

UNDERWATER BRIDGE INSPECTION REPORT

STRUCTURE NO. 9360

CSAH NO. 122

OVER THE

MISSISSIPPI RIVER

HENNEPIN COUNTY



OCTOBER 29, 2012

PREPARED FOR THE

MINNESOTA DEPARTMENT OF TRANSPORTATION

BY

COLLINS ENGINEERS, INC.

JOB NO. 7423

MINNESOTA DEPARTMENT OF TRANSPORTATION
UNDERWATER BRIDGE INSPECTION

REPORT SUMMARY:

The substructure units inspected at Bridge 9360, the East and West Piers, were generally found to be in good condition. The concrete of the piers was smooth and sound with random minor areas of poor consolidation. The footings at both piers were partially exposed on the main channel side with a maximum vertical exposure of 1 foot. Vertical hairline cracks, 1/16 inch maximum width with efflorescence extending from the top of the webwall to the waterline, were observed on the east and west faces of the piers. Scaling (heaviest at the noses of both piers) was observed from the waterline to 3 feet below the waterline with 1/2 inch maximum penetration. A minor accumulation of timber debris consisting of 4 to 6 inch diameter and smaller logs and branches was observed around the upstream nose of the West Pier.

INSPECTION FINDINGS:

- (A) The channel bottom around the West Pier consisted of 2 to 3 foot diameter riprap along the upstream nose. The west side of the pier consisted of sand and gravel with 6 inch of maximum probe rod penetration.
- (B) The channel bottom all around the East Pier consisted of 2 to 3 foot diameter riprap.
- (C) Partial footing exposure was observed at the northwest corner of the East Pier, 4 feet wide by 10 feet long with 1 foot of vertical exposure.
- (D) Several vertical hairline cracks with efflorescence were randomly observed on both piers extending from the top of the web wall to the waterline with 1/16 inch maximum width.
- (E) Footing exposure was present all along the east face of the West Pier with 1 foot of maximum vertical exposure at the downstream nose and protruding reinforcing steel.

- (F) Map hairline cracking was noted in random areas along the east face of East Pier.
- (G) A spall was observed along a joint at 1 foot below the waterline down 2 feet and was 2 inches wide with up to 1 inch of penetration.
- (H) Minor accumulation of 4 to 6 inch diameter timber debris was present around the upstream nose of the West Pier. Sheet piling was observed along the edge of the footing and reinforcing steel was protruding from the top of the footing.
- (I) Random scaling (heavier at upstream noses) was present on both piers from waterline to 3 feet below waterline with 1/2 inch maximum penetration.

RECOMMENDATIONS:

- (A) Monitor footing exposure during future underwater inspections.
- (B) Reinspect the submerged substructure units at the normal maximum recommended (NBIS) interval of sixty (60) months.

Inspection Team Leader:

WSB and Associates



Barritt Lovelace
Registered Professional Engineer
Bridge Safety Inspection Team Leader

Respectfully submitted,

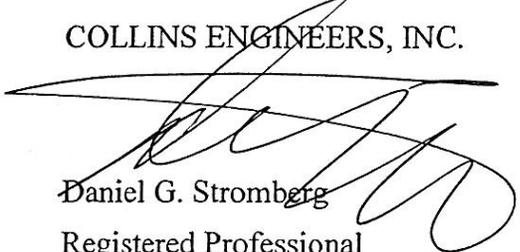
PROFESSIONAL ENGINEER

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.

Daniel G. Stromberg

Date 6/30/14 License # 21491

COLLINS ENGINEERS, INC.



Daniel G. Stromberg
Registered Professional
Engineer, State of Minnesota

MINNESOTA DEPARTMENT OF TRANSPORTATION
UNDERWATER BRIDGE INSPECTION

1. BRIDGE DATA

Bridge Number: 9360

Feature Crossed: Mississippi River

Feature Carried: CSAH No. 122

Location: Hennepin County

Bridge Description: The superstructure consists of four continuous haunched steel girders supporting a reinforced concrete deck. In addition, a commuter walkway was constructed above the original deck. The superstructure is supported by five reinforced concrete piers and two reinforced concrete abutments. The piers consist of spread footing founded on bedrock.

2. INSPECTION DATA

Professional Engineer/Team Leader: Barritt R Lovelace, P.E. (WSB)

Dive Team: Marc B. Parker, Lukas Janulis, P.E.

Date: October 29, 2012

Weather Conditions: Cloudy, 40° F

Underwater Visibility: 0.5 Foot

Waterway Velocity: 0.5 ft/sec

3. SUBSTRUCTURE INSPECTION DATA

Substructure Inspected: East and West Piers.

General Shape: The piers consist of a square pier cap supported by five square columns. The columns are connected by a concrete webwall which started above the waterline and extended into the channel bottom. The piers have spread footing founded on bedrock.

Maximum Water Depth at Substructure Inspected: Approximately 14.0 Feet.

4. WATERLINE DATUM

Water Level Reference: Cold Joint on the east face of the East Pier.

Water Surface: The waterline was approximately 4.6 feet below reference.

Waterline Elevation = 725.4.

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 92B: Underwater Inspection: Code B/10/12

Item 113: Scour Critical Bridges: Code P/93

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

 Yes X No

6. STRUCTURAL ELEMENT CONDITION RATING

Item #	Element Description	Quantity	Unit	Conditions				
				1	2	3	4	5
210	Reinforced Concrete Pier Wall	120	LF		120			
220	Reinforced Concrete Footing	2	EA	2				
361	Scour Smart Flag	1	EA	1				
985	Slopes and Slope Protection	1	EA	1				



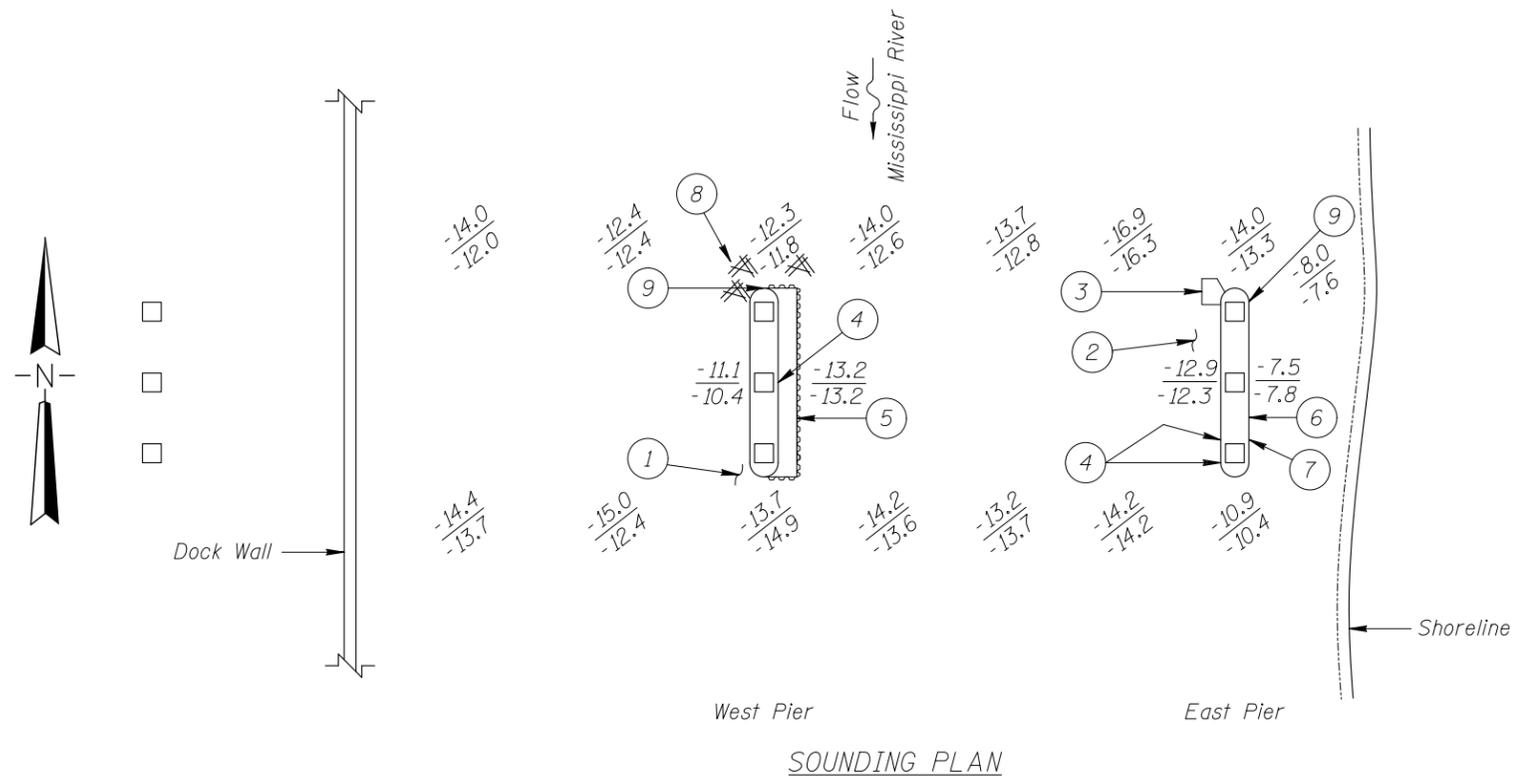
Photograph 1. Overall View of the Structure, Looking North.



Photograph 2. View of West Pier, Looking Southeast.



Photograph 3. View of East Pier, Looking Southeast.



SOUNDING PLAN

GENERAL NOTES:

1. The East and West Piers were inspected underwater.
2. At the time of inspection on October 29, 2012 the waterline was located approximately 4.6 feet below the Bench Mark at Elevation 730.0 referenced at the cold joint on the east face of the East Pier. This corresponds with a waterline elevation of 725.4.
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.

INSPECTION NOTES:

- 1 The channel bottom around the West Pier consisted of 2 to 3 foot diameter riprap along the upstream nose. The west side of the pier consisted of sand and gravel with 6 inch of maximum probe rod penetration.
- 2 The channel bottom all around the East Pier consisted of 2 to 3 foot diameter riprap.
- 3 Partial footing exposure was observed at the northwest corner of the East Pier, 4 feet wide by 10 feet long with 1 foot of vertical exposure.
- 4 Several vertical hairline crack with efflorescence were randomly observed on both piers extending from the top of the web wall to the waterline with 1/16 inch maximum width.
- 5 Footing exposure was present all along the east face of the West Pier with 1 foot of maximum vertical exposure at the downstream nose and protruding reinforcing steel.
- 6 Map hairline cracking was noted in random areas along the East face of East Pier.
- 7 A spall was observed along a joint at 1 foot below the waterline down 2 feet and was 2 inches wide with up to 1 inch of penetration.
- 8 Minor accumulation of 4 to 6 inch diameter was present timber debris around the upstream nose of the West Pier. Sheet piling was observed along the edge of the footing and reinforcing steel was protruding from the top of the footing.
- 9 Random scaling (heavier at upstream noses) was present on both piers from waterline to 3 feet below waterline with 1/2 inch maximum penetration.

Legend

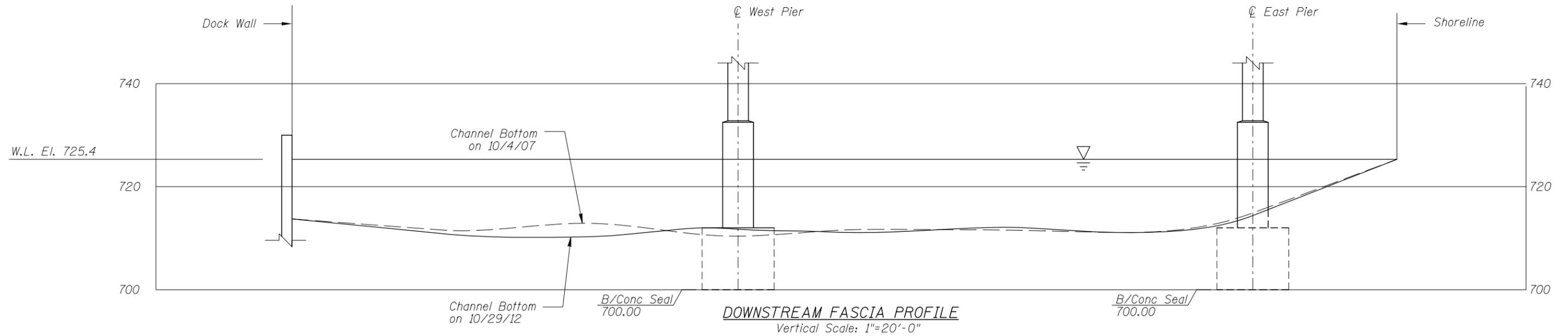
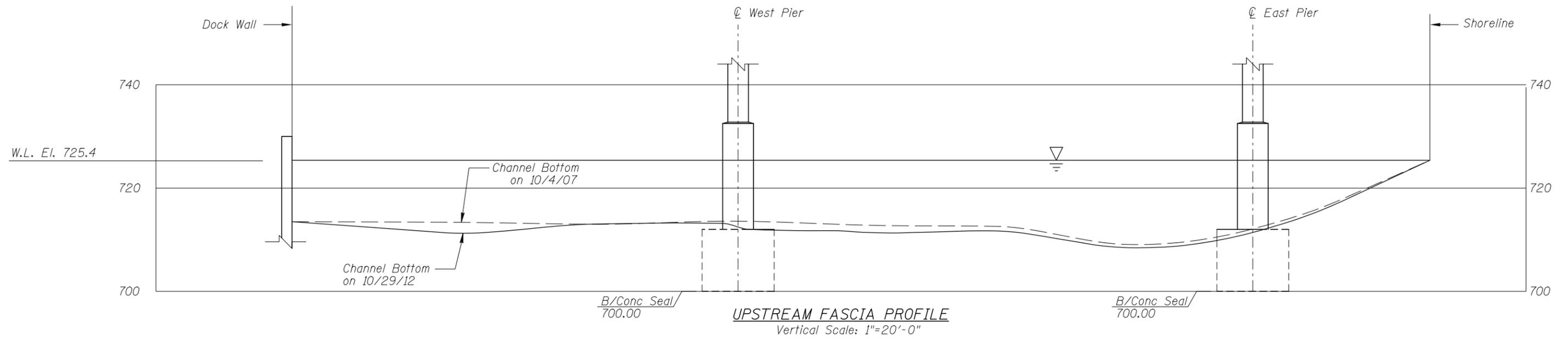
- 2.0 Sounding Depth (10/29/12)
- 5.2 Sounding Depth (10/4/07)
- Timber Debris

Note

All soundings based on 2012 waterline location.

MINNESOTA DEPARTMENT OF TRANSPORTATION UNDERWATER BRIDGE INSPECTION		
STRUCTURE NO. 9360 OVER THE MISSISSIPPI RIVER HENNEPIN COUNTY		
INSPECTION AND SOUNDING PLAN		
Drawn By: CRE	COLLINS ENGINEERS	Date: OCT. 2012
Checked By: LJ		Scale: NTS
CODE: 74239360		Figure No.: 1

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Chicago, IL 60606
(312) 704-9300
www.collinsengr.com



Note:
Refer to Figure 1 for General Notes.

MINNESOTA DEPARTMENT OF TRANSPORTATION UNDERWATER BRIDGE INSPECTION		
STRUCTURE NO. 9360 OVER THE MISSISSIPPI RIVER HENNEPIN COUNTY		
UPSTREAM AND DOWNSTREAM FASCIA PROFILES		
Drawn By: CRE	COLLINS ENGINEERS	Date: OCT. 2012
Checked By: LJ		Scale: NTS (U.O.N.)
Code: 74239360		Figure No.: 2

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MINNESOTA DEPARTMENT OF TRANSPORTATION
OFFICE OF BRIDGES AND STRUCTURES
DAILY DIVING REPORT

INSPECTORS: Collins Engineers, Inc. DATE: October 29, 2012

ON-SITE TEAM LEADER: Barritt R Lovelace, P.E. (WSB)

BRIDGE NO: 9360 WEATHER: Cloudy, 40°F

WATERWAY CROSSED: Mississippi River

DIVING OPERATION: X SCUBA SURFACE SUPPLIED AIR
 OTHER

PERSONNEL: Marc B. Parker, Lukas Janulis, P.E.

EQUIPMENT: Commercial Scuba, U/W Light, Scraper, Sounding Pole, Lead Line, Probe
Rod, Boat, Camera, Fathometer

TIME IN WATER: 12:40 p.m.

TIME OUT OF WATER: 12:55 p.m.

WATERWAY DATA: VELOCITY 0.5 ft/sec

VISIBILITY 0.5 foot

DEPTH 14.0 feet maximum at the East Pier.

ELEMENTS INSPECTED: East and West Piers

REMARKS: Overall, the East and West Piers were generally found to be in good condition. The concrete of the piers was smooth and sound with random minor areas of poor consolidation. The footings at both piers were partially exposed on the main channel side with a maximum vertical exposure of 1 foot. Vertical hairline cracks 1/16 inch maximum width with efflorescence extending from the top of the webwall to the waterline were observed on the east and west faces of the piers. Scaling (heaviest at the noses of both piers) was observed from the waterline to 3 feet below the waterline with 1/2 inch maximum penetration. A minor accumulation of timber debris consisting of 4 to 6 inch diameter and smaller logs and branches was observed around the upstream nose of the West Pier.

FURTHER ACTION NEEDED: _____ YES ___X___ NO

Monitor footing exposure during future underwater inspections.

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

MINNESOTA DEPARTMENT OF TRANSPORTATION
OFFICE OF BRIDGES AND STRUCTURES

UNDERWATER INSPECTION CONDITION RATING FORM

BRIDGE NO. 9360
 INSPECTORS Collins Engineers, Inc.
 ON-SITE TEAM LEADER Barritt Lovelace, P.E.
 WATERWAY CROSSED Mississippi River

INSPECTION DATE October 29, 2012

NOTE: USE ALL APPLICABLE CONDITION DEFINITIONS AS DEFINED IN THE MINNESOTA RECORDING AND CODING GUIDE INCLUDING GENERAL, SUBSTRUCTURE, CHANNEL AND PROTECTION, AND CULVERTS AND WALL DEFINITIONS TO COMPLETE THIS FORM.

CONDITION RATING

UNIT REFERENCE NO.	UNIT DESCRIPTION	MAXIMUM DEPTH OF WATER	SUBSTRUCTURE					CHANNEL					GENERAL						
			PILING	COLUMNS, SHAFTS, OR FACES*	FOOTINGS	DISPLACEMENT	OTHER	OVERALL SUBSTRUCTURE CONDITION CODE*	SCOUR	EMBANKMENT EROSION	EMBANKMENT PROTECTION	OTHER (DRIFT/DEBRIS)	OVERALL CHANNEL & PROTECTION CONDITION	CONCRETE	STEEL	TIMBER	LOSS OF SECTION	PREVIOUS REPAIR OR MAINTENANCE	OTHER
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
	East Pier	14.0'	N	7	7	N	N	7	7	N	7	N	7	7	N	N	N	N	N
	West Pier	13.7'	N	7	7	N	N	7	7	N	8	7	7	7	N	N	N	N	N

*UNDERWATER PORTION ONLY

REMARKS: Overall, the East and West Piers were generally found to be in good condition. The concrete of the piers was smooth and sound with random minor areas of poor consolidation. The footings at both piers were partially exposed on the main channel side with a maximum vertical exposure of 1 foot. Vertical hairline cracks 1/16 inch maximum width with efflorescence extending from the top of the webwall to the waterline were observed on the east and west faces of the piers. Scaling (heaviest at the noses of both piers) was observed from the waterline to 3 feet below the waterline with 1/2 inch maximum penetration. A minor accumulation of timber debris consisting of 4 to 6 inch diameter and smaller logs and branches was observed around the upstream nose of the West Pier.

NOTES: ATTACH SKETCHES AS NEEDED, IDENTIFY REMARK BY REFERRING TO UNIT REFERENCE NO. AND REMARK NO. USE GENERAL SECTION TO IDENTIFY OVERALL PRESENCE OF SPALLS, CRACKS, CORROSION, ETC.