013] Realigned element to Environment 2. [2015] Minor transverse cracks, minor rust staining on soffit areas under curb.								
510	Wearing Surfaces	Underwater	10/19/2016	18169 SF	0	17969	200	0
		Routine	10/31/2016	18169 SF	0	17969	200	0
Notes: Minor scaling, pitting and popouts(2011). [2015] Some pop-outs have exposed rebar; however, total area does not exceed 2% of total area. 2016- No change.								
107	Steel Open Girder/Beam	Underwater	10/19/2016	1339 LF	0	1239	100	0
		Routine	10/31/2016	1339 LF	0	1239	100	0
Notes: 4 beams - Corrosion at beam ends esp @ west finger joints(2012). [2013] Realigned element to Environment 2. No significant change; the superstructure in all finger joint and hinge areas has heavy flaking corrosion. See Photos 1 through 4 [2015] All beam ends at the finger joint have severe corrosion with pitting up to 3/8" deep.								
515	Steel Protective Coating	Underwater	10/19/2016	10500 SF	0	0	10300	200
		Routine	10/31/2016	10500 SF	0	0	10300	200
Notes: Corrosion at beam ends esp @ west finger joints(2012). [2015] All beam ends at the finger joint have severe corrosion with pitting up to 3/8" deep The superstructure in all finger joint and hinge areas has heavy flaking corrosion.								
113	Steel Stringer	Underwater	10/19/2016	2201 LF	0	2091	110	0
		Routine	10/31/2016	2201 LF	0	2091	110	0
Notes: (5 truss stringers) Paint failure and surface rust at floorbeam connection. [2013] Mostly top flange corrosion at the floorbeams. The south fascia stringer at LOS span 3 has about 3' of heavy corrosion with minor section loss. [2015] No significant change noted during this inspection.								
515	Steel Protective Coating	Underwater	10/19/2016	10800 SF	0	0	10600	200
		Routine	10/31/2016	10800 SF	0	0	10600	200
Notes: Paint failure and surface rust at floor beam connection. [2013] Mostly top flange corrosion at the floor beams. The south fascia stringer at LOS span 3 has about 3' of heavy corrosion with minor section loss.								

BRIDGE 7097 CSAH 7 OVER RED RIVER OF THE NORTH

ELEM NBR	ELEMENT NAME	REPORT TYPE	INSP. DATE	QUANTITY	QTY CS 1	QTY CS 2	QTY CS 3	QTY CS 4
120	Steel Truss	Underwater	10/19/2016	879 LF	0	779	100	0
		Routine	10/31/2016	879 LF	0	779	100	0
<p>Notes: Bottom Chord Notes: Paint failure. [2013-2015] The lower chord channels have paint failure with surface corrosion. Some of the batten plates have paint failure with pitting corrosion. Top Chord Notes: Scattered paint failure and minor surface rust. [2013-2015] There are scattered cracked tack welds throughout the structure (none propagated into the base metal). There is scattered paint failure with light surface corrosion throughout. The portions of the verticals and diagonals in the splash zone have paint failure with surface corrosion. Fracture Critical Smart Flag Notes: [2015] All members are structurally sound.</p>								
515 - Steel Protective Coating		Underwater	10/19/2016	22000 SF	0	0	20000	2000
		Routine	10/31/2016	22000 SF	0	0	20000	2000
<p>Notes: Steel area: Length x ave ht [2013-2015] The lower chord channels have paint failure with surface corrosion. Some of the batten plates have paint failure with pitting corrosion. Top chord members have scattered paint failure with light surface corrosion throughout. The portions of the verticals and diagonals in the splash zone have paint failure with surface corrosion.</p>								
152	Steel Floor Beam	Underwater	10/19/2016	571 LF	0	471	100	0
		Routine	10/31/2016	571 LF	0	471	100	0
<p>Notes: Areas of corrosion, especially top flange at the ends and at connections to gusset plate. [2013-2015] The floorbeams typically have about 2' of heavy corrosion on the top flange at the gusset plates. Floorbeam L0 and L0' of Span 3 and L0 of Span 4 have heavy corrosion on the web and flanges of the joint side of the floorbeam.</p>								
515 - Steel Protective Coating		Underwater	10/19/2016	5400 SF	0	0	5000	400
		Routine	10/31/2016	5400 SF	0	0	5000	400
<p>Notes: Areas of corrosion, especially top flange at the ends and at connections to gusset plate. [2013-2015] The floor beams typically have about 2' of heavy corrosion on the top flange at the gusset plates. Floor beam L0 and L0' of Span 3 and L0 of Span 4 have heavy corrosion on the web and flanges of the joint side of the floor beam.</p>								
162	Steel Gusset Plate	Underwater	10/19/2016	64 EA	0	20	44	0
		Routine	10/31/2016	64 EA	0	20	44	0
<p>Notes: 44 lower plates - paint failure and surface rust Gusset Plate Distortion Notes: 2 upper and 2 lower plates are bowed up 1/8" due to fit-up and the span L2N gusset plate has minor pack rust in the connection. [2013] Realigned element to Environment 2. [2015] No significant change noted. Pack Rust Notes: Minor rust in upper and lower gusset plate connections at span 3 L2N and span 3 L3S</p>								
515 - Steel Protective Coating		Underwater	10/19/2016	1500 SF	0	0	1450	50
		Routine	10/31/2016	1500 SF	0	0	1450	50
<p>Notes: 44 lower plates - paint failure and surface rust Span L2N gusset plate has minor pack rust in the connection. Minor rust in upper and lower gusset plate connections at span 3 L2N and span 3 L3S</p>								
202	Steel Column	Underwater	10/19/2016	12 EA	0	12	0	0
		Routine	10/31/2016	12 EA	0	12	0	0
<p>Notes: Minor misalignment of bents. Bent#1 is tipped 2" to east with a ht of 13'2". Bent #2 is tipped 3" to east with a ht of 19'10". Bent #3 is tipped 2" to east with a ht of 16'1". [2013-2015] All three bents were found to be less than 1 degree out of plumb.</p>								
515 - Steel Protective Coating		Underwater	10/19/2016	1010 SF	0	1010	0	0
		Routine	10/31/2016	1010 SF	0	1010	0	0
<p>Notes: SF=total area of bent 2016- Paint chalky</p>								
210	Reinforced Concrete Pier Wall	Underwater	10/19/2016	79 LF	0	0	79	0
		Routine	10/31/2016	79 LF	0	0	79	0
<p>Notes: Hairline cracks and efflorescence in all three piers. 1/16 to 1/8" vertical cracks east pier south end and west pier(2010). [2013-2016] No change. [2016 UW] Vertical Crack 1/8 inch wide extending from strut to channel bottom was located at midpoint of pier on east and west faces of Pier 1.</p>								

BRIDGE 7097 CSAH 7 OVER RED RIVER OF THE NORTH

ELEM NBR	ELEMENT NAME	REPORT TYPE	INSP. DATE	QUANTITY	QTY CS 1	QTY CS 2	QTY CS 3	QTY CS 4
215	Reinforced Concrete Abutment	Underwater	10/19/2016	84 LF	0	84	0	0
		Routine	10/31/2016	84 LF	0	84	0	0
Notes: Minor popouts and staining(2011). [2015] No significant findings. Wingwall notes: Minor popouts and staining(2011). [2015-2016] No significant change noted.								
220	Reinforced Concrete Pile Cap/Footing	Underwater	10/19/2016	80 LF	0	80	0	0
		Routine	10/31/2016	80 LF	0	80	0	0
Notes: Minor popouts and staining(2011). [2015] No significant findings.								
234	Reinforced Concrete Pier Cap	Underwater	10/19/2016	110 LF	0	110	0	0
		Routine	10/31/2016	110 LF	0	110	0	0
Notes: Crack - 1/16in in pier 1 at pier wall and cap resulting from uneven movement of pier. [2015] No significant findings.								
301	Pourable Joint Seal	Underwater	10/19/2016	469 LF	0	469	0	0
		Routine	10/31/2016	469 LF	0	469	0	0
Notes: [2015] No significant findings.								
305	Assembly Joint without Seal	Underwater	10/19/2016	158 LF	0	158	0	0
		Routine	10/31/2016	158 LF	0	158	0	0
Notes: (3 sliding plates at pier 1,3,5). [2015] All sliding plate joints are filled with debris. (Hinge 1, pier 2,4) Approach joint fully open, truss span joint closed. Cleaning required(2010). [2013] Realigned element to Environment 2. [2015] No significant change noted.								
311	Movable Bearing	Underwater	10/19/2016	4 EA	0	4	0	0
		Routine	10/31/2016	4 EA	0	4	0	0
Notes: (Expansion) Some rusting. Structural members under the finger joint on the east approach slab have corrosion and minor section loss. [2015] No significant change noted.								
313	Fixed Bearing	Underwater	10/19/2016	12 EA	0	12	0	0
		Routine	10/31/2016	12 EA	0	12	0	0
Notes: Some rusting. [2015] No significant change noted.								
330	Metal Bridge Railing	Underwater	10/19/2016	1512 LF	0	1512	0	0
		Routine	10/31/2016	1512 LF	0	1512	0	0
Notes: North rail west end poor. [2013] Realigned element to Environment 2. [2015] Moderate paint failure.								
515 - Steel Protective Coating		Underwater	10/19/2016	3800 SF	0	0	3800	0
		Routine	10/31/2016	3800 SF	0	0	3800	0
Notes: [2015] Moderate paint failure.								
800	Critical Deficiencies or Safety Hazards	Underwater	10/19/2016	1 EA	1	0	0	0
		Routine	10/31/2016	1 EA	1	0	0	0
Notes: [2015] No critical findings noted.								

BRIDGE 7097 CSAH 7 OVER RED RIVER OF THE NORTH

ELEM NBR	ELEMENT NAME	REPORT TYPE	INSP. DATE	QUANTITY	QTY CS 1	QTY CS 2	QTY CS 3	QTY CS 4
822	Bituminous Approach Roadway	Underwater	10/19/2016	2 EA	0	1	1	0
		Routine	10/31/2016	2 EA	0	1	1	0
<p>Notes: Settlement both approaches require patching(2010). Approx 2" settlement at west deck approach(2012). [2013] Realigned element to Environment 2. Settlement continues-2104. [2015] No significant change noted. 2016- Settlement requiring patching west approach/east approach fair.</p>								
850	Steel Hinge Assembly	Underwater	10/19/2016	24 EA	0	14	10	0
		Routine	10/31/2016	24 EA	0	14	10	0
<p>Notes: Support beams - extensive debris and corrosion, with flaking rust and minor section loss. [2013] Realigned element to Environment 2. [2015] No significant change noted.</p>								
855	Secondary Members (Superstructure)	Underwater	10/19/2016	1 EA	0	1	0	0
		Routine	10/31/2016	1 EA	0	1	0	0
<p>Notes: Isolated paint failure and surface rust on diagonal and wind bracing. Impact damage to span 4 east portal(2011). [2013] Realigned element to Environment 2. Most of the wind bracing has impact damage, [2015] All wind bracing has impact damage.</p>								
856	Secondary Members (Substructure)	Underwater	10/19/2016	1 EA	0	1	0	0
		Routine	10/31/2016	1 EA	0	1	0	0
<p>Notes: Pile bent bracing 2016- Paint chalky</p>								
880	Impact Damage	Underwater	10/19/2016	1 EA	0	1	0	0
		Routine	10/31/2016	1 EA	0	1	0	0
<p>Notes: Damage on span 4 east portal - portal is bent out of plane but structural integrity not reduced. [2013] Realigned element to Environment 2. [2015] No significant change noted.</p>								
881	Steel Section Loss	Underwater	10/19/2016	1 EA	0	1	0	0
		Routine	10/31/2016	1 EA	0	1	0	0
<p>Notes: Minimal section loss based on presence of pack rust(2011). [2015] There is moderate section loss on beam ends under finger joints; total loss is less than 5%.</p>								
883	Concrete Shear Cracking	Underwater	10/19/2016	1 EA	1	0	0	0
		Routine	10/31/2016	1 EA	1	0	0	0
884	Substructure Settlement & Movement	Underwater	10/19/2016	1 EA	0	1	0	0
		Routine	10/31/2016	1 EA	0	1	0	0
<p>Notes: Finger joint openings suggest the east and west piers have moved towards the center. [2015-2016] No significant change noted.</p>								
885	Scour	Underwater	10/19/2016	1 EA	1	0	0	0
		Routine	10/31/2016	1 EA	1	0	0	0
<p>Notes: Top of footing in SE corner of pier 2 exposed in 2007 underwater report. [2013] Realigned element to Environment 2. 2012 UW report indicates the footing is no longer exposed. [2015-2016] No significant change noted.</p>								
891	Other Bridge Signing	Underwater	10/19/2016	1 EA	1	0	0	0
		Routine	10/31/2016	1 EA	1	0	0	0
<p>Notes: [2013] Realigned element to Environment 2. [2015] All signs are in place and in good condition. 2016- 4 Delineators good</p>								

ELEM NBR	ELEMENT NAME	REPORT TYPE	INSP. DATE	QUANTITY	QTY CS 1	QTY CS 2	QTY CS 3	QTY CS 4
892	Slopes & Slope Protection	Underwater	10/19/2016	1 EA	0	1	0	0
		Routine	10/31/2016	1 EA	0	1	0	0
Notes: Brush should be removed west end near guardrail(2010). Tree removal required west end(2012). [2013] Realigned element to Environment 2. Enough brush and trees were removed from spans 1 and 2 to facilitate the inspection. Vegetation control is required on the north side of spans 1 and 2. [2015] Vegetation control is required under structure on the north side of Spans 1 and 2 2016- Brushing required west spans.								
893	Guardrail	Underwater	10/19/2016	1 EA	0	0	1	0
		Routine	10/31/2016	1 EA	0	0	1	0
Notes: End post SE corner of guardrail is broke exposing rebar. Guardrail repaired in 07. NW end post has 1sq ft spalled concrete at the top of the guardrail connection. SE end post at connection is split [2013] Realigned element to Environment 2. [2013-2015] Southwest guardrail impact damage [2015] Northwest guardrail has impact damage at bridge. 2016- Blocking loose various locations. SE end terminal has dropped due to broken post.								
894	Deck & Approach Drainage	Underwater	10/19/2016	1 EA	1	0	0	0
		Routine	10/31/2016	1 EA	1	0	0	0
Notes: [2013] Realigned element to Environment 2. [2015] All drains are open and functioning as designed; approach drainage functioning also as designed.								
895	Sidewalk, Curb, & Median	Underwater	10/19/2016	1 EA	0	1	0	0
		Routine	10/31/2016	1 EA	0	1	0	0
Notes: [2011] Back side of curb over floorbeams at approximately half of the gusset plate connectios have areas of spalled concrete, 18" in length, with exposed rebar at some locations(2011). [2013] Realigned element to Environment 2. [2015] No significant change noted. 2016- Cracking and delamination at curb ends								
900	Protected Species	Underwater	10/19/2016	1 EA	0	1	0	0
		Routine	10/31/2016	1 EA	0	1	0	0
Notes: 2016- swallows noted on center pier.								

General Notes: *PHOTO NO. 722 BUILT IN 1957 STEEL HIGH TRUSS

FRACTURE CRITICAL INSPECTION COMPLETED BY MNDOT. HERE ARE SOME OF THE GENERAL COMMENTS:

1. THE TRUSS PORTION OF THE BRIDGE APPEAR TO BE IN GOOD CONDITION. THERE IS LITTLE LOSS OF SECTION AND ONLY SOME PACK RUST. STRUCTURAL MEMBERS UNDER THE FINGER JOINT ON THE WEST APPROACH SLAB HAVE CORROSION, MINOR SECTION LOSS AND SHOULD BE CLEANED AND PAINTED. BEARING MEASUREMENTS WERE TAKEN, SPAN 3 BEARINGS WERE FOUND TO BE RETRACTION 2in. ON THE DOWNSTREAM BEARING AND 1 3/4in. ON THE UPSTREAM. SPAN 4 BEARINGS WERE ALSO IN RETRACTION 1 1/16in. ON THE DOWNSTREAM BEARING AND 1 1/2in. ON THE UPSTREAM BEARING. THE TEMP. WAS APPROX. 55 DEGREES.
2. NO FATIGUE CRACKS OR OTHER TYPES OF DEFICIENCIES THAT COULD LEAD TO FAILURE WERE OBSERVED.

Underwater inspection completed September 18, 2007. General Comments: Moderate to heavy timber debris buildup, vertical crack up to 1/8 in on face of pier 2, footing exposed east side of north column 1 foot. Monitor debris buildup. See sept 12, 2007 critical inspection report for detail comments.
August 30, 2012 - Debris buildup pier 2. No foting exposure at pier 2 - see report

Top Bent measurements (2'level)
Bent 1: North - 1/4", South - 1/2"
Bent 2: North - 3/8", South - 7/16"
Bent 2: North - 3/16", South - 7/16"

58. Deck NBI: [2013] No significant change. The deck has minor scaling, pitting and pop-outs with sporatic small spalls and minor cracking and leaching
[2015] Pop-outs have some exposed rebar.

36A. Brdg Railings NBI: Rail in place but substandard.

36B. Transitions NBI:

36C. Appr Guardrail NBI:

36D. Appr Guardrail
Terminal NBI:

ELEM NBR	ELEMENT NAME	REPORT TYPE	INSP. DATE	QUANTITY	QTY CS 1	QTY CS 2	QTY CS 3	QTY CS 4
59.	Superstructure NBI:	[2013-2015] No significant change. There is paint failure with surface corrosion scattered throughout. There is localized heavy corrosion primarily at the joints and beam ends. Upper lateral sway bracing and portals have experienced impact damage.						
60.	Substructure NBI:	[2013-2015] No significant change. Piers 1 and 2 have pier wall cracks. Substructure movement appears to have occurred.						
61.	Channel NBI:	[2013] No significant change. The 2012 Underwater Report identified moderate to heavy timber debris on the upstream side of Pier 2 (still there). Pier 2 has a 1/8" vertical crack on both faces that extends from the channel bottom to the strut. [2015] Most of the debris has cleared; there appears to be only 1 log left on the upstream side. No other significant changes noted.						
62.	Culvert NBI:							
71.	Waterway Adeq NBI:	2016- Occasional overtopping of bridge and approaches.						
72.	Appr Roadway Alignment NBI:							

Inspector's Signature

Reviewer's Signature

Pictures



Photo 1 - North Profile



Photo 2 - South Profile

Pictures



Photo 3 - West Abutment



Photo 4 - East Abutment

Pictures



Photo 5 - West Face of Pier



Photo 6 - East Face of Pier

Pictures



Photo 7 - Condition at Waterline

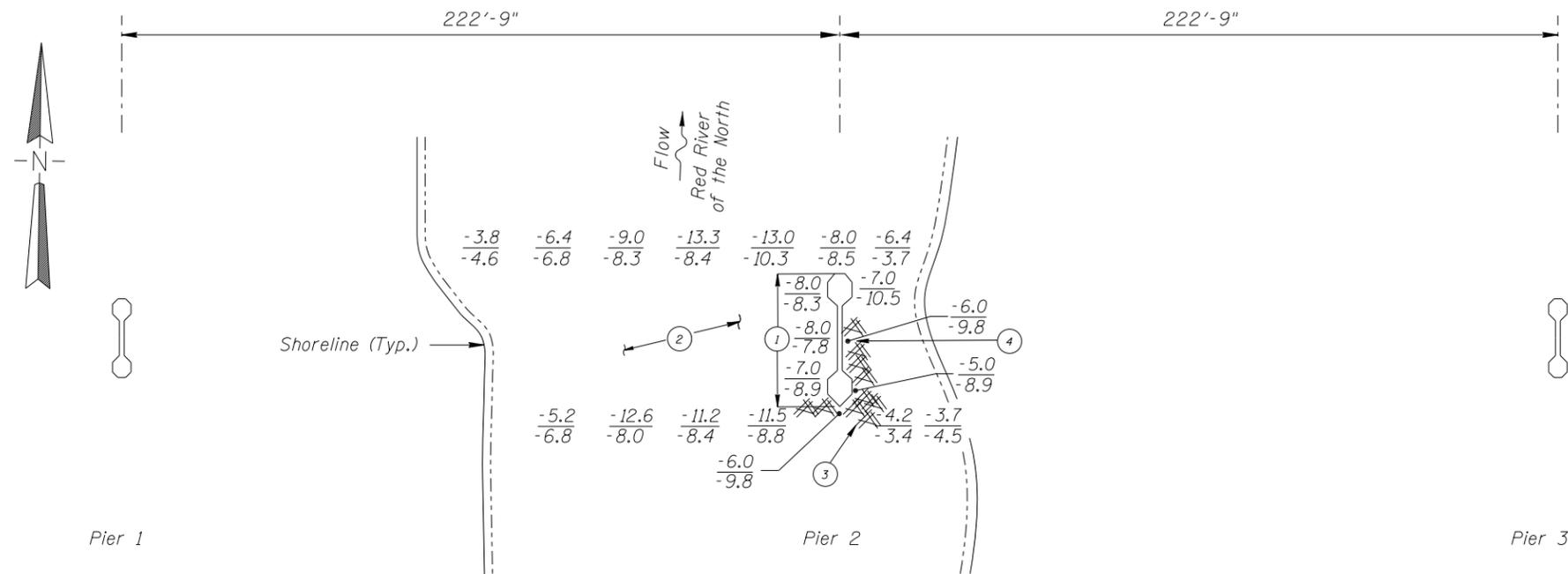


Photo 8 - Upstream Channel

Pictures



Photo 9 - Downstream Channel



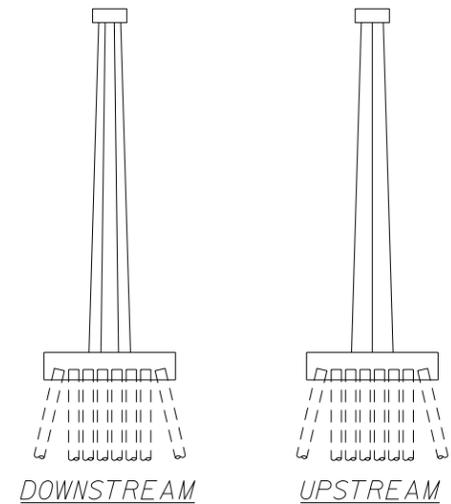
SOUNDING PLAN

GENERAL NOTES:

1. Pier 2 was inspected underwater.
2. At the time of inspection on October 19, 2016, the waterline was located approximately 50.9 feet below the top of the pier cap at the downstream end of Pier 2. This corresponds to a waterline elevation of 802.8 based on design drawings.
3. Soundings indicate the water depth at the time of inspection and are measured in feet.
4. Soundings were taken parallel to the bridge at the truss panel points between the substructure units.

INSPECTION NOTES:

- ① Overall, concrete was smooth and sound with no significant defects.
- ② The channel bottom consisted of soft silt with 2 feet of maximum probe rod penetration.
- ③ Moderate to heavy timber debris consisting of logs and branches 2 feet in diameter and smaller was observed at south end and east face of Pier 2. The debris extended from channel bottom to just below the waterline, 6 feet off the east face and 4 feet off the upstream nose.
- ④ Vertical crack 1/8 inch wide extending from strut to channel bottom was located at midpoint of pier on east and west faces of Pier 1.



TYPICAL END VIEWS OF PIER 2

Legend

- 2.0 Sounding Depth (10/19/16)
- 5.0 Sounding Depth (8/30/12)
- Timber Debris

MINNESOTA
DEPARTMENT OF TRANSPORTATION
UNDERWATER BRIDGE INSPECTION

STRUCTURE NO. 7097
OVER THE RED RIVER OF THE NORTH
DISTRICT 2, POLK COUNTY, CITY OF CLIMAX

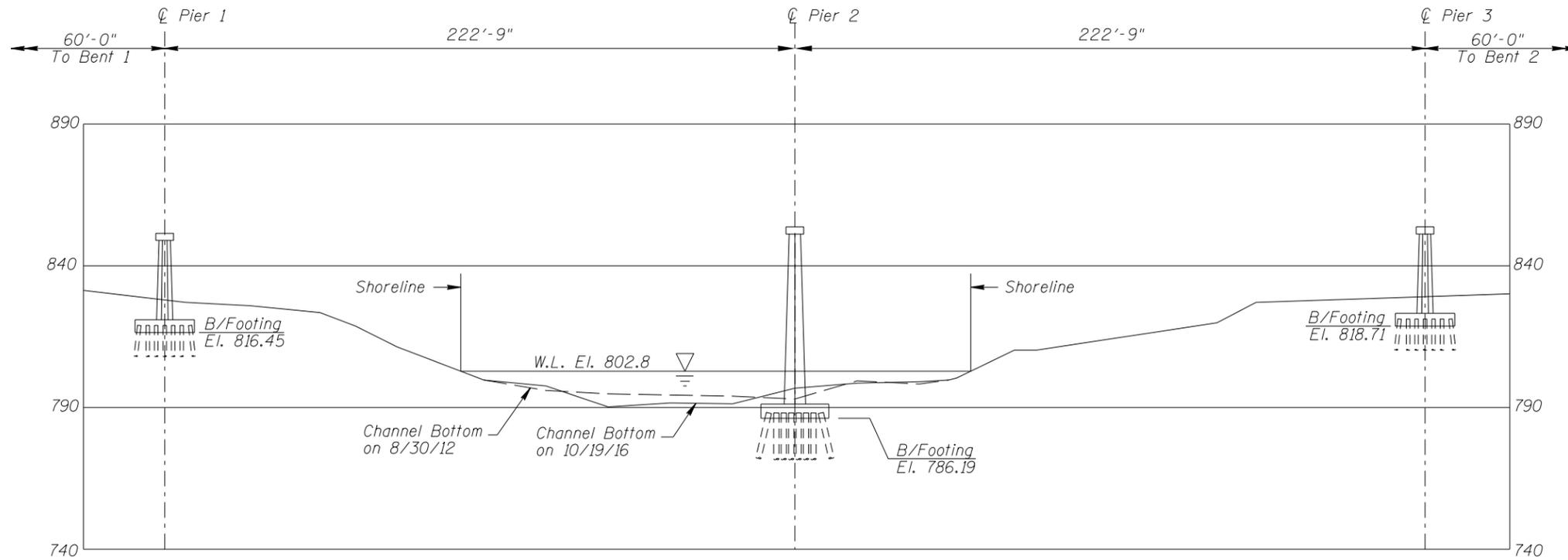
INSPECTION AND SOUNDING PLAN

COLLINS ENGINEERS
1599 Selby Avenue
Suite 206
St. Paul, MN 55104
(651) 646-8502
www.collinsengr.com

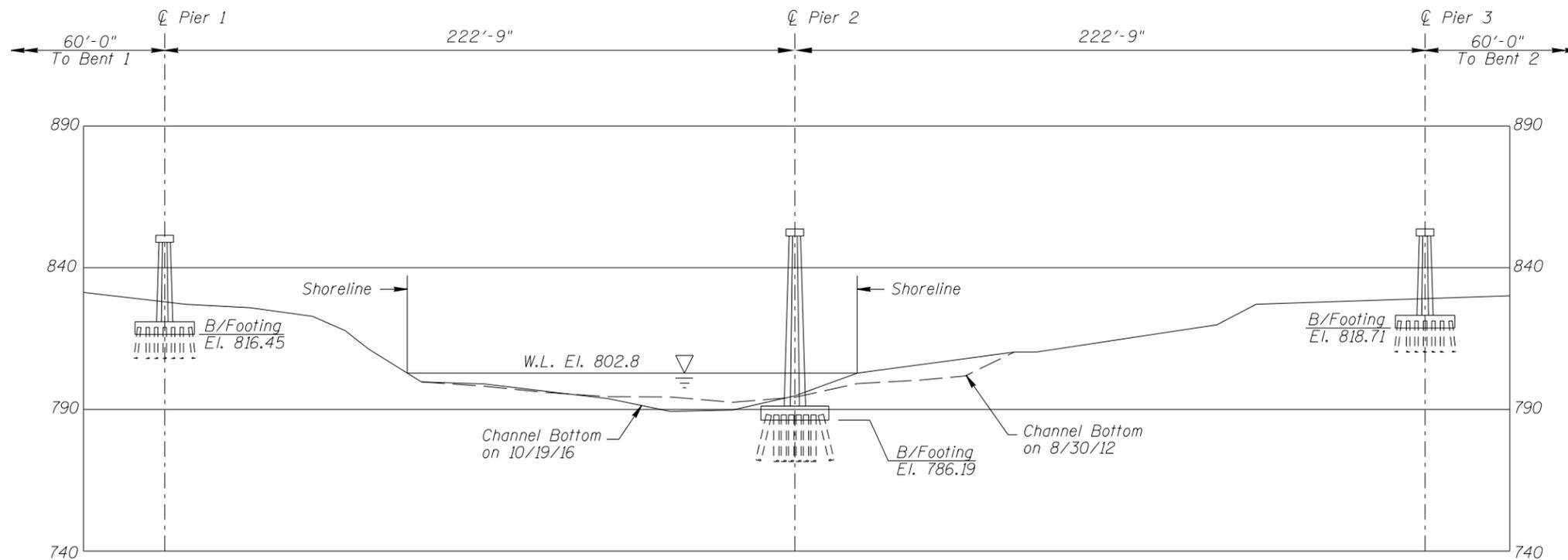
Drawn By: JCK
Checked By: BKS
Project: 63-9687

AYRES ASSOCIATES
3433 Oakwood Hills Parkway
Eau Claire, WI 54701
www.AyresAssociates.com

Date: OCT., 2016
Scale: NTS
Figure No.: 1



UPSTREAM FASCIA PROFILE



DOWNSTREAM FASCIA PROFILE

Note:
Refer to Figure 1 for General Notes.

MINNESOTA DEPARTMENT OF TRANSPORTATION UNDERWATER BRIDGE INSPECTION	
STRUCTURE NO. 7097 OVER THE RED RIVER OF THE NORTH DISTRICT 2, POLK COUNTY, CITY OF CLIMAX	
UPSTREAM AND DOWNSTREAM FASCIA PROFILES	
COLLINS ENGINEERS <small>1599 Selby Avenue Suite 206 St. Paul, MN 55104 (651) 646-8502 www.collinsengr.com</small>	AYRES ASSOCIATES <small>3433 Oakwood Hills Parkway Eau Claire, WI 54701 www.AyresAssociates.com</small>
Drawn By: JCK Checked By: BKS Project: 63-9687	Date: OCT., 2016 Scale: 1"=50' Figure No.: 2