

2016 UNDERWATER BRIDGE INSPECTION REPORT



BRIDGE # 66547 2 AVE NW(MSAS 123) over CANNON RIVER

DISTRICT: District 6 **COUNTY:** Rice **CITY/TOWNSHIP:** Faribault
STATE: Minnesota

Date of Inspection: 05/26/2016

Equipment Used:

Owner: City or Municipal Highway Agency

Inspected By: Owens, Garrett

Report Written By: Garrett Owens

Report Reviewed By:

Final Report Date:



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UNDERWATER INSPECTION

REPORT SUMMARY

The substructure units inspected below water at Bridge No. 66547, Piers 1 and 2, were found to be generally in good condition. However, an area of soft/scaled concrete with maximum 2 inch penetration was observed along both faces of Pier 2. The remainder of the concrete was smooth and sound. A 2.5 foot deep by 1.5 foot wide scour depression was present from downstream nose to downstream ¼ point. The slope protection mat was damaged in several random areas with many missing or displaced blocks.

INSPECTION FINDINGS

- (A) The north and south embankment slopes were lined with an articulated concrete revetment mat from top of slope to 1 foot below waterline within the immediate vicinity of the bridge.
- (B) An area of soft, heavily scaled concrete 3 feet wide with 2 inches of maximum penetration from water line up 1 foot was located near the upstream ¼ point on both faces of Pier 2.
- (C) Slope protection mat was missing many blocks in several random areas on both slopes. Largest missing section was 8 feet by 3 feet by 1 foot deep and was located on the south slope.
- (E) A 14 inch diameter log was found at the upstream end of Pier 1.
- (F) A 2.5 foot deep by 1.5 foot wide scour depression was present from downstream nose to downstream ¼ point.

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 #: 66547
Feature Intersected: CANNON RIVER
Facility Carried: 2 AVE NW(MSAS 123)
District: District 6
County: 066 - Rice

Bridge Description:

The superstructure consists of a three span concrete haunched slab bridge supporting a reinforced concrete deck. The bridge is supported by two reinforced concrete abutments and two reinforced concrete piers. The piers are numbered 1 and 2 from the south end of the structure.

2. INSPECTION DATA

Professional Engineer/Team Leader: Cory R. Stuber, P.E.
Inspection Diver: Garrett R. Owens, P.E.
Date of Underwater Inspection: 05/26/2016
Weather Conditions: Sunny, 80°F
Underwater Visibility (feet): 1.0
Waterway Velocity (ft/sec): 1.0

3. SUBSTRUCTURE INSPECTION DATA

Substructure(s) Inspected: Piers 1 and 2

General Shape:

The piers each consist of a rectangular architectural pier cap supported by a 70 foot oblong pier shaft that encases 18 driven steel H-piles.

Maximum Water Depth at Substructure(s) Inspected (feet): 3.8

4. WATERLINE DATUM

Water Level Reference: The bottom of the pier cap at the upstream end of Pier 1.
Waterline Elevation (feet): 956.2
Description: The waterline was approximately 6.7 feet 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: 7
Item 62: Culvert: Code:
Item 92B: Underwater Inspection: Code: Y 48 05/2016

Item 113: Scour Critical Bridge:

Code: L

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	141	LF	135		6	
885	Scour	1	EA		1		

UNDERWATER INSPECTION

INSPECTION PROCEDURES

The routine underwater inspection of Bridge 66547 (MSAS 123 over the Cannon River) was completed on May 26, 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. Due to waterway conditions at the time of inspection, the inspection could be accomplished by wading 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 Piers 1 and 2. According to the bridge inventory or design drawings, Piers 1 and 2 were founded on 18 steel H-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 a maximum of 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 BRIDGE INSPECTION REPORT

09/09/2016

Inspector: CO Bridge

BRIDGE 66547 2 AVE NW(MSAS 123) OVER CANNON RIVER

County: Rice	Location: 0.2 MI S OF JCT TH 3	Length: 162.3 ft.
City: Faribault	Route: 05 - MSAS 123 Ref. Pt.: 000+00.923	Deck Width: 72.3 ft.
Township:	Control Section:	Rdwy. Area/ Pct. Unsnd: 8443 sq. ft. / %
Section: 30 Township: 110N Range: 20W Maint. Area:		Paint Area/ Pct. Unsnd: sq. ft. / %
Span Type: 2 - Concrete Continuous 1 - Slab	Local Agency Bridge Nbr.:	Culvert: N/A
List:		Postings:
NBI Deck: 7 Super: 7 Sub: 7 Chan: 7 Culv: N		
	Open, Posted, Closed: A - Open	
	MN Scour Code: L - STBL - LOW RISK	

Appraisal Ratings - Approach: 8	Waterway: 9	Unofficial Structurally Deficient	N
Required Bridge Signs - Load Posting: 0 - Not Required	Traffic: 0 - Not Required	Unofficial Functionally Obsolete	N
Horizontal: 0 - Not Required	Vertical: N - Not Applicable	Unofficial Sufficiency Rating	81.9

ELEM NBR	ELEMENT NAME	REPORT TYPE	INSP. DATE	QUANTITY	QTY CS 1	QTY CS 2	QTY CS 3	QTY CS 4
38	Reinforced Concrete Slab	Underwater	05/26/2016	11744 SF	11424	320	0	0
		Routine	05/16/2016	11744 SF	11424	320	0	0
Notes: There are full length longitudinal cracks with staining on the under side of the deck and scattered vertical cracks along the outside edges. There are small areas of poorly consolidated concrete in spans 2 and 3. [2014, 2016] - no change								
510	Wearing Surfaces	Underwater	05/26/2016	8443 SF	8443	0	0	0
		Routine	05/16/2016	8443 SF	8443	0	0	0
Notes: Concrete Slab with Cathodic Protection System Notes: There are no spalls, delaminations, or patches noted in the surface of the deck. [2014, 2016] - no change								
210	Reinforced Concrete Pier Wall	Underwater	05/26/2016	141 LF	135	0	6	0
		Routine	05/16/2016	71 LF	61	10	0	0
Notes: No concrete deterioration noted. [2014] - no change [2016] - there are a few leaching cracks in each pier wall. [2016] Underwater Inspection - An area of soft, heavily scaled concrete 3 feet wide with 2 inches of maximum penetration from water line up 1 foot was located near the upstream 1/4 point on both faces of Pier 2.								
215	Reinforced Concrete Abutment	Underwater	05/26/2016	186 LF	186	0	0	0
		Routine	05/16/2016	186 LF	186	0	0	0
Notes: South Abutment - There are 2 hairline vertical cracks in the face of the abutment located to the east side of bearings 5 and 6. North Abutment - There are 3 hairline vertical cracks in the face of the abutment located under bearing 5 and between bearings 5 and 6. [2014, 2016] - no change								
234	Reinforced Concrete Pier Cap	Underwater	05/26/2016	71 LF	71	0	0	0
		Routine	05/16/2016	71 LF	71	0	0	0
Notes: No concrete deterioration noted. [2014, 2016] - no change								
300	Strip Seal Expansion Joint	Underwater	05/26/2016	146 LF	126	20	0	0
		Routine	05/16/2016	146 LF	126	20	0	0
Notes: South End - OK, the strip seals were full of dirt and debris. [2014] - Water leakage @ west end. [2016] - no change North End - OK, the strip seals were full of dirt and debris. [2014] - West end leaking on abutment. [2016] - no change								
301	Pourable Joint Seal	Underwater	05/26/2016	170 LF	135	35	0	0
		Routine	05/16/2016	170 LF	135	35	0	0
Notes: The pourable joints are the approach panel joints. [2016] - 20' at north end and 15' at south end with lost adhesion.								

BRIDGE 66547 2 AVE NW(MSAS 123) OVER CANNON RIVER

ELEM NBR	ELEMENT NAME	REPORT TYPE	INSP. DATE	QUANTITY	QTY CS 1	QTY CS 2	QTY CS 3	QTY CS 4
321	Reinforced Concrete Approach Slab	Underwater	05/26/2016	3400 SF	3350	50	0	0
		Routine	05/16/2016	3400 SF	3350	50	0	0
Notes: South Approach - There are 3 unsealed longitudinal cracks in the approach. North Approach - There are 3 unsealed longitudinal cracks in the approach. There is a small shallow 6" X 6" spalled area along the east curb at the north end. [2014, 2016] - no change								
330	Metal Bridge Railing	Underwater	05/26/2016	372 LF	372	0	0	0
		Routine	05/16/2016	372 LF	372	0	0	0
Notes: The railing consists of 30" high solid concrete base and 26" high painted steel railing attached to the top of the concrete rail. [2016] - The painted steel portion of the railing is in good condition. No structural damage is noted and all anchorages are secure.								
515 - Steel Protective Coating		Underwater	05/26/2016	750 SF	745	5	0	0
		Routine	05/16/2016	750 SF	745	5	0	0
Notes: [2016] - there are a few minor paint defects.								
331	Reinforced Concrete Bridge Railing	Underwater	05/26/2016	362 LF	352	10	0	0
		Routine	05/16/2016	362 LF	352	10	0	0
Notes: The railing consists of 30" high solid concrete lower railing and 26" high painted steel railing attached to the top of the concrete rail. [2016] - 10 of the twenty concrete rail sections have leaching vertical cracks.								
800	Critical Deficiencies or Safety Hazards	Underwater	05/26/2016	1 EA	1	0	0	0
		Routine	05/16/2016	1 EA	1	0	0	0
Notes: [2014, 2016] - No critical finding were noted at the time of this inspection.								
810	Concrete Decks - Cracking & Sealing	Underwater	05/26/2016	3000 LF	0	3000	0	0
		Routine	05/16/2016	3000 LF	0	3000	0	0
Notes: [2012] - there is approximately 3000 linear feet of minor unsealed cracks in the deck surface. mostly in the southbound lane. [2014, 2016] - no change								
885	Scour	Underwater	05/26/2016	1 EA	0	1	0	0
Notes: [2016] Underwater Inspection - A 2.5 foot deep by 1.5 foot wide scour depression from downstream nose to downstream ¼ point.								
892	Slopes & Slope Protection	Underwater	05/26/2016	1 EA	0	1	0	0
		Routine	05/16/2016	1 EA	0	1	0	0
Notes: The slopes are in stable condition. There are a few missing concrete blocks and some of the areas have been filled using cement grout. 2012 - the south slope has a hole with missing block (3 blocks x 5 blocks with 3 missing) 2014 Scattered blocks are heaving. The west side S slope has a small erosion hole along the wing and side walk. [2016] - missing block area has grown to 4 block x 6 block with 10 missing.								
894	Deck & Approach Drainage	Underwater	05/26/2016	1 EA	1	0	0	0
		Routine	05/16/2016	1 EA	1	0	0	0
Notes: The catch basins are located on the north end of the bridge, all were in good condition at the time of this inspection. [2014, 2016] - no change								
895	Sidewalk, Curb, & Median	Underwater	05/26/2016	1 EA	0	1	0	0
		Routine	05/16/2016	1 EA	0	1	0	0
Notes: There are unsealed cracks in the sidewalk. All of the curb sections are intact. 2014 E side sidewalk settled approx 2". N end East sidexnext to expansion plate is a 6"x6"spall. N end west side the side walk has settled 1". Both south sidewalks settled slightly. [2016] - no change								
899	Miscellaneous Items	Underwater	05/26/2016	1 EA	1	0	0	0
		Routine	05/16/2016	1 EA	1	0	0	0
Notes: There is a 155' long retaining wall starting from the end of the east side railing extending to the north. There are scattered full height vertical cracks in the retaining wall. There is a 16" diameter catch basin drain extension 45' north of the bridge that protrudes through the bottom of the retaining wall. There is no movement or tilting of the wall. [2016] - no change								

BRIDGE 66547 2 AVE NW(MSAS 123) OVER CANNON RIVER

ELEM NBR	ELEMENT NAME	REPORT TYPE	INSP. DATE	QUANTITY	QTY CS 1	QTY CS 2	QTY CS 3	QTY CS 4
900	Protected Species	Underwater	05/26/2016	1 EA	0	1	0	0
		Routine	05/16/2016	1 EA	0	1	0	0

Notes: [2016] - swallow nests are present

General Notes: Bridge 66547

NOTE: Bridge was built in 2008, it replaced Bridge 3579.

Channel - NBI 8 The banks are in stable condition.

[2010] - inspected by Robert Pyfferoen.
 [2012] - inspected by Gary Waletzki and Aaron Forthun.
 [2014] - inspected by Gary Waletzki and Aaron Forthun.
 [2016] - inspected by Robert Pyfferoen

58. Deck NBI: 2014 Minor deterioration.

36A. Brdg Railings NBI:

36B. Transitions NBI:

36C. Appr Guardrail NBI:

36D. Appr Guardrail
Terminal NBI:

59. Superstructure NBI: 2014 Isolated deterioration.

60. Substructure NBI: 2014 Isolated deterioration.

61. Channel NBI: 2014 Well vegetated.

62. Culvert NBI:

71. Waterway Adeq NBI: 2014 Chance of over topping remote.

72. Appr Roadway
Alignment NBI: 2014 No speed reduction required.

Inventory Notes:

Garrett Owens

Inspector's Signature

Reviewer's Signature

Pictures



Photo 1 - West Elevation, Looking East



Photo 2 - East Elevation, Looking West

Pictures

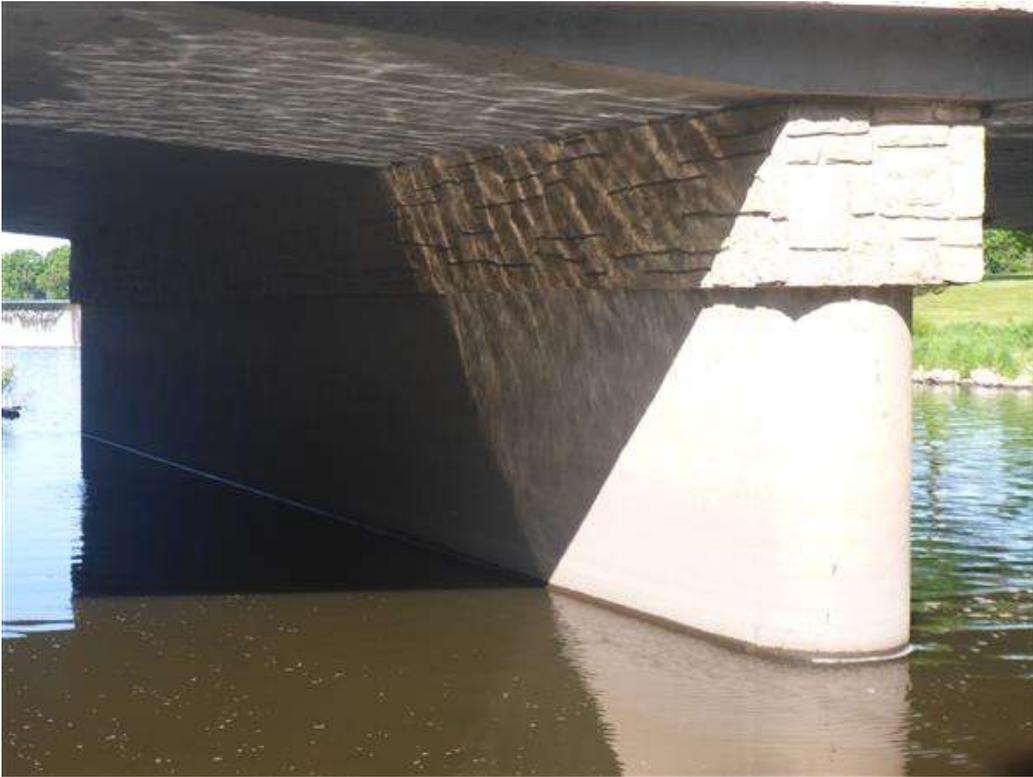


Photo 3 - Pier 1, Looking North



Photo 4 - Typical View of Pier 2, Looking South

Pictures



Photo 5 - View of Upstream Channel, Looking West



Photo 6 - View of South Shoreline, Looking West

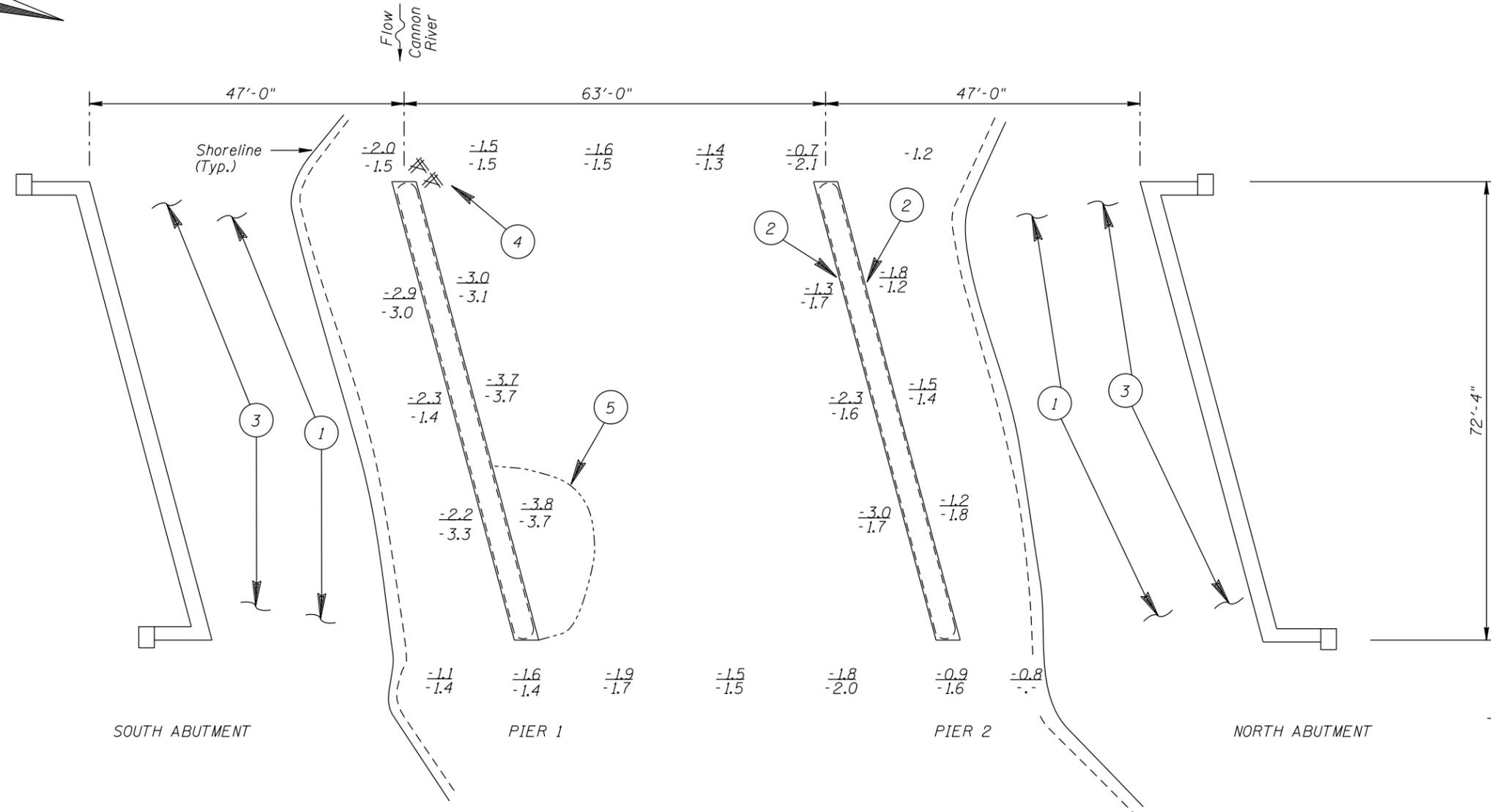
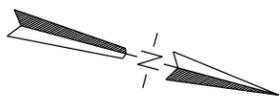
Pictures



Photo 7 - Typical Slope Mat and North Bank, Looking West



Photo 8 - View of Damaged Mat on South Slope, Looking South



SOUTH ABUTMENT

PIER 1

PIER 2

NORTH ABUTMENT

- Legend**
- 18.0 Sounding Depth from Waterline (5/26/16)
 - 18.0 Sounding Depth from Waterline (9/13/12)
 - (1) Inspection Note Number
 - Timber Debris
 - Scour Depression Boundary
 - .- Sounding Not Previously Taken

General Notes:

1. Piers 1 and 2 were inspected underwater.
2. At the time of inspection, on May 26, 2016, the waterline was located approximately 6.7 feet below the bottom of architectural cap on the upstream nose of Pier 1. This corresponds to a waterline elevation of 956.2 based on design plans.
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 1/4 point intervals between the substructure units as well as around the pier structures.
5. The channel bottom exhibited 1 foot diameter stone with silty sand infill.

Inspection Notes:

- 1 The north and south embankment slopes were lined with an articulated concrete revetment mat from top of slope to 1 foot above waterline within the immediate vicinity of the bridge
- 2 An area of soft, heavily scaled concrete 3 feet wide with 2 inches of maximum penetration from water line up 1 foot was located near the upstream 1/4 point on both faces of Pier 2.
- 3 Slope protection mat missing many blocks in several random areas. Largest missing sections is 8 feet by 3 feet and 1 foot deep.
- 4 A 14 inch diameter log was found at the upstream end of Pier 1.
- 5 2.5 foot deep by 1.5 foot wide scour depression from downstream nose to downstream 1/4 point.

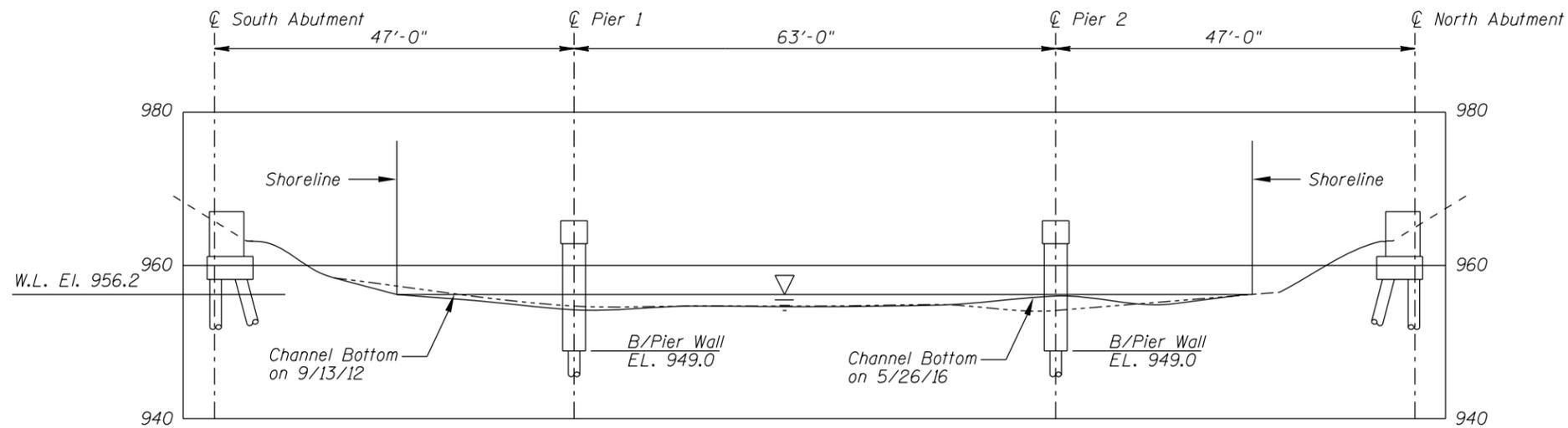
SOUNDING PLAN

Note:
Refer to Figure 2 for Inspection Notes.

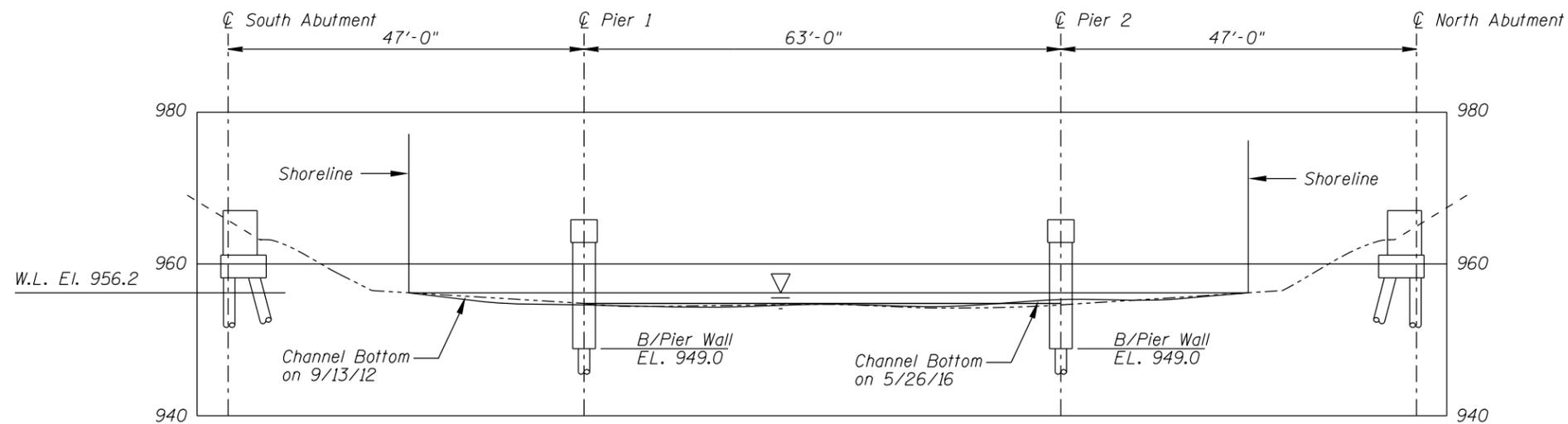


TYPICAL END VIEW OF TOWERS

MINNESOTA DEPARTMENT OF TRANSPORTATION UNDERWATER BRIDGE INSPECTION		
STRUCTURE NO. 66547 2nd AVE NW OVER THE CANNON RIVER FARIBAULT, RICE COUNTY		
INSPECTION AND SOUNDING PLAN		
Drawn By: BGDO	COLLINS ENGINEERS	Date: JUNE 2016
Checked By: BRL		Scale: 1"=40'
Project: 63-9687		Figure No.: 1
<small>1399 Selby Avenue Suite 206 St. Paul, MN, 55104 (651) 646-8502 www.collinsengr.com</small>		



UPSTREAM FASCIA PROFILE



DOWNSTREAM FASCIA PROFILE

Note:

Refer to Figure 1 for General Notes.

MINNESOTA DEPARTMENT OF TRANSPORTATION UNDERWATER BRIDGE INSPECTION		
STRUCTURE NO. 66547 2nd AVE NW OVER THE CANNON RIVER FARIBAULT, RICE COUNTY		
UPSTREAM AND DOWNSTREAM FASCIA PROFILES		
Drawn By: BGDO	COLLINS ENGINEERS	Date: JUNE 2016
Checked By: BRL		Scale: 1"=40'
Project: 63-9687		Figure No.: 2