



BRIDGE NO.04180

52980 - NEWTOWN
INTERSTATE 84 WESTBOUND
over
HOUSATONIC RIVER

Underwater Inspection

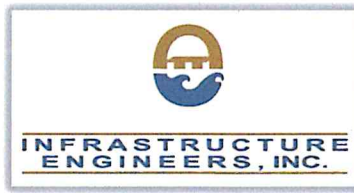
7/18/2018

Inspected by: Infrastructure



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Report Title Page

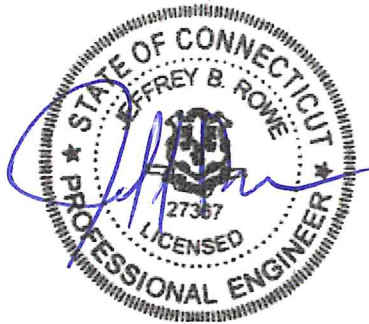
Project No.: 170-3339 (Underwater Inspections – NHS)

Structure: 04180, Interstate 84 Westbound over Housatonic River, Newtown

Inspected By: Infrastructure Engineers, Inc. **Inspection Date:** 7/18/2018

Professional Certification:

I hereby certify that this report, including all of its contents, has been approved by me, and that I am a duly licensed professional engineer under the laws of the State of Connecticut.



Jeffrey Rowe, PE (Infrastructure Engineers, Inc.)

PM / QAQC: Jeffrey Rowe, PE

CT License No.: 27367

Date: 8/10/2018

Form: Location

Inspection type: Underwater

Inspection Date: 7/18/2018

Inspected by: Infrastructure Engineers

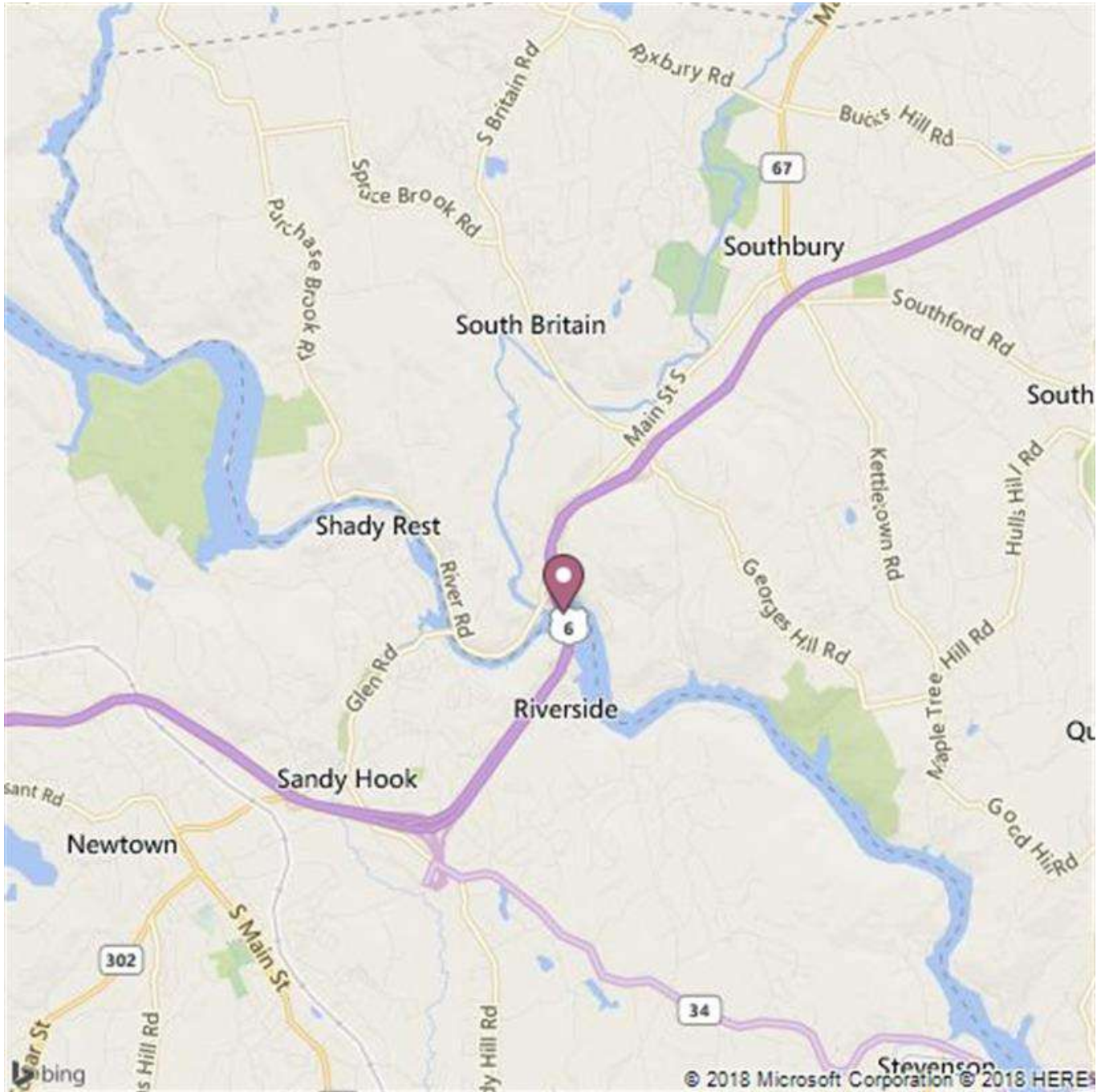
Bridge No: 04180

Town: NEWTOWN

Carried: INTERSTATE 84 WESTBOUND

Crossed: HOUSATONIC RIVER

Inventory Route: NHS



Location Map # 1
Bridge No. 04180
Interstate 84 Westbound over Housatonic
River
Newtown, CT

Form: BRI-19, Rev. 2/15
Inspection type: Underwater
Inspection Date: 7/18/2018
Inspected by: Infrastructure Engineers

Bridge No: 04180

Town: NEWTOWN
Carried: INTERSTATE 84 WESTBOUND
Crossed: HOUSATONIC RIVER
Inventory Route: NHS

STRUCTURE INVENTORY & APPRAISAL

INSPECTION

Structurally Deficient Functionally Obsolete
Sufficiency Rating
(90) Inspection Date (91) Frequency
Indepth Insp Proposed next Indepth Year
Deck Survey Date Class
Access Flagman

	Frequency	Date	Type
Fracture	<input type="text" value="24"/>	<input type="text"/>	C Two Girder System, welded plate girders
Underwater	<input type="text" value="24"/>	<input type="text" value="07/18/2018"/>	B Underwater Only
Special	<input type="text"/>	<input type="text"/>	<input type="text"/>

IDENTIFICATION

Bridge Name
Town Code - Name
(5) Inventory Route
(A) Record Type
(B) Signing Prefix
(C) Level of Service
(D) Route Number.
(E) Dir Suffix
(6A) Featured Intersected
(6B) Critical Facility Indicator
(7) Facility Carried
(9) Location
(11) Mile Post Miles
(16) Latitude Deg. Min. Sec.
(17) Longitude Deg. Min. Sec.
(98) Border Bridge
(A) State Code (B) Percent Responsibility %
(C) Border Town Name
(99) Border Bridge Structure No.

STRUCTURE TYPE & MATERIALS

(43) Structure Type, Main
A) Material
B) Design Type
(44) Structure Type, Approach
A) Material
B) Design Type
(45) Number of Spans, Main Unit
(46) Number of Approach Spans
(107) Deck Structure Type
(108) Wearing Surface/Protection Systems
A) Type of Wearing Surface
B) Type of Membrane
C) Type of Deck Protection
Substructure
A) Material
B) Design Type
Paint
Type
Year
Comment

GEOMETRIC DATA

(48) Length of Maximum Span ft.
(49) Structure Length ft.
(50) Curb or Sidewalk Widths
A) Left ft. in. B) Right ft. in.
(51) Bridge Roadway Width Curb to Curb ft. in.
(52) Deck Width, Out to Out ft. in.
(32) Approach Roadway Width ft.

(33) Bridge Median

Deck Area sq. ft.

(34) Skew Angle deg.

(35) Structure Flared

(10) Inv. Rte. Min. Vert. Clearance ft. in.

(47) Inv. Rte. Total Horiz. Clr. ft. in.

Log Inv. Rte. Total Horiz. Clr. ft. in.

RLog Inv. Rte. Total Horiz. Clr. ft. in.

(53) Min. Vert. Clearance Over Bridge ft. in.

(54) Log-Min. Vert. Underclearance ref. ft. in.

(55) Min. Lat Underclearance on Right ref. ft. in.

(56) Min. Lat Underclearance on Left ft. in.

CONDITION

(58) Deck

(59) Superstructure

(60) Substructure

(61) Channel & Channel Protections

(62) Culverts

(36) Traffic Safety Features

A) Bridge Railings

B) Transitions

C) Approach Guardrail

D) Approach Guardrail Ends

WATERWAY

Drainage Basin Waterway

(38) Navigation Control

(39) Navigation Vertical Clearance ft.

(40) Navigation Horiz. Clr. ft.

(111) Pier/Abutment Navigation

(116) Vert-Lift Brg Nav Min ft. in.

AGE AND SERVICE

Year Built (106) Year Reconstructed

(42) Type of Service

A) On

B) Under

(28) Number of Lanes

A) On B) Under

(29) Average Daily Traffic

Is Above Half ADT?

(109) Percent Truck %

(30) Years of ADT

(19) Bypass, Detour Length Miles

APPRAISALS

(67) Structural Evaluation

(68) Deck Geometry

(69) Underclearances, Vert. & Horiz.

(71) Waterway Adequacy

(72) Approach Roadway Alignment

(113) Scour Critical

COMMENTS

Special inspection: Horizontal cracking along floorbeams & main girders.

CLASSIFICATION

(112) NBIS Bridge Length

(104) Highway System

(26) Functional Class

(100) Defense Highway

(101) Parallel Structure

(102) Direction of Traffic

(103) Temporary Structure

(110) Designated National Network

(20) Toll

(21) Maintain

(22) Owner

Report Class

(37) Historical Significance

POSTED SIGNS

Other Posted Sign 1

Other Posted Sign 2

	Actual	Recomended	
Posted Load Single Unit Truck	<input type="text"/>	<input type="text"/>	tons
Posted Load Semi-Trailer Truck	<input type="text"/>	<input type="text"/>	tons
Posted Load 4 Axle Truck	<input type="text"/>	<input type="text"/>	tons
Posted Load 3S2 Truck	<input type="text"/>	<input type="text"/>	tons
All Vehicles	<input type="text"/>	<input type="text"/>	tons
Posted Vert. Clearance on Bridge	<input type="text"/> ft.	<input type="text"/> in.	
Posted Vert. Underclearance	<input type="text"/> ft.	<input type="text"/> in.	
Posted Speed Limit on Bridge	<input type="text"/> m.p.h.		

OTHER FEATURES

Fence Required

Fence Present

Fence Type

Fence Height

Fence Material

Fence Top Type

Barrel Ladders

Stand Pipes

Catwalks

Moveable Inspection System

Haunches Present over Roadway

Utilities

PROPOSED IMPROVEMENTS

(75A) Type of Work Proposed

(75B) Work Done By

(76) Length of Structure Improvement ft.

(94) Bridge Improvement Cost \$

(95) Roadway Improvement Cost \$

(96) Total Project Cost \$

(97) Year of Improvement Estimate

(114) Future ADT

(115) Year of Future ADT

DOT Bridge Program List No

Project No

Advertised Date

LOAD RATING & POSTING

(31) Design Load

(63) Operating Rating Type

(64) Operating Rating

(65) Inventory Rating Type

(66) Inventory Rating

Evaluation Code

Year of Evaluation

(70) Bridge Posting

(41) Structure Status

Form: BRI-19, Rev. 2/15

Inspection type: Underwater

Inspection Date: 7/18/2018

Inspected by: Infrastructure Engineers

Bridge No: 04180

Town: NEWTOWN

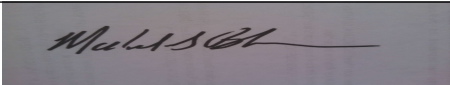
Carried: INTERSTATE 84 WESTBOUND

Crossed: HOUSATONIC RIVER

Inventory Route: NHS

INSPECTOR'S SIGNATURES:


1)  Date: 08/14/2018

2)  Date: 08/17/2018

3) _____ Date:

4) _____ Date:

P.E. SIGNATURE:



Date: 08/17/2018

P.E. #

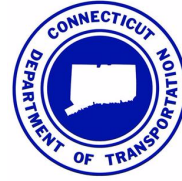
27367

Reviewed By:



Date: 09/04/2018

UNDERWATER INSPECTION (BRI-59)



Bridge: 04180 Town: 52980 - NEWTOWN Carried: INTERSTATE 84 WESTBOUND Crossed: HOUSATONIC RIVER

Total Number of Piers: 3

Piers in the Water: 3

Boat Used? Yes

Boat Size: 26'

Dive Station Used? Yes

Access to Bridge: Boat

Access/ Equipment Comments U/W: Underwater Inspections performed in conjunction with Bridge No. 01218.
Boat ramp located at the end of Scout Road in Southbury.

Type of water: Fresh

Marine Growth: Minor aquatic growth and zebra mussels up to 1" thick.

Max Water Depth: 25.0'

Max Water Depth at Pier Or Abutment: 25.0'

Current Strength: 1.0 fps

U/W Visibility: 8.0'

Bottom Composition: Cobbles, silt, river rock, and sand with up to 5.0' penetration into the channel bottom.

Form: BRI-58.

Inspection type: Underwater

Inspection Date: 7/18/2018

Inspected by: Infrastructure Engineers

Bridge No: 04180

Town: NEWTOWN

Carried: INTERSTATE 84 WESTBOUND

Crossed: HOUSATONIC RIVER

Inventory Route: NHS

UNDERWATER INSPECTION

ITEM	RATING	REMARKS
60. SUBSTRUCTURE	6	REINFORCED CONCRETE ABUTMENTS AND PIERS
ABUTMENT 1:	N	South Abutment. Located out of the channel.
STEM	N	
FOOTING	N	
EROSION	N	
SETTLEMENT	N	
SCOUR	N	
WINGWALLS	N	
General Remarks:		
ABUTMENT 2:	N	North Abutment. Located out of the channel.
STEM	N	
FOOTING	N	
EROSION	N	
SETTLEMENT	N	
SCOUR	N	
WINGWALLS	N	
General Remarks:		
PIER NO. 1	6	
PILES	N	• There is no exposure of the steel H-piles.
STEM	6	The reinforced concrete pier has the following deficiencies: <ul style="list-style-type: none"> • 5' high band of abrasion up to 1/4" deep extending from 1' above to 4' below the water surface. • Horizontal cracks up to 17' long x up to 1/2" wide along the cold joints above and below water. • Near the midpoint of the footing on both faces there is a vertical hairline crack x 5' long with efflorescence. • The north face has isolated vertical hairline cracks x up to 2' long throughout. • Random areas of Zebra mussels up to 50% coverage x 1" thick. (See UW Drawings 5 & 6 and Photos 3 - 5)
FOOTING	6	The step footing has the following deficiencies: <ul style="list-style-type: none"> • Step footing exposed over its full-length x up to full-height (5.4' high) along both faces of the pier. • Footing exposed up to 5.1' vertically over a length of 37' along the pier on both faces with no undermining. • Isolated vertical hairline cracks up to 5' long with efflorescence. (See UW Drawings 5 & 6 and Photos 6 & 7)

Form: BRI-58.

Inspection type: Underwater

Inspection Date: 7/18/2018

Inspected by: Infrastructure Engineers

Bridge No: 04180

Town: NEWTOWN

Carried: INTERSTATE 84 WESTBOUND

Crossed: HOUSATONIC RIVER

Inventory Route: NHS

SCOUR	6	<ul style="list-style-type: none">• Channel elevations have varied around the pier with an increase by up to 1.9', this is possibly due to the timber surrounding the pier.• Along the north face of the pier, there is a 20' length of sheet pile exposure up to 6' high located 5' off the pier face.• The Step Footing is exposed over its full-length x up to full-height (5.4' high) along both faces of the pier,• Footing has been exposed up to 5.1' vertically (previously 5.0' high) over a length of 37' on both faces of the pier.
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(See UW Drawings 5 & 6)

SETTLEMENT	8	<ul style="list-style-type: none">• No apparent settlement observed.
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General Remarks:

PIER NO. 2 6

PILES	N	<ul style="list-style-type: none">• There is no exposure of the steel H-piles.
-------	---	--

STEM	7	The reinforced concrete pier has the following deficiencies:
------	---	--

- 5' high band of abrasion up to 1/4" deep extending from 1' above to 4' below the water surface.
- There are steel H-piles intermittently exposed along the stem located above the step footing (formwork left in place from construction).
- Random areas of Zebra mussels up to 50% coverage x 1" thick.

(See UW Drawings 7 & 8 and Photos 8 - 10)

FOOTING	6	The step footing and footing have the following deficiencies:
---------	---	---

- The step footing is exposed over its full-length x up to full-height (5.0' high) on both faces of the pier.
- The footing has been exposed full length x up to full-height (5.5' high) on the south face and full length x up to 1.7' high (previously 0.2' high) on the north face of the pier with no undermining.
- The tremie seal has been exposed up to 1.0' long across the full-width of the Upstream (West) Nose and over 2' long x 0.5' high at the southwest corner of the pier.
- Random vertical hairline cracks up to 3' long with efflorescence on the footing.
- Isolated edge spalls on the footing up to 2' long x 4" wide x up to 4" deep.
- At the center of the Downstream (South) face of the step footing there is a spall 18" long x 1' wide x 4" deep.
- At the southwest corner of the footing/tremie interface there is a spall 2' long x 4" high x 3" deep.

(See UW Drawings 7 & 8 and Photos 10 & 11)

SCOUR	5	<ul style="list-style-type: none">• Channel elevations surrounding Pier 2 has had aggradation of up to 3.1' with isolated areas of degradation up to 3.0'.• The step footing is exposed full length x up to full-height (5.0' high) on both faces of the pier.• The footing has been exposed over its full-length x up to full-height (5.5' high) on the south face and full length x up to 1.7' high on the north face of the pier.• The Tremie Seal has been exposed up to 1.0' high (previously 0.9' high) across the full-width of the Upstream (West) Nose and over 2' long x 0.5' high at the southwest corner of the pier.
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(See UW Drawings 7 & 8)

SETTLEMENT	8	<ul style="list-style-type: none">• No apparent settlement observed.
------------	---	--

General Remarks:

PIER NO. 3 6

PILES	N	<ul style="list-style-type: none">• There is no exposure of the steel H-piles.
-------	---	--

STEM	7	The reinforced concrete pier has the following deficiencies:
------	---	--

- Band of abrasion up to 1/4" deep extending from 1' above the water surface down to the channel bottom.

- The north face towards the Upstream (West) Nose of the pier there is a 1.7' long vertical hairline crack below the construction joint.

(See UW Drawings 9 & 10 and Photos 12 & 13)

FOOTING N

- There is no exposure of the step footing or footing at the pier.
- There is a section of sheet pile exposed up to 6" high along the south face of the pier approximately 12.5' off the pier face.

(See UW Drawing 3)

SCOUR 7

- Channel bottom elevations have remained relatively unchanged (less than 0.6' variations) except for scour up to 3.0' along the north face of the pier since 2016 Inspection.

(See UW Drawings 9 & 10)

SETTLEMENT 8

- No apparent settlement observed.

General Remarks:

61. CHANNEL & CHANNEL PROTECTION:

5

The Housatonic River is a fresh body of water that flows from West to East beneath the structure.

CHANNEL SCOUR 5

- Channel bottom elevations along the upstream and downstream fascias have random areas of mostly aggradation up to 4.0' since the 2016 Underwater Inspection.
- Channel bottom elevations at Pier 1 have varied around the pier with an increase by up to 1.9', this is possibly due to the timber surrounding the pier since the 2016 Underwater Inspection.
- Channel bottom elevations at Pier 2 show evidence of aggradation of up to 3.1' with isolated areas of degradation up to 3.0' since the 2016 Underwater Inspection.
- Channel bottom elevations at Pier 3 south face have remained relatively unchanged (less than 0.6' variations) as compared to the 2016 Underwater Inspections.
- Channel bottom elevations at Pier 3 show evidence of degradation of up to 3.0' along the north face of the pier most likely due to the sandbar that was noted in the previous 2016 Underwater Inspection.
- At Piers 1 and 2, the step footing and footing have been exposed due to scour.
- At Pier 1, the step footing is exposed over its full-length x up to full-height (5.4' high) along both faces of the pier, and the footing has been exposed up to 5.1' vertically (previously 5.0' high) over a length of 37' on both faces of the pier.
- At Pier 2, the step footing is exposed over its full-length x up to full-height (5.0' high) on both faces of the pier and the footing has been exposed over its full-length x up to full-height (5.5' high) on the south face and full length x up to 1.7' high (previously 0.2' high) on the north face of the pier.
- At Pier 2 the Tremie Seal has been exposed up to 1.0' high (previously 0.9') across the full-width of the upstream (west) nose and over 2' long x up to 0.5' high at the southwest corner of the pier.
- There is no exposure of the footings at Pier 3.

(See UW Drawings 1 - 10)

EMBANKMENT EROSION 7

- There is no significant erosion along the channel embankments.

(See Photos 19 & 20)

DEBRIS 5

- There is timber debris up to 1' diameter at the upstream (west) and downstream (east) noses of Pier 1.
- There is moderate timber debris up to 2' diameter along the north face of Pier 1.
- There is timber debris up to 1' diameter at the upstream (west) nose of Pier 2.

VEGETATION 7

- The channel embankments are well vegetated.

CHANNEL CHANGE 7

- There is no apparent change to the channel orientation.
- Bridge No. 01218 is located approximately 40' downstream (East) of the bridge.
- There is approximately a 150' long x 20' wide x 3' high sandbar/area of aggradation located north of Pier 3.

(See UW Drawings 1 - 3 and Photos 16 - 18)

FENDER SYSTEM N

SPUR DIKES & JETTIES N

RIP RAP N

Form: BRI-58.

Inspection type: Underwater

Inspection Date: 7/18/2018

Inspected by: Infrastructure Engineers

Bridge No: 04180

Town: NEWTOWN

Carried: INTERSTATE 84 WESTBOUND

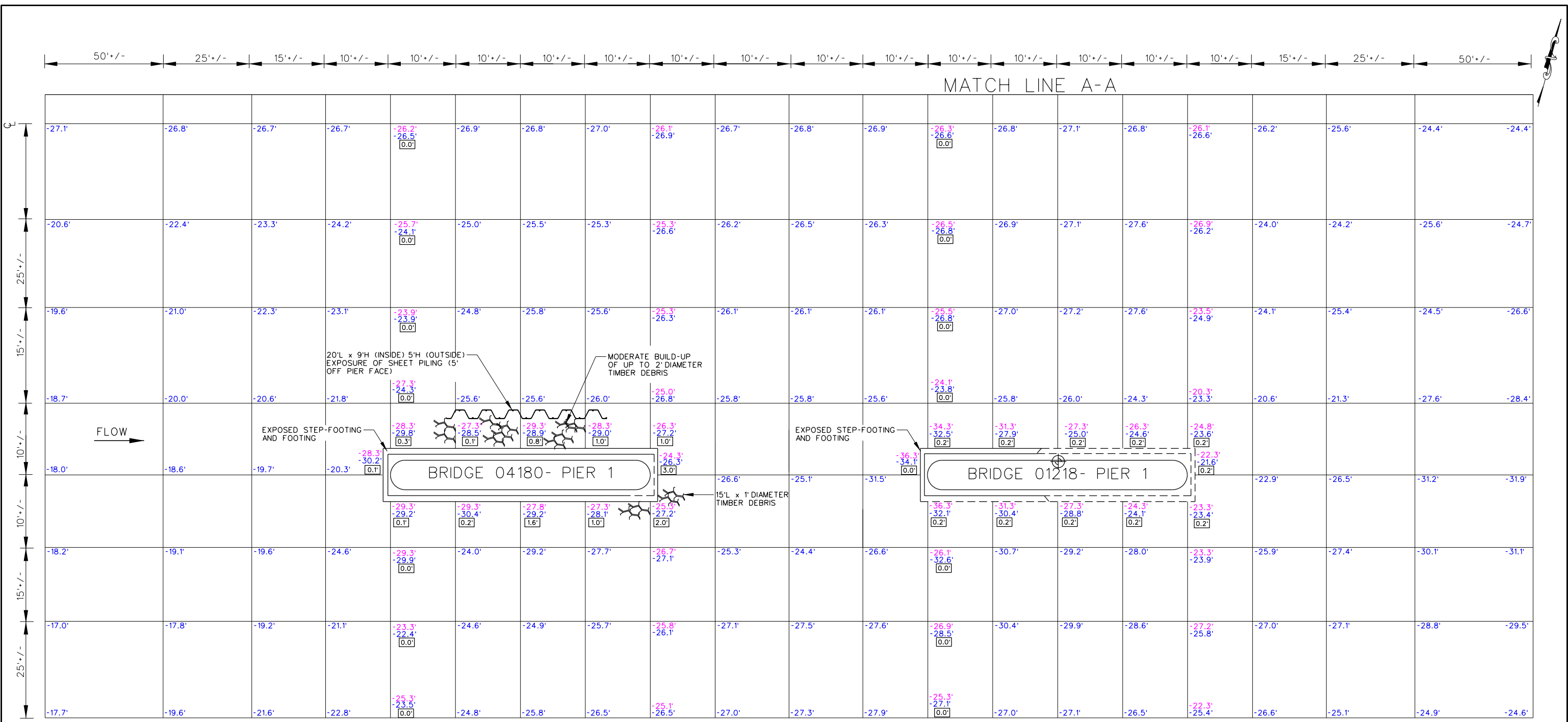
Crossed: HOUSATONIC RIVER

Inventory Route: NHS

General Remarks:

The navigation lights on Pier 1, Span 2 Fascia and Pier 2 and the west bridge fascia appear to be on timers and were not on at the time of the inspection.

(Photos 20 -22)



SOUNDING PLAN
N.T.S.

LEGEND FOR BOTTOM ELEVATIONS

JULY, 2018: -0.0'
JULY, 2016: -0.0'

LEGEND FOR SYMBOLS

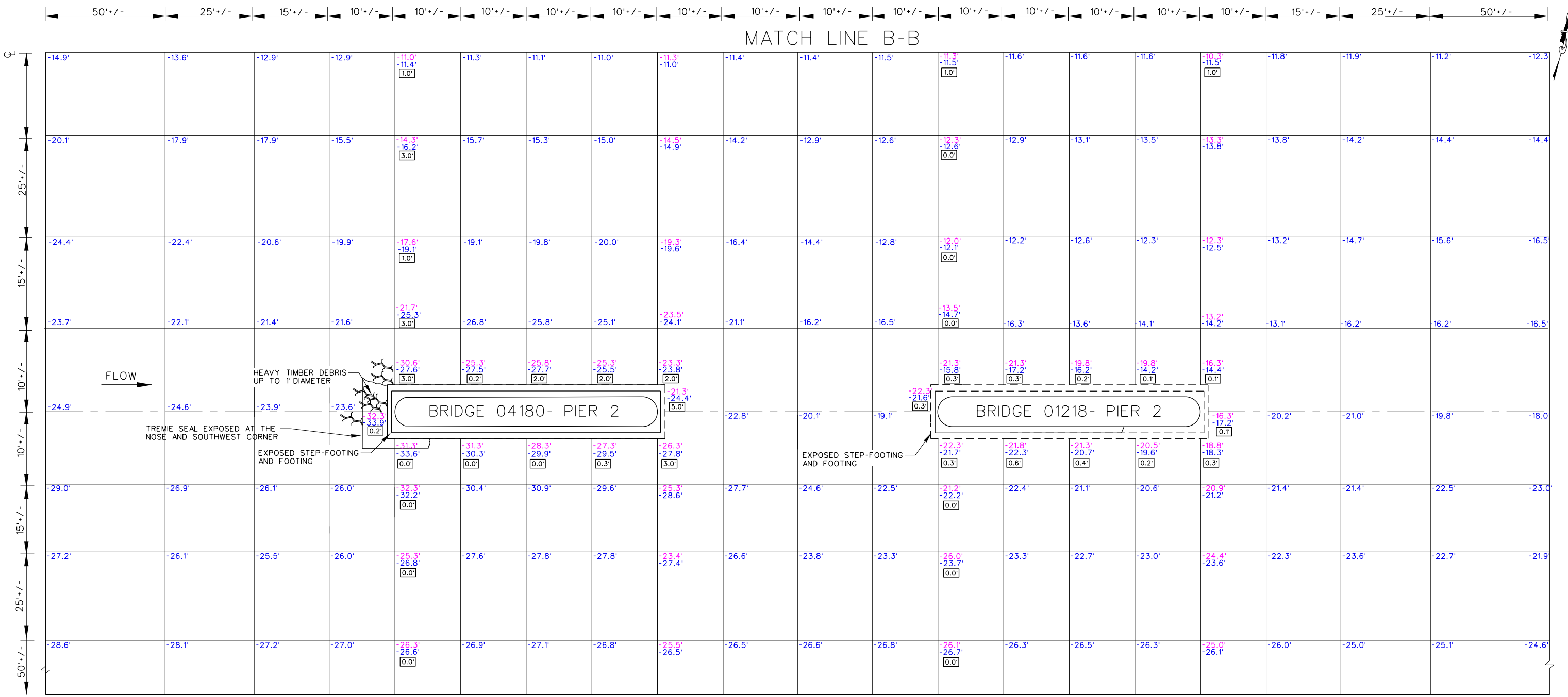
- ⊕ DATUM ELEV. 0.0' TAKEN FROM THE EASTBOUND BRIDGE 01218 AT THE SECOND CONSTRUCTION JOINT DOWN FROM THE TOP OF THE PIER AT THE CENTERLINE OF THE NORTH FACE OF PIER 1
- ▽ W.S. ELEV. -7.3'
-7.3'
- ⊠ DEPTH OF PENETRATION

INFRASTRUCTURE ENGINEERS, INC.
1-888-451-6822

CONNECTICUT DEPARTMENT OF TRANSPORTATION			
BRIDGE NO. 04180			
ROUTE 84 WESTBOUND OVER HOUSATONIC RIVER			
NEWTOWN		CONNECTICUT	
SOUNDING PLAN			
INSPECTED BY: JK, MB, JW	SCALE: AS SHOWN	DATE OF INSPECTION: 07 / 18 / 18	DRAWING NO. 04180 A
REVISED BY: FH			

UW DRAWING 1

MATCH LINE B-B



MATCH LINE A-A

SOUNDING PLAN

N.T.S.

LEGEND FOR BOTTOM ELEVATIONS

JULY, 2018: -0.0'
 JULY, 2016: -0.0'

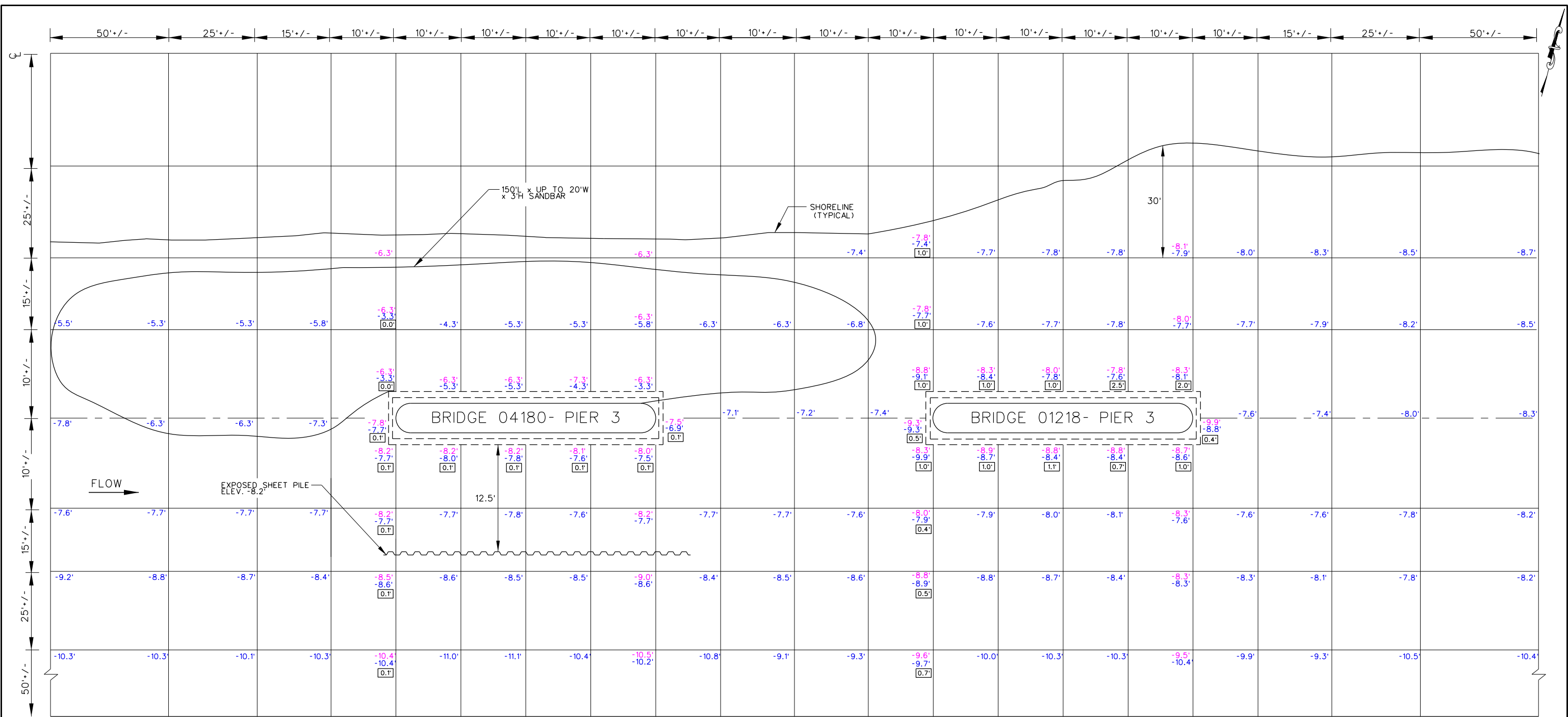
LEGEND FOR SYMBOLS

- ⊕ DATUM ELEV. 0.0' TAKEN FROM THE EASTBOUND BRIDGE 01218 AT THE SECOND CONSTRUCTION JOINT DOWN FROM THE TOP OF THE PIER AT THE CENTERLINE OF THE NORTH FACE OF PIER 1
- ▽ W.S. ELEV. -7.3'
-7.3'
- ☐ DEPTH OF PENETRATION

INFRASTRUCTURE ENGINEERS, INC.
 1-888-451-6822

CONNECTICUT DEPARTMENT OF TRANSPORTATION			
BRIDGE NO. 04180			
ROUTE 84 WESTBOUND OVER HOUSATONIC RIVER			
NEWTOWN			CONNECTICUT
SOUNDING PLAN			
INSPECTED BY: JK, MB, JW	SCALE: AS SHOWN	DATE OF INSPECTION: 07 / 18 / 18	DRAWING NO. 04180 B
REVISED BY: FH			

UW DRAWING 2



MATCH LINE B-B

SOUNDING PLAN
N.T.S.

LEGEND FOR BOTTOM ELEVATIONS

JULY, 2018: -0.0'
JULY, 2016: -0.0'

LEGEND FOR SYMBOLS

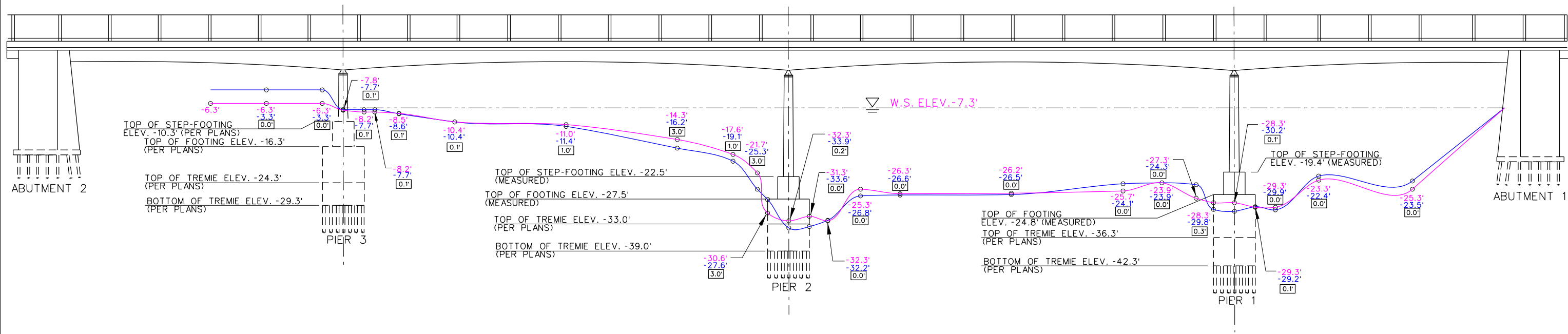
- ⊕ DATUM ELEV. 0.0' TAKEN FROM THE EASTBOUND BRIDGE 01218 AT THE SECOND CONSTRUCTION JOINT DOWN FROM THE TOP OF THE PIER AT THE CENTERLINE OF THE NORTH FACE OF PIER 1
- ▽ W.S. ELEV. -7.3'
-7.3'
- ☐ DEPTH OF PENETRATION



INFRASTRUCTURE ENGINEERS, INC.
1-888-451-6822

CONNECTICUT DEPARTMENT OF TRANSPORTATION			
BRIDGE NO. 04180			
ROUTE 84 WESTBOUND OVER HOUSATONIC RIVER			
NEWTOWN			CONNECTICUT
SOUNDING PLAN			
INSPECTED BY: JK, MB, JW	SCALE: AS SHOWN	DATE OF INSPECTION: 07 / 18 / 18	DRAWING NO. 04180 C
REVISED BY: FH			

UW DRAWING 3



UPSTREAM (WEST) ELEVATION

N.T.S.

LEGEND FOR BOTTOM ELEVATIONS

JULY, 2018: -0.0'
 JULY, 2016: -0.0'

LEGEND FOR MUDLINE ELEVATIONS

— JULY 2018
 — JULY 2016

LEGEND FOR SYMBOLS

- ⊕ DATUM ELEV. 0.0' TAKEN FROM THE EASTBOUND BRIDGE 01218 AT THE SECOND CONSTRUCTION JOINT DOWN FROM THE TOP OF THE PIER AT THE CENTERLINE OF THE NORTH FACE OF PIER 1
- ▽ W.S. ELEV. -7.3'
- ☐ DEPTH OF PENETRATION



INFRASTRUCTURE ENGINEERS, INC.
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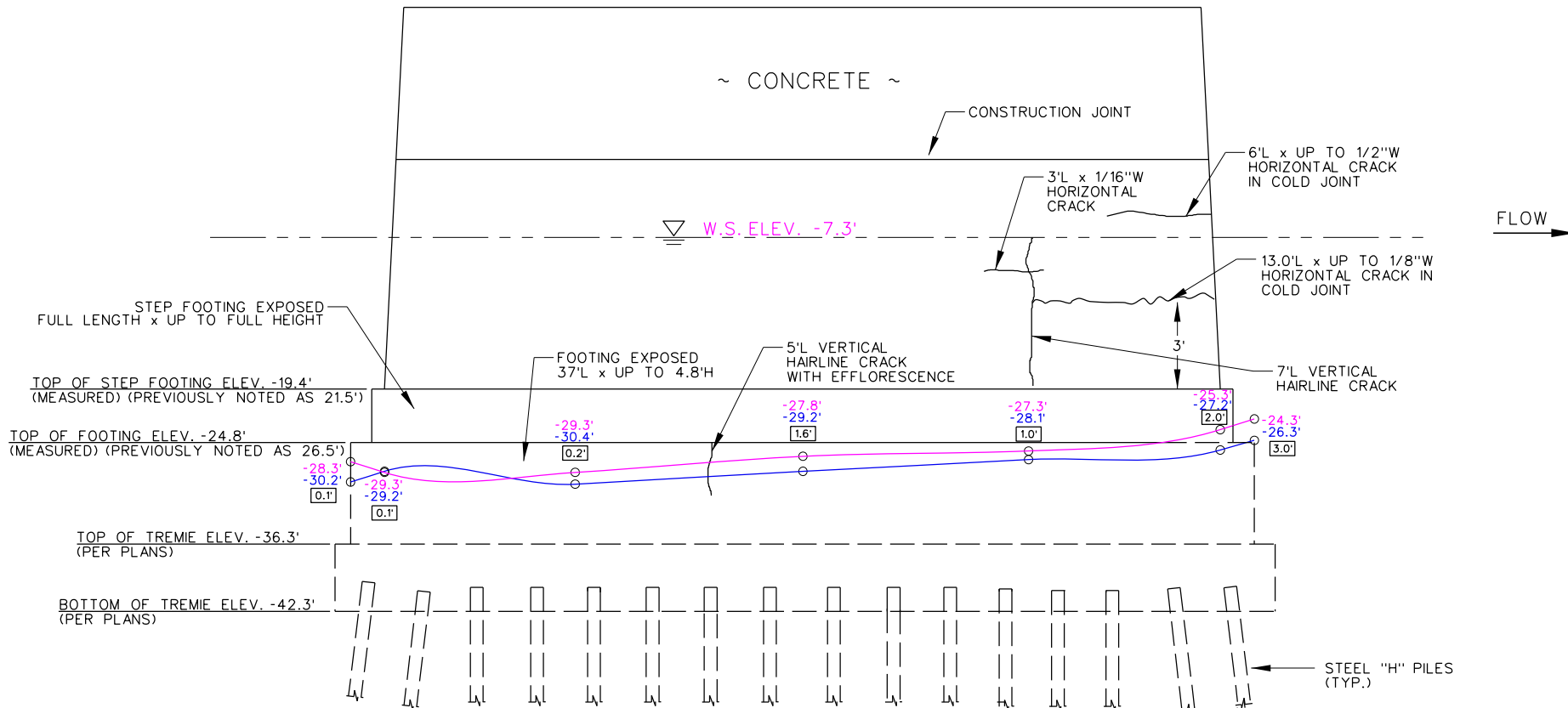
CONNECTICUT DEPARTMENT OF TRANSPORTATION

BRIDGE NO. 04180
 ROUTE 84 WESTBOUND OVER HOUSATONIC RIVER
 NEWTOWN CONNECTICUT

UPSTREAM (WEST) ELEVATION

INSPECTED BY: JK, MB, JW
 REVISIONS: FH
 SCALE: AS SHOWN
 DATE OF INSPECTION: 07 / 18 / 18
 DRAWING NO. 04180 D

UW DRAWING 4



PIER 1 (SOUTH) ELEVATION
N.T.S.

NOTE:

1. TIMBER DEBRIS UP TO 1' DIA. AT THE UPSTREAM AND DOWNSTREAM NOSE ALONG THE CHANNEL BOTTOM.
2. ABRASION UP TO 1/4" D FROM 4' BELOW WATER SURFACE TO 1' ABOVE.
3. RANDOM AREAS OF ZEBRA MUSSELS UP TO 50% COVERAGE X 1" THICK ON UNDERWATER SUBSTRUCTURE.

LEGEND FOR SYMBOLS


- ⊕ DATUM ELEV. 0.0' TAKEN FROM THE EASTBOUND BRIDGE 01218 AT THE SECOND CONSTRUCTION JOINT DOWN FROM THE TOP OF THE PIER AT THE CENTERLINE OF THE NORTH FACE OF PIER 1
- ▽ W.S. ELEV. -7.3'
- 7.3'
- [0.0] DEPTH OF PENETRATION

LEGEND FOR BOTTOM ELEVATIONS

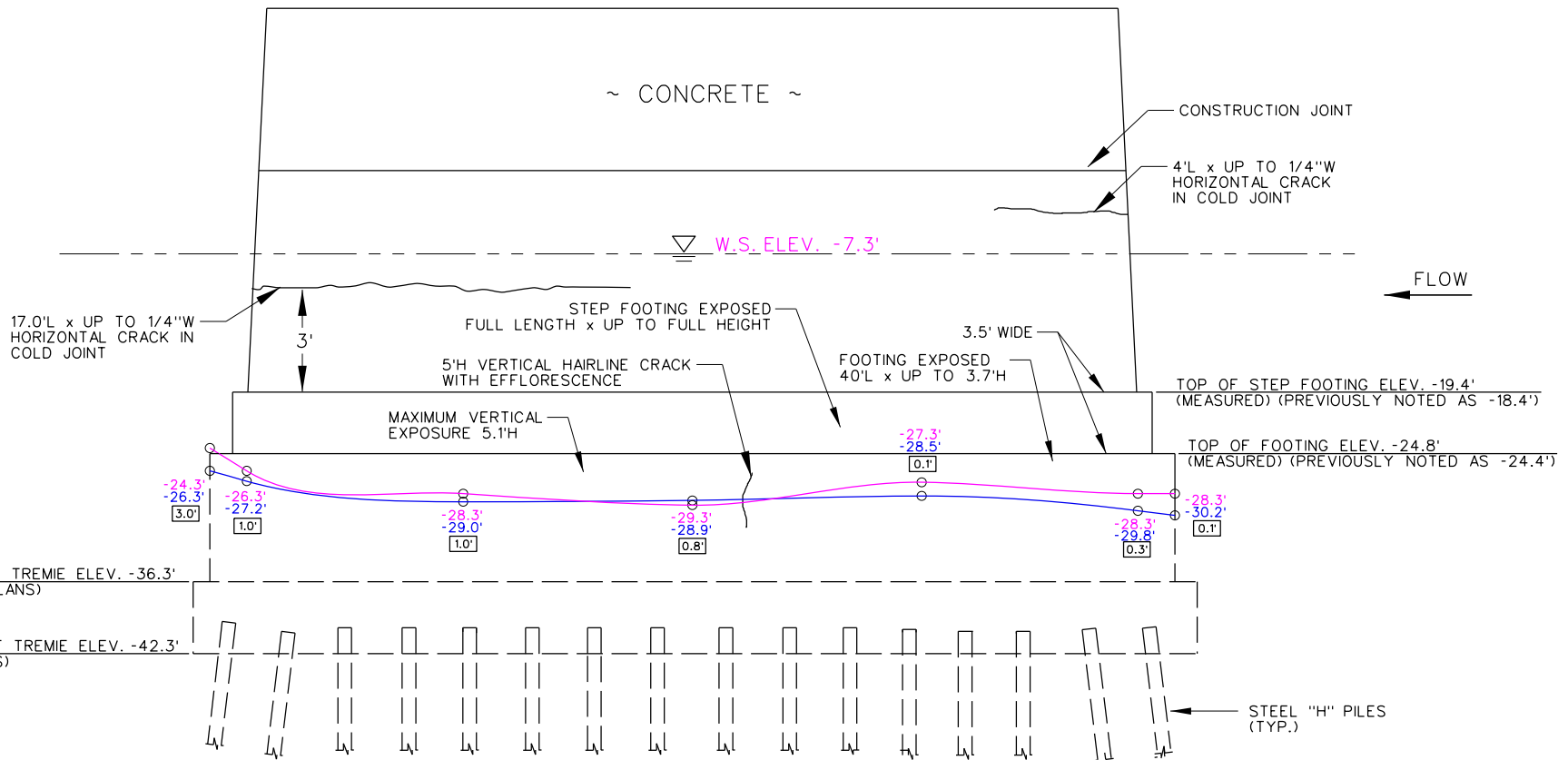
JULY, 2018: -0.0'
JULY, 2016: -0.0'

LEGEND FOR MUDLINE ELEVATIONS

— JULY, 2018
— JULY, 2016

 INFRASTRUCTURE ENGINEERS, INC. 1-888-451-6822		CONNECTICUT DEPARTMENT OF TRANSPORTATION	
		BRIDGE NO. 04180 ROUTE 84 WESTBOUND OVER HOUSATONIC RIVER NEWTOWN CONNECTICUT	
PIER 1 (SOUTH) ELEVATION			
INSPECTED BY: JK, MB, JW REVISED BY: FH	SCALE: AS SHOWN	DATE OF INSPECTION 07 / 18 / 18	DRAWING NO. 04180 E

UW DRAWING 5



NOTE:

1. TIMBER DEBRIS UP TO 1' DIA. AT THE UPSTREAM AND DOWNSTREAM NOSE ALONG THE CHANNEL BOTTOM, AND UP TO 2' DIA. ALONG THE SOUTH FACE.
2. ABRASION UP TO 1/4" DEEP FROM 4' BELOW WATER SURFACE TO 1' ABOVE.
3. PIER STEM DISPLAYS ISOLATED VERTICAL HAIRLINE CRACKS UP TO 2' LONG.
4. 20' LONG SHEET PILING 5' OFF OF THE FOOTING UP TO 9' HIGH (INSIDE), 5'H (OUTSIDE).
5. RANDOM AREAS OF ZEBRA MUSSEL UP TO 50% COVERAGE X 1" THICK ON UNDERWATER SUBSTRUCTURE.

PIER 1 (NORTH) ELEVATION

N.T.S.

LEGEND FOR SYMBOLS

⊕ DATUM ELEV. 0.0' TAKEN FROM THE EASTBOUND BRIDGE 01218 AT THE SECOND CONSTRUCTION JOINT DOWN FROM THE TOP OF THE PIER AT THE CENTERLINE OF THE NORTH FACE OF PIER 1

▽ W.S. ELEV. -7.3' -7.3'

[0.0] DEPTH OF PENETRATION

LEGEND FOR BOTTOM ELEVATIONS

JULY, 2018: -0.0'
JULY, 2016: -0.0'

LEGEND FOR MUDLINE ELEVATIONS

— JULY, 2018
— JULY, 2016



INFRASTRUCTURE ENGINEERS, INC.

1-888-451-6822

CONNECTICUT DEPARTMENT OF TRANSPORTATION

BRIDGE NO. 04180
ROUTE 84 WESTBOUND OVER HOUSATONIC RIVER

NEWTOWN

CONNECTICUT

PIER 1 (NORTH) ELEVATION

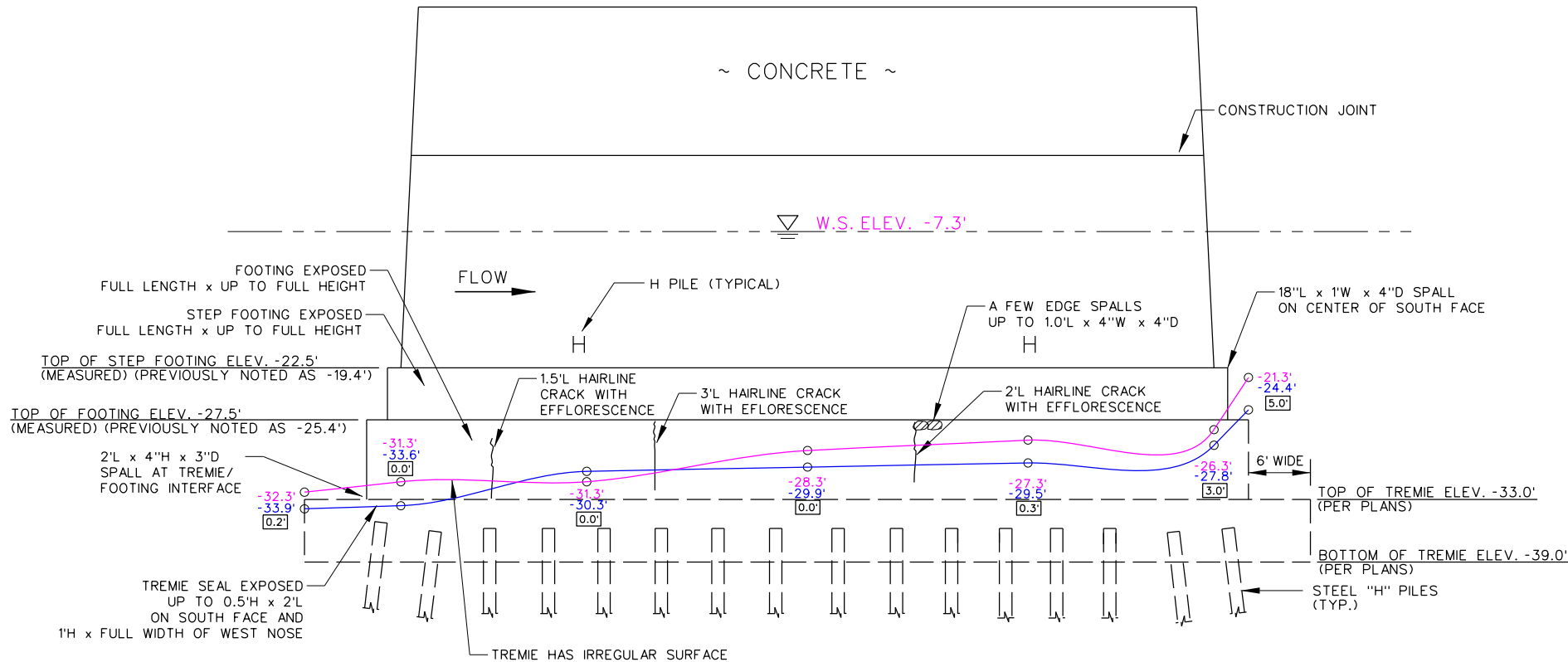
INSPECTED BY: JK, MB, JW
REVISED BY: FH

SCALE:
AS SHOWN

DATE OF INSPECTION
07 / 18 / 18

DRAWING NO. 04180 F

UW DRAWING 6



PIER 2 (SOUTH) ELEVATION
N.T.S.

NOTE:

1. HEAVY TIMBER DEBRIS UP TO 1' DIA. AT THE UPSTREAM NOSE ALONG CHANNEL BOTTOM.
2. ABRASION UP TO 1/8" DEEP FROM 4' BELOW TO 1.0' ABOVE THE WATER SURFACE.
3. RANDOM AREAS OF ZEBRA MUSSELS UP TO 50% COVERAGE x 1" THICK ON UNDERWATER SUBSTRUCTURE.

LEGEND FOR SYMBOLS

- ⊕ DATUM ELEV. 0.0' TAKEN FROM THE EASTBOUND BRIDGE 01218 AT THE SECOND CONSTRUCTION JOINT DOWN FROM THE TOP OF THE PIER AT THE CENTERLINE OF THE NORTH FACE OF PIER 1
- ▽ W.S. ELEV. -7.3'
- [0.0] DEPTH OF PENETRATION

LEGEND FOR BOTTOM ELEVATIONS

JULY, 2018: -0.0'
JULY, 2016: -0.0'

LEGEND FOR MUDLINE ELEVATIONS

— JULY, 2018
— JULY, 2016



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CONNECTICUT DEPARTMENT OF TRANSPORTATION

BRIDGE NO. 04180
ROUTE 84 WESTBOUND OVER HOUSATONIC RIVER

NEWTOWN

CONNECTICUT

PIER 2 (SOUTH) ELEVATION

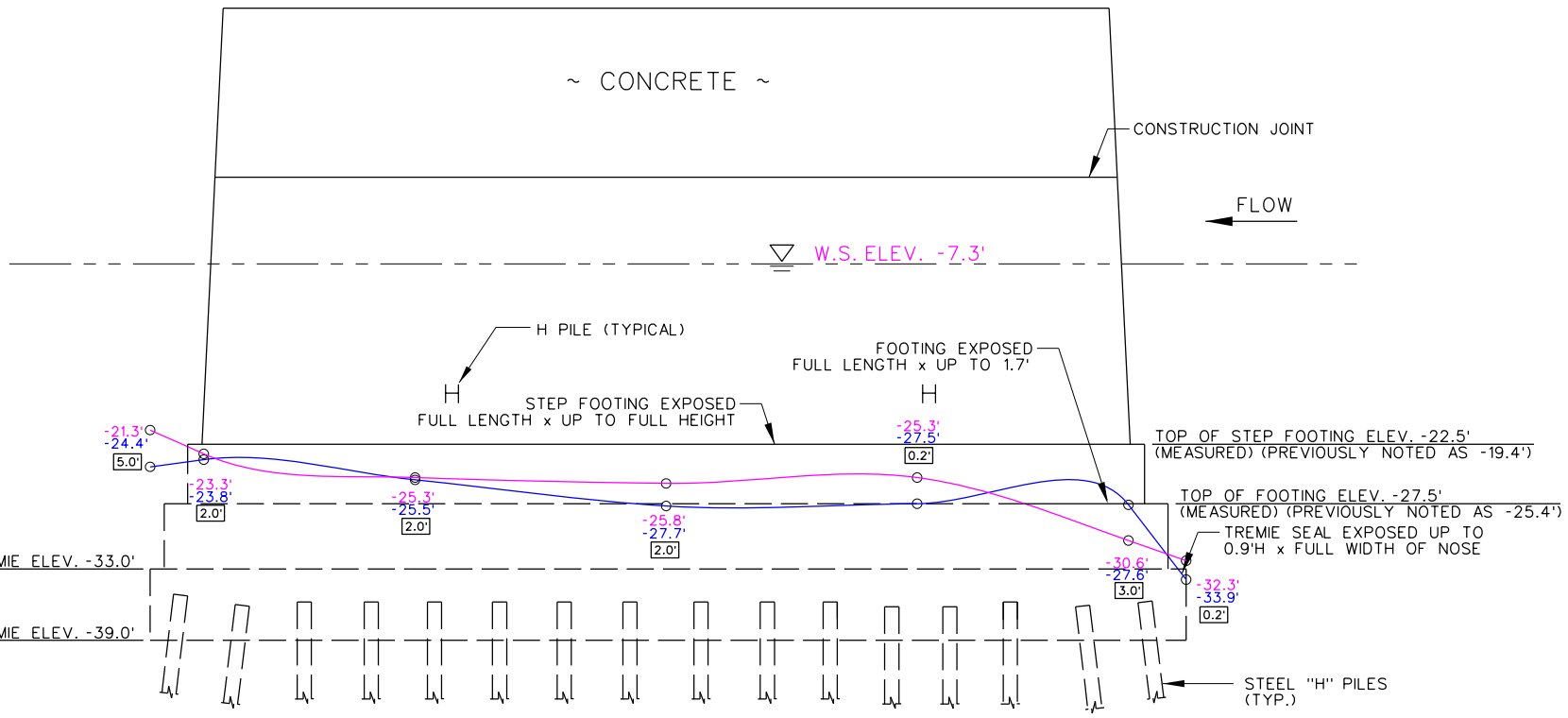
INSPECTED BY: JK, MB, JW
REVISED BY: FH

SCALE:
AS SHOWN

DATE OF INSPECTION
07 / 18 / 18

DRAWING NO. 04180 G

UW DRAWING 7



NOTE:

1. HEAVY TIMBER DEBRIS UP TO 1' DIA. AT THE UPSTREAM NOSE ALONG CHANNEL BOTTOM.
2. ABRASION UP TO 1/4" DEEP FROM 4' BELOW THE WATER SURFACE TO 1' ABOVE.
3. RANDOM AREAS OF ZEBRA MUSSELS UP TO 50% COVERAGE x 1" THICK ON UNDERWATER SUBSTRUCTURE.

PIER 2 (NORTH) ELEVATION
N.T.S.

LEGEND FOR SYMBOLS

⊕ DATUM ELEV. 0.0' TAKEN FROM THE EASTBOUND BRIDGE 01218 AT THE SECOND CONSTRUCTION JOINT DOWN FROM THE TOP OF THE PIER AT THE CENTERLINE OF THE NORTH FACE OF PIER 1

▽ W.S. ELEV. -7.3'

[0.0'] DEPTH OF PENETRATION

LEGEND FOR BOTTOM ELEVATIONS

JULY, 2018: -0.0'
JULY, 2016: -0.0'

LEGEND FOR MUDLINE ELEVATIONS

— JULY, 2018
— JULY, 2016



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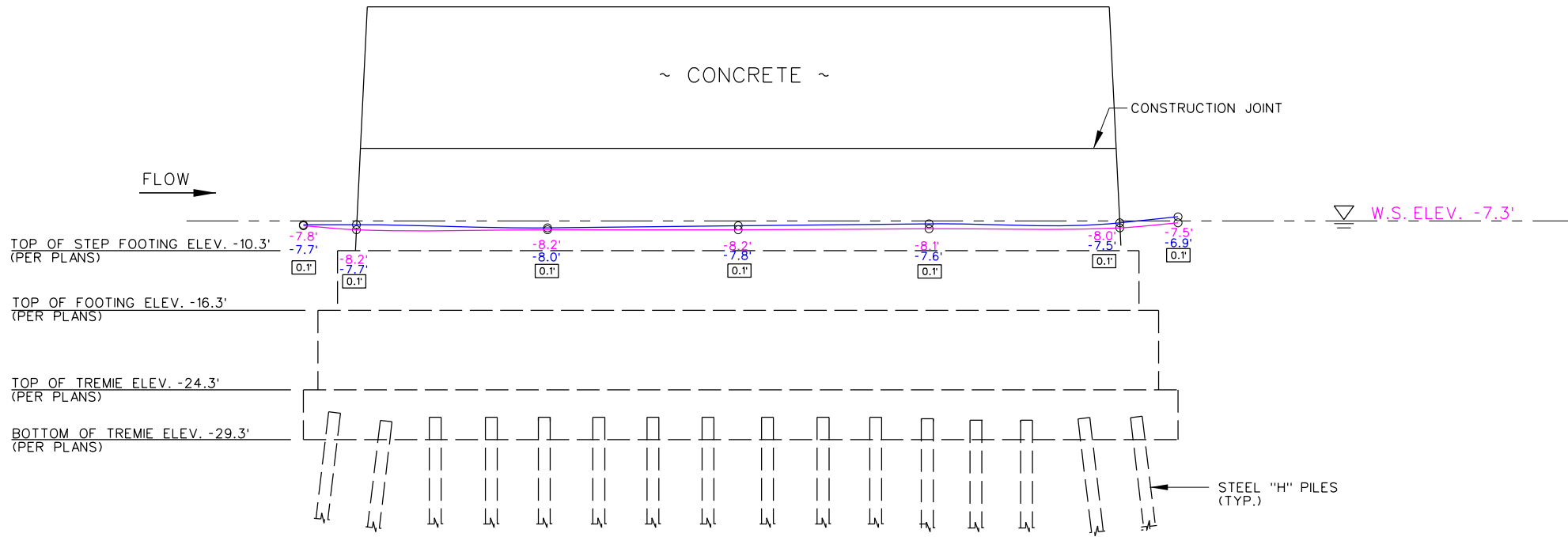
CONNECTICUT DEPARTMENT OF TRANSPORTATION

BRIDGE NO. 04180
ROUTE 84 WESTBOUND OVER HOUSATONIC RIVER
CONNECTICUT

PIER 2 (NORTH) ELEVATION

INSPECTED BY: JK, MB, JW
REVISOR: FH
SCALE: AS SHOWN
DATE OF INSPECTION: 07 / 18 / 18
DRAWING NO. 04180 H

UW DRAWING 8



PIER 3 (SOUTH) ELEVATION
N.T.S.

NOTES:

1. ABRASION UP TO 1/4" DEEP FROM MUDLINE TO 1.0' ABOVE THE WATER SURFACE.

LEGEND FOR SYMBOLS


- ⊕ DATUM ELEV. 0.0' TAKEN FROM THE EASTBOUND BRIDGE 01218 AT THE SECOND CONSTRUCTION JOINT DOWN FROM THE TOP OF THE PIER AT THE CENTERLINE OF THE NORTH FACE OF PIER 1
- ▽ W.S. ELEV. -7.3'
- 0.0' DEPTH OF PENETRATION

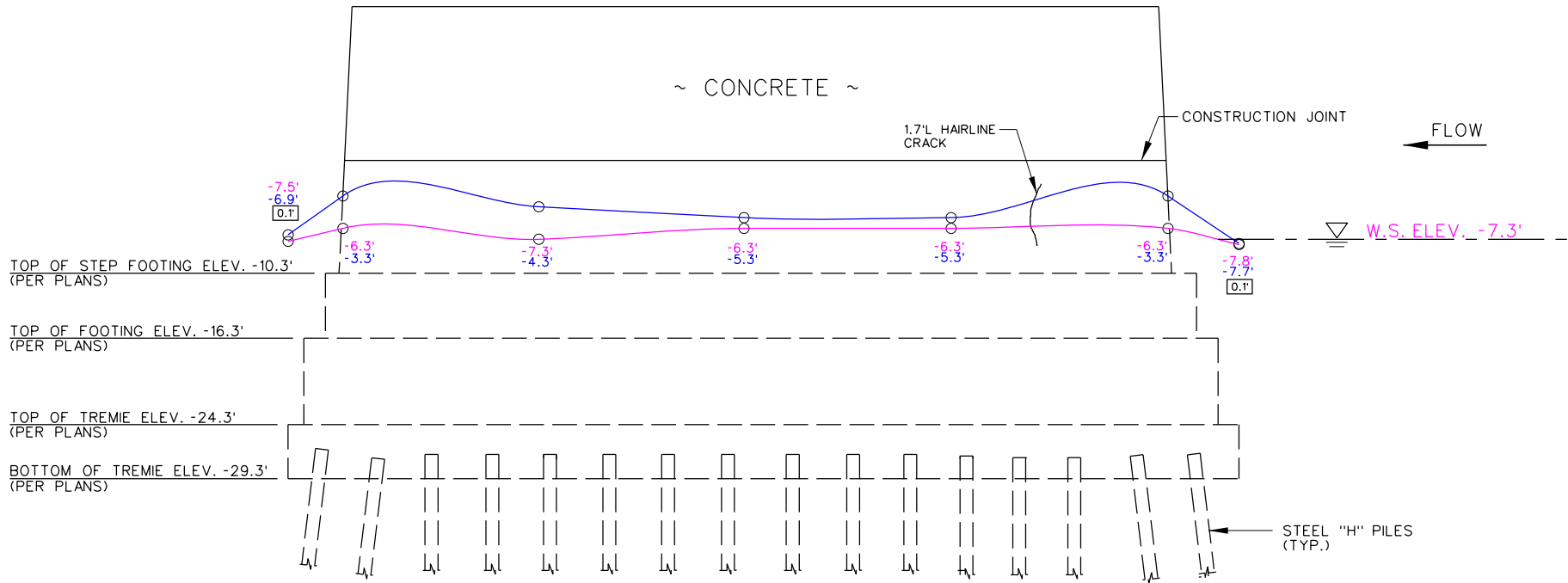
LEGEND FOR BOTTOM ELEVATIONS

JULY, 2018: -0.0'
JULY, 2016: -0.0'

LEGEND FOR MUDLINE ELEVATIONS

— JULY, 2018
— JULY, 2016

 INFRASTRUCTURE ENGINEERS, INC. 1-888-451-6822	CONNECTICUT DEPARTMENT OF TRANSPORTATION				UW DRAWING 9
	BRIDGE NO. 04180 ROUTE 84 WESTBOUND OVER HOUSATONIC RIVER NEWTOWN CONNECTICUT				
	PIER 3 (SOUTH) ELEVATION				
INSPECTED BY: JK, MB, JW REVISED BY: FH	SCALE: AS SHOWN	DATE OF INSPECTION 07 / 18 / 18	DRAWING NO. 04180 I		



PIER 3 (NORTH) ELEVATION
N.T.S.

NOTES:

1. ABRASION UP TO 1/4" DEEP FROM MUDLINE TO 1.0' ABOVE THE WATER SURFACE.

LEGEND FOR SYMBOLS

- ⊕ DATUM ELEV. 0.0' TAKEN FROM THE EASTBOUND BRIDGE 01218 AT THE SECOND CONSTRUCTION JOINT DOWN FROM THE TOP OF THE PIER AT THE CENTERLINE OF THE NORTH FACE OF PIER 1
- ▽ W.S. ELEV. -7.3'
- 7.3'
- ⓪ DEPTH OF PENETRATION

LEGEND FOR BOTTOM ELEVATIONS

JULY, 2018: -0.0'
JULY, 2016: -0.0'

LEGEND FOR MUDLINE ELEVATIONS

———— JULY, 2018
———— JULY, 2016



INFRASTRUCTURE ENGINEERS, INC.
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CONNECTICUT DEPARTMENT OF TRANSPORTATION

BRIDGE NO. 04180
ROUTE 84 WESTBOUND OVER HOUSATONIC RIVER
CONNECTICUT
NEWTOWN

PIER 3 (NORTH) ELEVATION

INSPECTED BY: JK, MB, JW SCALE: AS SHOWN DATE OF INSPECTION: 07 / 18 / 18 DRAWING NO. 04180 J
REVISED BY: FH

UW DRAWING 10

Form: Asset Photos

Inspection type: Underwater

Inspection Date: 7/18/2018

Inspected by: Infrastructure Engineers

Bridge No: 04180

Town: NEWTOWN

Carried: INTERSTATE 84 WESTBOUND

Crossed: HOUSATONIC RIVER

Inventory Route: NHS



Photo Number: 1

Photo Taken: 07/18/2018

Upstream (North) Bridge Elevation



Photo Number: 2

Photo Taken: 07/18/2018

Downstream (South) Bridge Elevation

Form: Asset Photos

Inspection type: Underwater

Inspection Date: 7/18/2018

Inspected by: Infrastructure Engineers

Bridge No: 04180

Town: NEWTOWN

Carried: INTERSTATE 84 WESTBOUND

Crossed: HOUSATONIC RIVER

Inventory Route: NHS



Photo Number: 3

Photo Taken: 07/18/2018

Pier 1 South Elevation



Photo Number: 4

Photo Taken: 07/18/2018

Pier 1 North Elevation

Form: Asset Photos

Inspection type: Underwater

Inspection Date: 7/18/2018

Inspected by: Infrastructure Engineers

Bridge No: 04180

Town: NEWTOWN

Carried: INTERSTATE 84 WESTBOUND

Crossed: HOUSATONIC RIVER

Inventory Route: NHS

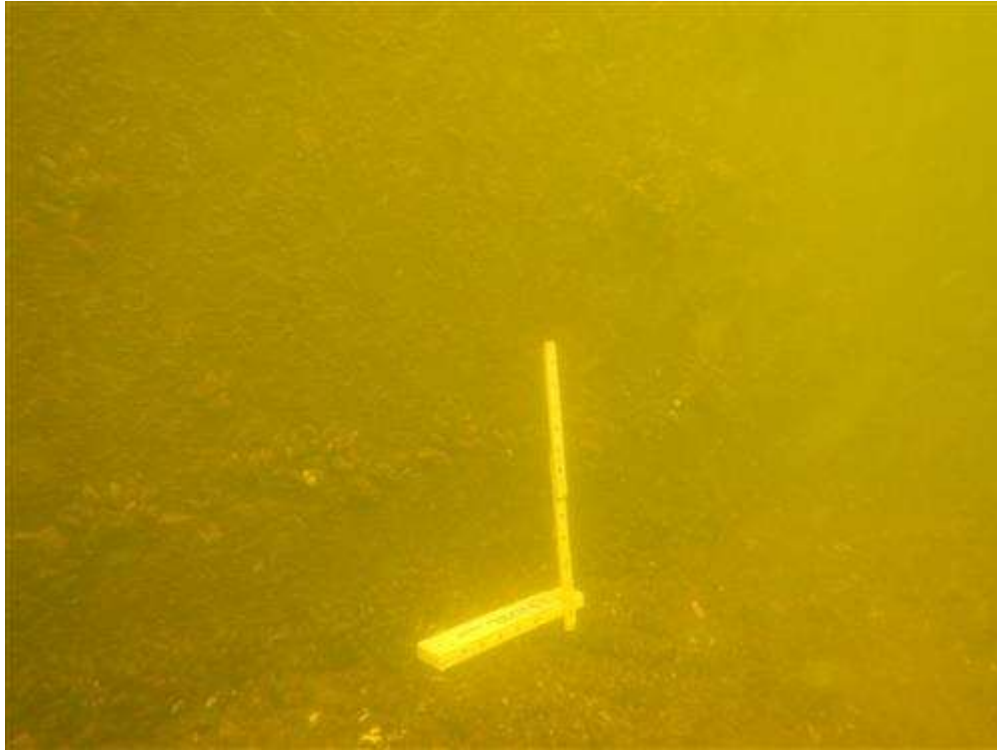


Photo Number: 5

Photo Taken: 07/18/2018

Pier 1 South Elevation Stem

Note: Zebra mussels on pier.



Photo Number: 6

Photo Taken: 07/18/2018

Pier 1 at Upstream Southwest Corner

Note: Exposed step and footing.

Form: Asset Photos

Inspection type: Underwater

Inspection Date: 7/18/2018

Inspected by: Infrastructure Engineers

Bridge No: 04180

Town: NEWTOWN

Carried: INTERSTATE 84 WESTBOUND

Crossed: HOUSATONIC RIVER

Inventory Route: NHS



Photo Number: 7

Photo Taken: 07/18/2018

Pier 1 at North Side Near Centerline

Note: Sheet piling.



Photo Number: 8

Photo Taken: 07/18/2018

Pier 2 South Elevation

Form: Asset Photos

Inspection type: Underwater

Inspection Date: 7/18/2018

Inspected by: Infrastructure Engineers

Bridge No: 04180

Town: NEWTOWN

Carried: INTERSTATE 84 WESTBOUND

Crossed: HOUSATONIC RIVER

Inventory Route: NHS



Photo Number: 9

Pier 2 North Elevation

Photo Taken: 07/18/2018

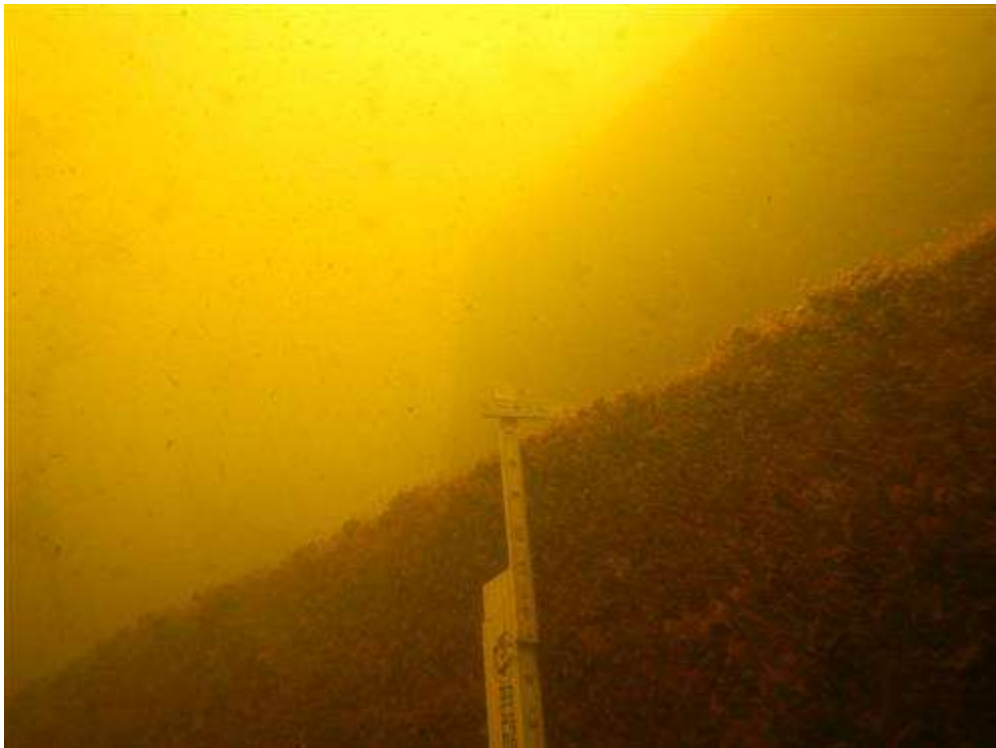


Photo Number: 10

Pier 2 Upstream South Elevation

Photo Taken: 07/18/2018

Note: Exposed footing and step.

Form: Asset Photos

Inspection type: Underwater

Inspection Date: 7/18/2018

Inspected by: Infrastructure Engineers

Bridge No: 04180

Town: NEWTOWN

Carried: INTERSTATE 84 WESTBOUND

Crossed: HOUSATONIC RIVER

Inventory Route: NHS

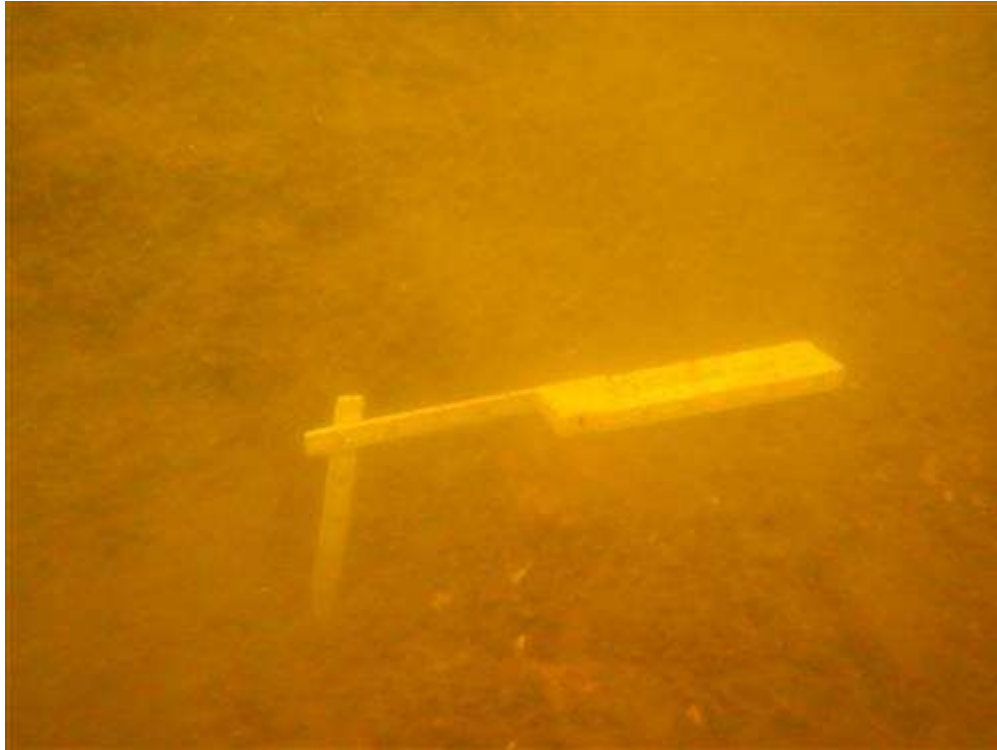


Photo Number: 11

Photo Taken: 07/18/2018

Pier 2 Upstream Nose

Note: Exposed tremie.



Photo Number: 12

Photo Taken: 07/18/2018

Pier 3 South Elevation

Form: Asset Photos

Inspection type: Underwater

Inspection Date: 7/18/2018

Inspected by: Infrastructure Engineers

Bridge No: 04180

Town: NEWTOWN

Carried: INTERSTATE 84 WESTBOUND

Crossed: HOUSATONIC RIVER

Inventory Route: NHS



Photo Number: 13

Pier 3 North Elevation

Photo Taken: 07/18/2018



Photo Number: 14

Channel Looking (West) Upstream

Photo Taken: 07/18/2018

Form: Asset Photos

Inspection type: Underwater

Inspection Date: 7/18/2018

Inspected by: Infrastructure Engineers

Bridge No: 04180

Town: NEWTOWN

Carried: INTERSTATE 84 WESTBOUND

Crossed: HOUSATONIC RIVER

Inventory Route: NHS



Photo Number: 15

Channel Looking (East) Downstream

Photo Taken: 07/18/2018



Photo Number: 16

Northwest Channel Embankment

Photo Taken: 07/18/2018

Form: Asset Photos

Inspection type: Underwater

Inspection Date: 7/18/2018

Inspected by: Infrastructure Engineers

Bridge No: 04180

Town: NEWTOWN

Carried: INTERSTATE 84 WESTBOUND

Crossed: HOUSATONIC RIVER

Inventory Route: NHS



Photo Number: 17

Photo Taken: 07/18/2018

Northeast Channel Embankment



Photo Number: 18

Photo Taken: 07/18/2018

Southwest Channel Embankment

Form: Asset Photos

Inspection type: Underwater

Inspection Date: 7/18/2018

Inspected by: Infrastructure Engineers

Bridge No: 04180

Town: NEWTOWN

Carried: INTERSTATE 84 WESTBOUND

Crossed: HOUSATONIC RIVER

Inventory Route: NHS



Photo Number: 19

Southeast Channel Embankment

Photo Taken: 07/18/2018



Photo Number: 20

Navigational Light Pier 1 (Upstream)

Photo Taken: 07/18/2018

Form: Asset Photos

Inspection type: Underwater

Inspection Date: 7/18/2018

Inspected by: Infrastructure Engineers

Bridge No: 04180

Town: NEWTOWN

Carried: INTERSTATE 84 WESTBOUND

Crossed: HOUSATONIC RIVER

Inventory Route: NHS



Photo Number: 21

Photo Taken: 07/18/2018

Navigational Light Span 2 (Upstream)



Photo Number: 22

Photo Taken: 07/18/2018

Navigational Light Pier 2 (Upstream)



**INFRASTRUCTURE
ENGINEERS, INC.**

BACK-UP MATERIAL

NATIONAL BRIDGE ELEMENTS RECORDING SHEET *

Structure No. 04180		By: Infrastructure Engineers			Date: 7/18/2018					
Element /Str. Unit No.	Env	Element/Structure Unit Description	Total Qty.	Units	Condition State Quantity					
					CS1	CS2	CS3	CS4		
SUBSTRUCTURE										
Pier 1										
210	Mod.	Reinforced Concrete Pier Wall	42	LF	0	21	21	0	0	
1130		Cracking	21	LF			21			
1190		Abrasion / Wear (PSC/RC)	21	LF		21				
220	Mod.	Reinforced Concrete Pile Cap/Footing	42	LF	0	0	42	0	0	
6000		Scour	42	LF			42			

- 5' high band of abrasion up to 1/4" deep extending from 1' above to 4' below the water surface.
- Horizontal cracks up to 17' long x up to 1/2" wide along the cold joints above and below water.
- Near the midpoint of the footing on both faces there is a vertical hairline crack x 5' long with efflorescence.
- The North face has isolated vertical hairline cracks x up to 2' long throughout.
- Zebra mussels up to full height x 1" thick.
- Step Footing exposed over its full-length x up to full-height (5.4' high) along both faces of the pier.
- Footing exposed up to 5.1' vertically over a length of 37' on the pier.
- Isolated vertical hairline cracks up to 5' long with efflorescence.

Pier 2										
210	Mod.	Reinforced Concrete Pier Wall	42	EA	0	42	0	0	0	
1190		Abrasion / Wear (PSC/RC)	42	LF		42				
220	Mod.	Reinforced Concrete Pile Cap/Footing	42	LF	0	0	42	0	0	
6000		Scour	42	LF			42			

- 5' high band of abrasion up to 1/4" deep extending from 1' above to 4' below the water surface.
- There are steel H-piles intermittently exposed along the stem located above the step footing (formwork left in place from construction).
- Random areas of Zebra mussels up to 50% coverage x 1" thick.
- The step footing is exposed over its full-length x up to full-height (5.0' high) on both faces of the pier.
- The footing has been exposed full length x up to full-height (5.5' high) on the South face and full length x up to 1.7' high on the North face of the pier,
- The Tremie Seal has been exposed up to 1.0' long across the full-width of the Upstream (West) nose and over 2' long x 0.5' high at the Southwest corner of the pier.
- Random vertical hairline cracks up to 3' long with efflorescence on the footing.
- Isolated edge spalls on the footing up to 2' long x 4" wide x up to 4" deep.
- At the center of the Downstream (South) face of the Step Footing there is a spall 18" long x 1' wide x 4" deep.
- At the Southwest corner of the Footing/Tremie interface there is a spall 2' long x 4" high x 3" deep.

Pier 3										
210	Mod.	Reinforced Concrete Pier Wall	42	LF	0	42	0	0	0	
1190		Abrasion / Wear (PSC/RC)	42	LF		42				

- Band of abrasion up to 1/4" deep extending from 1' above the water surface down to the channel bottom.
- Random areas of Zebra mussels up to 50% coverage x 1" thick.
- The North face towards the Upstream (West) nose of the pier there is a 1.7' long vertical hairline crack below the construction joint.
- There is no exposure of the Step Footing or Footing at the pier.
- There is a section of sheet pile exposed up to 6" high along the South face of the pier approximately 12.5' off the pier face

* Includes only defects on Piers 1 through 3 from the high water mark to the channel bottom.