



New Hampshire  
Department of Transportation

Scour Critical Bridge  
Plan of Action (POA) Report

Tamworth 061/091

Scour POA Priority:

- Priority Countermeasure
- Priority Monitoring



Feature Crossed: Swift River

Feature Carried: NH Route 113A

Owner: NHDOT

- Increased Inspection Frequency
- Fixed Monitoring Devices
- Conceptual Structural/Hydraulic Countermeasures
- Flood Monitoring Program
- Post Flood Inspection Tasks

Final Recommended Action:

Three-span bridge, built in 1956 with a superstructure rehab in 2006 - plans available. Shallow water – no diving inspection. In 2008 there was a minimum of 6 feet of embedment of the abutments and 6 feet at the piers. CHA recommends installing a flood monitoring placard at the left side (upstream face) of Pier 1 to assist with monitoring this bridge during and after significant flood events and to quantify any changes in embedment at the piers. If continued monitoring indicates a significant scour problem at piers, partially grouted rip-rap could be installed due the relatively shallow embedment depths.

The Following Materials Are Being Submitted With This Report

- POA Report
- Attachment A: Photos
- Attachment B: Map Showing Detour Route(s)
- Attachment C: Field Verification Card (FVC)
- Attachment D: Bridge Elevation Summary Showing Existing Streambed, Foundation Depth(s) and Observed and/or Calculated Scour Depths
- Attachment E: Boring Logs and/or Other Subsurface Information
- Attachment F: Survey Cross Sections From Current and Previous Inspection Reports
- Attachment G: Supporting Documentation, Calculations, Estimates, and Conceptual Designs for Scour Countermeasures
- Attachment H: Plan View Showing Location of Scour Holes, Debris, etc,
- Attachment I: Post Flood Inspection Documentation



# SCOUR CRITICAL BRIDGE - PLAN OF ACTION

## Tamworth 061/091

1. GENERAL INFORMATION			
<b>Structure:</b> 061/091	<b>City, County, State:</b> Tamworth, Carroll, New Hampshire	<b>Owner:</b> NHDOT	
<b>State Highway or Facility Carried:</b> NH Route 113A		<b>Waterway Crossed:</b> Swift River	<b>Bridge Maintenance Division</b> 3
<b>Year Built:</b> 1956	<b>Year Rebuilt:</b> NA	<b>Planned Bridge Replacement (if scheduled):</b> <input type="checkbox"/> <b>Anticipated Opening Date:</b>	
<b>Structure Size and Description:</b> The superstructure is a three span, continuous, steel multi-girder bridge with concrete deck. The abutments are concrete on spread footings. The piers are also concrete on spread footings.			
<b>Foundation Details:</b> <small>(Looking Downstream L to R)</small> <input checked="" type="checkbox"/> KNOWN <input type="checkbox"/> UNKNOWN	<b>Worst Abutment: Left</b>	<b>Embedment (feet):</b> 6	<b>Exposure:</b> None
	<b>Worst Pier: 2</b>	<b>Embedment (feet):</b> 6.2	<b>Exposure:</b> None
<b>Subsurface Soil Information:</b>	<b>Borings:</b> <input checked="" type="checkbox"/>	<b>Channel Primary Bed Material:</b> Sand & Gravel	<b>Channel Secondary Bed Material:</b> Cobbles
<b>Bridge ADT Info:</b> Total: 380		Year: 2004	
<b>Does the Bridge Provide Service to Emergency Facilities and/or an Evacuation Route (Y/N)?:</b>			<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
<b>If So, Describe:</b> No response was received from NHDOT			
<b>Scour Summary</b>			
<b>Flood History:</b> The bridge was originally constructed in 1956 and rehabilitated in 2006 with mainly the superstructure (rail and deck) being reconstructed. The Town of Tamworth FIS does not provide any documentation of flood history specific to the Swift River, however the FIS does indicate that the larger Bearcamp River Watershed (Swift River is a tributary) has experienced two significant floods (in 1959 and 1987) since the bridge was originally constructed.			
<b>Field Observation:</b> All substructures are founded on shallow spread footings with no scour protection. Abutments are set back, but located within the 100-year floodplain with estimated embedment depths of 6 feet at Left and 11 feet at Right. Piers are located at either edge of the main channel and are unprotected with 6-6.5 feet of embedment. Streambed material consists of sand, gravel and cobbles and exhibits a high potential for armoring. Based on drop-line survey the streambed elevation remains relatively unchanged from that shown on the design plans. There is a staff gage (painted on the inside of Pier 2), which may be useful for monitoring flood elevations. The upstream left wingwall is undermined (in an isolated area) about 21 inches due to roadway drainage.			
<b>Scour Calculations:</b> W&H predicts 12 and 13 ft of total scour at Piers 1 and 2 respectively during the 100 year event. The substructure labeling convention established by CHA defines left and right looking downstream, as such pier numbering also proceeds from the left to right bank.			
<b>Current Item 113 Code:</b> 3		<b>Source of Scour Critical Code:</b> Calculation	

2. RESPONSIBLE FOR POA	
<b>Author(s) of POA (name, title, agency/organization, telephone, email):</b> Robert Faulkner P.E., CHA Principal Eng. VI, (603) 357-2445, chakeene@chacompanies.com	
<b>Date:</b> 9/30/2009	
<b>Concurrences on POA):</b> NHDOT Bridge Design Bureau (603) 271-2731	
<b>POA Updated by:</b> NHDOT Bridge Design Bureau (603) 271-2731	
<b>Date of Update:</b> <b>Items Updated:</b>	
<b>POA to be Updated Every</b> <b>months by:</b> NHDOT Bridge Design Bureau (603) 271-2731	
<b>Date of Next Update:</b>	

### 3. RECOMMENDED ACTION(S) (see sections 5 and 6)

	<u>Recommended</u>		<u>Implemented</u>	
a. Increased Inspection Frequency:	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes	<input type="checkbox"/> No
b. Fixed Monitoring Device(s):	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes	<input type="checkbox"/> No
c. Flood Monitoring Program:	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No
d. Post Flood Inspection:	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No
e. Hydraulic/Structural Countermeasures:	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes	<input type="checkbox"/> No

### 4. NBI CODING INFORMATION

Inspection Date		<u>Current</u>	<u>Previous</u>
		7/29/2008	12/18/2006
Item 113	Scour Critical	3	3
Item 60	Substructure	7	7
Item 61	Channel & Channel Protection	7	7
Item 71	Waterway Adequacy	9	9

### 5. MONITORING PROGRAM RECOMMENDED

**5a. Regular Inspection Program**

Standard 2 Year Interval  
 1 Year Interval  
 Riverbed Profile Readings

**Underwater Inspection Required**

Standard 5 Year Interval  
 2 Year Interval  
 1 Year Interval

**Items to Watch:** Monitor channel elevations with riverbed profile readings, making note of any significant changes. Verify embedment at piers. Based on a 2008 field visit, the current embedment at the piers is 6-6.5 ft.

**Items to Watch:**

**5b. Fixed Monitoring Device(s)** **Not Applicable:**

Type of Instrument:  
Installation Location(s):  
Sample Interval:  30 min  1 hr.  6 hrs.  12 hrs.  Other  
Frequency of Data Download and Review:  Daily  Weekly  Monthly  Other:  
Scour Critical Elevation(s) For Each Pier:  
Action(s) Required if Scour Critical Elevation Detected: (See Section 7 and Section 8)  
Criteria of Termination For Fixed Monitoring:

**5c. Flood Monitoring Program**

Type:  Visual Inspection  
 Instrument (check all that apply)  
 Portable  Geophysical  Sonar  
 Other

**Contact Person(s):**

- NHDOT Bridge Design Bureau, Bridge Inspector
- NHDOT Bridge Maintenance Divisional Superintendent Crew# 3
- NHDOT Bridge Maintenance Divisional Foreman Crew# 3
- NHDOT Bridge Design Bureau, Existing Bridge Section
- NHDOT Bridge Design Bureau, Administrator

**Placard Location:** Left side of Pier 1 at upstream bridge fascia.

**During Precipitation Event, Look For:** Water surface at or above the placard elevation of 734.2'

Flood Monitoring event defined by: (check all that apply)

Notified By Public  
 Flood Warning Issued by NWS  
 Notified by Fixed Monitoring Device

USGS Gauge Station Station#:  
 Stage (WSE)  
 Discharge

Frequency of Flood Monitoring:  1 hr.  3 hrs.  6 hrs. Other

Criteria to End Flood Monitoring  Revisit Bridge  Recommended Post Flood Inspection  
 Close Bridge (See Section 7)  Conditions Stable / Water Receding

**5d. Post-Flood Inspection Tasks Required**

- Visual Inspection (See Attachment I)
- Riverbed Profile Readings (See Attachment I)
- Profile at Substructure (See Attachment I)
- Undermining (See Attachment I)

**Items to Watch:** Monitor channel elevations with riverbed profile readings, making note of any significant changes. Use substructure profile sheets to monitor embedment at piers. Based on a 2008 field visit, the current embedment at the piers is 6-6.5 ft.

Scour Critical Riverbed Elevation(s) for Each Pier/Abutment: One foot above bottom of footing - See Attachment D

Action(s) Required if Scour Critical Riverbed Elevation Detected:

Consider closing bridge, review detour requirements, and notify other affected agencies

NOTE: Additional Details for Action(s) Required May Be Included in Sections 7 and 8.

**Agency and Department Responsible for Monitoring:**

NHDOT

**Contact Person:**

NHDOT Bridge Design Bureau (603) 271-2731

**6. COUNTERMEASURE RECOMMENDATIONS**

Include Information on Hydraulic, Structural or Monitoring Countermeasures.

- Regular Inspection Program
- Flood Monitoring Program
- Fixed Monitoring Devices
- Post Flood Inspection Tasks Required

Conceptual Structural / Hydraulic Countermeasures

**Conceptual Cost Estimate:**

Estimated Cost

(1)	\$
(2)	\$
(3)	\$

**Basis for the Selection of the Preferred Scour Countermeasure:**

**Countermeasure Implementation Project Type:**

- Proposed Construction      Lead Agency:
- Bridge Maintenance
- Programmed Construction - Project Lead Agency
- Bridge Design
- Highway Design
- Other

**Recommended Countermeasures to be Performed by:**

**Contact Person:**

NHDOT Bridge Design Bureau (603) 271-2731

## 7. BRIDGE CLOSURE PLAN

Criteria For Consideration of Bridge Closure: (See Attachment C)

- Water Surface Elevation Reaches Low Chord
- Water Reaches Critical Elevation: 50-yr=734.2 ft (Placard)
- Overtopping Road or Structure
- Scour Measurement Results / Monitoring Device (See Section 5)
- Observed Structure Movement / Settlement
- Other:  Debris Accumulation  Movement of RipRap/Other Armor Protection  Loss of Road Embankment

Agency and Department Responsible for Closure:

- Transportation Management Center  NHDOT  Municipality:

Contact Person(s):

1. NHDOT Bridge Design Bureau, Bridge Inspector
2. NHDOT Bridge Maintenance Divisional Superintendent Crew# 3
3. NHDOT Bridge Maintenance Divisional Foreman Crew# 3
4. NHDOT Bridge Design Bureau, Existing Bridge Section
5. NHDOT Bridge Design Bureau, Administrator

## 8. DETOUR ROUTE

Detour Route Description: (See Attachment B)

See Attachment B

Bridges on Detour Route:

Bridge Number	Feature Carried	Feature Crossed	Item 113 Code	Load Posting (tons) (Date)	Vertical Clearance (feet)	Width Restrictions (feet)
Tamworth 112/114	MAIN STREET	SWIFT RIVER	8	46.3 (N/A)	unrestricted	28.0

Traffic Control Equipment (detour signing and barriers) and storage location(s)  
(NHDOT/Town): NHDOT Bridge Maintenance Divisional Crew 3

Highway Maintenance District: 03

NHDOT Bureau of Traffic

Additional Considerations or Critical Issues (susceptibility to overtopping, limited waterway adequacy, lane restrictions, etc.):

NHDOT Bridge Design Bureau (603) 271-2731

News Release, Other Public Notice (include authorized person(s), information to be provided and limitations):

NHDOT Public Information Officer, NHDOT Bridge Design Bureau (603) 271-2731

## 9. BRIDGE REOPENING PLAN

### 9a. Criteria for Consideration to Complete Interim Bridge Reopening:

- |  |   |
|--|---|
| <input checked="" type="checkbox"/> Water Surface Levels Dropping        | <input checked="" type="checkbox"/> Verify Riverbed Elevation (drop line readings)                          |
| <input checked="" type="checkbox"/> Critical Elevation Marker Is Visible | <input checked="" type="checkbox"/> Streambed Elevation Changes Less than <u>  3  </u> Feet                 |
| <input checked="" type="checkbox"/> Reasons for Closure Have Abated      | <input type="checkbox"/> Streambed Elevation 1.0 Feet<br>Above Critical Footing Elevation. (See Section 5d) |

### Agency and Person Responsible for Re-Opening Bridge After Inspection:

NHDOT Bridge Design Bureau (603) 271-2731

### 9b. Criteria for Completing Bridge Reopening Process:

- Post Flood Inspection Completed
- Diving Inspection Completed within 7 calendar days

**Bridge:** Tamworth 061/091  
**Date Taken:** 7/30/2008 2:41:30 PM  
**Source:** CHAScourInsp  
**Description:** Left Abutment



**Bridge:** Tamworth 061/091  
**Date Taken:** 7/30/2008 2:41:42 PM  
**Source:** CHAScourInsp  
**Description:** Pier #1



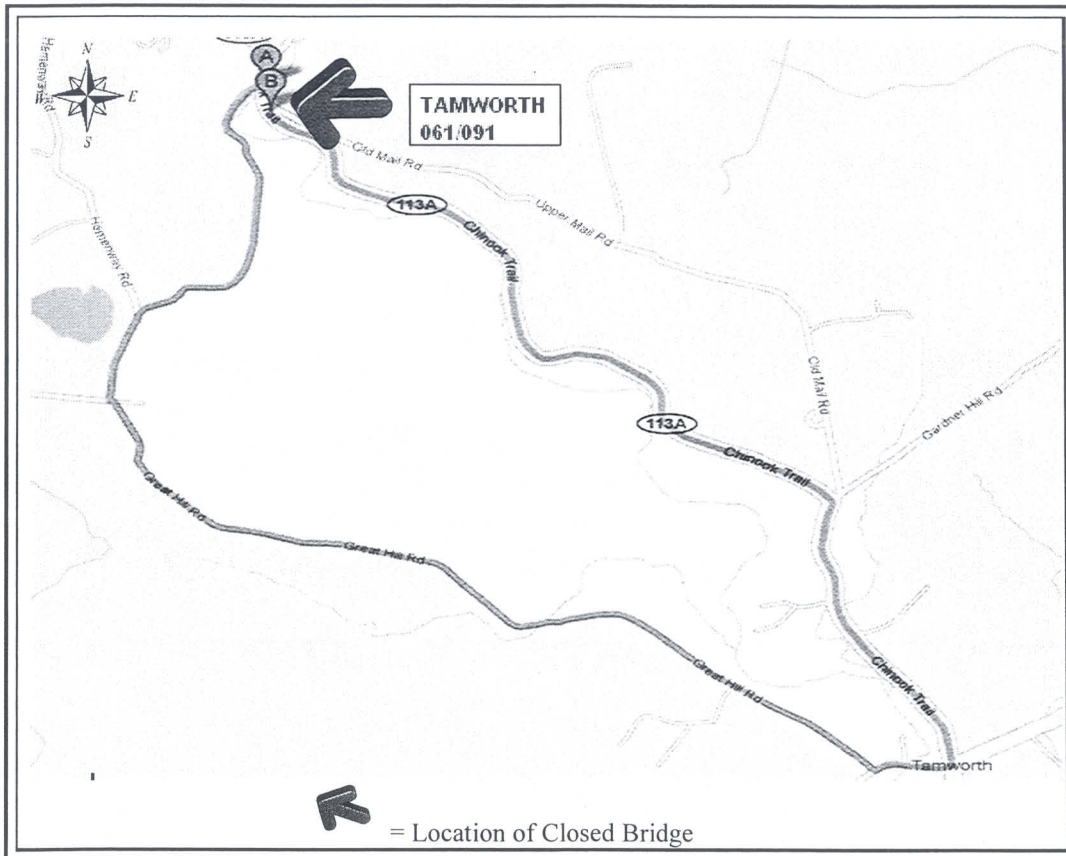
**Bridge:** Tamworth 061/091  
**Date Taken:** 7/30/2008 2:41:33 PM  
**Source:** CHAScourInsp  
**Description:** Pier #2



**Bridge:** Tamworth 061/091  
**Date Taken:** 7/30/2008 2:41:44 PM  
**Source:** CHAScourInsp  
**Description:** Right Abut







**DETOUR MAP**

**HEADING SOUTHEAST ON ROUTE 113A**

	1. Head north on Chinook Trail/RT-113A	go 59 ft total 59 ft
	2. Turn left toward Hemenway Rd About 3 mins	go 1.0 mi total 1.0 mi
	3. Slight left at Hemenway Rd About 1 min	go 0.3 mi total 1.3 mi
	4. Turn left at Great Hill Rd About 6 mins	go 2.5 mi total 3.9 mi
	5. Turn left at Cleveland Hill Rd/Main St	go 0.2 mi total 4.1 mi
	6. Turn left at Chinook Trail About 3 mins	go 1.0 mi total 5.1 mi
	7. Turn left at Chinook Trail/RT-113A About 6 mins	go 2.2 mi total 7.2 mi

**IF HEADING NORTHWEST ON ROUTE 113A, REVERSE DIRECTIONS**

**DETOUR DIRECTIONS**



11 King Court Keene, NH 03431-4648  
Main: (603) 357-2445

New Hampshire Scour Investigation

Tamworth 061/091

**Attachment B: Map of detour route**

# FIELD VERIFICATION CARD (POA Attachment C)

## GENERAL INFORMATION

Bridge: Tamworth 061/091

Feature Carried: NH Route 113A

Owner: NHDOT

Feature Crossed: Swift River

Town, County: Tamworth - Carroll

Contact Person: NHDOT Bridge Design Bureau (603) 271-2731

## BRIDGE INFORMATION

Detour (miles): 9

Last ADT: Total: 380

Year: 2004

Red List: No

USGS Gauge Station:

USGS Station Prox To Bridge:

Superstructure Type: Stringer/Multi-Beam or Girder

Number of Spans: 3

Superstructure Material: Steel

Diving Insp Reports:  Dates:

Foundation Details: <input type="checkbox"/> UNKNOWN (Looking Downstream L to R) <input checked="" type="checkbox"/> KNOWN	Worst Abutment: Left	Embedment (feet): 6	Exposure: None
	Worst Pier: 2	Embedment (feet): 6.2	Exposure: None

Scour Critical Feature: Piers 1 and 2

Placard Location: Left side of Pier 1 at upstream bridge fascia.

What To Look For: Evidence of scour and remaining embedment. Based on a 2008 field visit, the current embedment at the piers is 6-6.5 ft.

## CRITERIA FOR CONSIDERATION OF BRIDGE CLOSURE

- Water Surface Elevation Reaches Low Chord
- Water Reaches Critical Elevation: 50-yr=734.2 ft (Placard)
- Overtopping Road or Structure
- Scour Measurement Results / Monitoring Device
- Observed Structure Movement / Settlement
- Debris Accumulation
- Loss of Road Embankment
- Movement of RipRap/Other Armor Protection
- Ice Jam

## ACTION TAKEN

Post-Flood Inspection Recommendation

Revisit Bridge

Close Bridge

## POST-MONITORING VERIFICATION

Completed Proper Notification

Date/Time Notified:

Agency:

Traffic Control Equipment (detour signing and barriers) and storage location(s)  
(NHDOT/Town): NHDOT Bridge Maintenance Divisional Crew 3

Highway Maintenance District: 03

NHDOT Bureau of Traffic

## CRITERIA FOR CONSIDERATION TO COMPLETE INTERIM BRIDGE REOPENING

- Reasons for Closure Have Abated
- Water Surface Levels Dropping
- Critical Elevation Marker Is Visible
- Verify Riverbed Elevation
- Streambed Elevation Changes Less than 3 Feet
- Streambed Elevation 1.0 Feet Above Critical Footing Elevation. (See Section 5d)

## Agency and Person Responsible for Re-Opening Bridge After Inspection:

NHDOT Bridge Design Bureau (603) 271-2731

Interim Reopening Approved By:

Interim Reopening Date:

Time:

## INTERIM REOPENING COMMENTS

## REFERENCE PHOTOS

(Left to Right Convention Looking Downstream)

(Continued on Next Page)

**Upstream Low Water**



**Downstream Low Water**



**Upstream Elevation of Bridge at Low Water**



Downstream Elevation of Bridge at Low Water

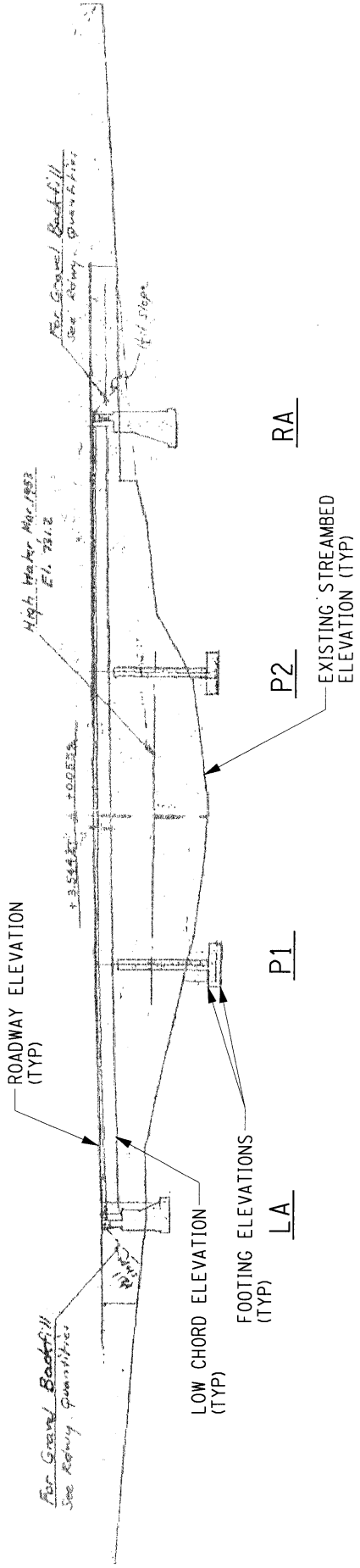


Scour Critical Feature at Low Water



Scour Critical Feature at Low Water






UPSTREAM ELEVATION  
N.T.S.

SUBSTR. UNIT	ROADWAY ELEVATION (FT)	LOW CHORD ELEVATION (FT)	FOOTING ELEVATION (FT)		STREAMBED ELEVATION (FT)		W&H 100-YEAR SCOUR ELEVATION (FT)
			TOP	BOTTOM	ORIGINAL (DESIGN PLANS-1955)	W&H (1992)	
LEFT ABUT.	741.2	737.8	729.5	728.0	732.3	N/A	734.1
PIER 1	742.6	739.4	719.5	717.0	724.0	723.0	711.0
PIER 2	743.6	740.3	720.4	717.9	724.0	724.0	711.0
RIGHT ABUT.	744.0	740.7	729.5	728.0	738.5	N/A	738.6

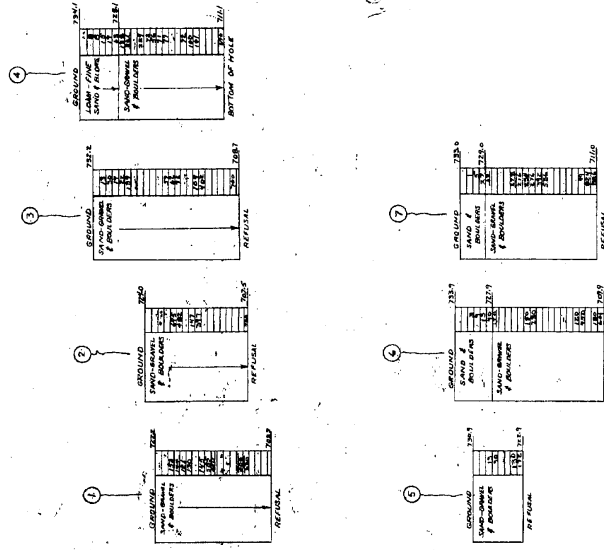
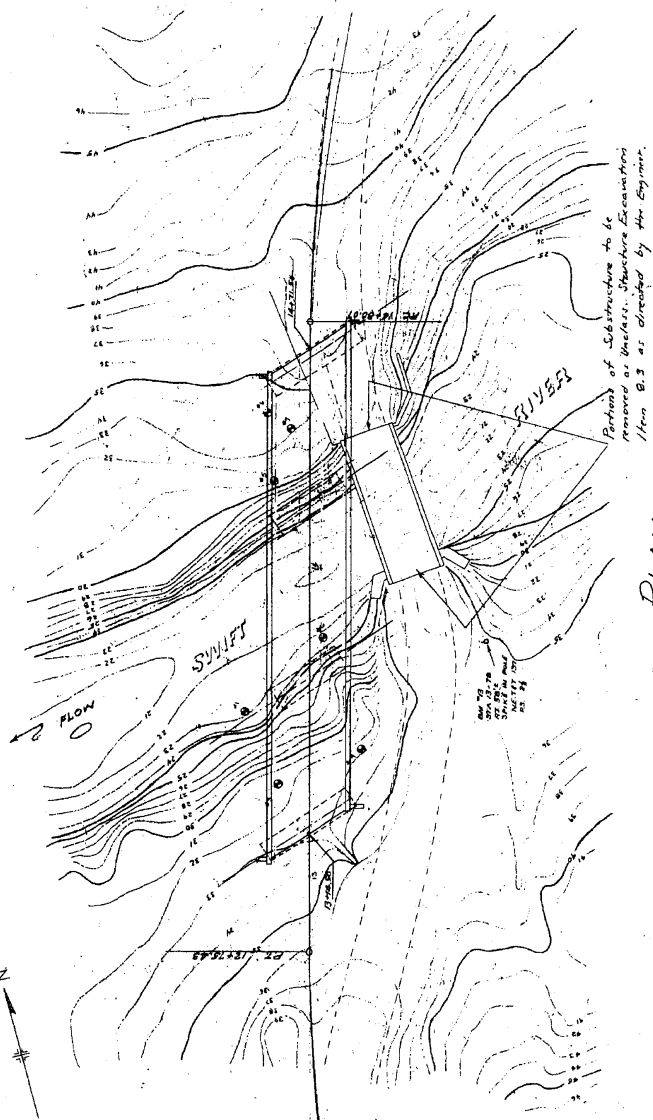
NOTES:

- 1) UNLESS OTHERWISE SPECIFIED, ALL ELEVATIONS ARE REFERENCED TO NGVD 1929
- 2) TOTAL 100-YR SCOUR ELEVATIONS ARE PROVIDED ONLY AT SUBSTRUCTURES THAT WERE ANALYZED BY WHITMAN & HOWARD (W&H)
- 3) THE SUBSTRUCTURE LABELING CONVENTION ESTABLISHED BY CHA DEFINES LEFT AND RIGHT LOOKING DOWNSTREAM.
- 4) STREAMBED ELEVATIONS PROVIDED ARE APPROXIMATE ELEVATIONS AT EACH SUBSTRUCTURE UNIT, EXCLUDING ISOLATED SCOUR HOLES (ATTACHMENT H PROVIDES LOCATION OF SCOUR HOLES).




11 Main Street, Suite 100, Nashua, NH 03071-4608  
Main: (603) 882-2465 • www.cha-engineering.com

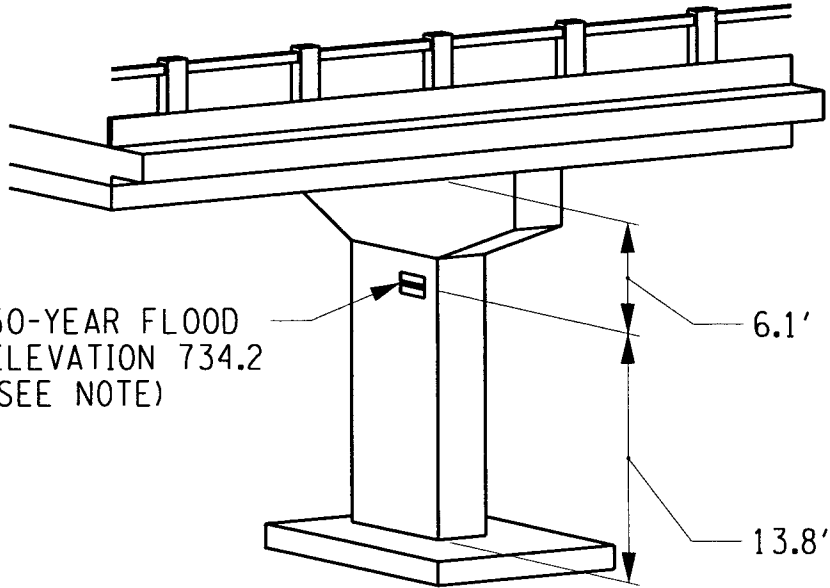
NEW HAMPSHIRE BRIDGE SCOUR INVESTIGATION	ATTACHMENT <b>D</b>
TAMWORTH 061/091	
BRIDGE ELEVATION SUMMARY	
DATE: 09/09	



LOG OF BORINGS  
 SCALE: 1"=100'

BORINGS MADE BY MCDONALD & MANNING - MIN. 955  
 PROGRAM IN NIGHT MARCH 1952. NUMBER OF  
 BLOWS REQUIRED TO DRIVE A 18" O.D. H.A.M. ONE FOOT,  
 USING A 735 LB. WEIGHT FALLING 2 FEET.  
 BORINGS ARE FOR DESIGN ONLY AND DO NOT NECESSARILY  
 REPRESENT MATERIAL TO BE ENCOUNTERED DURING  
 CONSTRUCTION. MATERIALS ENCOUNTERED MAY BE EXAMINED AT  
 THE OFFICE OF THE BRIDGE ENGINEER IN CONCORD, N.H.

 <p>11 King Court - Keene, NH 03421-4608          Main (603) 351-3425 - www.cha-engineering.com</p>	NEW HAMPSHIRE BRIDGE SCOUR INVESTIGATION	ATTACHMENT <b>E</b>
	TAMWORTH 061/091 BORING DETAILS	DATE: 11/08



50-YEAR FLOOD  
ELEVATION 734.2  
(SEE NOTE)

6.1'

13.8'

PIER 2

UPSTREAM ELEVATION

N.T.S.

NOTE:  
ELEVATION 734.2 CORRESPONDS TO A 50 YEAR FLOOD EVENT,  
PLACARD LOCATION IS DOWNSTREAM NOSE OF PIER 2 ON RIGHT SIDE.

ALL WORK IS TO BE PERFORMED IN DRY CONDITIONS  
CONCEPTUAL ONLY  
NOT FOR CONSTRUCTION  
NOT TO SCALE

FILE NAME = K:\181457\CADD\MSTIN\8-bridge POA files Part A\Tamworth 061\_091\181457\_cpb.pln.det.01.dgn  
DATE/TIME = 9/23/2009  
USER = 3631

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**CHA**

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Main: (603) 357-2445 • www.cloughharbour.com

NEW HAMPSHIRE BRIDGE SCOUR  
INVESTIGATION

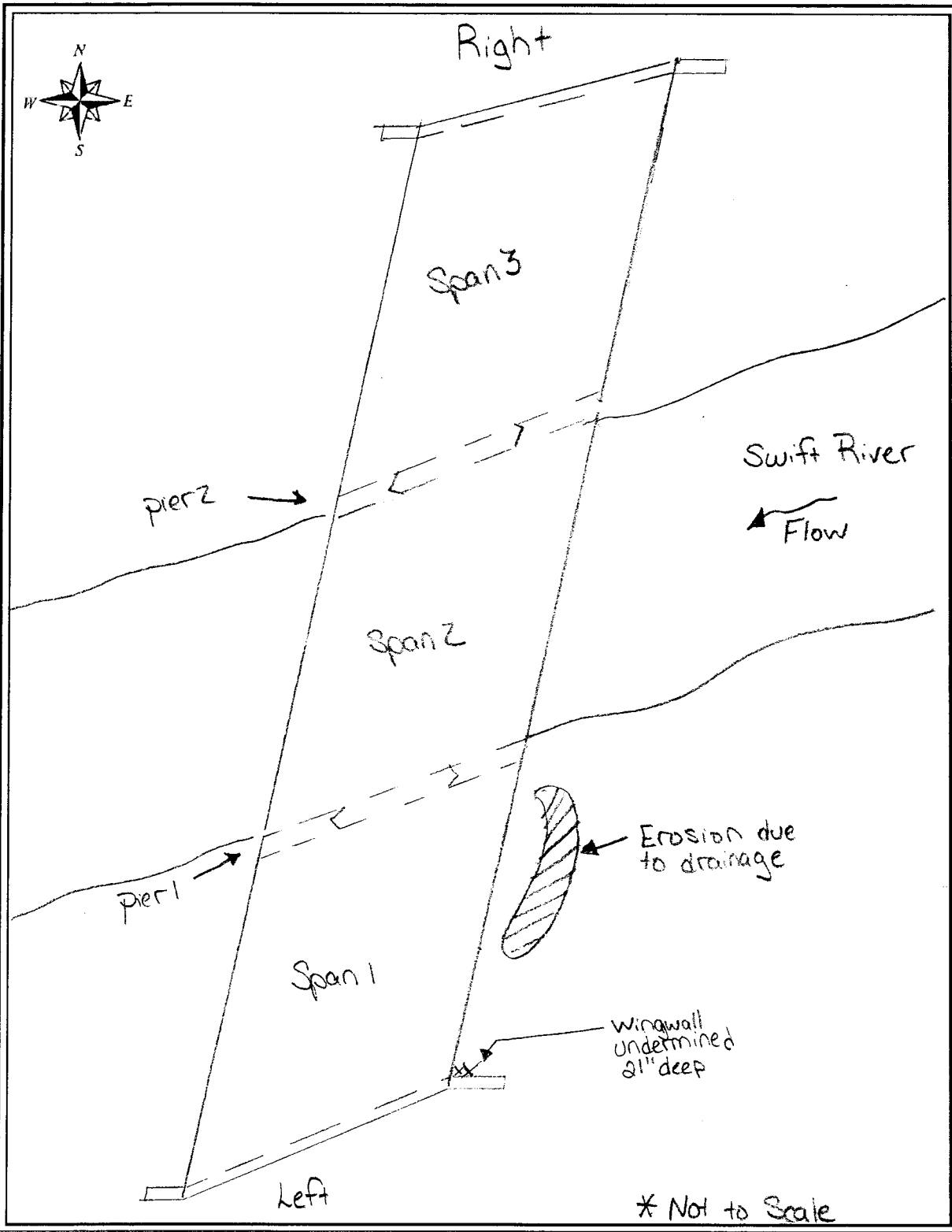
TAMWORTH 061/091

PLACARD INSTALLATION LOCATION

ATTACHMENT

**G**

DATE: 09/09



11 King Court Keene, NH 03431-4648  
Main: (603) 357-2445

New Hampshire Scour Investigation

Tamworth 061/091

**Attachment H: Plan view showing field observations**



# NHDOT POST FLOOD INSPECTION REPORT (POA Attachment I)

**Bridge:** Tamworth 061/091

**Post Flood Inspection Date:** \_\_\_\_\_

**GENERAL INFORMATION**

Town:	Tamworth
Feature Carried:	NH Route 113A
Functional Class:	08 - Rural Minor Collector
Detour Length:	9 (miles)
Year Built:	1956
Year of Reconstruction:	NA

Owner:	NHDOT		
Feature Crossed:	Swift River		
Major Basin (HU8):	Saco River		
Bridge Plan File Loc:	3-5-1-1		
Posting (Actual Metric Tons, Signed) :	33.6	NPR	
ADT:	380	Year of ADT:	2004
Overall Fed Sufficiency Rating:	80.5		
RedList:	No		

Existing: (scale of 1-9) (worst - best)	Substructure Item 60: 7	Channel Stability Item 61: 7	Hydraulic Adequacy Item 71: 9	Scour Risk Item 113: 3
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**HYDRAULIC INFORMATION**

FEMA Study:	<input checked="" type="checkbox"/>	7/16/1991
USGS Report:	<input type="checkbox"/>	
Tidal Influence:	<input type="checkbox"/>	
Watershed Area (sq. mi):	25.2	
100-Yr Overtopping Relief:	No Overtopping	

Whitman & Howard Information (Bridge Scour Report Nov 1992) :	<input checked="" type="checkbox"/>
100-Yr Water Velocity (feet per sec):	10
Angle Of Attack (Flood Flow) :	10

**Other Hydrologic & Hydraulic Data:**  
Swift River is not studied by detailed methods in FIS. Flows and WSEs provided by W&H. Bearcamp River Watershed.

**BRIDGE INFORMATION**

Bridge Width (in feet): 27.00    Bridge Length (in feet): 156.00    Plans Available:     Borings Available:   
 Abutment Foundation: Spread Footing    Pier Foundation: Spread Footing  
 Red List: No    USGS Gauge Station: \_\_\_\_\_    USGS Station Prox To Bridge: \_\_\_\_\_  
 Superstructure Type: Stringer/Multi-Beam or Girder    Number of Spans: 3  
 Superstructure Material: Steel    Diving Insp Reports:     Dates: \_\_\_\_\_

Foundation Details: <input type="checkbox"/> UNKNOWN	Worst Abutment: Left	Embedment (feet): 6	Exposure: None
(Looking Downstream L to R) <input checked="" type="checkbox"/> KNOWN	Worst Pier: 2	Embedment (feet): 6.2	Exposure: None

Scour Critical Feature: Piers 1 and 2

Placard Location: Left side of Pier 1 at upstream bridge fascia.

What To Look For: Evidence of scour and remaining embedment. Based on a 2008 field visit, the current embedment at the piers is 6-6.5 ft.

Flood History:    2005     2006     2007

**Flood / Scour History Comments:** The bridge was originally constructed in 1956 and rehabilitated in 2006 with mainly the superstructure (rail and deck) being reconstructed. The Town of Tamworth FIS does not provide any documentation of flood history specific to the Swift River, however the FIS does indicate that the larger Bearcamp River Watershed (Swift River is a tributary) has experienced two significant floods (in 1959 and 1987) since the bridge was originally constructed.

**RESULTS OF POST FLOOD INSPECTION**

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Date of Bridge Closure: \_\_\_\_\_  NA    Date of Interim Bridge Reopening: \_\_\_\_\_  NA  
 Date of Post Flood Inspection: \_\_\_\_\_    Post Flood Inspection Completed By: \_\_\_\_\_

# NH DOT CHANNEL PROFILE

## Bridge Information

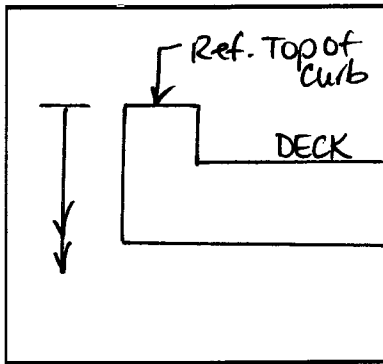
Town/Bridge No. TAMWORTH 061/091  
 Feature Carried NH ROUTE 113A  
 Feature Crossed SWIFT RIVER  
 Owner NHDOT

Date of Inspection 7/29/08  
 Inspector LLF

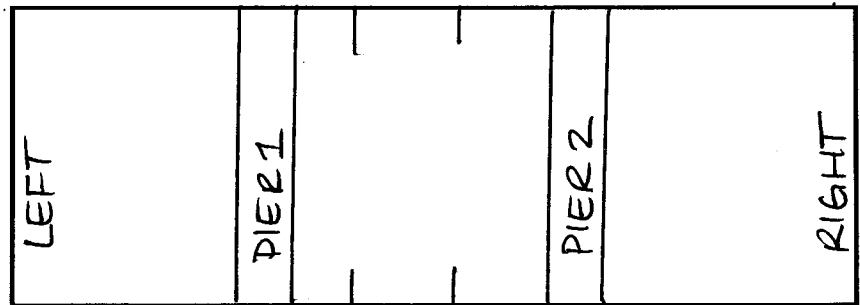
North



Direction of Flow



Datum Reference



\*Actual skew, if present, not shown

Fascia Location	Location/Description	Date: 7/29/08		Date:		Date:	
		Upstream Readings (ft)	Downstream Readings (ft)	Upstream Readings (ft)	Downstream Readings (ft)	Upstream Readings (ft)	Downstream Readings (ft)
Sta. 1	PIER 1	21.3	-				
Sta. 2	1/3 POINT	21.2	-				
Sta. 3	2/3 POINT	20.3	-				
Sta. 4	PIER 2	18.3	-				
Sta. 5							
Sta. 6							
Sta. 7							
Sta. 8							
Sta. 9							
Sta. 10							

Notes: All measurements taken from top of curb to streambed.

\*All units are in English and in decimal form

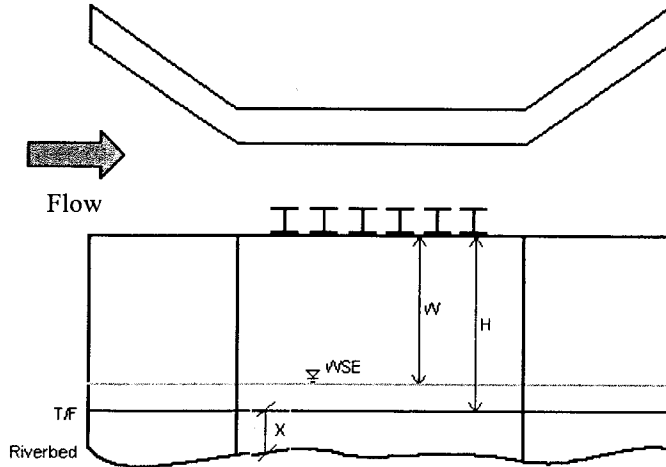
## NH DOT ABUTMENT RIVERBED PROFILE FORM

### Bridge Information

Town/Bridge No. TAMWORTH 061/091  
 Feature Carried NH ROUTE 113A  
 Feature Crossed SWIFT RIVER  
 Owner NHDOT

Date of Inspection 7/29/08  
 Inspector LLF

Abutment: Left



W = Distance from Low Chord to Water Surface = \_\_\_\_\_ ft

H = Distance from Low Chord to top of footing = \_\_\_\_\_ ft

Location	Location Description	DATE:	DATE:	DATE:
		X (ft)	X (ft)	X (ft)
0				
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				

Notes: No exposure observed during 2008 inspection.

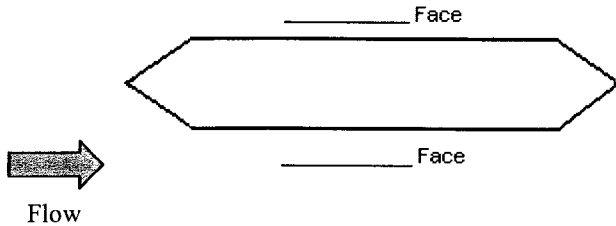
*\*All units are in English and in decimal form*

## NH DOT PIER PROFILE FORM

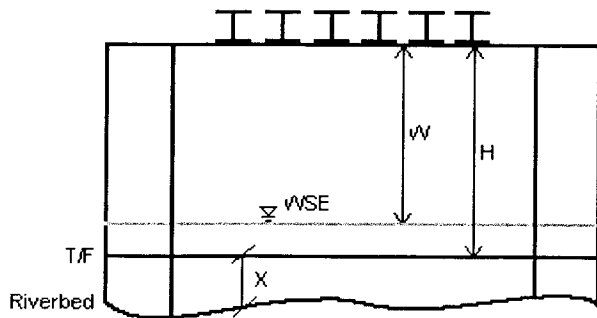
### Bridge Information

Town/Bridge No. TAMWORTH 061/091  
 Feature Carried NH ROUTE 113A  
 Feature Crossed SWIFT RIVER  
 Owner NHDOT

Date of Inspection 7/29/08  
 Inspector LLF



Pier: 1



W = Distance from Low Chord to Water Surface = 15 ft

H = Distance from Low Chord to top of footing = \_\_\_\_\_ ft

Location	Location/Description	Date:		Date:		Date:	
		Left Face (ft)	Right Face (ft)	Left Face (ft)	Right Face (ft)	Left Face (ft)	Right Face (ft)
0							
1							
2							
3							
4							
5							
6							
7							
8							
9							

Notes: No exposure observed during 2008 inspection.

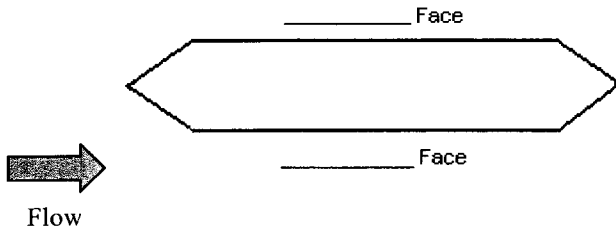
\*All units are in English and in decimal form

# NH DOT PIER PROFILE FORM

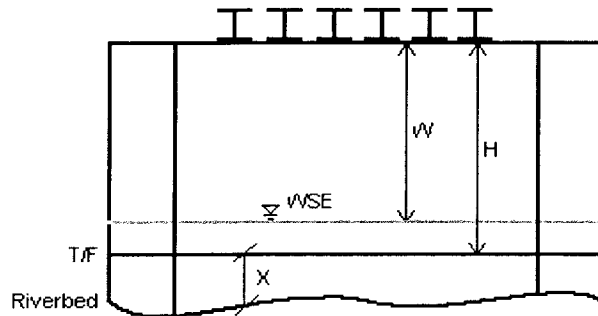
## Bridge Information

Town/Bridge No. TAMWORTH 061/091  
 Feature Carried NH ROUTE 113A  
 Feature Crossed SWIFT RIVER  
 Owner NHDOT

Date of Inspection 7/29/08  
 Inspector LLF



Pier: 2



W = Distance from Low Chord to Water Surface = 14.2 ft

H = Distance from Low Chord to top of footing = \_\_\_\_\_ ft

Location	Location/Description	Date:		Date:		Date:	
		Left Face (ft)	Right Face (ft)	Left Face (ft)	Right Face (ft)	Left Face (ft)	Right Face (ft)
0							
1							
2							
3							
4							
5							
6							
7							
8							
9							

Notes: No exposure observed during 2008 inspection.

\*All units are in English and in decimal form

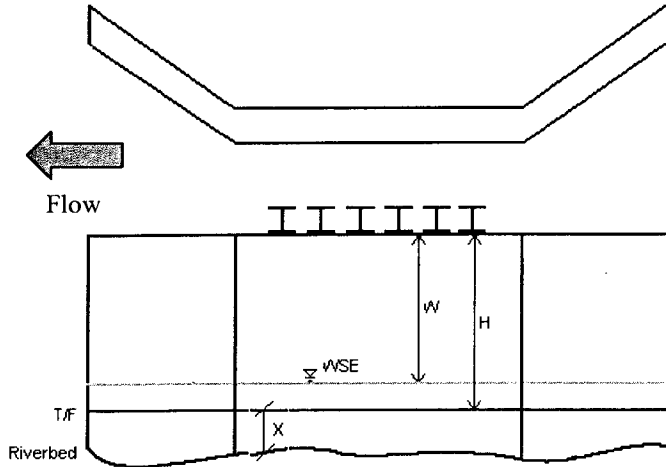
## NH DOT ABUTMENT RIVERBED PROFILE FORM

### Bridge Information

Town/Bridge No. TAMWORTH 061/091  
 Feature Carried NH ROUTE 113A  
 Feature Crossed SWIFT RIVER  
 Owner NHDOT

Date of Inspection 7/29/08  
 Inspector LLF

Abutment: Right



W = Distance from Low Chord to Water Surface = \_\_\_\_\_ ft

H = Distance from Low Chord to top of footing = \_\_\_\_\_ ft

Location	Location Description	DATE:	DATE:	DATE:
		X (ft)	X (ft)	X (ft)
0				
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				

Notes: No exposure observed during 2008 inspection.

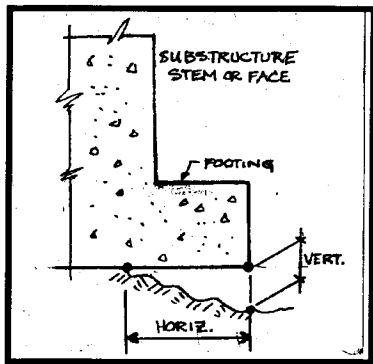
*\*All units are in English and in decimal form*

# NH DOT UNDERMINING FORM

## Bridge Information

Town/Bridge No. TAMWORTH 061/091  
 Feature Carried NH ROUTE 113A  
 Feature Crossed SWIFT RIVER  
 Owner NHDOT

Date of Inspection 7/29/08  
 Inspector LLF



Flow

SSU: \_\_\_\_\_

FACE: \_\_\_\_\_

Start Of Measurement \_\_\_\_\_

Interval of Measurement: \_\_\_\_\_

Location	Date:		Date:		Date:		Date:	
	Vertical (ft)	Horizontal (ft)	Vertical (ft)	Horizontal (ft)	Vertical (ft)	Horizontal (ft)	Vertical (ft)	Horizontal (ft)
0								
1								
2								
3								
4								
5								
6								
7								
8								
9								
10								

Notes: No undermining found during 2008 inspection at any substructure unit.

\*All units are in English and in decimal form