



**Maine
Turnpike
Authority**

UNDERWATER BRIDGE INSPECTION REPORT

BRIDGE 0086 AND 1494

**MAINE TURNPIKE (I-95) OVER THE ANDROSCOGGIN RIVER
(2) 6-SPAN BRIDGES (NB AND SB)**



**MILE MARKER 78.9
LEWISTON, MAINE**

INSPECTED ON: MAY 26, 2016

Prepared by:

**COLLINS
ENGINEERS** INC

650 Islington Street, Suite 1
Portsmouth, NH 03801

Prepared for:

HNTB

340 County Road, Suite 6-C
Westbrook, ME 04092

On Behalf of:



2360 Congress Street
Portland, ME 04102

Executive Summary

<u>Item 60 – Substructure</u>	<u>Overall Rating:</u>	<u>5</u>
<p>The piers are in Fair condition overall. The piers have significant cracking up to 1/4" wide above and below the waterline, and intermittent spalls with exposed reinforcing steel. The concrete below the waterline is typically soft and the outer 1/2" can easily be removed when struck with a hammer. Repair recommendations include sealing cracks with epoxy injection and spall repairs.</p>		

<u>Item 61 – Channel & Channel Protection</u>	<u>Overall Rating:</u>	<u>7</u>
<p>The Channel & Channel Protection are in Good condition. There is minor timber debris accumulated at the nose of Pier 3. The Channel embankments are well vegetated and appear stable, and the east embankment has scattered riprap protection. Repair recommendations include removing the timber debris at the pier nose to minimize scour potential.</p>		

<u>Item 113 – Scour</u>	<u>Overall Rating:</u>	<u>6</u>
<p>There was localized scour observed at all of the piers, exposing the footings with up to 4' of vertical exposure. However, based on information provided in the previous inspection report, the footings are cast on concrete seals which bear directly on bedrock, and the seals are not exposed. Based on the observed conditions, the foundation elements are determined to be stable and no action is required at this time.</p>		

Background Information

General

Mile Marker: 78.9
Bridge No.: 0086 and 1494
Bridge Name: Androscoggin River Bridge
Facility Carried: I-95 (NB & SB)
Feature Intersected: Androscoggin River
City/Town: Lewiston

Bridge Inventory Information

Bridge Type: 6 Span Steel Girder
Year Built / Rehabilitated: Unknown/1995
Bridge Orientation: The bridge is logged from south to north which is consistent with the previous inspection report.
Structure Length: 860 feet+/-
Width In to In: 40 feet+/- (Each Side, SB and NB)
No. of Span(s): 6
No of Pier(s): 5
No. of Abutment(s) in Water: n/a
No. of Pier(s) in Water: 3
Abutment / Pier Type: Expanded Concrete Hammerhead Piers
Foundation Type: Footing bearing on bedrock

Waterway Information

Type of Water: Fresh
Current Strength: 0.5 knots
Underwater Visibility: 5 feet
Max. Water Depth: 36 feet
Max Depth at Substructure: 36 feet
Bottom Composition: Sand with cobbles and shells. Typical soil penetration ranged from 0" to 12" when probed.
Marine Growth: Light algae up to 1/8".

Inspection / Diving Operations

Team Leader: Christopher Shepard PE
Inspection Team Members: Robert Snelgrove PE and Connor Golden
Inspection Date Started: 05/26/2016
Inspection Date Completed: 05/26/2016
Bridge Access: Southeast shoreline
Boat Size: 14-ft Jon Boat
Dive Mode: SCUBA
Equipment Comments: Standard hand tools were used for this inspection.
General Remarks: Inspection, probes, and soundings were completed on 05/26/2016.

Condensed Underwater Bridge Inspection Report

BRIDGE NUMBER	COUNTY NAME	ROAD NUMBER	ROAD NAME	DATE INSPECTED
0086 and 1494	Lewiston	95	Interstate	05/26/2016

BODY OF WATER: Androscoggin River **DIVE MODE:** SCUBA

DIVING CONDITIONS

MAXIMUM CURRENT:	0.5 knots	AIR TEMPERATURE:	70 deg F
AVERAGE VISIBILITY:	3-4 feet	WATER TEMPERATURE:	65 deg F
BOTTOM MATERIAL:	Sand with cobbles and shells. Typical soil penetration ranged from 0" to 12" when probed.	<u>MAXIMUM DEPTH:</u>	<u>36 feet</u>
INSPECTED ITEMS:	Concrete Hammerhead Piers and Footings		

ITEM OF INSPECTION	NCR**	REMARKS
1. PILING/SHAFTS	N	
2. FOOTINGS/CAISSONS/PEDESTALS	6*	Minor to moderate footing exposure
3. COLUMNS/WALL PIERS	5*	Minor deterioration, soft concrete
4. BRACING/STRUTS/WEB WALLS	N	
5. ABUTMENTS/END BENTS	N	
6. RETAINING WALLS/WING WALLS	N	
7. FENDER SYSTEM/PIER PROTECTION	N	
8. EMBANKMENTS/SLOPES/BULKHEADS	7*	
9. DEGRADATION/AGGRADATION	5*	Local scour with exposed footings
10. OBSTRUCTION/FLOW	7*	Minor timber debris
11. MOVABLE BRIDGE PIERS (PIVOT, BASCULE, REST)	N	
12. CULVERT BARRELS	N	
13. CULVERT HEADWALLS	N	
14. SUBMARINE CABLE(S)***	N	

* Deficiencies exist in this element that warrant written and/or sketched description which are provided in the "Report of Deficiencies" section of the report.
 ** NCR is an acronym for numerical condition rating, the definitions of which can be found on the back of this page.
 *** Submarine Cable(S) rated using Non-Structural Features rating system [1 (Poor) to 4 (Good) or N].

INSPECTION PARTY

Name: Christopher Shepard PE (Team Leader)	Name: Connor Golden
Name: Robert Snelgrove PE	Name:

NUMERICAL CONDITION RATING DEFINITIONS FOR STRUCTURAL ITEMS

<u>CODE</u>	<u>DESCRIPTION</u>
N	NOT APPLICABLE
9	EXCELLENT CONDITION
8	VERY GOOD CONDITION-No problems noted.
7	GOOD CONDITION-Some minor problems. Minor maintenance may be needed.
6	SATISFACTORY CONDITION-Structural elements show some minor deterioration. Major maintenance is needed.
5	FAIR CONDITION-All primary structural elements are sound but may have minor section loss, cracking, spalling. Minor rehabilitation may be needed.
4	POOR CONDITION-Advanced section loss, deterioration, spalling. Major rehabilitation may be needed.
3	SERIOUS CONDITION-Loss of section, deterioration, spalling have seriously affected primary structural elements. Local failures are possible. Fatigue cracks in steel or shear cracks in concrete may be present. Repair or rehabilitation required immediately.
2	CRITICAL CONDITION-Advanced deterioration of primary structural elements. Fatigue cracks in steel or shear cracks in concrete may be present. Unless closely monitored it may be necessary to close the bridge until corrective action is taken.
1	IMMINENT@ FAILURE CONDITION-Major deterioration or section loss present in critical structural components or obvious vertical or horizontal movement affecting structure stability. Bridge is closed to traffic but corrective action may put back in light service.
0	FAILED CONDITION-Out of Service-beyond corrective action

NUMERICAL CONDITION RATING DEFINITIONS FOR DEGRADATION/AGGRADATION

<u>CODE</u>	<u>DESCRIPTION</u>
N	NOT APPLICABLE-Use when bridge is not over a waterway.
9	EXCELLENT CONDITION-No noticeable or noteworthy deficiencies, which affect the condition of the channel.
8	VERY GOOD CONDITION-Banks are protected or well vegetated. River control devices, such as spur dikes and embankment protection, are not required or are in stable condition. Some minor scour has occurred near bridge.
7	GOOD CONDITION-Bank protection is in need of minor repairs. River control devices and embankment protection have minor damage. There is minor streambed movement evident. Minor local scour developing near substructure.
6	SATISFACTORY CONDITION-Bank is beginning to slump. River control devices and embankment protection have considerable minor damage. There is minor streambed movement evident. Debris is restricting the waterway slightly. Scour holes deepening.
5	FAIR CONDITION-Bank protection is being eroded. River control devices and/or embankment have major damage. Trees and brush restrict the channel. Scour holes are becoming more prominent, affecting the stability of the substructure.
4	POOR CONDITION-Bank and embankment protection undermined with corrective action required. River control devices have severe damage. Large deposits of debris in the waterway. The streambed has changed its location but is causing no problem.
3	SERIOUS CONDITION-Bank protection has failed completely. Scour holes forming in embankment. River control devices have been destroyed. Streambed aggradation or degradation has changed the waterway to now threaten the bridge and/or approach roadway.
2	CRITICAL CONDITION-Abutment has failed (portion has settled) due to undermining of footing. The waterway has changed and now threatens the bridge and/or embankment. Scour is of sufficient depth beneath footing that substructure is in near state of collapse.
1	IMMINENT@ FAILURE CONDITION-Bridge closed. Corrective action may put the structure back into light service.
0	FAILED CONDITION-Bridge closed. Replacement necessary.

Comprehensive Report of Deficiencies

Substructure Rating (Item 60)

5 – Fair Condition

Piers	Condition Rating: 5
<p>Findings</p>	<p>The concrete piers are in Fair condition overall (See Photo 2). The piers typically have a 4' wide band of moderate abrasion located at the waterline up to 1/4" deep (See Photo 3), and the outer concrete is soft and can be easily removed with a hammer, up to 1/4" deep at the waterline and up to 1/2" deep in submerged areas. Additionally, the piers have widespread cracking and with intermittent areas of spalling with expose reinforcing steel. Some repairs have been completed since the previous inspection, consisting of isolated spall repairs. The following is a list of additional deficiencies observed:</p> <p><u>Pier 1 and 5</u></p> <p>Pier 1 and 5 are located on dry land and therefore were not part of the underwater inspection contract.</p> <p><u>Pier 2</u></p> <ul style="list-style-type: none"> • There are 3'L to 5'L vertical hairline cracks spaced at 2' on-center on all sides of the pier, located in the band of abrasion just above the waterline. • There is a 1/8"W horizontal crack running the full length of the pier, located approximately 5' below the waterline on the east face. • There is a 1/16"W horizontal crack starting at the south end of the pier extending 55' to the north, located approximately 3' below the waterline on the east face. • There is a 12'L x 1/16"W diagonal crack extending down towards the north, at the top of the pier near the centerline on the east face • There is approximately 12 SF of spalling, and one 30 SF area that was previously repaired and has map cracking throughout on the east face. • There are two 1/8"W horizontal cracks running the full length of the pier, located approximately 1' and 3' below the waterline on the west face. • There is a 20'L x 1/8" horizontal crack extending from the north end of the pier, located approximately 5' below the waterline on the west face. • At the top of the pier, there are two 12'L x 1/8"W diagonal cracks at either ends of the concrete pedestal, extending down towards the center of the pier on the west face. • There is a 3 SF spall towards the north end of the pier, located approximately 10' above the waterline on the west face. • There is a 4 SF spall at the south end of the pier, located approximately 15' above the waterline on the west face. • On the north end of the pier, there is a 1'H x 1.5'W spall located just below the pier head.

Pier 3

- There are 3'L to 5'L vertical hairline cracks, spaced at 2'-3' on-center on all sides of the pier, located in the band of abrasion just above the waterline (See Photo 4).
- There is a 10'L x 1/16"W horizontal crack extending from the north end of the pier, located approximately 10' below the waterline on the east face
- There is a 15'L x 1/16"W crack at the south end of the pier, extending from the waterline up on the east face
- There are two 2'L x 2'H x 4" deep spalls at the south end of the pier on the east face, one located approximately 15' above the waterline and with exposed reinforcing steel, and the other one located at the top of the pier head.
- There is a 300 SF area of map cracking at the top of the pier near the centerline on the east face
- There is a 130 SF repaired area exhibited map cracking near the south end of the pier on the east face.
- There is a 15'L x 1/8"W vertical crack approximately 6' from the north end of the pier, extending up from the mudline on the west face.
- There is a 6'L x 1/8"W vertical crack approximately 20' from the north end of the pier extending down from the waterline on the west face.
- There is a 2'L x 1/4"W crack near the center of the pier, located approximately 3' above the mudline on the west face.
- There is a 6'L hairline crack extending from the south end of the pier, located approximately 3' above the mudline on the west face.
- There is a 4"L x 4"W x 1"D spall with exposed reinforcing located approximately 10' above the waterline near the north end of the pier on the west face.
- There is a 3'L x 2'H x 6"D spall with exposed reinforcing approximately 5' below the top of the pier near the centerline on the west face.
- There are approximately 150 SF of previous repairs with map cracking throughout on the west face.
- On the south end of the pier there are three areas of spalling, totaling approximately 70 SF of spalls, one of which has exposed reinforcing steel (See Photo 5).

Pier 4

- There are 3'L to 5'L vertical hairline cracks spaced at 2'-3' on-center on all sides of the pier, located in the band of abrasion just above the waterline.
- There is a 30'L x 1/8"W horizontal crack extending to the south from the north end of the pier, located approximately 10' above the waterline on the east face
- At the top of the pier head, near the south end of the pier on the east face, there are four spalls with exposed reinforcing steel, each measuring approximately 1'L x 1'W x 2"D.

	<ul style="list-style-type: none">• At the bottom of the pier head, near the south end of the pier on the east face, there is a 6'H x 8"W x 2"D spall with exposed reinforcing steel (See Photo 6).• Near the center of the pier, there are three 10'L x 1/8"W diagonal cracks extending down from the top of the pier head on the east face.• Near the center of the pier, there are two 10'L x 1/8"W vertical cracks extending down from the bottom of the pier head on the east face.• There is a hairline horizontal crack running the full length of the pier, located approximately 6' above the waterline on the west face.• There is a 25'L x 1/8"W crack extending from the north end of the pier on the west face, located approximately 3' below the waterline.• There is a 20'L x 1/16"W crack extending from the north end of the pier on the west face, located approximately 6' below the waterline (See Photo 7).• There are two vertical cracks near the north end of the pier on the west face, the first 10'L x 1/8"W, and the second 3'L x 1/16"W, both extending up from the waterline.• Near the center of the pier, there are three 10'L x 1/8"W diagonal cracks extending down from the top of the pier head on the west face.• Near the center of the pier, there are two 10'L x 1/8"W vertical cracks with rust staining extending down from the bottom of the pier head on the west face.• There is a 1'L x 1'H spall near the center of the pier on the west face, located approximately 3' below the pier head.• There is a 2'L x 1'H spall at the south end of the pier on the west face, located just below the pier head.• There is 3'H x 1.5'W x 2"D spall with exposed reinforcing steel located on the west face, at the top of the pier head near the south end.• There is a 4' x 3' spall located approximately 5' above the waterline near the south end of the pier on the west face.• There is a 1/4"W horizontal crack extending the entire width of the nose, located approximately 10' below the waterline on the north end of the pier.• There are two vertical 5'L hairline cracks on the north end of the pier, extending up from the waterline.• There is a 1'L x 1'W spall on the north end of the pier, located approximately 2' below the waterline.• There is a 1/16"W horizontal crack extending the entire width of the nose, located approximately 8' below the waterline on the south end of the pier.• There is a 3'L x 1.5'W x 2"D spall with exposed reinforcing on the south end of the pier, located just below the pier head.
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Footings	Condition Rating: 6
<p>Findings</p>	<p>Per the previous inspection report, based on available record drawings, the footings are cast on a concrete seal which is bearing directly on bedrock. The footings had partial exposure at various locations, however the concrete seal was completely buried at all piers. The following is specific information on the footing exposure observed, and defects identified in the exposed areas of the footings.</p> <p><u>Pier 2</u></p> <p>The entire footing along the east face is exposed down to the top of the seal, and an approximate 15' length of the footing is exposed on the west face at the north end of the pier, and a 5' length at the south end of the pier.</p> <ul style="list-style-type: none"> • On the east face, there is a 25'L x 1/4"W horizontal crack located approximately 3' below the top of the footing, extending from the north end of the pier, with two intersecting 3' x 1/8"W cracks extending to the top of the footing (See Photo 8). • There is an 18'L x 1/8"W crack located approximately 4' from the top of the footing near the north end of the pier on the east face. • There is also a 10' x 1/4"W crack located approximately 4' below the top of the footing on the east face, extending from the south end of the pier, with an adjacent 3.5'L x 1/4"W vertical crack at the north end (See Photo 9). • Near the pier centerline, there is a 2 SF area of honey combing approximately 1 1/2"D, located approximately 4' below the top of the footing on the east face. • There is a 14'L x 1/4"W horizontal crack located approximately 2' below the top of the footing extending back from the north end of the pier on the west face. • On the north end of the pier, there is a horizontal crack that extends across the entire face, up to 1" wide, and located approximately 2' below the top of the footing. • There is a 2'L x 1/2"W crack extending down from the top of the footing in the center of the north end of the pier. <p><u>Pier 3</u></p> <p>The footing is exposed on the east face of the pier with up to 3' of vertical exposure, extending from the south end of pier approximately 20'. The remainder of the footing along the east face is exposed intermittently, with up to 8" of vertical exposure. Large boulders up to 4' in diameter were observed against the exposed footing along the east face.</p> <p><u>Pier 4</u></p> <p>The footing is exposed from the northwest corner, extending approximately 30' along the west face, with up to 3' of vertical exposure. On the east face, the top of the footing is exposed at the northeast corner, with up to 2" of vertical exposure.</p>

Channel and Channel Protection Rating (Item 61)

7 – Good Condition

Flow and Channel Protection		Condition Rating: 7
Findings	There are large boulders located around the east and north nose of Pier 3, and a 10"x4' long tree trunk is lodged against the north nose.	

Embankments		Condition Rating: 7
Findings	Both embankments are well vegetated and appear stable. There is scattered riprap place along the east embankment for additional protection.	

Scour (Item 113)

5 – Fair Condition

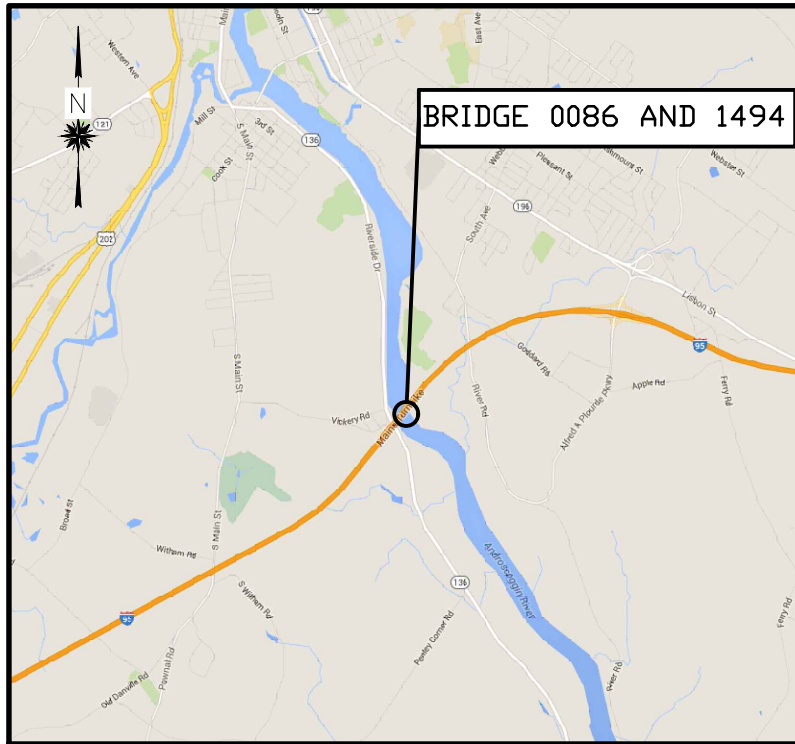
Scour		Condition Rating: 5
Findings	There was localized scour observed at all of the piers, exposing the footings with up to 4' of vertical exposure. However, based on information provided in the previous inspection report, the footings are cast on concrete seals which are bearing directly on bedrock, and no seals were exposed. Based on the observed conditions, the foundation elements are determined to be stable and no action is required at this time.	

Recommended Corrective Action

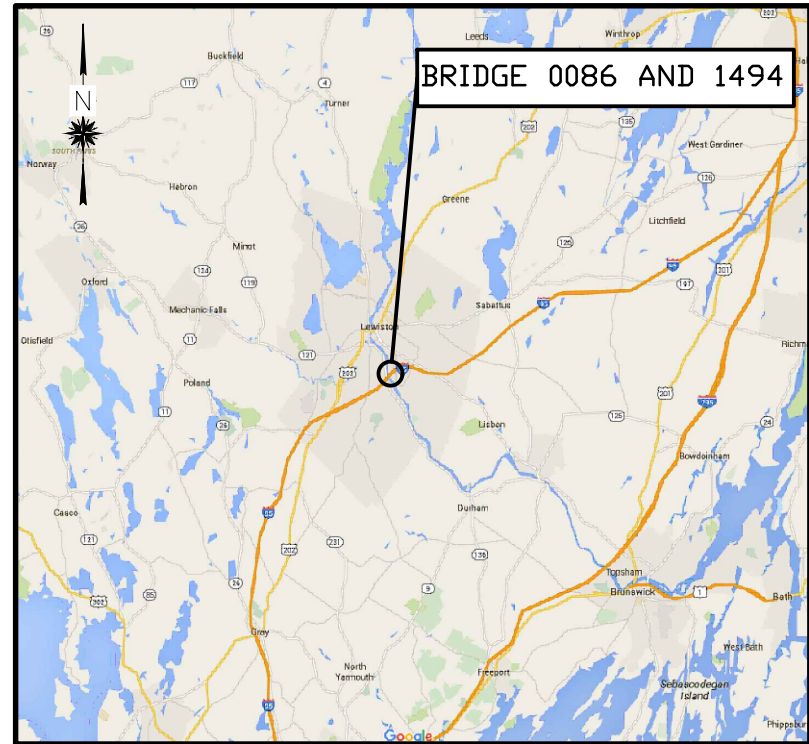
The timber debris should be removed to limit local scour. All cracks 1/16" and greater should be repaired with epoxy injection. Spalls and areas of map cracking should be repaired by removing loose and deleterious material down to sound concrete, cleaning reinforcing steel, and placing a marine grade concrete or patching compound.

The repairs have a total estimated construction cost of \$550,000.

Based on recommended inspection intervals in accordance with the Federal Highway Administration, the next underwater inspection should be completed in May, 2021.

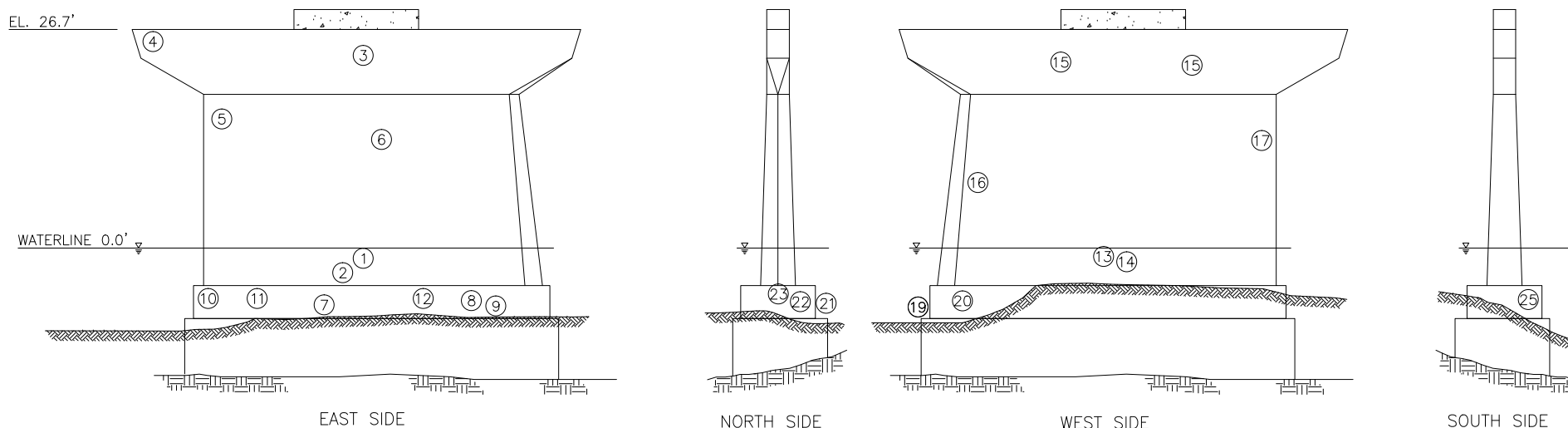


LOCATION
(1" = 4100 FT)



VICINITY
(1" = 5.8 MILES)

	Maine Turnpike Authority	Bridge 0086 and 1494 OVER ANDROSCOGGIN RIVER LEWISTON, ME	
		LOCATION AND VICINITY MAPS	
Drawn By: CMG		650 ISLINGTON ST, SUITE 1 PORTSMOUTH, NH 03801 (603) 334-4742	Date: 05/26/2016 Scale: VARIES Figure No.: 1
Checked By: ZDJ			
Project: 15-09625			



GENERAL NOTES:

1. 4' WIDE BAND OF ABRASION UP TO 1/4" DEEP, LOCATED AT THE WATERLINE, WITH VERTICAL HAIRLINE CRACKS SPACED AT 2'-3' ON ALL FACES OF THE PIER.
2. CONCRETE IF SOFT, UP TO 1/4" DEEP AT THE WATERLINE, AND UP TO 1/2" IN SUBMERGED AREAS.

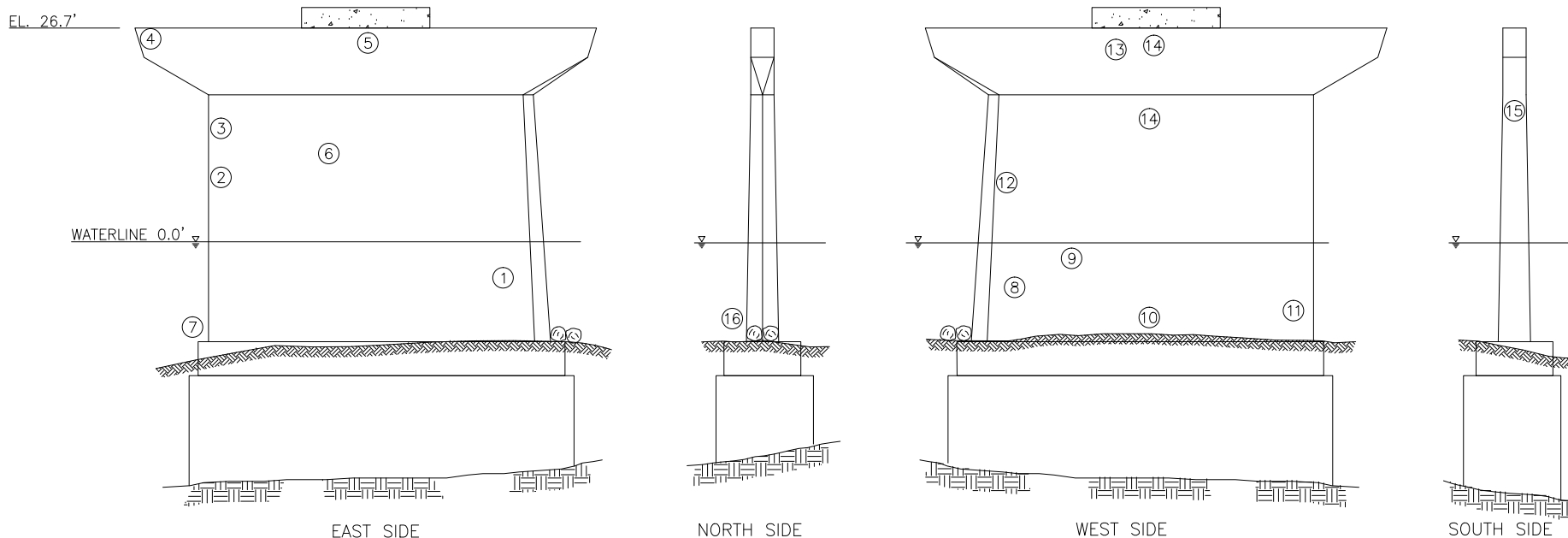
INSPECTION NOTES:

1. HORIZONTAL CRACK: 1/8"W X FULL LENGTH OF THE PIER, LOCATED APPROXIMATELY 5' BELOW THE WATERLINE.
2. HORIZONTAL CRACK: 55'L X 1/16"W, STARTING AT THE SOUTH END OF THE PIER EXTENDING TO THE NORTH, LOCATED APPROXIMATELY 3' BELOW THE WATERLINE.
3. DIAGONAL CRACK: 12'L X 1/16"W EXTENDING DOWN TOWARDS THE NORTH, LOCATED AT THE TOP OF THE PIER NEAR THE CENTERLINE ON THE EAST FACE
4. SPALL: 2 SF
5. SPALL: 10 SF
6. PREVIOUS REPAIR WITH HAIRLINE MAP CRACKING: 30 SF.
7. FOOTING IS EXPOSED ALONG THE EAST FACE, DOWN TO THE TOP OF THE SEAL
8. ON THE EAST FACE, THERE IS A 25'L X 1/4"W HORIZONTAL CRACK LOCATED APPROXIMATELY 3' BELOW THE TOP OF THE FOOTING, EXTENDING FROM THE NORTH END OF THE PIER, WITH TWO INTERSECTING 3' X 1/8"W CRACKS EXTENDING TO THE TOP OF THE FOOTING
9. HORIZONTAL CRACK: 18'L X 1/8"W, LOCATED APPROXIMATELY 4' FROM THE TOP OF THE FOOTING NEAR THE NORTH END OF THE PIER.
10. HORIZONTAL CRACK: 10'L X 1/4"W, LOCATED APPROXIMATELY 4' BELOW THE TOP OF THE FOOTING, EXTENDING FROM THE SOUTH END OF THE PIER,
11. VERTICAL CRACK: 3.5'L X 1/4", LOCATE APPROXIMATELY 4' FROM THE TOP OF THE FOOTING.
12. NEAR THE PIER CENTERLINE, THERE IS A 2 SF AREA OF HONEY COMBING APPROXIMATELY 1 1/2"D, LOCATED APPROXIMATELY 4' BELOW THE TOP OF THE FOOTING.
13. HORIZONTAL CRACKS (2): 1/8"W X FULL LENGTH OF THE PIER, LOCATED APPROXIMATELY 1' AND 3' BELOW THE WATERLINE.
14. HORIZONTAL CRACK: 20'L X 1/8"W EXTENDING FROM THE NORTH END OF THE PIER, LOCATED APPROXIMATELY 5' BELOW THE WATERLINE ON THE WEST FACE.
15. DIAGONAL CRACKS (2): 12'L X 1/8"W AT EITHER ENDS OF THE CONCRETE PEDESTAL, EXTENDING DOWN TOWARDS THE CENTER OF THE PIER.
16. SPALL: 3 SF, LOCATED TOWARDS THE NORTH END OF THE PIER, APPROXIMATELY 10' ABOVE THE WATERLINE.

ELEVATIONS - PIER 2
(Scale: 1/32" = 1'-0")

17. SPALL: 4 SF, LOCATED AT THE SOUTH END OF THE PIER, APPROXIMATELY 15' ABOVE THE WATERLINE.
18. SPALL: 1'H X 1.5'W, LOCATED JUST BELOW THE PIER HEAD.
19. FOOTING IS EXPOSED ON THE WEST FACE AT THE NORTH END OF THE PIER, APPROXIMATE 15' LONG,
20. HORIZONTAL CRACK: 14'L X 1/4"W, LOCATED APPROXIMATELY 2' BELOW THE TOP OF THE FOOTING, EXTENDING BACK FROM THE NORTH END OF THE PIER.
21. FOOTING IS EXPOSED ON THE NORTH FACE OF THE PIER, DOWN TO THE SEAL.
22. HORIZONTAL CRACK: UP TO 1" WIDE X FULL LENGTH, LOCATED APPROXIMATELY 2' BELOW THE TOP OF THE FOOTING.
23. HORIZONTAL CRACK: 2'L X 1/2"W, EXTENDING DOWN FROM THE TOP OF THE FOOTING AT THE CENTER OF THE PIER.
24. A 5' LENGTH OF THE FOOTING IS EXPOSED AT THE SOUTH END OF THE PIER.

	Maine Turnpike Authority		Bridge 0086 and 1494 OVER ANDROSCOGG RIVER LEWISTON, ME	
			ELEVATIONS	
	Drawn By: CMG Checked By: ZDJ Project: 15-09625		650 ISLINGTON ST, SUITE 1 PORTSMOUTH, NH 03801 (603) 334-4742	Date: 05/26/2016 Scale: 1/32"=1'-0" Figure No.: 2



GENERAL NOTES:



1. 4' WIDE BAND OF ABRASION UP TO 1/4" DEEP, LOCATED AT THE WATERLINE, WITH VERTICAL HAIRLINE CRACKS SPACED AT 2'-3' ON ALL FACES OF THE PIER.
2. CONCRETE IF SOFT, UP TO 1/4" DEEP AT THE WATERLINE, AND UP TO 1/2" IN SUBMERGED AREAS.

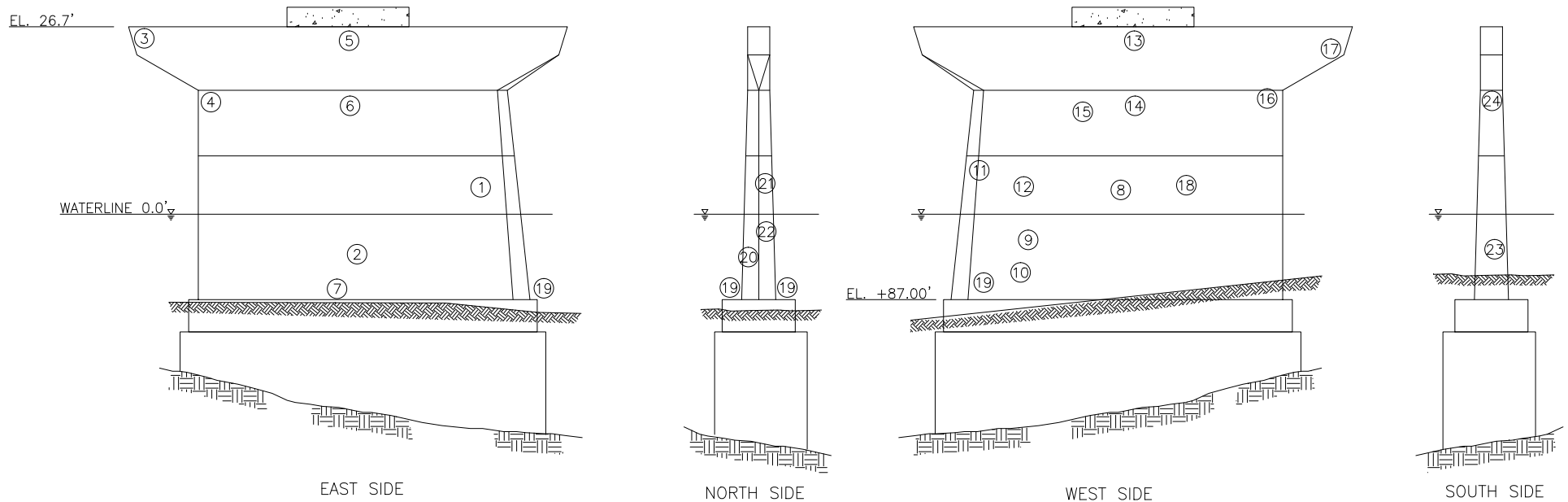
INSPECTION NOTES:

1. HORIZONTAL CRACK: 10'L X 1/16", EXTENDING FROM THE NORTH END OF THE PIER, LOCATED APPROXIMATELY 10' BELOW THE WATERLINE
2. VERTICAL CRACK: 15'L X 1/16"W AT THE SOUTH END OF THE PIER, EXTENDING FROM THE WATERLINE UP
3. SPALL: 2'L X 2'H X 4"D, AT THE SOUTH END OF THE PIER, LOCATED APPROXIMATELY 15' ABOVE THE WATERLINE
4. SPALL: 2'L X 2'H X 4"D, AT THE SOUTH END OF THE PIER, LOCATED AT THE TOP OF THE PIER HEAD
5. MAP CRACKING: 300 SF, AT THE TOP OF THE PIER HEAD NEAR THE CENTERLINE
6. REPAIRED AREA EXHIBITED MAP CRACKING: 130 SF NEAR THE SOUTH END OF THE PIER
7. THE FOOTING IS EXPOSED ON THE EAST FACE OF THE PIER WITH UP TO 3' OF VERTICAL EXPOSURE, EXTENDING FROM THE SOUTH END OF PIER APPROXIMATELY 20'. THE REMAINDER OF THE FOOTING ALONG THE EAST FACE IS EXPOSED INTERMITTENTLY, WITH UP TO 8" OF VERTICAL EXPOSURE. LARGE BOULDERS UP TO 4' IN DIAMETER WERE OBSERVED AGAINST THE EXPOSED FOOTING ALONG THE EAST FACE.
8. VERTICAL CRACK: 15'L X 1/8", LOCATED APPROXIMATELY 6' FROM THE NORTH END OF THE PIER, EXTENDING UP FROM THE MUDLINE.
9. VERTICAL CRACK: 6'L X 1/16"W, LOCATED APPROXIMATELY 20' FROM THE NORTH END OF THE PIER, EXTENDING DOWN FROM THE WATERLINE
10. HORIZONTAL CRACK: 2'L X 1/4"W, LOCATED NEAR THE CENTER OF THE PIER APPROXIMATELY 3' ABOVE THE MUDLINE

ELEVATIONS - PIER 3
(Scale: 1/32" = 1'-0")

11. HORIZONTAL CRACK: 6'L X HAIRLINE, EXTENDING FROM THE SOUTH END OF THE PIER, LOCATED APPROXIMATELY 3' ABOVE THE MUDLINE
12. SPALL: 4"L X 4"W X 1"D WITH EXPOSED REINFORCING, LOCATED APPROXIMATELY 10' ABOVE THE WATERLINE NEAR THE NORTH END OF THE PIER
13. SPALL: 3'L X 2'H X 6"D WITH EXPOSED REINFORCING, LOCATED APPROXIMATELY 5' BELOW THE TOP OF THE PIER NEAR THE CENTERLINE
14. PREVIOUS REPAIRS WITH MAP CRACKING: APPROXIMATELY 150 SF
15. SPALLS: TOTALING APPROXIMATELY 70 SF, ONE OF WHICH HAS EXPOSED REINFORCING STEEL
16. 10"Ø X 4' LONG TIMBER TREE TRUNK AGAINST PIER NOSE

 Maine Turnpike Authority		Bridge 0086 and 1494 OVER ANDROSCOGGIN RIVER LEWISTON, ME	
		ELEVATIONS	
Drawn By: CMG Checked By: ZDJ Project: 15-09625	 COLLINS ENGINEERS	650 ISLINGTON ST, SUITE 1 PORTSMOUTH, NH 03801 (603) 334-4742	Date: 05/26/2016 Scale: 1/32"=1'-0" Figure No.: 3



GENERAL NOTES:

1. 4' WIDE BAND OF ABRASION UP TO 1/4" DEEP, LOCATED AT THE WATERLINE, WITH VERTICAL HAIRLINE CRACKS SPACED AT 2'-3" ON ALL FACES OF THE PIER.
2. CONCRETE IF SOFT, UP TO 1/4" DEEP AT THE WATERLINE, AND UP TO 1/2" IN SUBMERGED AREAS.

ELEVATIONS - PIER 4
(Scale: 1/32" = 1'-0")

INSPECTION NOTES:

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| <ol style="list-style-type: none"> 1. HORIZONTAL CRACK: 30'L X 1/8"W, EXTENDING FROM THE NORTH END OF THE PIER, LOCATED APPROXIMATELY 10' ABOVE THE WATERLINE 2. COLD JOINT, SURROUNDING CONCRETE IS SOUND. 3. SPALLS (4): EACH MEASURING APPROXIMATELY 1'L X 1'W X 2"D WITH EXPOSED REINFORCING STEEL, LOCATED AT THE TOP OF THE PIER HEAD, NEAR THE SOUTH END OF THE PIER 4. SPALL: 6'H X 8"W X 2"D WITH EXPOSED REINFORCING STEEL, LOCATED AT THE BOTTOM OF THE PIER HEAD, NEAR THE SOUTH END OF THE PIER 5. DIAGONAL CRACKS (3): 10'L X 1/8"W NEAR THE CENTER OF THE PIER, EXTENDING DOWN FROM THE TOP OF THE PIER HEAD 6. VERTICAL CRACKS (2): 10'L X 1/8"W NEAR THE CENTER OF THE PIER, EXTENDING DOWN FROM THE BOTTOM OF THE PIER HEAD 7. THE TOP OF THE FOOTING IS EXPOSED INTERMITTENTLY ALONG THE EAST FACE, WITH UP TO 2" OF VERTICAL EXPOSURE. 8. HORIZONTAL CRACK: HAIRLINE X FULL LENGTH OF THE PIER, LOCATED APPROXIMATELY 6' ABOVE THE WATERLINE 9. HORIZONTAL CRACK: 25'L X 1/8"W, EXTENDING FROM THE NORTH END OF THE PIER, LOCATED APPROXIMATELY 3' BELOW THE WATERLINE 10. HORIZONTAL CRACK: 20'L X 1/16"W, EXTENDING FROM THE NORTH END OF THE PIER, LOCATED APPROXIMATELY 6' BELOW THE WATERLINE 11. VERTICAL CRACK: 10'L X 1/8"W, EXTENDING UP FROM THE WATERLINE NEAR THE NORTH END OF THE PIER. 12. VERTICAL CRACK: 3'L X 1/16"W, EXTENDING UP FROM THE WATERLINE NEAR THE NORTH END OF THE PIER. 13. DIAGONAL CRACKS (3): 10'L X 1/8"W NEAR THE CENTER OF THE PIER, EXTENDING DOWN FROM THE TOP OF THE PIER HEAD 14. VERTICAL CRACKS (4): 10'L X 1/8"W NEAR THE CENTER OF THE PIER, EXTENDING DOWN FROM THE BOTTOM OF THE PIER HEAD. WITH RUST STAINING 15. SPALL: 1'L X 1'H SPALL NEAR THE CENTER OF THE PIER, LOCATED APPROXIMATELY 3' BELOW THE PIER HEAD. | <ol style="list-style-type: none"> 16. SPALL: 2'L X 1'H SPALL AT THE SOUTH END OF THE PIER, LOCATED JUST BELOW THE PIER HEAD. 17. SPALL: 3'H X 1.5'W X 2"D WITH EXPOSED REINFORCING STEEL, LOCATED AT THE TOP OF THE PIER HEAD NEAR THE SOUTH END. 18. SPALL: 4' X 3', LOCATED APPROXIMATELY 5' ABOVE THE WATERLINE NEAR THE SOUTH END OF THE PIER 19. THE FOOTING IS EXPOSED AT THE NORTH FACE, WITH UP TO 3' OF VERTICAL EXPOSURE. THE FOOTING EXPOSURE CONTINUES AROUND THE NORTHWEST AND NORTHEAST CORNERS, EXTENDING APPROXIMATELY 30' ALONG THE WEST FACE AND 10' ALONG THE EAST FACE. 20. HORIZONTAL CRACK: 1/4"W X FULL LENGTH, LOCATED APPROXIMATELY 10' BELOW THE WATERLINE. 21. VERTICAL CRACKS: (2) 5'L X HAIRLINE CRACK, EXTENDING UP FROM THE WATERLINE NEAR THE NORTHEAST AND NORTHWEST CORNER OF THE BRIDGE. 22. SPALL: 1'L X 1'W, LOCATED APPROXIMATELY 2' BELOW THE WATERLINE 23. HORIZONTAL CRACK: 1/16"W X FULL LENGTH, LOCATED APPROXIMATELY 8' BELOW THE WATERLINE ON THE SOUTH END OF THE PIER. 24. SPALL 3'L X 1.5'W X 2"D WITH EXPOSED REINFORCING, LOCATED JUST BELOW THE PIER HEAD. |
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Photographs



Photo 1 – South Elevation (Looking North)



Photo 2 – Typical Pier Configuration (Pier 2 Shown, Looking West)

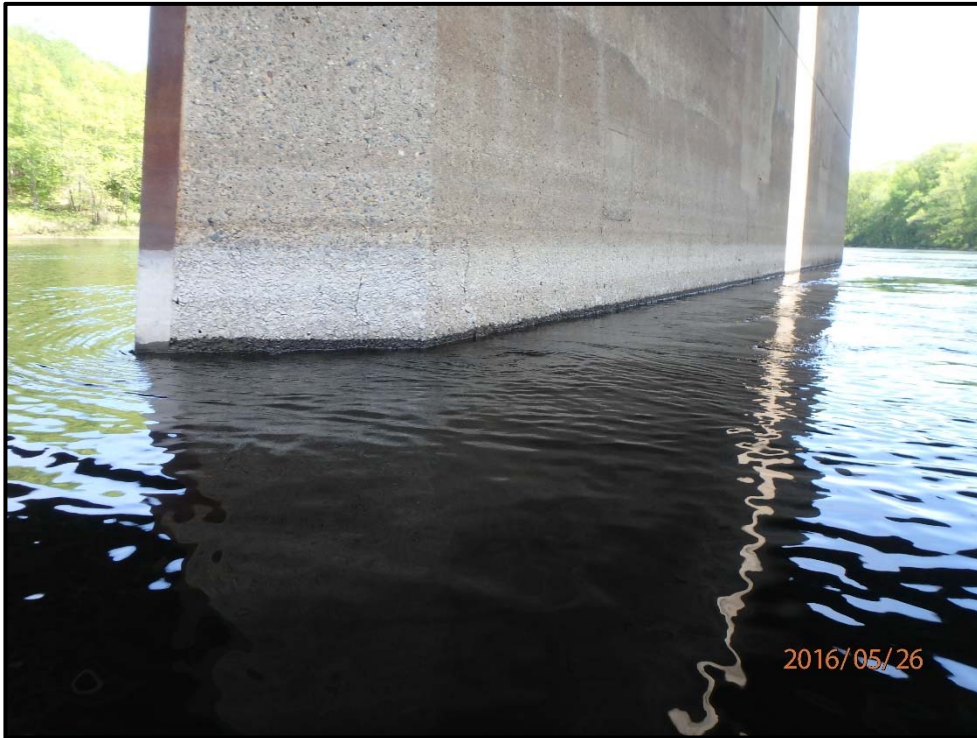


Photo 3 – Typical Abrasion Band (Pier 3 Shown, North/West Face)

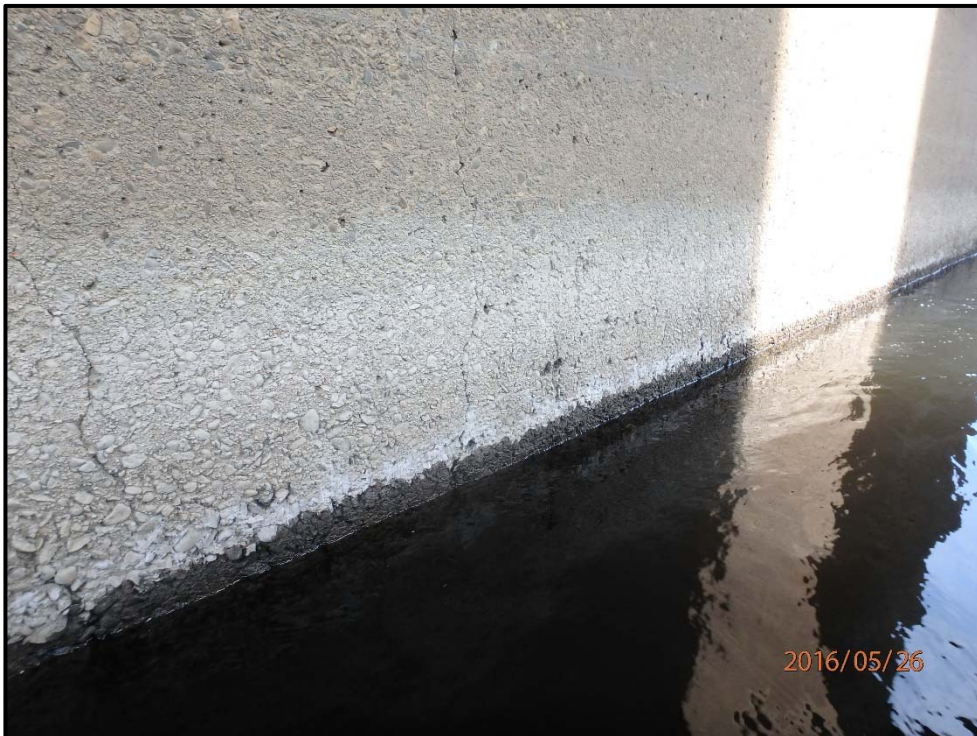


Photo 4 – Typical Vertical Cracking in Abrasion Band (Pier 3 Shown, West Face)



Photo 5 – Typical Spall with Exposed Reinforcing Steel (Pier 3 Shown, South Face)



Photo 6 – Typical Spall with Exposed Reinforcing (Pier 4 Shown, East Face)



Photo 7 – Typical Horizontal Crack in Pier (Pier 4 Shown, West Face)



Photo 8 – Typical Horizontal Crack in Exposed Footing (Pier 2 Shown, East Nose)

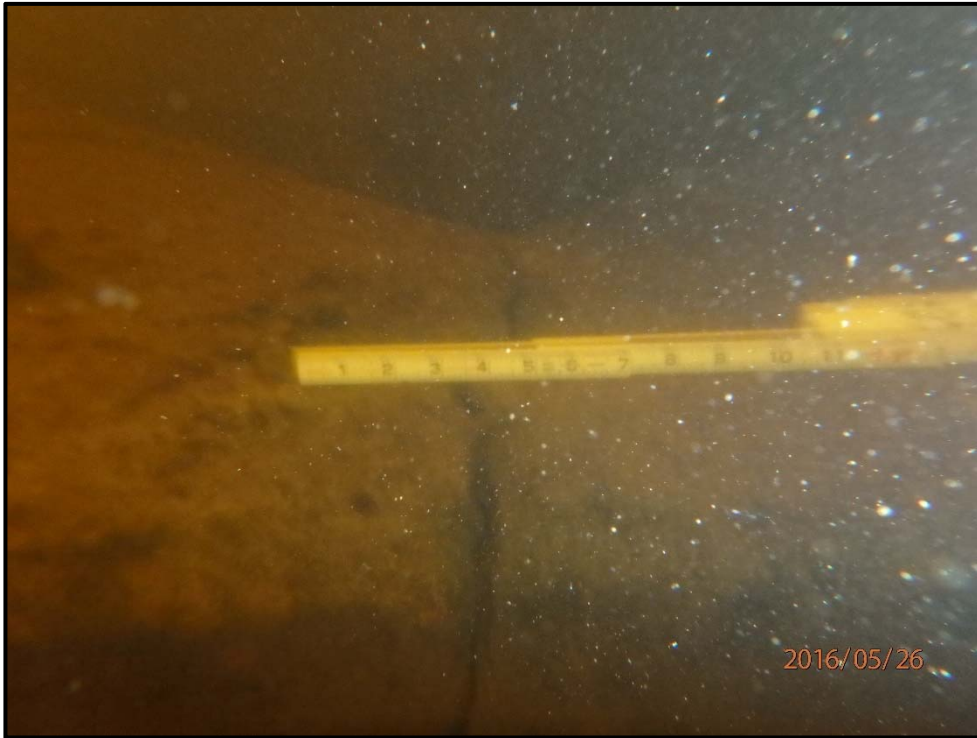


Photo 9 – Typical Vertical Crack in Exposed Footing (Pier 2 Shown, North Nose)

Repair Cost Estimate

Date Prepared: August 2016

ACTIVITY AND LOCATION Bridge 0086 and 1494 Repairs Lewiston, Maine			CONSTRUCTION CONTRACT NO.				IDENTIFICATION NUMBER				
			ESTIMATED BY Collins Engineers, Inc.				CATEGORY CODE NUMBER				
PROJECT TITLE Maine Turnpike Authority Underwater Bridge Inspections			STATUS OF DESIGN _X_ PED ___ 35% ___ 65% _X_ 100% ___ FINAL				JOB ORDER NUMBER				
			ITEM DESCRIPTION			QUANTITY		MATERIAL COST		LABOR COST	
No.	UNIT	UNIT COST				TOTAL	UNIT COST	TOTAL	UNIT COST	TOTAL	
Bridge Repairs											
Remove Timber Debris			1	LS	\$0	\$0	\$5,000	\$5,000	\$5,000	\$5,000	
Above Water Crack Repairs			210	LF	\$20	\$4,200	\$55	\$11,550	\$75	\$15,750	
Below Water Crack Repairs			510	LF	\$30	\$15,300	\$220	\$112,200	\$250	\$127,500	
Above Water Spall Repairs			810	SF	\$100	\$81,000	\$150	\$121,500	\$250	\$202,500	
Below Water Spall Repairs			1	SF	\$150	\$150	\$300	\$300	\$450	\$450	
									Subtotal	\$351,200	
Mobilization/Demobilization											
Mobilization/Demobilization			Estimated 15% For Medium Scale Project						15%	\$52,680	
									Subtotal	\$403,880	
Overhead and Profit											
Overhead									15%	\$60,582	
Profit									10%	\$40,388	
Contingency									10%	\$40,388	
									Subtotal	\$545,238	
									Estimated Budget Amount	\$545,238	
									Say	\$550,000	