

PREDESIGN/PRESURVEY REPORT

County: Orange

Project No.:

TIP No.:

Let Date:

WBS No.: 17BP.7.R.75

Bridge No.: 670077

Road No.: SR1113 (Arthur Minnis Rd)

Stream: New Hope Creek

Type of Request:

Date: 5/28/2013

Name:

Assigned to: EMT/CJL

Checked by:

Prior Survey Date (attach copy of prior survey):

Study by Scour Section: 4/18/11

Flood Zone:

Detail Study: N/A

Date: 02/02/07

Panel No.: 9861

BM Info:

Quad Map: Efland, Hillsborough

Drainage

4.4 sq.mi

From: Quad/StreamStats

Chapel Hill, White Cross

Area:

Q25: 1300cfs

Q50: 1600cfs

Q100: 1900cfs

Method: USGS Rural Regression: Region 1

EXISTING BRIDGE INFORMATION

Location: 0.8 Miles West of JCT SR1009 (Old NC 86)

Average Daily Traffic: 2009 - 1500

Length: 36'

Bed-to-Crown: 9'

Water Depth: 1'

Type of Structure: Tim Deck on Tim Joists; End/Int. Bnts: Tim. Caps, Posts&Piles, Conc. Encased, Tim. Bulkhead

Type of Span(s): 2@17'9

Upstream Structure: 670075 – 2@17'9 Tim Deck on Tim Joists; End/Int. Bnts: Tim Caps/Piles, Conc. Encased, Tim Bulkheads

Location: 0.6 Miles West of JCT SR1113 (Arthur Minnis Rd)

Bed-to-Crown: 10'

Prior Survey:

Downstream Structure: 670076 – 1@17'9, 1@40'0 Tim Deck on, App: Tim Joists, Main: I-Beams; End&INTBTS: Tim Caps, Posts &Piles, Conc. Encased, Tim. Bulkheads

Location: 0.4 Miles West of JCT SR1009 (Old NC 86)

Bed-to-Crown: 11'

Prior Survey:

SCS Watershed:

ENVIRONMENTAL

Trout Stream: No

Anadromous Fish: No

Primary Nursery Area: No

High Quality Waters: No

Nutrient Sensitive Waters: Yes

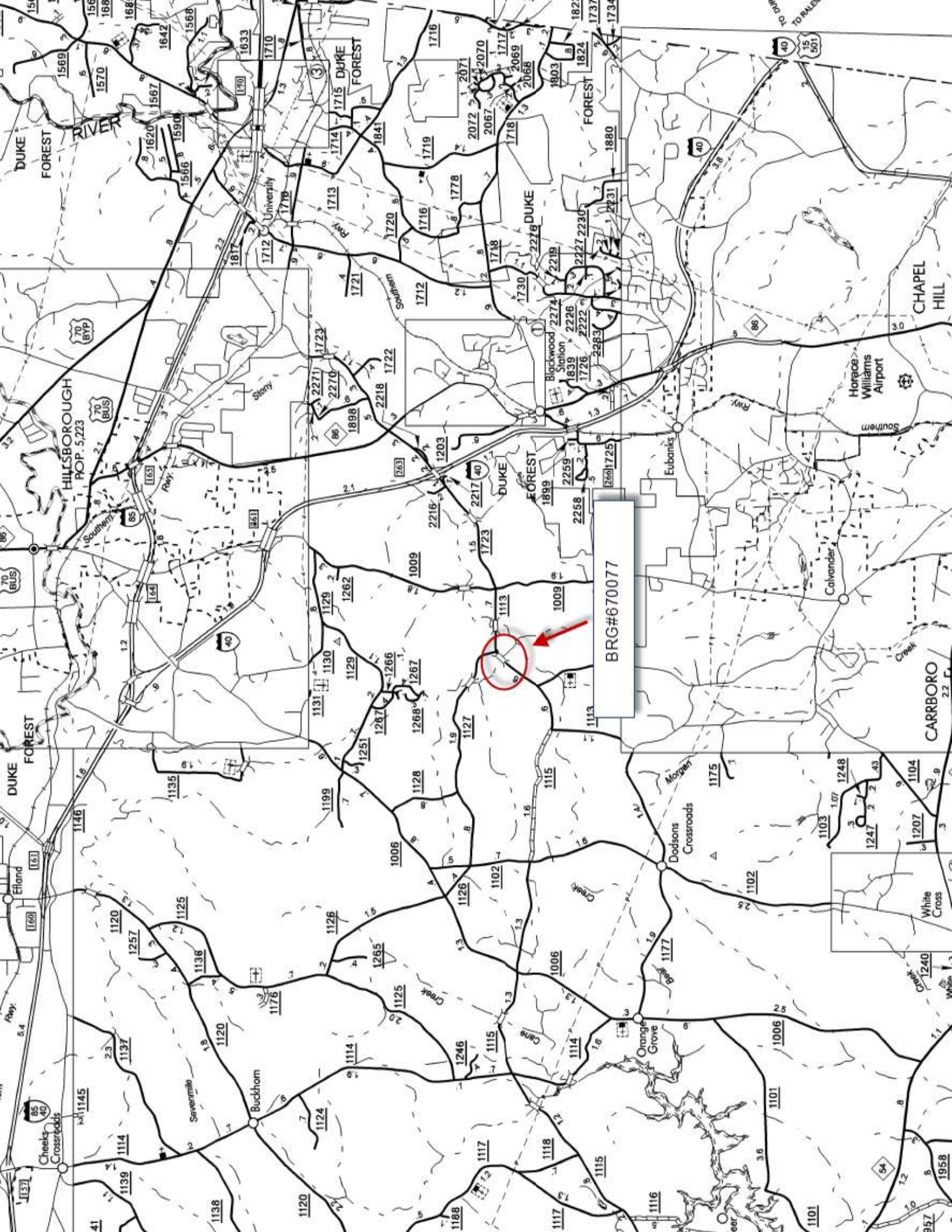
Near Water Supply Intake:

CAMA County: No

Notes: None

MAINTENANCE COORDINATION

Comments:





NC DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
BRIDGE MANAGEMENT UNIT

ATTENTION

BRIDGE INSPECTION REPORT

INSPECTION TYPE: Routine Inspection

COUNTY ORANGE BRIDGE NUMBER 670077 INSPECTION CYCLE 2 YRS
ROUTE SR1113 ACROSS NEW HOPE CREEK M.P. 0

LOCATION 0.8 MI. W. JCT. SR1009

SUPERSTRUCTURE TIMBER DECK ON TIMBER JOISTS

SUBSTRUCTURE END&INT.BENTS:TIM.CAPS,POSTS&PILES,CONC.ENCASED,TIM.BULKHEAD

SPANS 2@17'9

LONGITUDE 79° 7' 10.3"

LATITUDE 36° 0' 0.7"

PRESENT CONDITION FAIR

INVENTORY RATING

INSPECTION DATE 10/10/2011

OPERATING RATING

PRESENT POSTING SV 19 TTST 27 SV 19 TTST 27

PROPOSED POSTING

COMPUTER UPDATE

ANALYSIS DATE

POSTING LETTER DATE

SUFFICIENCY RATING

OTHER SIGNS PRESENT 4- DELINEATORS



LOOKING EAST AT WEIGHT POSTING

SIGN NOTICE ISSUED FOR	NUMBERED REQUIRED
<u>No</u> WEIGHT LIMIT	<u></u>
<u>No</u> DELINEATORS	<u></u>
<u>No</u> NARROW BRIDGE	<u></u>
<u>No</u> ONE LANE BRIDGE	<u></u>
<u>No</u> LOW CLEARANCE	<u></u>

NATIONAL BRIDGE INVENTORY----- STRUCTURE INVENTORY AND APPRAISAL Run Date: 11/01/2011

IDENTIFICATION							
(1) STATE NAME -NORTH CAROLINA	BRIDGE	670077		SUFFICIENCY RATING =		53.5	
(8) STRUCTURE NUMBER(FEDERAL)		000000001350077		STATUS =	Not Deficient		
INVENTORY ROUTE (ON/UNDER) - ON		131011130					
(2) STATE HIGHWAY DEPARTMENT DISTRICT		7					
(3) COUNTY CODE	135	(4) PLACE CODE	00000		CLASSIFICATION		CODE
(6) FEATURE INTERSECTED - NEW HOPE CREEK				(112)NBIS BRIDGE SYSTEM -			YES
(7) FACILITY CARRIED SR1113				(104)HIGHWAY SYSTEM	NON NHS Route		0
(9) LOCATION 0.8 MI. W. JCT. SR1009				(26) FUNCTIONAL CLASS -	Local		09
(11)MILEPOINT				(100)STRAHNET HIGHWAY -	Not a STRAHNET Route		0
(16)LAT 36° 0' 0.7"	(17)LONG	79° 7' 10.3"		(101)PARALLEL STRUCTURE -	No Parallel Structure		N
(98)BORDER BRIDGE STATE CODE	PCT SHARE			(102)DIRECTION OF TRAFFIC -	2-way Traffic		2
(99)BORDER BRIDGE STRUCTURE NO				(103)TEMPORARY STRUCTURE -	Not Temporary		
				(110)DESIGNATED NATIONAL NETWORK -	Not Part of		0
				(20) TOLL	On Free Road		3
				(31) MAINTAIN -	State Highway Agency		01
				(22) OWNER -	State Highway Agency		01
				(37) HISTORICAL SIGNIFICANCE -	Not Eligible		5
STRUCTURE TYPE AND MATERIAL							
(43) STRUCTURE TYPE MAIN: Wood or Timber							
TYPE - Stringer Multibeam or Girder	CODE	702					
(44) STRUCTURE TYPE APPR :							
TYPE -	CODE				CONDITION		CODE
(45) NUMBER OF SPANS IN MAIN UNIT		2		(58) DECK			5
(46) NUMBER OF APPROACH SPANS				(59) SUPERSTRUCTURE			7
(107)DECK STRUCTURE TYPE - Timber	CODE	8		(60) SUBSTRUCTURE			5
(108)WEARING SURFACE / PROTECTIVE SYSTEM :				(61) CHANNEL & CHANNEL PROTECTION			7
(A) TYPE OF WEARING SURFACE - Bituminous	CODE	6		(62) CULVERTS			N
(B) TYPE OF MEMBRANE - None	CODE	0					
(C) TYPE OF DECK PROTECTION - None	CODE	0			LOAD RATING AND POSTING		CODE
				(31) DESIGN LOAD	Other or Unknown		0
				(64) OPERATING RATING -	HS-18		132
				(66) INVENTORY RATING -	HS-12		122
				(70) BRIDGE POSTING -	Posting Required		1
				(41) STRUCTURE OPEN, POSTED ,OR CLOSED			P
				DESCRIPTION -	Posted for Load		
AGE AND SERVICE							
(27) YEAR BUILT		1954					
(106)YEAR RECONSTRUCTED		1984					
(42) TYPE OF SERVICE : ON - Highway							
UNDER - Waterway	CODE	15					
(28) LANES: ON STRUCTURE 2 UNDER STRUCTURE					APPRAISAL		CODE
(29) AVERAGE DAILY TRAFFIC		1500		(67) STRUCTURAL EVALUATION			5
(30) YEAR OF ADT 2009	(109) TRUCK ADT PCT	6 %		(68) DECK GEOMETRY			4
(19) BYPASS OR DETOUR LENGTH		4 MI		(69) UNDERCLEARANCES,VERTI & HORIZ			N
GEOMETRIC DATA				(71) WATERWAY ADEQUACY			5
(48) LENGTH OF MAXIMUM SPAN		18 FT		(72) APPROACH ROADWAY ALIGNMENT			7
(49) STRUCTURE LENGTH		36 FT		(36) TRAFFIC SAFETY FEATURES			0000
(50)CURB OR SIDEWALK: LEFT 0.3 FT RIGHT 0.3 FT				(113)SCOUR CRITICAL BRIDGES			5
(51) BRIDGE ROADWAY WIDTH CURB TO CURB		25.0 FT		SCOUR PLAN OF ACTION			
(52) DECK WIDTH OUT TO OUT		26.0 FT					
(32) APPROACH ROADWAY WIDTH (W/SHOULDERS)		20.0 FT			PROPOSED IMPROVEMENTS		
(33) BRIDGE MEDIAN - No Median	CODE	0		(75) TYPE OF WORK -			
(34) SKEW 0° (35) STRUCTURE FLARED		NO		(76) LENGTH OF STRUCTURE IMPROVEMENT	CODE		0 FT
(10) INVENTORY ROUTE MIN VERT CLEAR		99 FT 99 IN		(94) BRIDGE IMPROVEMENT COST			
(47) INVENTORY ROUTE TOTAL HORIZ CLEAR		25.0 FT		(95) ROADWAY IMPROVEMENT COST			
(53) MIN VERT CLEAR OVER BRIDGE RDWY		99 FT 99 IN		(96) TOTAL PROJECT COST			
(54) MIN VERT UNDERCLEAR REF Not a Highway or Railroad				(97) YEAR OF IMPROVEMENT COST ESTIMATE			20
(55) MIN LAT UNDERCLEAR RT REF Not a Highway or Railroad		99.9 FT		(114)FUTURE ADT 3000	(115) YEAR FUTURE ADT		2025
(56) MIN LAT UNDERCLEAR LT REF -		0.0 FT					
NAVIGATION DATA				INSPECTIONS			
(38) NAVIGATION CONTROL - No Navigational Control	CODE	0		(90) INSPECTION DATE			10/10/2011
(111)PIER PROTECTION - Not Applicable	CODE			(92) CRITICAL FEATURE INSPECTION :		(93) CFI DATE	
(39) NAVIGATION VERTICAL CLEARANCE		0		A) FRACTURE CRIT DETAIL -	NO	A)	
(116)VERT - LIFT BRIDGE NAV MIN VERT CLEAR				B) UNDERWATER INSP -	NO	B)	
(40) NAVIGATION HORIZONTAL CLEARANCE		0		C) OTHER SPECIAL INSP	NO	C)	
				SCOUR			

BRIDGE MANAGEMENT UNIT
DATA ON EXISTING STRUCTURE

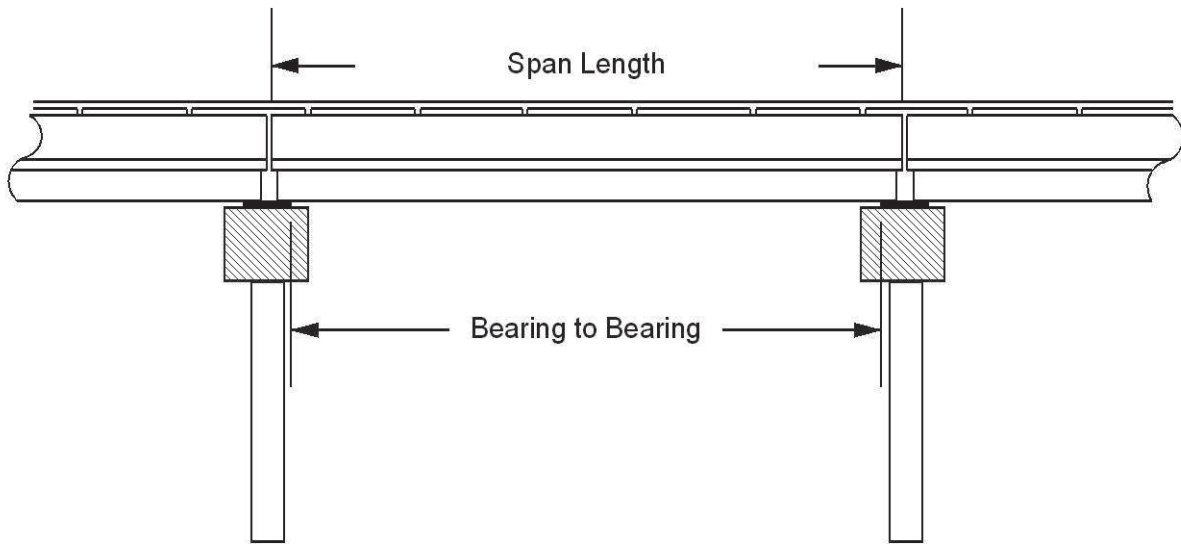
Run Date: 11/01/2011

COUNTY : ORANGE	DIV : 7	DIST : 1	STRUCTURE NUMBER : 670077	LENGTH : 36 FEET
ROUTE CARRIED : SR1113		FEATURE INTERSECTED : NEW HOPE CREEK		
LOCATED : 0.8 MI. W. JCT. SR1009		BRIDGE NAME :		CITY :
FUNC. CLASS : 09	SYST.ON : NFA	SYST.UNDER : NFA	ADT & YR : 1500 2009	RAIL TYPE : LT 227 RT 227
BUILT : 1954	BY : BMU	PROJ :	FED.AID PROJ :	DESIGN LOAD : Other or Unknown
REHAB : 1984	BY : BMU	PROJ : 5.5051	ALIGNMENT : TAN	SKEW : 90
LANES : ON 2 UNDER				
NAVIGATION : VC 0.0 FT HC 0.0 FT		HT. CRN. TO BED : 9 FT		WATER DEPTH : 1 FT
SUPERSTRUCTURE : TIMBER DECK ON TIMBER JOISTS				
SUBSTRUCTURE : END&INT.BENTS:TIM.CAPS,POSTS&PILES,CONC.ENCASED,TIM.BULKHEAD				
SPANS : 2@17'9				
BEAMS OR GIRDERS : SP1:19LNS 6X12 TIM.JST@1'4 CT,SP2:20LNS 6X12 TIM.JST@VAR.CTS				
FLOOR : 4X12 TIM, 2 AWS	ENCROACHMENT :		DECK (OUT TO OUT) : 26.0 FT	
CLEAR ROADWAY : 25.0 FT	BETWEEN RAILS : 25.7 FT		SIDEWALK OR CURB : LT 0.3 FT RT 0.3 FT	
VERT.CL.OVER : 99 FT 99 IN	VERT.CL.UNDER : 00 FT 00 IN		HOR.CL.UNDER : 0.0 FT	
INV.RTG. : HS-12	OPE.RTG. : HS-18	CONTR.MEMBER : Int Joist	POSTED : SV 19 TTST 27 DATE 09/19/2008	
SYSTEM : Secondary S.R. Route		GREEN LINE ROUTE : N		
2ND OPENING :		3RD OPENING :	4TH OPENING :	5TH OPENING :
REMARKS :				

Structure Data Worksheet

Spans

County: ORANGE Structure No: 670077 Date: 10/10/2011 Inspected By: TFM



Span No	Span Length	Bearing to Bearing	Comments
1	17.75	17.00	NBIS BL 33.5
2	17.75	17	

Stream Bed Soundings

(See next sheet for profile sketch)

Bridge No: 670077 County: ORANGE Date: 10/10/2011 By: TFM

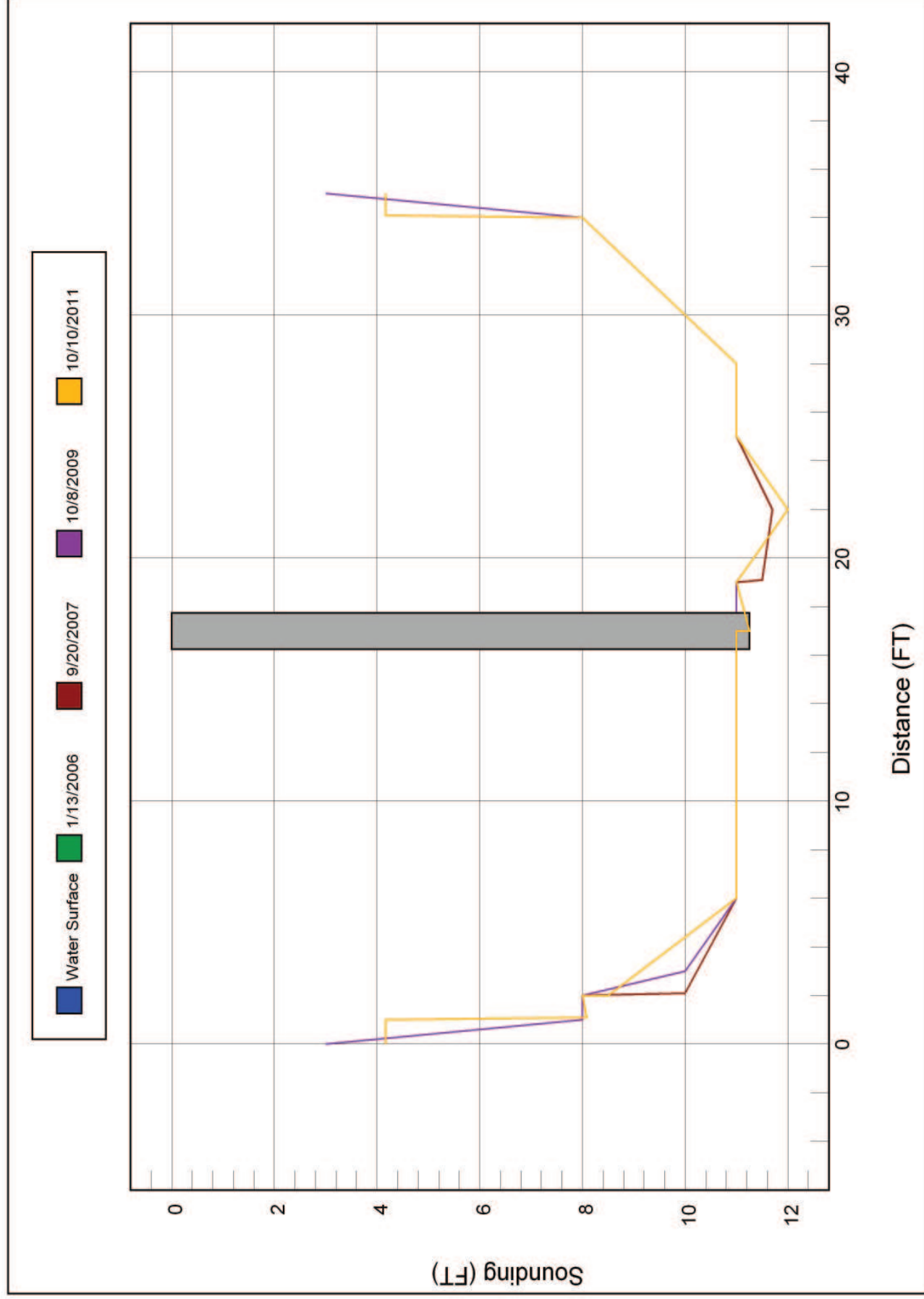
Record sounding from top of rail. Other location if needed: _____

Distance from Highwater Mark to top of rail: _____ Location of Highwater Mark: _____

DOWNSTREAM			UPSTREAM		
Distance (Station) (ft)	Sounding (ft)	Description	Distance (Station) (ft)	Sounding (ft)	Description
0	4.167	Top of Cap			
1	4.167	Top of Cap			
1.1	8.083	TOP OF FOOTER			
2	8				
2	8.5	GROUND AT FOOTER			
6	11				
12	11	NO H2O AT THIS INSPECTION			
15	11				
17	11				
17	11.25	Bent			
19	11				
22	12				
25	11				
28	11				
30	10				
34	8	GROUND AT CAP			
34	8				
34.1	4.167	Top of Cap			
35	4.167	Top of Cap			

STREAMBED PROFILE (Downstream)

Top of Rail = 0 FT (Sounding)



Bridge Inspection Field Sketch



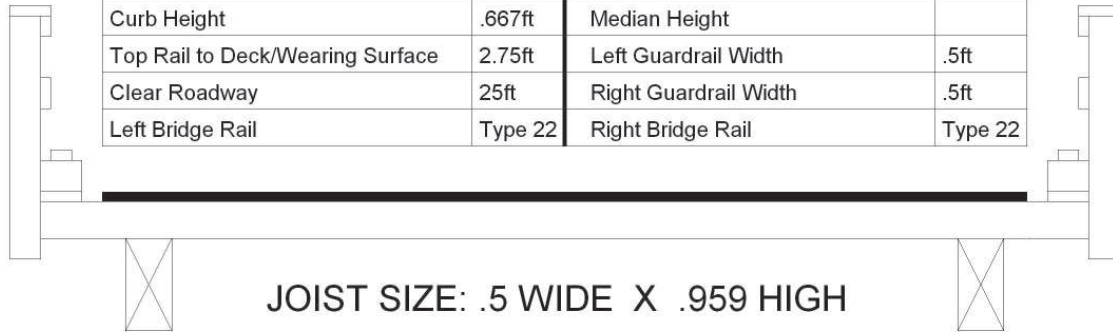
Roadway	20ft Wide	2 Paved Lanes	Looking North
Left Shoulder	6ft Wide		6ft Unpaved
Right Shoulder	6ft Wide		6ft Unpaved

MEASUREMENTS VERIFIED, TFM 10/10/2011

Title		Description	
APPROACH ROADWAY SKETCH		APPROACH ROADWAY SKETCH	
Bridge No: 670077	Drawn By: GDP	Date: 10/08/09	File Name: S0066000623

Bridge Inspection Field Sketch

Deck Width/Out to Out	26ft	Wearing Surface	.167ft
Between Rails	25.667ft	Median Width	
Curb Height	.667ft	Median Height	
Top Rail to Deck/Wearing Surface	2.75ft	Left Guardrail Width	.5ft
Clear Roadway	25ft	Right Guardrail Width	.5ft
Left Bridge Rail	Type 22	Right Bridge Rail	Type 22



JOIST SIZE: .5 WIDE X .959 HIGH

Measurements for Span #	1		
Deck Thickness	.313	Left Overhang	1
Top of Rail to Bottom of Beam	4.25	Right Overhang	1

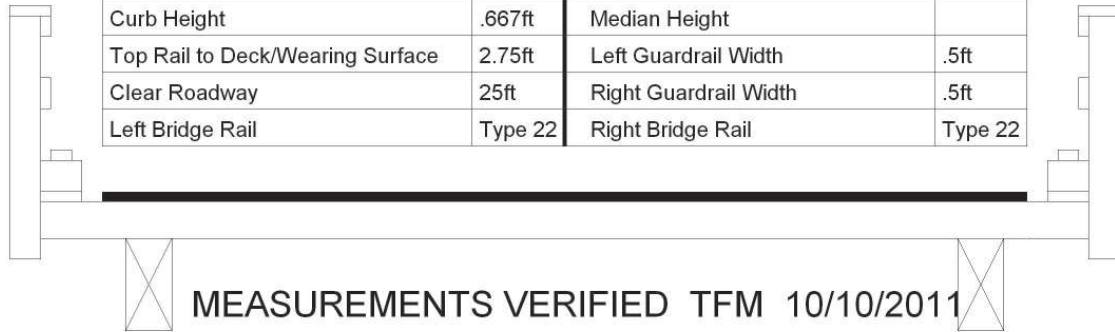
Beam No	Beam Type	Spacing	Comments
1	Timber (Rectangular)	1.333ft	SPAN A ONLY
2	Timber (Rectangular)	1.333ft	SPAN A ONLY
3	Timber (Rectangular)	1.333ft	SPAN A ONLY
4	Timber (Rectangular)	1.333ft	SPAN A ONLY
5	Timber (Rectangular)	1.333ft	SPAN A ONLY
6	Timber (Rectangular)	1.333ft	SPAN A ONLY
7	Timber (Rectangular)	1.333ft	SPAN A ONLY
8	Timber (Rectangular)	1.333ft	SPAN A ONLY
9	Timber (Rectangular)	1.333ft	SPAN A ONLY
10	Timber (Rectangular)	1.333ft	SPAN A ONLY
11	Timber (Rectangular)	1.333ft	SPAN A ONLY
12	Timber (Rectangular)	1.333ft	SPAN A ONLY
13	Timber (Rectangular)	1.333ft	SPAN A ONLY
14	Timber (Rectangular)	1.333ft	SPAN A ONLY
15	Timber (Rectangular)	1.333ft	SPAN A ONLY
16	Timber (Rectangular)	1.333ft	SPAN A ONLY
17	Timber (Rectangular)	1.333ft	SPAN A ONLY
18	Timber (Rectangular)	1.333ft	SPAN A ONLY
19	Timber (Rectangular)		SPAN A ONLY

MEASUREMENTS VERIFIED TFM 10/10/2011

Title		Description	
STRUCTURE DATA SKETCH		STRUCTURE DATA SKETCH	
Bridge No: 670077	Drawn By: GDP	Date: 10/08/09	File Name: S0066000624

Bridge Inspection Field Sketch

Deck Width/Out to Out	26ft	Wearing Surface	.167ft
Between Rails	25.667ft	Median Width	
Curb Height	.667ft	Median Height	
Top Rail to Deck/Wearing Surface	2.75ft	Left Guardrail Width	.5ft
Clear Roadway	25ft	Right Guardrail Width	.5ft
Left Bridge Rail	Type 22	Right Bridge Rail	Type 22



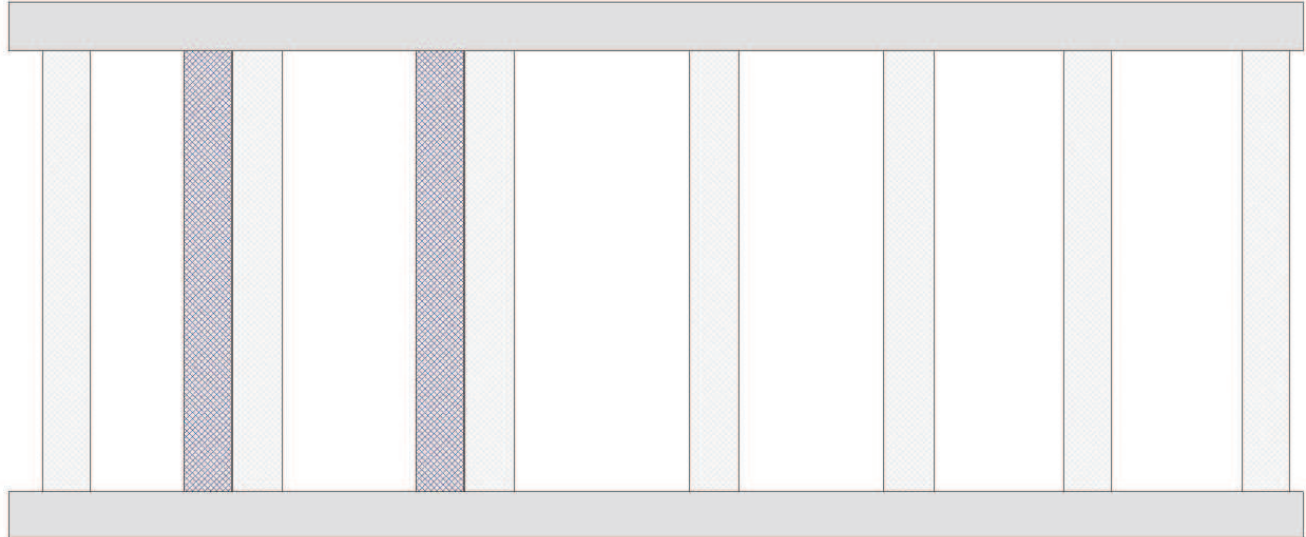
MEASUREMENTS VERIFIED TFM 10/10/2011

Measurements for Span #	2		
Deck Thickness	.313	Left Overhang	1
Top of Rail to Bottom of Beam	4.25	Right Overhang	1

Beam No	Beam Type	Spacing	Comments
1	Timber (Rectangular)	.75ft	SPAN B ONLY
2	Timber (Rectangular)	1.083ft	SPAN B ONLY
3	Timber (Rectangular)	1.333ft	SPAN B ONLY
4	Timber (Rectangular)	1.333ft	SPAN B ONLY
5	Timber (Rectangular)	1.333ft	SPAN B ONLY
6	Timber (Rectangular)	1.333ft	SPAN B ONLY
7	Timber (Rectangular)	1.333ft	SPAN B ONLY
8	Timber (Rectangular)	1.333ft	SPAN B ONLY
9	Timber (Rectangular)	1.333ft	SPAN B ONLY
10	Timber (Rectangular)	1.333ft	SPAN B ONLY
11	Timber (Rectangular)	1.333ft	SPAN B ONLY
12	Timber (Rectangular)	1.333ft	SPAN B ONLY
13	Timber (Rectangular)	1.333ft	SPAN B ONLY
14	Timber (Rectangular)	1.333ft	SPAN B ONLY
15	Timber (Rectangular)	1.333ft	SPAN B ONLY
16	Timber (Rectangular)	1.333ft	SPAN B ONLY
17	Timber (Rectangular)	1.333ft	SPAN B ONLY
18	Timber (Rectangular)	1.333ft	SPAN B ONLY
19	Timber (Rectangular)	.833ft	SPAN B ONLY
20	Timber (Rectangular)		SPAN B ONLY

Title		Description	
JOIST SPACINGS FOR SPAN B		JOIST SPACINGS FOR SPAN B	
Bridge No: 670077	Drawn By: GDP	Date: 10/08/09	File Name: S0066000625

Bridge Inspection Field Sketch



Cap Information			Material Timber							
Length 26 ft.	Width 1 ft.	Height .98 ft.	Left Overhang 1.167 ft.	Right Overhang 1.167 ft.	Left Beam to End of Cap. 1 ft.	Right Beam to End of Cap. 1 ft.				
Subcap Information			Material							
Length	Width	Height	Left Overhang	Right Overhang	Left Pile to Splice.					
Sill Information			Material							
Length 26 ft.	Width 2.833 ft.	Height 2.5 ft.								
Pile #	Material	Spacing	Width/Dia.	Height	Length	Orientation	Driven?	Replacement?	Removed?	Collar?
1	Timber	2.833 ft.	0.959 ft.			Vertical	No	No	No	No
2	Timber	1 ft.	0.959 ft.			Vertical	No	Yes	No	No
3	Timber	3.667 ft.	1 ft.			Vertical	No	No	No	No
4	Timber	1 ft.	0.959 ft.			Vertical	No	Yes	No	No
5	Timber	4.5 ft.	1 ft.			Vertical	No	No	No	No
6	Timber	3.917 ft.	1 ft.			Vertical	No	No	No	No
7	Timber	3.583 ft.	1 ft.			Vertical	No	No	No	No
8	Timber	3.583 ft.	0.959 ft.			Vertical	No	No	No	No
9	Timber		0.959 ft.			Vertical	No	No	No	No
SQUARE POST USED BESIDE ROUND PILES										

Bent/Abutment #: 1 Similar Bents:

Title

PILE DIAGRAM END BENT 1

Description

PILE DIAGRAM END BENT 1

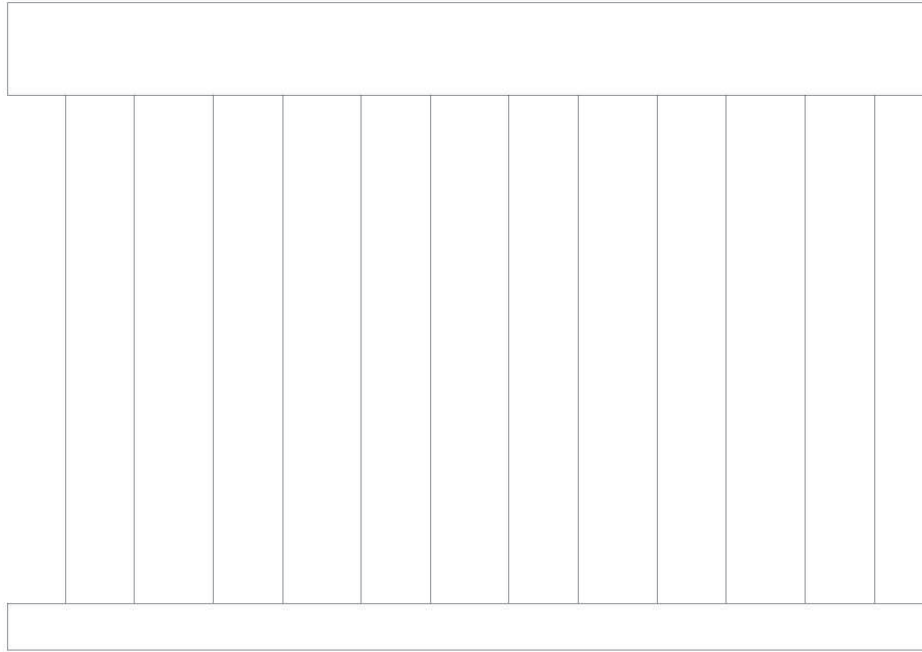
Bridge No: 670077

Drawn By: TFM

Date: 10/10/2011

File Name: S0066000626

Bridge Inspection Field Sketch



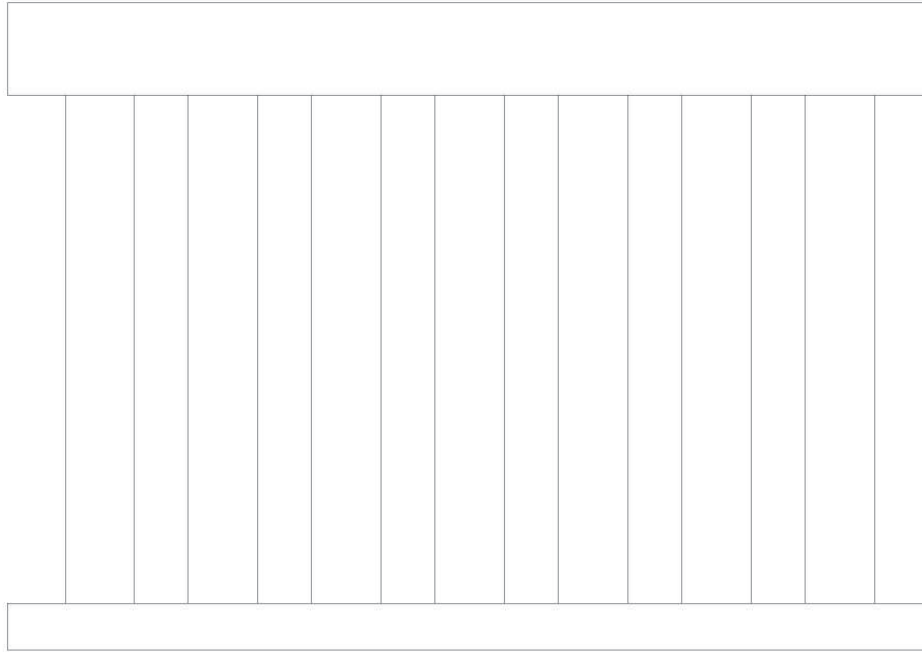
Bent #	1		
Cap - Beam Type (Wood or Steel)			
Cap Size	26ft Long	1ft Wide	.98ft High
Left Overhang	1ft	Lt Cap/Beam Overhang	1.167ft
Right Overhang	1ft	Rt Cap/Beam Overhang	1.167ft
Sill - Sill			
Sill Size	26ft Long	3ft Wide	2.667ft High

Pile #	Material	Pile Type	Spacing	Length	Width/Diam.	Height	Orientation
1	Wood or Timber	Pile Bent	2.667		.959 x .959 POST		Vertical
2	Wood or Timber	Pile Bent	5.417		1		Vertical
3	Wood or Timber	Pile Bent	6		1		Vertical
4	Wood or Timber	Pile Bent	5.667		1		Vertical
5	Wood or Timber	Pile Bent	2.667		1		Vertical
6	Wood or Timber	Pile Bent			.959 x .959 POST		Vertical

MEASUREMENTS VERIFIED TFM 10/10/2011

Title		Description	
PILE DIAGRAM FOR PIER		PILE DIAGRAM FOR PIER	
Bridge No: 670077	Drawn By: GDP	Date: 10/08/09	File Name: S0066000627

Bridge Inspection Field Sketch



Abutment #	2		
Cap - Beam Type (Wood or Steel)			
Cap Size	26ft Long	1ft Wide	.98ft High
Left Overhang	1.667ft	Lt Cap/Beam Overhang	1ft
Right Overhang	1.667ft	Rt Cap/Beam Overhang	1ft
Sill - Sill			
Sill Size	26ft Long	2.917ft Wide	1.667ft High

Pile #	Material	Pile Type	Spacing	Length	Width/Diam.	Height	Orientation
1	Wood or Timber	Pile Bent	3.083		.959 x .959 POST		Vertical
2	Wood or Timber	Pile Bent	4.333		1		Vertical
3	Wood or Timber	Pile Bent	4.417		1		Vertical
4	Wood or Timber	Pile Bent	4.417		1.083		Vertical
5	Wood or Timber	Pile Bent	3.833		.98		Vertical
6	Wood or Timber	Pile Bent	3.917		1.167		Vertical
7	Wood or Timber	Pile Bent			.959 x .959 POST		Vertical

MEASUREMENTS VERIFIED TFM 10/10/2011

Title		Description	
PILE DIAGRAM FOR END BENT 2		PILE DIAGRAM FOR END BENT 2	
Bridge No: 670077	Drawn By: GDP	Date: 10/08/09	File Name: S0066000628



END BENT 2 APPROACH ROADWAY



LOOKING WEST FROM BRIDGE



LOOKING EAST FROM BRIDGE



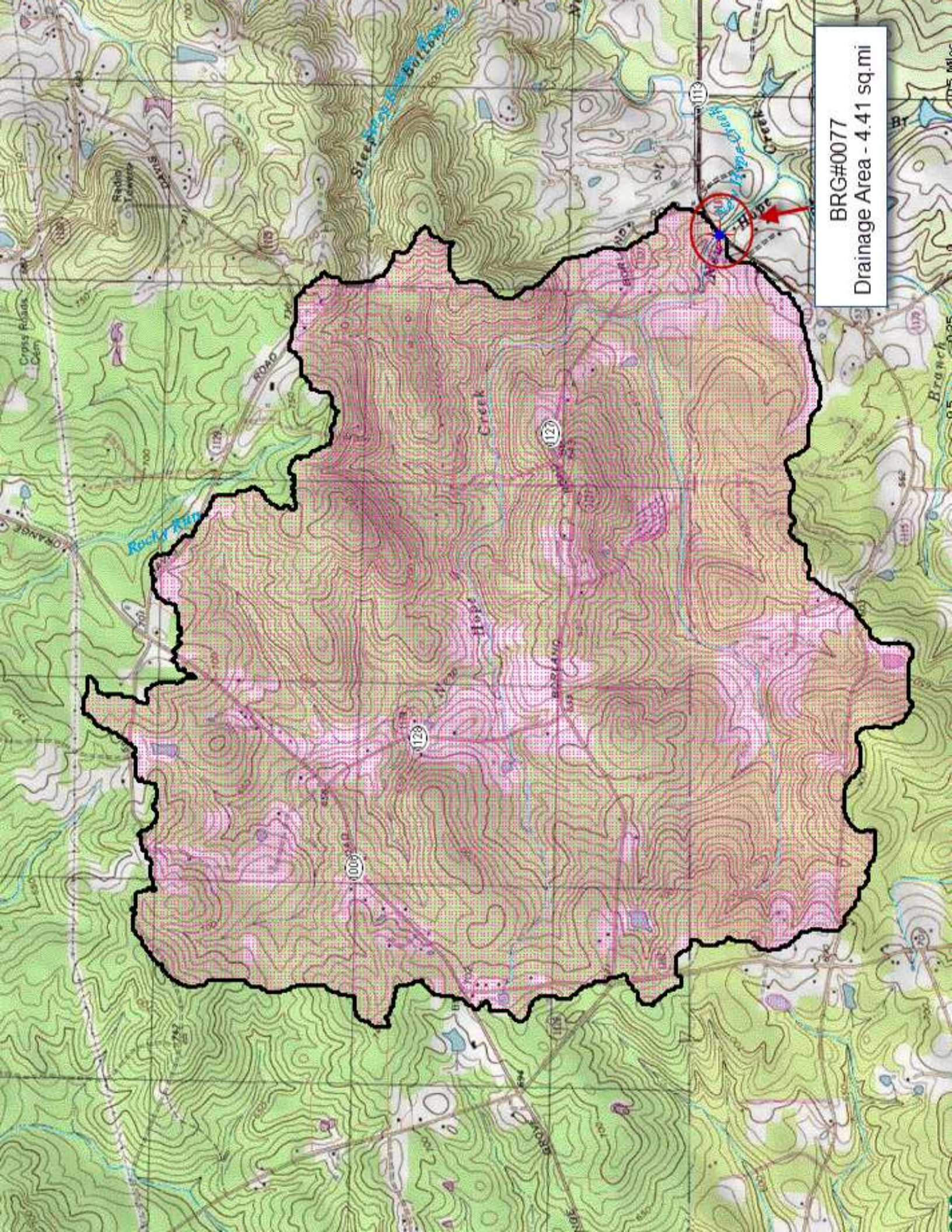
LOOKING NORTH FROM BRIDGE



LOOKING SOUTH UPSTREAM

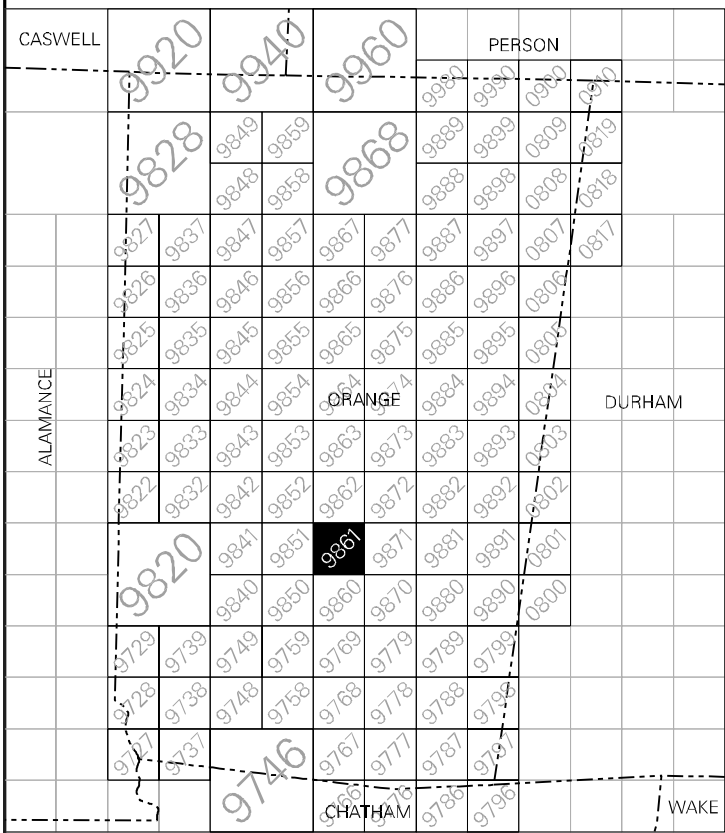


LOOKING NORTH DOWNSTREAM



BRG#0077
Drainage Area - 4.41 sq.mi

STATE OF NORTH CAROLINA FIRM PANEL LOCATOR DIAGRAM



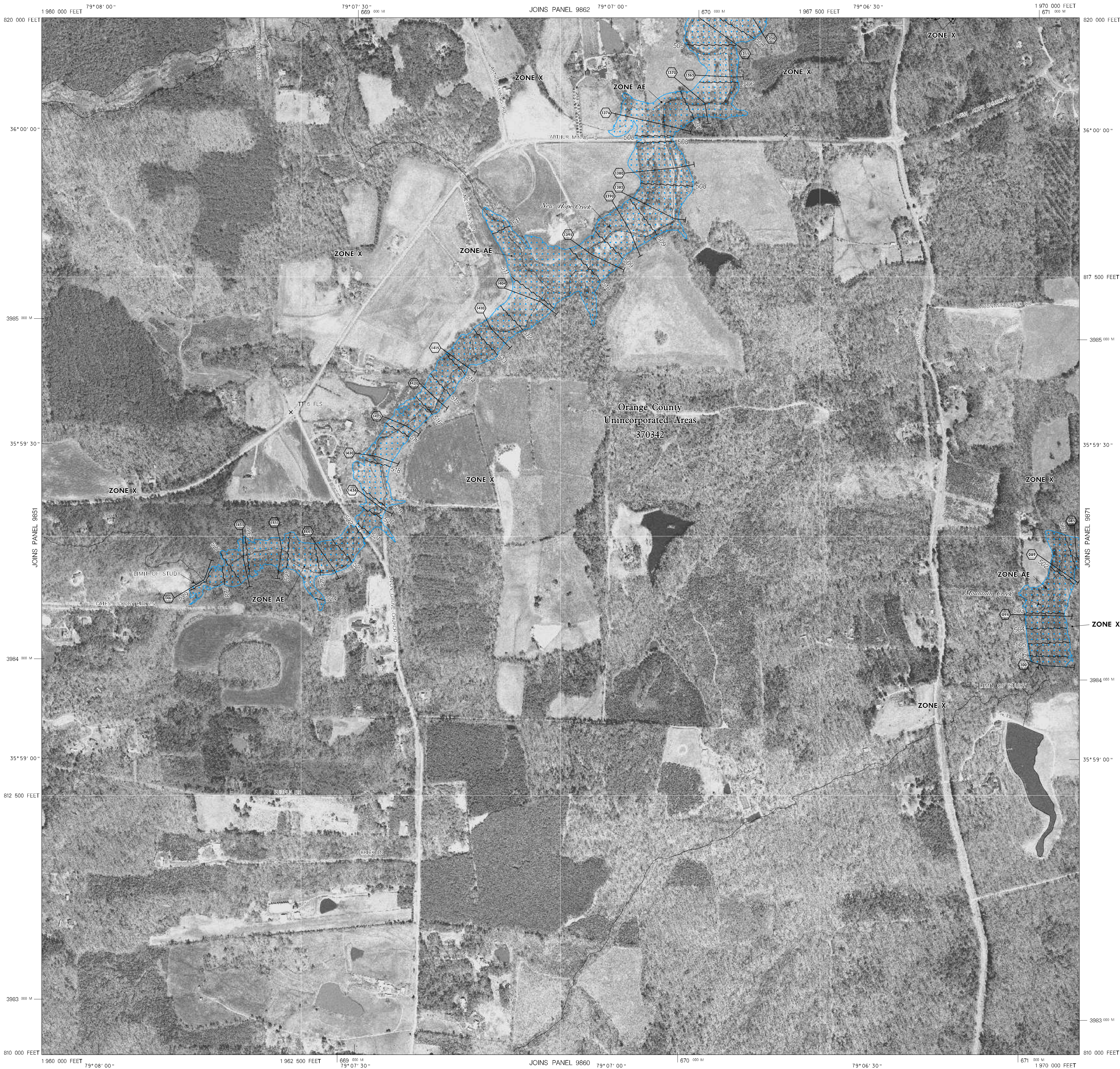
DATUM INFORMATION

The **projection** used in the preparation of this map was the North Carolina State Plane (FIPSZONE 3200). The **horizontal datum** was the North American Datum of 1983, GRS80 ellipsoid. Differences in datum, ellipsoid, projection, or Universal Transverse Mercator zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdictional boundaries. These differences do not affect the accuracy of this FIRM. All coordinates on this map are in U.S. Survey Feet, where 1 U.S. Survey Foot = 1200/3937 Meters.

Flood elevations on this map are referenced to the North American Vertical Datum of 1988 (NAVD 88). These flood elevations must be compared to structure and ground elevations referenced to the same **vertical datum**. An average offset between NAVD 88 and the National Geodetic Vertical Datum of 1929 (NGVD 29) has been computed for each North Carolina county. This offset was then applied to the NGVD 29 flood elevations that were not revised during the creation of this statewide format FIRM. The offsets for each county shown on this FIRM panel are shown in the vertical datum offset table below. Where a county boundary and a flooding source with unrevised NGVD 29 flood elevations are coincident, an individual offset has been calculated and applied during the creation of this statewide format FIRM. See Section 6.1 of the accompanying Flood Insurance Study report to obtain further information on the conversion of elevations between NAVD 88 and NGVD 29. To obtain current elevation, description, and/or location information for **bench marks** shown on this map, please contact the North Carolina Geodetic Survey at the address shown below. You may also contact the Information Services Branch of the National Geodetic Survey at (301) 713-3242, or visit its website at www.ngs.noaa.gov.

North Carolina Geodetic Survey 121 West Jones Street Raleigh, NC 27601 (919) 733-3636 www.ncgs.state.nc.us	County Average Vertical Datum Offset Table County Vertical Datum Offset (ft) Orange - 0.79 Example: NAVD 88 = NGVD 29 + (-0.79)
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All streams listed in the **Flood Hazard Data Table** below were studied by detailed methods using field survey. Other flood hazard data shown on this map may have been derived using either a coastal analysis or limited detailed riverine analysis. More information on the flooding sources studied by these analyses is contained in the Flood Insurance Study report.



LEGEND

SPECIAL FLOOD HAZARD AREAS (SFHAs) SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

The 1% annual chance flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, A99, V, and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.

- ZONE A** No Base Flood Elevations determined.
- ZONE AE** Base Flood Elevations determined. Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.
- ZONE AH** Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.
- ZONE AO** Special Flood Hazard Area formerly protected from the 1% annual chance flood by a flood control system that was subsequently identified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.
- ZONE AR** Area to be protected from 1% annual chance flood by a Federal flood protection system under construction; no Base Flood Elevations determined.
- ZONE A99** Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.
- ZONE VE** Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

ZONE X Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

OTHER AREAS

ZONE X Areas determined to be outside the 0.2% annual chance floodplain. Areas in which flood hazards are undetermined, but possible.

ZONE D Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

- 1% annual chance floodplain boundary
- 0.2% annual chance floodplain boundary
- Floodway boundary
- Zone D Boundary
- CBRS and OPA boundary
- Boundary dividing Special Flood Hazard Area Zones and boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths or flood velocities.
- Base Flood Elevation line and value; elevation in feet* (EL 987)
- Base Flood Elevation value where uniform within zone; elevation in feet*

*Referenced to the North American Vertical Datum of 1988

- Cross section line
- Transect line
- Geographic coordinates referenced to the North American Datum of 1983 (NAD 83)
- 1000-meter Universal Transverse Mercator grid ticks, zone 18
- 2500-foot grid values North Carolina State Plane coordinate system (FIPSZONE 3200, State Plane NAD 83 feet)
- North Carolina Geodetic Survey bench mark (see explanation in the Datum Information section of this FIRM panel).
- National Geodetic Survey bench mark (see explanation in the Datum Information section of this FIRM panel).
- River Mile



GRID NORTH
MAP SCALE 1" = 500' (1 : 6,000)
250 500 1000 1500
0 150 300
FEET
METERS

NOTES TO USERS

This map is for use in administering the National Flood Insurance Program. It does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size. The **community map repository** should be consulted for possible updated or additional flood hazard information.

To obtain more detailed information in areas where **Base Flood Elevations** (BFEs) and/or **Floodways** have been determined, users are encouraged to consult the Flood Profiles, Floodway Data, Limited Detailed Flood Hazard Data, and/or Summary of Stillwater Elevations tables contained within the Flood Insurance Study (FIS) report that accompanies this FIRM. Users should be aware that BFEs shown on the FIRM represent rounded whole-foot elevations. These BFEs are intended for flood insurance rating purposes only and should not be used as the sole source of flood elevation information. Accordingly, flood elevation data presented in the FIS report should be utilized in conjunction with the FIRM for purposes of construction and/or floodplain management.

Boundaries of **regulatory floodways** shown on the FIRM for flooding sources studied by detailed methods were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data for flooding sources studied by detailed methods as well as **non-encroachment widths** for flooding sources studied by limited detailed methods are provided in the FIS report for this jurisdiction. The FIS report also provides instructions for determining a floodway using non-encroachment widths for flooding sources studied by limited detailed methods.

Certain areas not in Special Flood Hazard Areas may be protected by **flood control structures**. Refer to Section 4.4 "Flood Protection Measures" of the Flood Insurance Study report for information on flood control structures in this jurisdiction.

Base map information and geospatial data used to develop this FIRM were obtained from various organizations, including the participating local communities, state and federal agencies, and/or other sources. The primary base for this FIRM is aerial imagery acquired by Orange County. The time period of collection for the imagery is 2003. Information and geospatial data supplied by the local communities that met FEMA base map specifications were considered the preferred source for development of the base map. See geospatial metadata for the associated digital FIRM for additional information about base map preparation.

Base map features shown on this map, such as **corporate limits**, are based on the most up-to-date data available at the time of publication. **Changes in the corporate limits may have occurred since this map was published.** Map users should consult the appropriate community official or website to verify current conditions of jurisdictional boundaries and base map features. This map may contain roads that were not considered in the hydraulic analysis of streams where no new hydraulic model was created during the production of this statewide format FIRM.

This map reflects more detailed and up-to-date **stream channel configurations** than those shown on the previous FIRM for this jurisdiction. The floodplains and floodways that were transferred from the previous FIRM may have been adjusted to conform to these new stream channel configurations. As a result, the Flood Profiles and Floodway Data tables in the Flood Insurance Study report (which contains authoritative hydraulic data) may reflect stream channel distances that differ from what is shown on this map.

Please refer to the separately printed **Map Index** for an overview map of the county showing the layout of map panels, community map repository addresses, and a Listing of Communities table containing National Flood Insurance Program dates for each community as well as a listing of the panels on which each community is located.

If you have **questions about this map** or questions concerning the National Flood Insurance Program in general, please call **1-877-FEMA MAP** (1-877-336-2627) or visit the FEMA website at www.fema.gov.

An accompanying Flood Insurance Study report, Letter of Map Revision (LOMR) or Letter of Map Amendment (LOMA) revising portions of this panel, and digital versions of this FIRM may be available. Visit the **North Carolina Floodplain Mapping Program** website at www.ncfloodmaps.com, or contact the **FEMA Map Service Center** at 1-800-358-9616 for information on all related products associated with this FIRM. The FEMA Map Service Center may also be reached by Fax at 1-800-358-9620 and its website at www.msc.fema.gov.

MAP REPOSITORY
Refer to Listing of Map Repositories on Map Index or visit www.ncfloodmaps.com.

EFFECTIVE DATE OF FLOOD INSURANCE RATE MAP PANEL
FEBRUARY 2, 2007

EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL

For community map revision history prior to statewide mapping, refer to the Community Map History table located in the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in this community, contact your insurance agent, the North Carolina Division of Emergency Management or the National Flood Insurance Program at the following phone numbers or websites:

NC Division of Emergency Management
(919) 715-8000
www.ncemergencycontrol.org/nfip
National Flood Insurance Program
1-800-638-6620
www.fema.gov/nfip



This digital Flood Insurance Rate Map (FIRM) was produced through a unique cooperative partnership between the State of North Carolina and the Federal Emergency Management Agency (FEMA). The State of North Carolina has implemented a long term approach of floodplain management to decrease the costs associated with flooding. This is demonstrated by the State's commitment to map floodplain areas at the local level. As a part of this effort, the State of North Carolina has joined in a Cooperating Technical State agreement with FEMA to produce and maintain this digital FIRM.

www.ncfloodmaps.com

PANEL 9861J

FIRM
FLOOD INSURANCE RATE MAP
NORTH CAROLINA

PANEL 9861

(SEE LOCATOR DIAGRAM OR MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY ORANGE COUNTY
OID No. 370342
PANEL 9861
SUFFIX J

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

EFFECTIVE DATE
FEBRUARY 2, 2007

MAP NUMBER
370986100J



State of North Carolina
Federal Emergency Management Agency