

PREDESIGN-PRESURVEY REPORT

Project#
TIP# B-5691
Let Date
WBS#

County CUMBERLAND

Bridge# 250052
Road# SR1006 Maxwell Rd.
Stream SOUTH RIVER

Type Of Request: POC Force Account TIP NCMA POT. DES/BUILD
Date 11-2015 Name JLL Assigned To
Checked By

Prior Survey Date NONE (attach copy of prior survey)

Study By Scour Section See attached.

Flood Zone LIMITED ^{LIMITED} Detail Study ✓ Date 1-5-07 Panel# 0488 model available on files NO QT

B.M. Info

Quad Map STEDMAN Drainage Area 196 sq. mi From STREAM STARTS
Q25 6000 cfs Q50 7350 cfs Q100 8750 cfs Method USGS 2009-5158

EXISTING BRIDGE INFORMATION

Location SR1006 0.2 miles EAST OF JNCT. SR1818

Average Daily Traffic 2500 2012

Length 211 Bed- To Crown 22' Water Depth 11'

Type Structure STEEL PLANK ON I-BEAMS

Type Spans 3 @ 35 90° SKW

Upstream Structure SR 56 Built 1987

Location SR 1823 186 Feet CURED Slab 47, 46, 47 3 spans

Bed- To Crown 17' Prior Survey

Downstream Structure BRIDGES 171 & 172 ON SR 1851 171 = 231' 172 = 151'

Location 0.3 & 0.4 mile EAST JNCT. 1848

Bed- To Crown 12' & 16' Prior Survey NO

SCS Watershed

ENVIRONMENTAL

Trout Stream NO Anadromous Fish NO Primary Nursery Area NO
High Quality Waters NO Nutrient Sensitive Waters NO
Near Water Supply Intake NO CAMA County NO
Stream Classification C, SW
DENR River Basin Info. CAPE FEAR

OFFICE EST. BR. Length = 210'



NC DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
STRUCTURE MANAGEMENT UNIT

ATTENTION: TEMPORARY REPAIRS : ENCASED PILES

Structure Safety Report

Routine Element Inspection

COUNTY: CUMBERLAND STRUCTURE NUMBER: 250052 FREQUENCY: 24 MONTHS

FACILITY CARRIED: SR1006 MILE POST:

LOCATION: 0.2 MI.E. OF JCT.SR1818

FEATURE INTERSECTED: SOUTH RIVER

LATITUDE: 35° 5' 7.07" LONGITUDE: 78° 40' 20.26"

SUPERSTRUCTURE: STEEL PLANK FLOOR ON I-BEAMS

SUBSTRUCTURE: EBTS&IBTS:TIM.CAP&SUB-CAP/TIM.PILES @ VARIOUS CTS.

SPANS: 1@35"4;4@35"1;1@35"4

☐ FRACTURE CRITICAL ☐ TEMPORARY SHORING ☐ SCOUR CRITICAL ☐ SCOUR PLAN OF ACTION

PRESENT CONDITION: Poor INSPECTION DATE: 03/19/2015

POSTED SV: Not Posted POSTED TTST: Not Posted

OTHER SIGNS PRESENT: 4 DELINEATORS



LOOKING EAST (MAXWELL ROAD)

Sign noticed issued for		Number Required
<u>NO</u>	WEIGHT LIMIT	<u>0</u>
<u>NO</u>	DELINEATORS	<u>0</u>
<u>NO</u>	NARROW BRIDGE	<u>0</u>
<u>NO</u>	ONE LANE BRIDGE	<u>0</u>
<u>NO</u>	LOW CLEARANCE	<u>0</u>

INSPECTED BY R.D. HEATH	SIGNATURE <i>R.D. Heath</i>	ASSISTED BY R.L. KISNER
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BRIDGE MANAGEMENT UNIT

DATA ON EXISTING STRUCTURE

Run Date: 06/25/2015

COUNTY :	DIVISION :	DISTRICT :	STRUCTURE NUMBER :	LENGTH :
CUMBERLAND	6	2	250052	211 FEET

ROUTE CARRIED :	FEATURE INTERSECTED :
SR1006	SOUTH RIVER

LOCATED :	BRIDGE NAME :	CITY :
0.2 MI.E. OF JCT.SR1818		

FUNC. CLASS :	SYST.ON :	SYST.UNDER :	ADT & YR :	RAIL TYPE :
07	FA	NFA	2500 2012	LT 233 RT 233

BUILT :	BY :	PROJ :	FED.AID PROJ :	DESIGN LOAD :
1973	BMU	5.4451		Unknown

REHAB :	BY :	PROJ :	ALIGNMENT :	SKEW :	LANES :
			TAN	90	ON 2 UNDER 0

NAVIGATION :	HT. CRN. TO BED :	WATER DEPTH :
VC 0 FT HC 0 FT 22 FT		11 FT

SUPERSTRUCTURE : STEEL PLANK FLOOR ON I-BEAMS

SUBSTRUCTURE : EBTS&IBTS:TIM.CAP&SUB-CAP/TIM.PILES @ VARIOUS CTS.

SPANS : 1@35'4;4@35'1;1@35'4

BEAMS OR GIRDERS : 10 LINES OF 21 I-BMS @ VAR.CTS.

FLOOR :	ENCROACHMENT :	DECK (OUT TO OUT) :
STL.PLK/2 AWS		28 FT

CLEAR ROADWAY :	BETWEEN RAILS :	SIDEWALK OR CURB :
28 FT	28 FT	LT 0 FT RT 0 FT

VERT.CL.OVER :
999.9 FT

INV.RTG. :	OPE.RTG. :	CONTR.MEMBER :	POSTED :	DATE
HS-1	HS-1	int.bm	SV TTST	06/12/2013

SYSTEM :	GREEN LINE ROUTE :
Secondary S.R. Route	N

UNDER ROUTES AND CLEARANCES

REMARKS :

Stream Bed Soundings

(See next sheet for profile sketch)

Bridge No: 250052 County: CUMBERLAND Date: _____ By: RDH

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	2.2	TOP OF BULKHEAD			
1	4.6	Top of Cap			
2	9.1	GROUND AT CAP	2	8.7	GROUND AT CAP
15	11.3				
22	12.1	WSWE (SOUTH)			
35	13.9	BENT 1	35	13.3	BENT 1
60	22.4				
70	24	BENT 2	70	23.4	BENT 2
90	24.2				
105	14.9	BENT 3	105	23	BENT 3
118	12.1	WSWE			
120	11				
140	11.8	BENT 4	140	11.9	BENT 4
157	11				
175	11.4	BENT 5	175	11.4	BENT 5
190	10.7				
210	9.5	GROUND AT CAP	210	9.9	GROUND AT CAP
211	4.6	Top of Cap			
211.5	2.2	TOP OF BULKHEAD			

$$\begin{array}{r}
 24.2 \\
 4.6 \\
 \hline
 19.6 \times 15 \times 2 = 58.8 + 20 = 78.8 + \text{stream width.} \\
 96.0 \\
 \hline
 174.8 \text{ ss } 175' \\
 \text{Do not shorten.} \\
 \text{align bent. } 210'
 \end{array}$$

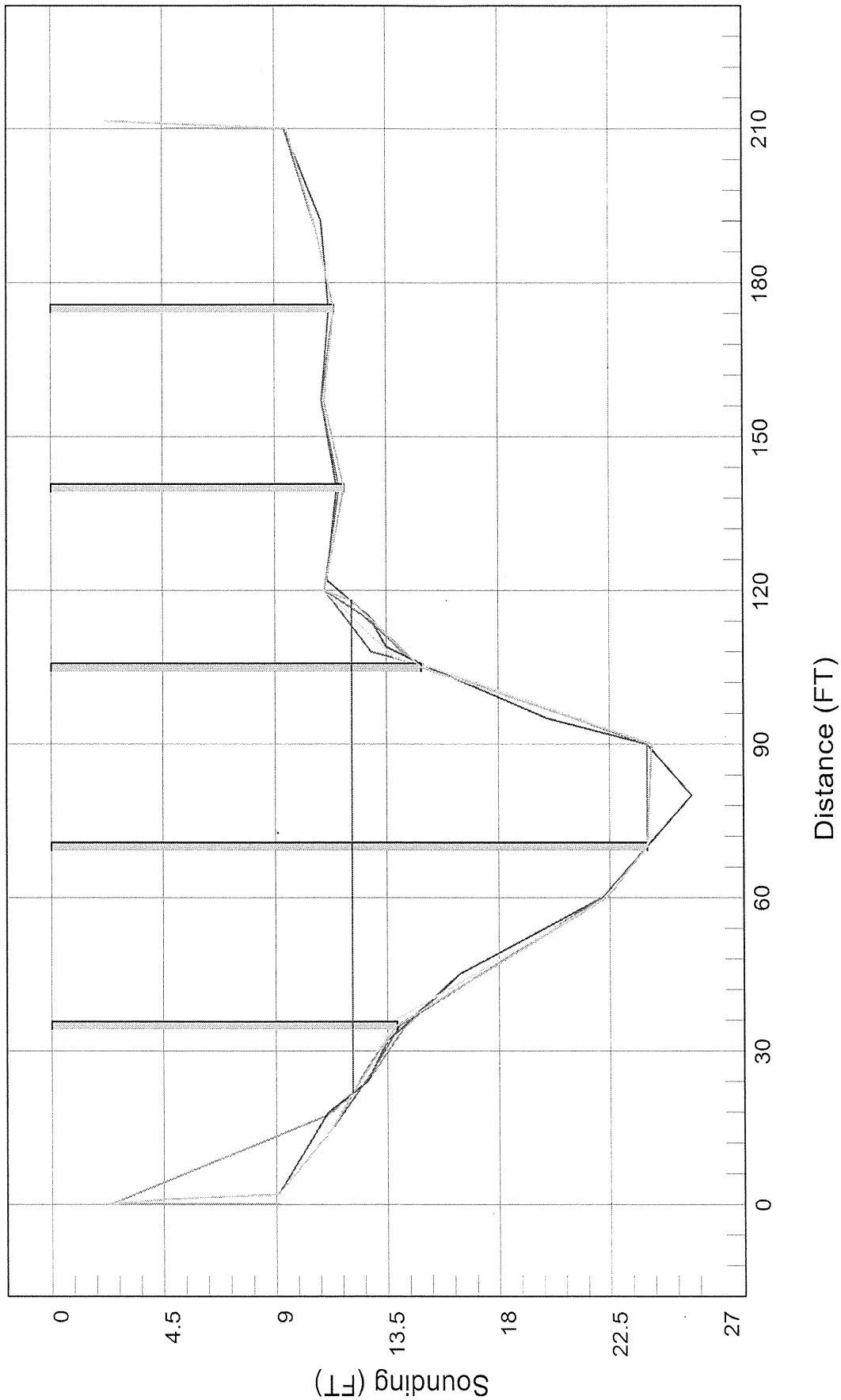
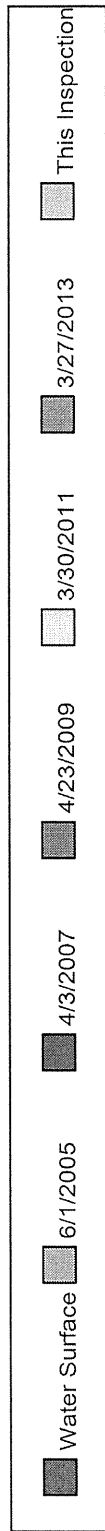
Bridge: 250052

County CUMBERLAND

Date:

STREAMBED PROFILE (Downstream)

Top of Rail = 0 FT (Sounding)

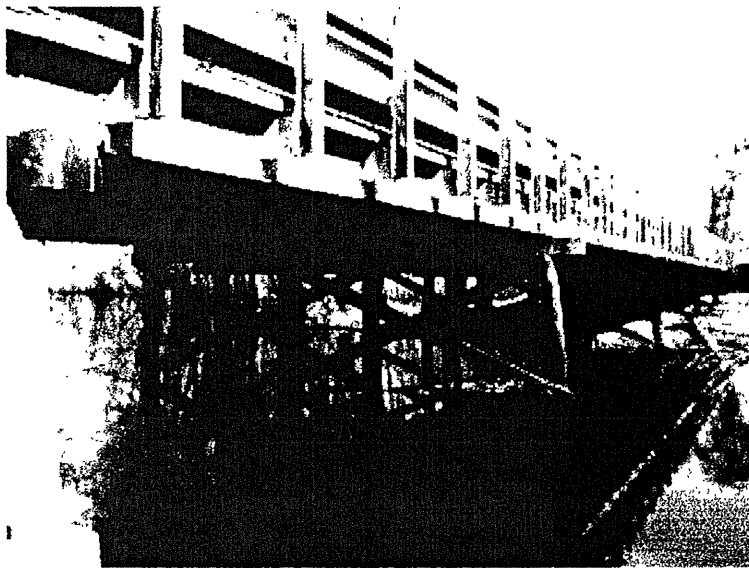




Unknown Foundation Determination

Substructure Report

Cumberland County #250052
SR 1006 over South River



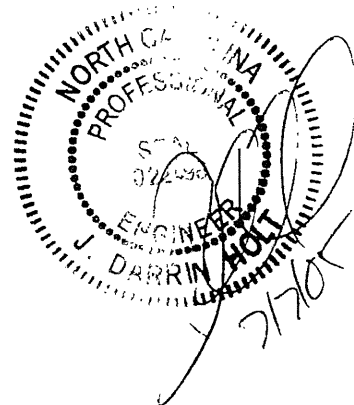
FDH Project # 04-0101E(310)

Submitted by:

J. Darrin Holt, Ph.D., P.E.
President

FDH Engineering, Inc.
PO Box 33037 Raleigh, NC 27636-3037
T: (919) 755-1012 F: (919) 755-1031
www.fdh-inc.com
info@fdh-inc.com

February 28, 2005



Report Submitted to: Mr. Jerry Beard, PE
NCDOT Hydraulics Unit
1590 Mail Service Station
Raleigh, NC 27695-1590

Facility Carried: SR 1006

Feature: South River

Original Construction: 1973 **Year Reconstructed:** N/A **ADT:** 7900 (2000)

Work Performed: Site visit, records search, sounding, Dispersive Wave Test.

Substructure Type: Timber Piles

No. of Interior Bents: Five (5)

Piles per Bent: 6 timber piles at the interior bents and both end bents.

Reference Document(s):

Bridge Maintenance files contained a hand written record of the pile embedments at each bent, and the original purchased pile lengths prior to cutoff, and the final cutoff.

Field Work Performed and Comments / Field Observations:

Creek had low flow the day of our visit. Evidence suggests water line does get to the bottom of the pile cap during high water events. No noticeable settlement was apparent. Sounding was performed at the site, as well as pile testing for length since the original records showed embedment only from 1973 and there was no indication as to the bent numbering system used in 1973 as used today. Additionally, there was no historical information located as to how much soil was lost to scour between 1973 and 1984.

Information used for evaluating the foundation

- Sounding data.
- Pile embedment records.
- Dispersive Wave Testing.

Summary of Findings:**Dispersive Wave Propagation Testing Results*****Notations used in the Table of Results***

Pile ID / Location : An identifier assigned to a particular pile by FDH Engineering. See the CAD schematic in the **Appendix** for a description of this location.

Compute Pile Length : The computed total length of pile from pile top, where it touches the pile cap, to the pile tip, in feet; or it may be from the pile top to the location from an area of complete corrosion or major bend in the pile's cross section which caused the wave energy to reflect prior to reaching the pile tip.

Top of Rail to Pile Tip : The measured distance from top of bridge rail to the bottom of pile cap, in feet, PLUS the computed total pile length from the testing.

Thalweg : The measured distance from top of rail to Thalweg, in feet. Thalweg determined by soundings in the field or from most recent Thalweg data in Bridge Maintenance Files.

Embedment Below Thalweg: The embedded length of a pile, in feet, below Thalweg, in feet.

Pile ID / Location	Computed Total Pile Length (ft)	Top of Rail to Pile Tip (ft)	Thalweg (ft)	Embedment Below Thalweg (ft)
Bent 2 Pile 4	27.0	32.5	25.4	7.1
Bent 3 Pile 5	26.0	31.5		6.1

Sounding Data:

Location	Distance from Top of Rail (ft)	Blows per Foot (BPF)
Bent 3	21.7	12
	26.5	12
	30.7	76
	31.5	108+

Pile Lengths from handwritten pile records

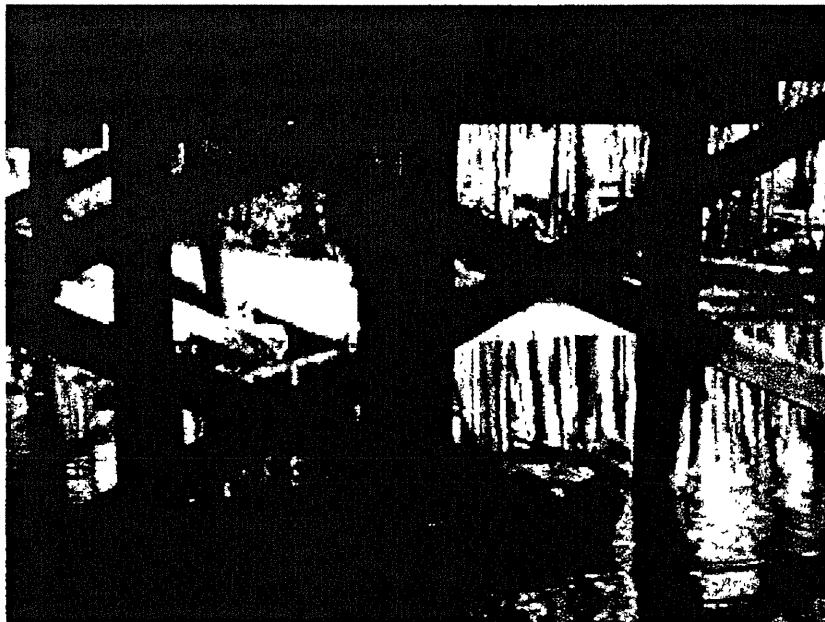
Pile ID / Location	Recorded Total Pile Length (from Rail) (ft)	Thalweg (ft)	Embedment Below 3/2003 Thalweg (ft)	* Penetration from Ground Surface in 1973 (ft)
End Bent 1	34.5	25.4	9.1	23.0
Bent 1	34.5	25.4	9.1	20.0
Bent 2	34.5	25.4	9.1	9.0
Bent 3	34.5	25.4	9.1	9.0
Bent 4	34.5	25.4	9.1	23.0
Bent 5	34.5	25.4	9.1	23.0
End Bent 2	34.5	25.4	9.1	23.0

* It is unknown what bent numbering system used in 1973.

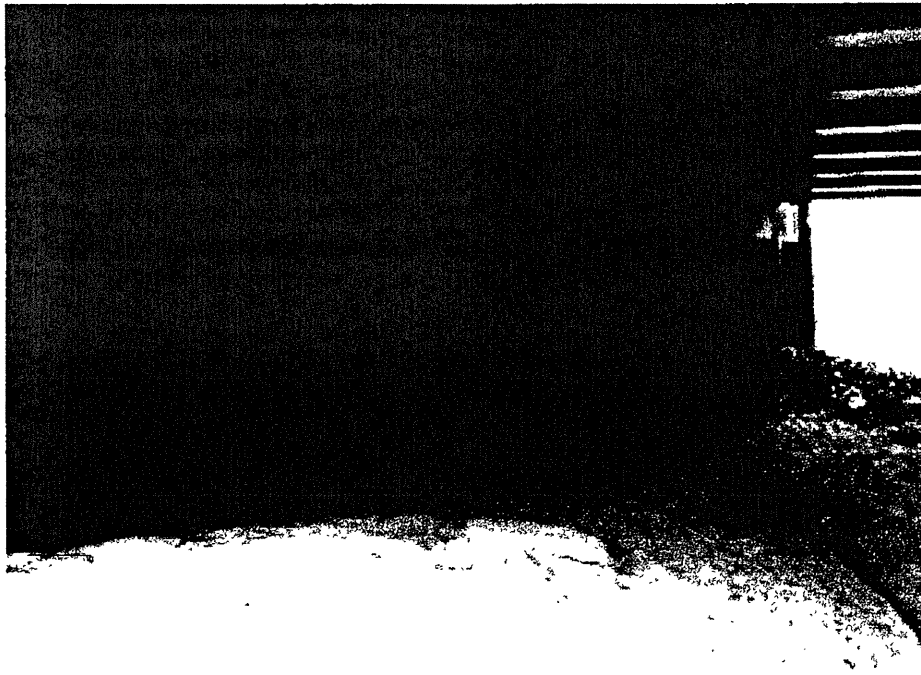
Conclusions

A Pile record exists for this structure that gives the apparent total pile lengths of 29.0 ft, as well as the embedment values in 1973 when they were driven. No indication was given as to the bent numbering system used in 1973. Dispersive wave tests for length and condition suggests that 29.0 ft piles were most likely driven and no indication of material condition problems were apparent in the data from Bent 2 Pile 4 and Bent 3 Pile 5. There have been timber condition problems previously as some piles have been spliced (see CAD schematic). From the sounding data, the pile tips are embedded into 108+ BPF material.

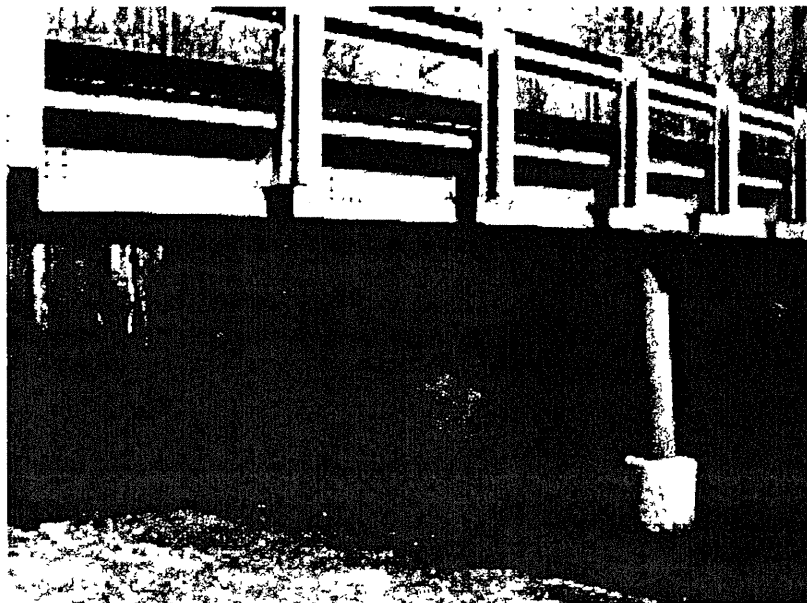
It should be noted that the embedment values in 1973 were recorded as 9 ft to 23 ft. From the historical thalweg data, there appears to have been significant scour at end bents 1 and 2, and bents 1,4, and 5 between 1973 and 1984.



FDH performing a length and condition test on a timber pile.



Typical End Bent

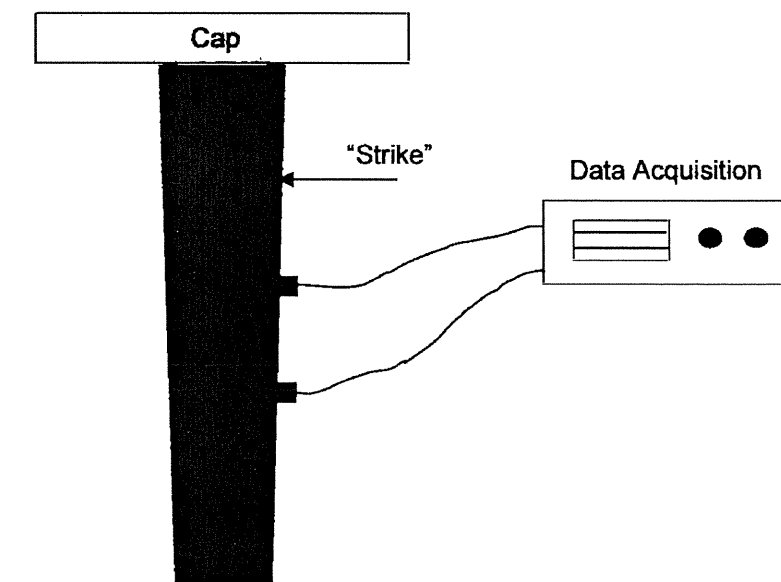


Interior bent showing a spliced pile.

General Comments

Dispersive Flexural Wave Propagation Method

FDH's methods of Dispersive Wave Propagation are conducted by temporarily mounting accelerometers (gages) on a pile's side and then striking the pile with a variety of hand-held hammers (Schematic 1). The waves created by the blow, rich in spectral content, propagate up and down the pile's length with the reflections being recorded and stored on a digital storage oscilloscope each time they pass the gages. The data then is analyzed by digital signal processing techniques using cross correlation procedures. This analysis permits computation of the time needed for a select group of frequencies to travel from the gages to the bottom of the pile and back. The pile's length then is computed by knowing the distance from the pile cap to the gages and from the product of frequency velocity and the corresponding time required for wave travel.



Schematic 1: General Set-Up for Flexural Wave Tests

The pile length determined is considered to be from its top, where it enters or touches the pile cap, to its tip. If there exists a break, fracture, deterioration, mushrooming of the pile tips, or some other significant material anomaly a wave reflection would be found on the data record at the approximate location of the anomaly. The computed pile length then would be the distance from its top to the location of such a material anomaly. With no prior knowledge of pile lengths, and without sampling a large portion of the piles present in the structure, interpreting whether the computed length is most likely the distance to the pile tip or to an area of damage is difficult. Previous work has determined this method to compute pile lengths to within approximately +/-10%.

At present it is not practical to determine the quantitative value, or percent loss in cross section, that may have occurred from breaks, fractures, or deterioration/corrosion. Only a qualitative assessment is possible.

References

- Holt, J.D., and Douglas, R.A., "A Field Test Procedure for Finding the Overall Lengths of Installed Timber Piles", Report for: NCDOT - ITRE, Number NC/R&D/94-001, University of North Carolina, March 1994.
- Douglas, R.A. and Holt, J.D., "Determining Lengths of Installed Timber Pilings by Dispersive Wave Propagation Methods", Report for: Center for Transportation Engineering Studies, NC State University, June 1993.
- Holt, J.D., "Dispersive Wave Methods for Unknown Pile Lengths", Water Resources Engineering Conference, 1998, Volume 1, Memphis, TN

Sounding Rods

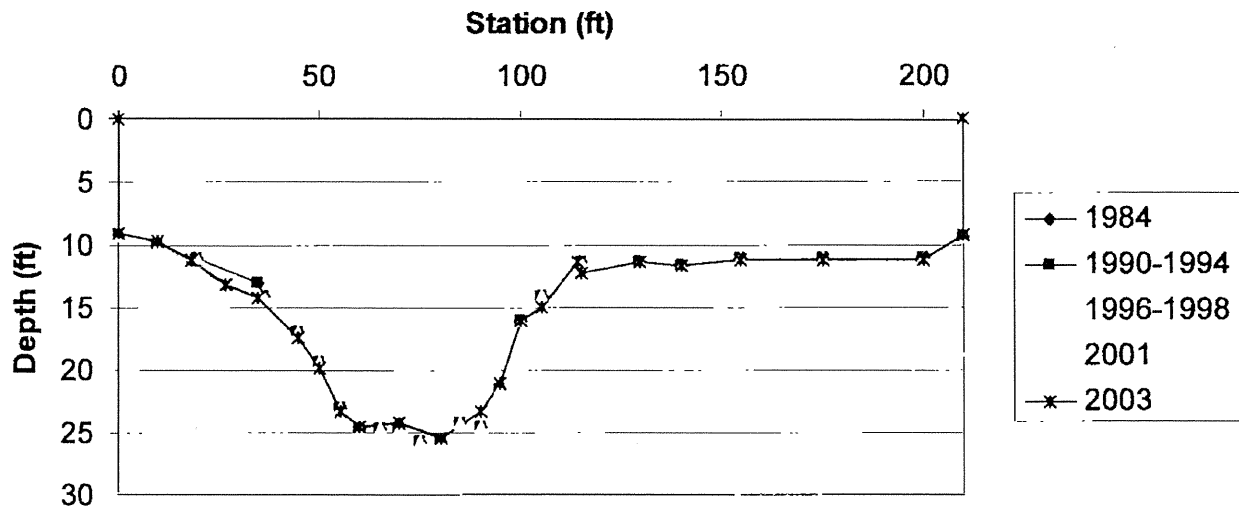
Sounding rods driven at a site are ½" in diameter and vary in segment length from 5 ft to 10 ft. Coupling devices are used for extending the rods to depths greater than the individual rod lengths. The driving head weighs 16 lbs. Determining blow counts involves dropping the 16 lb hammer and counting the actual number of blows required to drive the rod 1 ft into the material.

Reference

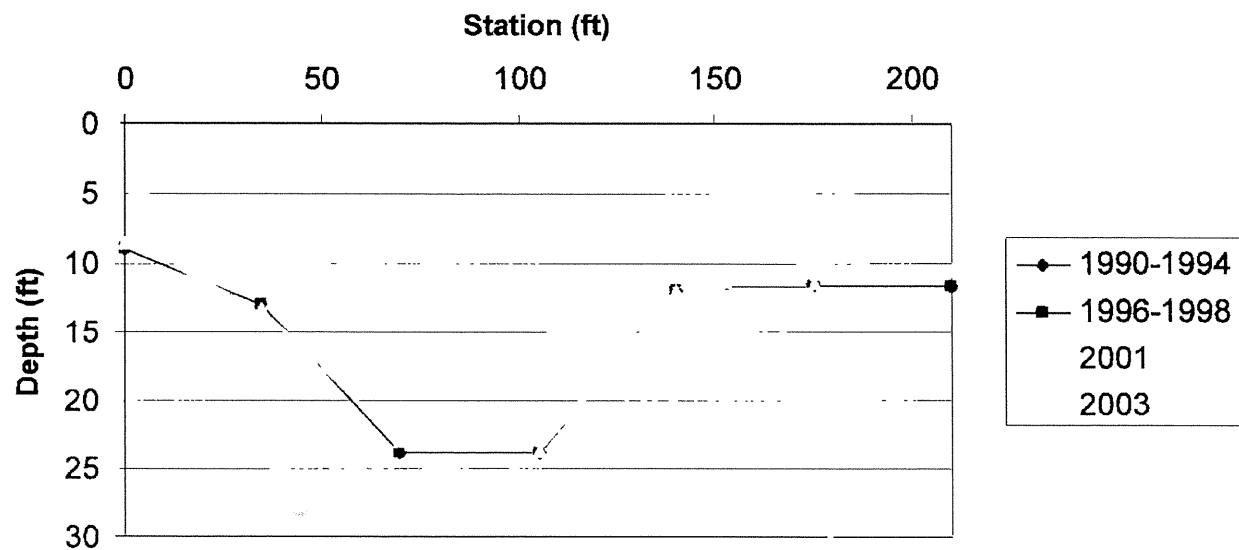
- Chen, Shunyi and Abar, Nariman, "Finding Unknown Installed Pile Lengths by Wave Propagation", Paper presented at the 78th Annual Transportation Research Board Meeting, January 10-14, 1999, Washington, DC
- Standard practices used by the Hydraulics Unit of the North Carolina Department of Transportation.

Professional judgments are incorporated into this report. These are based on our evaluations of field information gathered, on our understanding of the characteristics of the project, and on our experience and capabilities with the topic of unknown foundations. We guarantee only that our work and judgments rendered meet the standard of care of our profession.

Cumberland County 250052
Downstream Cross Section (from top of rail)



Cumberland County 250052
Upstream Cross Section (from top of rail)



BRIDGE REPORT

3017

C.L.C.E.

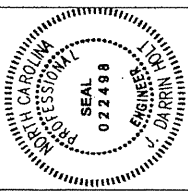
Div. 6 Dist. _____ S.R. No. 1006 Br. No. 52 County CumberlandBuilt By Br. Mte. Proj. _____ File 3039 Date Built 6-1-73Over South River0.2 miles from SR-1818toward Sampson County Line.superstr. 21" I-Bms.substr. 6 Creo. timber piles @ 5'4" Ctrs.12"x12" Creo. timber caps, 30' long.File Cut-off 29'.Overall Length 210'6" Skew 90° Approx. Grade 0.0 %Spans 6 @ 35'Clear Rd'wy. 28' Rd'wy Btwn. Rails 29' Sd'wk. _____Ht. Floor to Str. Bed. 21' M.V.C. _____ M.H.C. _____Stringers 10 Lines 21"x35', I-Bms.Floor Steel PlankW.S. ± 1" AsphaltForeman Morris Gedy

Hand-drawn plan view of a pile field. The field is rectangular, with dimensions 100' x 100' indicated by arrows and text. The top and bottom edges are labeled "Tie Back Piling 85'". The left edge is labeled "35' 1/2\"

SIMPSON County



FDI ENGINEERING, INC.
807 N. HARRIS ST.
RALEIGH, NC 27608
PHONE (919) 752-1012
FAX (919) 752-1031



SHEET NO. 250052
DRAWN BY: BLD
CHECKED BY: JDL
DATE: 04-01-01 (310)

SUBMITTALS	
DATE	BY
3/24/01	J. DARRIN HARRIS

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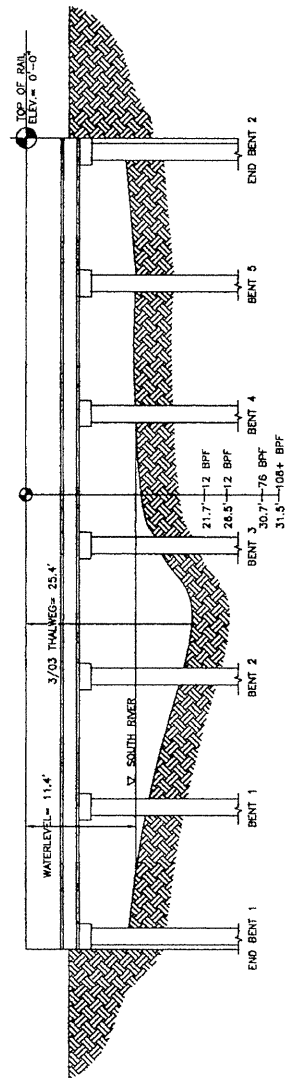
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CUMBERLAND COUNTY

SITE NUMBER:
250052

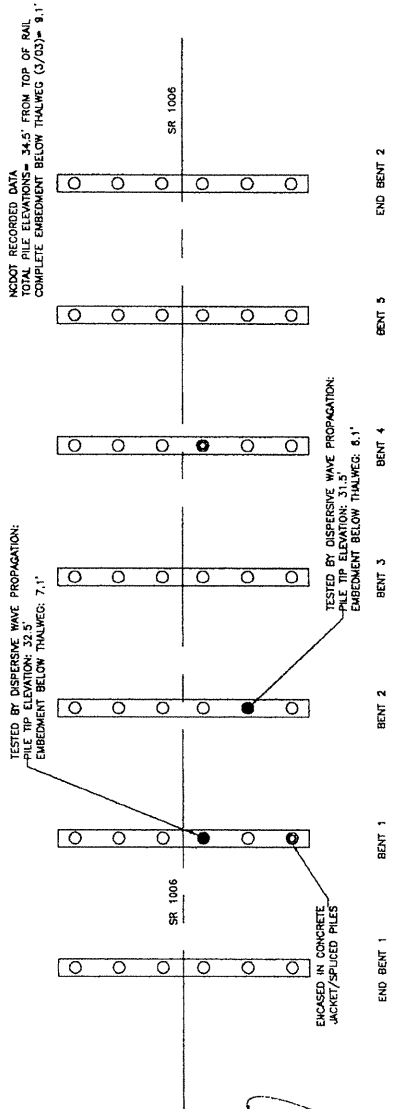
SITE ADDRESS:
**CUMBERLAND COUNTY
NORTH CAROLINA**

SHEET TITLE:
FOUNDATION PLANS

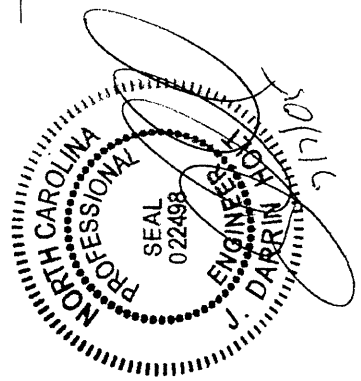
SHEET NUMBER:
S-1



ELEVATION



FOUNDATION PLAN



DOWNSTREAM STRUCTURE(S)

BRIDGE MANAGEMENT UNIT

DATA ON EXISTING STRUCTURE

Run Date: 03/12/2014

COUNTY : CUMBERLAND DIVISION : 6 DISTRICT : 2 STRUCTURE NUMBER : 250172 LENGTH : 151 FEET

ROUTE CARRIED : SR1851 FEATURE INTERSECTED : SOUTH RIVER

LOCATED : 0.4 MI.E.JCT.SR1848 BRIDGE NAME : CITY :

FUNC. CLASS : 09 SYST.ON : NFA SYST.UNDER : NFA ADT & YR : 560 2012 RAIL TYPE : LT 233 RT 233

BUILT : 1965 BY : BMU PROJ : FED.AID PROJ : DESIGN LOAD : H 15

REHAB : BY : PROJ : ALIGNMENT : TAN. SKEW : 90 LANES : ON 2 UNDER 0

NAVIGATION : VC 0 FT HC 0 FT HT. CRN. TO BED : 12 FT WATER DEPTH : 5 FT

SUPERSTRUCTURE : PRESTRESSED CONCRETE CHANNELS STD.BMD-13A & 13-1

SUBSTRUCTURE : E.BTS&INT.BTS:PPC CAP/TIM.PILES;W/TIM.CROSSCAPS @ INTBTS.

SPANS : 1@30.25';3@30.083';1@30.25'

BEAMS OR GIRDERS : 10 PRESTR.CONC.CHANNEL SECTIONS

FLOOR : PPC.CH./3 AWS ENCROACHMENT : DECK (OUT TO OUT) : 25.667 FT

CLEAR ROADWAY : 24.167 FT BETWEEN RAILS : 25.25 FT SIDEWALK OR CURB : LT .5415 FT RT .5415 FT

VERT.CL.OVER : 999.9 FT

INV.RTG. : HS-1 OPE.RTG. : HS-1 CONTR.MEMBER : PS Channel POSTED : SV 25 TTST 37 DATE 03/12/2014

SYSTEM : Secondary S.R. Route GREEN LINE ROUTE : N

UNDER ROUTES AND CLEARANCES

REMARKS :

DOWNSTREAM STRUCTURE(S)

BRIDGE MANAGEMENT UNIT

DATA ON EXISTING STRUCTURE

Run Date: 03/13/2014

COUNTY : CUMBERLAND DIVISION : 6 DISTRICT : 2 STRUCTURE NUMBER : 250171 LENGTH : 91 FEET

ROUTE CARRIED : SR1851 FEATURE INTERSECTED : SOUTH RIVER

LOCATED : 0.3 MILE JCT. SR1848 BRIDGE NAME : CITY :

FUNC. CLASS : 09 SYST.ON : NFA SYST.UNDER : NFA ADT & YR : 560 2012 RAIL TYPE : LT 233 RT 233

BUILT : 1965 BY : BMU PROJ : 6756 FED.AID PROJ : DESIGN LOAD : HS 15

REHAB : BY : DBM PROJ : ALIGNMENT : TAN. SKEW : 90 LANES : ON 2 UNDER 0

NAVIGATION : VC 0 FT HC 0 FT HT. CRN. TO BED : 16 FT WATER DEPTH : 10 FT

SUPERSTRUCTURE : PRESTRESSED CONCRETE CHANNELS

SUBSTRUCTURE : E.BTS&INT.BTS:PPC.CAPS/TIM.PILES;W/TIM.CROSSCAPS.@ INTBTS.

SPANS : 1@30.333';1@30.083';1@30.333'

BEAMS OR GIRDERS : 10 LINES PPC CONCRETE CHANNEL SECTIONS

FLOOR : PPC.CH./3 AWS ENCROACHMENT : DECK (OUT TO OUT) : 25.667 FT

CLEAR ROADWAY : 24.167 FT BETWEEN RAILS : 25.25 FT SIDEWALK OR CURB : LT .5415 FT RT .5415 FT

VERT.CL.OVER : 999.9 FT

INV.RTG. : HS-1 OPE.RTG. : HS-1 CONTR.MEMBER : Chan - Pat B POSTED : SV 40 TTST LGW DATE 06/28/2012

SYSTEM : Secondary S.R. Route GREEN LINE ROUTE : N

UNDER ROUTES AND CLEARANCES

REMARKS :

UPSTREAM STRUCTURE

BRIDGE MANAGEMENT UNIT

DATA ON EXISTING STRUCTURE

Run Date: 09/04/2013

COUNTY : CUMBERLAND DIVISION : 6 DISTRICT : 2 STRUCTURE NUMBER : 250056 LENGTH : 186 FEET

ROUTE CARRIED : SR1823 FEATURE INTERSECTED : SOUTH RIVER

LOCATED : 0.8 MI E JCT SR1820 BRIDGE NAME : CITY :

FUNC. CLASS : 09 SYST.ON : NFA SYST.UNDER : NFA ADT & YR : 340 2012 RAIL TYPE : LT 41 RT 41

BUILT : 1987 BY : DOH PROJ : 8.2440401 FED.AID PROJ : BRZ-1823(1) DESIGN LOAD : HS 20 + MOD

REHAB : BY : PROJ : ALIGNMENT : TAN. SKEW : 90 LANES : ON 2 UNDER 0

NAVIGATION : VC 0 FT HC 0 FT HT. CRN. TO BED : 17 FT WATER DEPTH : 5 FT

SUPERSTRUCTURE : PPC CORED SLAB

SUBSTRUCTURE : EBTS&IBTS:RC CAP/PPC PILES

SPANS : 1@47';2@46';1@47'

BEAMS OR GIRDERS : 9 PPC CORED SLAB SECTIONS

FLOOR : PPCCS/6 AWS ENCROACHMENT : DECK (OUT TO OUT) : 27 FT

CLEAR ROADWAY : 24 FT BETWEEN RAILS : 24 FT SIDEWALK OR CURB : LT 0 FT RT 0 FT

VERT.CL.OVER : 999.9 FT

INV.RTG. : HS-31 OPE.RTG. : HS-52 CONTR.MEMBER : C. Slab .438" POSTED : SV TTST DATE 10/12/1987

SYSTEM : Secondary S.R. Route GREEN LINE ROUTE : Y

UNDER ROUTES AND CLEARANCES

REMARKS :

StreamStats Version 3 Beta**Basin Characteristics Ungaged Site Report**

Date: Wed Nov 25, 2015 2:39:49 PM GMT-5

NAD 1983 Latitude: 35.0853 (35 05 07)

NAD 1983 Longitude: -78.672 (-78 40 20)

Label	Value	Units	Definition
DRNAREA	196	square miles	Area that drains to a point on a stream

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U.S. Department of the Interior | U.S. Geological Survey

URL: http://streamstatsags.cr.usgs.gov/v3_beta/BCreport.htm

Page Contact Information: [StreamStats Help](#)

[Streamstats Status](#)[News](#)

Page Last Modified: 08/24/2015 15:42:48 (Web2)



Drainage Area 168 M² Obtained from USGS QUADRANGLES
Character of Drainage Area FLAT TO GENTLY ROLLING PREDOMINANTLY WOODLAND WITH SOME RESIDENTIAL AND FARM USE.
Highwater Mark(s) _____ Dates _____ Obtained From _____

117.2 1962 ASHLEY HARRIS (LOCAL RESIDENT)

117 1962 K.L. CARROLL (LOCAL RESIDENT)

Maximum Discharge of Record 13000 cfs ± Sec. ft. _____ Date 1962

Discharge Data Obtained From USGS WATER RESOURCES INVESTIGATION 76-17

Period Covered by Discharge Records N/A

Discharge Used for Design of Waterway 6000 cfs (WATERWAY BELOW DESIGN HWE 1405 M²) Sec. Ft. _____

Waterway Area Considered Necessary 1405 Sq. Ft. _____

Waterway Area Provided by Recommended Structure 1586 TOTAL, 1405 BELOW 25 year DESIGN H.W. ELEV. Sq. Ft. _____

Data on Existing Structure 161' long, 19' 3" CLEAR ROADWAY, CONSISTING OF CREOSOTE

TIMBER AND STEEL I-BEAMS SUPPORTED BY TIMBER PILES AND CAPS.

4 spans @ 40' ±; Waterway opening below Q₂₅ = 1397 sq. ft., total = 1446 sq. ft.; Q₂₅ H.W. elev = 113.89 msl (.04' of backwater); Q₁₀₀ H.W. elev. = 116.34 msl (.26' of backwater).

Data on other Structures Up or Down Stream _____

None obtained.

Method Used in Determining Foundation Material SOIL BORINGS WILL BE MADE AND SUBMITTED TO THE GEOLOGY DEPARTMENT.

Is Additional Foundation Investigation Considered Advisable NO

Other Information PROJECT LOCATED IN A FEMA DESIGNATED FLOOD

HAZARD ZONE (study not completed). The proposed structure does not increase present backwater elevations (proposed structure provides more waterway opening than the existing structure).

Information to be shown on plans

Design Discharge 6000 cfs Frequency 25 year

100 yr. Discharge 10,000 cfs

Design High Water Elev. 113.89 M.S.L. (.05 ft. BACKWATER - ABOVE NATURAL CONDITIONS)

100 yr. High Water Elev. 116.34 (.25 ft. BACKWATER - ABOVE NATURAL CONDITIONS)

Flood of Record 1962 13000 cfs ± 200 yr. ±
Date Discharge Frequency

OVERTOPPING FLOOD Elev. 117.1 ±, DISCHARGE 13000 cfs ±, FREQUENCY 200 yr. ±

HYDROGRAPHIC DEPARTMENT
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N. C.

BRIDGE SURVEY REPORT

A.R.C.
UPSTREAM
STRUCTURE

PROJECT NO. 8.2440401 (B-1149) COUNTY, STA. 7+77

BRIDGE OVER CUMBERLAND AND SAMPSON Known as BRIDGE #56 OVER SOUTH RIVER

On SR 1823 & SR 1445 between SR 1820 and HAYS MILL

Recommended Width of Roadway 24 ft. Skew 90°

Recommended Structure PRESTRESSED CORED CONCRETE SLAB SUPERSTRUCTURE WITH 20" Sq. PRESTRESSED CONCRETE PILES. 4 SPANS @ 46' EACH, TOTAL LENGTH 184'

Rip Rap CLASS II REQUIRED TO ELEVATION 116 MSL

Temporary Crossing NONE. DETOURED TRAFFIC CAN UTILIZE US 13, SR 1446 and SR 1821

Present Structure SHALL BE REMOVED

New Location is UNCHANGED Up/Down Stream from Crossing on Present Road

Nearest Shipping Point FAYETTEVILLE On SEABOARD COASTLINE R. R.

Distance from Shipping Point to Bridge Site is 22 (APPROX.) miles.

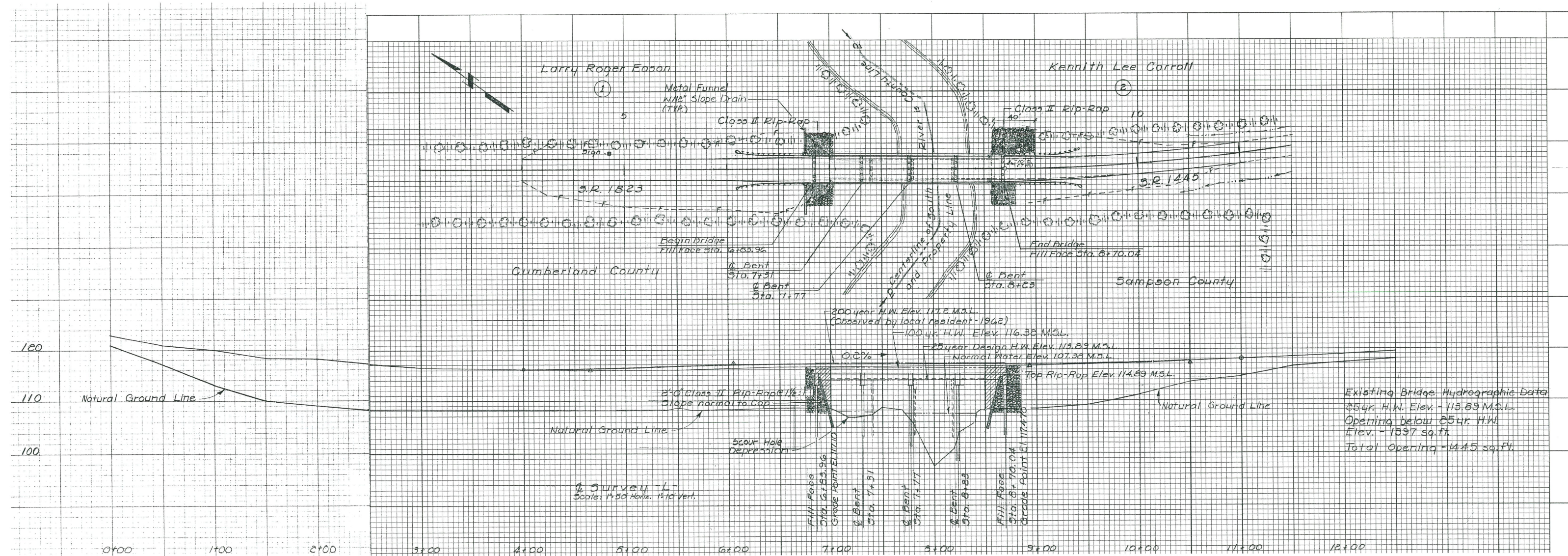
Elevations From B. M. USGS "WADE 1949" CUMBERLAND COUNTY Elev. 152.496
141' S.W. OF N.W. CORNER OF FORMER WADE HIGH SCHOOL BLDG. (WADE M.C.) NOW OWNED BY A PRIVATE LUMBER CO. Datum: MSL

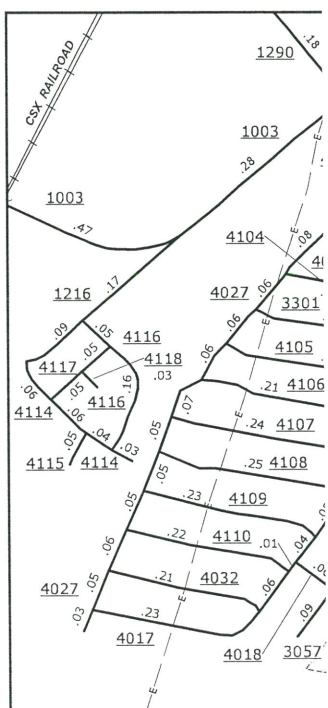
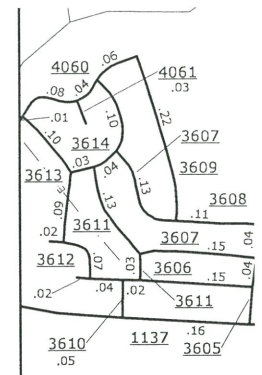
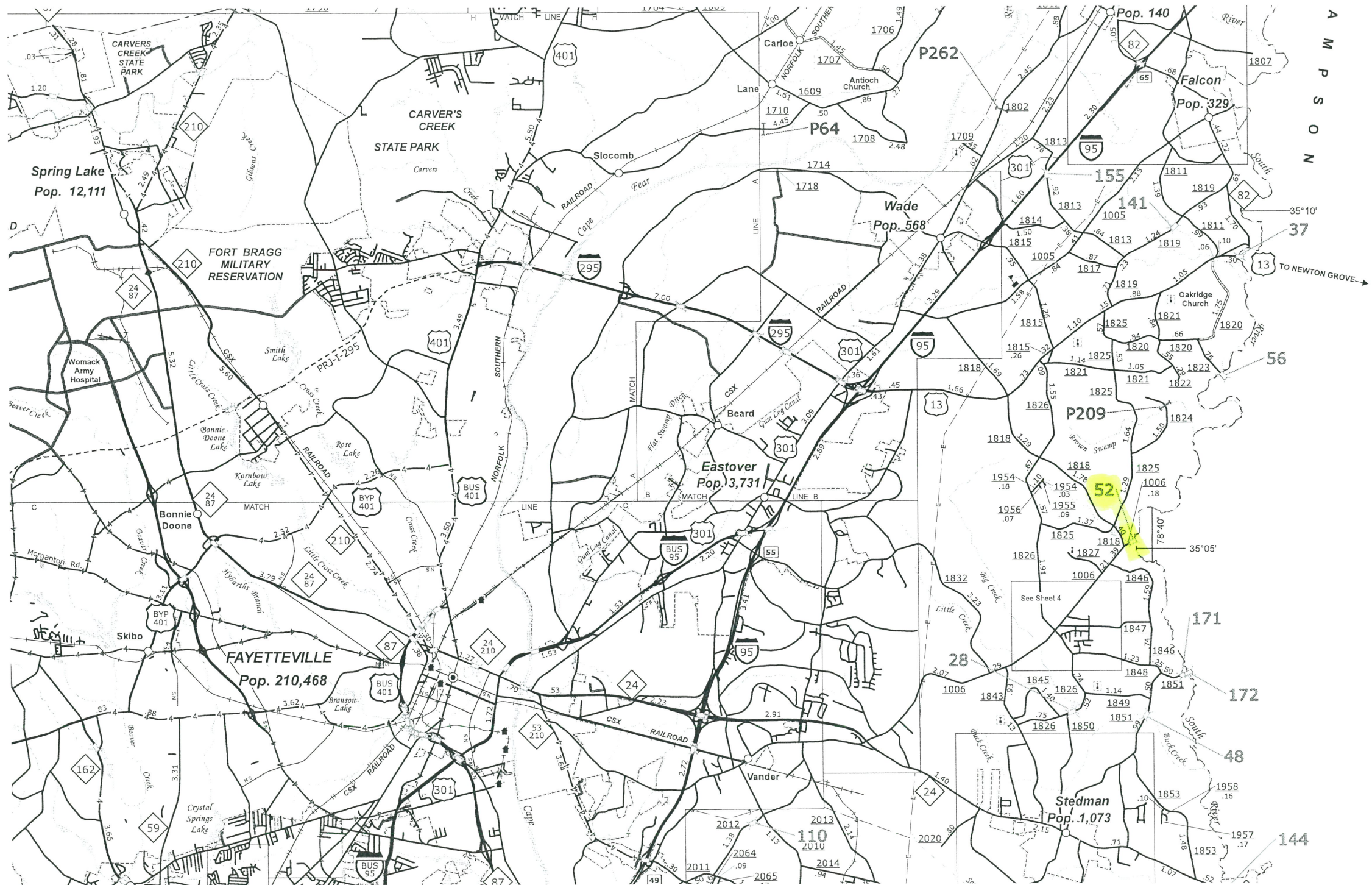
B.M. @ PROJECT SITE IS NAIL IN POWER POLE @ STA. 2+65, 29.6' RT. ELEV. 112.716'

USE THIS SPACE FOR PHOTOGRAPH OF PROPOSED SITE, SHOWING CENTER LINE, DIRECTION OF FLOW AND OTHER IMPORTANT POINTS ON PHOTOGRAPH.

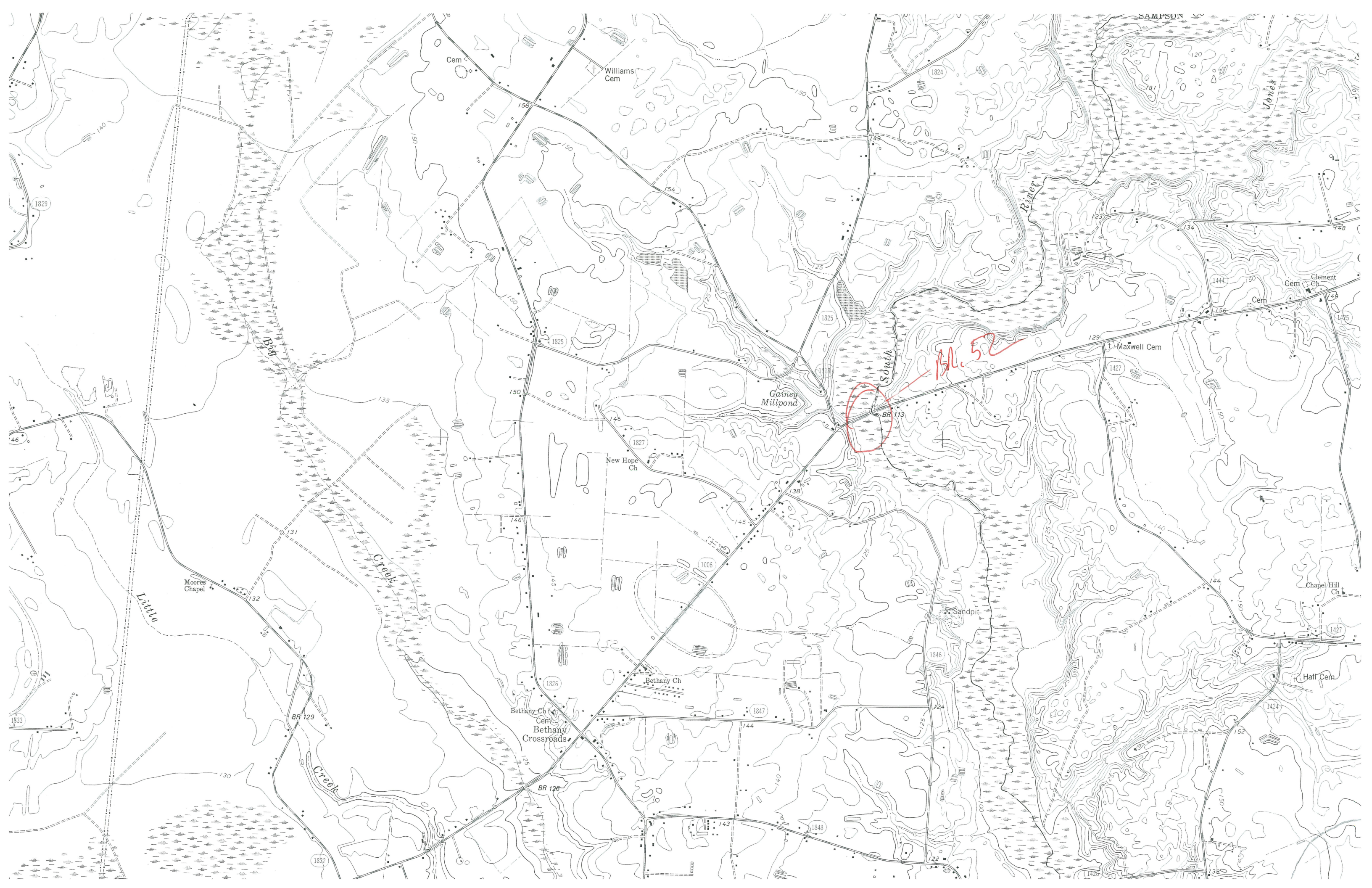
Surveyed by RONALD A. DERANEK Assisted by LARRY W. PEARCE Date 12/12/84

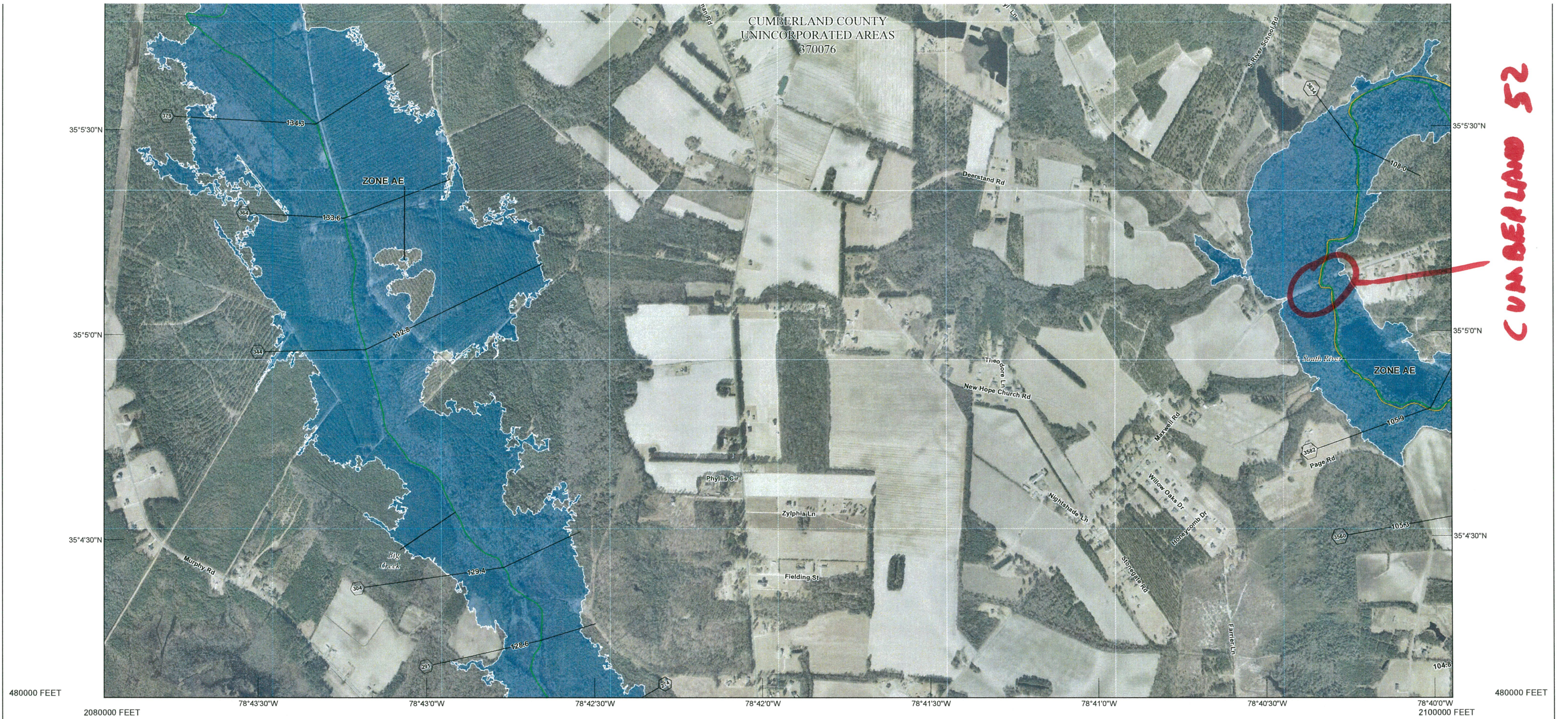
UPSTREAM STRUCTURE





CUMBERLAND 52



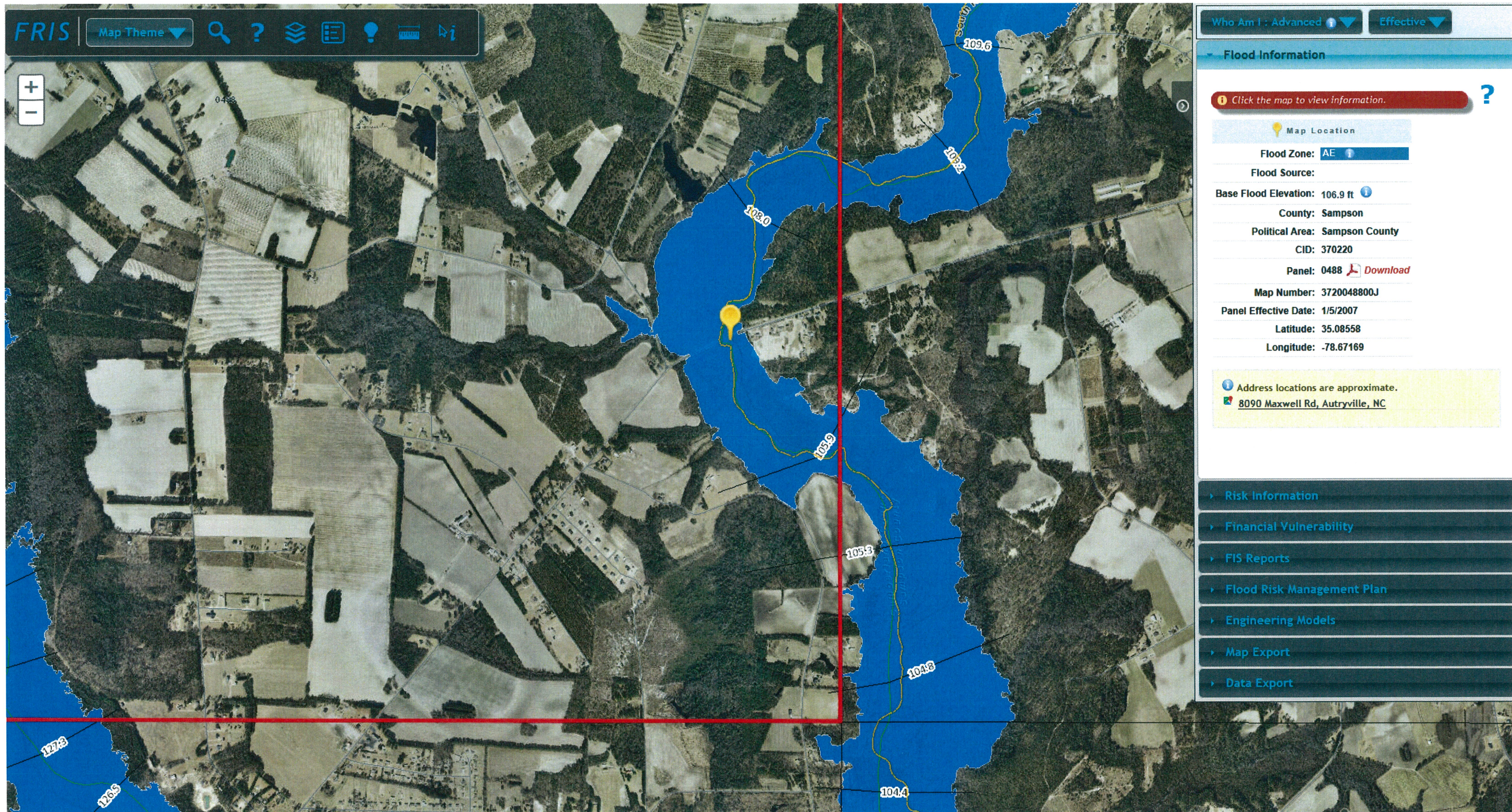


25
CUMBERLAND

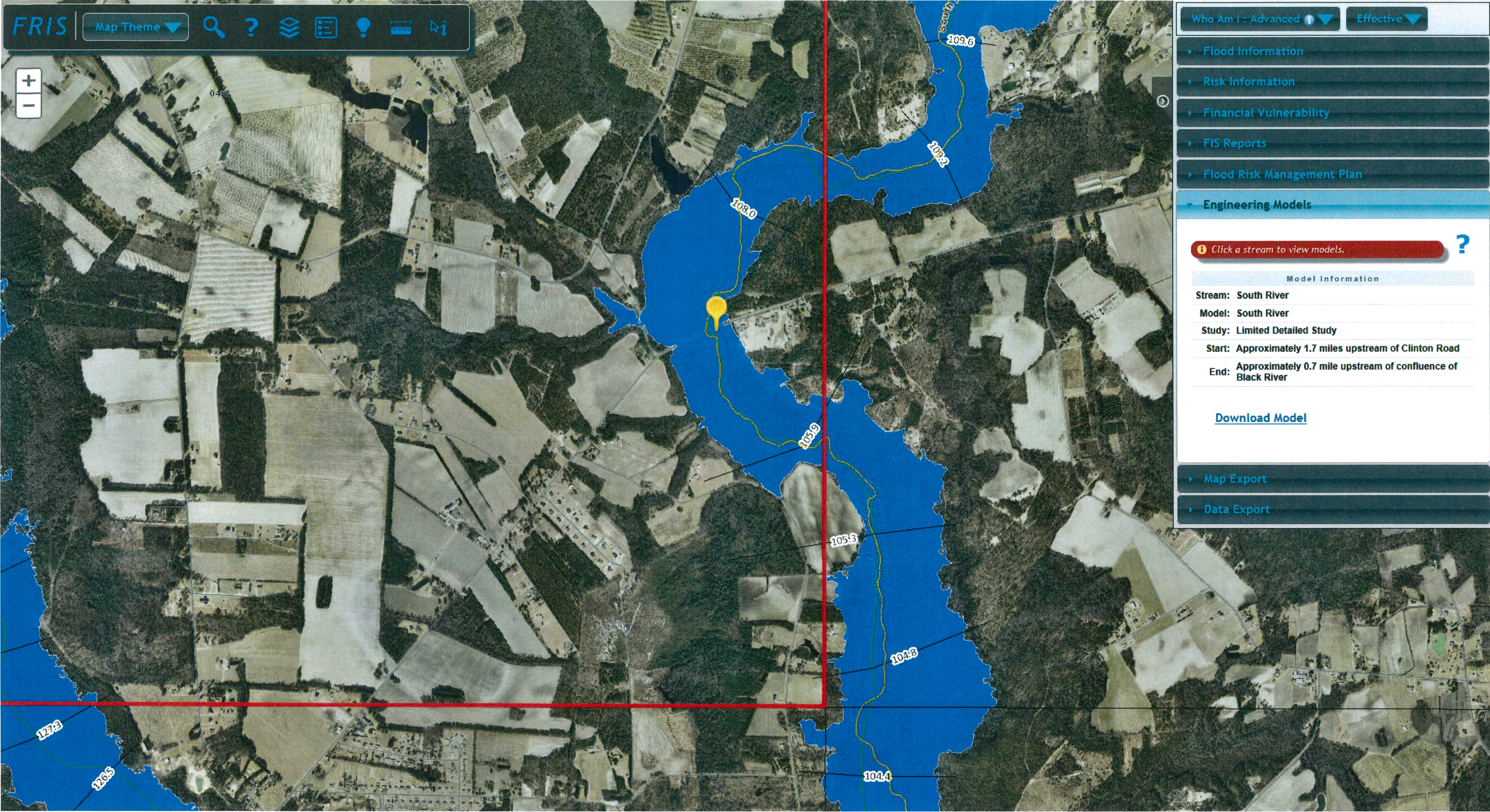


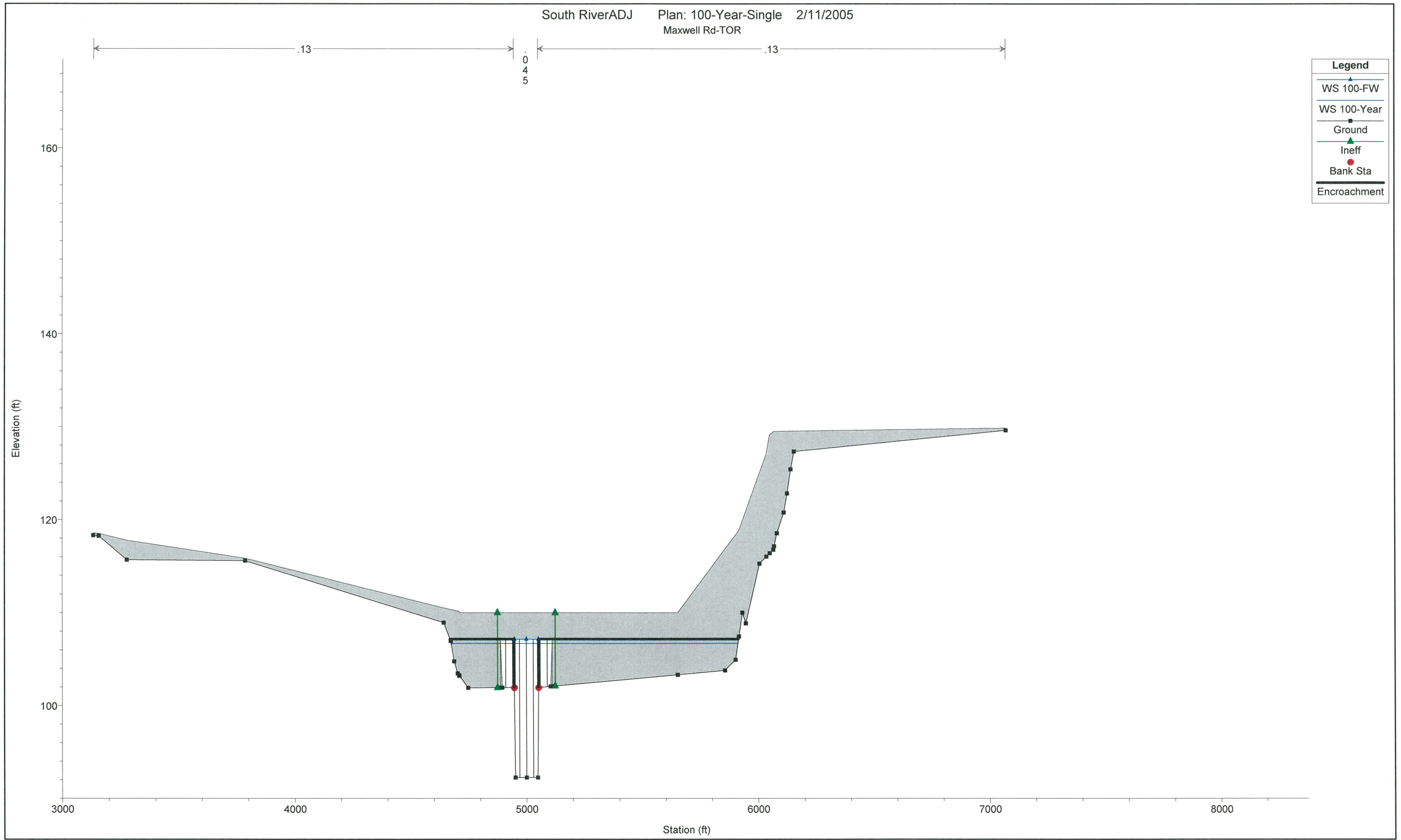
This digital Flood Insurance Rate Map (FIRM) was produced through a unique cooperative partnership between the State of North Carolina and the Federal Emergency Management Agency (FEMA). The State of North Carolina has implemented a long term approach to floodplain management to decrease the costs associated with flooding. This is demonstrated by the State's commitment to map flood hazard 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.

Cumberland 52



Cumbrall DMU 52





MODEL AVAILABLE ON FAS



StreamStats

Delineation Results

- Be sure to thoroughly check the delineated basin for accuracy before using the tools below.

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