

21" Coral Slab L= 120'
Span: 3@40'

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

County LINCOLN

Bridge# 540124
Road# SR 1113 (REEPSVILLE R)
Stream CREEK (HOWARD'S) ✓

Type Of Request: POC Force Account TIP NCMA

Date 5/23/12 Name WSH

Assigned To RCH

Checked By _____

Prior Survey Date Not Found (attach copy of prior survey) BROWN BOOK 522 9-403

Study By Scour Section YES

Flood Zone AE Detail Study LIMITED Date _____ Panel# 2686 Z (NOT AVAILABLE ON ESM)

B.M. Info N/A

ATTACHED 2686 J- (IN FILE CABINET)

Quad Map BANOAK Drainage Area 7.3 Sq. Mi. From QUAD SHEET
Q25 1800 cfs Q50 = 2200 Q100 = 2500 Method RURAL REG. EQU.
REGION 1

EXISTING BRIDGE INFORMATION

Location 0.1 MI. W. JCT. SR 1199

Average Daily Traffic 1600 (TRK 6%)

Length 111' Bed- To Crown 18' Water Depth 1'

Type Structure REINFORCED CONC DECK ON I BEAMS / TIMBER PILE, CONC. CAPS

Type Spans 1 e 22' 3" 3 e 22' 1 e 22' 3"

Upstream Structure #127, P125, pipe

Location SR 1960, SR 1123

Bed- To Crown — Prior Survey —

Downstream Structure C139 (3 x 11x11 RCBC) - 1993

Location SR 1198 (0.7 MI. E. JCT. SR 1591)

Bed- To Crown 16' (1' deep) Prior Survey —

SCS Watershed —

ENVIRONMENTAL

Trout Stream NO Anadromous Fish NO Primary Nursery Area NO

No 303D

High Quality Waters NO Nutrient Sensitive Waters NO

Near Water Supply Intake NO CAMA County NO

Stream Classification C Stream # 11-129-4 (8/01/98)

DENR River Basin Info. CATAWBA

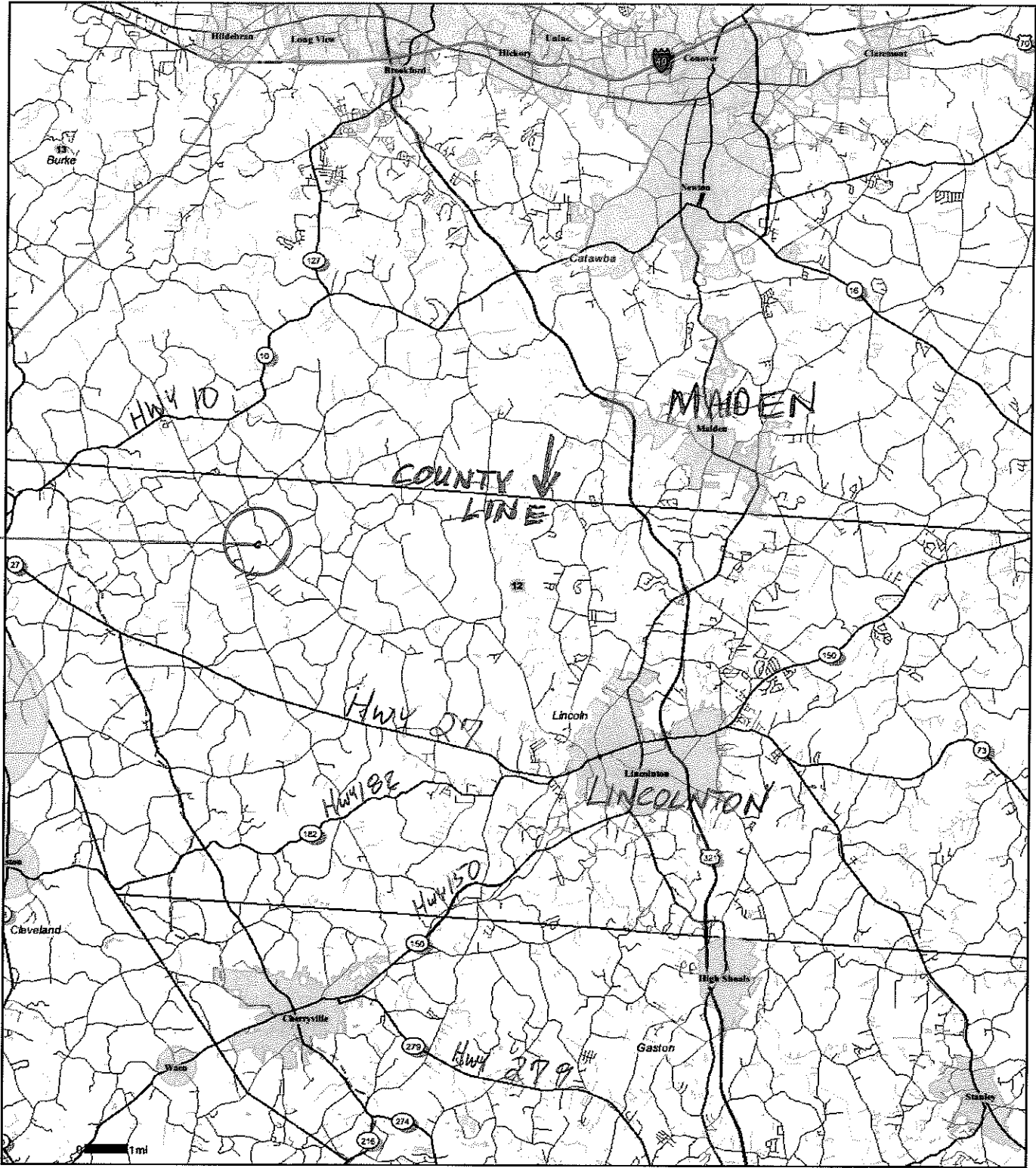
Howard's Creek from source to Catawba River

Environmental Sensitivity Map - 2008

5/24/2012 4:01 PM

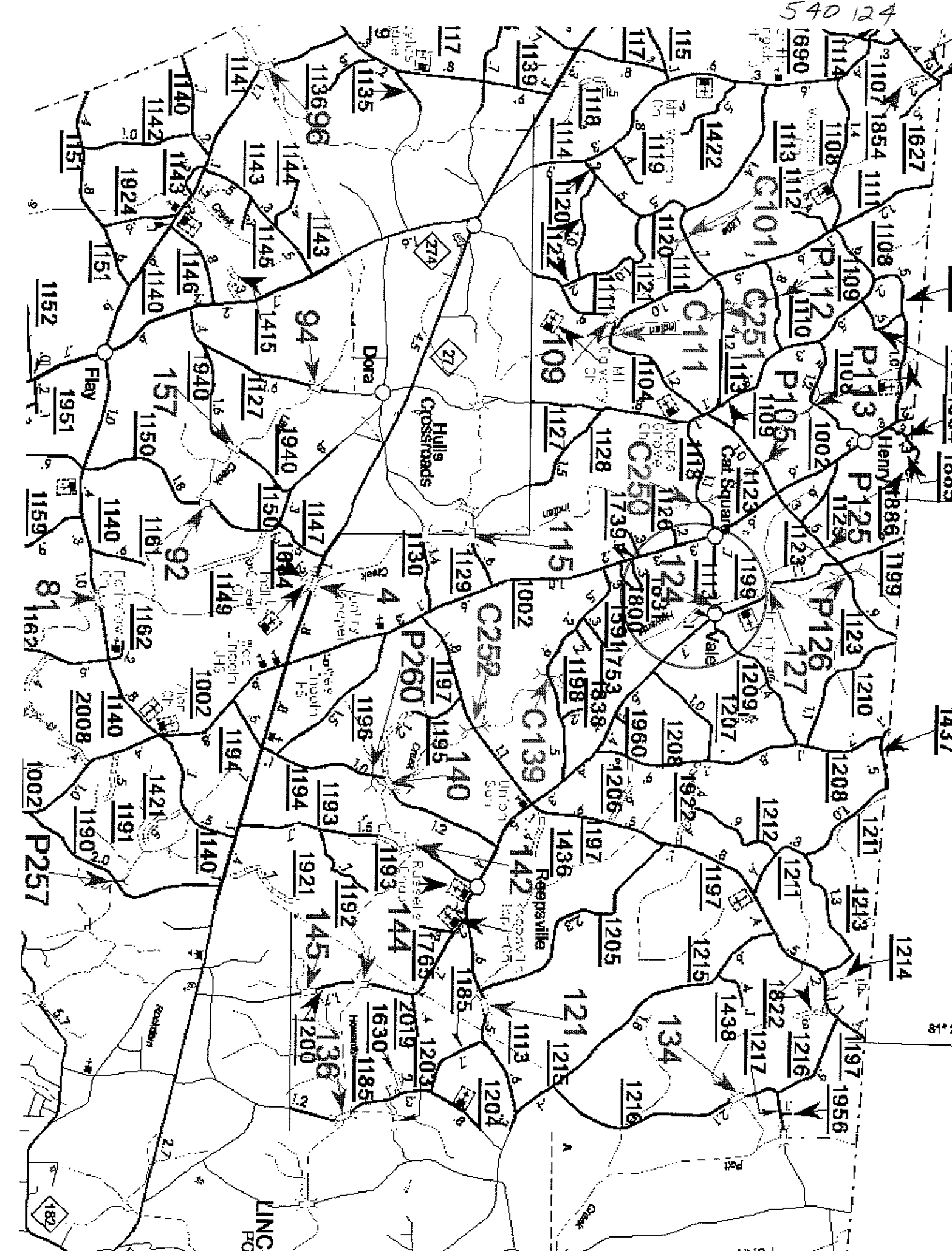


540124 LOCATION

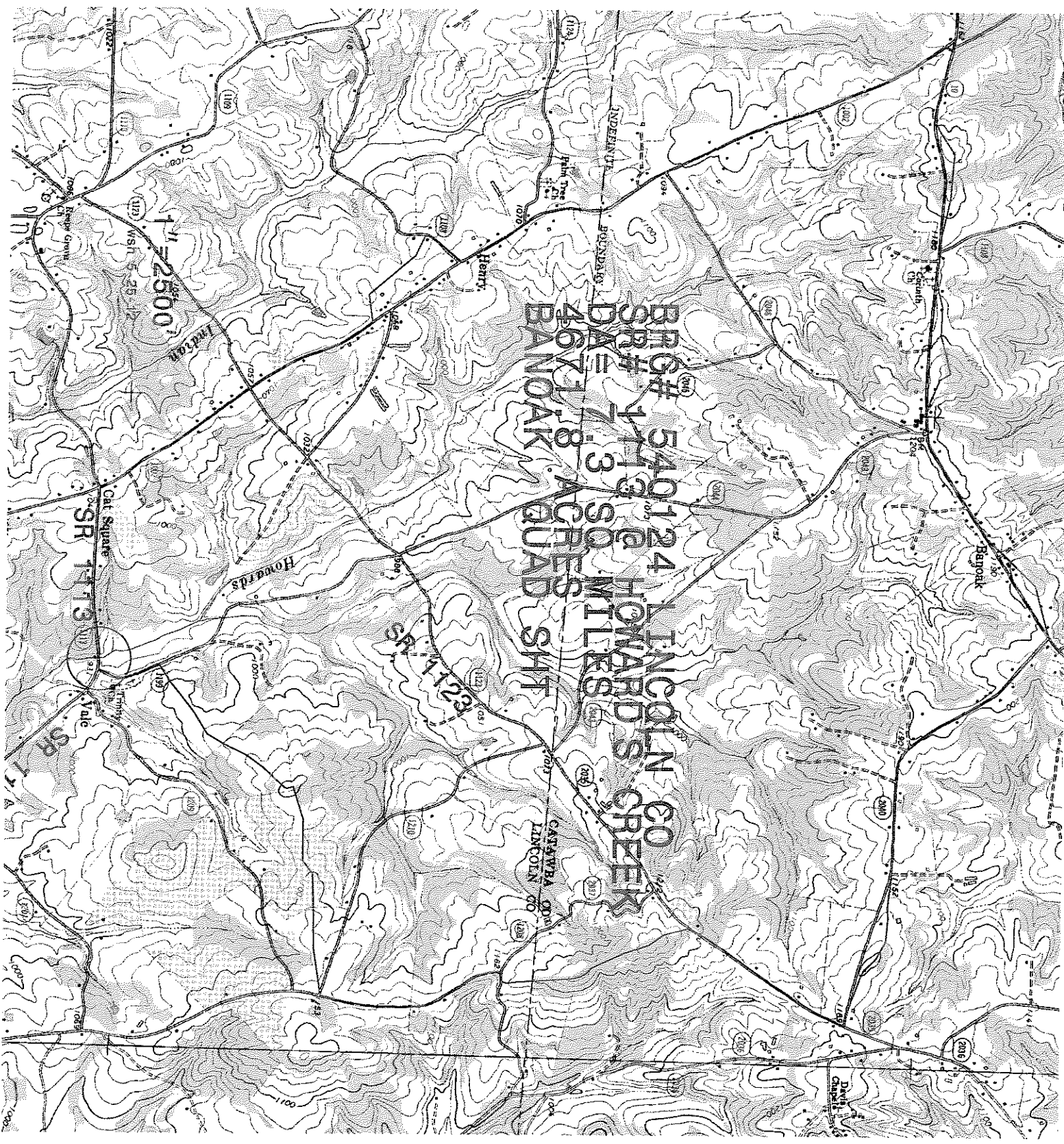


Legend

- | | | | | | |
|--|--|---|---|---|---|
| <ul style="list-style-type: none">City/TownDOQQ Grid24K Grid100K GridDrainage Areas of Selected SitesUSGS Continuous Gage Station 2003USGS Gage Stations CGIA CopyAmbient Water Monitoring StationsIndustrial Outfalls 2006Implicit Outfalls 2007DRAFT Stormwater ControlsIDDEP | <ul style="list-style-type: none">NPDES SitesTIP Intersections 2004 To 2010TIP Bridge 2004 To 2010NCDOT BridgesTIP Road Section 2004 To 2010TIP Intersections 2007 To 2013TIP Bridge 2007 To 2013TIP Road Section 2007 To 2013AirportsFerry RoutesPower/Transmission LineRest Areas | <ul style="list-style-type: none">RailroadLocal RoadsSecondary RoadInterstateHighway US RouteHighway NC RouteSurface Water IntakeAnadromous Spawning StreamsWater Supply WatershedsPrimary NurserySecondary NurserySpecial Secondary Nursery | <ul style="list-style-type: none">SA WaterORWHOW_ORW_DWQ_2006High Quality Water ZoneHazardous Spill Basin Line303D Streams24K Hydrography LineFederal LandsNational Wetlands InventoryHazardous Spill Basin PolygonHSB Boundary24K Hydrography Polygon100K Hydrography Line | <ul style="list-style-type: none">100K Hydrography PolygonStreambed Mapping (19 Counties)Trout Water WRCTrout Water DWQSoilState BoundaryEEP TLW Local PlanningEEP TLW Basinwide PlanningSub River Basin14 Digit Hydrologic Catalog Unit8 Digit Hydrologic Catalog UnitRiver BasinMajor Urban | <ul style="list-style-type: none">Minor UrbanJordan BoundaryFalls Lake BoundaryHigh Rock BoundaryCatawba Main StemRND BoundaryGoose Creek BoundaryPiedmont HydrogeologyCountyPhysiographic Frame Data500K Physiographic RegionDOT DivisionBackground County |
|--|--|---|---|---|---|



540124



BRG# 540124 LINCOLN CO
SR# 1113 HOWARD CREEK
DA# 7.3 SO MILES
4671.8 ACRES
BANDOK GUAD SHIT

1"=2500'

WSN 5-58-12

SR 1113

CATAPBA
LINCOLN CO



NOTES TO USERS

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 community(ies), state and federal agencies, and/or other sources. The primary base for this FIRM is aerial imagery acquired by Catawba County and Lincoln County. The time period of collection for the Catawba imagery is 2002. The time period of collection for the Lincoln imagery is 2005. Information and geospatial data supplied by the local community(ies) that met FEMA base map specifications were considered the preferred source for development of the base map. See geospatial metadata for the participating local community(ies) for more information.

This map reflects more detailed and shown on the previous FIRM for this transferred from the previous FIRM: channel configurations. As a result, the Insurance Study report (which contains distances that differ from what is shown

Please refer to the separately printed **M** layout of map panels, community map i containing National Flood Insurance Prc panels on which each community i



NC DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
BRIDGE MANAGEMENT UNIT

ATTENTION TEMP. REPAIRS TO I-BMS. (PLATES WELDED)

BRIDGE INSPECTION REPORT

INSPECTION TYPE: Routine Inspection

COUNTY LINCOLN BRIDGE NUMBER 540124 INSPECTION CYCLE 2 YRS

ROUTE SR1113 ACROSS HOWARD'S CREEK M.P. 0

LOCATION 0.1 MI. W. JCT. SR1199

SUPERSTRUCTURE REINFORCED CONCRETE DECK ON I-BEAMS

SUBSTRUCTURE END & INTERIOR BENTS: REINFORCED CONCRETE CAPS & TIMBER PILES

SPANS 1@22'3, 3@22'0, 1@22'3

LONGITUDE 81° 23' 0.2"

LATITUDE 35° 32' 27.3"

PRESENT CONDITION FAIR

INVENTORY RATING

INSPECTION DATE 01/24/2012

OPERATING RATING

PRESENT POSTING SV 15 TTST 21

PROPOSED POSTING

COMPUTER UPDATE

ANALYSIS DATE

POSTING LETTER DATE

SUFFICIENCY RATING

OTHER SIGNS PRESENT 4 DELINEATORS



WEST APPROACH

SIGN NOTICE
ISSUED FOR

NUMBERED
REQUIRED

No WEIGHT LIMIT

No DELINEATORS

No NARROW BRIDGE

No ONE LANE BRIDGE

No LOW CLEARANCE

NATIONAL BRIDGE INVENTORY----- STRUCTURE INVENTORY AND APPRAISAL

Run Date: 02/21/2012

IDENTIFICATION				CLASSIFICATION		CODE
(1) STATE NAME -NORTH CAROLINA	BRIDGE	540124		SUFFICIENCY RATING =		20.45
(8) STRUCTURE NUMBER(FEDERAL)		000000001090124		STATUS =	Structurally Deficient	
(5) INVENTORY ROUTE (ON/UNDER) - ON		31011130				
(2) STATE HIGHWAY DEPARTMENT DISTRICT		3				
(3) COUNTY CODE	109	(4) PLACE CODE	00000	(112)NBIS BRIDGE SYSTEM -		YES
(6) FEATURE INTERSECTED - HOWARD'S CREEK				(104)HIGHWAY SYSTEM	Is not on NHS	0
(7) FACILITY CARRIED SR1113				(26) FUNCTIONAL CLASS -	Minor Collector	08
(9) LOCATION 0.1 MI. W. JCT. SR1199				(100)STRAHNET HIGHWAY -	Not a STRAHNET Route	0
(11)MILEPOINT		0		(101)PARALLEL STRUCTURE -	No Parallel Structure	N
(16)LAT 35° 32' 26.2"	(17)LONG	81° 23' 58.4"		(102)DIRECTION OF TRAFFIC -	2-way Traffic	2
(98)BORDER BRIDGE STATE CODE	PCT SHARE			(103)TEMPORARY STRUCTURE -	Temporary Structure/Conditions	T
(99)BORDER BRIDGE STRUCTURE NO				(110)DESIGNATED NATIONAL NETWORK -	Not on the National Network	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				CONDITION		CODE
(43) STRUCTURE TYPE MAIN: Steel				(58) DECK		5
TYPE - Stringer Multibeam or Girder	CODE	302		(59) SUPERSTRUCTURE		4
(44) STRUCTURE TYPE APPR :				(60) SUBSTRUCTURE		5
TYPE -	CODE	000		(61) CHANNEL & CHANNEL PROTECTION		5
(45) NUMBER OF SPANS IN MAIN UNIT		5		(62) CULVERTS		N
(46) NUMBER OF APPROACH SPANS						
(107)DECK STRUCTURE TYPE - 8	CODE			LOAD RATING AND POSTING		CODE
(108)WEARING SURFACE / PROTECTIVE SYSTEM :				(31) DESIGN LOAD	H 15	2
(A) TYPE OF WEARING SURFACE -	CODE			(63) OPERATING RATING METHOD -	Allowable Stress	
(B) TYPE OF MEMBRANE	CODE			(64) OPERATING RATING -	HS-1	201
(C) TYPE OF DECK PROTECTION -	CODE			(65) INVENTORY RATING METHOD -	Allowable Stress	
				(66) INVENTORY RATING -	HS-1	201
				(70) BRIDGE POSTING -	Posting Required	0
				(41) STRUCTURE OPEN, POSTED, OR CLOSED		P
				DESCRIPTION -	Posted for Load	
AGE AND SERVICE				APPRAISAL		CODE
(27) YEAR BUILT		1948		(67) STRUCTURAL EVALUATION		4
(106)YEAR RECONSTRUCTED				(68) DECK GEOMETRY		4
(42) TYPE OF SERVICE : ON - Highway				(69) UNDERCLEARANCES,VERTI & HORIZ		N
UNDER - Waterway	CODE	15		(71) WATERWAY ADEQUACY		5
(28) LANES: ON STRUCTURE 2 UNDER STRUCTURE				(72) APPROACH ROADWAY ALIGNMENT		7
(29) AVERAGE DAILY TRAFFIC		1600		(36) TRAFFIC SAFETY FEATURES		0000
(30) YEAR OF ADT 2009	(109) TRUCK ADT PCT	6%		(113)SCOUR CRITICAL BRIDGES		5
(19) BYPASS OR DETOUR LENGTH		2 MI				
GEOMETRIC DATA				PROPOSED IMPROVEMENTS		CODE
(48) LENGTH OF MAXIMUM SPAN		22 FT		(75) TYPE OF WORK -		CODE
(49) STRUCTURE LENGTH		111 FT		(76) LENGTH OF STRUCTURE IMPROVEMENT		
(50)CURB OR SIDEWALK: LEFT 1 FT RIGHT		1 FT		(94) BRIDGE IMPROVEMENT COST		
(51) BRIDGE ROADWAY WIDTH CURB TO CURB		24 FT		(95) ROADWAY IMPROVEMENT COST		
(52) DECK WIDTH OUT TO OUT		25.3 FT		(96) TOTAL PROJECT COST		
(32) APPROACH ROADWAY WIDTH (W/SHOULDERS)		19 FT		(97) YEAR OF IMPROVEMENT COST ESTIMATE		
(33) BRIDGE MEDIAN - No Median	CODE	0		(114)FUTURE ADT	3200	(115) YEAR FUTURE ADT
(34) SKEW 0°	(35) STRUCTURE FLARED	0				2025
(10) INVENTORY ROUTE MIN VERT CLEAR		999.9 FT		INSPECTIONS		
(47) INVENTORY ROUTE TOTAL HORIZ CLEAR		24 FT		(90) INSPECTION DATE		01/24/2012
(53) MIN VERT CLEAR OVER BRIDGE RDWY		999.9 FT		(92) CRITICAL FEATURE INSPECTION :		(93) CFI DATE
(54) MIN VERT UNDERCLEAR REF Not a Highway or Railroad		0 FT		A) FRACTURE CRIT DETAIL -	NO	A)
(55) MIN LAT UNDERCLEAR RT REF Not a Highway or Railroad		000 FT		B) UNDERWATER INSP -	NO	B)
(56) MIN LAT UNDERCLEAR LT REF -		000 FT		C) OTHER SPECIAL INSP	NO	C)
				SCOUR		
NAVIGATION DATA						
(38) NAVIGATION CONTROL - No Navigational Control	CODE	0				
(111)PIER PROTECTION -	CODE					
(39) NAVIGATION VERTICAL CLEARANCE		0				
(116)VERT - LIFT BRIDGE NAV MIN VERT CLEAR		FT				
(40) NAVIGATION HORIZONTAL CLEARANCE		0 FT				

540124

BRIDGE MANAGEMENT UNIT

DATA ON EXISTING STRUCTURE

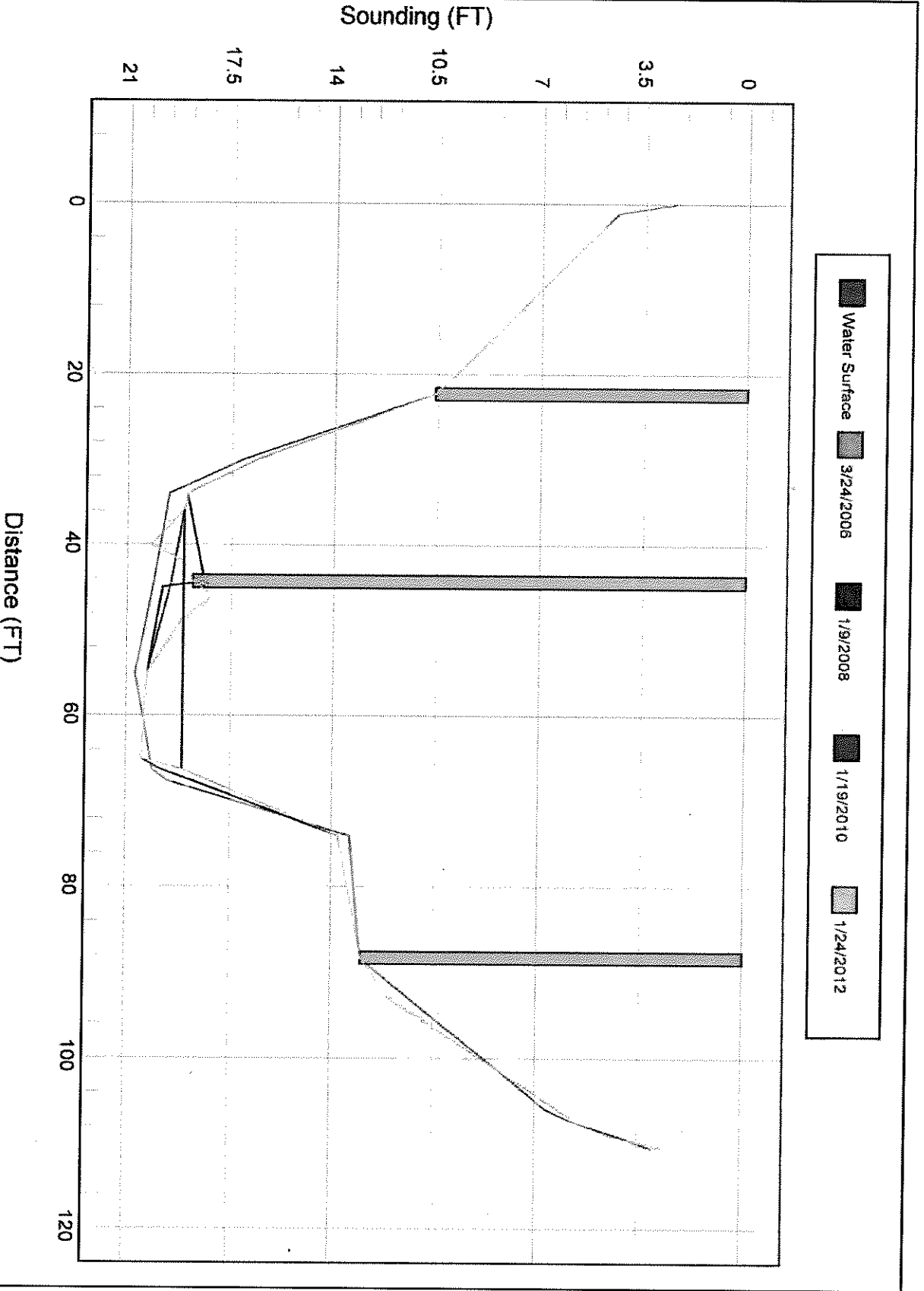
Run Date: 02/21/2012

COUNTY : LINCOLN	DIVISION : 12	DISTRICT : 3	STRUCTURE NUMBER : 540124	LENGTH : 111 FEET
ROUTE CARRIED : SR1113		FEATURE INTERSECTED : HOWARD'S CREEK		
LOCATED : 0.1 MI. W. JCT. SR1199		BRIDGE NAME :		CITY :
FUNC. CLASS : 08	SYST.ON : NFA	SYST.UNDER : NFA	ADT & YR : 1600 2009	RAIL TYPE : LT 181 RT 181
BUILT : 1948	BY : SHPWC	PROJ : 9-403	FED.AID PROJ :	DESIGN LOAD : H 15
REHAB :	BY :	PROJ :	ALIGNMENT : TAN	SKEW : 90
			LANES : ON 2 UNDER	
NAVIGATION : VC 0 FT	HC 0 FT	HT. CRN. TO BED : 18 FT	WATER DEPTH : 1 FT	
SUPERSTRUCTURE : REINFORCED CONCRETE DECK ON I-BEAMS				
SUBSTRUCTURE : END & INTERIOR BENTS:REINFORCED CONCRETE CAPS & TIMBER PILES				
SPANS : 1 22'3, 3 22'0, 1 22'3				
BEAMS OR GIRDERS : 6 LINES OF W16X40 I-BEAMS 4'8 CENTERS				
FLOOR : 5 3/4 RC SLAB	ENCROACHMENT :		DECK (OUT TO OUT) : 25.3 FT	
CLEAR ROADWAY : 24 FT	BETWEEN RAILS : 26 FT		SIDEWALK OR CURB : LT 1 FT RT 1 FT	
VERT.C.L.OVER : 999.9 FT				
INV.RTG. : HS-1	OPE.RTG. : HS-1	CONTR.MEMBER : E.L.Bm15	POSTED : SV 15	TTST 21 DATE 05/10/2010
SYSTEM : Secondary S.R. Route			GREEN LINE ROUTE : N	
UNDER ROUTES AND CLEARANCES				

REMARKS :

Top of Rail = 0 FT (Sounding)

STREAMBED PROFILE (Downstream)



Structure 540124

County LINCOLN

Date: 01/24/2012

Structure Photos

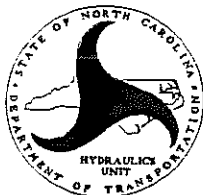


BENT 1



UPSTREAM

BRIDGE SCOUR EVALUATION ASSESSMENT



AND DATA SUMMARY REPORT

ASSESSED 11-7-96
BY: JAF
CODE 3
CLASSIFIED Scour Critical

SITE IDENTIFICATION:

COUNTY LINCOLN CITY/TOWN Reepville BRIDGE NO. 124
ROUTE ~~124~~ SR 113 STREAM HOWARD'S CREEK ROAD MILE _____
DUAL BRIDGE NO. _____ IS US/DS _____
ORIG. PROJECT NO. 9-403 YEAR BUILT 1948
REHAB. PROJECT NO. _____ YEAR REHAB. _____
CURRENT ADT 1300 YEAR 1995 FUTURE ADT _____ YEAR _____

INFORMATION RESOURCES AVAILABLE:

HYDRAULIC STUDY REPORT (DATE)	_____
AS-BUILT CONSTRUCTION PLANS (DATE)	<u>4/48</u>
FOUNDATION REPORT (DATE)	_____
OTHER AGENCY STUDIES (DATE)	<u>NOT WITHIN DETAILED</u>
(FEMA, CORPS, T.V.A., SCS)	<u>STUDY LIMITS</u>
QUAD MAPS (NAME & DATE)	<u>BANDAK 1970</u>
AERIAL PHOTOGRAPHY (DATE)	_____
GAGE DATA (TYPE, NO., DRAINAGE AREA)	<u>0214305600; P2 DA=11.6</u>
DISTANCE TO SITE (UP/DN STREAM)	<u>AT SITE</u>
BRIDGE INSPECTION REPORT (DATE)	<u>3/25/96</u>
UNDERWATER INSPECTION (DATE, CYCLE)	_____
STRUCTURE DATA FILE (DATE)	<u>3/25/96</u>

HYDRAULIC DATA:

DRAINAGE AREA 11.6 SQ. MI. SOURCE GAGE DATA
100 YR. WATERWAY OPENING (NORMAL TO FLOW) _____ SQ. FT.

HISTORICAL FLOODS

DATE	ELEV.(FT.)	APPROX. FREQ. (YRS.)	APPROX. DISCH.	ADJUSTED TO SITE
1940	913	UNK	UNK	@

SOURCE AS-BUILT PLANS

FLOOD FREQUENCY (YRS.)

ELEVATION (FT.)

DISCHARGE (CFS)

AVG. VELOCITY (Q/A)

SOURCE: USGS REGRESSION
Blue-Ridge Piedmont

Q ₁₀	Q ₅₀	Q ₁₀₀	Q ₅₀₀
1700	2860	3480	5280

COMMENTS: _____

$$\begin{aligned} \text{TOR}_{\text{avg}} &= 918.0 + .08(12) + 2.67 = 919.7 \\ \text{TOR}_{4/5} &= 918 + .08(12) + 2.67 = 921.6 \end{aligned}$$
BRIDGE LENGTH 111

SUFFICIENCY RATING

NO. OF SPANS 5 SPAN

UNDERCLEARANCE (BED TO LOW BEAM) 18'

BENT NO. (W-E), (S-N)

TYPE

SKED

FIG. // FOUNDATION TYPE

COLUMN WIDTH

COLUMN//BENT SHAPE

FOOTING THICKNESS

TOP FTG. ELEV.

17

CTR.

RT.

BOTTOM FTG. ELEV.

LT.

CTR.

RT.

TOP SILL ELEV.

ET

CTF

RT.

BOTTOM SILL ELEV. 17.1

LI. CTR

RT.

CONC.//RIP RAP PROTECTION

PILE TYPE

PILE LENGTHS (AVERAGE)

PILE TIP ELEV. (AVERAGE)

PILE EMBEDMENT

MIN. BEARING CAPACITY

SPREAD FOOTING EMBED.

* EMBEDMENT REFERENCE

COMMENTS:

†
THALWEG OR NATURAL GROUND

Avg. Pile Top Elev. = 919.67

EB-1	B-1	B-2	B-3	B-4	EB-2
Spill thru 90°	Piles			→	Spill Thru
Piles				→	
-	1.5'			→	-
-	Round Nose			→	-
RipRap					RipRap
12" creosoted timber piles					
198'	22.5'	25'	27.5'	25.3'	22.6'
894.9	892.2	889.7	887.2	889.4	892.1
20.0	15.0	9.9	12.4	17.7	22.8
17.5	19.9	18.8	13.3	17.5	18.8
NG	NG	TW	TW	NG	NG

GEOMORPHIC DATA: (LOOKING DOWNSTREAM)

CHANNEL (NORMAL TO FLOW):

AVG. BASE WIDTH 30 AVG. TOP WIDTH 70 AVG. DEPTH 5AT CROSSING: STRAIGHT ☒ MILD CURVE _____ SHARP BEND _____FLOW ANGLE OF APPROACH: LOW ☒ (0°-5°) MILD _____ (5°-20°) HIGH _____ (20°+)

CROSSING WIDTH COMPARED TO:

UPSTREAM: WIDER _____ SAME ☒ NARROWER _____
DOWNSTREAM: WIDER _____ SAME ☒ NARROWER _____BASED ON COMPARISON OF SECTIONS TAKEN AT DATES 1948 - 1996CHANNEL HAS: WIDENED _____ FT. SAME ☒ NARROWED _____ FT.
AGGRADATED _____ FT. SAME _____ DEGRADATED 1 FT.
SHIFTED LT. 3 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	☒ R-2			
CHANNEL BED				
OTHER _____				

IS REPORTED PROBLEM CHANNEL FLOW ASSOCIATED? YES

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. _____
- 2) POTENTIAL FOR SLOW CHANGE OVER TIME. NOT PRONE TO A MAJOR ONE-EVENT CHANGE. ☒ _____
- 3) UNSTABLE. SUBJECT TO RAPID EVOLUTIONARY CHANGE. _____

ASSESSMENT

- 1) PIER AND/OR ABUTMENT SPREAD FOOTINGS WITHIN POTENTIAL CHANNEL SCOUR AREA ARE INDICATED ON THE _____ TO BE ON SCOUR RESISTANT MATERIAL. THIS FINDING HAS BEEN REVIEWED AND CONCURRED WITH BY _____ NO
(GEOTECHNICAL UNIT.)
- 2) DO THE PILE BENTS OR PILE FOOTINGS (IN THE PIEDMONT AND MOUNTAIN PROVINCE) WITHIN THE POTENTIAL CHANNEL SCOUR AREA, HAVE PILES THAT PENETRATE 20 OR MORE FEET BELOW THE STREAM BED ? N/D
- 3) DO THE PILE BENTS OR PILE FOOTINGS (IN THE COASTAL PLAIN) WITHIN THE POTENTIAL CHANNEL SCOUR AREA, HAVE PILES THAT PENETRTRATE 30 OR MORE FEET BELOW THE STREAM BED ? N/A
- 4) ARE ALL PIERS AND ABUTMENTS OUTSIDE THE NORMAL CHANNEL SECTION ? NO
- 5) HAS THE CROSSING EXPERIENCED A FLOOD OF 50 OR MORE YEARS ESTIMATED MAGNITUDE WITH NO REPORTED OR INDICATED SCOUR PROBLEM ? UNK
- 6) ARE THE BOTTOMS OF THE CHANNEL PIER SPREAD FOOTINGS MORE THAN 7 FEET BELOW BED ? N/A
- 7) IS THE AVERAGE VELOCITY IN BRIDGE OPENING (SIMPLE ANALYSIS $V=Q/A$) FOR THE ESTIMATED 100 YR. EVENT LESS THAN 4 FT./SEC ? UNK
- 8) IS THE APPROACH ROADWAY OR BRIDGE OVERTOPPED DURING MINOR FLOODS (≤ 10 YR.) REQUIRING CLOSURE AND INSPECTION BEFORE REOPENING ? NO

THIS STRUCTURE MEETS CRITERIA DESCRIBED IN WHICH OF THE ABOVE LISTED ITEMS FOR CLASSIFICATION AS A LOW RISK STRUCTURE?

NONE

BASED ON AN EVALUATION OF THE AVAILABLE DATA AND REPORTS THE CLASSIFICATION OF THIS STRUCTURE AS LOW RISK FOR THE REASON(S) LISTED ABOVE APPEARS REASONABLE AND PRUDENT.

NO

COMMENTS:

DECISION:

CLASSIFIED AS:

SCOUR CRITICAL
UNKNOWN FOUNDATION
LOW RISK

✓

RECOMMENDED SCOUR CODE

3

ASSESSMENT COMMENTS:

Construction plans are as-builts. Creosoted timber
piles used in all bents. Interior bent embedments < 20'. No reported
scour in BIR. Bridge appears scour critical due to embedments.

SCHEDULE FOR DETAILED STUDY

SCHEDULE FOR FURTHER IN-HOUSE STUDY

ASSESSED BY:

John Fisher, PE

APPROVED BY:

P. FISHER

FIRM:

Hayes, Seay, Mattern & Mattern

DATE:

3/21/97

DATE:

11/7/96

CHECKED BY:

C. Bush

FIRM:

D + D

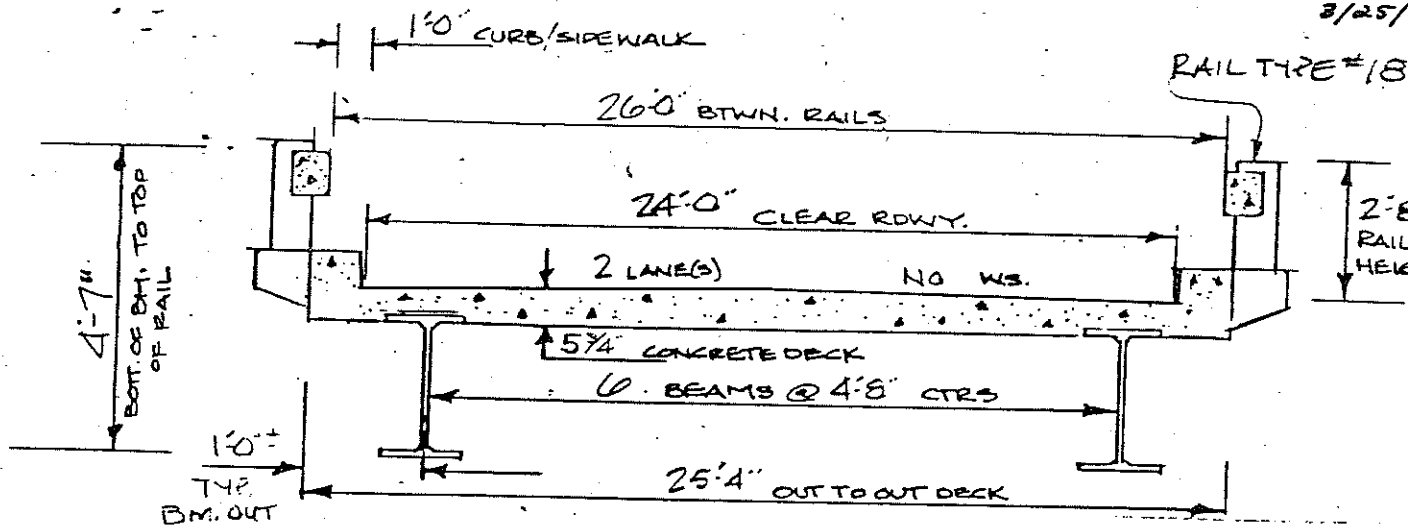
DATE:

11-26-96

FINAL COMMENTS :

STRUCTURE DATA WORKSHEET

BRIDGE NO. 124 COUNTY LINCOLN DATE 10/27/89
BY G.L.S.
VERIFIED BY WOC
3/25/



— SEE PLANS —

★ (SEE FIELD REPORT FOR BEAM REPAIRS)

(SEE NEXT SHEET FOR PROFILE SKETCH)

RECORD SOUNDINGS FROM TOP OF HAIL. OTHER LOCATION IF NEEDED: _____

NOTE: DRAFT A STREAM BED PROFILE CENTER AND RECORD SOUNDINGS AT THE STREAM FACE OF ABUTMENTS, C/L OF PIERS, W, & WS, AND MAJOR CONTOUR CHANGES ON THE DOWNSTREAM SIDE. RECORD SOUNDINGS AT THE STREAM FACE OF ABUTMENTS AND C/L OF PIERS ON THE UPSTREAM SIDE.

DOWNSTREAM

UPSTREAM

State of _____

STREAM BED SOUNDINGS

(SEE NEXT SHEET FOR PROFILE SKETCH)

BRIDGE NO. 124 COUNTY LINCOLN DATE 10-27-93 BY GLS

RECORD SOUNDINGS FROM TOP OF RAIL. OTHER LOCATION IF NEEDED: _____

DISTANCE H. M. MARK TO TOP OF RAIL _____ LOCATION H. M. MARK _____

NOTE: DRAFT A STREAM BED PROFILE SKETCH AND RECORD SOUNDINGS AT THE STREAM
FACE OF ABUTMENTS, C/L OF PIERS, WE. & WS, AND MAJOR CONTOUR CHANGES ON THE
DOWNSTREAM SIDE. RECORD SOUNDINGS AT THE STREAM FACE OF ABUTMENTS
AND C/L OF PIERS ON THE UPSTREAM SIDE.

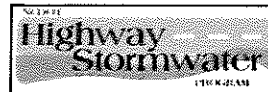
1986 SOUNDINGS
DOWNSTREAM

UPSTREAM

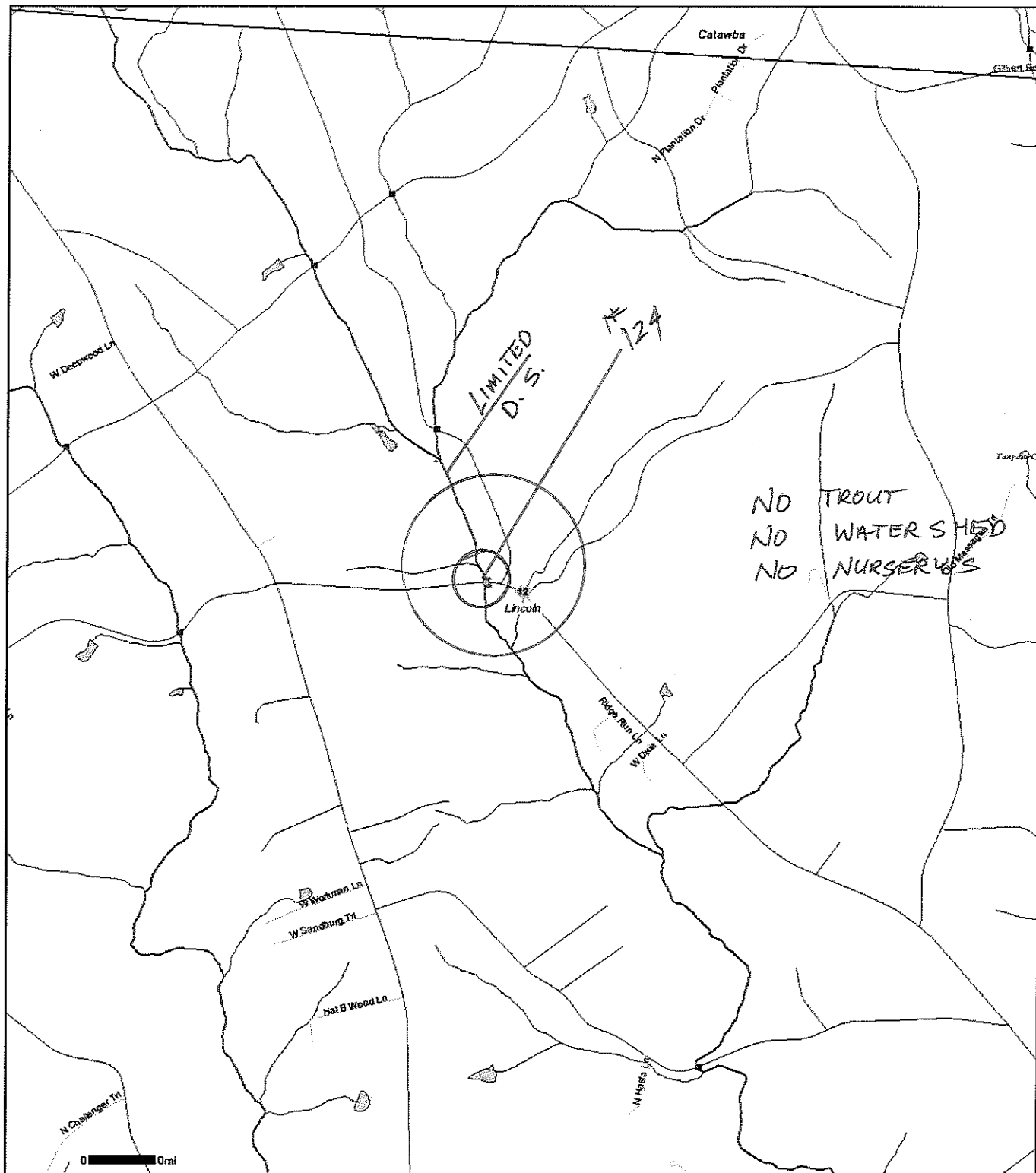
STATION	SOUNDING	DESCRIPTION	STATION	SOUNDING	DESCRIPTION
0+00	4.9	S.F. CAP @ E.B.T.#1			
0+19.5	10.5	E.B.T.#1			
0+36.9	19.6	W.E. & W.S.			
0+41	20.5	E.B.T.#2			
0+47	20.8	DEEPEST PT.			
0+54	19.6	W.E. & W.S.			
0+63	18.0	E.B.T.#3			
0+84.5	12.6	E.B.T.#4			
0+91	11.3	TOE OF RIPRAP			
1+02	5.8	TOP OF RIPRAP			
1+04.5	5.5	S.F. CAP @ E.B.T.#2			
1991 & 1993 SOUNDINGS					
0+00	4.9	S.F. CAP @ E.B.T.#1	0+00	6.3	S.F. CAP @ E.B.T.#1
0+19.5	10.5	E.B.T.#1	0+19.5	14.4	E.B.T.#1
0+35	19.3	W.E. & W.S.			
0+37	20.2	DEEPEST PT.			
0+41	19.4	E.B.T.#2	0+41	21.8	E.B.T.#2
0+47	19.2				
0+54	19.3				
0+63	19.3	W.E. & W.S. E.B.T.#3	0+63	17.4	E.B.T.#3
0+84.5	12.6	E.B.T.#4	0+84.5	15.4	E.B.T.#4
0+91	11.3	TOE OF RIPRAP			
1+02	5.8	TOP OF RIPRAP			
1+04.5	5.5	S.F. CAP @ E.B.T.#2	1+04.5	6.0	S.F. CAP @ E.B.T.#2

Environmental Sensitivity Map - 2008

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Legend

- | | | | | | |
|---|---|--|---|---|---|
| <ul style="list-style-type: none"> City/Town DOQQ Grid 24K Grid 100K Grid Drainage Areas of Selected Sites USGS Continuous Gage Station 2003 USGS Gage Stations CGIA Copy Ambient Water Monitoring Stations Industrial Outfalls 2006 Implicit Outfalls 2007 DRAFT Stormwater Controls IDDEP | <ul style="list-style-type: none"> NPDES Sites TIP Intersections 2004 To 2010 TIP Bridge 2004 To 2010 NCDOT Bridges TIP Road Section 2004 To 2010 TIP Intersections 2007 To 2013 TIP Bridge 2007 To 2013 TIP Road Section 2007 To 2013 Airports Ferry Routes Power/Transmission Line Rest Areas | <ul style="list-style-type: none"> Railroad Local Roads Secondary Road Interstate Highway US Route Highway NC Route Surface Water Intake Anadromous Spawning Streams Water Supply Watersheds Primary Nursery Secondary Nursery Special Secondary Nursery | <ul style="list-style-type: none"> SA Water ORW HQW_ORW_DWQ_2006 High Quality Water Zone Hazardous Spill Basin Line 303D Streams 24K Hydrography Line Federal Lands National Wetlands Inventory Hazardous Spill Basin Polygon HSB Boundary 24K Hydrography Polygon 100K Hydrography Line | <ul style="list-style-type: none"> 100K Hydrography Polygon Streambed Mapping (19 Counties) Trout Water WRC Trout Water DWQ Soil State Boundary EEP TLW Local Planning EEP TLW Basinwide Planning Sub River Basin 14 Digit Hydrologic Catalog Unit 8 Digit Hydrologic Catalog Unit River Basin Major Urban | <ul style="list-style-type: none"> Minor Urban Jordan Boundary Falls Lake Boundary High Rock Boundary Catawba Main Stem RND Boundary Goose Creek Boundary Piedmont Hydrogeology County Physiographic Frame Data 500K Physiographic Region DOT Division Background County |
|---|---|--|---|---|---|

Section 4.0 – Area Studied

Table 5—Flooding Sources Studied by Detailed Methods: Limited Detailed

Source	Riverine Sources		Affected Communities
	From	To	
Crooked Creek	The confluence with Leepers Creek	Approximately 0.9 mile upstream of confluence with Leepers Creek	Lincoln County (Unincorporated Areas)
Dellinger Branch	The confluence with Leepers Creek	Approximately 1,130 feet upstream of South Low Bridge Road	Lincoln County (Unincorporated Areas)
Dellinger Branch Tributary 1	The confluence with Dellinger Branch	Approximately 1,150 feet upstream of East Orchard Road	Lincoln County (Unincorporated Areas)
Forney Creek Tributary 1	The confluence with Forney Creek	Approximately 1,440 feet upstream of confluence of Forney Creek Tributary 1B	Lincoln County (Unincorporated Areas)
Forney Creek Tributary 1A	The confluence with Forney Creek Tributary 1	Approximately 0.7 mile upstream of confluence with Forney Creek Tributary 1	Lincoln County (Unincorporated Areas)
Forney Creek Tributary 1B	The confluence with Forney Creek Tributary 1	Approximately 2,000 feet upstream of confluence with Forney Creek Tributary 1	Lincoln County (Unincorporated Areas)
Glenn Creek	The Lincoln/Cleveland County boundary	Approximately 400 feet downstream of NC 27	Lincoln County (Unincorporated Areas)
Hog Branch	The confluence with Larkard Creek	Approximately 1.0 mile upstream of N US 321 (SR 1844)	Lincoln County (Unincorporated Areas)
Hooper Creek	The confluence with Anderson Creek and Wingate Creek	Approximately 1.6 miles upstream of confluence with Anderson Creek and Wingate Creek	Lincoln County (Unincorporated Areas)
Howards Creek	The confluence with South Fork Catawba River	The Lincoln/Catawba County boundary	Lincoln County (Unincorporated Areas)
Howards Creek Tributary 1	The confluence with Howards Creek	Approximately 0.8 mile upstream of confluence with Howards Creek	Lincoln County (Unincorporated Areas)
Howards Creek Tributary 2	The confluence with Howards Creek	Approximately 1.4 miles upstream of North Alf Hoover Road	Lincoln County (Unincorporated Areas)
Howards Creek Tributary 3	The confluence with Howards Creek	Approximately 0.5 mile upstream of North Howards Creek Mill Road	Lincoln County (Unincorporated Areas)
Howards Creek Tributary 4	The confluence with Howards Creek	Approximately 0.5 mile upstream of West Abernethy Farm Road	Lincoln County (Unincorporated Areas)
Howards Creek Tributary 5	The confluence with Howards Creek	Approximately 70 feet downstream of North Overlook Lane	Lincoln County (Unincorporated Areas)

Section 5.0 – Engineering Methods

Table 6—Summary of Discharges

Flooding Source	Location	Drainage Area (square miles)	Discharges (cfs)			
			10% Annual Chance	2% Annual Chance	1% Annual Chance	0.2% Annual Chance
Hog Branch	Approximately 10 feet upstream of the confluence with Larkard Creek	2.03	*	*	1,600	*
	Approximately 1,660 feet upstream of US 321	1.60	*	*	1,444	*
	Approximately 0.9 mile upstream of US 321	1.15	*	*	1,302	*
	Approximately 1.0 mile upstream of US 321	1.11	*	*	1,292	*
Hooper Creek	Approximately 10 feet upstream of the confluence with Anderson Creek	2.08	*	*	1,481	*
	Approximately 0.5 mile upstream from the confluence with Anderson Creek	1.47	*	*	1,193	*
	Approximately 0.8 mile upstream from the confluence with Anderson Creek	1.35	*	*	1,129	*
	Approximately 1.2 miles upstream from the confluence with Anderson Creek	1.17	*	*	1,034	*
	Approximately 1.5 miles upstream from the confluence with Anderson Creek	0.94	*	*	900	*
	Approximately 1.6 miles upstream from the confluence with Anderson Creek	0.56	*	*	648	*
Howards Creek	Approximately 10 feet upstream of the confluence with South Fork Catawba River	33.95	*	*	8,479	*
	Approximately 10 feet upstream of the confluence of Rockdam Creek	29.66	*	*	7,793	*
	Approximately 300 feet downstream of North Daniels Road	26.76	*	*	7,308	*

Section 5.0 – Engineering Methods

Table 6—Summary of Discharges

Flooding Source	Location	Drainage Area (square miles)	Discharges (cfs)			
			10% Annual Chance	2% Annual Chance	1% Annual Chance	0.2% Annual Chance
Howards Creek (continued)	Approximately 10 feet upstream of the confluence of Tanyard Creek	18.43	*	*	5,789	*
	Approximately 10 feet upstream of the confluence of Howards Creek Tributary 2	16.96	*	*	5,496	*
	Approximately 550 feet downstream of North Wise Road	15.34	*	*	5,161	*
	Approximately 335 feet downstream of confluence of Howards Creek Tributary 3	14.28	*	*	4,934	*
	Approximately 10 feet upstream of the confluence of Howards Creek Tributary 3	13.03	*	*	4,660	*
	Approximately 10 feet upstream of the confluence of Howards Creek Tributary 4	11.77	*	*	4,374	*
	Approximately 10 feet upstream of the confluence of Howards Creek Tributary 5	11.11	*	*	4,218	*
	Approximately 470 feet downstream of West Bill Sain Road	10.53	*	*	4,079	*
	Approximately 10 feet upstream of the confluence of Howards Creek Tributary 6	8.58	*	*	3,590	*
	Approximately 0.5 mile downstream of West Reepsville Road	8.09	*	*	3,459	*
	Approximately 565 feet downstream of West Reepsville Road	7.26	*	*	3,232	*

Section 5.0 – Engineering Methods

Table 6—Summary of Discharges

Flooding Source	Location	Drainage Area (square miles)	Discharges (cfs)			
			10% Annual Chance	2% Annual Chance	1% Annual Chance	0.2% Annual Chance
Howards Creek (continued)	Approximately 10 feet upstream of the confluence of Howards Creek Tributary 7	2.87	*	*	1,810	*
	Approximately 260 feet downstream of North Zur Leonard Road	2.30	*	*	1,576	*
	Approximately 0.5 mile downstream of Lincoln/Catawba County boundary	1.58	*	*	1,246	*
Howards Creek Tributary 1	Approximately 10 feet upstream of the confluence with Howards Creek	0.94	*	*	900	*
Howards Creek Tributary 2	Approximately 10 feet upstream of the confluence with Howards Creek	1.46	*	*	1,185	*
	Approximately 0.5 mile upstream of North Alf Hoover Road	0.95	*	*	906	*
Howards Creek Tributary 3	Approximately 10 feet upstream of the confluence with Howards Creek	1.24	*	*	1,071	*
Howards Creek Tributary 4	Approximately 10 feet upstream of the confluence with Howards Creek	0.67	*	*	730	*
Howards Creek Tributary 5	Approximately 10 feet upstream of the confluence with Howards Creek	0.48	*	*	593	*
Howards Creek Tributary 6	Approximately 10 feet upstream of the confluence with Howards Creek	0.99	*	*	929	*
Howards Creek Tributary 7	Approximately 10 feet upstream of the confluence with Howards Creek	4.11	*	*	2,265	*
	Approximately 0.4 mile upstream of confluence with Howards Creek	1.22	*	*	1,062	*

Section 5.0 – Engineering Methods

Table 8—Roughness Coefficients

Stream	Channel "n"	Overbank "n"
Catawba River Tributary 6	0.040 – 0.045	0.150
Clarks Creek	0.040 – 0.075	0.035 – 0.200
Clarks Creek Tributary 1	0.060	0.150
Clarks Creek Tributary 2	0.047 – 0.050	0.120 – 0.150
Crooked Creek	0.050	0.140 – 0.150
Dellinger Branch	0.050 – 0.080	0.080 – 0.160
Dellinger Branch Tributary 1	0.050	0.080 – 0.150
Forney Creek	0.045 – 0.050	0.080 – 0.140
Forney Creek Tributary 1	0.048	0.120
Forney Creek Tributary 1A	0.050	0.080 – 0.150
Forney Creek Tributary 1B	0.050	0.100 – 0.150
Glenn Creek	0.048 – 0.052	0.070 – 0.150
Hog Branch	0.045 – 0.055	0.060 – 0.150
Hooper Creek	0.050	0.080 – 0.150
Howards Creek	0.045 – 0.050	0.080 – 0.200
Howards Creek Tributary 1	0.048	0.060 – 0.120
Howards Creek Tributary 2	0.045 – 0.050	0.100 – 0.150
Howards Creek Tributary 3	0.050	0.100 – 0.150
Howards Creek Tributary 4	0.050	0.080 – 0.150
Howards Creek Tributary 5	0.050	0.100 – 0.150
Howards Creek Tributary 6	0.050	0.080 – 0.150
Howards Creek Tributary 7	0.050	0.080 – 0.150
Hoyle Creek	0.040 – 0.050	0.120 – 0.130
Hoyle Creek Tributary 1	0.050	0.100 – 0.120
Hoyle Creek Tributary 2	0.050	0.120 – 0.150
Hoyle Creek Tributary 4	0.050	0.150
Hoyle Creek Tributary 5	0.050	0.100 – 0.150
Hoyle Creek Tributary 6	0.048 – 0.050	0.100 – 0.140
Indian Creek	0.045 – 0.055	0.060 – 0.150
Indian Creek Tributary 1	0.045 – 0.050	0.110 – 0.150
Indian Creek Tributary 2	0.035 – 0.050	0.012 – 0.150
Johnson Creek	0.040 – 0.050	0.100 – 0.150
Killian Creek	0.045 – 0.050	0.080 – 0.150
Larkard Creek	0.045 – 0.050	0.100 – 0.150
Leepers Creek	0.045 – 0.050	0.080 – 0.150
Leepers Creek Tributary 1	0.050	0.080 – 0.150
Leepers Creek Tributary 2	0.050	0.080 – 0.150
Leepers Creek Tributary 3	0.050	0.080 – 0.150

Section 5.0 – Engineering Methods

Table 9—Limited Detailed Flood Hazard Data

Cross Section ¹	Stream Station ²	Flood Discharge (cfs)	1% Annual Chance Water-Surface Elevation (feet NAVD 88)	Non-Encroachment Width ³ (feet)
HOOPER CREEK (continued)				
034	3,410	1,193	723.5	55 / 29
036	3,606	1,193	724.7	13 / 33
039	3,887	1,193	727.1	42 / 12
040	4,034	1,193	728.3	35 / 18
041	4,091	1,193	728.6	15 / 13
042	4,173	1,193	730.1	21 / 18
043	4,276	1,193	731.0	16 / 17
044	4,358	1,129	732.9	16 / 20
044	4,419	1,129	733.5	17 / 30
045	4,502	1,129	734.1	15 / 70
046	4,592	1,129	734.4	15 / 91
049	4,879	1,129	735.2	115 / 11
052	5,227	1,129	735.8	13 / 51
056	5,648	1,129	737.9	95 / 14
059	5,931	1,129	739.9	20 / 48
062	6,226	1,034	741.4	23 / 18
064	6,359	1,034	742.7	33 / 24
067	6,690	1,034	744.9	85 / 12
069	6,868	1,034	745.2	140 / 12
073	7,277	1,034	746.1	72 / 12
077	7,658	1,034	748.4	88 / 12
079	7,872	900	749.5	12 / 77
081	8,085	900	751.3	21 / 36
084	8,447	648	753.1	19 / 85
HOWARDS CREEK				
005	522	8,479	768.9 ⁴	587 / 116
010	1,000	8,479	768.9 ⁴	338 / 40
015	1,500	8,479	768.9 ⁴	254 / 28
020	2,000	8,479	768.9 ⁴	315 / 25
025	2,500	8,479	768.9 ⁴	331 / 28
032	3,198	7,793	768.9 ⁴	65 / 504
036	3,633	7,793	768.9 ⁴	35 / 445
040	4,000	7,793	768.9 ⁴	26 / 225
044	4,442	7,793	768.9 ⁴	57 / 48
049	4,921	7,793	768.9 ⁴	578 / 47
055	5,482	7,793	768.9 ⁴	334 / 460
058	5,798	7,793	768.9 ⁴	108 / 343
065	6,506	7,793	768.9 ⁴	106 / 225
070	6,964	7,793	768.9 ⁴	189 / 259
073	7,318	7,793	768.9 ⁴	69 / 276
077	7,721	7,793	768.9 ⁴	83 / 138
085	8,500	7,468	769.9	56 / 34
091	9,140	7,468	773.1	211 / 75

Section 5.0 – Engineering Methods

Table 9—Limited Detailed Flood Hazard Data

Cross Section ¹	Stream Station ²	Flood Discharge (cfs)	1% Annual Chance Water-Surface Elevation (feet NAVD 88)	Non-Encroachment Width ³ (feet)
HOWARDS CREEK (continued)				
096	9,624	7,468	773.3	390 / 252
100	10,042	7,468	773.3	420 / 278
105	10,500	7,468	773.4	299 / 327
110	11,000	7,468	773.5	419 / 406
115	11,500	7,468	773.6	707 / 452
120	12,000	7,468	773.6	764 / 529
125	12,500	7,468	773.7	410 / 181
130	12,963	7,468	773.9	107 / 144
134	13,418	7,308	775.3	150 / 92
140	14,049	7,308	778.4	264 / 266
143	14,335	7,308	778.5	288 / 662
150	15,000	7,308	778.6	222 / 167
155	15,500	7,308	779.0	452 / 488
160	16,000	5,789	779.1	951 / 531
165	16,500	5,789	779.1	875 / 604
170	17,000	5,789	779.2	579 / 748
174	17,430	5,789	780.1	195 / 86
183	18,291	5,496	783.8	186 / 423
187	18,691	5,496	783.9	51 / 150
190	19,030	5,496	784.9	293 / 47
196	19,633	5,496	785.5	83 / 34
199	19,924	5,496	786.6	89 / 139
204	20,374	5,496	790.0	170 / 439
211	21,137	5,496	790.3	623 / 158
215	21,500	5,496	790.3	170 / 42
216	21,621	5,496	790.5	157 / 32
218	21,772	5,496	790.6	24 / 37
220	22,000	5,496	791.3	45 / 20
225	22,515	5,496	795.3	39 / 95
230	23,009	5,496	799.9	84 / 54
235	23,468	5,496	800.6	151 / 91
237	23,681	5,496	800.6	102 / 26
239	23,855	5,496	801.2	125 / 334
244	24,350	5,496	801.3	454 / 108
248	24,784	5,496	801.4	440 / 161
255	25,500	5,496	801.5	100 / 118
259	25,879	5,496	802.6	37 / 220
265	26,456	5,496	803.5	30 / 60
270	27,000	5,496	806.8	20 / 30
275	27,475	5,496	808.6	35 / 40
280	28,000	5,161	811.3	44 / 21
284	28,394	5,161	813.6	40 / 18
287	28,699	5,161	818.0	46 / 13

Section 5.0 – Engineering Methods

Table 9—Limited Detailed Flood Hazard Data

Cross Section ¹	Stream Station ²	Flood Discharge (cfs)	1% Annual Chance Water-Surface Elevation (feet NAVD 88)	Non-Encroachment Width ³ (feet)
HOWARDS CREEK (continued)				
290	29,000	5,161	820.3	35 / 23
293	29,320	5,161	822.4	27 / 26
295	29,534	5,161	823.9	15 / 28
299	29,907	5,161	826.6	23 / 20
304	30,404	5,161	829.4	39 / 33
308	30,842	5,161	830.4	28 / 81
315	31,535	5,161	833.5	16 / 19
320	32,025	4,934	837.7	59 / 19
326	32,562	4,660	841.1	11 / 34
327	32,748	4,660	846.3	31 / 30
330	32,995	4,660	849.7	28 / 46
335	33,500	4,660	852.8	45 / 30
340	34,039	4,660	854.0	25 / 41
344	34,412	4,660	855.6	17 / 60
348	34,750	4,660	856.7	170 / 150
354	35,415	4,660	857.3	17 / 227
358	35,795	4,660	858.1	155 / 142
362	36,196	4,660	858.7	86 / 209
370	36,999	4,374	859.8	17 / 124
373	37,295	4,374	861.3	16 / 194
378	37,758	4,374	863.1	264 / 17
382	38,169	4,374	863.9	117 / 17
384	38,438	4,374	865.0	149 / 16
390	39,044	4,374	866.6	22 / 90
393	39,266	4,218	867.9	33 / 237
399	39,895	4,218	868.7	184 / 296
406	40,649	4,218	869.8	19 / 407
414	41,365	4,218	871.6	26 / 16
417	41,656	4,218	874.4	167 / 29
423	42,306	4,218	876.8	23 / 16
426	42,592	4,218	879.5	73 / 30
431	43,132	4,218	882.0	24 / 16
437	43,663	4,218	885.9	22 / 33
439	43,943	4,079	887.4	15 / 19
448	44,756	4,079	894.6	17 / 26
450	45,000	4,079	896.7	29 / 43
454	45,409	4,079	898.4	77 / 17
457	45,742	4,079	899.6	105 / 15
460	46,021	4,079	901.4	115 / 63
463	46,323	4,079	902.5	146 / 15
470	47,000	4,079	905.0	77 / 25
475	47,512	4,079	907.5	29 / 196
479	47,930	4,079	908.1	15 / 321

Section 5.0 – Engineering Methods

Table 9—Limited Detailed Flood Hazard Data

Cross Section¹	Stream Station²	Flood Discharge (cfs)	1% Annual Chance Water- Surface Elevation (feet NAVD 88)	Non- Encroachment Width³ (feet)
HOWARDS CREEK (continued)				
483	48,326	4,079	908.7	15 / 199
491	49,111	3,590	911.1	20 / 231
493	49,316	3,590	911.5	16 / 189
500	49,980	3,590	913.7	78 / 14
504	50,425	3,590	915.0	203 / 241
509	50,940	3,590	915.5	185 / 107
515	51,500	3,459	916.7	125 / 31
518	51,845	3,459	918.2	129 / 34
525	52,468	3,459	919.9	101 / 179
530	53,049	3,459	921.0	185 / 25
535	53,513	3,232	922.0	152 / 13
543	54,340	3,232	926.3	183 / 215
550	55,000	3,232	926.5	156 / 316
555	55,500	3,232	926.7	148 / 213
560	56,000	3,232	927.3	167 / 13
567	56,666	1,810	929.6	62 / 131
570	57,019	1,810	930.4	9 / 176
575	57,528	1,810	932.5	54 / 12
580	58,000	1,810	936.3	83 / 9
585	58,500	1,810	937.9	65 / 35
590	59,000	1,810	939.6	53 / 102
594	59,438	1,810	941.1	9 / 85
596	59,641	1,576	942.7	33 / 83
601	60,117	1,576	945.7	144 / 129
605	60,500	1,576	945.9	148 / 65
610	61,000	1,576	946.7	73 / 36
616	61,552	1,576	950.7	22 / 20
619	61,878	1,576	952.5	15 / 41
624	62,427	1,576	954.7	25 / 155
628	62,757	1,576	955.6	8 / 44
632	63,228	1,246	957.7	230 / 14
636	63,631	1,246	959.1	111 / 7
640	64,000	1,246	961.5	110 / 7
645	64,500	1,246	963.9	144 / 12
650	65,000	1,246	968.0	17 / 110
655	65,498	1,246	971.2	9 / 127
HOWARDS CREEK TRIBUTARY 1				
002	241	900	768.9 ⁴	15 / 76
011	1,138	900	768.9 ⁴	20 / 29
015	1,529	900	771.8	8 / 81
021	2,092	900	777.7	45 / 8
024	2,378	900	780.2	14 / 8
026	2,618	900	782.0	37 / 90

Howards Creek Limited Detail Study Plan: Floodway Run 2/8/2008
 Reepsville Road TOR HC Structure ID: LDS_HC_09 Approximate Survey

