

# 2017 UNDERWATER BRIDGE INSPECTION REPORT



## BRIDGE # 58510 CSAH 61 over SNAKE RIVER

DISTRICT: District 1

COUNTY: Pine

CITY/TOWNSHIP: Pine City

STATE: Minnesota

Date of Inspection: 09/22/2016

Equipment Used:

Owner: County Highway Agency

Inspected By: Stromberg, Dan

Report Written By: Dan Stromberg

Report Reviewed By:

Final Report Date:



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## UNDERWATER INSPECTION

### REPORT SUMMARY

The substructure units inspected at Bridge No. 58510, Piers 1 through 4, were found to be in fair condition with light to moderate corrosion and pitting along the pile surfaces from the bottom of cap to channel bottom. Below water the steel piles exhibited up to 1/2 inch diameter rust nodules with associated pitting up to 1/8 inch deep. The steel deterioration below water has progressed since the previous inspection, but has not compromised the piers' structural integrity. The channel bottom around the substructure units and the shorelines appeared stable with no significant scour or changes in configuration since the last inspection.

### INSPECTION FINDINGS

- A. A light amount of scattered timber debris, 3 inch diameter and smaller, was observed along the south side of Piers 1 and 2. A light to moderate accumulation of timber debris, 6 inch diameter and smaller, was observed along the upstream half of Pier 3 extending from channel bottom to 3 feet below the waterline.
- B. Four deformations were present on the east and south side of the easternmost pile of Pier 4:
  - a. A 6 inch wide by 3 inch high by 2 inch deep dent was located 4 feet below water on the south face.
  - b. A 6 inch wide by 3 inch high by 1 inch deep dent was located at 3 feet below the waterline.
  - c. A 6 inch diameter by 2 inch deep dent was located at the waterline. This dent was accompanied by 1/8 inch deep corrosion pitting.
  - d. An 8 inch diameter by 1 inch deep dent was located at 1.5 foot below the waterline.
- C. Timber piles from an earlier structure were located along the north side of each pier. The tops of the piles were located at 2 feet above channel bottom.
- D. Channel bottom material consisted of gravelly sand with scattered riprap and cobbles allowing 2 inches of maximum probe rod penetration.
- E. Light to moderate corrosion on all piles from bottom of cap to the channel bottom, with up to 1/2 inch diameter rust nodules below water covering up to 100% of the surface area of the piles, and with a maximum of 1/8 inch deep pitting from 1 foot below waterline to channel bottom.
- F. Metal dock framing debris was observed around the two upstream piles of Pier 1.

### RECOMMENDATIONS

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

Contractor: Collins Engineers, Inc.

Contractor Job Number: 9687

## UNDERWATER INSPECTION

### 1. BRIDGE DATA

Bridge #: 58510  
Feature Intersected: SNAKE RIVER  
Facility Carried: CSAH 61  
District: District 1  
County: 058 - Pine

#### Bridge Description:

The superstructure consists of five spans of precast concrete deck slabs. The superstructure is supported by four piers and two concrete abutments. The piers are numbered 1 through 4 starting from the south. Each pier consists of a concrete cap supported by twelve concrete filled, steel shell piles.

### 2. INSPECTION DATA

Professional Engineer/Team Leader: Garrett R. Owens  
Inspection Diver: Garrett R. Owens  
Date of Underwater Inspection: 09/22/2016  
Weather Conditions: Overcast, 57°F  
Underwater Visibility (feet): 2.0 feet  
Waterway Velocity (ft/sec): 1.5 ft/sec

### 3. SUBSTRUCTURE INSPECTION DATA

Substructure(s) Inspected: Piers 1 through 4.

#### General Shape:

Each pier consists of a rectangular shaped concrete cap supported by twelve concrete filled, steel shell piles in a single row.

Maximum Water Depth at Substructure(s) Inspected (feet): 11.5 feet

### 4. WATERLINE DATUM

Water Level Reference: The top of cap at the downstream end of Pier 1.  
Waterline Elevation (feet): 933.9 feet  
Description: The waterline was located approximately 8.9 feet below the reference.

### 5. NBIS CODING INFORMATION

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

Item 60: Substructure: Code: 5  
Item 61: Channel and Channel Protection: Code: 6  
Item 62: Culvert: Code:  
Item 92B: Underwater Inspection: Code: Y 48 09/2016

Item 113: Scour Critical Bridge:

Code: R

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
225	Steel Pile	48	EA		20	28	
885	Scour	1	EA	1			

## UNDERWATER INSPECTION

### INSPECTION PROCEDURES

The routine underwater inspection of Bridge 58510 (CSAH 61 over Snake River) was completed on September 22, 2016. The underwater inspection was conducted from a 14 foot boat. The inspection was conducted by a team consisting of a Professional Engineer Diver with a valid MnDOT Team Leader certification, a backup diver and 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 four piers consisting of a concrete cap supported by twelve concrete filled, steel shell piles. According to design drawings, the inspected substructure units are designated as Piers 1 through 4 starting from the south. Inspection procedures followed FHWA guidance and the MnDOT Bridge and Structure Inspection Program Manual with channel bottom probing to search for foundations. The maximum 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: 58510

CSAH 61 over SNAKE RIVER

Date: 01/05/2017

+ GENERAL +	+ ROADWAY +	+ INSPECTION +																				
<b>Agency Br. No.</b> S83 <b>Crew</b> <b>District</b> 01 <b>Maint. Area</b> <b>County</b> 058 - Pine <b>City</b> Pine City <b>Township</b> <b>Desc. Loc.</b> 0.2 MI N OF JCT CSAH 8 <b>Sect., Twp., Range</b> 33 - 039N - 21W <b>Latitude</b> 45 ° 49 ' 46.81 " <b>Longitude</b> 92 ° 58 ' 13.82 " <b>Custodian</b> 02 - County Highway Agency <b>Owner</b> 02 - County Highway Agency <b>BMU Agreement</b> <b>Year Built</b> 1976 <b>MN Year Reconstructed</b> <b>FHWA Year Reconstructed</b> <b>MN Temporary Status</b> <b>Bridge Plan Location</b> 3 - COUNTY <b>Date Opened to Traffic</b> <b>On - Off System</b> 1 - ON <b>Legislative District</b> 08B <b>Potential ABC</b> 2 - N/A	<b>Bridge Match ID (TIS)</b> 0 <b>Roadway O/U Key</b> Route On Structure <b>Route Sys</b> 04 - CSAH <b>Number</b> 61 <b>Roadway Name or Description</b> MAIN ST. N. <b>Level of Service</b> 1 - MAINLINE <b>Roadway Type</b> 2 - 2-way traffic <b>Control Section (TH Only)</b> <b>Reference Point</b> 004+00.417 <b>Detour Length</b> 12.0 <b>mi.</b> <b>Lanes</b> <b>ON</b> 2 <b>UNDER</b> 0 <b>ADT</b> 8500 <b>YEAR</b> 2008 <b>HCA DT</b> <b>ADTT</b> % <b>Functional Class</b> 07 - Rural - Major Collector	<b>Userkey</b> 98 <b>Structurally Deficient</b> N <b>Functionally Obsolete</b> N <b>Sufficiency Rating</b> 77.0 <b>Routine Inspection Date</b> 11/24/2015 <b>Routine Inspection Frequency</b> 24 <b>Inspector Name</b> Stromberg, Dan <b>Status</b> A - Open																				
		<b>+ NBI      CONDITION      RATINGS +</b>																				
		<b>Deck</b> 6 <b>Unsound Deck %</b> <b>Superstructure</b> 6 <b>Substructure</b> 5 <b>Channel</b> 6 <b>Culvert</b> N																				
	<b>+ RDWY      DIMENSIONS +</b>	<b>+ NBI      APPRAISAL      RATINGS +</b>																				
	<b>If Divided</b> <b>NB-EB</b> <b>SB-WB</b> <b>Roadway Width</b> 49.00 <b>ft.</b> <b>ft.</b> <b>Vertical Clearance</b> <b>ft.</b> <b>ft.</b> <b>Max. Vert. Clear.</b> <b>ft.</b> <b>ft.</b> <b>Horizontal Clear.</b> 48.9 <b>ft.</b> <b>ft.</b> <b>Lateral Clearance</b> <b>ft.</b> <b>ft.</b> <b>Appr. Surface Width</b> 46.0 <b>ft.</b> <b>Bridge Roadway Width</b> 49.0 <b>ft.</b> <b>Median Width On Bridge</b> <b>ft.</b>	<b>Structure Evaluation</b> 5 <b>Deck Geometry</b> 9 <b>Underclearances</b> N <b>Waterway Adequacy</b> 8 <b>Approach Alignment</b> 8																				
<b>+ STRUCTURE +</b>		<b>+ SAFETY      FEATURES +</b>																				
<b>Service On</b> 5 - Highway-pedestrian <b>Service Under</b> 5 - Waterway <b>Main Span Type</b> 5 - Prestress or Precast <b>Main Span Design</b> 07 - Box Girder <b>Main Span Detail</b> <b>Appr. Span Type</b> <b>Appr. Span Design</b> <b>Appr. Span Detail</b> <b>Skew</b> 0 <b>Culvert Type</b> <b>Barrel Length</b> <b>Cantilever ID</b>	<b>+ MISC.      BRIDGE      DATA +</b>	<b>Bridge Railing</b> 1 - MEETS STANDARDS <b>GR Transition</b> 0 - SUBSTANDARD <b>Appr. Guardrail</b> 0 - SUBSTANDARD <b>GR Termini</b> 0 - SUBSTANDARD																				
	<b>Structure Flared</b> 0 - No flare <b>Parallel Structure</b> N - No parallel structure <b>Field Conn. ID</b> <b>Abutment Foundation (Material/Type)</b> 3 - FTG PILE <b>Pier Foundation (Material/Type)</b> 4 - PILE BENT <b>Historic Status</b> 5 - Not eligible	<b>+ IN      DEPTH      INSP. +</b>																				
		<table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 60%;"></th> <th style="width: 10%; text-align: center;">Y/N</th> <th style="width: 15%; text-align: center;">Freq</th> <th style="width: 15%; text-align: center;">Date</th> </tr> </thead> <tbody> <tr> <td><b>Frac. Critical</b></td> <td></td> <td></td> <td></td> </tr> <tr> <td><b>Underwater</b></td> <td></td> <td style="text-align: center;">60</td> <td style="text-align: center;">09/22/2016</td> </tr> <tr> <td><b>Pinned Asbly.</b></td> <td></td> <td></td> <td></td> </tr> <tr> <td><b>Spec. Feat.</b></td> <td></td> <td></td> <td></td> </tr> </tbody> </table>		Y/N	Freq	Date	<b>Frac. Critical</b>				<b>Underwater</b>		60	09/22/2016	<b>Pinned Asbly.</b>				<b>Spec. Feat.</b>			
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<b>Pinned Asbly.</b>																						
<b>Spec. Feat.</b>																						
	<b>+ PAINT +</b>	<b>+ WATERWAY +</b>																				
<b>Number of Spans</b> <b>MAIN:</b> 5 <b>APPR:</b> 0 <b>TOTAL:</b> <b>Main Span Length</b> 65.1 <b>ft.</b> <b>Structure Length</b> 325.3 <b>ft.</b> <b>Deck Width (Out-to-Out)</b> 60.1 <b>ft.</b> <b>Deck Material</b> 1 - Concrete Cast-in-Place <b>Wear Surf Type</b> 6 - Bituminous <b>Wear Surf Install Year</b> <b>Wear Course/Fill Depth</b> 0.20 <b>ft.</b> <b>Deck Membrane</b> 0 - None <b>Deck Rebars</b> 0 - None <b>Deck Rebars Install Year</b> <b>Structure Area (Out-to-Out)</b> 19551 <b>sq. ft.</b> <b>Roadway Area (Curb-to-Curb)</b> 15941 <b>sq. ft.</b> <b>Sidewalk Width</b> 50A. Lt 8.00 <b>ft.</b> 50B. Rt 0.00 <b>ft.</b> <b>Curb Height</b> Lt 0.75 <b>ft.</b> Rt 0.67 <b>ft.</b> <b>Rail Type</b> Lt 19 <b>Rt</b> 19	<b>Year Painted</b> <b>Unsound Paint %</b> <b>Painted Area</b> <b>sq. ft.</b> <b>Primer Type</b> <b>Finish Type</b>	<b>Drainage Area (sq. mi.)</b> 958.0 <b>Waterway Opening (sf.)</b> 3475 <b>Navigation Control</b> 0 - No nav. control on <b>Pier Protection</b> - <b>Nav. Clr. (ft.)</b> <b>Vert.</b> 0.0 <b>Horiz.</b> 0.0 <b>Nav. Vert. Lift Bridge Clear. (ft.)</b> <b>MN Scour Code</b> R - CRIT - <b>Year</b> 2008																				
	<b>+ BRIDGE      SIGNS +</b>	<b>+ CAPACITY      RATINGS +</b>																				
<b>Posted Load</b> 0 - Not Required <b>Traffic</b> 0 - Not Required <b>Horizontal</b> 1 - Object Markers <b>Vertical</b> N - Not Applicable	<b>Design Load</b> 5 - HS 20 <b>Operating Rating</b> 2 - HS TRUCK      25.8 <b>Inventory Rating</b> 2 - HS TRUCK      18.4 <b>Posting VEH:</b> <b>SEMI:</b> <b>DBL:</b> <b>Rating Date</b> 4/1/1998 <b>Overweight Permit Codes</b> <b>A</b> N - N/A <b>B</b> N - N/A <b>C</b> N - N/A																					

MINNESOTA BRIDGE INSPECTION REPORT

01/13/2017

Inspector: CO Bridge

BRIDGE 58510 CSAH 61 OVER SNAKE RIVER

County: Pine Location: 0.2 MI N OF JCT CSAH 8 Length: 325.3 ft.  
 City: Pine City Route: 04 - CSAH 61 Ref. Pt.: 004+00.417 Deck Width: 60.1 ft.  
 Township: Control Section: Rdwy. Area/ Pct. Unsnd: 15941 sq. ft. / %  
 Section: 33 Township: 039N Range: 21W Maint. Area: Paint Area/ Pct. Unsnd: sq. ft. / %  
 Span Type: 5 - Prestressed Concrete 5 - Box Beam Local Agency Bridge Nbr.: S83 Culvert: N/A  
 List: or Girders - Multiple Postings:  
 NBI Deck: 6 Super: 6 Sub: 5 Chan: 6 Culv: N  
 Open, Posted, Closed: A - Open  
 MN Scour Code: R - CRIT - MONITOR

Appraisal Ratings - Approach: 8 Waterway: 8 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: N - Not Applicable Unofficial Sufficiency Rating 77.0

ELEM NBR	ELEMENT NAME	REPORT TYPE	INSP. DATE	QUANTITY	QTY CS 1	QTY CS 2	QTY CS 3	QTY CS 4
15	Prestressed Concrete Top Flange	Underwater	01/05/2017	19551 SF	19551	0	0	0
		Migrated Values		19551 SF	19551	0	0	0
	Notes: Bituminous Overlay Notes: [2016] Migrator assumed CS1.							
510	Wearing Surfaces	Underwater	01/05/2017	15941 SF	15622	0	319	0
		Migrated Values		15941 SF	15622	0	319	0
	Notes: Bituminous Overlay Notes: 2001 NEW BITUMINOUS APPROACH TO DECK ON SOUTH END. 2003 MILLED 2 in. OF OLD BITUMINOUS FROM BRIDGE DECK AND PLACED NEW SURFACE, ALSO NEW BITUMINOUS ON NORTH APPROACH. LARGE CRACKS IN BITUMINOUS SURFACE OVER THE PIERS. Several transverse cracks throughout. Deck is leaching water through to pier caps which are deteriorating. 2015 transverse cracks over piers have been patched. other transverse cracks continue but seem tight. water still leaching through bituminous and beam joints.							
104	Prestressed Concrete Closed Web/Box Girder	Underwater	01/05/2017	4551 LF	4522	29	0	0
		Migrated Values		4551 LF	4522	29	0	0
	Notes: THE LAST 2 ft. ON EACH END OF BOX GIRDERS OVER PIERS ON EAST SIDE OF BRIDGE ARE BREAKING OUT WITH EXPOSED REBAR. 1/4 in. BITUMINOUS FELT BETWEEN THE SECOND BOX GIRDER FROM WEST IN THE NORTH SPAN AND THE NORTH PIER CAP IS WORKING ITS WAY OUT APPROX. 8 in. Some spalls and delams, see underdeck notes. 2015 see attached document for under beam conditions and notes. 29 lin.ft. in condition 2 includes spall, delamination, and fascia crack\distress areas.							
215	Reinforced Concrete Abutment	Underwater	01/05/2017	161 LF	161	0	0	0
		Migrated Values		161 LF	161	0	0	0
	Notes: [2016] Migrator added 40 LF to abutment quantity to account for wingwalls (CS1:40 CS2:0 CS3:0 CS4:0). NORTH ABUTMENT END DIAPHRAM\FILLER BLOCK BETWEEN EAST BEAM AND WING WALL CONCRETE BROKEN OUT. 2015 BLOCK AT SOUTH ABUT EAST CORNER IS SPALLED WITH EXPOSED REBAR. ABUTMENTS IN GOOD CONDITION WITH MINOR STAINING. Wingwall notes: 2015 wings in good shape, end of nw wingwall has some minor concrete chips.							
225	Steel Pile	Underwater	01/05/2017	48 EA	0	20	28	0
		Migrated Values		48 EA	0	20	28	0
	Notes: MINOR RUSTING OF C-I-P PILING AT WATERLINE. UNDERWATER INSPECTION DONE IN 1992, 1997, 2002, 2007, 2012 2013 the 7 easterly pile in each pier are rusting at the junction of the pier cap. paint system gone and top of pile are showing surface corrosion with flaking rust. The remaining pile have failed paint system with surface corrosion. 2015 see attached document for pier conditions and notes. easterly 7 pile in each pier rated c.s. 3. other piles that are flaking at top pile\bottom pier cap location will be reviewed next inspection.							
515	Steel Protective Coating	Underwater	01/05/2017	999 SF	999	0	0	0
		Migrated Values		999 SF	999	0	0	0
	Notes: [2016] Migrator assumed CS1 and a quantity of 999 SF.							

ELEM NBR	ELEMENT NAME	REPORT TYPE	INSP. DATE	QUANTITY	QTY CS 1	QTY CS 2	QTY CS 3	QTY CS 4
234	Reinforced Concrete Pier Cap	Underwater	01/05/2017	240 LF	0	240	0	0
		Migrated Values		240 LF	0	240	0	0
Notes: 2013-Moderate cracking and minor concrete delamination areas in all pier caps. Delamination and crack areas are at bottom portion of pier cap at piling locations, worst areas seem to be from the center of the caps to the east.								
2015 see attached document for pier conditions and notes.								
330	Metal Bridge Railing	Underwater	01/05/2017	650 LF	650	0	0	0
		Migrated Values		650 LF	650	0	0	0
Notes: [2016] Migrator assumed concrete/metal combination type rail.								
2015 caulking around uprights is failing. minor cracks in concrete, some with staining. concrete face has some wear/surface abrasion .								
515	Steel Protective Coating	Underwater	01/05/2017	999 SF	999	0	0	0
		Migrated Values		999 SF	999	0	0	0
Notes: [2016] Migrator assumed CS1 and a quantity of 999 SF.								
331	Reinforced Concrete Bridge Railing	Underwater	01/05/2017	650 LF	650	0	0	0
		Migrated Values		650 LF	650	0	0	0
Notes: [2016] Migrator assumed concrete/metal combination type rail.								
2015 caulking around uprights is failing. minor cracks in concrete, some with staining. concrete face has some wear/surface abrasion .								
800	Critical Deficiencies or Safety Hazards	Underwater	01/05/2017	1 EA	1	0	0	0
		Migrated Values		1 EA	1	0	0	0
Notes: No critical structural deficiencies or serious safety hazards are present on this structure.								
822	Bituminous Approach Roadway	Underwater	01/05/2017	2 EA	0	2	0	0
		Migrated Values		2 EA	0	2	0	0
Notes: 2015 both approaches have been patched/crack sealed.								
883	Concrete Shear Cracking	Underwater	01/05/2017	1 EA	1	0	0	0
		Migrated Values		1 EA	1	0	0	0
Notes: Use this element to monitor the presence of shear cracking on concrete elements. Pay particular attention to the concrete pier caps.								
885	Scour	Underwater	01/05/2017	1 EA	1	0	0	0
		Migrated Values		1 EA	1	0	0	0
Notes: R - Scour critical. Monitoring required.								
891	Other Bridge Signing	Underwater	01/05/2017	1 EA	1	0	0	0
		Migrated Values		1 EA	1	0	0	0
Notes: Signs Required: Horizontal Clearance 2015 DELINEATORS ARE INPLACE.								
892	Slopes & Slope Protection	Underwater	01/05/2017	1 EA	1	0	0	0
		Migrated Values		1 EA	1	0	0	0
Notes: SLOPES HAVE CONCRETE BLANKET PLACED ON EACH END. IN GOOD CONDITION. STORM SEWER OUTLET ON SOUTH SLOPE HAS BEEN PLUGGED WITH CONCRETE, NEW OUTLET IS APPROXIMATELY 20 ft. WEST OF SLOPE BLANKET. 2015 minor washing along northeast blanket								
894	Deck & Approach Drainage	Underwater	01/05/2017	1 EA	0	1	0	0
		Migrated Values		1 EA	0	1	0	0
Notes: DECK DRAINS ARE PLUGGED. 2015 east side drains are plugged.								
895	Sidewalk, Curb, & Median	Underwater	01/05/2017	1 EA	0	1	0	0
		Migrated Values		1 EA	0	1	0	0
Notes: SOME LARGER CRACKS AT JOINT LOCATIONS. 2015 small spalls over piers 1,2,3. 24"x8" spall over pier 4. surface scale of some of sidewalk surface. both ends of approach sidewalk are low, north side has been patched with bituminous.								

ELEM NBR	ELEMENT NAME	REPORT TYPE	INSP. DATE	QUANTITY	QTY CS 1	QTY CS 2	QTY CS 3	QTY CS 4
899	Miscellaneous Items	Underwater	01/05/2017	1 EA	1	0	0	0
		Migrated Values		1 EA	1	0	0	0
Notes: 2015 BOAT LIFT WEDGED UNDER SOUTH PIER.								

900	Protected Species	Underwater	01/05/2017	1 EA	1	0	0	0
		Migrated Values		1 EA	1	0	0	0
Notes: Use this element to track the presence of protected species living on this structure.								

General Notes: THERE IS AN UNDERWATER INSPECTION REPORT FOR 1992, 1997,2002, 2007, 2012 ON FILE.

Viewed piers, piling and undre beams from ice on 1-21-16

58. Deck NBI: bituminous surface over voided box beams has several transverse cracks which are leaching water onto beams. box beams showing some distress from underside.

36A. Brdg Railings NBI:

36B. Transitions NBI:

36C. Appr Guardrail NBI:

36D. Appr Guardrail  
Terminal NBI:

59. Superstructure NBI: concrete voided box beams showing distress from underside. see pontis items and attached rating document.

60. Substructure NBI: as per underwater inspection and conditions of pier pile and pier caps. see attached rating document.

61. Channel NBI: as per underwater inspection

62. Culvert NBI:

71. Waterway Adeq NBI:

72. Appr Roadway  
Alignment NBI:

Inventory Notes:

\_\_\_\_\_  
Inspector's Signature

\_\_\_\_\_  
Reviewer's Signature

# Pictures



Photo 1 - Overall View of Upstream Fascia, Looking Northeast



Photo 2 - Overall View of Downstream Fascia, Looking Southwest

# Pictures



Photo 3 - View of Pier 1, Looking Northeast



Photo 4 - View of Pier 2, Looking Northeast

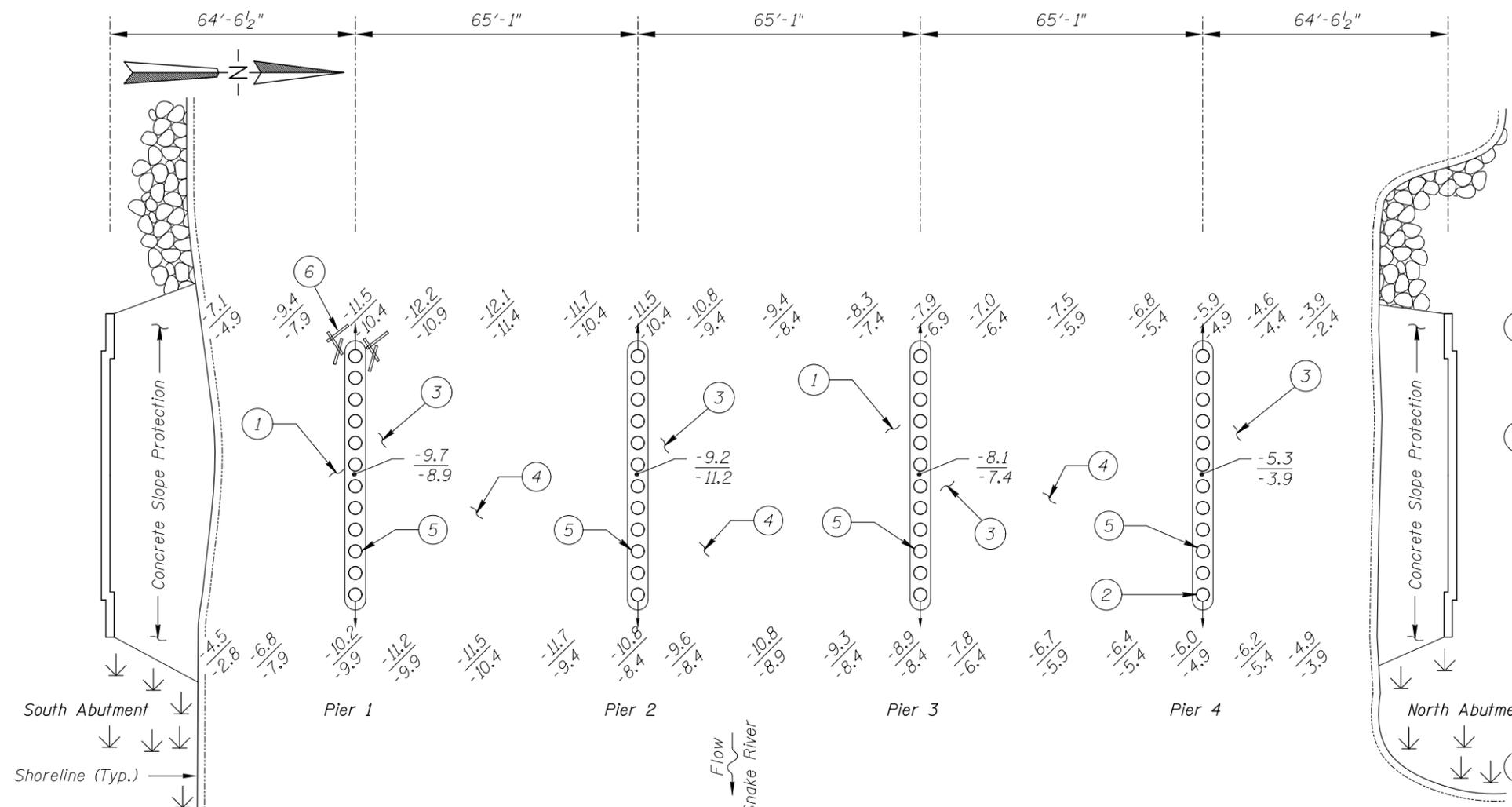
# Pictures



Photo 5 - View of Pier 3, Looking Northeast



Photo 6 - View of Pier 4, Looking Northeast



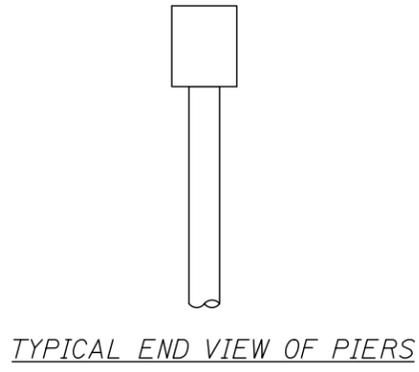
**SOUNDING PLAN**

**GENERAL NOTES:**

1. Piers 1 through 4 were inspected underwater.
2. At the time of inspection on September 22, 2016, the waterline was located 8.9 feet below the top of the pile cap at the downstream end of Pier 1. This corresponds to a waterline elevation of 933.7 based on design drawings.
3. Soundings indicate water depth at the time of inspection and are measured in feet.
4. Soundings were taken parallel to the bridge at 1/4 points intervals between the substructure units.

**INSPECTION NOTES:**

- ① A light amount of scattered timber debris, 3 inch diameter and smaller, was observed along the south side of Piers 1 and 2. A light to moderate accumulation of timber debris, 6 inch diameter and smaller, was observed along the upstream half of Pier 3 extending from channel bottom to 3 feet below the waterline.
- ② Four deformations were present on the east and south side of the easternmost pile of Pier 4:
  - A. A 6 inch wide by 3 inch high by 2 inch deep dent was located 4 feet below water on the south face.
  - B. A 6 inch wide by 3 inch high by 1 inch deep dent was located at 3 feet below the waterline.
  - C. A 6 inch diameter by 2 inch deep dent was located at the waterline. This dent was accompanied by 1/8 inch deep corrosion pitting.
  - D. An 8 inch diameter by 1 inch deep dent was located at 1.5 foot below the waterline.
- ③ Timber piles from an earlier structure were located along the north side of each pier. The tops of the piles were located at 2 feet above channel bottom.
- ④ Channel bottom material consisted of gravelly sand with scattered riprap and cobbles allowing 2 inches of maximum probe rod penetration.
- ⑤ Light to moderate corrosion on all piles from bottom of cap to the channel bottom, with up to 1/2 inch diameter rust nodules below water covering up to 100% of the surface area of the piles, and with a maximum of 1/8 inch deep pitting from 1 foot below waterline to channel bottom.
- ⑥ Metal dock framing debris was observed around the two upstream piles of Pier 1.



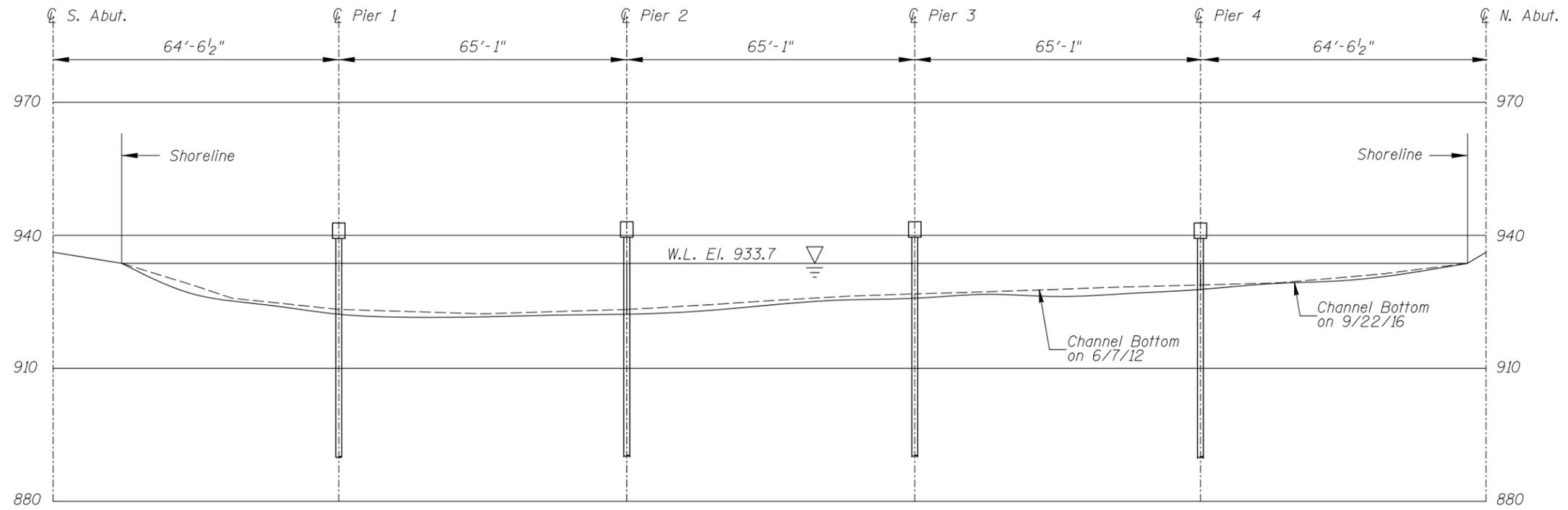
**TYPICAL END VIEW OF PIERS**

**Legend**

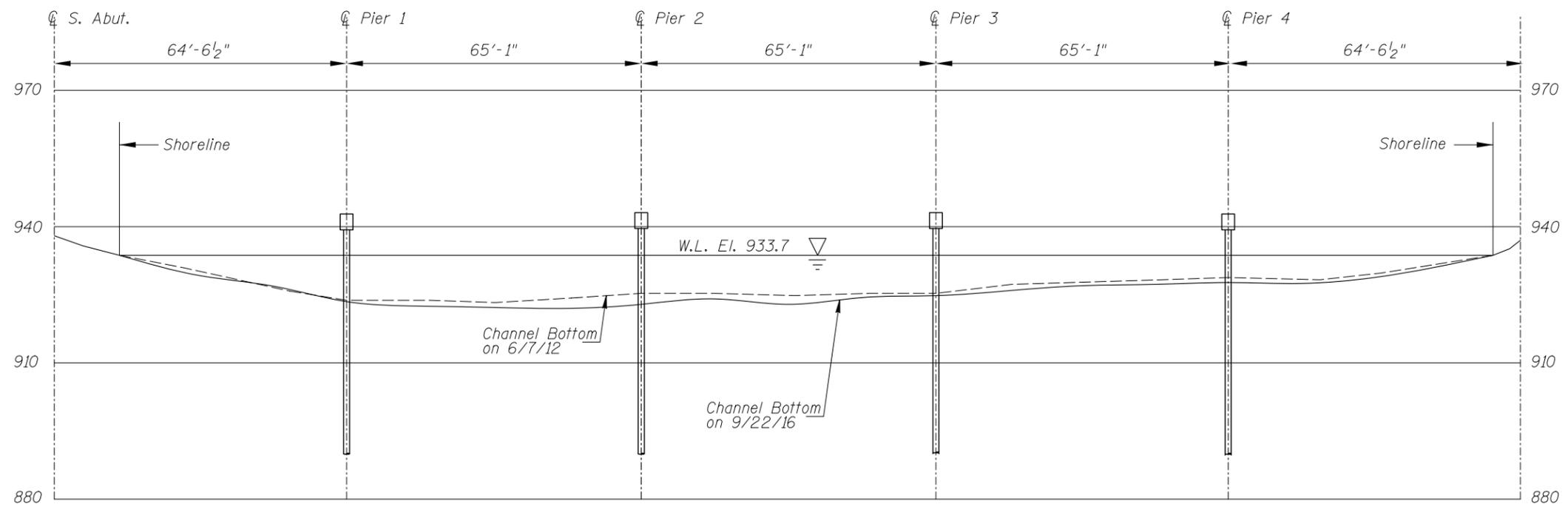
- 2.0 Sounding Depth (9/22/16)
- 5.2 Sounding Depth (6/7/12)
- Concrete Filled Pipe Pile
- Concrete Filled Battered Pipe Pile
- ⊠ Riprap
- ↓ Grassy Vegetation

**Note:**  
All soundings based on 2016 waterline location.

<b>MINNESOTA DEPARTMENT OF TRANSPORTATION UNDERWATER BRIDGE INSPECTION</b>		
STRUCTURE NO. 58510 OVER THE SNAKE RIVER DISTRICT 1, PINE COUNTY		
<b>INSPECTION AND SOUNDING PLAN</b>		
Drawn By: BMS	<b>COLLINS ENGINEERS</b>	Date: DEC., 2016
Checked By: DGS	<small>123 North Wacker Drive Suite 900 Chicago, IL 60606 (312) 704-9300 www.collinsngr.com</small>	Scale: NTS
Code: 968758510		Figure No.: 1



UPSTREAM FASCIA PROFILE



DOWNSTREAM FASCIA PROFILE

**MINNESOTA  
DEPARTMENT OF TRANSPORTATION  
UNDERWATER BRIDGE INSPECTION**

STRUCTURE NO. 58510  
OVER THE SNAKE RIVER  
DISTRICT I, PINE COUNTY

UPSTREAM AND DOWNSTREAM  
FASCIA PROFILES

Drawn By: BMS  
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Suite 900  
Chicago, IL 60606  
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Date: DEC., 2016  
Scale: 1"=30'  
Figure No.: 2