OFFICE ESTIMATE: _____

Project# _____
TIP# _____
Let Date _____
WBS# _____

PREDESIGN-SCOPING REPORT

Bridge# 130115 C-14
County CALDWELL (DIV. 11)
Road# SR 1310 ABINGTON RD.
Stream GREASY CREEK

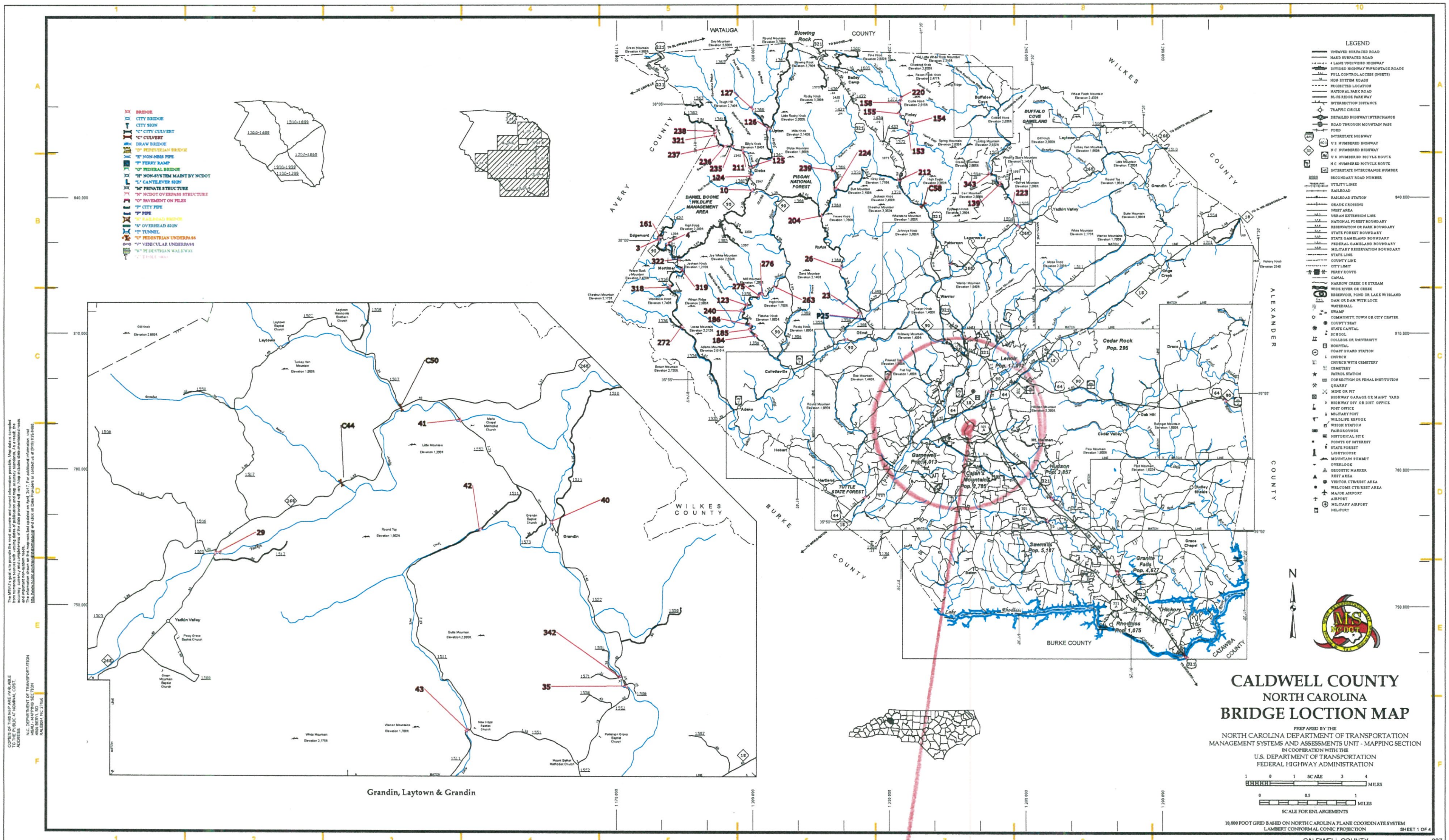
Type Of Request: POC Force Account TIP NCMA
Date 5/5/17 Name WSH Assigned To PFF / MTS
Checked By SJS 5-5-17
Prior Survey Date 01 1971 (attach copy of prior survey) BRN. BK.: 2@30' 1-71 CO. FILE: NONE
Study By Scour Section YES - ATTACHED CODE: 5 PDR: NO BSR: NO
Flood Zone X Detail Study NO STUDY Date 7-7-09 Panel# 2749
B.M. Info N/A ~~ESM~~ S.STATS DA = 4.46 Sq. Mi. ✓
Quad Map LENIOR Drainage Area 4.4 Sq Mi ✓ From DASS STA: 21411900
Q25 1500 Q50 1800 cfs Q100 2100 Method REG. EQU 2014-5030 C2
LONG.: -81.566317
LAT.: 35.905866
FEMA 3750 cfs IA = 1.53 %

EXISTING BRIDGE INFORMATION YEAR BUILT: 1972
CLEAR ROADWAY WIDTH: 28'
Location 0.1 MW JCT SR 1305
Average Daily Traffic 4800 (2013) 6% TRK.
Length 61' Bed- To Crown 12' Water Depth 1'
Type Structure STEEL PLANK FLR ON I BEAMS, TIM. PILES
Type Spans 2@30' 3"
Upstream Structure 130326 ✓ TIMBER FLR ON I Beams YR. BUILT: 1966 (1@35'8")
Location 0.7 M NW JCT SR 1310 LONG.: -81.573243
Bed- To Crown 8 (1' DEEP) Prior Survey N/A LAT.: 35.912354
Downstream Structure 130009
Location SR 1425 (0.1M NE JCT US 64) YR. BUILT: 1955
Bed- To Crown 14' (1' DEEP) Prior Survey N/A LONG.: -81.568606
LAT.: 35.895745
TIM. FLR ON T BEAMS
1@5'9", 1@15', 1@15'3"

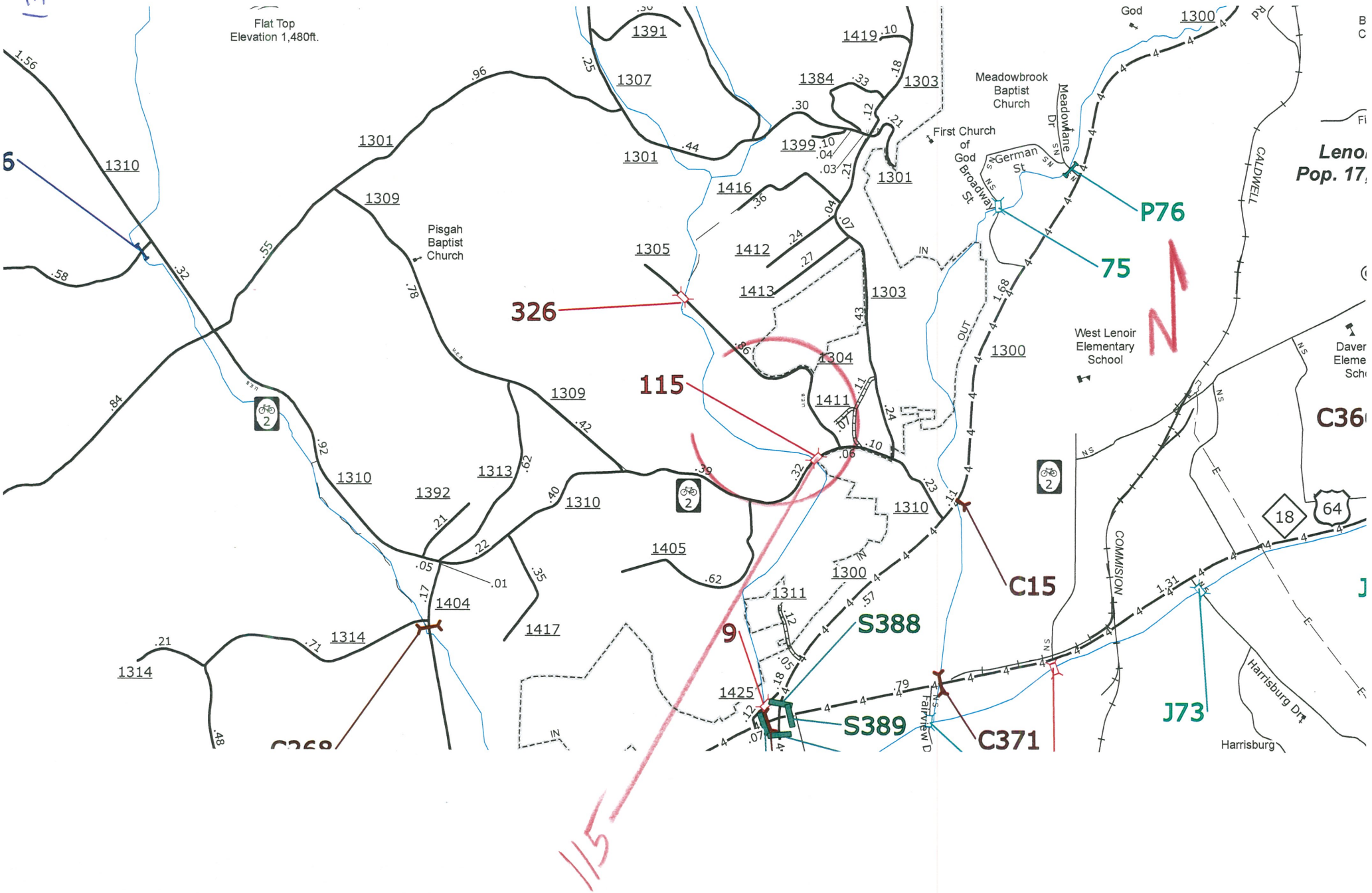
ENVIRONMENTAL TVA: NO
Trout Stream NO Anadromous Fish NO Primary Nursery Area NO
High Quality Waters NO Nutrient Sensitive Waters NO
Near Water Supply Intake NO CAMA County NO
Stream Classification C STREAM #: 11-39-4
DENR River Basin Info. CATAWBA

1, 46, 49, 80.
u/s ~~12~~ 22
d/s 27

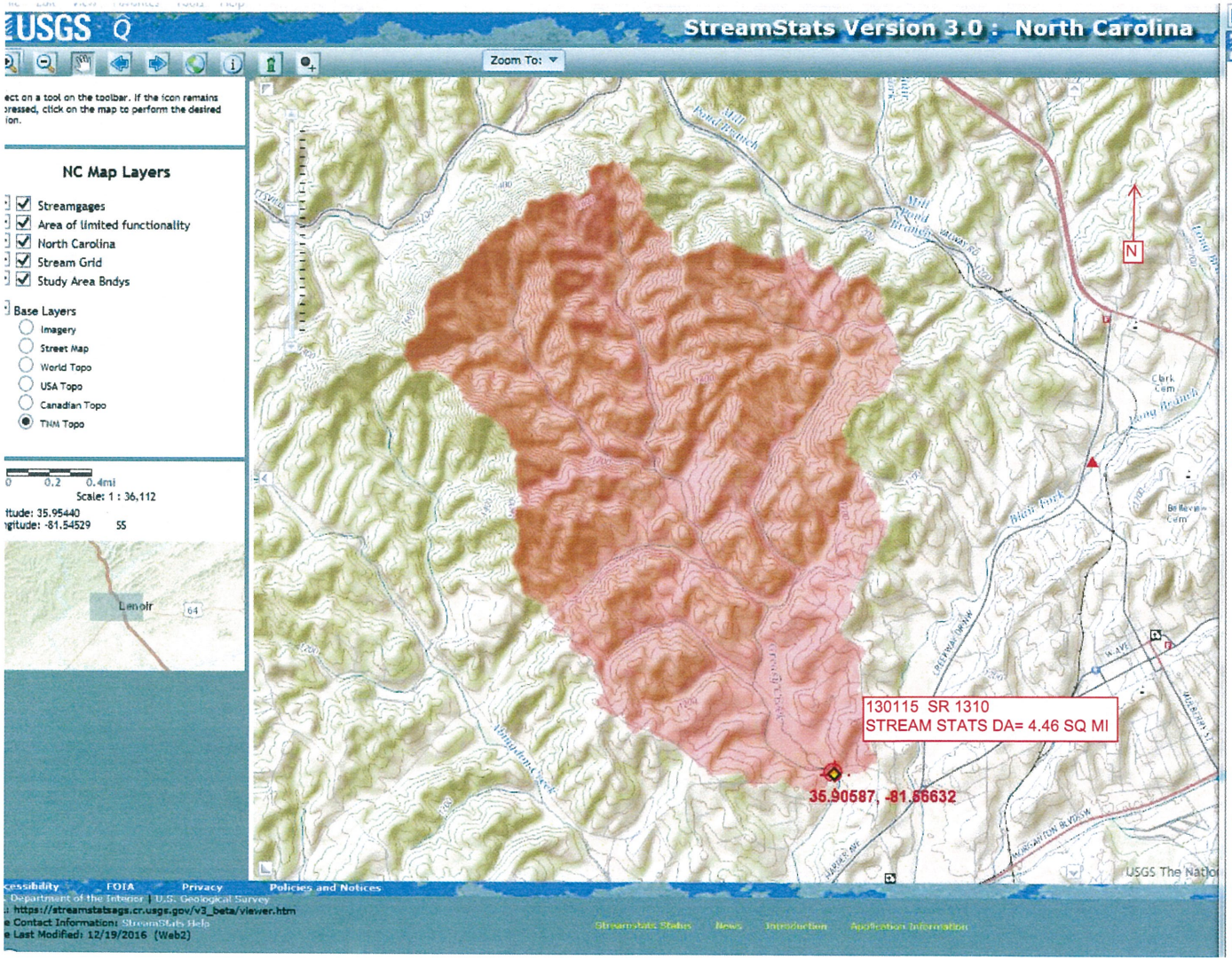
130115



CALDWELL COUNTY
NORTH CAROLINA
BRIDGE LOCTION MAP
PREPARED BY THE
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
MANAGEMENT SYSTEMS AND ASSESSMENTS UNIT - MAPPING SECTION
IN COOPERATION WITH THE
U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
SCALE
MILES
SCALE FOR ENLARGEMENTS
10,000 FOOT GRID BASED ON NORTH CAROLINA PLANE COORDINATE SYSTEM
LAMBERT CONFORMAL CONIC PROJECTION
SHEET 1 OF 4
DIVISION 11
DISTRICT 2
CALDWELL COUNTY
NORTH CAROLINA
027
LEGEND
Grandin, Laytown & Grandin
WATAUGA COUNTY
AVERY COUNTY
WILKES COUNTY
ALEXANDER COUNTY
BURKE COUNTY
CATAWBA COUNTY
Blowing Rock
Lenoir
Cedar Rock Pop. 295
Sawmills Pop. 5,187
Granite Falls Pop. 4,677
Hudson
Rhodhiss
PISGAH NATIONAL FOREST
DANIEL BOONE WILDLIFE MANAGEMENT AREA
BUFFALO COVE GAMELAND
TUTTLE STATE FOREST
#115


130115
Flat Top
Elevation 1,480ft.
Pisgah
Baptist
Church
First Church
of God
Meadowbrook
Baptist
Church
West Lenoir
Elementary
School
Harrisburg
Harrisburg Dr
German St
Broadway St
Meadowlane Dr
CALDWELL
COMMISSION
326
115
9
P76
75
C15
S388
S389
C371
J73
C36
1310
1309
1301
1307
1391
1303
1384
1399
1419
1416
1412
1413
1305
1304
1411
1300
1392
1313
1405
1311
1425
1404
1314
1417
1310
1303
1301
1300
64
18

130115



https://streamstatsags.cr.usgs.gov/v3_beta/FTreport.htm?rcode=NC&workspaceID=NC20170504145405

USGS StreamStats Version 3.0

Flow Statistics Ungaged Site Report

Date: Thurs May 4, 2017 4:57:05 PM GMT-4
Study Area: North Carolina
NAD 1983 Latitude: 35.9057 (35 54 21)
NAD 1983 Longitude: -81.5661 (-81 33 58)
Drainage Area: 4.46 mi2

Peak Flows Region Grid Basin Characteristics

100% Peak Southeast US over 1 sqmi 2009 5158 (4.46 mi2)

Parameter	Value	Regression Equation Valid Range	
		Min	Max
Drainage Area (square miles)	4.46	1	9000
Percent Area in Region 1 (percent)	100.000	0	100
Percent Area in Region 2 (percent)	0.000	0	100
Percent Area in Region 3 (percent)	0.000	0	100
Percent Area in Region 4 (percent)	0.000	0	100
Percent Area in Region 5 (percent)	0.000	0	100

Urban Flows Region Grid Basin Characteristics

Area in square miles=4.46

Percent imperviousness of basin area 2006 NLCD=1.53

100% Region 1 Urban over 3 sqmi 2014 5030 (4.46 mi2)

Parameter	Value	Regression Equation Valid Range	
		Min	Max
Drainage Area (square miles)	4.46	3	436
Percent Impervious NLCD2006 (percent)	1.53	0	47.9

Peak Flows Region Grid Statistics

Statistic	Value	Unit	Prediction Error (percent)	Equivalent years of record	90-Percent Prediction Interval	
					Min	Max
PK2	418	ft3/s	35		241	727
PK5	754	ft3/s	34		437	1300
PK10	1000	ft3/s	35		571	1760
PK25	1330	ft3/s	38		731	2410
PK50	1620	ft3/s	40		864	3040
PK100	1890	ft3/s	42		972	3660
PK200	2150	ft3/s	44		1070	4320
PK500	2560	ft3/s	48		1210	5400

http://pubs.usgs.gov/sir/2009/5158/
Weaver, J.C., Feaster, T.D., and Gotvald, A.J., 2009, Magnitude and frequency of rural floods in the Southeastern United States, through 2006—Volume 2, North Carolina: U.S. Geological Survey Scientific Investigations Report 2009-5158, 111 p.

130115

NC DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
STRUCTURE MANAGEMENT UNIT

ATTENTION: PMN'S ISSUED FOR SUBSTRUCTURE AND SUPERSTRUCTURE... TEMP. REPAIR TO DECK...

Structure Safety Report

Routine Element Inspection

COUNTY: CALDWELL **STRUCTURE NUMBER:** 130115 **FREQUENCY:** 24 MONTHS

FACILITY CARRIED: SR1310 **MILE POST:**

LOCATION: 0.1 MI.W.JCT.SR1305

FEATURE INTERSECTED: GREASY CREEK

LATITUDE: 35° 54' 21.12" **LONGITUDE:** 81° 33' 58.85"

SUPERSTRUCTURE: STEEL PLANK FLOOR ON I-BEAMS

SUBSTRUCTURE: E.BTS&INT.BTS:TIMBER CAPS/TIMBER PILES @ VAR. CENTERS

SPANS: 2 @ 30' - 3"
2 @ 30'-3

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

PRESENT CONDITION: Poor **INSPECTION DATE:** 03/02/2016

POSTED SV: 23 **POSTED TTST:** 30

OTHER SIGNS PRESENT: 4 DELINEATORS



WEST TO EAST

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

INSPECTED BY	SIGNATURE	ASSISTED BY
ANDREW GLASCO	Andrew P. Glasco	MAX FORD

130115

Structure: 130115 County: CALDWELL Date: 03/02/2016 Structure Photos



NORTH PROFILE



SOUTH PROFILE

130115

BRIDGE MANAGEMENT UNIT

DATA ON EXISTING STRUCTURE Run Date: 03/18/2016

COUNTY :	DIVISION :	DISTRICT:	STRUCTURE NUMBER :	LENGTH :
CALDWELL	11	2	130115	61 FEET

ROUTE CARRIED : SR1310

FEATURE INTERSECTED : GREASY CREEK

LOCATED : 0.1 MI.W.JCT.SR1305

BRIDGE NAME :

CITY : *LENOIR

FUNC. CLASS :	SYST.ON :	SYST.UNDER :	ADT & YR :	RAIL TYPE :
08	NFA	NFA	4800 2013	LT 233 RT 233

BUILT :	BY :	PROJ :	FED.AID PROJ :	DESIGN LOAD :
1972	BMU			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	12 FT	1 FT

SUPERSTRUCTURE : STEEL PLANK FLOOR ON I-BEAMS

SUBSTRUCTURE : E.BTS&INT.BTS:TIMBER CAPS/TIMBER PILES @ VAR. CENTERS

SPANS : 2 @ 30'-3

BEAMS OR GIRDERS : 12 LINES 16 I-BEAMS @ VAR. CENTERS

FLOOR :	ENCROACHMENT :	DECK (OUT TO OUT) :
STL.PLK/5 AWS		28.167 FT

CLEAR ROADWAY :	BETWEEN RAILS :	SIDEWALK OR CURB :
28 FT	28.417 FT	LT .2 FT RT .2 FT

VERT.CL.OVER : 999.9 FT

INV.RTG. :	OPE.RTG. :	CONTR.MEMBER :	POSTED :
HS-8	HS-14	I-Bm 4 SpA	SV 15 TTST 20 DATE 03/18/2016

SYSTEM : Secondary S.R. Route

GREEN LINE ROUTE : N

UNDER ROUTES AND CLEARANCES

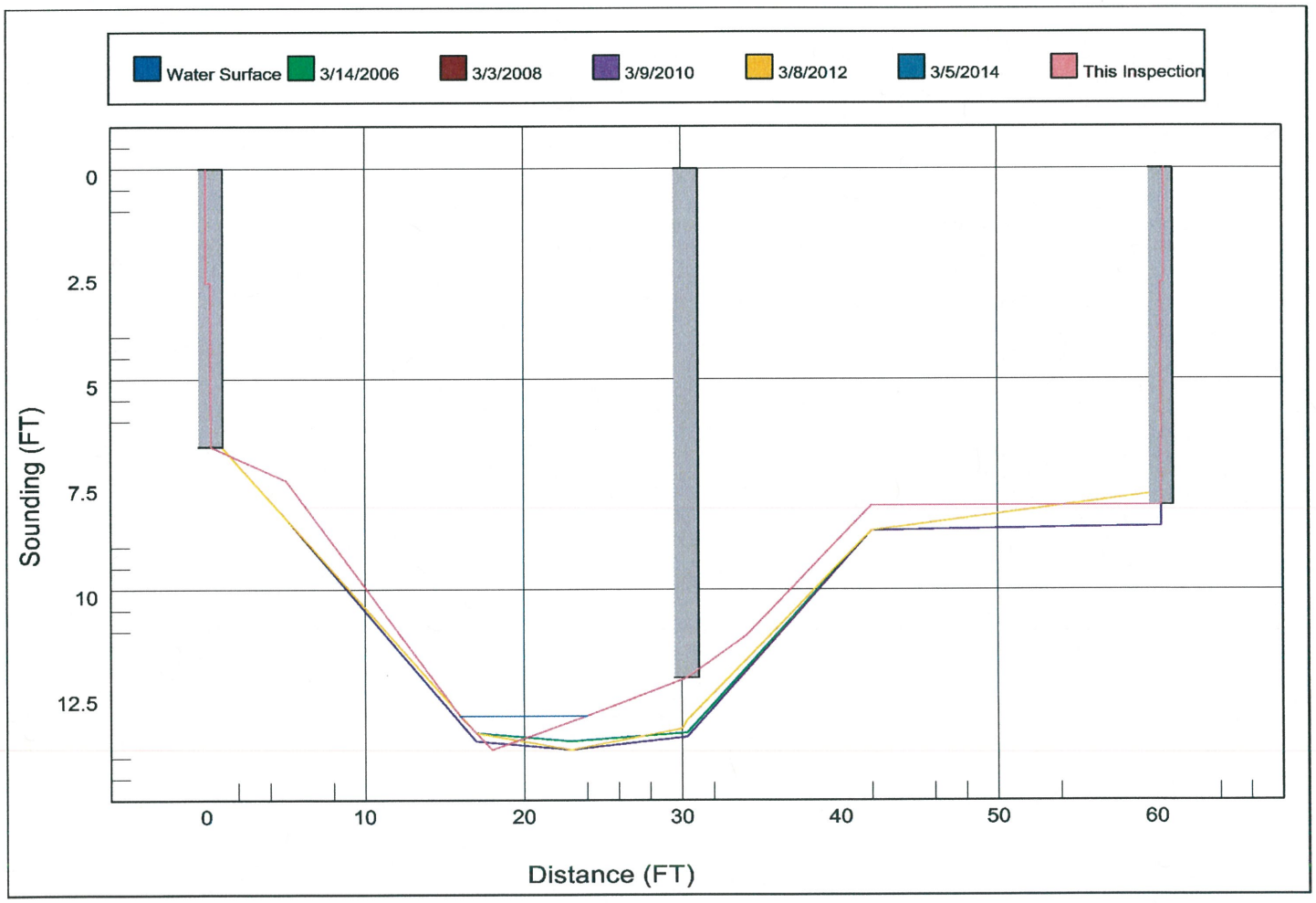
REMARKS :

130115

Bridge: 130115 County CALDWELL Date:

STREAMBED PROFILE (Downstream)

Top of Rail = 0 FT (Sounding)



U/S STR. 130115

Structure: 130236 County: CALDWELL Date: 01/06/2016 Structure Photos



LOOKING SOUTH



EAST PROFILE

D/S STR 130115

Structure: 130009 County: CALDWELL Date: 03/08/2016 Structure Photos



EAST PROFILE



ABUTMENT B

SITE: SR 1310 130115

DATE: 5/5/2017

old regression equations:

	REGION 1	REGION 2
Q25	1317.973	1163.437
Q50	1607.952	1387.824
Q100	1870.995	1653.673

D.A. = 4.4 sq mi lpArea= 1.53

current regression equations:

UPDATED: .1 to 3mi					3mi TO 436mi
	REGION 1	REGION 2			REGION 1
Q25	1664.345		1.018847	Q25	1477.52
Q50	2064.899			Q50	1797.83
Q100	2498.471			Q100	2110.75

rev. 5/2009

130 115

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

NCDOT UNITS:
BRIDGE MAINTENANCE UNIT
HYDRAULIC DESIGN UNIT
GEOTECHNICAL UNIT
STRUCTURE DESIGN UNIT
SOILS AND FOUNDATION UNIT

FULL SCOUR REP. AVAILABLE

IN HYDRAULICS FILES

BRIDGE SCOUR REPORT

COUNTY: Caldwell BRIDGE: 115 ROUTE: SR1310 STREAM CROSSED: Greasy Creek

ASSESSMENT: Yes EVALUATION: _____ BY: JJB DATE: 5/27/2009

FHWA STRUCTURE INVENTORY & APPRAISAL CODES:

SUBSTRUCTURE CONDITION (ITEM 60)
CHANNEL AND CHANNEL PROTECTION (ITEM 61)
WATERWAY ADEQUACY (ITEM 71)
SCOUR CRITICAL BRIDGE (ITEM1113)

MONITORING:

PLAN REQUIRED? YES ✓ NO _____

- FLOOD MONITORING EVENT (UPSTREAM FACE, FROM TOP OF RAIL):

REQUIRED ACTION: _____

- CRITICAL MONITORING DEPTH (UPSTREAM FACE, FROM TOP OF RAIL):

If mudline at B1 scours to 17' below top of rail;

REQUIRED ACTION: Contact Hydraulics Unit.

- CRITICAL HIGH WATER DEPTH (UPSTREAM FACE, FROM TOP OF RAIL):

REQUIRED ACTION: _____

- SCOUR CRITICAL DEPTH (UPSTREAM FACE, FROM TOP OF RAIL):

REQUIRED ACTION: _____

INCREASE UNDERWATER INSPECTION CYCLE? YES _____ NO ✓ FREQUENCY _____

COUNTER MEASURES:

PLAN REQUIRED? YES _____ NO ✓
SUMMARY OF PLAN:

CONSTRUCTION COMPLETE DATE: _____
FINAL CODING AFTER WORK IS COMPLETED (ITEM 113) _____ DATE: _____

BRIDGE MAINTENANCE COMMENTS:

B1 timber pile is tipped in 28 blow/1' material.

BRIDGE SCOUR EVALUATION ASSESSMENT

AND
DATA SUMMARY REPORT

ASSESSED: 5/27/2009
BY: JJB
CODE: 5
CLASSIFIED: Low Risk

SITE IDENTIFICATION:

COUNTY Cadwell CITY/TOWN _____ BRIDGE NO. 115
ROUTE SR 1310 STREAM Greasy Creek ROAD MILE _____
DUAL BRIDGE NO. ___ IS US/DS
ORIGINAL PROJECT NO. _____ YEAR BUILT 1972
REHAB PROJECT NO. _____ YEAR BUILT _____
CURRENT ADT 5800 YEAR 2002 FUTURE ADT _____ YEAR _____

INFORMATION RESOURCES AVAILABLE:

HYDRAULIC STUDY REPORT (DATE): _____
AS-BUILT CONSTRUCTION PLANS (DATE): _____
FOUNDATION REPORT (DATE): _____
OTHER AGENCY STUDIES (DATE): _____
(FEMA, CORPS, T.V.A., SCS)
QUAD MAPS (NAME & DATE): _____
AERIAL PHOTOGRAPHY (DATE): _____
GAGE DATA (TYPE, NO., DRAINAGE AREA): _____
DISTANCE TO SITE (UP/DOWN STREAM): _____
BRIDGE INSPECTION REPORT (DATE): 3/2004
UNDERWATER INSPECTION (DATE, CYCLE): _____
STRUCTURE DATA FILE (DATE): 5/2004
OTHER _____ (DATE): _____

HYDRAULIC DATA:

DRAINAGE AREA _____ SQ. MILE SOURCE _____
100 YR. WATERWAY OPENING (NORMAL TO FLOW) _____

HISTORICAL FLOODS

DATE	ELEV. (FT BELOW TOP OF RAIL)	APPROX. FREQ. (YEARS)	APPROX. DISCH.	ADJUSTED TO SITE
	10' below top of rail	every few years		

SOURCE Local Resident

FLOOD FREQUENCY (YRS)	Q___	Q___	Q___	Q___
ELEVATION (FT)				
DISCHARGE (CFS)				
AVG. VELOCITY (Q/A)				

SOURCE _____

COMMENTS: _____

rev. 5/2009

STRUCTURE DATA:

BRIDGE LENGTH: 61'
SUFFICIENCY RATING 56
NO. OF SPANS 2
BED TO CROWN 12'

EST. REMAINING LIFE YRS: _____ **DATE:** 5/27/2009
SPAN LENGTHS 2@30'-3
SIMPLE OR CONTINUOUS Continuous
TOP OF RAIL ELEVATION 0' [measure down from]**T HALWEG ELEVATION** 14.8'

BENT NO. (W-E, N-S)		EB1	B1	EB2				
TYPE		Timber Cap/	Timber Cap/	Timber Cap/				
SKEW		Timber Pile	Timber Pile	Timber Pile				
FTG./FOUNDATION TYPE								
FOOTING THICKNESS								
TOP FTG. ELEV.	LT							
	CTR							
	RT							
BOTTOM FTG. ELEV.	LT							
	CTR							
	RT							
TOP SILL ELEV.	LT							
	CTR							
	RT							
BOTTOM SILL ELEV.	LT							
	CTR							
	RT							
CONC./ RIP RAP PROTECTION								
PILE TYPE		Timber Pile	Timber Pile	Timber Pile				
PILE LENGTH (AVERAGE)								
PILE TIP ELEV. (AVERAGE)		23.5'	21.9'	23.2'				
PILE EMBED BELOW THALWEG		8.7'	7.1'	8.4'				
FTG. EMBED BELOW THALWEG								

COMMENTS: _____

GEOMORPHIC DATA: (LOOKING DOWNSTREAM)

CHANNEL (NORMAL TO FLOW):

AVG. BASE WIDTH_____ AVG. TOP WIDTH_____ AVG. DEPTH_____

AT CROSSING:

STRAIGHT_✓_ MILD CURVE_____ SHARP BEND_____

FLOW ANGLE OF APPROACH:

LOW_✓_ MILD_____ HIGH_____

(0°-5°) (5°-20°) (20°+)

CROSSING WIDTH COMPARED TO:

UPSTREAM: WIDER_____ SAME_____ NARROWER_____

DOWNSTREAM: WIDER_____ SAME_____ NARROWER_____

BASED ON COMPARISON OF SECTIONS TAKEN AT DATES _____

CHANNEL HAS:

WIDENED	_____ FT	SAME_____	NARROWED	_____ FT
AGGRADATED	_____ FT	SAME_____	DEGRADATED	_____ FT
SHIFTED LT	_____ FT	SAME_____	SHIFTED RT.	_____ FT

THALWEG HAS:

SHIFTED LT	_____ FT	SAME_✓_	SHIFTED RT.	_____ FT

REPORTED SITE SCOUR PROBLEM:

	MINOR	MODERATE	SEVERE	UNKNOWN
LT. BANK				
RT. BANK				
LT. SPILL SLOPE				
RT. SPILL SLOPE				
PIER(S)				
DEBRIS	✓			
CHANNEL BED				
OTHER _____				

IS REPORTED PROBLEM CHANNEL FLOW ASSOCIATED? N/A

BASED ON THE AVAILABLE GEOMORPHIC DATA, THE CHANNEL STABILITY POTENTIAL OVER THE LIFETIME OF THE EXISTING STRUCTURE CAN BEST BE DESCRIBED AS:

1. RELATIVELY STABLE WITH LITTLE EXPECTED CHANGE N/A
2. POTENTIAL FOR SLOW CHANGE OVER TIME. NOT PRONE TO A MAJOR ONE-EVENT CHANGE. N/A
3. UNSTABLE SUBJECT TO RAPID EVOLUTIONARY CHANGE N/A

DECISION:

CLASSIFIED AS:

SCOUR CRITICAL	
UNKNOWN FOUNDATION	
LOW RISK	✓

RECOMMENDED SCOUR CODE: 5

ASSESSMENT COMMENTS:

EB1- Timber pile 23.5' below Top of Rail with 50 blow/1" material @ 11.1' below TOR.

B1- Timber pile 21.9' below TOR on 28 blow/1' material.

EB2- Timber pile 23.2' below TOR with 100 blow/6" material @ 16.6' below TOR.

SCHEDULE FOR DETAILED STUDY

SCHEDULE FOR FURTHER IN-HOUSE STUDY

ASSESSED BY: JJB
FIRM: NCDOT
DATE: 5/27/2009
CHECKED BY:
DATE:
FIRM:

APPROVED BY: JLL
DATE: 5/27/2009

FINAL COMMENTS:

Scour committee recommends code 5. See report by FDH dated 5/27/2009.

Scour committee recommends monitoring- if mudline at B1 scours to 17' below top of rail, contact hydraulics unit.

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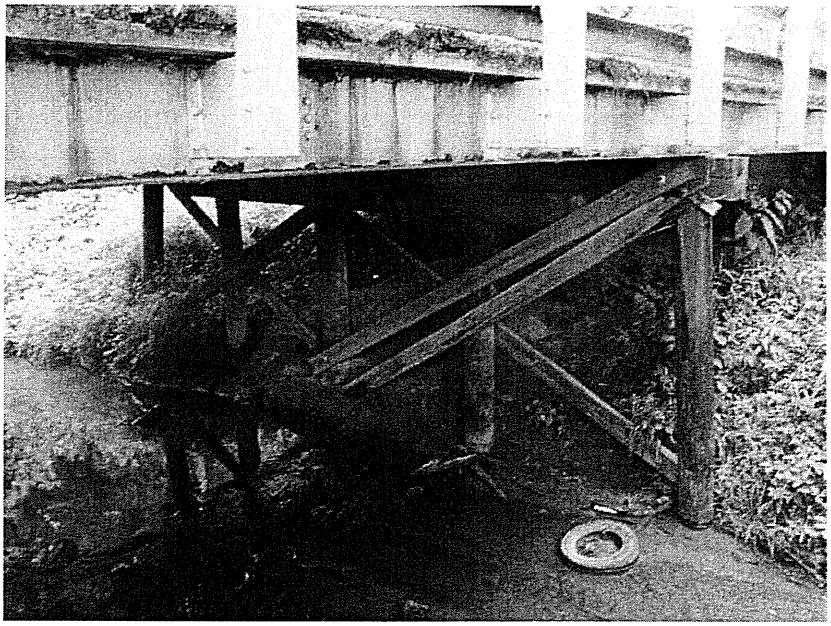
FDH

NCDOT - HYDRAULICS DEPT.
1590 MAIL SERVICE CENTER
RALEIGH, NC 27699-1590

Unknown Foundation Determination

Substructure Report

Caldwell 130115
Abirgton Rd. (SR 1310) over Greasy Creek



FDH Project # 08-06077E

Submitted by:

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

FDH Engineering, Inc.
2730 Rowland Rd., Raleigh, NC 27615
T: (919) 755-1012 F: (919) 755-1031
www.fdh-inc.com
holt@fdh-inc.com

May 27, 2009

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

Facility Carried: Abirgton Rd. (SR 1310)

Feature: Over Greasy Creek

Substructure Type: E.BTS & INT BTS:TIMBER CAPS/TIMBER PILES @ VAR. CENTERS

No. of Interior Bents: One (1)

Piles per Bent: Five (5)

Reference Document(s): Bridge Inspection Report from March 2004 found. Structure Data File May 2004 found.

Comments: No noticeable scour at time of testing.

Field Work Performed:

- Sounding rods were driven next to EB1, B1 and EB2 to determine the depth to high blow count material.
- Dispersive wave propagation testing was conducted on EB1P2, B1P3 and EB2P5.

Bridge Information From March 2004 Inspection Report:

Substructure Condition: 7
Channel and Channel Protection: 6
Waterway Adequacy: 7
Bridge Length: 61.0'
Sufficiency Rating: 56.0
Number of Spans: 2 Span Lengths: 2@ 30'-3
Underclearance: 10'-5
List of Scour Problems and Repairs:NA
Original Construction: 1972 Year Reconstructed: 0000
Current ADT: 005800 Year: 2002
Crown to Bed: 12'-0

Summary of Findings:

Hydraulic Data:

Maintenance Personal : Local Resident
Reference to top rail: ~10.0
Date of high water: Every few years
Does bridge overtop during minor floods (<10 year event):No

Requiring closure and inspection before reopening? No

Reported of apparent scour problem? No
List any major events: Hurricanes or storms and year of event and high water (reference to TOR)
Hurricane Hugo 1989, Hurricane Dennis 1999, Hurricane Isabel 2003, Hurricane Ivan 2004.

Field Observations:
Any Scouring Noted: No
Angle of Stream Attack: Straight
Debris: Large Trees Leaning on Bank? No
Debris Piled up on Bents? Yes, small branches
Has Thalweg Shifted? No

Field Testing Results:

TABLE ½" ROD DRIVES					
BC2		BC3		BC3	
DEPTH FROM TOP OF RAIL	BLOWS/ FT	DEPTH (TOR)	BLOWS/ FT	DEPTH (TOR)	BLOWS/ FT
10.1-11.0	25	13.1'-14.1'	2	7.1'-8.1'	3
11.1'	50/0"	14.1'-15.1'	3	8.1'-9.1'	6
-	-	15.1'-16.1'	9	9.1'-10.1'	9
-	-	16.1'-17.1'	19	10.1'-11.1'	16
-	-	17.1'-18.1'	12	11.1'-12.1'	39
-	-	18.1'-19.1'	29	12.1'-13.1'	78
-	-	19.1'-20.1'	16	13.1'-14.1'	84
-	-	20.1'-21.1'	30	14.1'-15.1'	103
-	-	*21.1'-22.1'	28	15.1'-16.1'	124
-	-	22.1'-23.1'	24	16.1'-16.6'	100/6"
-	-	23.1'-24.1'	66	-	-
-	-	24.1'-25.1'	94	-	-
-	-	25.1'	50/0"	-	-

* indicates bottom of pile at location of blow count.

Sounding Rods:

Sounding rods of diameter ½" were driven at EB1 and EB2.

Dispersive Wave Testing

Dispersive wave propagation testing was conducted on EB1P2, B1P3 and EB2P5 that had been installed during the 1972 construction. The results indicated EB1P2 is 23.3 ft, B1P3 is 21.9 ft and EB2P5 is 23.2 ft from the top of rail to bottom of pile.

Conclusions

Foundation consists of timber piles. EB1P2 is 23.3 ft, B1P3 is 21.9 ft and EB2P5 is 23.2 ft from the top of rail to bottom of pile. Sounding data indicates EB1 and EB2 are resting on material too hard to penetrate with sounding rods at BC1 and BC3. B1P3 is resting on material of 28 BPF at BC2.

BOTTOM OF FOOTING			
Pile and Footing Location	**Test Method**	**Top of Rail to Bottom of Footing (FT)**	**Embedment Below Thalweg (FT)**
EB1P2	**DW**	**23.5**	**8.7**
B1P3	**DW/ROD**	**21.9**	**7.1**
EB2P5	**DW/ROD**	**23.2**	**8.4**

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 with a 2 foot drop and counting the actual number of blows required to drive the rod 1 ft into the material.

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.



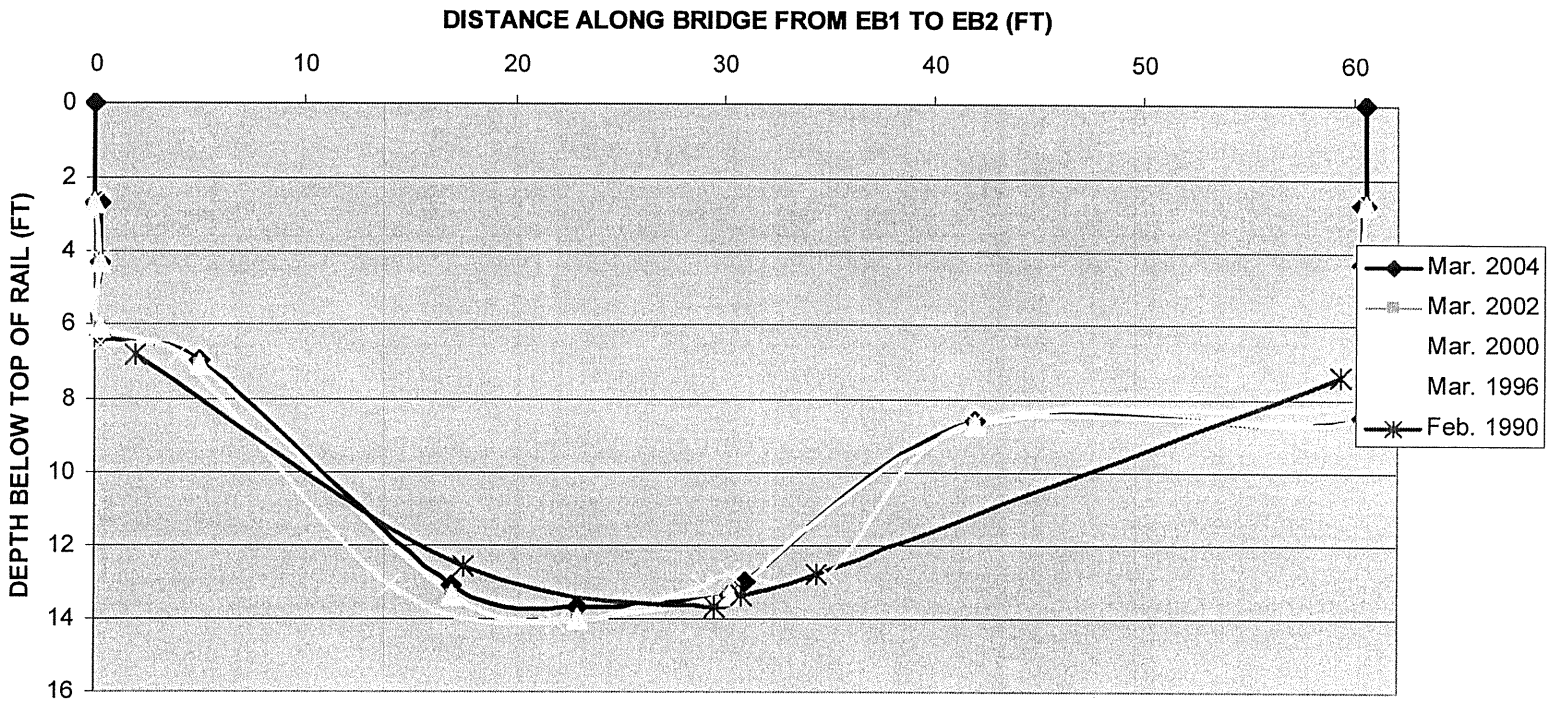
View of EB1.

15

Caldwell 130115

5
02/23/2009

DOWN STREAM BED SOUNDINGS

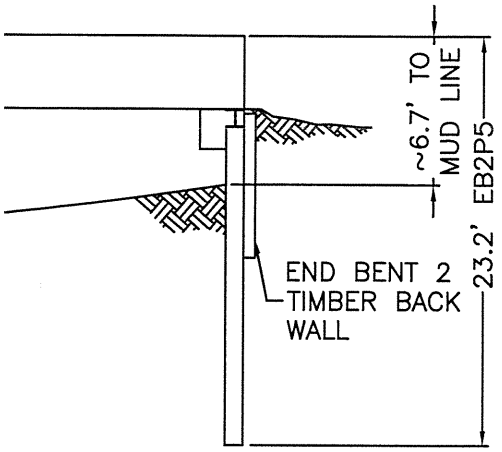


FDH Engineering, Inc. 2730 Rowland Rd., Raleigh, NC 27615 T: (919) 755-1012 F: (919) 755-1031

130115

BLOW COUNT CHART					
BC1		BC2		BC3	
DEPTH (T.O.R.)	BPF	DEPTH (T.O.R.)	BPF	DEPTH (T.O.R.)	BPF
10.1'-11.1'	25	13.1'-14.1'	2	7.1'-8.1'	3
11.1'	50/0"	14.1'-15.1'	3	8.1'-9.1'	6
		15.1'-16.1'	9	9.1'-10.1'	9
		16.1'-17.1'	19	10.1'-11.1'	16
		17.1'-18.1'	12	11.1'-12.1'	39
		18.1'-19.1'	29	12.1'-13.1'	78
		19.1'-20.1'	16	13.1'-14.1'	84
		20.1'-21.1'	30	14.1'-15.1'	103
		*21.1'-22.1'	28	15.1'-16.1'	123
		22.1'-23.1'	24	16.1'-16.6'	100/6"
		23.1'-24.1'	66		
		24.1'-25.1'	94		
		25.1'	50/0"		

*INDICATES BOTTOM OF PILE AT LOCATION OF BLOW COUNT.



Prepared for:
NCDOT - HYDRAULICS DEPT.
1590 MAIL SERVICE CENTER
RALEIGH, NC 27699-1590

Prepared by:
FDH ENGINEERING
2730 ROWLAND DRIVE
SUITE 100
RALEIGH, NC 27615
PHONE (919) 755-1012
FAX (919) 755-1031

NORTH CAROLINA PROFESSIONAL SEAL 022498 ENGINEER J. DARRIN HOLT

SITE ID:	#130115
DRAWN BY:	ARZ
CHECKED BY:	JDH
JOB NO:	08-06077E

SUBMITTALS		
DATE	DESCRIPTION	REV
05/27/09		A

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SITE NAME:
CALDWELL 115

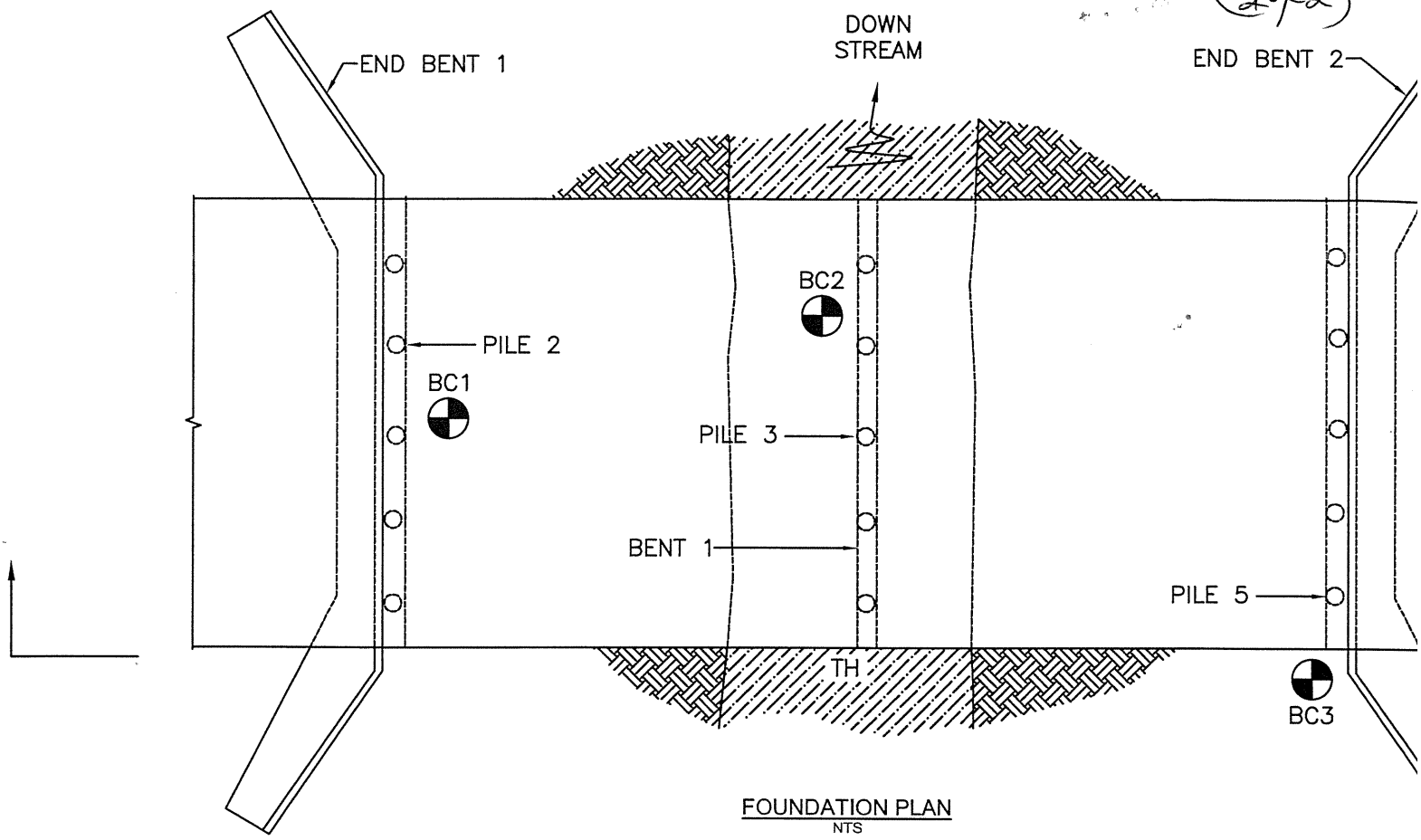
SITE NUMBER:
#130115

SITE ADDRESS:
0.1 MI. W. JCT. SR1305
CALDWELL COUNTY

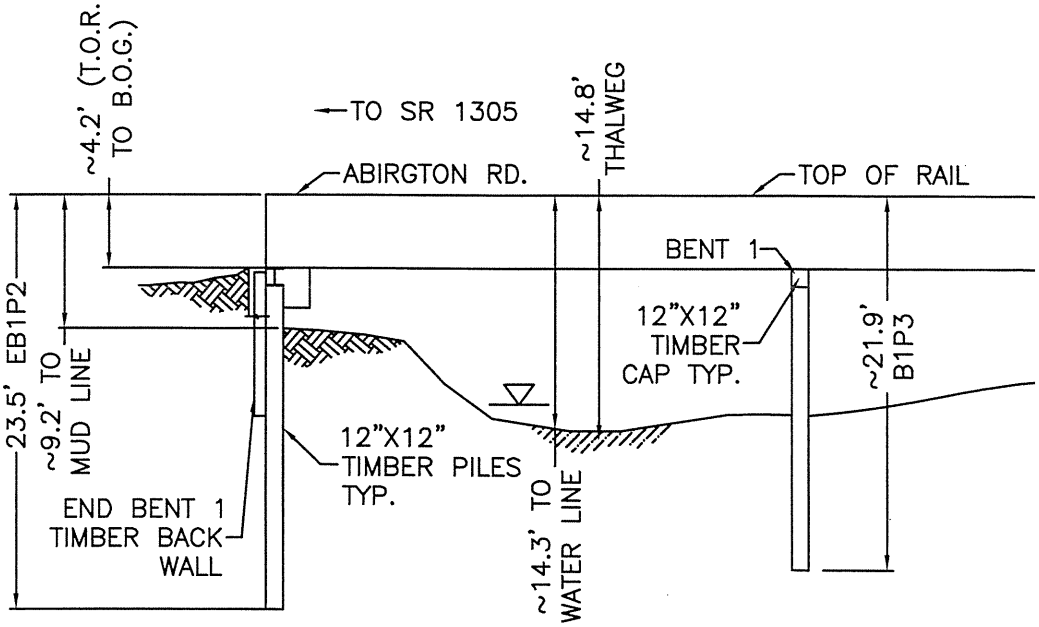
SHEET TITLE
FOUNDATION PLANS

SHEET NUMBER
A-1

130115
(2 of 2)

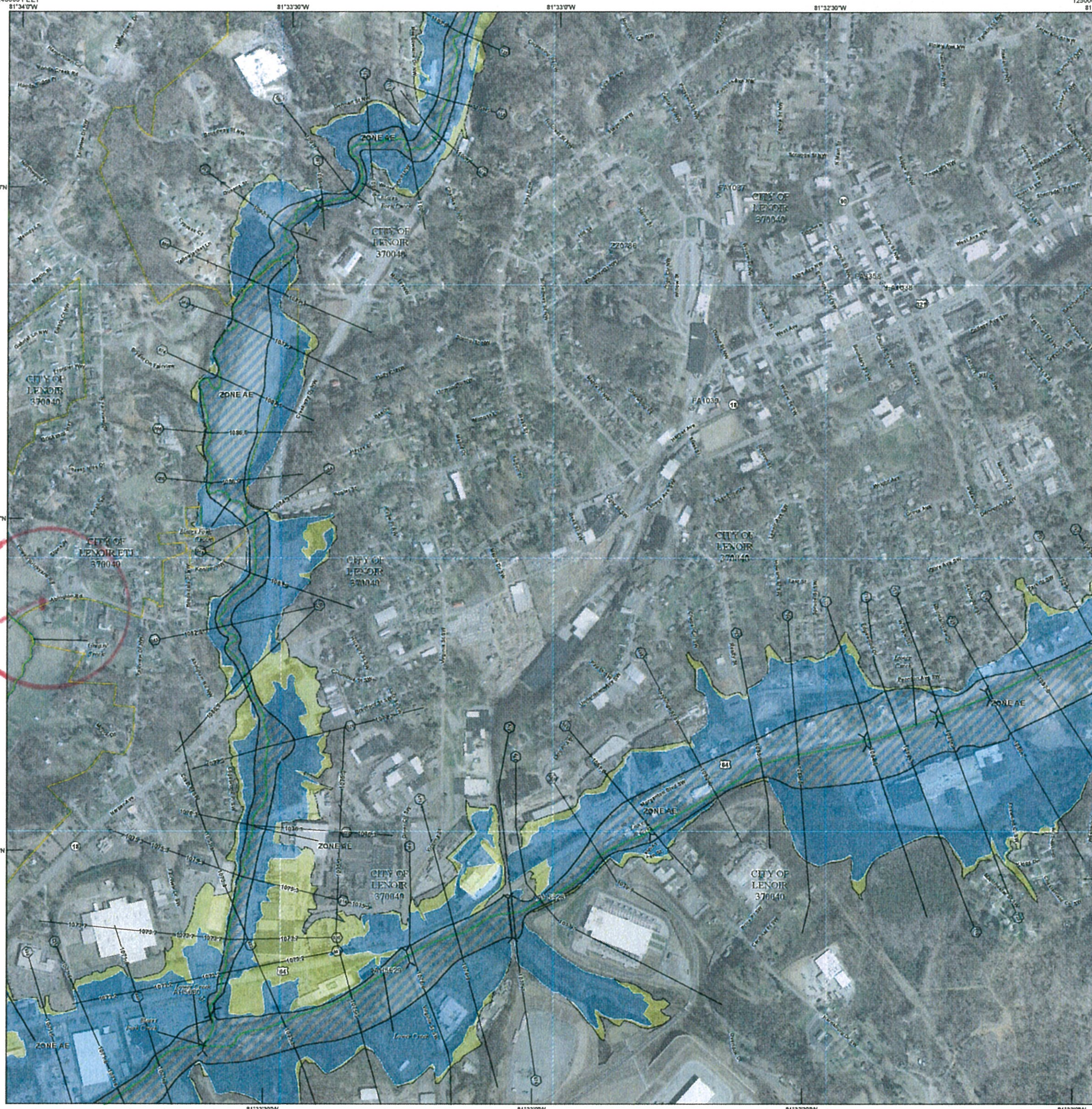


FOUNDATION PLAN
NTS



ELEVATION
NTS

130115



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.

FLOOD HAZARD INFORMATION

SEE FIS REPORT FOR ZONE DESCRIPTIONS AND INDEX MAP

THE INFORMATION DEPICTED ON THIS MAP AND SUPPORTING DOCUMENTATION ARE ALSO AVAILABLE IN DIGITAL FORMAT AT HTTP://FRIS.NC.GOV/FRIS

SPECIAL FLOOD HAZARD AREAS	Without Base Flood Elevation (BFE) *Zone A, V, A99*
	With BFE or Depth *Zone AE, AO, AH, VE, AR*
	Regulatory Floodway
OTHER AREAS OF FLOOD HAZARD	0.2% Annual Chance Flood Hazard, Areas of 1% Annual Chance Flood with Average Depth Less Than One Foot or With Drainage Areas of Less Than One Square Mile *Zone X*
	Future Conditions 1% Annual Chance Flood Hazard *Zone X*
	Area with Reduced Flood Risk due to Levee See Notes *Zone X*
OTHER AREAS	Areas Determined to be Outside the 0.2% Annual Chance Floodplain *Zone X*
GENERAL STRUCTURES	Channel, Culvert, or Storm Sewer
	Accredited or Provisionally Accredited Levee, Dike, or Floodwall
	Non-accredited Levee, Dike, or Floodwall
	BM5510 North Carolina Geodetic Survey bench mark
	BM5510 National Geodetic Survey bench mark
	BM5510 Contractor Est. NCFMP Survey bench mark
	012 18.2 Cross Sections with 1% Annual Chance Water Surface Elevation (BFE)
	8 Coastal Transect
	Coastal Transect Baseline
	Profile Baseline
	Hydrographic Feature
OTHER FEATURES	Limit of Study
	Jurisdiction Boundary

NOTES TO USERS

For information and questions about this map, available products associated with this FIRM including historic versions of this FIRM, how to order products or the National Flood Insurance Program in general, please call the FEMA Map Information eXchange at 1-877-FEMA-MAP (1-877-336-2627) or visit the FEMA Map Service Center website at http://msc.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 http://www.ncfloodmaps.com, or contact the FEMA Map Service Center.

Communities annexing land on adjacent FIRM panels must obtain a current copy of the adjacent panel as well as the current FIRM Index. These may be ordered directly from the Map Service Center at the number listed above.

For community and countywide map dates refer to the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in the community, contact your Insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

Base map information shown on this FIRM was provided in digital format by the North Carolina Floodplain Mapping Program (NCFMP). The source of this information can be determined from the metadata available in the digital FLOOD database and in the Technical Support Data Notebook (TSDN).

ACCREDITED LEVEE NOTES TO USERS: If an accredited levee note appears on this panel check with your local community to obtain more information, such as the estimated level of protection provided (which may exceed the 1-percent-annual-chance level) and Emergency Action Plan, on the levee system(s) shown as providing protection. To mitigate flood risk in residual risk areas, property owners and residents are encouraged to consider flood insurance and floodproofing or other protective measures. For more information on flood insurance, interested parties should visit the FEMA Website at http://www.fema.gov/business/nfip/index.shtm.

PROVISIONALLY ACCREDITED LEVEE NOTES TO USERS: If a Provisionally Accredited Levee (PAL) note appears on this panel, check with your local community to obtain more information, such as the estimated level of protection provided (which may exceed the 1-percent-annual-chance level) and Emergency Action Plan, on the levee system(s) shown as providing protection. To maintain accreditation, the levee owner or community is required to submit the data and documentation necessary to comply with Section 65.10 of the NFIP regulations. If the community or owner does not provide the necessary data and documentation or if the data and documentation provided indicates the levee system does not comply with Section 65.10 requirements, FEMA will revise the flood hazard and risk information for this area to reflect de-accreditation of the levee system. To mitigate flood risk in residual risk areas, property owners and residents are encouraged to consider flood insurance and floodproofing or other protective measures. For more information on flood insurance, interested parties should visit the FEMA Website at http://www.fema.gov/business/nfip/index.shtm.

LIMIT OF MODERATE WAVE ACTION NOTES TO USERS: For some coastal flooding zones the AE Zone category has been divided by a Limit of Moderate Wave Action (LiMWA). The LiMWA represents the approximate landward limit of the 1.5-foot breaking wave. The effects of wave hazards between the VE Zone and the LiMWA (or between the shoreline and the LiMWA for areas where VE Zones are not identified) will be similar to, but less severe than those in the VE Zone.

Limit of Moderate Wave Action (LiMWA)

COASTAL BARRIER RESOURCES SYSTEM (CBRS) NOTE

This map may include approximate boundaries of the CBRS for informational purposes only. Flood insurance is not available within CBRS areas for structures that are newly built or substantially improved on or after the date(s) indicated on the map. For more information see http://www.fws.gov/habitatconservation/coastal_barrier.html, the FIS Report, or call the U.S. Fish and Wildlife Service Customer Service Center at 1-800-344-WILD.

CBRS Area — Otherwise Protected Area

SCALE

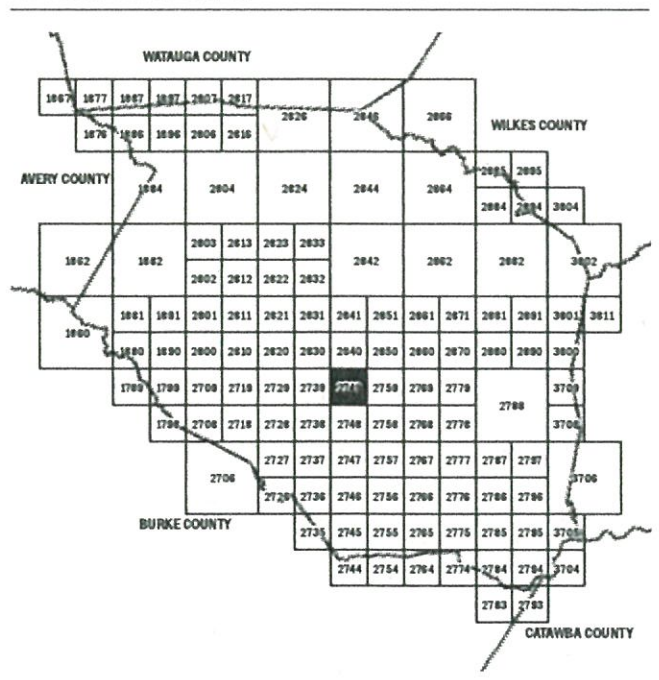
Map Projection:
North Carolina State Plane Projection Feet (Zone 3200)
Datum: NAD 1983 (Horizontal), NAVD 1988 (Vertical)

1 inch = 500 feet — 1:6,000

0 250 500 1,000 Feet

0 75 150 300 Meters

PANEL LOCATOR



FEMA

National Flood Insurance Program

NORTH CAROLINA FLOODPLAIN MAPPING PROGRAM
NATIONAL FLOOD INSURANCE PROGRAM
FLOOD INSURANCE RATE MAP

NORTH CAROLINA

PANEL 2749

Panel Conta

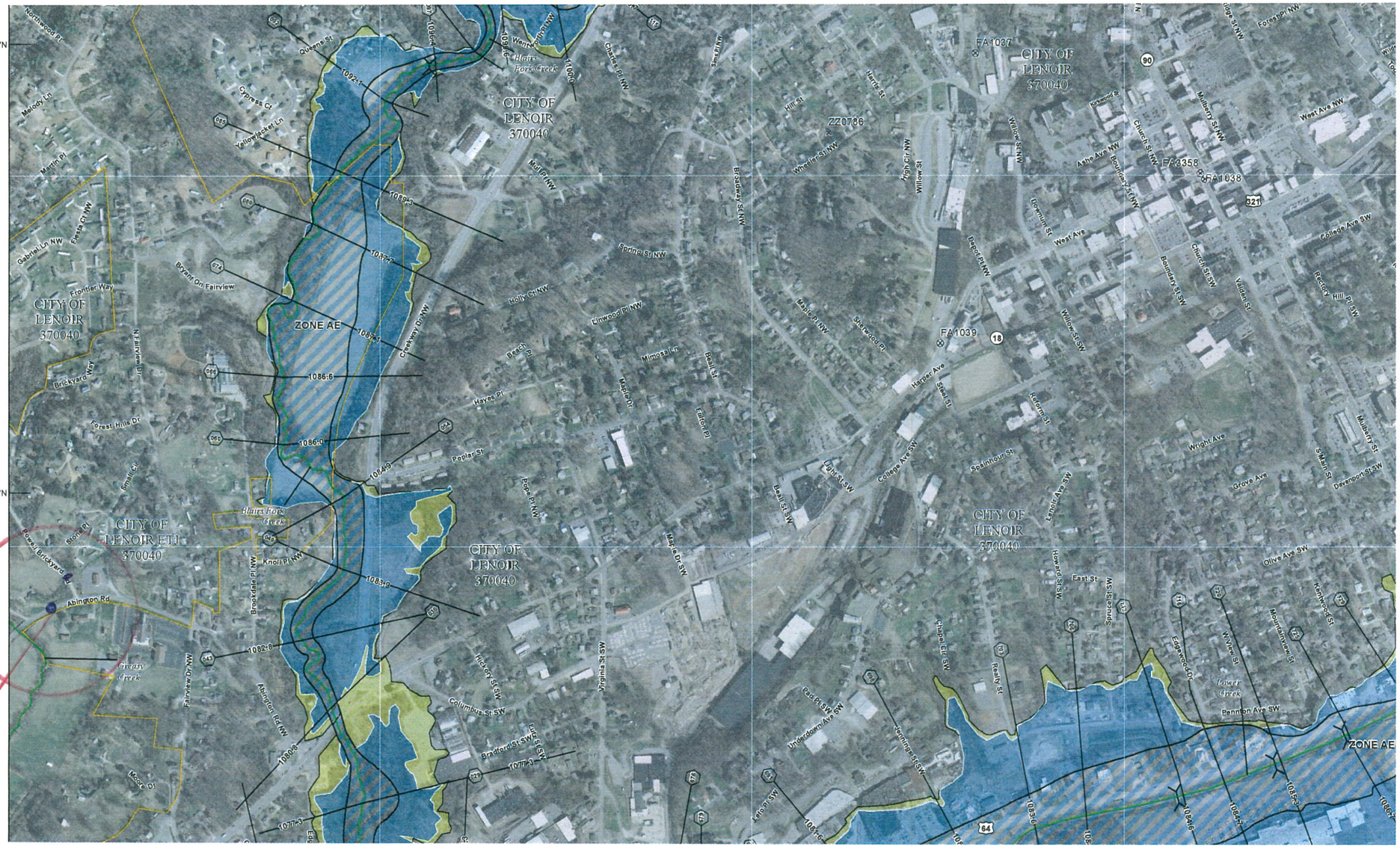
COMMUNITY	CID	PANEL	SUFFIX
LENOIR, CITY OF	370040	2749	J

2749

7 | 7 | 09

MAP NUMBER
3710274900J

MAP REVISED
7/7/2009


35°55'0"N
35°54'30"N
CITY OF LENOIR 370040
CITY OF LENOIR ETJ 370040
ZONE AE
Blairs Fork Creek
Lower Creek
FA1027
FA1038
FA1039
FA3358
ZZ0786
1086.5
1086.7
1086.1
1086.6
1086.0
1084.9
1083.9
1082.6
1080.0
1077.3
1077.3
1085.6
1084.6
1083.2
1082.1
1080.0
Queens St
Cypress Ct
Yellowhammer Ln
Martin Pl
Melody Ln
Gabriel Ln NW
Frontier Way
Bryan Dr
Fairview
Brickyard Way
N Fairview Dr
Forest Hills Dr
Emall Ct
Scott Pl
Forest Brickyard Dr
Abington Rd
Brookdale Pl NW
Knoll Pl NW
Abington Rd NW
Fairway Dr NW
Moore Dr
Creekview Dr NW
Holly Ct NW
Spring St NW
Poplar St
Hayes Pl
Birch Pl
Mimosa Ln
Maple Dr
Pope Pl NW
Hickory St SW
Columbine St SW
Bradford St SW
Little St SW
Virginia St SW
Maple Dr SW
Charles Pl NW
Hill St
Broadway St NW
Mulford NW
Harris St
Willow St
Wheeler St NW
Ash Cir NW
Willow St NW
Ash Ave NW
Boundary St NW
Mulberry St NW
Forest Pl NW
Ridge St NW
West Ave NW
Dogwood St
Depot Pl NW
Maple Pl NW
Sherwood Pl
Harper Ave
Scott St
Redeem St
Light St SW
Bell St SW
College Ave SW
Springhouse St
Howard St SW
East St
Spencer St SW
Chapel Cir SW
Realty St
Red Pl SW
Underdown Ave
Hamilton St SW
Kelly Pl SW
Edgewood Dr
WView St
Mountainview St
Northwood St
Olive Ave SW
Pennton Ave SW
Grove Ave
Wright Ave
Devenport St SW
S Main St
Mulberry St
Rectory Hill Pl SW
College Ave SW
Church St SW
Boundary St SW
Walton St
West Ave
Broadway St SW
Willow St SW
Church St NW
Mulberry St NW
Kennedy St
90
321
10
64
84

130115

A No HEC RAS X-SECTION

