



Underwater Inspection of New York Avenue Bridge

DDOT Bridge #0076

May 10th 2016

*Prepared for: District Department of
Transportation*

Prepared by:

COLLINS
ENGINEERS INC.

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UNDERWATER INSPECTION

Bridge No. 76 • New York Avenue over the Anacostia River
Washington, DC • May 2016



EXECUTIVE SUMMARY

Project: Underwater Inspection of New York Avenue Bridge
Purpose of Project: To perform a visual and tactile inspection of the bridge substructure.
Inspection Team: Team Leader – Garrett Owens, P.E.
Team Member – Chuck Euwema
Team Member – Russell Richard
Reviewing Engineer: Mark Bostick, P.E.
Inspection Date(s): May 10, 2016

Repairs Prior to 2016 Underwater Inspection:

- No repairs have been made to the underwater portion of the substructure since the 2011 underwater inspection.

Summary of Findings:

- Heavy scale with random areas of unsound concrete present below the high waterline on Piers 1 through 3 and the East Abutment.
- Hairline cracks and mortar loss typical at the upstream and downstream nose of Piers 1 through 3.
- Hairline vertical cracks along the vertical chamfer joints of all SSUs.
- Area of localized scour up to 13.1' deep at the southeast corner of Pier 2.

Summary of Recommendations:

- Areas of section loss due to scale should be repaired by removing unsound concrete and patching with cementitious material suitable for the marine environment.
- Exposed reinforcing bars should be cleaned and coated with anti-corrosion primer prior to patching. Reinforcing bars exhibiting extensive section loss should be replaced.
- Repoint areas of mortar loss in masonry joints.
- Seal cracks in concrete wider than 1/16".
- Remove debris on the northwest end of Pier 3.
- The next underwater inspection of Bridge No. 76 is recommended to occur within the next 60 months (May 2021) in accordance with the NBIS.

UNDERWATER INSPECTION

Bridge No. 76 • New York Avenue over the Anacostia River
Washington, DC • May 2016



Table of Contents

1.0	INTRODUCTION	1
1.1	Purpose and Scope	1
1.2	General Description of the Structure.....	1
1.3	Method of Investigation	1
2.0	EXISTING CONDITIONS	2
2.1	Substructure Units.....	2
2.1.1	West Abutment	2
2.1.2	Pier 1	2
2.1.3	Pier 2.....	3
2.1.4	Pier 3.....	3
2.1.5	East Abutment.....	3
2.2	Shorelines and Embankments	3
2.3	Channel	4
3.0	EVALUATION AND RECOMMENDATIONS	5
	APPENDIX A: LOCATION PLAN	6
	APPENDIX B: INSPECTION PHOTOS	8
	APPENDIX C: INSPECTION PLANS	19
	APPENDIX D: SOUNDING DATA.....	30

UNDERWATER INSPECTION

Bridge No. 76 • New York Avenue over the Anacostia River
Washington, DC • May 2016



1.0 INTRODUCTION

1.1 Purpose and Scope

DDOT Bridge No. 76 (New York Avenue Bridge) carries New York Avenue over the Anacostia River in Washington, D.C. On May 10, 2016, Collins Engineers, Inc. (Collins) conducted an underwater inspection of the bridge, from the high water mark to the channel bottom, as part of an evaluation to determine options for the rehabilitation of the structure. Sounding data was collected at points along the substructure units (SSUs), along the bridge fascias, and parallel to the bridge fascias at distances of 10', 20', and 30'. to determine any significant changes in the channel profile.

1.2 General Description of the Structure

DDOT Bridge No. 76 (New York Avenue Bridge) is a four span steel girder bridge supported on three solid shaft piers and two cellular abutments. All of the piers and abutments are constructed of reinforced concrete founded on a concrete spread footing. The piers and abutments are skewed approximately 41 degrees with respect to the roadway centerline at midspan of the bridge. Based on the previous underwater inspection report, the bridge was constructed in 1953. Refer to Figure 3 in Appendix C for a plan view of the bridge and Photographs 1 and 2 in Appendix B for overall views of the bridge.

1.3 Method of Investigation

A dive team consisting of commercially trained divers, led by an NBIS qualified Underwater Inspection Team Leader conducted the underwater investigation. The team members and their duties were as follows: Garrett Owens, P.E. – Team Leader; Chuck Euwema – Inspector; and Russell Richard – Inspector. The inspection was conducted using surface supplied air diving equipment from a 21' boat in accordance with ADCI and OSHA standards.

The inspection consisted of a visual and tactile examination of the substructure from the high water mark to the channel bottom to evaluate the overall condition of the SSUs. A Level II inspection was performed on 10% of the SSUs. The SSUs are numbered from west to east. An assessment of the channel bottom around the observed SSUs was performed. The type of channel bottom material was noted, as well as the location and extent of any observed scour, riprap, or debris. Sounding data was collected at points along the SSUs, at the upstream and downstream fascias, and 10', 20', and 30' from the fascias. At the time of inspection, the location of the waterline with respect to a fixed bridge reference point was noted and photographs were taken to document general conditions and observed deficiencies.

2.0 EXISTING CONDITIONS

The SSUs at the New York Avenue Bridge were inspected on May 10, 2016. At the time of the inspection, the weather was clear with air temperatures ranging from 55 to 65 degrees Fahrenheit. The water temperature at the bridge was approximately 60 degrees Fahrenheit. Underwater visibility was less than 6". The channel bottom was composed of silt and sand. At the time of inspection, the water surface was 15.5' below the underside of the girder at the northwest corner of Pier 2. The water depths along the SSUs varied from 1.5' to a maximum of 13.1' deep at Pier 2.

2.1 Substructure Units

At the time of inspection the substructure units were in fair to poor condition. These condition ratings are a reflection of the findings from the high waterline to the mudline. Refer to Figure 3 in Appendix C for a plan and elevation view of the bridge that shows the locations of all the substructure units.

2.1.1 West Abutment

The West Abutment was in overall fair condition. At the upstream and downstream noses there was minor mortar loss in the stone masonry. Several random areas of delamination were present throughout the concrete surfaces extending within 3' of the mudline. Minor areas of soft concrete were adjacent to the delamination. Hairline vertical cracks were present (one was up to 1/16" wide) mainly in the vertical chamfer joints from the mudline to top of the pier. There were several hairline diagonal cracks extending up from the mudline or scuppers. Refer to Figure 4 in Appendix C for specific details and locations and Photograph 3 in Appendix B for views of the West Abutment.

2.1.2 Pier 1

Pier 1 was in overall fair condition, primarily due to the severe scale, 4' wide by 3' high by 3" deep, along the west face with two exposed reinforcing bars. Mortar loss was generally less than 10% at the upstream and downstream ends. A 3/16" wide vertical crack was located in the fascia stones at both ends. Several hairline to 1/16" wide vertical cracks were present along the east and west concrete faces of the pier. Cracking typically extended from the mudline to the top of the pier. A few cracks were up to 1/8" wide on the west face. Refer to Figures 5 and 6 in Appendix C for specific defect details and locations and Photographs 4 through 6 in Appendix B for views of Pier 1.

UNDERWATER INSPECTION

Bridge No. 76 • New York Avenue over the Anacostia River
Washington, DC • May 2016



2.1.3 Pier 2

Pier 2 was in overall poor condition, primarily due to the heavy to severe scale full-length by up to 6” deep on the east and west concrete portions below the high waterline. Approximately 30 vertical reinforcing bars were exposed on the west face, several bars had 15% to 30% loss of section, and three vertical reinforcing bars were exposed on the east face. Mortar loss was generally less than 10% at the upstream and downstream ends. Several hairline to 1/16” wide vertical cracks were present on the east and west concrete faces of the pier. Refer to Figures 7 and 8 in Appendix C for specific details and locations and Photographs 7 through 9 in Appendix B for views of Pier 2.

2.1.4 Pier 3

Pier 3 was in overall poor condition, primarily due to the heavy scale full-length by up to 1-1/2” deep on the east and west concrete portions below the high waterline. Mortar loss was generally less than 10% at the upstream and downstream ends. Several hairline to 1/16” wide vertical cracks were present on the east and west concrete faces of the pier. A few cracks were up to 1/8” wide on the east face. A 1/4” wide vertical crack was located in the fascia stones on the west side of the upstream nose, from 2’ above high waterline to the mudline. Many of the cracks extended from the mudline to top of the pier along the vertical chamfer joints. Moderate timber debris was present on the channel bottom at the northwest nose of the pier. Refer to Figures 9 and 10 in Appendix C for specific details and locations and Photographs 10 through 13 in Appendix B for views of Pier 3.

2.1.5 East Abutment

The East Abutment was in overall fair condition, primarily due to the severe scale between Joints 1 and 4. The scale was approximately 30’ long and up to 3 1/2” deep with 5 exposed vertical bars and 2 exposed horizontal bars. There were hairline vertical cracks (one was up to 1/16” wide) mainly in the vertical chamfer joints from the mudline to top of the pier. There were several hairline diagonal cracks extending up from the mudline. Refer to Figure 11 in Appendix C for specific details and locations and Photographs 14 and 15 in Appendix B for views of the East Abutment.

2.2 Shorelines and Embankments

Both embankments are steeply sloped immediately adjacent to the bridge and moderately vegetated. Refer to Photographs 16 through 19 in Appendix B for views of the embankments.

UNDERWATER INSPECTION

Bridge No. 76 • New York Avenue over the Anacostia River
Washington, DC • May 2016



2.3 Channel

Bridge No. 76 carries New York Avenue (six lanes) over the Anacostia River. All piers and abutments were in water at the time of inspection. The channel bottom primarily consisted of silt and sand. The Anacostia River is tidal with ebb flow from North to South and a maximum tidal range of 4.5'. The river widens as it approaches the bridge, causing the river to flow at an angle relative to the piers. This resulted in heavier scale on the west faces of the piers and localized scour on the east faces of Piers 1 and 2. Areas of scour typically existed at the upstream ends of the piers with sediment accumulation at the downstream ends. Pier 2 had an area of localized scour at the southeast face. There were no significant changes to the channel bottom profile when compared to the previous sounding data. A moderate amount of timber debris had accumulated at the northwest end of Pier 3.

Refer to the Appendix D for further details on the channel profile. Measurements are provided for comparison with future measurements to track changes in the channel bottom profile.

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Bridge No. 76 • New York Avenue over the Anacostia River
Washington, DC • May 2016



3.0 EVALUATION AND RECOMMENDATIONS

Overall, the submerged substructure units were in fair to poor condition. The heavy to severe scale should be repaired to prevent further deterioration and exposure of reinforcing steel especially at the areas where reinforcing steel is exposed. Debris found at the northwest end of Pier 3 should also be removed to prevent localized scour from developing further. The joints with mortar loss should be cleaned and repointed. Cracks in the concrete wider than 1/16" should also be sealed and repaired. In accordance with the National Bridge Inspection Standards and DDOT Underwater Bridge Inspection Guidelines and based on the inspection findings, it is recommended that the submerged substructure units of Bridge No. 76 be next inspected at an interval not to exceed 60 months.

Substructure Element	Recommended Repair	Priority Code
All SSUs	Remove unsound concrete and patch areas of heavy scale. Clean and coat any exposed steel reinforcement with anti-corrosion coating prior to patching.	4
Piers 1, 2, 3	Repoint areas of mortar loss in masonry joints.	4
All SSUs	Seal cracks wider than 1/16".	4
Pier 3	Remove debris on the northwest end of Pier 3.	5

- Priority Codes:
- 0 – Critical Safety Deficiency (Prompt Action Required)
 - 1 – Emergency within 6 months
 - 2 – Emergency within 12 months
 - 3 – Emergency within 2 years
 - 4 – Routine Structural (Can be delayed until funds are available)
 - 5 – Routine Non-Structural (Can be delayed until programmed)



Respectfully Submitted,
COLLINS ENGINEERS, INC.

Ken Fabian, P.E.
Project Engineer

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Bridge No. 76 • New York Avenue over the Anacostia River
Washington, DC • May 2016



APPENDIX A: LOCATION PLAN

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Bridge No. 76 • New York Avenue over the Anacostia River
Washington, DC • May 2016

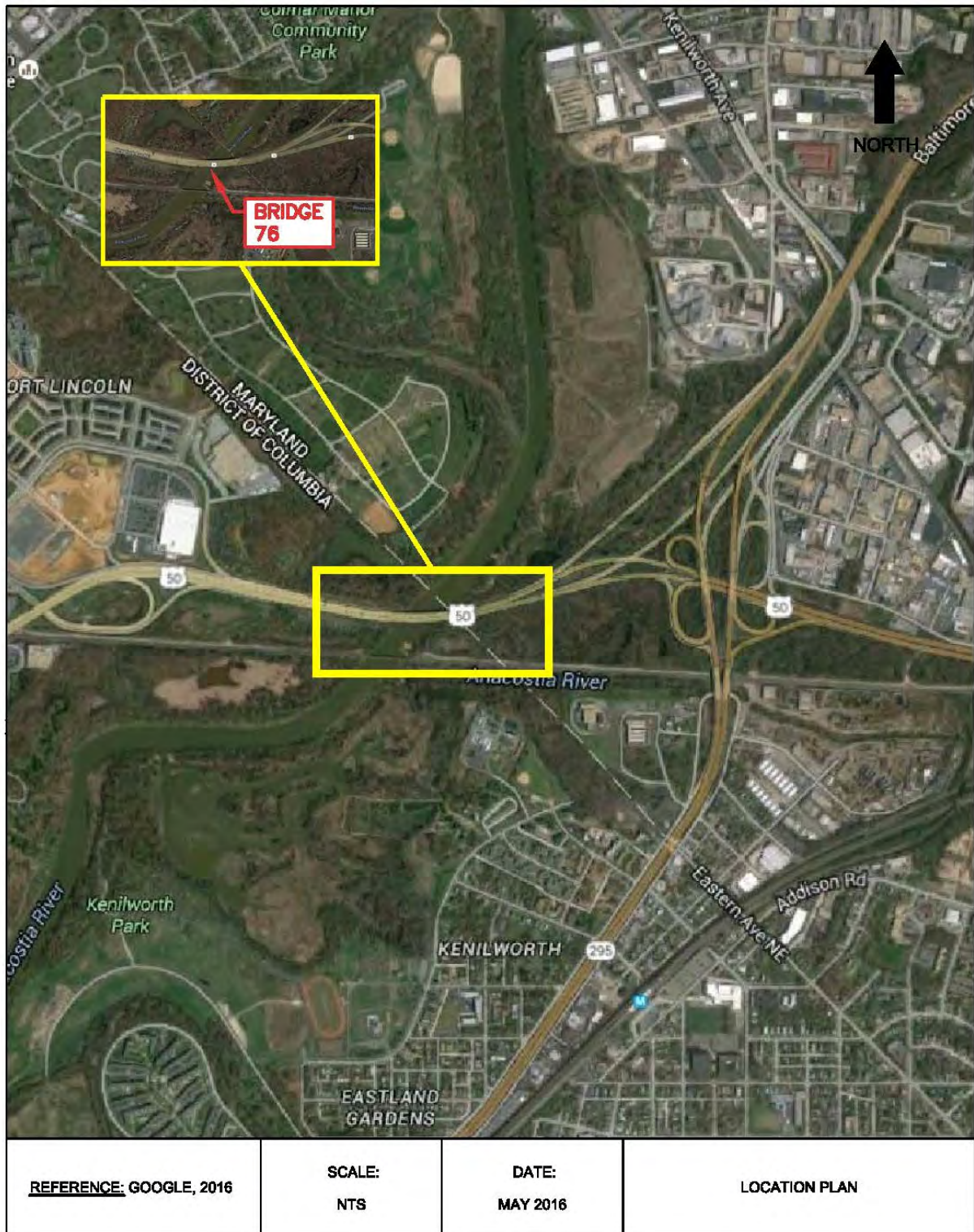


FIGURE 1: LOCATION PLAN

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Washington, DC • May 2016



APPENDIX B: INSPECTION PHOTOS

UNDERWATER INSPECTION

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Washington, DC • May 2016



Photograph 1: Overall View of South Elevation, Looking North



Photograph 2: Overall View of North Elevation, Looking South

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Bridge No. 76 • New York Avenue over the Anacostia River
Washington, DC • May 2016



Photograph 3: View of West Abutment, Looking Northwest



Photograph 4: View of Pier 1, Looking Southeast

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Washington, DC • May 2016



Photograph 5: View of Vertical Crack in Fascia Stones on Pier 1 Upstream Nose, Looking South



Photograph 6: View of Typical Crack Extending from Mudline to Top of Pier 1, Looking West

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Bridge No. 76 • New York Avenue over the Anacostia River
Washington, DC • May 2016



Photograph 7: View of Pier 2, Looking Southeast



Photograph 8: View of Typical Scale on Pier 2 West Face, Looking East

UNDERWATER INSPECTION

Bridge No. 76 • New York Avenue over the Anacostia River
Washington, DC • May 2016



Photograph 9: View of Typical Fascia Stone Mortar Loss at Pier 2 Southwest Face, Looking East



Photograph 10: View of Pier 3, Looking Southeast

UNDERWATER INSPECTION

Bridge No. 76 • New York Avenue over the Anacostia River
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Photograph 11: View of Mortar Loss at Pier 3 Downstream Nose, Looking North



Photograph 12: View of Mortar Loss at Pier 3 Upstream Nose, Looking East

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Bridge No. 76 • New York Avenue over the Anacostia River
Washington, DC • May 2016



Photograph 13: View of 1/4" Wide Vertical Crack in Fascia Stones at Pier 3 Upstream Nose, Looking South



Photograph 14: View of East Abutment and Recently Constructed Pedestrian Riverwalk, Looking Southeast

UNDERWATER INSPECTION

Bridge No. 76 • New York Avenue over the Anacostia River
Washington, DC • May 2016



Photograph 15: View of Typical Scale on East Abutment, Looking East



Photograph 16: View of Southwest Embankment, Looking West

UNDERWATER INSPECTION

Bridge No. 76 • New York Avenue over the Anacostia River
Washington, DC • May 2016



Photograph 17: View of Northwest Embankment, Looking Northwest



Photograph 18: View of Southeast Embankment and Pedestrian Riverwalk, Looking East

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Washington, DC • May 2016



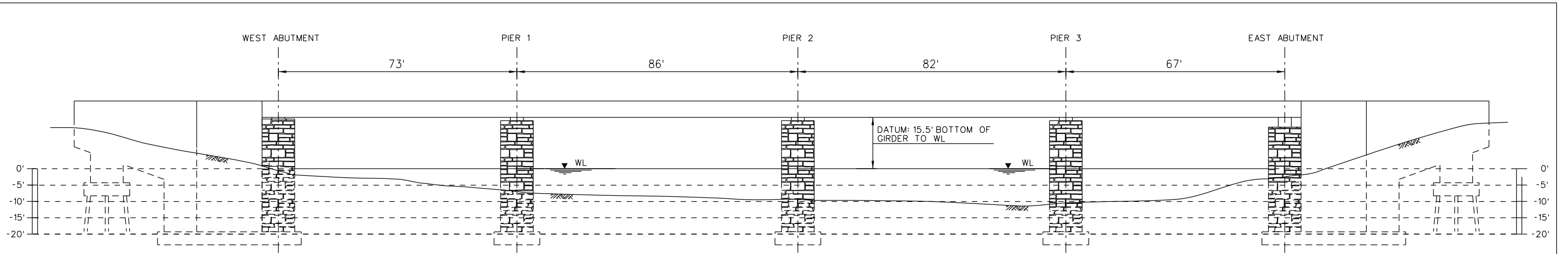
Photograph 19: View of Northeast Embankment and Pedestrian Riverwalk, Looking Southeast

UNDERWATER INSPECTION

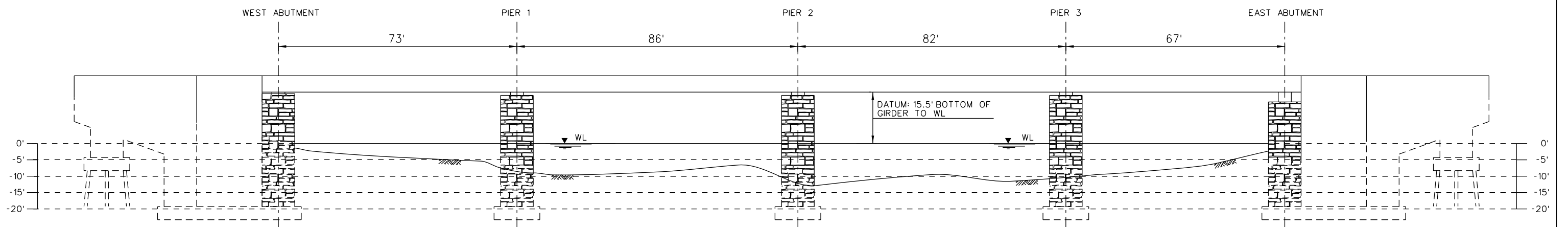
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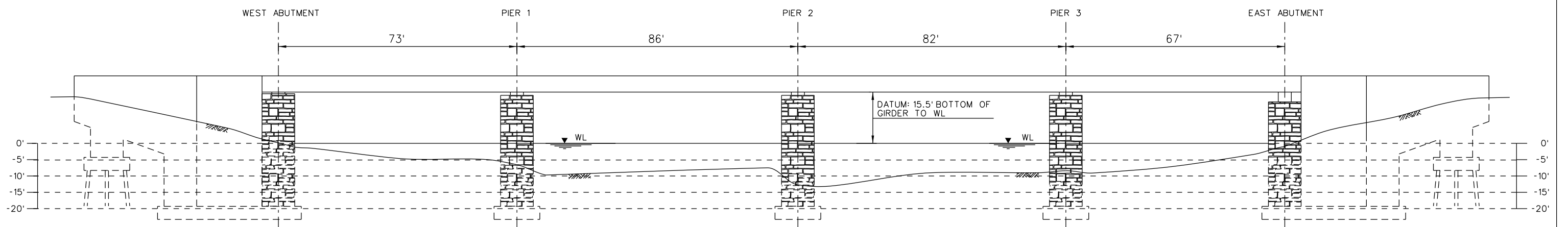
APPENDIX C: INSPECTION PLANS



UPSTREAM (NORTH) CHANNEL PROFILE



CENTERLINE CHANNEL PROFILE



DOWNSTREAM (SOUTH) CHANNEL PROFILE

GENERAL NOTE:

1. HWL DENOTES THE HIGH WATERLINE STAIN VISIBLE ON THE SUBSTRUCTURE UNITS.

7/15/2016




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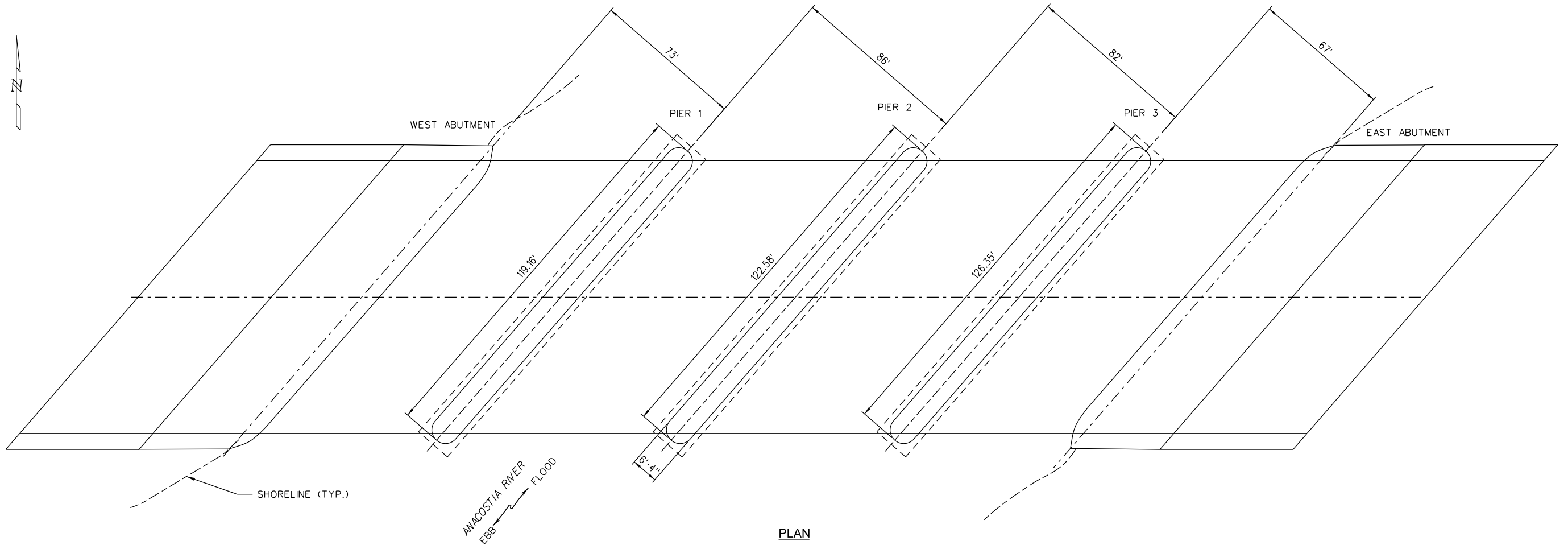
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 REVIEW ENG. MARK BOSTICK, P.E.

DISTRICT OF COLUMBIA 2016 UNDERWATER BRIDGE INSPECTIONS
BRIDGE 76 NEW YORK AVENUE OVER ANACOSTIA RIVER
CHANNEL BOTTOM PROFILES

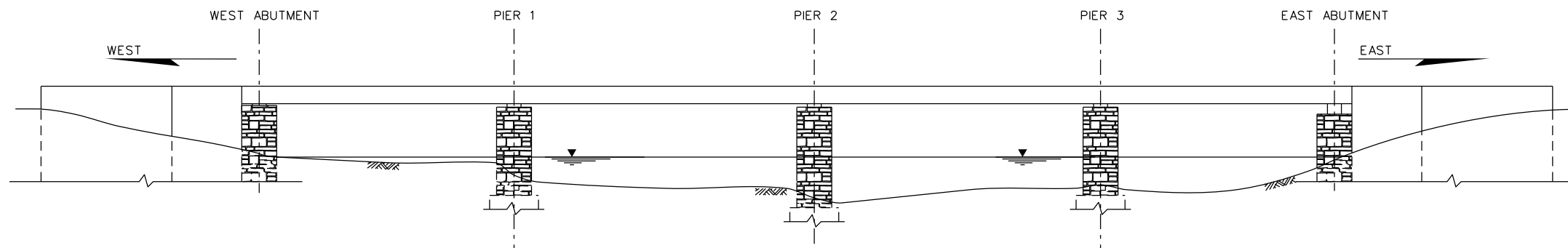
BRIDGE NO.
76

FIGURE NO.

2 OF 12



PLAN



ELEVATION

GENERAL NOTES:

1. EXISTING DIMENSIONS, TYPES AND LOCATIONS OF FOUNDATIONS ARE BASED ON PREVIOUS REPORTS PROVIDED BY DDOT AND FIELD DATA ACQUISITION.
2. HWL DENOTES THE HIGH WATERLINE STAIN VISIBLE ON THE SUBSTRUCTURE UNITS.

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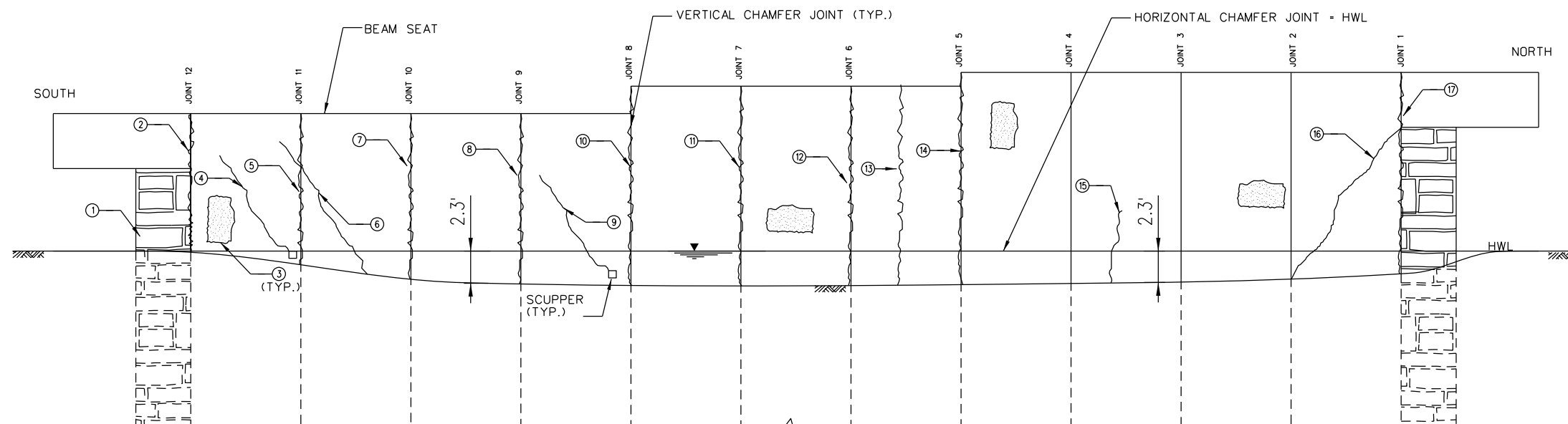
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 INSP. DIVERS GO/CE/RR VISIBILITY APPROX. 6"
 REVIEW ENG. MARK BOSTICK, P.E.

**DISTRICT OF COLUMBIA 2016 UNDERWATER BRIDGE INSPECTIONS
 BRIDGE 76 NEW YORK AVENUE OVER ANACOSTIA RIVER**

**PLAN AND ELEVATION
 DETAILS OF INSPECTION FINDINGS**

BRIDGE NO.
76

FIGURE NO.
 3 OF 12



ELEVATION - WEST ABUTMENT

INSPECTION FINDINGS - WEST ABUTMENT

- ① 5% LOSS OF MORTAR AT UPSTREAM AND DOWNSTREAM ENDS.
- ② HL V.C. FROM ML TO TOP OF PIER ALONG JOINT 12.
- ③ RANDOM DELAMINATED AREAS THROUGHOUT CONCRETE SURFACES EXTENDING TO WITHIN 3' OF ML. TYPICALLY 1-2 SOFT AREAS OF CONCRETE NEAR DELAMINATION.
- ④ 10' LONG HL D.C. FROM ML EXTENDS UPWARDS TO THE SOUTH TO JOINT 12 FROM SCUPPER.
- ⑤ HL V.C. FROM ML TO TOP OF PIER ALONG JOINT 11.
- ⑥ 12' LONG HL D.C. FROM HWL EXTENDS UPWARDS TO THE SOUTH. CRACK EXTENDS PAST JOINT 11.
- ⑦ HL V.C. FROM ML TO TOP OF PIER ALONG JOINT 10.
- ⑧ V.C. UP TO 1/16" W. FROM ML TO TOP OF PIER ALONG JOINT 9.
- ⑨ 8' LONG HL D.C. FROM SCUPPER BETWEEN JOINTS 8 AND 9 EXTENDS UPWARDS TO THE SOUTH.
- ⑩ HL V.C. FROM ML TO TOP OF PIER ALONG JOINT 8.
- ⑪ HL V.C. FROM ML TO TOP OF PIER ALONG JOINT 7.
- ⑫ HL V.C. FROM ML TO TOP OF PIER ALONG JOINT 6.
- ⑬ HL V.C. FROM ML TO TOP OF PIER BETWEEN JOINTS 5 AND 6.
- ⑭ HL V.C. FROM ML TO TOP OF PIER ALONG JOINT 5.
- ⑮ 5' LONG X HL V.C. FROM ML BETWEEN JOINTS 3 AND 4.
- ⑯ HL D.C. FROM ML AT JOINT 1 TO JOINT 2. CRCK EXTENDS UPWARDS TO THE NORTH.
- ⑰ HL V.C. W/ MOD. EFFLO. FROM ML TO TOP OF PIER ALONG JOINT 1.

ABBREVIATIONS & DEFINITIONS

T.O.F. - TOP OF FOOTING	INT. - INTERMITTENT
T.O.SF. - TOP OF SUB-FOOTING	W/ - WITH
ML - MUDLINE/CHANNEL BOTT.	HVY. - HEAVY
HWL - HIGH WATERLINE STAIN	MOD. - MODERATE
V.C. - VERTICAL CRACK	ASSOC. - ASSOCIATED
H.C. - HORIZONTAL CRACK	EFFLO. - EFFLORESCENCE
D.C. - DIAGONAL CRACK	COL. - COLUMN
HL - HAIRLINE CRACK (<1/16")	-XX' - LOCATION BASED ON
1/16" to 1/8" WIDE - NARROW CRACK	WATER DEPTH (WL = 0)
1/8" to 3/16" WIDE - MEDIUM CRACK	TYP. - TYPICALLY
>3/16" WIDE - WIDE CRACK	MAX. - MAXIMUM

- GENERAL NOTES:
- EXISTING DIMENSIONS, TYPES AND LOCATIONS OF FOUNDATIONS ARE BASED ON PREVIOUS REPORTS PROVIDED BY DDOT AND FIELD DATA ACQUISITION.
 - DEFECT LOCATIONS ARE APPROXIMATE.
 - LESS THAN 5% OF ABUTMENT WAS UNDERWATER AT THE TIME OF INSPECTION.

7/15/2016

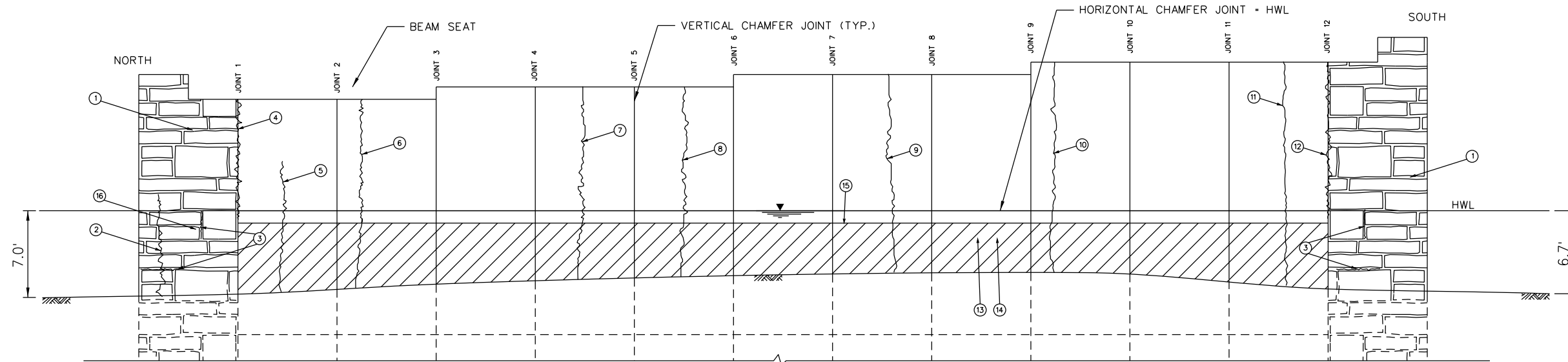


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SCALE 1" = 10'
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 INSP. DIVERS GO/CE/RR VISIBILITY APPROX. 6"
 REVIEW ENG. MARK BOSTICK, P.E.

DISTRICT OF COLUMBIA 2016 UNDERWATER BRIDGE INSPECTIONS
 BRIDGE 76 NEW YORK AVENUE OVER ANACOSTIA RIVER
 WEST ABUTMENT
 DETAILS OF INSPECTION FINDINGS

BRIDGE NO. **76**
 FIGURE NO. 4 OF 12



WEST ELEVATION - PIER 1

INSPECTION FINDINGS - PIER 1

- ① GENERALLY LESS THAN 10% LOSS OF MORTAR AT UPSTREAM AND DOWNSTREAM ENDS.
- ② 3/16" W V.C. IN FASCIA STONE IN UPSTREAM NOSE FROM ML TO APPROX. 2' ABOVE HWL.
- ③ HAIRLINE CRACKS THROUGHOUT MORTAR.
- ④ HL V.C. ALONG JOINT 1 EXTENDING UP FROM HWL TO TOP OF PIER.
- ⑤ HL V.C. BETWEEN JOINTS 1 AND 2 EXTENDING UP FROM ML TO WITHIN 5' OF TOP OF PIER.
- ⑥ V.C. UP TO 1/16" W. FROM ML TO TOP OF PIER AT 2' SOUTH OF JOINT 2.
- ⑦ HL V.C. FROM ML TO TOP OF PIER BETWEEN JOINTS 4 AND 5.
- ⑧ V.C. UP TO 1/16" W. FROM ML TO TOP OF PIER BETWEEN JOINTS 5 AND 6.
- ⑨ V.C. UP TO 1/16" W. FROM ML TO TOP OF PIER BETWEEN JOINTS 7 AND 8.
- ⑩ V.C. UP TO 1/8" W. FROM ML TO TOP OF PIER BETWEEN JOINTS 9 AND 10.
- ⑪ V.C. UP TO 1/16" W. FROM ML TO TOP OF PIER BETWEEN JOINTS 11 AND 12.
- ⑫ HL V.C. FROM HWL TO TOP OF PIER ALONG JOINT 12.
- ⑬ RANDOM AREAS OF SOFT CONCRETE FROM 1' BELOW WL TO ML ALONG FULL-LENGTH OF PIER.
- ⑭ SCALE PRESENT ALONG FULL-LENGTH OF PIER, UP TO 3/4" D. FROM 1' TO 3' BELOW HWL, 1/4" D. NEAR WL, AND 1" D. FROM 3' BELOW HWL TO ML.
- ⑮ SEVERE SCALE 4' W X 3' V X 3" D, 1' BELOW THE HIGH WATERLINE NEAR JOINT 7, WITH 2 EXPOSED REINFORCING BARS WITH UP TO 15% LOSS OF SECTION. THERE IS A 6" DIA. STEEL PIPE IN CENTER OF THE SCALE.
- ⑯ MISSING STONE MASONRY 6" H X 6" V X 8"D, 8' FROM THE NORTH NOSE AT 1.5' BELOW HWL.

ABBREVIATIONS & DEFINITIONS

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1/8" to 3/16" WIDE - MEDIUM CRACK	TYP. - TYPICALLY
>3/16" WIDE - WIDE CRACK	MAX. - MAXIMUM

GENERAL NOTES:

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- 2. DEFECT LOCATIONS ARE APPROXIMATE.

7/15/2016

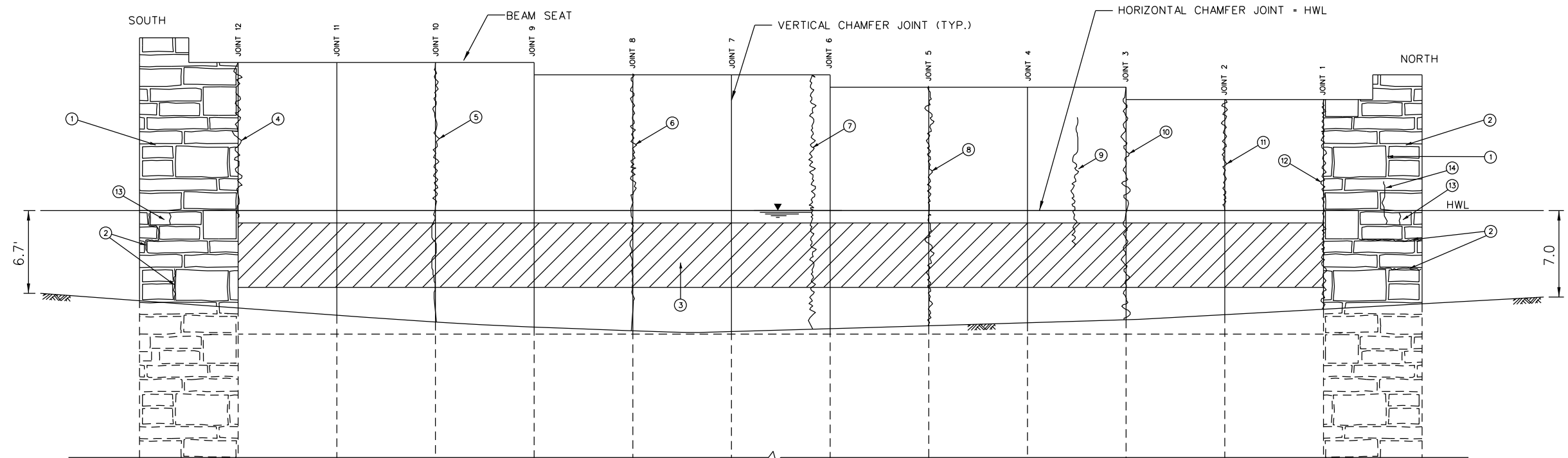
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SCALE 1" = 10'
 INSP. DATE MAY 10, 2016 HWL TO WL DURING INSP. N/A
 INSP. DIVERS GO/CE/RR VISIBILITY APPROX. 6"
 REVIEW ENG. MARK BOSTICK, P.E.

DISTRICT OF COLUMBIA 2016 UNDERWATER BRIDGE INSPECTIONS
 BRIDGE 76 NEW YORK AVENUE OVER ANACOSTIA RIVER
 PIER 1 WEST FACE
 DETAILS OF INSPECTION FINDINGS

BRIDGE NO. **76**
 FIGURE NO. 5 OF 12



EAST ELEVATION - PIER 1

INSPECTION FINDINGS - PIER 1

- ① GENERALLY LESS THAN 10% LOSS OF MORTAR AT UPSTREAM AND DOWNSTREAM ENDS.
- ② HAIRLINE CRACKS THROUGHOUT MORTAR.
- ③ HEAVY SCALE, 1.5" D, ALONG FULL-LENGTH OF PIER FROM 1' BELOW HWL TO 2' ABOVE ML.
- ④ HL V.C. FROM HWL TO TOP OF PIER ALONG JOINT 12.
- ⑤ HL V.C. FROM ML TO TOP OF PIER ALONG JOINT 10.
- ⑥ HL V.C. FROM ML TO TOP OF PIER ALONG JOINT 8.
- ⑦ 1/16" W. V.C. FROM ML TO TOP OF PIER 1' SOUTH OF JOINT 6.
- ⑧ HL V.C. FROM ML TO TOP OF PIER ALONG JOINT 5.
- ⑨ HL V.C. FROM 7' ABOVE HWL TO 3' BELOW HWL BETWEEN JOINTS 3 AND 4.
- ⑩ 1/16" W. V.C. FROM ML TO TOP OF PIER ALONG JOINT 3.
- ⑪ FINE HL V.C. FROM HWL TO TOP OF PIER ALONG JOINT 2.
- ⑫ 1/16" V.C. FROM ML TO TOP OF PIER ALONG JOINT 1.
- ⑬ FULL-HEIGHT X 1/32" W. V.C. IN SINGLE STONE, 6" BELOW HWL AT THE UPSTREAM AND DOWNSTREAM NOSE.
- ⑭ 3/16" W. V.C. IN STONE, 6" BELOW HWL AND EXTENDING INTO COURSE ABOVE HWL.

ABBREVIATIONS & DEFINITIONS

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V.C. - VERTICAL CRACK	ASSOC. - ASSOCIATED
H.C. - HORIZONTAL CRACK	EFFLO. - EFFLORESCENCE
D.C. - DIAGONAL CRACK	COL. - COLUMN
HL - HAIRLINE CRACK (<1/16")	-XX' - LOCATION BASED ON
1/16" to 1/8" WIDE - NARROW CRACK	WATER DEPTH (WL = 0)
1/8" to 3/16" WIDE - MEDIUM CRACK	TYP. - TYPICALLY
>3/16" WIDE - WIDE CRACK	MAX. - MAXIMUM

GENERAL NOTES:

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- 2. DEFECT LOCATIONS ARE APPROXIMATE.

7/15/2016

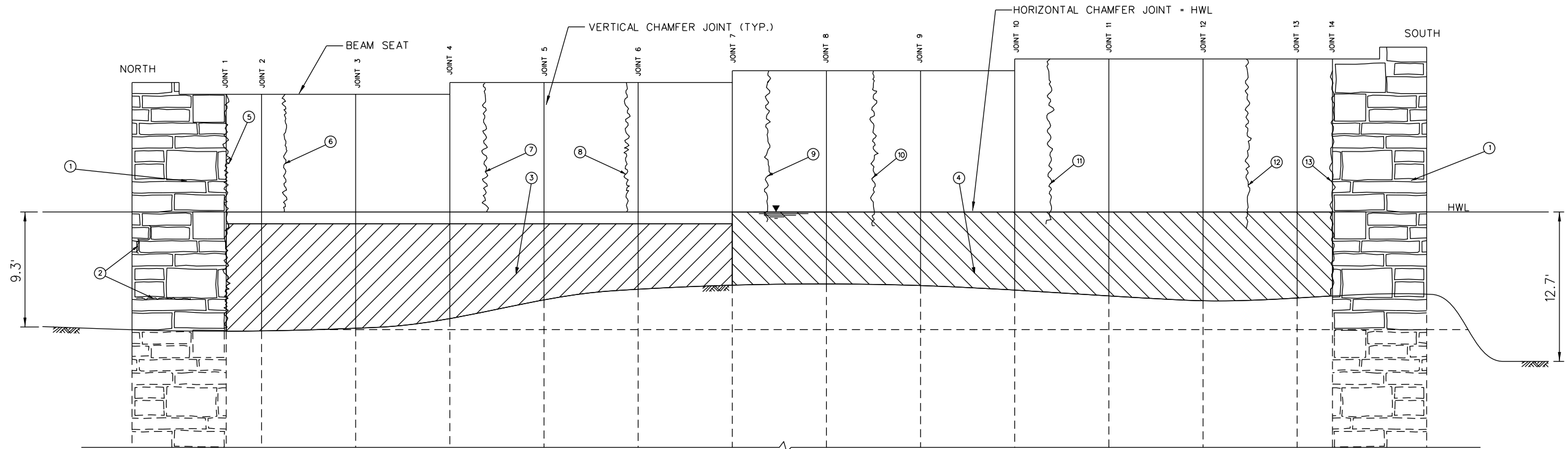


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 Asset Management Division

SCALE 1" = 10'
 INSP. DATE MAY 10, 2016 HWL TO WL DURING INSP. N/A
 INSP. DIVERS GO/CE/RR VISIBILITY APPROX. 6"
 REVIEW ENG. MARK BOSTICK, P.E.

DISTRICT OF COLUMBIA 2016 UNDERWATER BRIDGE INSPECTIONS
 BRIDGE 76 NEW YORK AVENUE OVER ANACOSTIA RIVER
 PIER 1 EAST FACE
 DETAILS OF INSPECTION FINDINGS

BRIDGE NO. 76
 FIGURE NO. 6 OF 12



WEST ELEVATION - PIER 2

INSPECTION FINDINGS - PIER 2

- | | |
|---|--|
| <ul style="list-style-type: none"> ① GENERALLY 10% LOSS OF MORTAR AT UPSTREAM AND DOWNSTREAM ENDS. ② HAIRLINE CRACKS THROUGHOUT MORTAR. ③ AREA OF SEVERE SCALE ON UPSTREAM HALF OF FACE UP TO 2"D, FROM 1' BELOW HWL TO 18" ABOVE ML, WITH 1 VERTICAL BAR EXPOSED AND RANDOM AREAS OF SOFT CONCRETE UP TO 2"D. ④ AREA OF SEVERE SCALE ON DOWNSTREAM HALF OF FACE UP TO 6" DEEP FROM HWL TO 12" ABOVE ML, 30 VERTICAL BARS EXPOSED, FULL CIRCUMFERENCE OF SEVERAL BARS EXPOSED WITH 15% TO 30% LOSS OF SECTION. ⑤ HL V.C. EXTENDING UP FROM ML TO TOP OF PIER ALONG JOINT 1. ⑥ HL V.C. EXTENDING UP FROM HWL TO TOP OF PIER 2' SOUTH OF JOINT 2. | <ul style="list-style-type: none"> ⑦ 1/16" V.C. EXTENDING UP FROM HWL TO TOP OF PIER 3' SOUTH OF JOINT 4. ⑧ HL V.C. FROM HWL TO TOP OF PIER 1' NORTH OF JOINT 6. ⑨ HL V.C. FROM SCALE AREA TO TOP OF PIER 3' SOUTH OF JOINT 7. ⑩ HL V.C. FROM SCALE AREA TO TOP OF PIER 4' SOUTH OF JOINT 8. ⑪ V.C. UP TO 1/16" W. FROM SCALE AREA TO TOP OF PIER 3' SOUTH OF JOINT 10. ⑫ HL V.C. FROM SCALE AREA TO TOP OF PIER 3' SOUTH OF JOINT 12. ⑬ HL V.C. FROM ML TO TOP OF PIER ALONG JOINT 14. |
|---|--|

ABBREVIATIONS & DEFINITIONS

T.O.F. - TOP OF FOOTING	INT. - INTERMITTENT
T.O.S.F. - TOP OF SUB-FOOTING	W/ - WITH
ML - MUDLINE/CHANNEL BOTT.	HVY. - HEAVY
HWL - HIGH WATERLINE STAIN	MOD. - MODERATE
V.C. - VERTICAL CRACK	ASSOC. - ASSOCIATED
H.C. - HORIZONTAL CRACK	EFFLO. - EFFLORESCENCE
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1/16" to 1/8" WIDE - NARROW CRACK	WATER DEPTH (WL = 0)
1/8" to 3/16" WIDE - MEDIUM CRACK	TYP. - TYPICALLY
>3/16" WIDE - WIDE CRACK	MAX. - MAXIMUM

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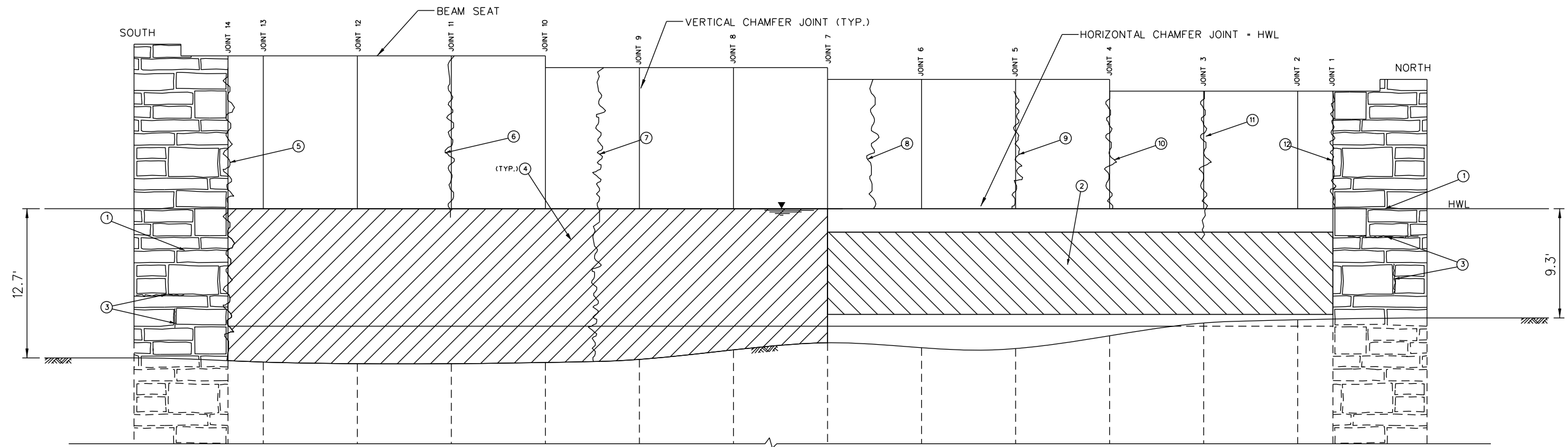
DISTRICT OF COLUMBIA 2016 UNDERWATER BRIDGE INSPECTIONS
 BRIDGE 76 NEW YORK AVENUE OVER ANACOSTIA RIVER

PIER 2 WEST FACE
 DETAILS OF INSPECTION FINDINGS

BRIDGE NO. **76**

FIGURE NO.

7 OF 12



EAST ELEVATION - PIER 2

INSPECTION FINDINGS - PIER 2

- | | |
|---|--|
| ① GENERALLY 10% LOSS OF MORTAR AT UPSTREAM AND DOWNSTREAM ENDS. | ⑦ 1/16" V.C. EXTENDING UP FROM ML TO TOP OF PIER 2' SOUTH OF JOINT 9. |
| ② HVY. SCALE UP TO 1.5" D. FROM 2' BELOW HWL TO 1' ABOVE ML ON THE UPSTREAM HALF OF FACE, WITH RANDOM AREAS OF SOFT CONCRETE. | ⑧ HL V.C. EXTENDING UP FROM HWL TO TOP OF PIER 4' SOUTH OF JOINT 6. |
| ③ HAIRLINE CRACKS THROUGHOUT MORTAR. | ⑨ HL V.C. EXTENDING UP FROM HWL TO TOP OF PIER ALONG JOINT 5. |
| ④ AREAS OF SEVERE SCALE ON DOWNSTREAM HALF OF FACE UP TO 3" D FROM HWL TO ML, 3 EXPOSED VERTICAL BARS. | ⑩ HL V.C. W/ EFFLO EXTENDING UP FROM HWL TO TOP OF PIER ALONG JOINT 4. |
| ⑤ HL V.C. EXTENDING UP FROM ML TO TOP OF PIER ALONG JOINT 14. | ⑪ HL V.C. EXTENDING UP FROM SCALED AREA TO TOP OF PIER ALONG JOINT 3. |
| ⑥ V.C. UP TO 1/8" W. EXTENDING UP FROM SCALE AREA TO TOP OF PIER ALONG JOINT 11. | ⑫ HL V.C. EXTENDING UP FROM HWL TO TOP OF PIER ALONG JOINT 1. |

ABBREVIATIONS & DEFINITIONS

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T.O.S.F. - TOP OF SUB-FOOTING	W/ - WITH
ML - MUDLINE/CHANNEL BOTT.	HVY. - HEAVY
HWL - HIGH WATERLINE STAIN	MOD. - MODERATE
V.C. - VERTICAL CRACK	ASSOC. - ASSOCIATED
H.C. - HORIZONTAL CRACK	EFFLO. - EFFLORESCENCE
D.C. - DIAGONAL CRACK	COL. - COLUMN
HL - HAIRLINE CRACK (<1/16")	-XX' - LOCATION BASED ON
1/16" to 1/8" WIDE - NARROW CRACK	WATER DEPTH (WL = 0)
1/8" to 3/16" WIDE - MEDIUM CRACK	TYP. - TYPICALLY
>3/16" WIDE - WIDE CRACK	MAX. - MAXIMUM

GENERAL NOTES:

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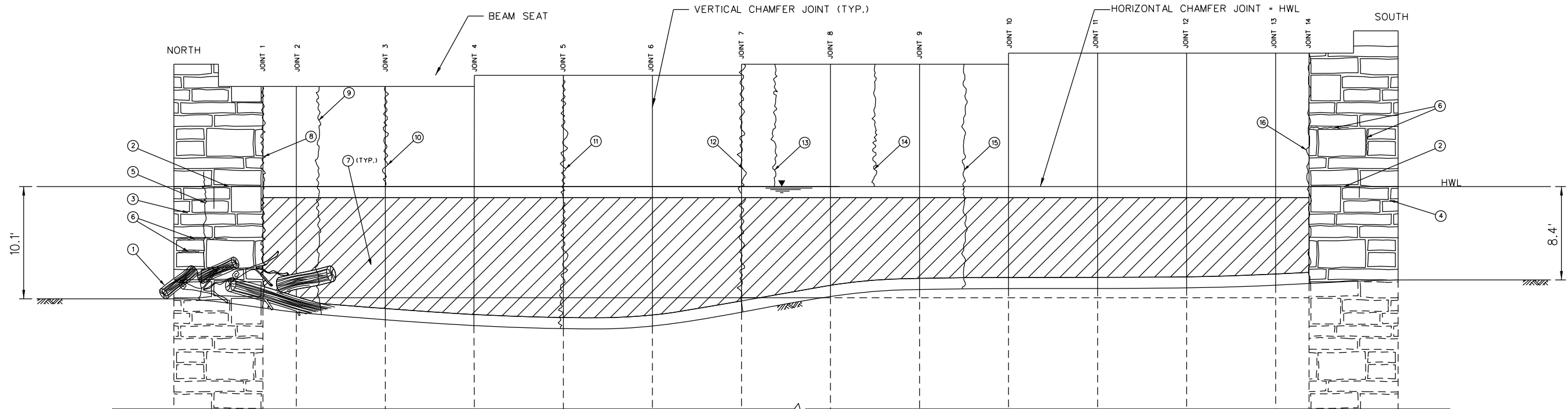


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DISTRICT OF COLUMBIA 2016 UNDERWATER BRIDGE INSPECTIONS
 BRIDGE 76 NEW YORK AVENUE OVER ANACOSTIA RIVER
 PIER 2 EAST FACE
 DETAILS OF INSPECTION FINDINGS

BRIDGE NO. 76
 FIGURE NO. 8 OF 12



WEST ELEVATION - PIER 3

INSPECTION FINDINGS - PIER 3

- ① 15' LONG DEBRIS PILE EXTENDING DOWN FROM UPSTREAM END.
- ② GENERALLY 10% LOSS OF MORTAR AT UPSTREAM AND DOWNSTREAM ENDS.
- ③ MORTAR LOSS 8" V X 7" D AT UPSTREAM NOSE 2' BELOW HWL.
- ④ MORTAR LOSS 9" V X 4" D AT DOWNSTREAM NOSE 6" BELOW HWL.
- ⑤ 1/4" W. V.C. IN FASCIA STONES IN UPSTREAM NOSE FROM ML TO 2' ABOVE HWL.
- ⑥ HAIRLINE CRACKS THROUGHOUT MORTAR.
- ⑦ HVY. SCALE UP TO 1.5" D ALONG FULL-LENGTH OF PIER, FROM 1' BELOW HWL TO 1' ABOVE ML.
- ⑧ 1/16" W V.C. EXTENDING UP FROM ML TO TOP OF PIER ALONG JOINT 1.
- ⑨ 1/16" V.C. EXTENDING UP FROM ML TO TOP OF PIER 2' SOUTH OF JOINT 2.
- ⑩ INT. HL V.C. EXTENDING UP FROM HWL TO TOP OF PIER ALONG JOINT 3.
- ⑪ V.C. UP TO 1/8" W. EXTENDING UP FROM ML TO TOP OF PIER ALONG JOINT 5.
- ⑫ 1/16" V.C. EXTENDING UP FROM ML TO TOP OF PIER ALONG JOINT 7.
- ⑬ HL V.C. EXTENDING UP FROM HWL TO TOP OF PIER 3' SOUTH OF JOINT 7.
- ⑭ V.C. UP TO 1/16" W. EXTENDING UP FROM HWL TO TOP OF PIER 4' SOUTH OF JOINT 8.
- ⑮ 1/16" V.C. EXTENDING UP FROM ML TO TOP OF PIER 4' SOUTH OF JOINT 9.
- ⑯ HL V.C. EXTENDING UP FROM ML TO TOP OF PIER ALONG JOINT 14.

ABBREVIATIONS & DEFINITIONS

T.O.F. - TOP OF FOOTING	INT. - INTERMITTENT
T.O.S.F. - TOP OF SUB-FOOTING	W/ - WITH
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V.C. - VERTICAL CRACK	ASSOC. - ASSOCIATED
H.C. - HORIZONTAL CRACK	EFFLO. - EFFLORESCENCE
D.C. - DIAGONAL CRACK	COL. - COLUMN
HL - HAIRLINE CRACK (<1/16")	-XX' - LOCATION BASED ON
1/16" to 1/8" WIDE - NARROW CRACK	WATER DEPTH (WL = 0)
1/8" to 3/16" WIDE - MEDIUM CRACK	TYP. - TYPICALLY
>3/16" WIDE - WIDE CRACK	MAX. - MAXIMUM

GENERAL NOTES:

1. EXISTING DIMENSIONS, TYPES AND LOCATIONS OF FOUNDATIONS ARE BASED ON PREVIOUS REPORTS PROVIDED BY DDOT AND FIELD DATA ACQUISITION.
2. DEFECT LOCATIONS ARE APPROXIMATE.
3. LEDGE ON UPSTREAM NOSE EXTENDS 1.5' DOWN AND RETURNS TO MASONRY CONCRETE CONSTRUCTION APPROX. 3' VERTICALLY EXPOSED.

7/15/2016

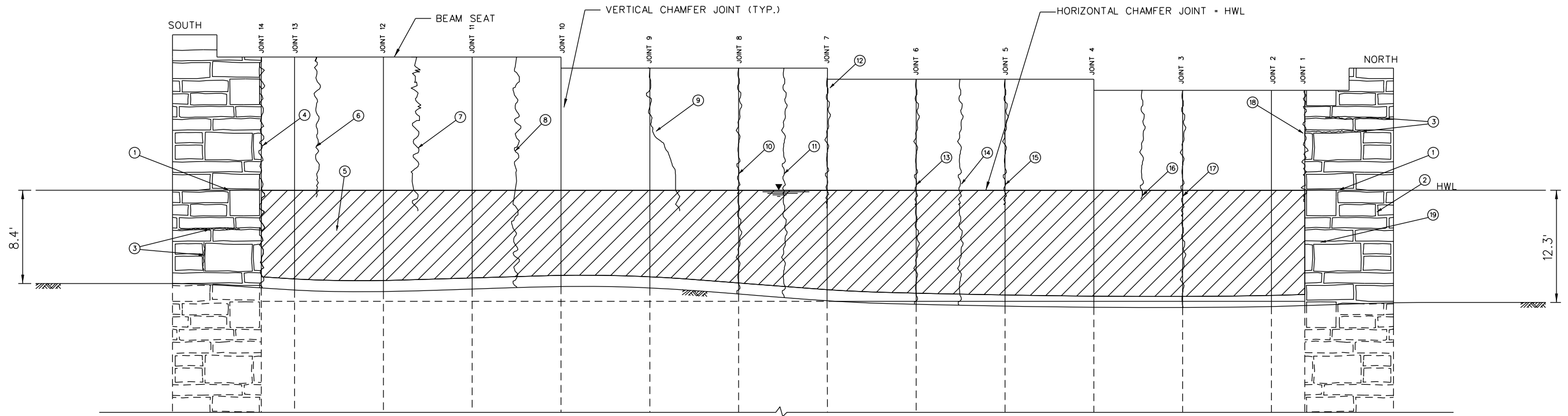
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DISTRICT OF COLUMBIA 2016 UNDERWATER BRIDGE INSPECTIONS
 BRIDGE 76 NEW YORK AVENUE OVER ANACOSTIA RIVER
 PIER 3 WEST FACE
 DETAILS OF INSPECTION FINDINGS

BRIDGE NO. **76**
 FIGURE NO. 9 OF 12



EAST ELEVATION - PIER 3

INSPECTION FINDINGS - PIER 3

- ① GENERALLY LESS THAN 10% LOSS OF MORTAR AT UPSTREAM AND DOWNSTREAM ENDS, LOCALIZED IN TIDAL ZONE.
- ② MORTAR LOSS OF 8" V X 7" D AT UPSTREAM NOSE 2' BELOW HWL.
- ③ HAIRLINE CRACKS THROUGHOUT MORTAR.
- ④ HL V.C. EXTENDING UP FROM ML TO TOP OF PIER ALONG JOINT 14 .
- ⑤ HEAVY SCALE THROUGHOUT FACE UP TO 1" D FROM HWL TO 12" ABOVE ML.
- ⑥ V.C. UP TO 1/8" W. EXTENDING UP FROM SCALE AREA TO TOP OF PIER 2' NORTH OF JOINT 13.
- ⑦ HL V.C. EXTENDING UP FROM SCALE AREA TO TOP OF PIER 3' NORTH OF JOINT 12.
- ⑧ 1/16" W. V.C. EXTENDING UP FROM ML TO TOP OF PIER 4' NORTH OF JOINT 11.
- ⑨ V.C. (D.C. AT MID-HEIGHT) UP TO 1/16" W. EXTENDING UP FROM SCALE AREA TO TOP OF PIER ALONG JOINT 9.
- ⑩ V.C. UP TO 1/16" W. EXTENDING UP FROM ML TO TOP OF PIER ALONG JOINT 8.
- ⑪ V.C. UP TO 1/8" W. EXTENDING UP FROM ML TO TOP OF PIER BEWTWEEN JOINTS 7 AND 8.
- ⑫ INT. HL V.C. EXTENDING UP FROM ML TO TOP OF PIER ALONG JOINT 7.
- ⑬ HL V.C. EXTENDING UP FROM ML TO TOP OF PIER ALONG JOINT 6.
- ⑭ V.C. UP TO 1/8" W. EXTENDING UP FROM ML TO TOP OF PIER BEWTWEEN JOINTS 5 AND 6.
- ⑮ HL V.C. EXTENDING UP FROM TOP OF SCALE AREA TO TOP OF PIER ALONG JOINT 5.
- ⑯ HL V.C. EXTENDING UP FROM TOP OF SCALE AREA TO TOP OF PIER BEWTWEEN JOINTS 3 AND 4.
- ⑰ HL V.C. EXTENDING UP FROM ML TO TOP OF PIER ALONG JOINT 3.
- ⑱ HL V.C. EXTENDING UP FROM ML TO TOP OF PIER ALONG JOINT 1.
- ⑲ 60% LOSS OF MORTAR FROM 4' SOUTH OF UPSTREAM END TO CONCRETE INTERFACE.

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1/8" to 3/16" WIDE MEDIUM CRACK	TYP. - TYPICALLY
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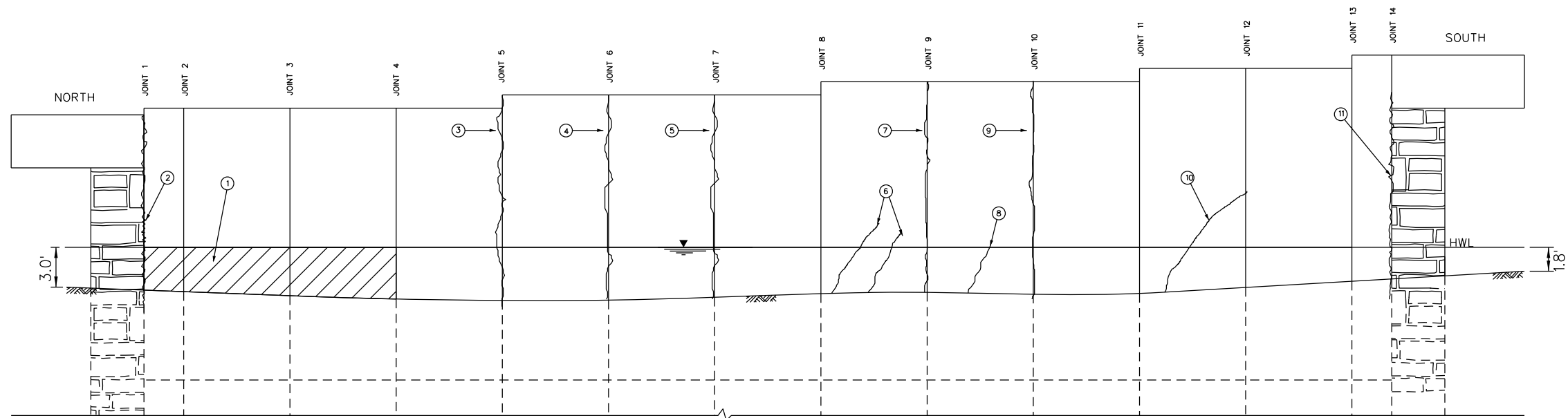
DISTRICT OF COLUMBIA 2016 UNDERWATER BRIDGE INSPECTIONS
 BRIDGE 76 NEW YORK AVENUE OVER ANACOSTIA RIVER

PIER 3 EAST FACE
 DETAILS OF INSPECTION FINDINGS

BRIDGE NO.
76

FIGURE NO.

10 OF 12



ELEVATION - EAST ABUTMENT

INSPECTION FINDINGS - EAST ABUTMENT

- ① SEVERE SCALE TYPICALLY 3 1/2" D FROM JOINT 1 TO JOINT 4 WITH AREA UP TO 7" D NEAR NORTH SCUPPER, APPROXIMATELY 30'L WITH 5 EXPOSED VERTICAL BARS AND 2 EXPOSED HORIZONTAL BARS.
- ② HL V.C. FROM ML TO TOP OF PIER ALONG JOINT 1.
- ③ HL V.C. FROM ML TO TOP OF PIER ALONG JOINT 5.
- ④ HL V.C. FROM ML TO TOP OF PIER ALONG JOINT 6.
- ⑤ V.C. UP TO 1/16" FROM ML TO TOP OF PIER ALONG JOINT 7.
- ⑥ 2 TOTAL HL DIAGONAL CRACKS 6' LONG EACH FROM ML EXTENDING UP TOWARDS THE SOUTH BETWEEN JOINTS 8 AND 9
- ⑦ HL V.C. FROM ML TO TOP OF PIER ALONG JOINT 9.
- ⑧ HL D.C. FROM ML EXTENDING UP TOWARDS THE SOUTH BETWEEN JOINTS 9 AND 10.
- ⑨ INT. HL V.C. FROM ML TO TOP OF PIER ALONG JOINT 10.
- ⑩ HL D.C. FROM ML EXTENDING UP TOWARDS THE SOUTH BETWEEN JOINTS 11 AND 12.
- ⑪ HL V.C. FROM ML TO TOP OF PIER ALONG JOINT 14.

GENERAL NOTES:

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HL = HAIRLINE CRACK (<1/16")	-XX' = LOCATION BASED ON
1/16" to 1/8" WIDE = NARROW CRACK	WATER DEPTH (WL = 0)
1/8" to 3/16" WIDE = MEDIUM CRACK	TYP. = TYPICALLY
>3/16" WIDE = WIDE CRACK	MAX. = MAXIMUM

7/15/2016

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BRIDGE 76 NEW YORK AVENUE OVER ANACOSTIA RIVER
EAST ABUTMENT
DETAILS OF INSPECTION FINDINGS

BRIDGE NO. **76**
 FIGURE NO. 11 OF 12

UNDERWATER INSPECTION

Bridge No. 76 • New York Avenue over the Anacostia River
Washington, DC • May 2016



APPENDIX D: SOUNDING DATA

UNDERWATER INSPECTION

Bridge No. 76 • New York Avenue over the Anacostia River
Washington, DC • May 2016

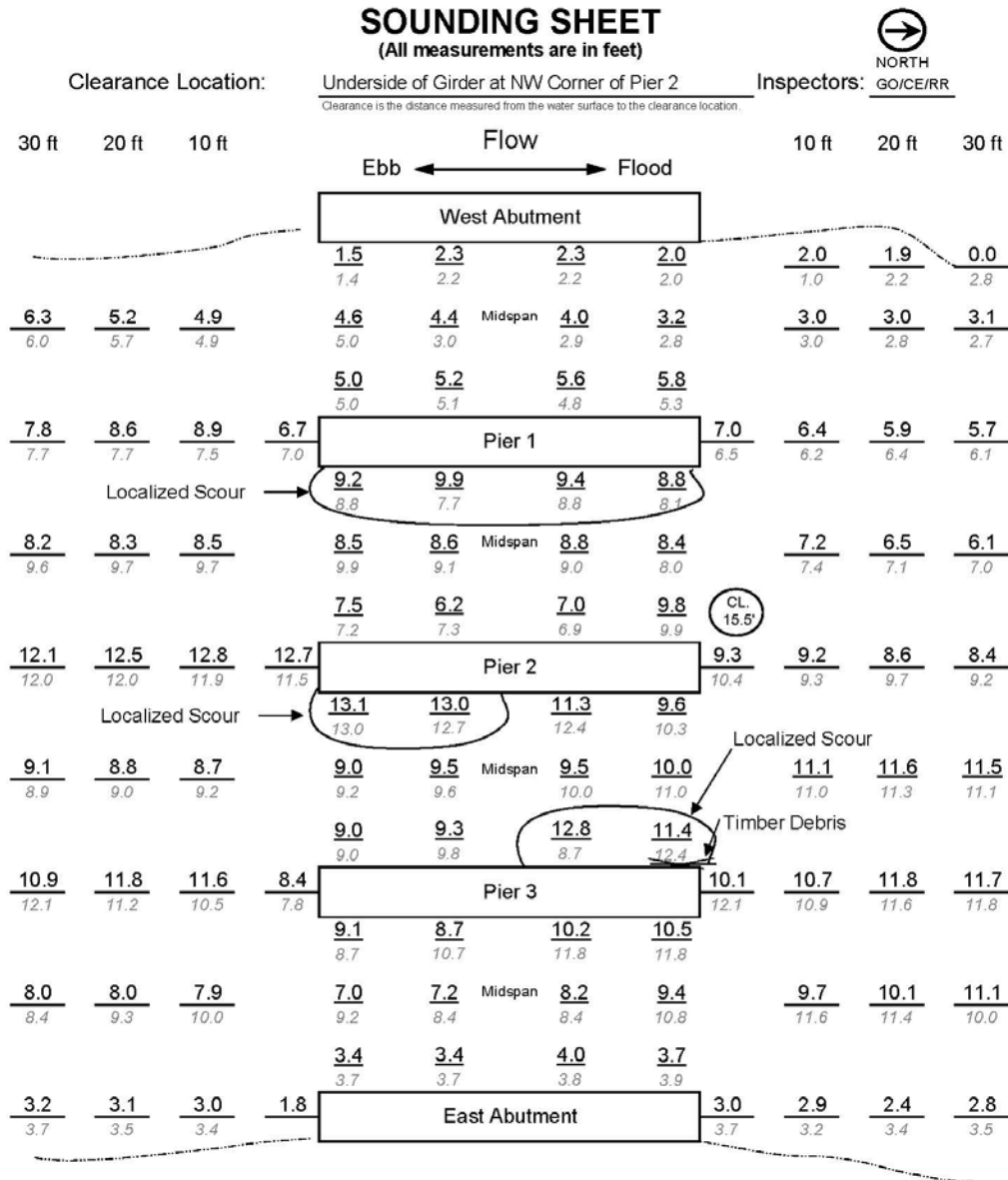


FIGURE 12: SOUNDING DATA