



2015 Kane County Underwater Inspection Report

STRUCTURE NO. 045-3097

Fabyan Parkway / F.A.P. 0363

over

Fox River

October 13, 2015

Prepared for:



Kane County Division of Transportation

Prepared by:

COLLINS ENGINEERS INC.

123 North Wacker Drive, Suite 900
Chicago, Illinois 60606
312.704.9300 • www.collinsengr.com

STRUCTURE INVENTORY DATA

INSPECTION INFORMATION

Date: October 13, 2015
Weather: 55° F, Overcast

STRUCTURE INFORMATION

Structure Number: 045-3097
District: 1
County: Kane
Township: Geneva
Feature Carried: Fabyan Parkway / F.A.P. 0363
Feature Crossed: Fox River
Type: Non-Composite Welded Plate Girders (Haunched Girders in Unit 1)
Span Arrangement: Seven spans (Unit 1: 175'-0", 280'-0", 280'-0", 175'-0", Unit 2: 130'-0", 130'-0", 130'-0")
Length: 1,309'-4" back-to-back of abutments
Width: 62'-0" out-to-out of deck
58'-6" face-to-face of curbs
Skew: 0°
Abutments: West – Open spill through abutment on spread footings; East – Pile supported stub abutment
Piers: Double hammerhead concrete piers on spread footings keyed into rock
Year Constructed: 1974
Year/s Reconstructed: 1980 – Deck overlay
1991 – Partial/full depth deck repairs, new overlay
1998 – Expansion joint repairs and concrete repairs
2005 – New deck overlay, electrical work

INSPECTION HISTORY (NBIS RATINGS)

<u>Year</u>	<u>UW</u>
2010	6
2015	6

PURPOSE & SCOPE

This report consists of the results of an underwater inspection of Fabyan Parkway Bridge (S.N. 045-3097) over the Fox River in Kane County, Illinois. Collins Engineers, Inc. conducted the underwater investigation on October 13, 2015. The primary purpose of the investigation was to determine the condition of the substructure components located in the water at the time of the inspection, from the waterline to the channel bottom. In addition, a brief inspection was made of the areas above the waterline that could potentially be submerged during periods of higher water. Soundings of the channel bottom were taken along the upstream and

downstream fascias, along lines 100 feet upstream and downstream of the bridge, and around the substructure units in the water.

The following report includes a description of the structure, the method of investigation, a description of existing conditions, and an evaluation and recommendations based on the conditions.

METHOD OF INVESTIGATION

A detailed underwater investigation was conducted to determine the physical condition of the substructure unit from the waterline to the channel bottom. A visual examination of the substructure unit above the waterline was also completed.

A three-person team, consisting of a licensed structural engineer-diver, a professional engineer-diver, and an engineer-diver conducted the inspection. It was conducted by wading/swimming with the use of a dry suit and the site was accessed via boat. The inspection consisted of a visual and tactile examination of the entire surface of the substructure units from the waterline to the channel bottom, with particular attention given to any noted areas of excessive deterioration or apparent distress. Photographs were taken to document typical conditions and any deterioration that may be present. In addition to the substructure units, observations of the adjacent channel bottom were completed. The type of channel bottom material, presence and extent of riprap, location of any structural defects, and the presence of debris was noted. The shoreline condition in the vicinity of the bridge was also recorded.

The location of the waterline with respect to the top of the pier cap was noted and water depth soundings were taken with a fathometer along the upstream and downstream bridge fascia's, 100 feet upstream and downstream along the bridge, and around the substructure units in the water. A sounding plan was developed with the recorded soundings that displays the channel limits and channel bottom elevations around the structure (Figure 2 in Appendix A).

EXISTING CONDITIONS

WATERWAY

At the time of the inspection, the waterline of the Fox River was located approximately 17.2 feet below the top of the concrete cap at the downstream end of Pier 2, which is the only substructure unit located in the waterway. This corresponds to a waterline elevation of 664.3 feet according to the available bridge drawings. The visibility in the water was approximately 1 foot and the river was flowing north to south at approximately 0.5 feet per second.

SHORELINE (see *Photo No. 3-6*)

The east and west shorelines, upstream and downstream of the bridge consisted of natural embankments with light to moderate vegetation. No evidence of erosion was observed along either shoreline.

SUBSTRUCTURE (see *Photo No. 7-9*)

Pier 2 is in **satisfactory condition** with no significant structural defects. No footing exposure was observed during the inspection. The concrete was typically smooth and sound below the waterline, with only slight scaling present around both pier shafts extending from 1.25 feet above to 0.25 feet below the waterline, with up to 1/4 inch of penetration (see *Photo No. 10*). There are two locations of concrete section loss, on the southeast and southwest corners of the south pier shaft. The southeast corner spall is approximately 1.5 feet high and extends 8 inches wide on the south and east faces of the shaft with up to a maximum of 2 inches of penetration (see *Photo No. 11*). The southwest corner is approximately 1 foot in height and extends 3 inches wide on the south and west faces of the shaft, with up to 1 inch of penetration (see *Photo No. 12*). No reinforcement is exposed at either location. The above water concrete of the pier is typically smooth and sound with heavy rust staining, a result of run-off from the superstructure.

The channel bottom around Pier 2 typically consists of riprap up to 2 feet in diameter and 2 to 3 feet deep. Refer to Figure 2 in Appendix A for a Sounding Plan and Figure 3 in Appendix A for the Pier 2 Plan, Elevations, Soundings, and Inspection Notes.

EVALUATION AND RECOMMENDATIONS

EVALUATION

- Overall, the submerged substructure unit, Pier 2, was in satisfactory condition with no structural defects. The footings were fully embedded in the channel bottom with no undermining observed, and riprap protection surrounding the substructure unit indicates that there is no immediate scour concern.
- The areas of section loss at the waterline on the south shaft of Pier 2 are not affecting the structural capacity of the pier and they do not seem to have worsened since the previous inspection.
- The minor scaling around the shafts of Pier 2 are also not structurally significant at this time given the small surface area in relation to the overall size of the pier.
- The embankments are in good condition and no repairs are recommended at this time.
- In accordance with the National Bridge Inspection Standards (NBIS), it is recommended that the underwater inspection continue to be performed at intervals not to exceed 60 months.

RECOMMENDATIONS

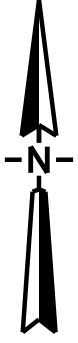
- Continue to monitor channel bottom to ensure that no significant degradation is occurring.
- Monitor areas of section loss on the shafts of Pier 2 for increased loss or exposed reinforcement.
- Continue to monitor scaling to safeguard against any progression.
- Inspection interval to not exceed 60 months in accordance with the National Bridge Inspection Standards (NBIS).
- Complete soundings during or soon after significant flood occurrences.

APPENDICES

- Appendix A Figures
- Appendix B Structure Photos
- Appendix C BBS UIP Form
- Appendix D Underwater Inspection Report Form

APPENDIX A

FIGURES



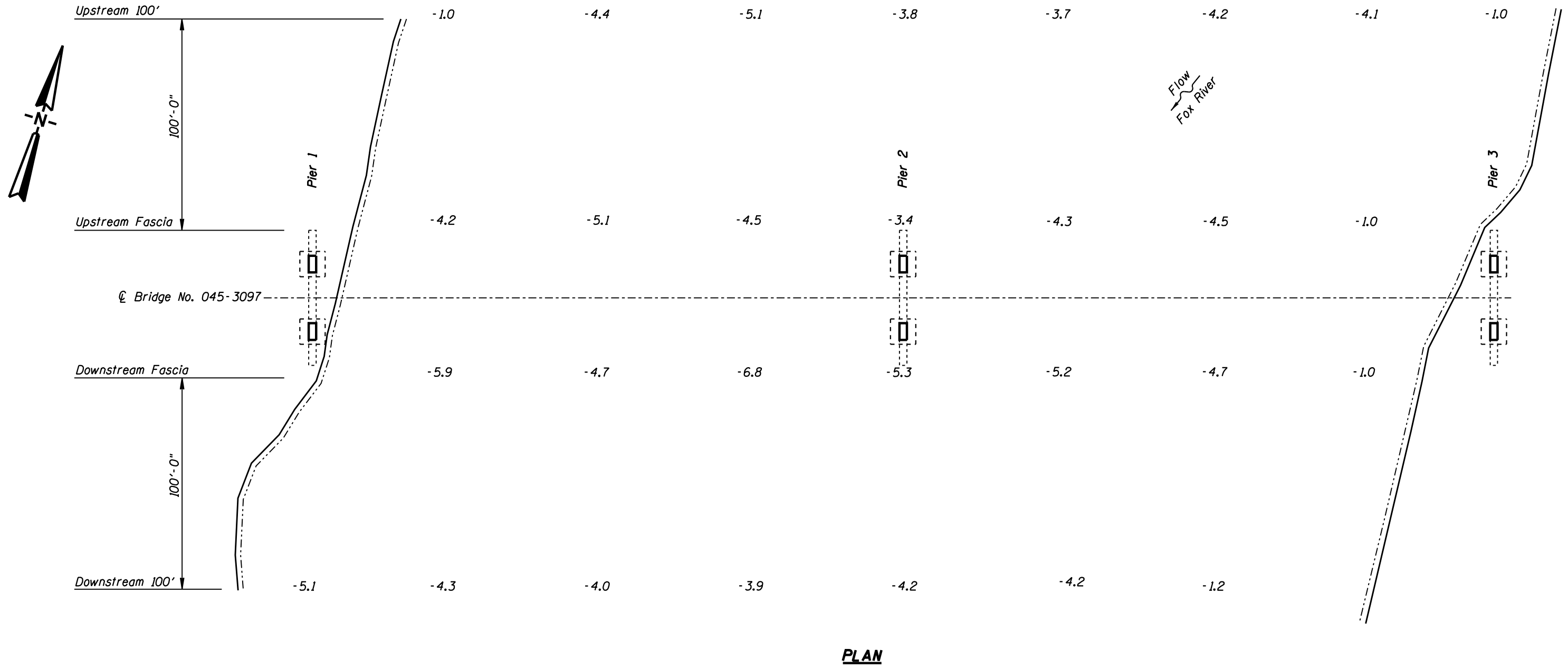
**KANE COUNTY OF ILLINOIS
UNDERWATER BRIDGE INSPECTION**

BRIDGE NO. 045-3097
FAYBAN PARKWAY BRIDGE
OVER FOX RIVER
IN GENEVA, ILLINOIS
LOCATION MAP

DRAWN BY: ELN
CHECKED BY: MAH
PROJECT NO. 8847

COLLINS ENGINEERS
123 North Wacker Drive
Suite 300
Chicago, IL 60606
(312) 704-9300
www.collinsengr.com

DATE: 10/13/2015
SCALE: NONE
FIGURE NO. 1 OF 3



PLAN

GENERAL NOTES:

1. Pier 2 was inspected underwater.
2. At the time of inspection on October 13, 2015, the waterline of the Fox River was located approximately 17.2 feet below the top of the concrete cap at the downstream end of Pier 2, a benchmark elevation of 681.5 feet. This corresponds to a waterline elevation of 664.3 feet, based on the 1972 design plans.
3. Soundings indicate the channel bottom elevation at the time of inspection, and are measured in feet.
4. Soundings were taken parallel to the bridge fascias and along lines of 100 feet upstream and downstream of the bridge. Additional soundings were taken around the submerged substructure units.
5. The water velocity of the Fox River at the time of inspection was approximately 0.5 feet per second.

LEGEND:

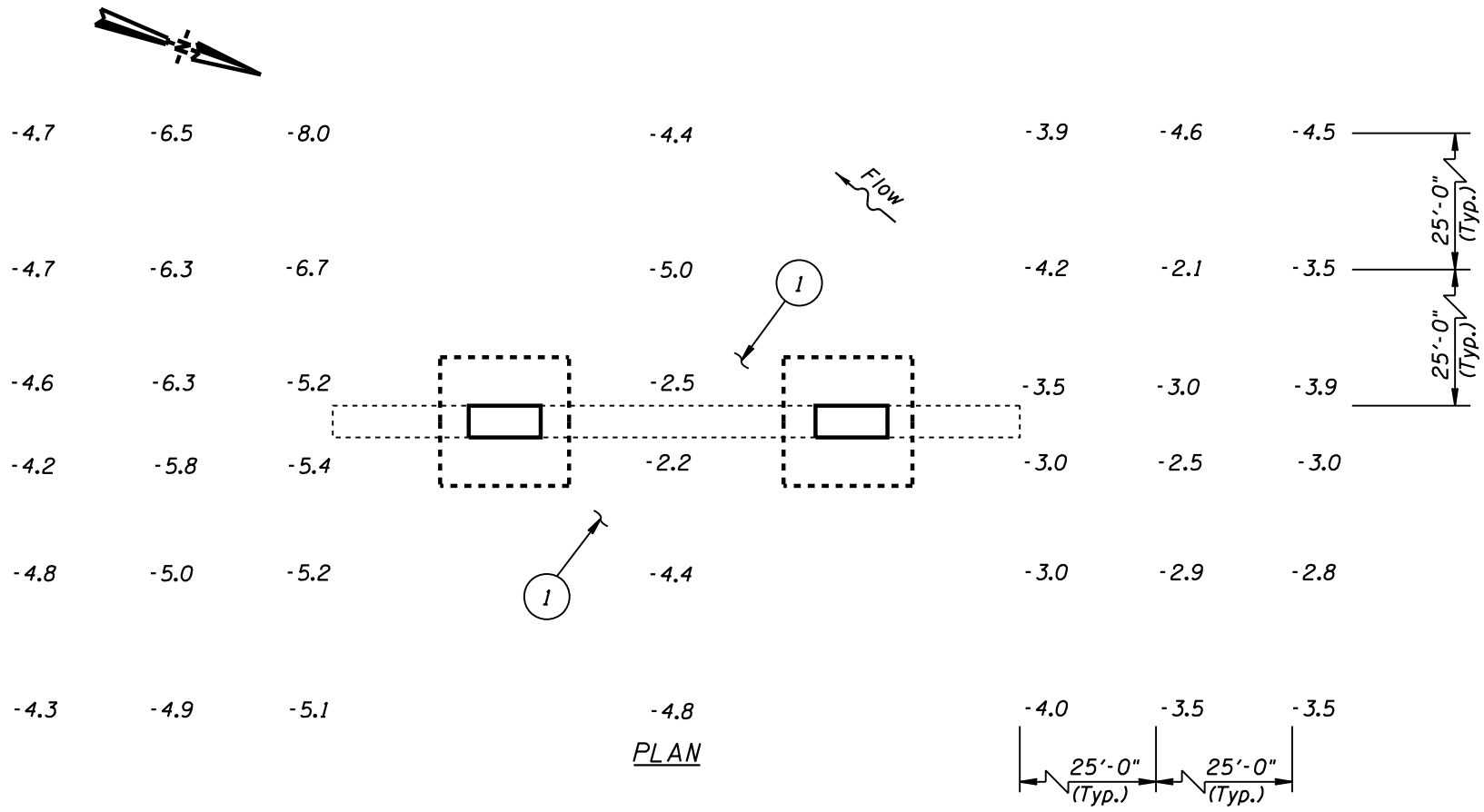
-20.0 Water Depth in Feet

**KANE COUNTY OF ILLINOIS
UNDERWATER BRIDGE INSPECTION**

BRIDGE NO. 045-3097
FABYAN PARKWAY BRIDGE
OVER FOX RIVER
IN GENEVA, ILLINOIS

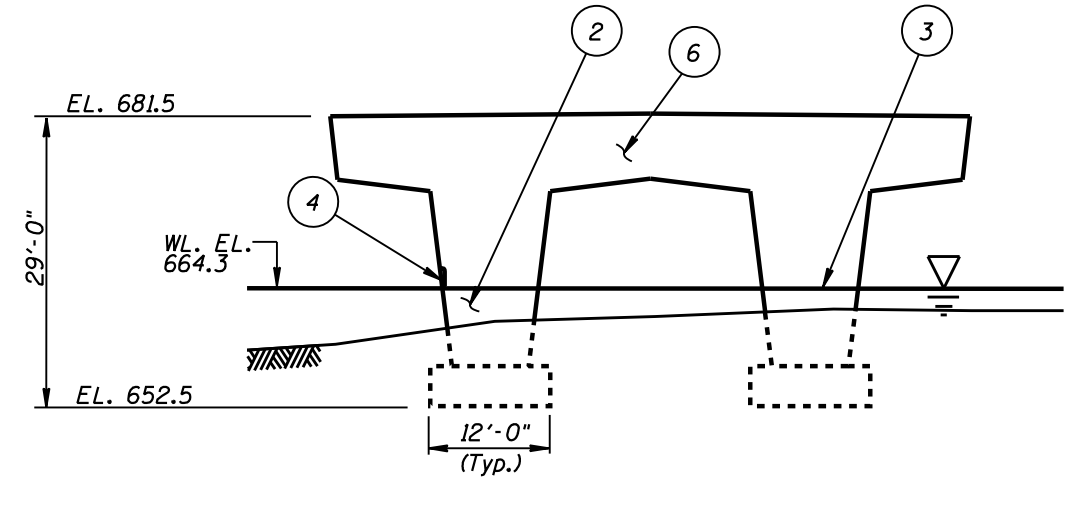
SOUNDING PLAN

DRAWN BY: ELN	 123 North Wacker Drive Suite 300 Chicago, IL 60606 (312) 704-9300 www.collinseng.com	DATE: 10/13/2015
CHECKED BY: MAH		SCALE: 1"=50'
PROJECT NO. 8847		FIGURE NO. 2 OF 3

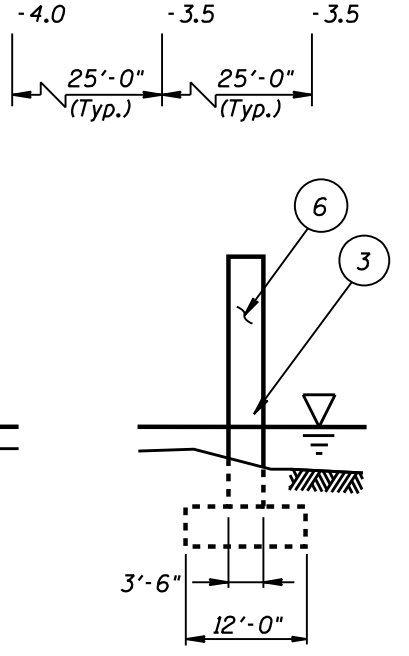


INSPECTION NOTES:

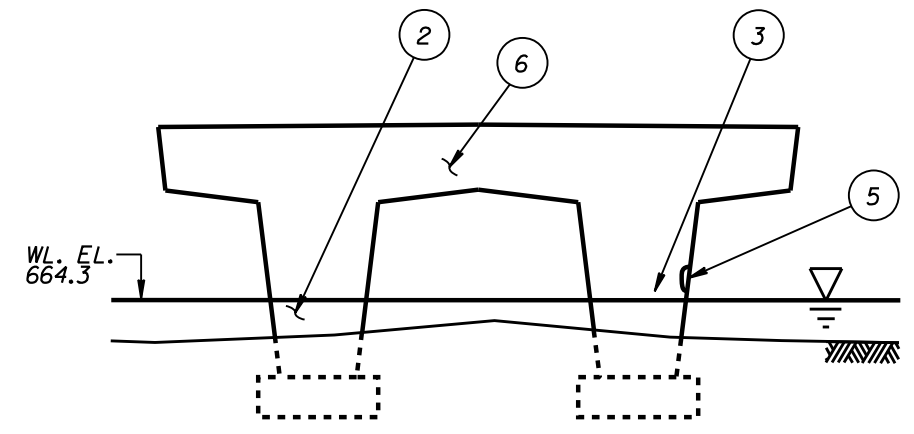
- 1 The channel bottom material around Pier 2 typically consisted of riprap measuring up to 2 feet in diameter and 2-3 feet deep.
- 2 Concrete surfaces were typically smooth and sound with no significant damage below the waterline.
- 3 A band of light scaling was located around both pier shafts, extending from 1.25 feet above to 0.25 foot below the waterline, with up to 1/4 inch of penetration.
- 4 An area of concrete section loss was located at the waterline at the southeast corner of the south pier shaft. The area extended from 1.25 feet above to 0.25 feet below the waterline and measured up to 8 inches wide on the south and east faces of the shaft, with up to a maximum of 2 inches of penetration and no exposed reinforcing steel.
- 5 An area of concrete section loss was located at the waterline at the southwest corner of the south pier shaft. The area extended from the waterline up 1 foot and measured up to 3 inches wide on the south and west faces of the shaft, with up to 1 inch of penetration and no exposed reinforcing steel.
- 6 The above water concrete surfaces of the pier were typically smooth and sound and exhibited heavy rust staining, most likely induced by run-off from the superstructure.



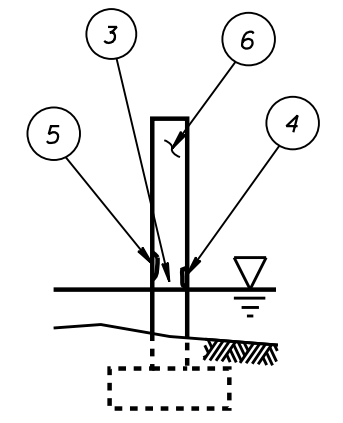
EAST ELEVATION



NORTH ELEVATION



WEST ELEVATION



SOUTH ELEVATION

GENERAL NOTES:

1. At the time of inspection on October 13, 2015, the waterline of the Fox River was located approximately 17.2 feet below the top of the concrete cap at the downstream end of Pier 2, a benchmark elevation of 681.5 feet. This corresponds to a waterline elevation of 664.3 feet, based on the 1972 design plans.
2. Soundings indicate the channel bottom elevation at the time of inspection, and are measured in feet.

LEGEND:

- 20.0 Water Depth (in feet)
- 2015 Channel Bottom Profile
- ④ Indicates Inspection Note Number
- ▨ Channel Bottom

KANE COUNTY OF ILLINOIS UNDERWATER BRIDGE INSPECTION		
BRIDGE NO. 045-3097 FAYBAN PARKWAY BRIDGE OVER FOX RIVER IN GENEVA, ILLINOIS		
PIER 2 INSPECTION NOTES		
DRAWN BY: ELN	COLLINS ENGINEERS	DATE: 10/13/2015
CHECKED BY: MAH	<small>123 North Wacker Drive Suite 300 Chicago, IL 60606 (312) 704-9300 www.collinseng.com</small>	SCALE: 1"=20'
PROJECT NO. 8847		FIGURE NO. 3 OF 3

APPENDIX B

STRUCTURE PHOTOS



Photo No. 1
North Elevation, looking South



Photo No. 2
South Elevation, looking North



Photo No. 3
East Shoreline Upstream of Bridge, looking Northeast



Photo No. 4
West Shoreline Upstream of Bridge, looking Northwest



Photo No. 5
East Shoreline Downstream of Bridge, looking Southeast



Photo No. 6
West Shoreline Downstream of Bridge, looking Southwest



Photo No. 7
Pier 1 Elevation (East Elevation Shown), looking West



Photo No. 8
Pier 2 Elevation (East Face Shown), looking West



Photo No. 9
Pier 4 Elevation (West Face Shown), looking East



Photo No. 10
South Pier Shaft of Pier 2 Scaling (West Face Shown), looking East



Photo No. 11

Southeast Corner Spall on the South Pier Shaft of Pier 2, looking North



Photo No. 12

Southwest Corner Spall on the South Pier Shaft of Pier 2, looking Northeast

APPENDIX C

BBS UIP FORM



SN: 045-3097

Facility Carried: Fabyan Parkway

Feature Crossed: Fox River

Location: Fabyan Parkway West of IL 25

Underwater Inspection Frequency: 60 Months

Description of Structure:

Fabyan Parkway Bridge is a 7 span steel continuous multi-girder bridge (Haunched girders in Unit 1) supported by two abutments and 6 piers. The two abutments are designated as East Abutment and West Abutment and the piers are designated 1-6 with 1 being the westernmost pier. The piers are double hammerhead concrete on spread footings keyed into rock.

Underwater Inspection Scope:

The underwater inspection consisted of a visual and tactile examination of the accessible surfaces of the submerged substructure units with particular attention given to any areas of deterioration or apparent distress. The type of channel bottom material, presence and extent of scour, riprap, and debris were noted. The concrete pier was inspected for any structural defects. In addition, the conditions of the shorelines in the vicinity of the structure were noted. Photographs were taken to document general conditions and observed deficiencies.

Inspection Equipment:

The inspection was conducted by wading/swimming and the site was accessed via boat. The channel bottom depths were obtained utilizing a fathometer. Sounding of concrete was completed using a hammer.

Site Access:

Boat launch located in the Fabyan Forest Preserve approximately 800 feet upstream of the bridge accessed by Route 31.

Traffic Control:

Not Applicable.

Underwater Inspection Procedures:

A three-person team consisting of a structural engineer-diver, a professional engineer-diver, and an engineer-diver conducted the underwater inspection. The inspection was conducted via boat.

Revision History:

None

Instructions

Underwater Inspections are to be performed on all structures which meet the Basic Submergence Criteria of having one or more substructure units in water which is normally 4 feet or greater in depth according to Section 3.3.4.1 of the Structural Services Manual.

All structures that require an Underwater Inspection shall have an Underwater Inspection Plan (Form BBS UIP) according to Section 3.3.4 of the Structural Services Manual and the National Bridge Inspection Standards (NBIS).

Form BBS UIP is intended to be used only for routine Underwater Inspections where all substructure units can be safely accessed by a boat and all surfaces below the waterline can be adequately probed to determine their condition. If it is not possible to access all areas of the substructures, a diving inspection shall be scheduled to complete the required inspection.

At a minimum, Inspection procedures shall include 100% probing of all subject substructure units and channel cross sections. Channel cross sections should be taken at the upstream and downstream faces of the substructure units and fifty feet upstream and fifty feet downstream of the bridge in order to record channel changes over time. A boat equipped with a sonar depth finder is recommended for obtaining channel cross-sections.

The Underwater Inspection Plan, previous underwater inspection reports and channel cross-sections shall be included in the Bridge File or their locations should be noted on the structure's Bridge File Checklist. The inspection Team Leader shall have access to this information.

The Underwater Inspection Plan should be updated as necessary.

APPENDIX D

UNDERWATER INSPECTION REPORT FORM



SN: 045-3097	District: 1	Spans: 7	Appr. Spans:0	Skew: 0	ADT: 29200	Truck Pct: 8
ADT Un:	Maint. Co: Kane	Twp: Geneva		Status: Open-No Restrictions		
Facility Carried: Fabyan Parkway			Feature Crossed: Fox River			
Location: Fabyan Pk W of IL 25		Municipality: Batavia		Team/Sub Section: /		Insp/Rte:
Bridge Name: Fabyan			Material & Type: Steel Continuous/Stringer/Multi-beam/girder			
Insp. Intervals Routine: 24		Fracture Critical: 0		Underwater: 60		Special: N
93B- Inspection Date: 10 / 13 / 2015		93B6- Temp. (°F): 55°				
Is Delinquent:	<input type="checkbox"/>	Reason:				
90A - Agency Program Manager: James Hamelka			90A3 - Consultant Program Manager:			
93B3 - Team Leader: Lukas Janulis			93B7 - Inspector: Joe Guerriero			
93B2 - Underwater Inspection Remarks:						

Previous Inspection: Satisfactory condition - Two areas of concrete section loss on the corners of the south shaft of Pier 2 with up to 2 inches of penetration.

Resources

Time to Inspect (H:M):	__:	4:00	Traffic Control:	__	N	Boat:	__	Y	Waders:	__	N	Snooper:	__	N
Ladder:	__	N	Manlift:	__	N	Bucket Truck:	__	N	Other:					

Inspector's Appraisals

93B8- Substructure Units Inspected

93B1- Rating

Pier 2

Prev	New
6	6

93B4 - Method:

<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
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 V A P D V S P If "O-Other" Describe:

93B2 - Underwater Inspection Remarks:

Areas of section loss have not worsened since the previous inspection.
 Minor scaling present on all pier shaft faces of Pier 2 extending 1.25 feet above to 0.25 feet below the waterline.

	Signature	Date
Inspection Team Leader:	<i>Lukas Janulis</i>	10 / 13 / 2015
Consultant Program Manager:		/ /
Agency Program Manager	<i>James Hamelka</i>	10 / 13 / 2015