

COLLINS ENGINEERS^{INC}

Underwater Inspection Report
Structure No. 31512
CSAH No. 18 over Mississippi River
District 1 – Itasca County
June 15, 2010

On June 15, 2010 Collins Engineers, Inc. under the on-site direct supervision of Daniel Stromberg, P.E. (Minnesota P.E. 21491) conducted an underwater inspection of the submerged substructure at Bridge No. 31512, which carries Itasca CSAH No. 18 over the Mississippi River. Overall, the inspection revealed the below water portions of the bridge to be generally in good condition with no defects of notable structural significance. In general, the extent of corrosion on the steel pile shells of Piers 1 and 2 has not changed appreciably from what was last reported in 2002, and there continues to be little, if any, loss of original section due to the deterioration. Overall, there has only been minor, insignificant changes in the channel bottom configuration at the bridge since 2002, and the previously noted heavier drift/debris accumulations were no longer present, with just a moderate extent of drift/debris now present at the piers, more so at Pier 1.

Based on the findings of this inspection, it is reasonable to consider the bridge to be in safe and acceptable condition from an underwater standpoint until the next regularly scheduled underwater inspection is conducted in 2012. Prior to that point, however, if any extreme high water/high flow events are experienced at the bridge, an underwater inspection may be warranted at that time. Attached herewith please find the Minnesota DOT Underwater Inspection Rating Form, an Inspection and Sounding Plan figure, and various photos, which serve to further present the conditions encountered during this inspection. If there are any questions or a need for further information, please contact us.

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



Date 6/30/2012 Registration No. 21491

Respectfully submitted,

COLLINS ENGINEERS, INC.



Daniel G. Stromberg
Registered Professional
Engineer, State of Minnesota

MINNESOTA DEPARTMENT OF TRANSPORTATION
OFFICE OF BRIDGES AND STRUCTURES

UNDERWATER INSPECTION CONDITION RATING FORM

BRIDGE NO. 31512
 INSPECTORS Collins Engineers, Inc.
 ON-SITE TEAM LEADER, Daniel G. Stromberg, P.E.
 WATERWAY CROSSED Mississippi River

INSPECTION DATE June 15, 2010
 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.

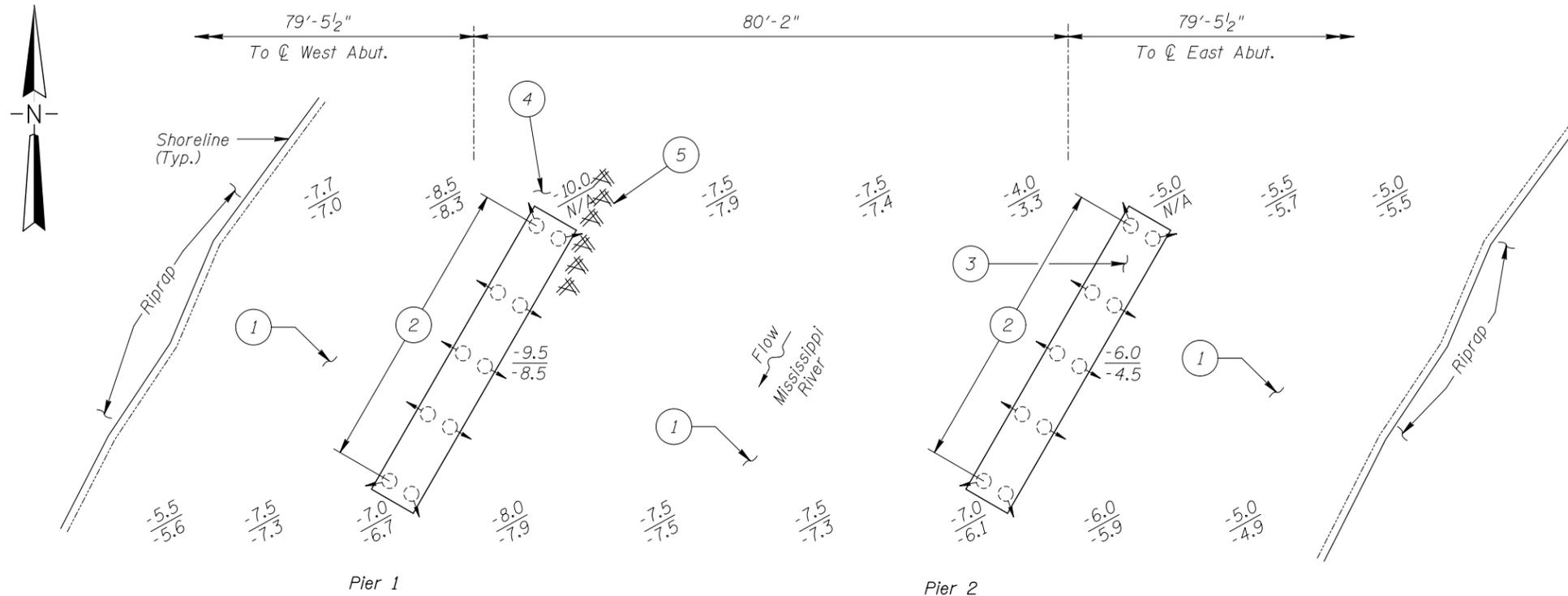
CONDITION RATING

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
	Pier 1	10.0'	7	7	N	9	N	7	7	N	N	6	6	N	7	N	8	N	N
	Pier 2	7.0'	7	7	N	9	N	7	7	N	N	6	6	N	7	N	8	N	N

*UNDERWATER PORTION ONLY

REMARKS: Overall, the submerged piles at Piers 1 and 2 were generally in good condition with complete coating failure and nodular corrosion between 2.5 feet above the waterline and the channel bottom. Thus far, the corrosion, which was the heaviest in the upper 3 to 4 feet of the water depth, has resulted in minimal section loss with only the early stages of pitting having depths of no more than 1/32 inch. At Pier 1, there was a moderate accumulation of one 1 foot diameter tree trunk and a dense organic material buildup around the upstream two piles. At Pier 2, the organic material was generally light in extent and was located around the upstream six piles. The accumulation at Pier 1 is influencing scour around the upstream side of the pier.

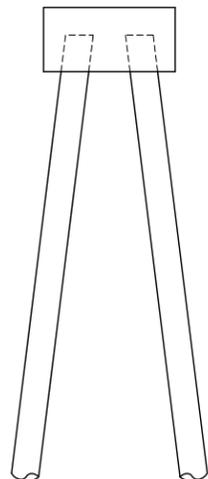
NOTES: ATTACH SKETCHES AS NEEDED, IDENTIFY REMARK BY REFERRING TO UNIT REFERENCE NO. AND REMARK NO. USE GENERAL SECTION TO IDENTIFY OVERALL PRESENCE OF SPALLS, CRACKS, CORROSION, ETC.



SOUNDING PLAN

INSPECTION NOTES:

- ① The channel bottom material consisted of firm sandy gravel with scattered 6 inch cobbles and a probe rod penetration of approximately 1 inch.
- ② All piles exhibited paint coating deterioration, corrosion, and rust nodules on 50 to 100 percent of the surface area, from 1 foot above the waterline to the channel bottom. Heaviest corrosion (up to 100 percent of surface area) was present between 2.5 feet above and 3 feet below the waterline. Random pitting with a maximum of 1/32 inch penetration was observed on the steel pipe piles.
- ③ There was a moderate accumulation of weeds and organics around the upstream six piles of Pier 2 extending from the channel bottom up 3 feet.
- ④ A 6 foot diameter by 6 foot high pile of organic accumulation and vegetation, consisting of dense roots and organic material, was observed at the channel bottom near the upstream end of Pier 1.
- ⑤ Timber debris, consisting primarily of 1 foot diameter tree, was present on the channel bottom at the upstream end of Pier 1.



TYPICAL END VIEW OF PIERS

GENERAL NOTES:

- 1. Piers 1 and 2 were inspected underwater.
- 2. At the time of inspection on June 15, 2010, the waterline was located approximately 8.5 feet below the top of the cap at the upstream end of Pier 1. This corresponds with a waterline elevation of 1273.2 feet based on previous report dated August 23, 2002.
- 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.

Legend

- 2.0 Sounding Depth from Waterline (6/15/2010)
- 5.2 Sounding Depth from Waterline (8/23/02)
- Steel Pile
- with arrow Battered Steel Pile
- ⌘ Timber Debris

Note:

All soundings based on 2010 waterline location.

MINNESOTA DEPARTMENT OF TRANSPORTATION UNDERWATER BRIDGE INSPECTION		
STRUCTURE NO. 31512 OVER THE MISSISSIPPI RIVER DISTRICT 1, ITASCA COUNTY		
INSPECTION AND SOUNDING PLAN		
Drawn By: LJ	COLLINS ENGINEERS	Date: JUNE 2010
Checked By: DGS	<small>123 North Wacker Drive Suite 300 Chicago, IL 60606 (312) 704-9300 www.collinsengr.com</small>	Scale: NTS
Code: 522131512		Figure No.: 1



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



Photograph 2. Overall View of the Structure, Looking Southwest.



Photograph 3. View of Pier 1, Looking Northeast.



Photograph 4. View of Pier 2, Looking Southwest.