Cover Page

Hydraulics Unit Pre-Design Report (Pre-Scoping) for Structure #: 540144

Date: 10/12/2016

County: Lincoln **Stream:** HOWARDS CREEK

Road #: SR 1200 **Road Name:** ALF HOOVER ROAD

Division: 12 **Location:** 1.3 M N JCT SR 1187

Latitude: 35.49788 **Longitude:** -81.34003 Decimal degrees, a min of 5 decimal points

Assigned to:

Prepared By: wsh/SJS

Hydro Mgr: PFF Hydro Reviewer: PFF

Project Type:

Existing Structure

Structure Type: Timber Deck/ I Beams Yr Built: 1953

Span Arrangement: 1@ 17'3", 1@ 16'10",1@ 39',1@17'8", 1@17'10" OAL (ft): 109.0 Skew: 90 Abutment Type: Timber Caps on Timber Pile

Number of Barrels: @ Span (ft): x Rise (ft):

Bed to Crown (ft): 18.0 Clear Roadway (ft): Water Depth (ft) 2.0 Superstructure Depth:

ADT: 850 Year ADT: 2012 Scour Code (item113): U Prior Survey Completed: ☑ Survey Date: 09/09/1983

Drainage Area: 16.7 Sq. Mi. Drainage Area Source: Sel.-Sites Roadway Overtops at Q100: ☐

Discharge Method: USGS Regression Equations USGS Region: 1- Piedmon Stream Gage Number(if applicable): 214308665

Q10 (cfs): Q25 (cfs): 3,100 Q50 (cfs): 3,700 Q100 (cfs): 4,300 QBFE (cfs):

☐ Structure in Flood Hazard Zone Panel #: 3604 Panel Date: 08/16/2007 Type of FIS: REDELINEATED Date of FIS:

Enviromental

Quad Map: LINCOLNTON WEST, NC River Basin: Catawba Buffer Rule:

Primary Stream Classification

☐ Class B ☑ Class C ☐ SA ☐ SB

☐ SC ☐ SWL ☐ WL ☐ WS I

☐ WS II ☐ WS III ☐ WS IV ☐ WS V

Supplemental Stream Classification

☐ FWS ☐ HQW ☐ NSW ☐ ORW

☐ Sw ☐ Tr ☐ UWL ☐ w/in 0.5mi. of CA

Other Stream Classification

☐ Anadromous Fish ☐ Area of Envronmental Concern

☐ CAMA County ☐ Federal Wild & Scenic Rivers

☐ HSB Requried ☐ NC Natural & Scenic Rivers

☐ Impaired [303d] ☐ Primary Nursery Area

☐ TVA ☐ Designated Shellfish Harvesting Area

☐ Designated Public Mountain Trout Waters

Up/Down Stream Features

Upstream Feature: Bridge

Location: 0.6 M S JCT SR 1113

Structure #: 540142 Route: SR 1193

Latitude: 35.50333 Longitude: -81.36095

Prior Survey Completed: ☐ Survey Date: Bed to Crown (ft): 23.0 Year Built: 2009

Structure Type: RC Deck/ on PPC Girders

Span Arrangement: 2@ 65' OAL (ft): 131.0

Number of Barrels: @ Span (ft): x Rise (ft):

Downstream Feature: Bridge

Location: 0.4 M S JCT SR 1203

Structure #: 540136 Route: SR 1185

Latitude: 35.49613 Longitude: -81.31976

Prior Survey Completed: ☑ Survey Date: 02/01/1993 Bed to Crown (ft) 16.0 Year Built: 1995

Structure Type: Precast PrestressConc Cor

Span Arrangement: 1@ 45', 1@ 46' OAL (ft):

Number of Barrels: @ Span (ft): x Rise (ft):

Preliminary Structure Estimate [Office Estimate]

Structure Type: Skew:

Dimensions/Spans:

Notes

Stream Assigned #: 11-129-4

OFFICE ESTIMATE: _____

Project# _____
TIP# _____
Let Date _____
WBS# _____ B-21

PREDESIGN-SCOPING REPORT

County LINCOLN (DIV. 12)
Bridge# 540144
Road# SR 1200 ALF HOOVER RD.
Stream HOWARDS CREEK

Type Of Request: POC Force Account TIP NCMA
Date 10/11/16 Name WSH
Assigned To PFF/MTS
Checked By SJS 10-12-16
Prior Survey Date YES - ATTACHED (attach copy of prior survey)
BRN. 4e17 1e40 CO. BK.: 9-9-83-224 FILE NONE
EXISTING PDR? NO
Study By Scour Section NONE
Flood Zone AE Detail Study LIMITED (HEC-RAS) Date 8/16/07 Panel# 3604 [0]
B.M. Info N/A
STREAM STATS. DA = 16.7 SQ MI
Quad Map LINCOLNTON W. Drainage Area 16.7 SQ. MILES From DASS STA: 214308665
Q25 3100 cfs Q50 3700 cfs Q100 4300 cfs Method
LONG.: -81.340026
LAT.: 35.497877
NEW REG. EQU.
REGION 1
IA = 1.01%

EXISTING BRIDGE INFORMATION

Location 1.3 M. N. JCT. SR 1187
Average Daily Traffic 850 (2012) 6% TRK YEAR BUILT: 1953
Length 109' Bed- To Crown 18' Water Depth 2'
Type Structure TIMBER DECK ON SALVAGED I-BEAMS - Timber caps + piles
Type Spans 1e17'3", 1e16'10", 1e39', 1e17'8", 1e17'10"

Upstream Structure 540142 (2e65') L = 130' YR. BUILT: 2009 (RC DECK ON PPC GIRDERS)
Location WISE RD. /SR 1193 0.6 M. S. JCT. SR 1113 LONG: -81.360954
Bed- To Crown 23" (H_2O = 3' deep) Prior Survey N/A LAT: 35.503326

Downstream Structure 540136 (1e46, 1e45, 1e46') YR. BUILT: 1995
Location DANIELS RD. /SR 1185 /0.4 Mi. S. JCT SR 1203 PRECAST PRESTRESS CONC CORED SLAB
Bed- To Crown 16' (H_2O = 2' deep) Prior Survey 2-193 LONG: -81.319758
LAT: 35.496125

ENVIRONMENTAL

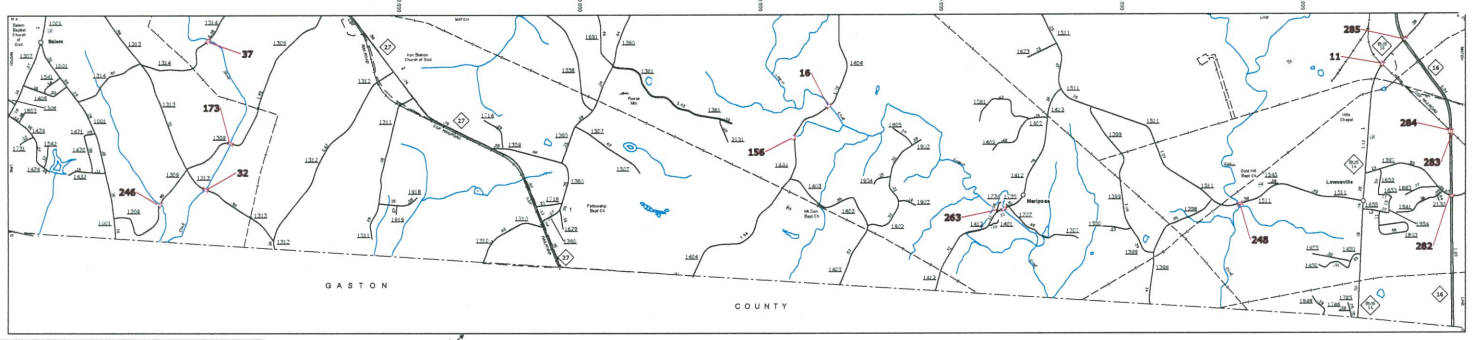
TVA: NO
Trout Stream NO Anadromous Fish NO Primary Nursery Area NO
High Quality Waters NO Nutrient Sensitive Waters NO
Near Water Supply Intake NO CAMA County NO
Stream Classification C STREAM #: 11-129-4 ✓
DENR River Basin Info. CATAWBA

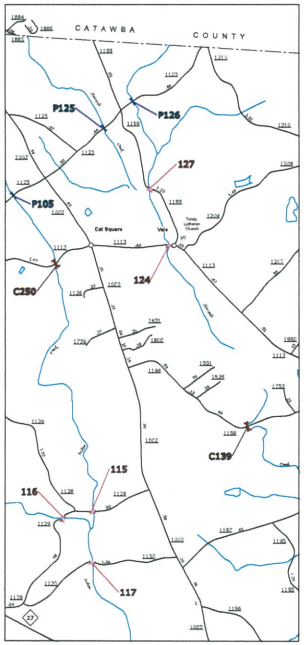
1,59,72,55
U/S 28 D/S 38

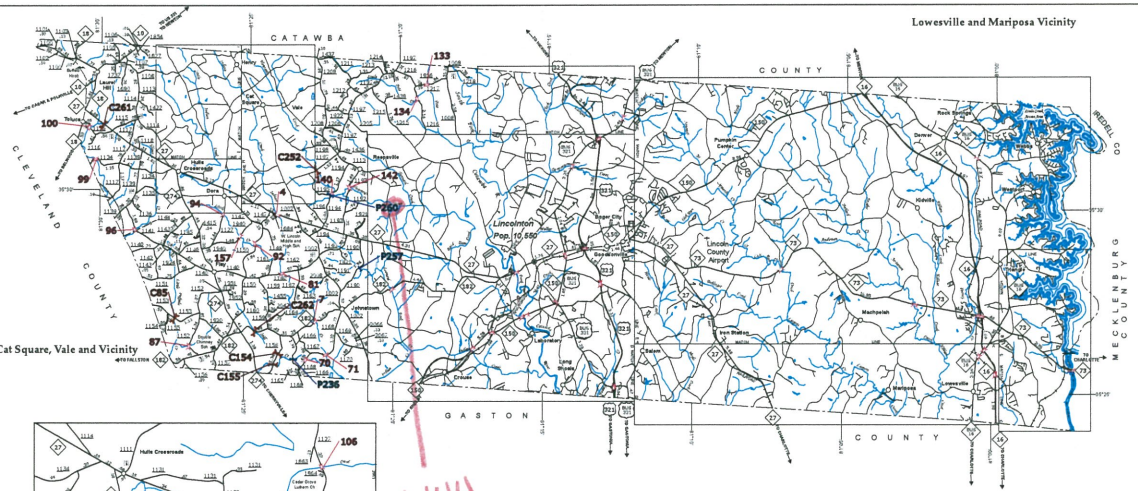
PSR ✓ (PDR in S) ✓

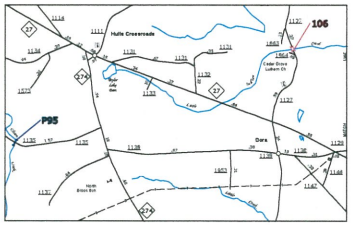
S 10-12

540144









#144

LEGEND

- UNPAVED SURFACED ROAD
- HARD SURFACED ROAD
- 4 LANE UNDIVIDED HIGHWAY
- DIVIDED HIGHWAY WITH MEDIAN
- DIVIDED HIGHWAY WITH MEDIAN AND CONTROLLED ACCESS (EXISTS)
- NON SYSTEM ROADS
- PROJECTED LOCATION
- NATIONAL PARK ROAD
- BLUE RIDGE PARKWAY
- INTERSECTION DISTANCE
- TRAFFIC CIRCLE
- DETAILED HIGHWAY INTERCHANGE
- ROAD THROUGH MOUNTAIN PASS
- FORD
- INTERSTATE HIGHWAY
- U.S. NUMBERED HIGHWAY
- N.C. NUMBERED HIGHWAY
- U.S. NUMBERED BICYCLE ROUTE
- N.C. NUMBERED BICYCLE ROUTE
- INTERSTATE INTERCHANGE NUMBER
- SECONDARY ROAD NUMBER
- UTILITY LINES
- RAILROAD
- RAILROAD STATION
- GRADE CROSSING
- BUILT AREA
- URBAN EXTENSION LINE
- NATIONAL FOREST BOUNDARY
- RESERVATION OR PARK BOUNDARY
- STATE FOREST BOUNDARY
- STATE GAMELAND BOUNDARY
- FEDERAL GAMELAND BOUNDARY
- MILITARY RESERVATION BOUNDARY
- STATE LINE
- COUNTY LINE
- CITY LIMIT
- FERRY ROUTE
- CANAL
- NARROW CREEK OR STREAM
- WIDE RIVER OR CREEK
- RESERVOIR, POND OR LAKE W/ ISLAND
- DAM OR DAM WITH LOCK
- WATERFALL
- SWAMP
- COMMUNITY, TOWN OR CITY CENTER
- COUNTY SEAT
- STATE CAPITAL
- SCHOOL
- COLLEGE OR UNIVERSITY
- HOSPITAL
- COAST GUARD STATION
- CHURCH
- CHURCH WITH CEMETERY
- CEMETERY
- PATROL STATION
- CORRECTION OR PENAL INSTITUTION
- QUARRY
- MINE OR PIT
- HIGHWAY GARAGE OR MAINT. YARD
- HIGHWAY DIV. OR DIST. OFFICE
- POST OFFICE
- MILITARY POST
- WILDLIFE REFUGE
- WEIGH STATION
- PARK/RECREATION
- HISTORICAL SITE
- POINTS OF INTEREST
- STATE FOREST
- LIGHTHOUSE
- MOUNTAIN SUMMIT
- OVERLOOK
- GEODETIC MARKER
- REST AREA
- VISITOR (TRANSIT) AREA
- WELCOME (TRANSIT) AREA
- MAJOR AIRPORT
- AIRPORT
- MILITARY AIRPORT
- HELIPORT

BRIDGE
CITY BRIDGE
CITY HIGH
"CI" CITY CULVERT
"CU" CULVERT
DRAW BRIDGE
"F" HIGH MAST FIXTURE
"FB" FERRY BOAT
"FB" FEDERAL BRIDGE
"H" NON SYSTEM MAINT BY NCDOT
"L" CANTILEVER SIGN
"M" PEDDLE STRUCTURE
"N" NCDOT OVERHEAD STRUCTURE
"P" PAVEMENT ON FILES
"P" PIPE
"S" OVERHEAD SIGN
"T" TUNNEL
"U" PEDESTRIAN UNDERPASS
"V" VEHICULAR UNDERPASS
"W" PEDESTRIAN WALKWAY

N

LINCOLN COUNTY
NORTH CAROLINA
BRIDGE LOCATION MAP

PREPARED BY THE
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
MANAGEMENT SYSTEMS AND ASSESSMENT UNIT - MAPPING SECTION
IN COOPERATION WITH THE
U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

SCALE
1 0 1 2 3 4 MILES
0 0.5 1 MILES
SCALE FOR ENLARGEMENTS

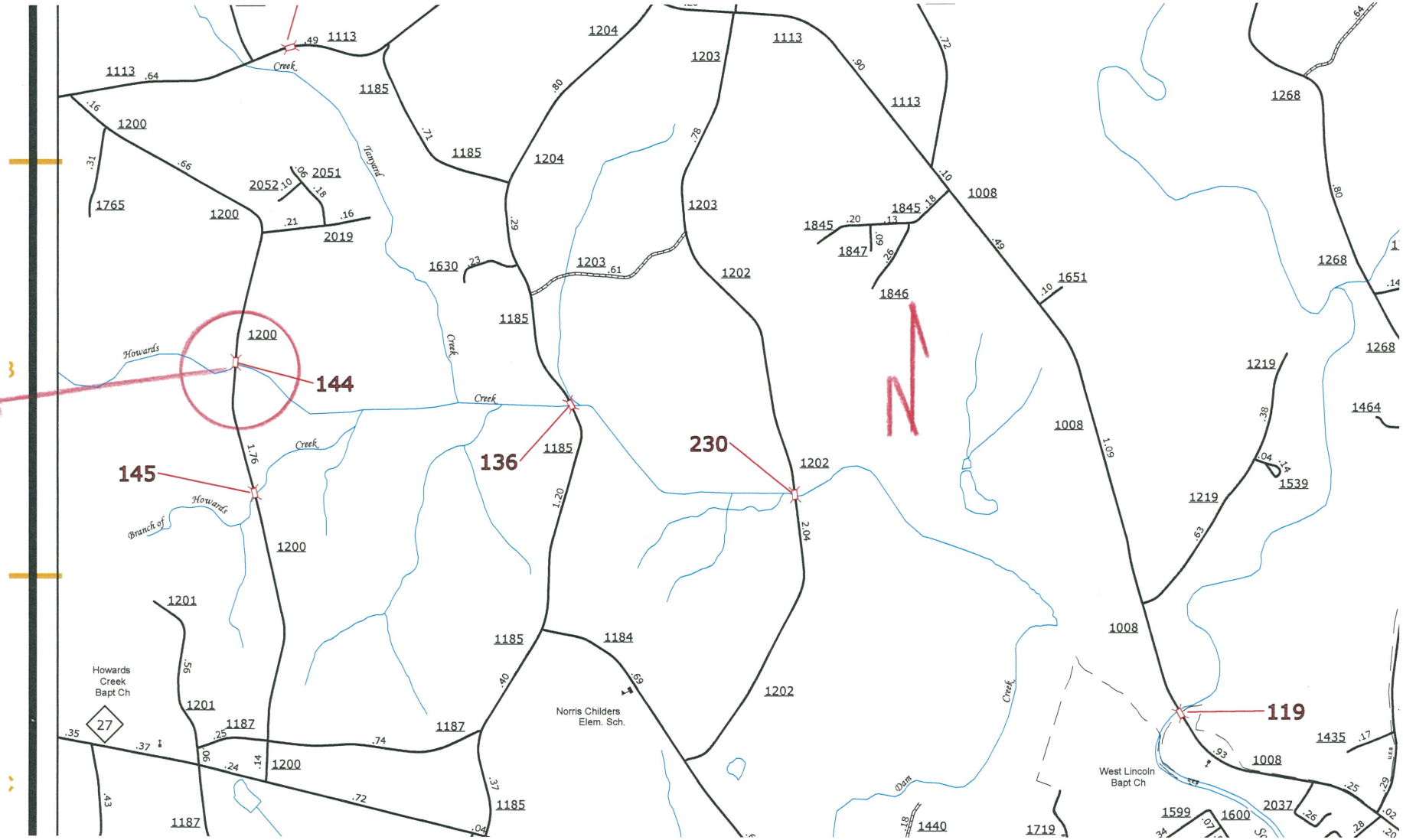
10,000 FOOT GRID BASED ON NORTH CAROLINA PLANE COORDINATE SYSTEM
LAMBERT CONFORMAL CONIC PROJECTION

SHEET 1 OF 3

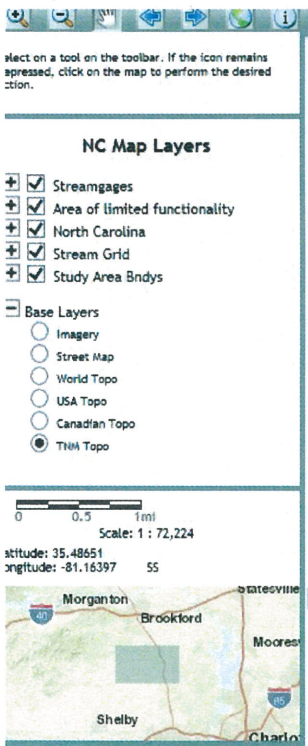
DIVISION 12 DISTRICT 3 LINCOLN COUNTY NORTH CAROLINA 109

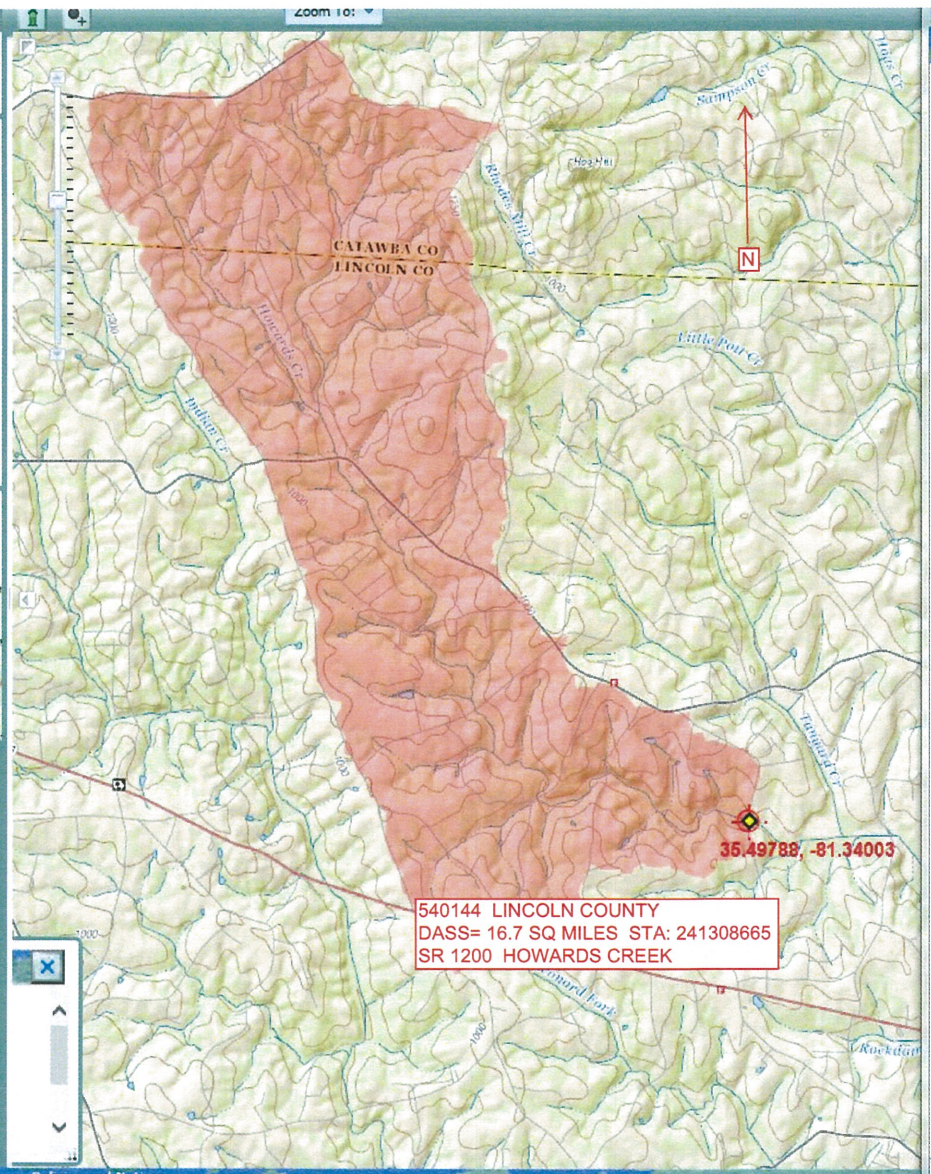
540144

#144


144
145
136
230
119
Howards Creek Bapt Ch
Norris Childers Elem. Sch.
West Lincoln Bapt Ch
Howards
Branch of
Creek
Tanyard
Dam
1113
1200
1185
1204
1203
1202
1008
1651
1846
1845
1847
1268
1219
1464
1539
1201
1187
1184
1435
1599
1600
2037
1719
1440
1765
2019
2051
2052
1630
27

540144





USGS StreamStats Version 3.0

Flow Statistics Ungaged Site Report

Date: Tues Oct 11, 2016 1:29:08 PM GMT-4
Study Area: North Carolina
NAD 1983 Latitude: 35.4978 (35 29 52)
NAD 1983 Longitude: -81.3399 (-81 20 24)
Drainage Area: 16.7 mi2

Peak Flows Region Grid Basin Characteristics

100% Peak Southeast US over 1 sqmi 2009 5158 (16.7 mi2)

Parameter	Value	Regression Equation Valid Range	
		Min	Max
Drainage Area (square miles)	16.7	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=16.7
Percent imperviousness of basin area 2006 NLCD=1.01

100% Region 1 Urban over 3 sqmi 2014 5030 (16.7 mi2)

Parameter	Value	Regression Equation Valid Range	
		Min	Max
Drainage Area (square miles)	16.7	3	436
Percent Impervious NLCD2006 (percent)	1.01	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	985	ft3/s	35		568	1710
PK5	1720	ft3/s	34		1000	2970
PK10	2260	ft3/s	35		1290	3960
PK25	2960	ft3/s	38		1630	5360
PK50	3580	ft3/s	40		1910	6700
PK100	4130	ft3/s	42		2140	8000
PK200	4680	ft3/s	44		2330	9380
PK500	5530	ft3/s	48		2630	11600

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.

Urban Flows Region Grid Statistics

540144

NC DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
STRUCTURE MANAGEMENT UNIT

ATTENTION: STRUCTURE DATA CHANGED, PRIORITY MAINTENANCE, SALVAGED BEAMS

Structure Safety Report

Routine Element Inspection - Contract

COUNTY: LINCOLN **STRUCTURE NUMBER:** 540144 **FREQUENCY:** 24 MONTHS

FACILITY CARRIED: SR1200 SR 1200 **MILE POST:**

LOCATION: 1.3 MI. N. JCT. SR1187 1.3 MILES NORTH OF JUNCTION WITH SR1187

FEATURE INTERSECTED: HOWARDS CREEK

LATITUDE: 35° 29' 52.2" **LONGITUDE:** 81° 20' 24.08"

SUPERSTRUCTURE: TIMBER DECK ON SALVAGED I-BEAMS TIMBER DECK ON I-BEAMS

SUBSTRUCTURE: END & INTERIOR BENTS:TIMBER CAPS ON TIMBER PILES

SPANS: 1@17'-3", 1@16'-10", 1@39'-1", 1@17'-8", 1@17'-10" 1@17'3", 1@16'10", 1@39'1", 1@17'8", 1@17'10"

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

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

POSTED SV: 17 **POSTED TTST:** 20

OTHER SIGNS PRESENT: (2) NARROW BRIDGE; (4) DELINEATORS



LOOKING NORTH

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
FORREST E. ROBBINS	Forrest E. Robbins	MARK E. GUSTAFSON

540144

BRIDGE MANAGEMENT UNIT

DATA ON EXISTING STRUCTURE Run Date: 07/20/2016

COUNTY :	DIVISION :	DISTRICT:	STRUCTURE NUMBER :	LENGTH :
LINCOLN	12	3	540144	109 FEET

ROUTE CARRIED : SR1200

FEATURE INTERSECTED : HOWARDS CREEK

LOCATED : 1.3 MI. N. JCT. SR1187

BRIDGE NAME :

CITY :

FUNC. CLASS :	SYST.ON :	SYST.UNDER :	ADT & YR :	RAIL TYPE :
09	NFA	NFA	850 2012	LT 227 RT 227

BUILT :	BY :	PROJ :	FED.AID PROJ :	DESIGN LOAD :
1953	BMU			Unknown

REHAB :	BY :	PROJ :	ALIGNMENT :	SKEW :	LANES :
	BMU	5.8351	TAN	90	ON 2 UNDER 0

NAVIGATION :					HT. CRN. TO BED :		WATER DEPTH :	
VC	0	FT	HC	0 FT	18	FT	2	FT

SUPERSTRUCTURE : TIMBER DECK ON I-BEAMS

SUBSTRUCTURE : END & INTERIOR BENTS:TIMBER CAPS ON TIMBER PILES

SPANS : 1@17'3", 1@16'10", 1@39'1", 1@17'8", 1@17'10"

BEAMS OR GIRDERS : SP#1&2,4&5:10 LINES OF 12" I-BEAMS, SP#3:8 LINES OF 16" I-BEAMS, ALL@ VARIOUS CENTERS

FLOOR :	ENCROACHMENT :	DECK (OUT TO OUT) :
3X4" TIM, 2" AWS		20.167 FT

CLEAR ROADWAY :	BETWEEN RAILS :	SIDEWALK OR CURB :
19.167 FT	19.833 FT	LT .333 FT RT .333 FT

VERT.CL.OVER : 999.9 FT

INV.RTG. :	OPE.RTG. :	CONTR.MEMBER :	POSTED :				
HS-6	HS-12	Int.bmsSpC ,Pile2-Pier3	SV 17	TTST 20	DATE 12/15/1987		

SYSTEM : Secondary S.R. Route

GREEN LINE ROUTE : N

UNDER ROUTES AND CLEARANCES

REMARKS :

540144

Structure: 540144 County: LINCOLN Date: 03/02/2016 Structure Photos



DOWNSTREAM PROFILE, LOOKING WEST



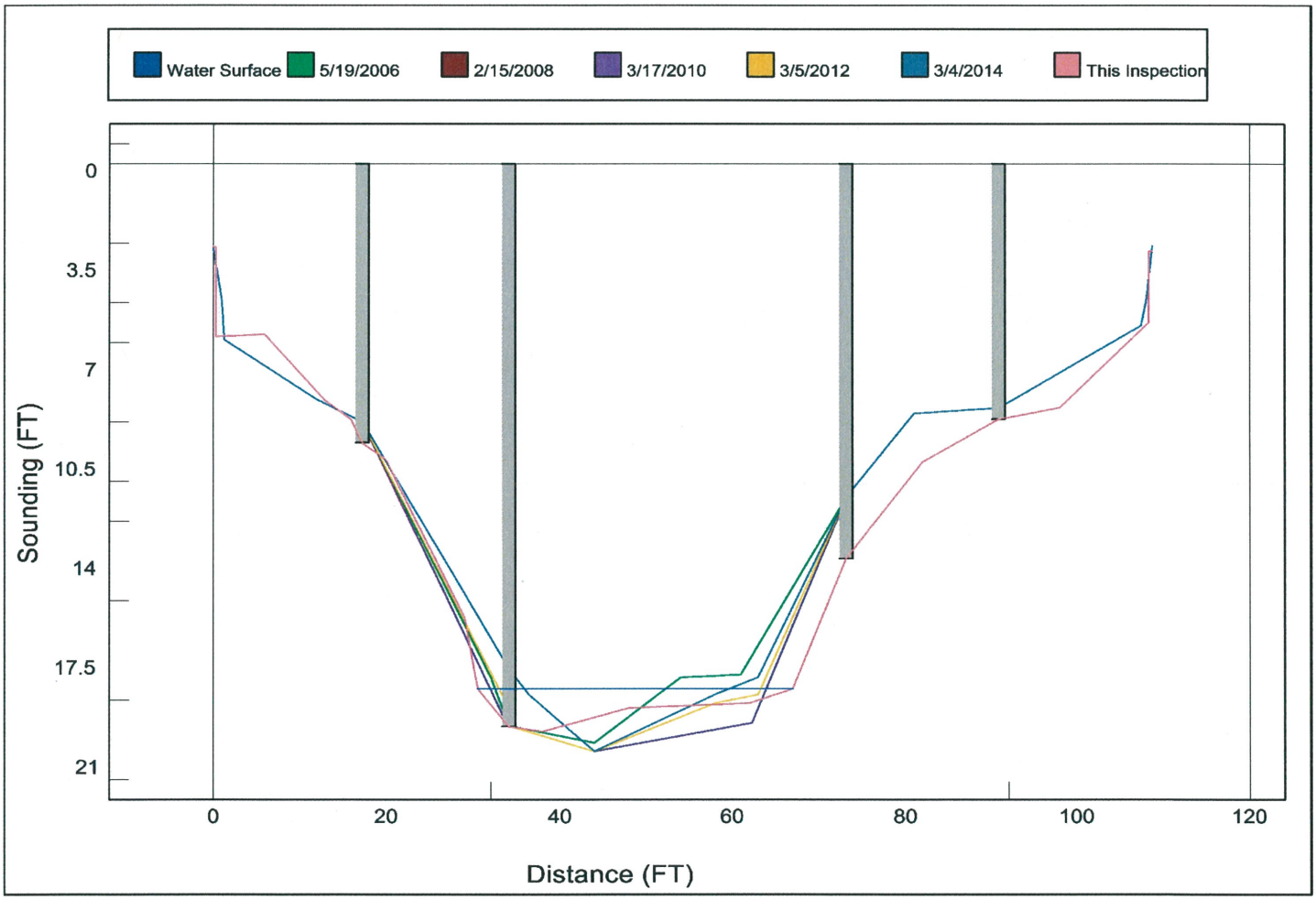
BEARING ASSEMBLY, BENT 3, SPAN 3 BEAM 8, SPAN 4 BEAM 10, LOOKING NORTH

540144

Bridge: 540144 County LINCOLN Date:

STREAMBED PROFILE (Downstream)

Top of Rail = 0 FT (Sounding)



U/S STR FOR 540144

Structure: 540142 County: LINCOLN Date: 11/04/2015 Structure Photos



BENT 1 LOOKING NORTH



LOOKING EAST

D/S STR FOR 540144

Structure: 540136 County: LINCOLN Date: 03/03/2016 Structure Photos

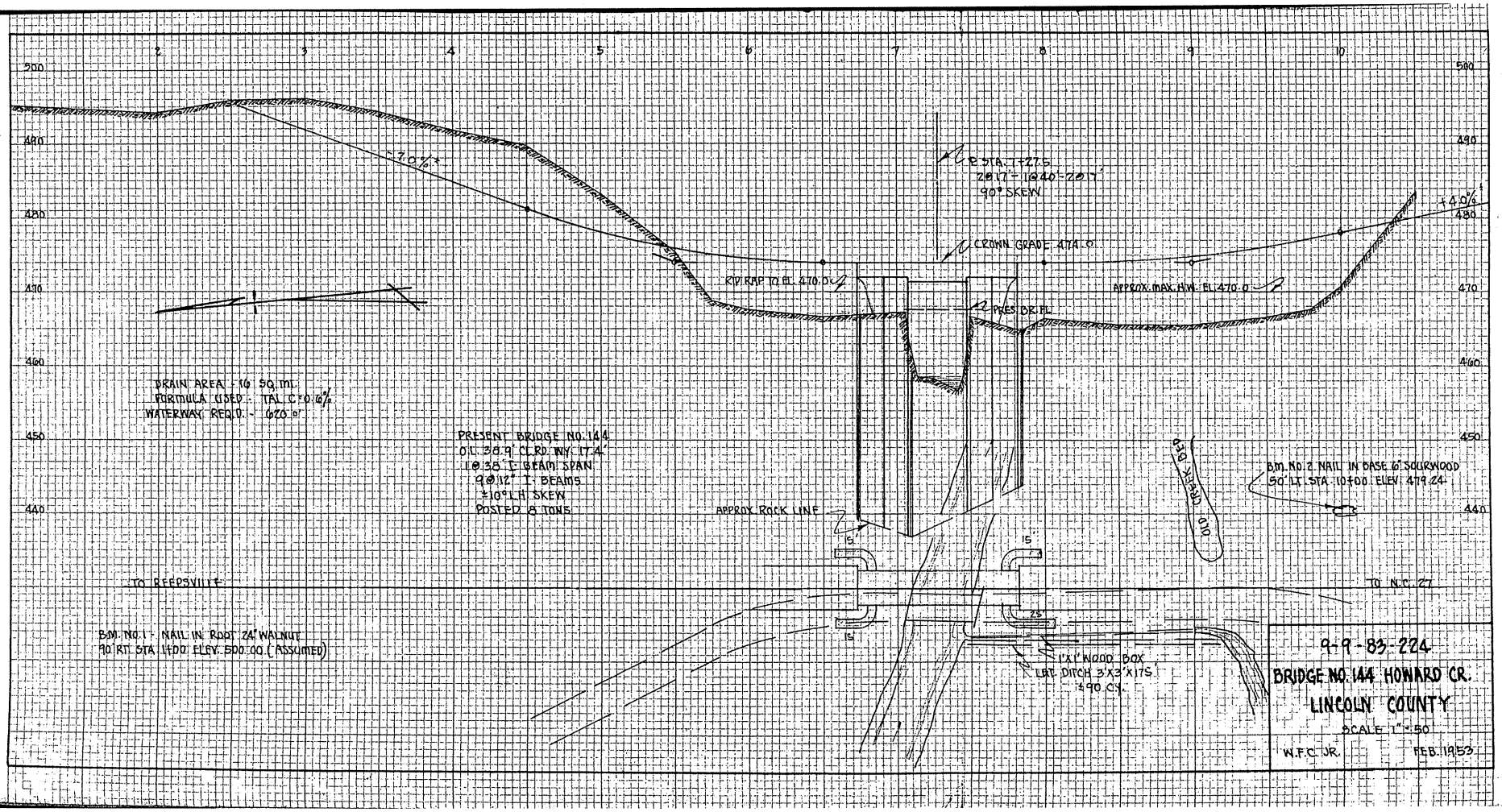


UPSTREAM PROFILE, LOOKING EAST



DOWNSTREAM PROFILE, LOOKING WEST

5Q144


CHARLES BRUNING COMPANY
CROSS SECTION 10 x 10
PRINTED IN U.S.A.
2
3
4
5
6
7
8
9
10
500
490
480
470
460
450
440
-7.0%
+4.0%
℄ STA. 7+27.5
20'17" - 1@40'-20'17"
90° SKEW
CROWN GRADE 474.0
RIP RAP TO EL. 470.0
APPROX. MAX. H.W. EL 470.0
PRES. DR. EL.
DRAIN AREA - 10 SQ. MI.
FORMULA USED - TAL C = 0.6
WATERWAY REQ'D. - 620 s.f.
PRESENT BRIDGE NO. 144
O.L. 38.9' CL RD. WY. 17.4'
1@ 36' I. BEAM SPAN
9@ 12" I. BEAMS
±10° LH SKEW
POSTED 8 TONS
APPROX. ROCK LINE
DEEP DITCH
B.M. NO. 2 NAIL IN BASE 6" SOURWOOD
50' LT. STA. 10+00 ELEV. 479.24
TO REEPSVILLE
TO N.C. 27
B.M. NO. 1 - NAIL IN ROOT 24" WALNUT
90' RT. STA. 14+00 ELEV. 500.00 (ASSUMED)
1'X1' WOOD BOX
LAT. DITCH 3'X3'X17'S
±90 C.Y.
9-9-83-224
BRIDGE NO. 144 HOWARD CR.
LINCOLN COUNTY
SCALE 1" = 50'
W.F.C. JR.
FEB. 1953

540144



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 12-2 Cross Sections with 1% Annual Chance Water Surface Elevation (BFE)
- B Coastal Transect
- Coastal Transect Baseline
- Profile Baseline

OTHER FEATURES
- Hydrographic Feature
- 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

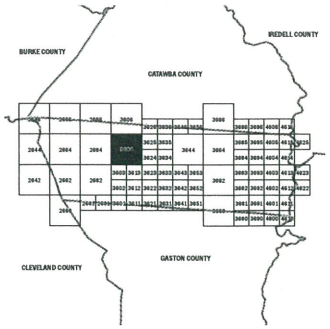
Map Projection:
North Carolina State Plane Projection Feet (Zone 3200)
Datum: NAD 1983 (Horizontal), NAVD 1988 (Vertical)

1 inch = 1,000 feet 1:12,000

0 500 1,000 2,000 Feet

0 150 300 600 Meters

PANEL LOCATOR



FEMA

National Flood Insurance Program

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

NORTH CAROLINA

PANEL 3604

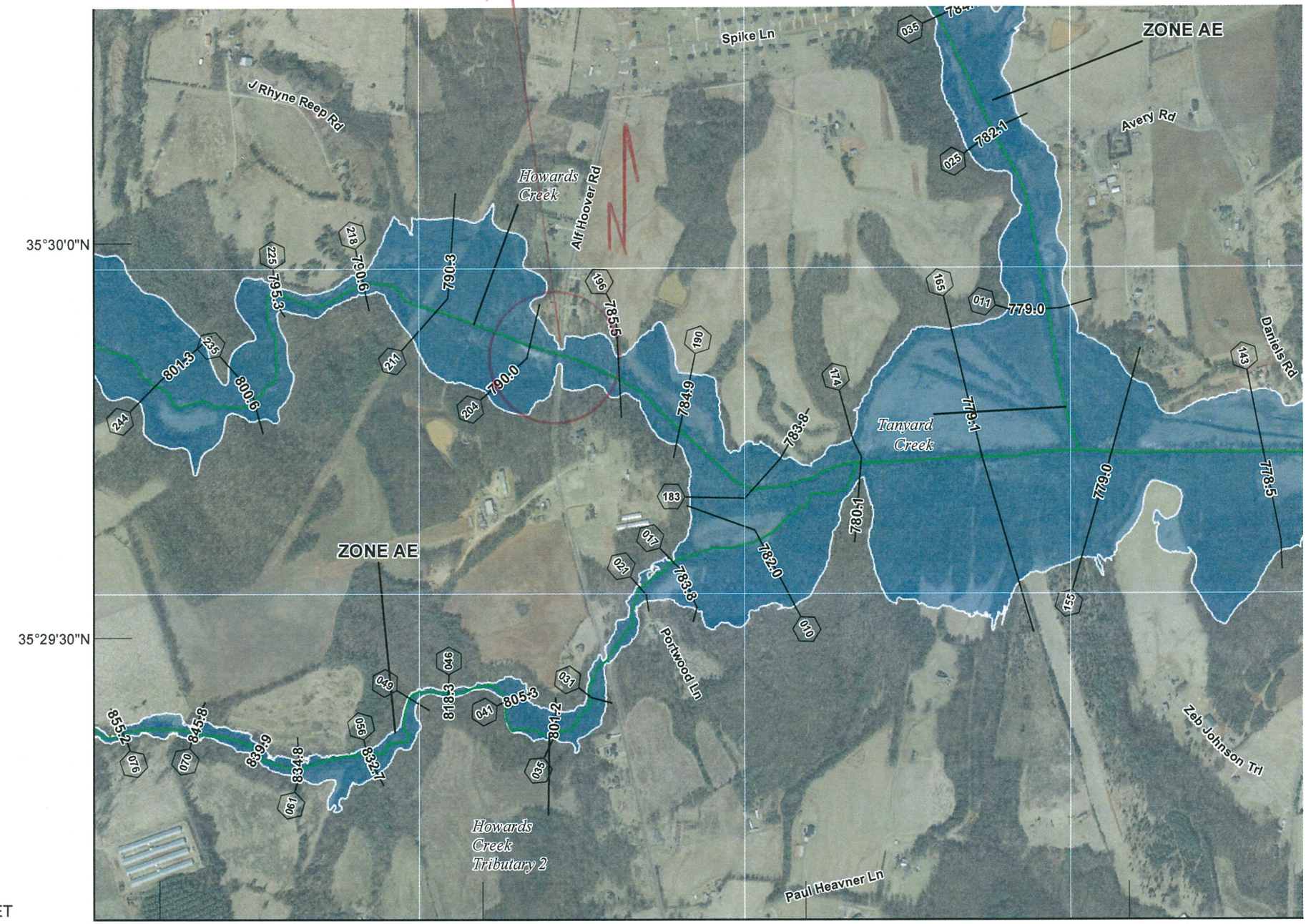
Panel Contains:

COMMUNITY	CID	PANEL	SUFFIX
LINCOLN COUNTY	370146	3604	J

MAP NUMBER
3710360400J
MAP REVISED
8/16/2007

#149

540144



35°30'0"N

35°29'30"N

640000 FEET

81°21'0"W

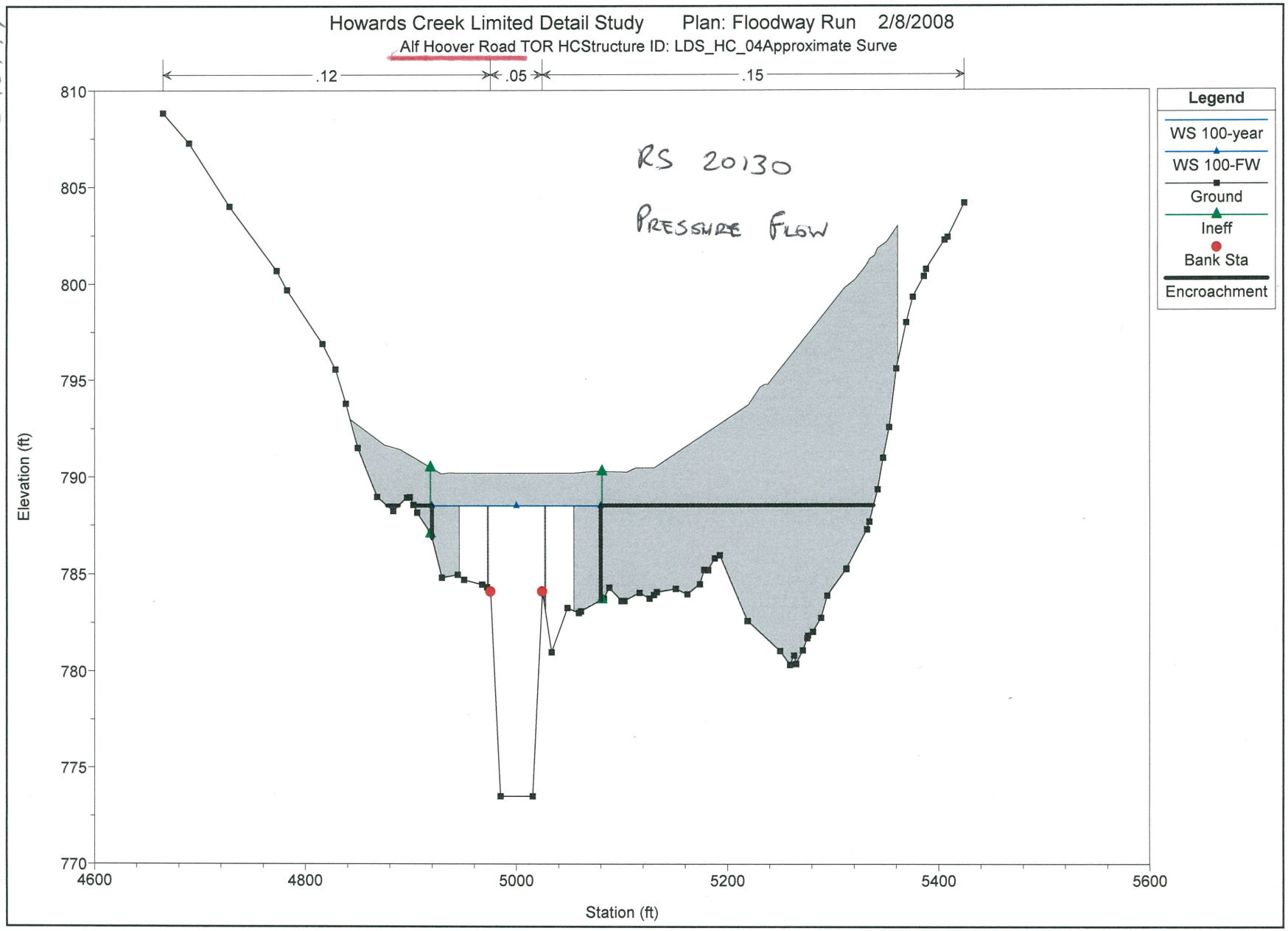
1300000 FEET

81°20'30"W

81°20'0"W

81°19'30"W

540144


Howards Creek Limited Detail Study Plan: Floodway Run 2/8/2008
Alf Hoover Road TOR HCStructure ID: LDS_HC_04Approximate Surve
.12
.05
.15
RS 20130
PRESSURE FLOW
Legend
WS 100-year
WS 100-FW
Ground
Ineff
Bank Sta
Encroachment
Elevation (ft)
Station (ft)
810
805
800
795
790
785
780
775
770
4600
4800
5000
5200
5400
5600