2017 Underwater Bridge Inspection
SN 8941
West Spring Lake Road over Smith Bayou

City of Ferrysburg

Great Lakes Engineering Group, LLC

August 2017
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Underwater Bridge Inspection Report
West Spring Lake Road over Smith Bayou
Structure Number 8941
August 30, 2017

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Executive Summary

West Spring Lake Road over Smith Bayou is an 8-span prestressed concrete bridge located in the City of Ferrysburg. The structure carries two lanes of two-way traffic and is 448 feet in length. The bridge was built in 1972 and was overlaid in 2008. There are seven pier units that are submerged in water, piers 1S-7S, which were subject to underwater inspection on August 30, 2017.

Based upon the underwater inspection, the submerged portions of the piers are in fair condition. Minor corrosion was observed on the H-piles within one foot of the channel bottom. The fiber reinforced polymer (FRP) column jacket at pier 6S, column 6W is cracked and pulling away from the column. Above water, cracks, spalls, and patches were observed in the pier columns and caps.

The following are recommendations for SN 8941 as a result of the underwater inspection:

- Replace FRP column jacket at pier 6S, column 6W.
- Add riprap at south abutment to address bare areas.
- Confirm bridge is on a navigable waterway per USCG. If waterway is navigable, evaluate need for pier protection systems. Update SIA Item #38 (Navigation control) and #111 (Pier protection) accordingly.

Current NBI Ratings
Item #60: 5
Item #61: 7
Item #71: 9
Item #111: 1
Item #113: 5

Proposed NBI Ratings
Item #60: 5
Item #61: 7
Item #71: 9
Item #111: 1
Item #113: 5
GENERAL SITE PROCEDURES

Qualified Team

The team performing the underwater inspection is qualified in accordance with the National Bridge Inspection Standards 23 CFR Part 650.309. The underwater inspection was conducted by a three-person team consisting of a Professional Engineer Dive Team Leader/Qualified Dive Inspector and 2 Dive Tenders.

Equipment

The inspection was done using Self-Contained Underwater Breathing Apparatus (SCUBA). During the inspection the divers accessed the bridge and worked from a dive safety boat. Two-way wireless communications were used to convey inspection notes from the diver to the team leader, and recorded on note sheets. Other equipment consisted of an underwater digital camera, underwater video camera, high intensity flashlight, dive knife, scraper, probing rod, 25’ and 50’ survey rods, and a digital depth sounder with built-in transducer.

Level of Inspection

The Level I underwater inspection consisted of a close visual and tactile examination using large sweeping motions of the hands where visibility was limited. A Level II inspection was performed on 10% of the submerged units. The inspection was conducted over the total exterior surface of each underwater substructure unit. Probing along the mud line was also done along each substructure unit and the adjacent streambed. Upstream and downstream cross sections were taken and recorded using elevation information from old plans.

Approvals

This bridge does not fall under the jurisdiction of the United States Coast Guard (USCG). Approval was not required to perform the underwater inspections.
FIELD INSPECTION FINDINGS

West Spring Lake Road over Smith Bayou is an 8-span prestressed concrete bridge located in the City of Ferrysburg. The structure carries two lanes of two-way traffic and is 448 feet in length. The bridge was built in 1972 and was overlaid in 2008. There are seven pier units that are submerged in water, piers 1S-7S, which were subject to underwater inspection on August 30, 2017. The overall condition of the submerged portions of the substructure is fair. Below is a summary of the field observations for the various components of the underwater inspection.

<table>
<thead>
<tr>
<th>Substructure Unit</th>
<th>Observations Below the Waterline</th>
<th>Observations Above the Waterline</th>
</tr>
</thead>
</table>
| Pier 1S           | • Steel reinforcement extends below concrete pile encasement at random locations.  
                    • Light corrosion on H-piles within 1’ of channel bottom.  | • Vertical and horizontal cracks in pier cap and columns.  
                    |                                                                 | 6 ft spall in south side of cap, 6” deep. |
| Pier 2S           | • Steel reinforcement extends below concrete pile encasement at random locations.  
                    • Light corrosion on H-piles within 1’ of channel bottom.  | • FRP column jackets in place at column 1W and 3W at waterline.  
                    |                                                                 | Vertical and horizontal cracks in pier cap and columns. |
| Pier 3S           | • Steel reinforcement extends below concrete pile encasement at random locations.  
                    • Light corrosion on H-piles within 1’ of channel bottom.  | • FRP column jackets in place at column 1W, 2W, 3W, 4W, and 6W at waterline.  
                    |                                                                 | Vertical and horizontal cracks in pier cap and columns.  
                    |                                                                 | 1 ft spall with exposed rebar in column 3W. |
| Pier 4S           | • Steel reinforcement extends below concrete pile encasement at random locations.  
                    • Light corrosion on H-piles within 1’ of channel bottom.  | • FRP column jackets in place at column 1W, 2W, 3W, and 4W at waterline.  
                    |                                                                 | Vertical cracks in pier cap and columns. |
| Pier 5S           | • Steel reinforcement extends below concrete pile encasement at random locations.  
                    • Light corrosion on H-piles within 1’ of channel bottom.  
                    • Submerged debris along south side of pier at upstream end.  | • Vertical cracks in pier cap and columns.  
                    |                                                                 | 1 ft delamination in column 5W. |
| Pier 6S           | • Steel reinforcement extends below concrete pile encasement at random locations.  
                    • Light corrosion on H-piles within 1’ of channel bottom.  
                    • Submerged debris along south side of pier at column 3W.  
                    • Crack in FRP jacket at column 6W. Crack extends from top of jacket to within 2’ of bottom of jacket.  | • FRP column jackets in place at column 1W and 6W at waterline.  
                    |                                                                 | Crack in FRP jacket at column 6W.  
                    |                                                                 | Vertical and horizontal cracks in pier cap and columns. |
| Pier 7S           | • Steel reinforcement extends below concrete pile encasement at random locations.  
                    • Light corrosion on H-piles within 1’ of channel bottom.  
                    • Submerged debris along south side of pier at upstream end.  | • FRP column jacket in place at column 6W.  
                    |                                                                 | Vertical and horizontal cracks in pier cap and columns. |
FIELD INSPECTION FINDINGS

SUBSTRUCTURE

Piers 1S-7S are founded 60-ton capacity steel H-piles. Each pier consists of six columns with a concrete cap. The H-piles are encased in concrete; the encasement starts at the top of the pile at the pier cap and extends below the water surface by 6'-8'. In addition to the concrete encasement at each column, some columns are further protected by a fiber reinforced polymer (FRP) jacket at the waterline.

Below water, the exposed portions of the H-piles have light corrosion within 1’ of the channel bottom. Steel reinforcement extends out of the bottom of the concrete encasement at random columns. Submerged debris was found at the south side of piers 5S, 6S and 7S. Above water there are vertical cracks in the pier caps and columns, horizontal cracks in the columns, as well as spalls and random concrete patches in the pier caps.

The FRP column jacket at the east column (column 6W) of pier 6S is cracked. The crack is vertical in orientation and extends from the top of the jacket down to within 2’ of the bottom of the jacket. The dive inspector was able to pull the FRP away from the pier a few inches.

The current Bridge Safety Inspection Report rating for Substructure (SIA Item #60) is a 5. The current rating for the piers alone is a 5. Based upon the underwater inspection of piers 1S-7S, it is recommended that the pier rating remain a 5. The abutments are not in the channel and therefore were not part of the underwater inspection.

SCOUR COUNTERMEASURES

The channel banks are lined with heavy riprap below the bridge. Portions of riprap are missing along the south slope creating a bare area near the center of the south abutment. The riprap at the north abutment is in good condition. There are no scour countermeasures at the piers.

The current Bridge Safety Inspection Report coding for Scour Critical Bridges (SIA Item #113) is a 5. It is recommended that this coding remain a 5.
FIELD INSPECTION FINDINGS

NAVIGATION PROTECTION SYSTEMS

According to the inventory data, this bridge is located on a navigable waterway as determined by the USCG. As a result, protection systems and navigation lights at or near the bridge are required. However, there are no protection systems or navigation lights in place at this bridge.

The current Bridge Safety Inspection Report coding for Item #38 - Navigation Control is a 1 which indicates “Navigation control on waterway”. Item #111 - Pier or Abutment Protection is currently coded a 1 which corresponds to “Navigation protection not required”. These two codings are in conflict with each other. It is recommended that these codings be reviewed to determine if the bridge is in fact on a navigable waterway per USCG. If this area is considered navigable, the need for protection systems should be reviewed.

CHANNEL AND CHANNEL PROTECTION

The physical conditions associated with the flow of water through the bridge, such as stream stability and the condition of the channel and slope, were evaluated.

The channel flows through all spans and is open under the bridge with only minor submerged debris found at pier 5S-7S. The channel banks are stable in the vicinity of the bridge with no erosion observed. Riprap is in place on both slopes; some of the riprap on the south slope is missing. There is no riprap at the piers.

The current Bridge Safety Inspection Report rating for Channel and Channel Protection (SIA Item #61) is a 7. It is recommended that the rating remain a 7.

WATERWAY ADEQUACY

The waterway opening, with respect to the passage of flow through the bridge, was evaluated. The bridge deck and roadway approaches are well above flood water elevations (high water) and the chance of overtopping is remote.

The current Bridge Safety Inspection Report coding for Waterway Adequacy (SIA Item #71) is a 9. It is recommended that the coding remain a 9.

STREAMBED PROFILES

The water surface elevation at the time of inspection was 581.50 feet. Piers 1S-7S were in the waterway at the time of inspection, while both abutments were outside the channel limits. The channel was approximately 435 feet wide and the current was flowing very slowly from northwest to southeast.
FIELD INSPECTION FINDINGS

Both upstream and downstream cross sections were taken across the length of the bridge along the fascias. Previous cross section data was plotted from the 2012 inspection as well. The channel bottom depths taken during this inspection are in line with previous inspections; no long term scour is occurring. Please refer to “Stream Cross Sections” tab of this report for the stream profiles.

EVALUATION AND RECOMMENDATIONS

Overall, the submerged portions of the piers are in fair condition. Minor corrosion was observed on the H-piles within one foot of the channel bottom. The fiber reinforced polymer (FRP) column jacket at pier 6S, column 6W is cracked and pulling away from the column. Above water, cracks, spalls, and patches were observed in the pier columns and caps.

The following are recommendations for SN 8941 as a result of the underwater inspection:

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- Add riprap at south abutment to address bare areas.
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SAND STREAMBED MATERIAL

TURBIDITY VELOCITY OF WATER

75° WATER TEMP

THERMAL SHOCK TO CEMENT LINES

PLN VIEW

AT THE TIME OF DIVE

NOTE:

SOUNDING DEPTH FROM WATER SURFACE TO RIVER BOTTOM.

SOUNDING DEPTH FROM WATER SURFACE TO PIER HEAD TYP.

CITY OF FERRYSBURG

SPRING LAKE ROAD OVER SMITHS BAYOU

STRUCTURE NUMBER 8941

UNDERWATER BRIDGE INSPECTION

0.75 MI NE OF CITY OF FERRYSBURG

NOTE:

-00.0 WATER SURFACE LEVEL AT TIME OF DIVE DETERMINED BY GPS.

-00.0 WATER SURFACE LEVEL AT THE TOP OF PIER CAP OUTLINE TYP.

-00.0 PIER CAP OUTLINE TYP.

-00.0 PIER COLUMN OUTLINE TYP.

-00.0 TIMBER/DEBRIS PILE TYP.

-00.0 SHEET PILING TYP.

-00.0 EDGE OF WATER

-00.0 SOUTH ABUTMENT

-00.0 NORTH ABUTMENT

DRAWN BY:

JLS 08/30/17

PIER SOUNDING PLAN

STRUCTURE NO:

GLEG JOB NO:

DATE:

CHECKED BY:

ALT

FILE:

1017-2-453

453 pl.dgn

SPRING LAKE RD

BRIDGE CONST &

SPRING LAKE RD

PIER 1S

PIER 2S

PIER 3S

PIER 4S

PIER 4S

PIER 5S

PIER 6S

PIER 7S

PIER 1S

PIER 2S

PIER 3S

PIER 4S

PIER 5S

PIER 6S

PIER 7S

LEGEND

DRILL BIT

TIMBER/DEBRIS PILE TYP.

SOUTH ABUTMENT

NORTH ABUTMENT
PIER 1S SOUTH ELEVATION

PIER 1S EAST END

PIER 1S NORTH ELEVATION

PIER 1S WEST END

LEGEND

-00.0 SOUNDING DEPTH FROM WATER SURFACE TO RIVER BOTTOM

-00.0 SOUNDING DEPTH FROM WATER SURFACE TO RIVER BOTTOM ALONG BRIDGE FASCIA

VERTICAL EXPOSURE OF ALGAE

VERTICAL EXPOSURE OF TRENCH

VERTICAL EXPOSURE OF TRENCH INCISED INTO MATERIAL

VERTICAL EXPOSURE OF TRENCH

VERTICAL EXPOSURE OF TRENCH INCISED INTO MATERIAL

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VERTICAL EXPOSURE OF TRENCH

VERTICAL EXPOSURE OF TRENCH INCISED INTO MATERIAL

NOTES:

- Below water surface on all substructure 1" thick algae

- Light corrosion on H-piles within 1' of channel bottom

- Patches 2 SFT CONC

- 6 SFT PATCH

SPRING LAKE ROAD OVER SMITHS BAYOU
UNDERWATER BRIDGE INSPECTION
0.75 MI NE OF CITY OF FERRYSBURG
CITY OF FERRYSBURG

STRUCTURE NO: 8941
GLEG JOB NO: 8941
DATE: 08/30/17
DRAWN BY: JLS
CHECKED BY: ALT
FILE: 453.elev.dgn

NOTE: WATER SURFACE ELEVATION AT THE TIME OF INSPECTION WAS AS SHOWN ON DRAWING. HEIGHT OF ELEVATION WAS NOT AS TAKEN AT TOP OF PIER 1S EAST END.

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NOTE:
BELOW WATER SURFACE ON ALL SUBSTRUCTURE
"THICK ALGAE
NOTE:
(LP ALL PILES)
WITHIN 1' OF CHANNEL BOTTOM
LIGHT CORROSION ON H-PILES
(TYP ALL PILES)
WITHIN 1' OF CHANNEL BOTTOM
LIGHT CORROSION ON H-PILES
(JACKET (TYP)
FRP COLUMN
Patching
4 SFT CONCRETE
Patching
3 SFT CONCRETE

LEGEND

WATER SURFACE
WATER SURFACE TO RIVER BOTTOM
SOUNDING DEPTHS FROM WATER SURFACE TO RIVER BOTTOM
VERTICAL EXPOSURE OF FOOTING
VERTICAL EXPOSURE OF BURDEN
VERTICAL UNDERMINING
VERTICAL UNDERMINING OF TREMIE
NOTE: WATER SURFACE ELEVATION AT THE TIME OF SERVICE INSPECTION WAS TAKEN ON STRUCTURE TOP OF PIER ELEVATION WAS NOT AT TIME OF PIER EAST END.

NOTE: WATER LEVEL SURFACE TO RIVER BOTTOM.

NOTE: SOUNDING DEPTH FROM WATER SURFACE TO RIVER BOTTOM.

NOTE: VERTICAL EXPOSURE OF Footing.

NOTE: Vertical Exposing of Rebar.

NOTE: 1 SFT SPALL.

NOTE: LIGHT CORROSION ON H-PILES WITHIN 1' OF CHANNEL BOTTOM.
PIER 6S SOUTH ELEVATION

PIER 6S EAST END

PIER 6S NORTH ELEVATION

PIER 6S WEST END

LEGEND

-00.0 SOUNDING DEPTH FROM WATER SURFACE TO RIVER BOTTOM
-00.0 SOUNDING DEPTH FROM WATER SURFACE TO BANK BOTTOM

PIER 6S SOUTH ELEVATION

PIER 6S EAST END

PIER 6S NORTH ELEVATION

PIER 6S WEST END

NOTE:

BELOW WATER SURFACE ON ALL SUBSTRUCTURE 
"THICK ALGAE

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NOTE:

BELOW WATER SURFACE ON ALL SUBSTRUC
**BRIDGE CROSS-SECTIONS**

**DATE:** 8/30/2017  
**STRUCTURE NO.:** 8941  
**CONTROL SECTION:** N/A  
**ROUTE:** W. Spring Lake Road  
**WATERCOURSE:** Smith Bayou

### CURRENT CROSS SECTION

#### UPSTREAM FACE

<table>
<thead>
<tr>
<th>BENCHMARK ELEVATION:</th>
<th>590.47</th>
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<tr>
<td>DESCRIPTION OF BENCHMARK:</td>
<td>Top of pier 1S, west end</td>
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<tr>
<td>UNDERCLEARANCE ELEVATION:</td>
<td></td>
</tr>
<tr>
<td>TOP OF ROAD ELEVATION:</td>
<td></td>
</tr>
<tr>
<td>WATER SURFACE ELEVATION:</td>
<td>581.5</td>
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### PREVIOUS CROSS SECTION

#### UPSTREAM FACE

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<tr>
<th>BENCHMARK ELEVATION:</th>
<th>590.47</th>
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<tbody>
<tr>
<td>DESCRIPTION OF BENCHMARK:</td>
<td>Top of pier 1S, west end</td>
</tr>
<tr>
<td>UNDERCLEARANCE ELEVATION:</td>
<td></td>
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<tr>
<td>TOP OF ROAD ELEVATION:</td>
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<tr>
<td>WATER SURFACE ELEVATION:</td>
<td>578.7</td>
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### Station Reading Elevation Description

<table>
<thead>
<tr>
<th>Station</th>
<th>Reading</th>
<th>Elevation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.0</td>
<td>+3.0</td>
<td>584.5</td>
<td>North abutment</td>
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<tr>
<td>10.0</td>
<td>0.0</td>
<td>581.5</td>
<td>North edge of water</td>
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<tr>
<td>14.0</td>
<td>1.0</td>
<td>580.5</td>
<td>Span 6S, 3/4 point</td>
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<tr>
<td>28.0</td>
<td>3.2</td>
<td>578.3</td>
<td>Span 6S, 1/2 point</td>
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<tr>
<td>42.0</td>
<td>5.5</td>
<td>576.0</td>
<td>Span 6S, 1/4 point</td>
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<tr>
<td>56.0</td>
<td>12.0</td>
<td>569.5</td>
<td>Pier 7S</td>
</tr>
<tr>
<td>70.0</td>
<td>15.9</td>
<td>565.6</td>
<td>Span 7S, 3/4 point</td>
</tr>
<tr>
<td>84.0</td>
<td>19.5</td>
<td>562.0</td>
<td>Span 7S, 1/2 point</td>
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<tr>
<td>98.0</td>
<td>22.9</td>
<td>558.6</td>
<td>Span 7S, 1/4 point</td>
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<td>112.0</td>
<td>24.0</td>
<td>557.5</td>
<td>Pier 8S</td>
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<td>25.1</td>
<td>556.4</td>
<td>Span 6S, 3/4 point</td>
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<td>140.0</td>
<td>24.6</td>
<td>556.9</td>
<td>Span 6S, 1/2 point</td>
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<td>556.3</td>
<td>Span 6S, 1/4 point</td>
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<td>168.0</td>
<td>25.5</td>
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<td>Pier 9S</td>
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<tr>
<td>182.0</td>
<td>25.5</td>
<td>556.0</td>
<td>Span 5S, 3/4 point</td>
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**DATE:** 8/30/2017  
**REFERENCE ELEVATION:** 581.5  
**DATE:** 8/20/2012  
**REFERENCE ELEVATION:** 578.7
**DATE:** 8/30/2017  
**STRUCTURE NO.:** 8941  
**CONTROL SECTION:** N/A  
**ROUTE:** W. Spring Lake Road  
**WATERCOURSE:** Smith Bayou

### CURRENT CROSS SECTION

**BENCHMARK ELEVATION:** 590.47  
**DESCRIPTION OF BENCHMARK:** Top of pier 1S, west end  
**UNDERCLEARANCE ELEVATION:**  
**TOP OF ROAD ELEVATION:**  
**WATER SURFACE ELEVATION:** 581.5

### PREVIOUS CROSS SECTION

**BENCHMARK ELEVATION:** 590.47  
**DESCRIPTION OF BENCHMARK:** Top of pier 1S, west end  
**UNDERCLEARANCE ELEVATION:**  
**TOP OF ROAD ELEVATION:**  
**WATER SURFACE ELEVATION:** 578.7

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## UNDERWATER SPECIAL INSPECTION

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<td>Amy Trahey</td>
<td>Great Lakes Engineering Group, LLC</td>
<td>60</td>
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### GENERAL NOTES

Based upon the underwater inspection, the submerged portions of the piers are in fair condition. Minor corrosion was observed on the H-piles within one foot of the channel bottom. The fiber reinforced polymer (FRP) column jacket at pier 6S, column 6W is cracked and pulling away from the column. Above water, cracks, spalls, and patches were observed in the pier columns and caps.

### INSPECTION PROCEDURES

The team performing the underwater inspection is qualified in accordance with the National Bridge Inspection Standards 23 CFR Part 650.309. The underwater inspection was conducted by a three-person team consisting of a Professional Engineer Dive Team Leader/Qualified Dive Inspector and 2 Dive Tenders.

The inspection was done using Self-Contained Underwater Breathing Apparatus (SCUBA). During the inspection the divers accessed the bridge and worked from a dive safety boat. Two-way wireless communications were used to convey inspection notes from the diver to the team leader, and recorded on note sheets. Other equipment consisted of an underwater digital camera, underwater video camera, high intensity flashlight, dive knife, scraper, probing rod, 25-foot and 50-foot survey rods, and a digital depth sounder with built-in transducer.

The Level I underwater inspection consisted of a close visual and tactile examination using large sweeping motions of the hands where visibility was limited. A Level II inspection was performed on 10% of the submerged units. The inspection was conducted over the total exterior surface of each underwater substructure unit. Probing along the mud line was also done along each substructure unit and the adjacent streambed. Upstream and downstream cross sections were taken and recorded using elevation information from old plans.

### NAVIGATION PROTECTION SYSTEMS

**Protection Systems**

**Inspection Comments**

According to the inventory data, this bridge is located on a navigable waterway as determined by the USCG. As a result, protection systems and navigation lights at or near the bridge are required. However, there are no protection systems or navigation lights in place at this bridge.

### SCOUR PROTECTION

**Number of Substructure Elements in Waterway**

7

**Scour Counter Measures**

Rip-Rap

**Inspection Comments**

The channel banks are lined with heavy riprap below the bridge. Portions of riprap are missing along the south slope creating a bare area near the center of the south abutment. The riprap at the north abutment is in good condition. There are no scour countermeasures at the piers.

**Scour Critical Action Plan Available?**

N

**Scour Critical Action Plan Location**

### WATERWAY & WEATHER CONDITIONS

**Current Speed**

0.0

**Turbidity**

3.0

**Water Temperature**

75

**Stream Bed Material**

Sand

**Maximum Depth**

26

**Air Temperature**

75

**Marine Growth on Structure**

Thin layer of algae on substructure surfaces below water.

**Weather Conditions on Day of Dive**

Sunny, warm, light winds.

### INSPECTION STAFF & EQUIPMENT
### Engineer
Amy L. Trahey, P.E.

### Diver
Brian Trahey

### Tender
Evan Currie, P.E.

### Dive Equipment
Scuba

### Nearest Boat Launch Site
At bridge site, SW quadrant.

### Safety Concerns
Recreational boats moving through channel. Submerged debris. Current is very slow.

## INSPECTION DETAILS

### Waterway and Bank Observations
The channel flows through all spans and is open under the bridge with only minor submerged debris found at pier 5S-7S. The channel banks are stable in the vicinity of the bridge with no erosion observed. Riprap is in place on both slopes; some of the riprap on the south slope is missing. There is no riprap at the piers.

### Substructure Observations (Above the waterline)

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### Substructure Observations (Below the waterline)

Typical all piers: Steel reinforcement extends below concrete pile encasement at random locations. Light corrosion on H-piles within one foot of channel bottom.

### Debris in Waterway
Submerged debris along south side of pier 5S, 6S, and 7S.

### Recommendations

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### Channel Repair

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Printed on 09/18/2017
Add riprap at south abutment to address bare areas.

Confirm bridge is on a navigable waterway per USCG. If waterway is navigable, evaluate need for pier protection systems. Update SIA Item #38 (Navigation control) and #111 (Pier protection) accordingly.
MICHIGAN DEPARTMENT OF TRANSPORTATION

STR 8941

UNDERWATER INSPECTION REPORT [SIA #92-B]

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**SUPPORTING IMAGES**

- Document Name: IMG_2639.JPG
  Category: Elevation
  Comments: West elevation

- Document Name: IMG_2641.JPG
  Category: Substructure
  Comments: South abutment

- Document Name: IMG_2647.JPG
  Category: Substructure
  Comments: Pier 1S

- Document Name: IMG_2650.JPG
  Category: Substructure
  Comments: Pier 2S
### Facility
- **Facility**: WEST SPRING LAKE R
- **Feature**: SMITH BAYOU

### Feature
- **Length / Width / Spans**: 447.8 / 44 / 8

### Location
- **Location**: AT 168TH AVENUE

### Region / County
- **Region / County**: Grand(3) / Ottawa(70)

### MDOT Structure ID
- **MDOT Structure ID**: 704232600078B01

### Structure Condition
- **Structure Condition**: Serious Condition(3)

### Built / Recon. / Paint / Ovly.
- **Built**: 1972
- **Recon.**: / 2008

### Material / Design
- **Material**: 5 Prestressed Concrete / 05
- **Box Bm/Gird- Multiple

### Owner
- **City**: FERRYSBURG(2326)

### TSC
- **TSC**: Muskegon(21)

### Operational Status
- **P Posted for load(35NNNN)

### Last NBI Inspection
- **Last NBI Inspection**: 04/27/2017 / YRE4

### Scour Evaluation
- **5 Stable w/in footing

### Document Name: IMG_2659.JPG
- **Category**: Substructure
- **Comments**: Pier 4S

### Document Name: IMG_2661.JPG
- **Category**: Substructure
- **Comments**: Pier 5S

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**Printed on 09/18/2017**

**Page 5 of 8**
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<thead>
<tr>
<th>Facility</th>
<th>Latitude / Longitude</th>
<th>MDOT Structure ID</th>
<th>Structure Condition</th>
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<td>704232600078B01</td>
<td>Serious Condition(3)</td>
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<td>Location</td>
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<td>TSC</td>
<td>Operational Status</td>
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<td>Muskegon(21)</td>
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