

UNDERWATER BRIDGE INSPECTION REPORT

STRUCTURE NO. 05521
CSAH NO. 2
OVER THE
MISSISSIPPI RIVER
DISTRICT 3 - BENTON COUNTY



OCTOBER 25, 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 No. 05521, Piers 1, 2, and 3, were found to be in good condition with no defects of structural significance observed. A band of minor concrete scaling was observed around all piers located at the waterline. The channel bottom around the substructure units consisted of firm material that was well established; however, a minor scour depression was present developed at the upstream nose of Pier 1. The channel bottom configuration was comparable to the previous underwater inspection.

INSPECTION FINDINGS:

- (A) A band of minor scaling was observed at all piers from 3 feet above to 3 foot below the waterline with typical penetrations of 1/8 inch and a maximum penetration of ¼ inch. The heaviest scaling was at the upstream nose.
- (B) A 3-foot-radius by 2.5-foot-deep scour depression was observed at the upstream end of Pier 2.
- (C) The channel bottom material consisted of sandy gravel and up to 5-inch-diameter cobbles allowing a maximum probe rod penetration of 4 inches.

RECOMMENDATIONS:

- (A) 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,

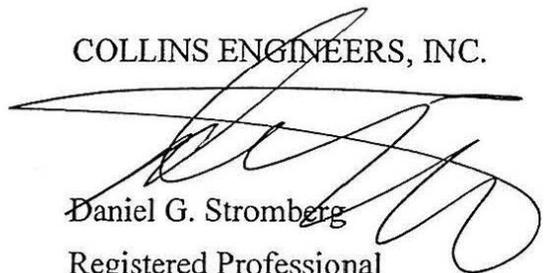
PROFESSIONAL ENGINEER

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: 05521

Feature Crossed: Mississippi River

Feature Carried: CSAH No. 2

Location: District 3 - Benton County

Bridge Description: The bridge superstructure consists of four spans of multiple welded plate girders supporting a reinforced concrete deck. The superstructure is supported by three reinforced concrete piers and two reinforced concrete abutments, all of which are founded on timber piles. The piers are numbered 1 through 3 starting from the west end of the bridge.

2. INSPECTION DATA

Professional Engineer/Team Leader: Barritt Lovelace, P.E.

Dive Team: Lukas Janulis, Mark Parker

Date: October 25, 2012

Weather Conditions: Cloudy, 40°F

Underwater Visibility: 3.0 feet

Waterway Velocity: 2.0 ft/sec

3. SUBSTRUCTURE INSPECTION DATA

Substructure Inspected: Piers 1, 2, and 3.

General Shape: The piers consist of a rectangular reinforced concrete shaft with rounded ends supporting a rectangular reinforced concrete hammerhead pier cap. Each pier shaft is supported on a rectangular footing founded on timber piles.

Maximum Water Depth at Substructure Inspected: Approximately 9.5 feet.

4. WATERLINE DATUM

Water Level Reference: The top of the parapet wall at the south end of Pier 1.

Water Surface: The waterline was approximately 26.9 feet below reference.
Waterline Elevation = 1014.9.

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 L

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	Concrete Pier Wall	66	LF	66				
985	Slopes	1	EA	1				



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



Photograph 2. View of Pier 1, Looking East.



Photograph 3. View of Pier 2, Looking East.



Photograph 4. View of Pier 3, Looking East.

MINNESOTA DEPARTMENT OF TRANSPORTATION
OFFICE OF BRIDGES AND STRUCTURES

UNDERWATER INSPECTION CONDITION RATING FORM

BRIDGE NO. 05521
 INSPECTORS Collins Engineers, Inc.
 ON-SITE TEAM LEADER Barritt Lovelace, P.E.
 WATERWAY CROSSED Mississippi River

INSPECTION DATE October 25, 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.

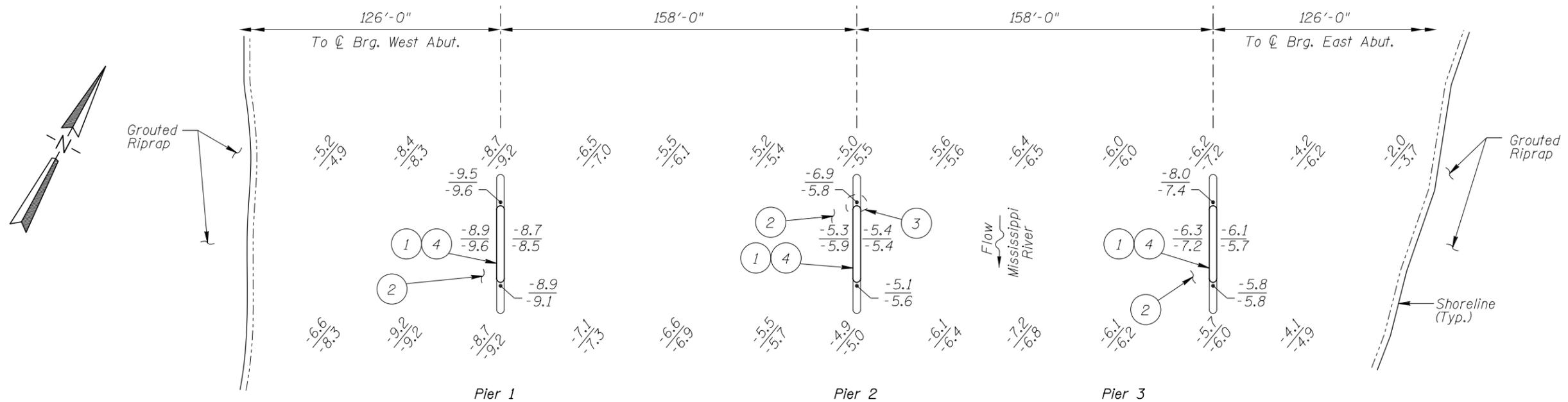
CONDITION RATING

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
	Pier 1	9.5'	N	7	N	8	N	7	N	8	8	N	8	7	N	N	N	N	N
	Pier 2	6.9'	N	7	N	8	N	7	7	N	N	N	7	7	N	N	N	N	N
	Pier 3	8.0'	N	7	N	8	N	7	N	8	8	N	8	7	N	N	N	N	N

*UNDERWATER PORTION ONLY

REMARKS: Overall, above the concrete of the pier shafts was smooth and sound. The exception was a band of minor scaling observed at all piers from 3 feet above to 3 foot below the waterline with up to ¼ inch penetration. A minor scour pocket was observed at the upstream nose of Pier 1. The embankments were well protected with grouted riprap.

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.



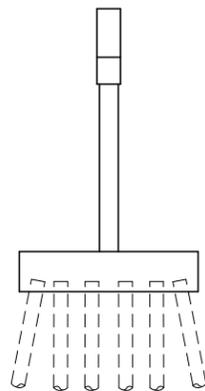
SOUNDING PLAN

INSPECTION NOTES:

- 1 A band of minor scaling was observed at all piers from 3 feet above to 3 feet below the waterline, with typical penetrations of 1/8 inch and a maximum penetration of 1/4 inch, with heaviest deterioration at the upstream nose.
- 2 The channel bottom material consisted of sandy gravel and up to 5-inch-diameter cobbles allowing a maximum probe rod penetration of 4 inches.
- 3 A 3-foot-radius, 2.5-foot-deep scour pocket was observed at the upstream end of Pier 2.
- 4 Above and below the band of scaling the concrete surfaces were smooth and sound.

GENERAL NOTES:

- 1. Piers 1, 2, and 3 were inspected underwater.
- 2. At the time of inspection on October 25, 2012, the waterline was located approximately 26.9 feet below the top of the parapet at the downstream end of Pier 1. This corresponds to a waterline elevation of 1014.9.
- 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.



TYPICAL END VIEW OF PIERS

Legend

- 1.7 Sounding Depth (10/25/12)
- 1.9 Sounding Depth (8/15/07)

Note:

All soundings based on 2012 waterline location.

MINNESOTA DEPARTMENT OF TRANSPORTATION UNDERWATER BRIDGE INSPECTION		
STRUCTURE NO. 05521 OVER THE MISSISSIPPI RIVER DISTRICT 3, BENTON COUNTY		
INSPECTION AND SOUNDING PLAN		
Drawn By: JTF	COLLINS ENGINEERS	Date: OCTOBER 2012
Checked By: LJ	<small>123 North Wacker Drive Suite 900 Chicago, IL 60606 (312) 704-9300 www.collinsengr.com</small>	Scale: NTS
Code: 74235521		Figure No.: 1

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

INSPECTORS: Collins Engineers, Inc. DATE: October 25, 2012

ON-SITE TEAM LEADER Barritt Lovelace, P.E.

BRIDGE NO: 05521 WEATHER: Cloudy, 40°F

WATERWAY CROSSED: Mississippi River

DIVING OPERATION: SCUBA SURFACE SUPPLIED AIR
 OTHER

PERSONNEL: Lukas Janulis, Mark Parker

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

TIME IN WATER: 4:30 p.m.

TIME OUT OF WATER: 4:45 p.m.

WATERWAY DATA: VELOCITY 2.0 ft/sec

VISIBILITY 3.0 feet

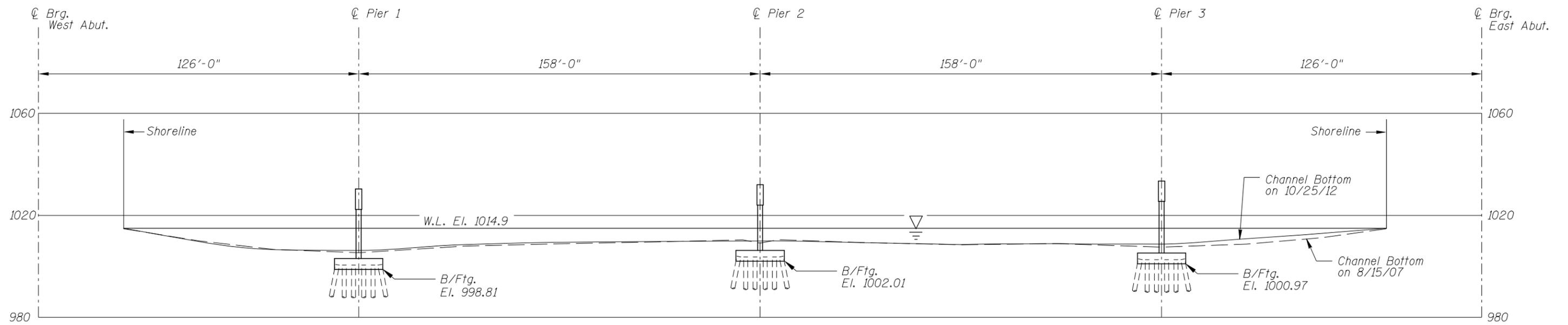
DEPTH 9.5 feet maximum at Pier 1

ELEMENTS INSPECTED: Piers 1, 2, and 3

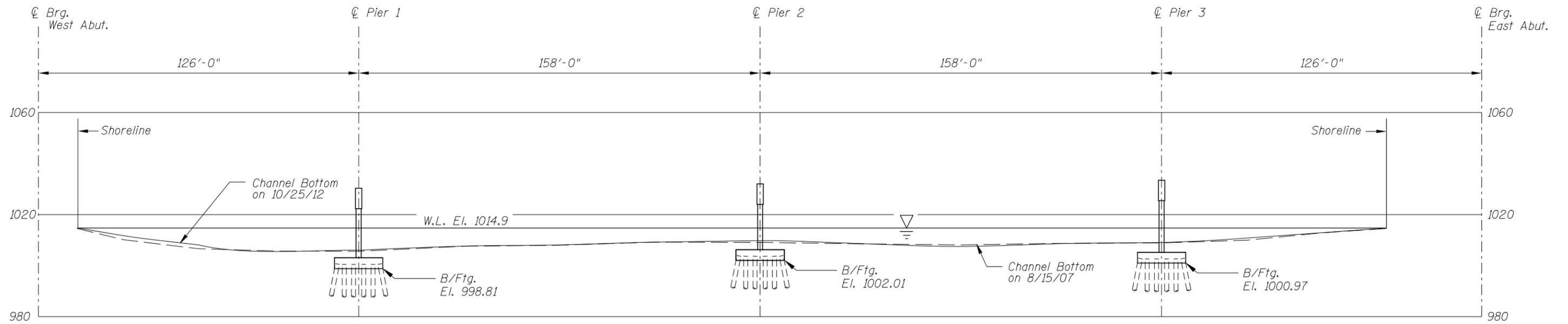
REMARKS: Overall, above the concrete of the pier shafts was smooth and sound. The exception was a band of minor scaling observed at all piers from 3 feet above to 3 foot below the waterline with up to ¼ inch penetration. A minor scour pocket was observed at the upstream nose of Pier 1. The embankments were well protected with grouted riprap.

FURTHER ACTION NEEDED: YES NO

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



UPSTREAM FASCIA PROFILE



DOWNSTREAM FASCIA PROFILE

Note:
Refer to Figure 1 for General Notes.

MINNESOTA DEPARTMENT OF TRANSPORTATION UNDERWATER BRIDGE INSPECTION		
STRUCTURE NO. 05521 OVER THE MISSISSIPPI RIVER DISTRICT 3, BENTON COUNTY		
UPSTREAM AND DOWNSTREAM FASCIA PROFILES		
Drawn By: JTF	COLLINS ENGINEERS <small>123 North Wacker Drive Suite 900 Chicago, IL 60606 (312) 704-9300 www.collinsengr.com</small>	Date: OCTOBER 2012
Checked By: LJ		Scale: 1"=40'
Code: 74235521		Figure No.: 2