Cover Page

Hydraulics Unit Pre-Design Report (Pre-Scoping) for Structure #: 540140

Date: 10/13/2016

County: Lincoln | **Stream:** HOWARDS CREEK

Road #: SR 1194 | **Road Name:** HOWARDS CRK MILL RD

Division: 12 | **Location:** 0.1 M N JCT SR 1195

Latitude: 35.50064 | **Longitude:** -81.37072 Decimal degrees, a min of 5 decimal points

Assigned to:

Prepared By: wsh/REL

Hydro Mgr: PFF | Hydro Reviewer: MTS

Project Type:

Existing Structure

Structure Type: Bridge | Yr Built: 1962

Span Arrangement: 1 @ 30'3", 1@30',1@30'3" | OAL (ft): 91.0 | Skew: 90 | Abutment Type: Vertical -Timber

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

Bed to Crown (ft): 15.0 | Clear Roadway (ft): 24.0 | Water Depth (ft) 2.0 | Superstructure Depth:

ADT: 380 | Year ADT: 2013 | Scour Code (item113): U | Prior Survey Completed: ☑ | Survey Date: 12/01/1961

Drainage Area: 14.3 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): 214308650

Q10 (cfs): | Q25 (cfs): 2,800 | Q50 (cfs): 3,400 | Q100 (cfs): 4,000 | QBFE (cfs):

☐ Structure in Flood Hazard Zone | Panel #: 2684 | Panel Date: 08/16/2007 | Type of FIS: LIMITED | Date of FIS:

Enviromental

Quad Map: REEPSVILLE, 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: Culvert

Location: 0.3 M E JCT SR 1195

Structure #: 540252 | Route: SR 1197

Latitude: 35.51093 | Longitude: -81.37963

Prior Survey Completed: ☐ | Survey Date: | Bed to Crown (ft): 18.0 | Year Built: 1950

Structure Type: RCBC

Span Arrangement: | OAL (ft):

Number of Barrels: 3 | @ Span (ft): 12.0 | x Rise (ft): 15.0

Downstream Feature: Bridge

Location: 0.6 M S JCT SR 1113

Structure #: 540142 | Route: SR 1193

Latitude: 35.50332 | Longitude: -81.36082

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

Structure Type: RC Deck/on PPC Girders

Span Arrangement: 2@ 65' | OAL (ft): 131.00

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# _____

PREDESIGN-SCOPING REPORT

D-4

County LINCOLN (DIV. 12)

Bridge# 540 140
Road# SR 1194 ✓ HOWARDS CRK. MILL RD.
Stream HOWARDS CREEK

Type Of Request: POC Force Account TIP NCMA

Date 10/10/16 Name WSH
Assigned To PFF/MTS
Checked By RJL 10-12-16
BRN: 3e30' BK: 6.832016 CO. FILE NONE
Prior Survey Date DEC 1961 (attach copy of prior survey)
PDR? NO
Study By Scour Section NONE
Flood Zone AE Detail Study LIMITED (HEC-RAS) Date 8-16-07 Panel# 2684
B.M. Info N/A
(DA IN STREAM STATS = 13. Sq Mi)
Quad Map REEPSVILLE Drainage Area 14.3 Sq Mi From DASS STA: 214 308650
Q25 2800 cfs Q50 3400 cfs Q100 4000 cfs Method NEW REG. EQU.
LONG: -81.370723
LAT: 35.500635
REGION 1
IA = 0.99%

EXISTING BRIDGE INFORMATION

Location 0.1 M. N. JCT. SR 1195
Average Daily Traffic 380 (2013) 6% TRK YEAR BUILT: 1962
Length 91' Bed-To Crown 15 Water Depth 2'
Type Structure PRECAST PRESTRESSED CONC. CHANELS, TIM. PILES, PPC CAPS
Type Spans 1@30'3", 1@30, 1@30'3" VERTICAL TIMBER ABUT.
Upstream Structure 540252 RCBC 3 x 12' x 15' YR. BUILT: 1950
Location HOOVER ELMORE RD SR 1197 / 0.3 M.E. JCT SR 1195 LONG: -81.379633
Bed-To Crown 18' (H_2O = 1' DEEP) Prior Survey N/A LAT: 35.510928
Downstream Structure 540142 YR. BUILT: 2009
Location WISE RD., SR 1193, 0.6 M. S. JCT. SR 1113 RC DECK ON PPC GIRDERS
Bed-To Crown 23' H_2O = 3' DEEP Prior Survey N/A LONG: -81.360821 (2@65')
LAT: 35.503324

ENVIRONMENTAL TVA: NO

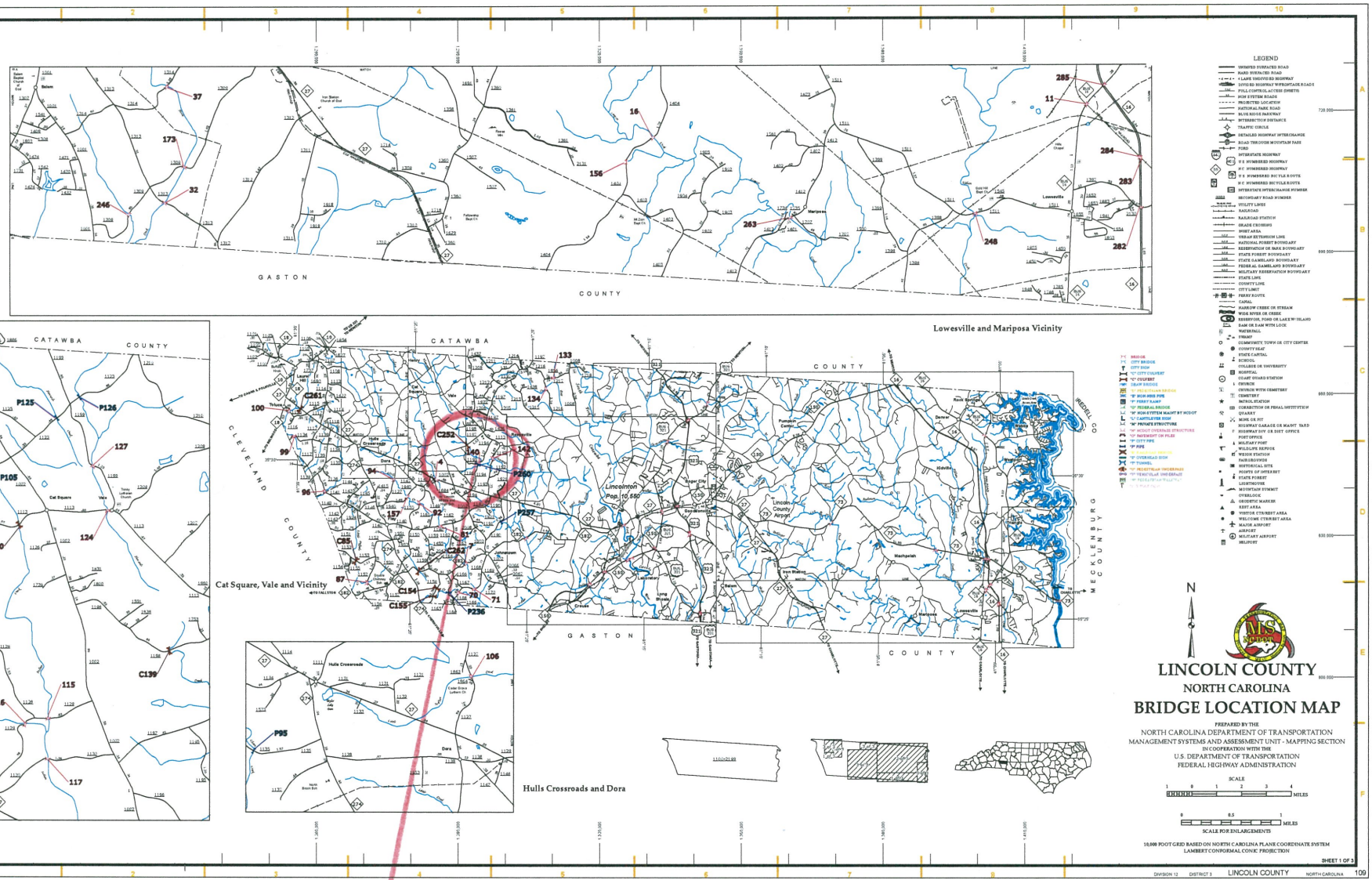
Trout Stream NO Anadromous Fish NO Primary Nursery Area NO
High Quality Waters NO Nutrient Sensitive Waters NO
Near Water Supply Intake NO CAMA County NO
Stream Classification C ✓ STREAM #: 11-129-4
DENR River Basin Info. CATAWBA

1,55,64,67,83
D/S 28
U/S 16

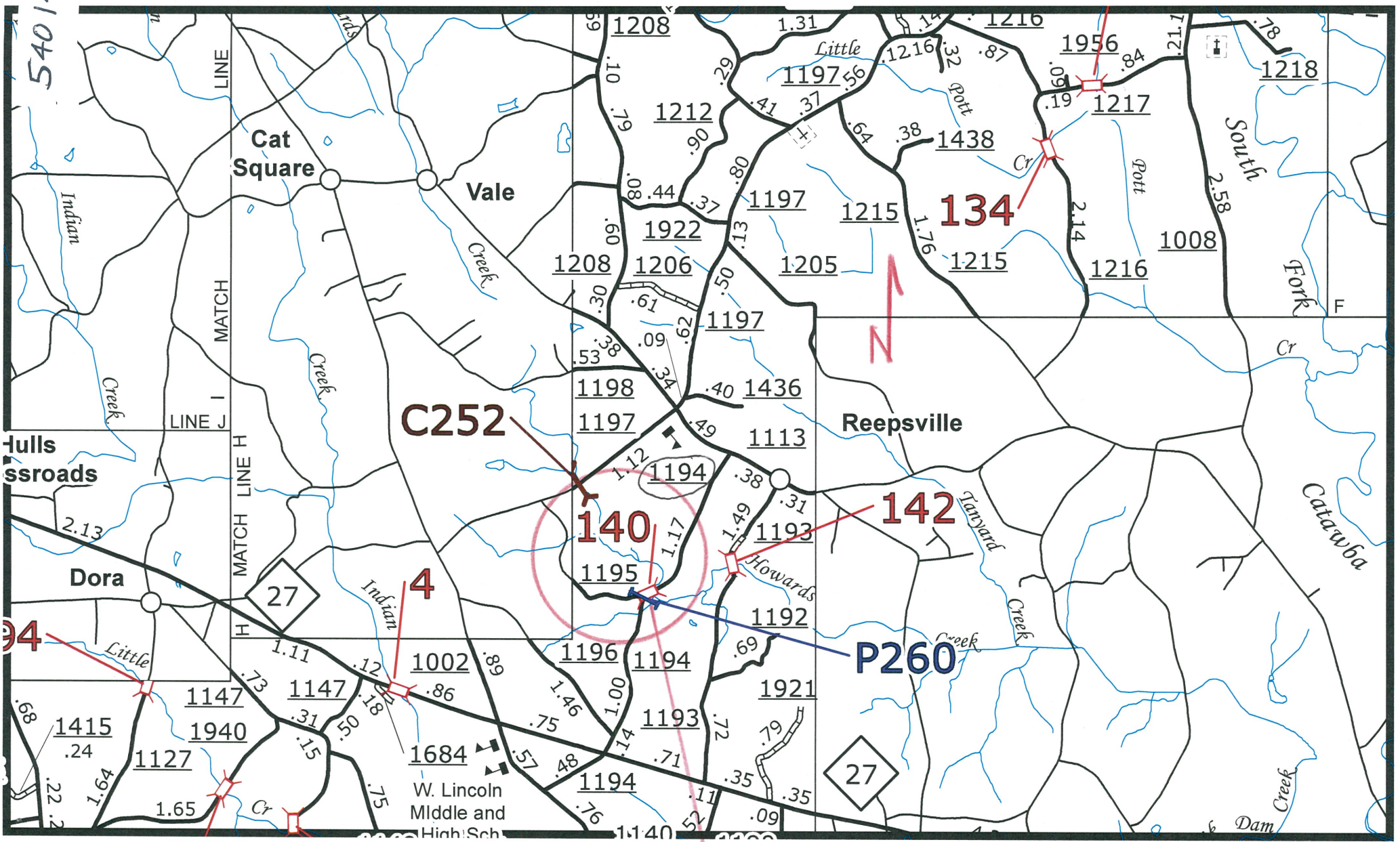
PSR 10-12 (PDR FILED IN S DRIVE) ✓

SCANNED 10-12

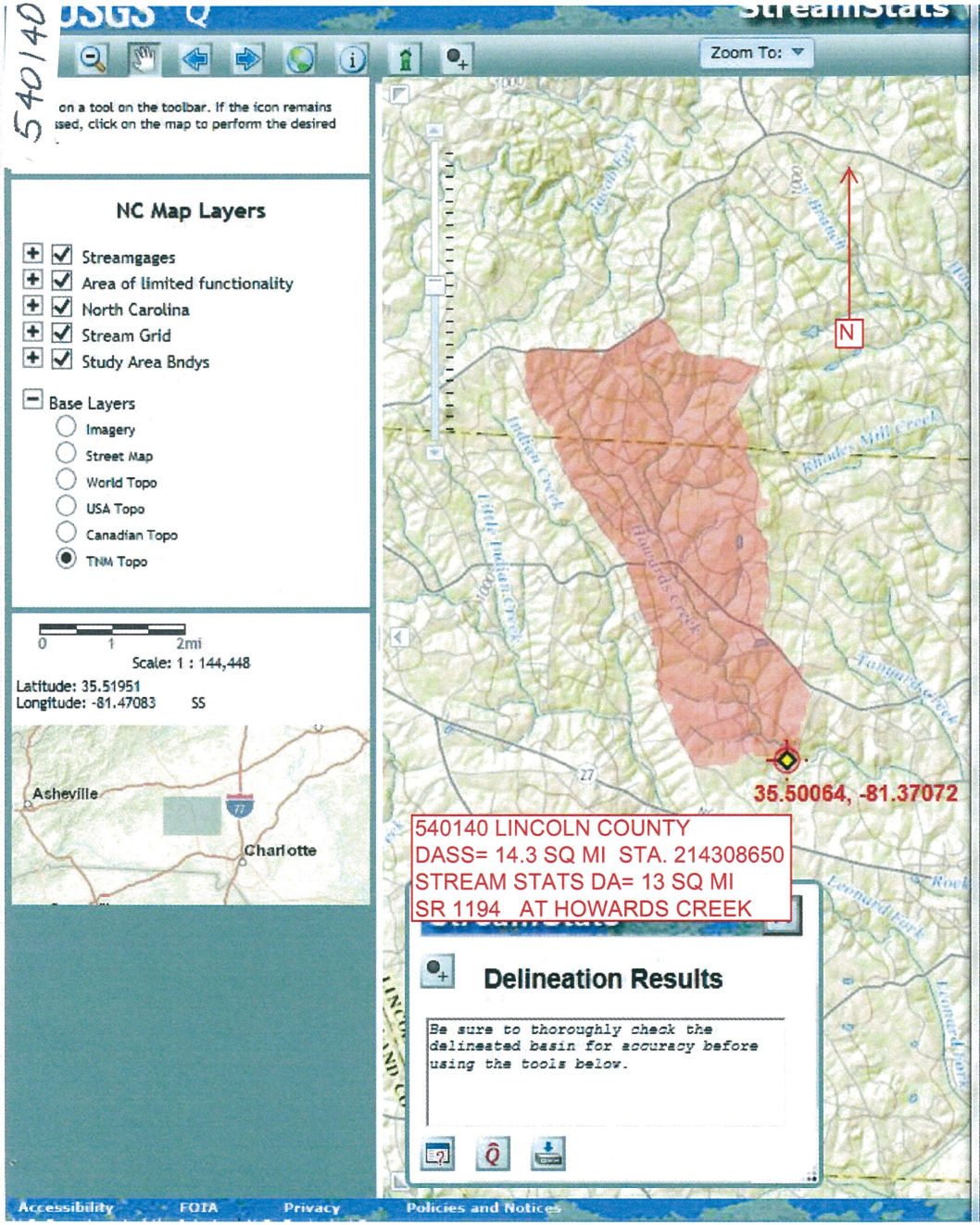
540140


GASTON
COUNTY
CATAWBA
COUNTY
CLEVELAND
COUNTY
MECKLENBURG
COUNTY
Lowesville and Mariposa Vicinity
Cat Square, Vale and Vicinity
Hulls Crossroads and Dora
Lincolnton
Pop. 10,680
Lincoln County Airport
LEGEND
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
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

140


540 140
Cat Square
Vale
Reepsville
Dora
Hulls Crossroads
C252
140
142
134
P260
4
Indian Creek
Little Creek
Pott Cr
South Fork Catawba
Tanyard Creek
Howards Creek
MATCH LINE H
MATCH LINE I
LINE J
LINE F
27
W. Lincoln Middle and High Sch
#140

540140



USGS StreamStats Version 3.0

Flow Statistics Ungaged Site Report

Date: Tues Oct 11, 2016 7:37:52 AM GMT-4
Study Area: North Carolina
NAD 1983 Latitude: 35.5006 (35 30 02)
NAD 1983 Longitude: -81.3706 (-81 22 15)
Drainage Area: 13 mi2

Peak Flows Region Grid Basin Characteristics

100% Peak Southeast US over 1 sqmi 2009 5158 (13 mi2)

Parameter	Value	Regression Equation Valid Range	
		Min	Max
Drainage Area (square miles)	13	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=13

Percent imperviousness of basin area 2006 NLCD=0.99

100% Region 1 Urban over 3 sqmi 2014 5030 (13 mi2)

Parameter	Value	Regression Equation Valid Range	
		Min	Max
Drainage Area (square miles)	13	3	436
Percent Impervious NLCD2006 (percent)	0.99	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	837	ft3/s	35		483	1450
PK5	1470	ft3/s	34		855	2540
PK10	1940	ft3/s	35		1110	3390
PK25	2540	ft3/s	38		1400	4610
PK50	3080	ft3/s	40		1640	5760
PK100	3560	ft3/s	42		1840	6900
PK200	4040	ft3/s	44		2010	8100
PK500	4780	ft3/s	48		2270	10100

http://pubs.usgs.gov/sir/2009/5158/

540140

	REGION 1	REGION 2
Q25	2692.204	2731.155
Q50	3261.393	3234.944
Q100	3768.177	3831.973

D.A. = 14.3 sq mi IpArea= 0.99
Ac SITE *()

UPDATED: .1 to 3mi

	REGION 1	REGION 2
Q25	4122.809	
Q50	5217.256	
Q100	6424.363	

1.012155

3mi T0 436mi

	REGION 1
Q25	2815.36
Q50	3393.13
Q100	3968.49

140

NC DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
STRUCTURE MANAGEMENT UNIT

ATTENTION: PRIORITY MAINTENANCE, TEMPORARY REPAIRS, CHANGES TO STRUCTURE DATA

Structure Safety Report

Routine Element Inspection - Contract

COUNTY: LINCOLN **STRUCTURE NUMBER:** 540140 **FREQUENCY:** 24 MONTHS

FACILITY CARRIED: SR1194 SR 1194 **MILE POST:**

LOCATION: 0.1 MI. N. JCT. SR1195 0.1 MILE NORTH OF JUNCTION WITH SR 1195

FEATURE INTERSECTED: HOWARDS CREEK

LATITUDE: 35° 30' 2.18" **LONGITUDE:** 81° 22' 14.51"

SUPERSTRUCTURE: PRECAST PRESTRESSED CONCRETE CHANNELS

SUBSTRUCTURE: END&INT.BENTS:PPC CAPS ON TIM.PILES,INT.BENTS CONC.ENCASED

SPANS: 1@30'-3", 1@30'-0", 1@30'-3"
1@30'3", 1@30'0", 1@30'3"

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

PRESENT CONDITION: Fair **INSPECTION DATE:** 03/14/2016

POSTED SV: Not Posted **POSTED TTST:** Not Posted

OTHER SIGNS PRESENT: (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
T. GLENN ZEBLO	T Glenn Zeblo	MICHAEL R. MEYER

Structure: 540140 County: LINCOLN Date: 03/14/2016 Structure Photos



DOWNSTREAM PROFILE, LOOKING WEST



UPSTREAM PROFILE, LOOKING EAST

BRIDGE MANAGEMENT UNIT

DATA ON EXISTING STRUCTURE Run Date: 07/12/2016

COUNTY :	DIVISION :	DISTRICT:	STRUCTURE NUMBER :	LENGTH :
LINCOLN	12	3	540140	91 FEET

ROUTE CARRIED : SR1194

FEATURE INTERSECTED : HOWARDS CREEK

LOCATED : 0.1 MI. N. JCT. SR1195

BRIDGE NAME :

CITY :

FUNC. CLASS :	SYST.ON :	SYST.UNDER :	ADT & YR :	RAIL TYPE :
09	NFA	NFA	380 2013	LT 233 RT 233

BUILT :	BY :	PROJ :	FED.AID PROJ :	DESIGN LOAD :
1962	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	15 FT	2 FT

SUPERSTRUCTURE : PRECAST PRESTRESSED CONCRETE CHANNELS

SUBSTRUCTURE : END&INT.BENTS:PPC CAPS ON TIM.PILES,INT.BENTS CONC.ENCASED

SPANS : 1@30'3", 1@30'0", 1@30'3"

BEAMS OR GIRDERS : 10 SECTIONS OF PRECAST PRESTRESSED CONCRETE CHANNELS

FLOOR :	ENCROACHMENT :	DECK (OUT TO OUT) :
PPC.CH.,3. 5"AWS		25.833 FT

CLEAR ROADWAY :	BETWEEN RAILS :	SIDEWALK OR CURB :
24 FT	24.833 FT	LT .4165 FT RT .4165 FT

VERT.CL.OVER : 999.9 FT

INV.RTG. :	OPE.RTG. :	CONTR.MEMBER :	POSTED :
HS-1	HS-1	Int.ch	SV 41 TTST LGW DATE 07/11/2016

SYSTEM : Secondary S.R. Route

GREEN LINE ROUTE : N

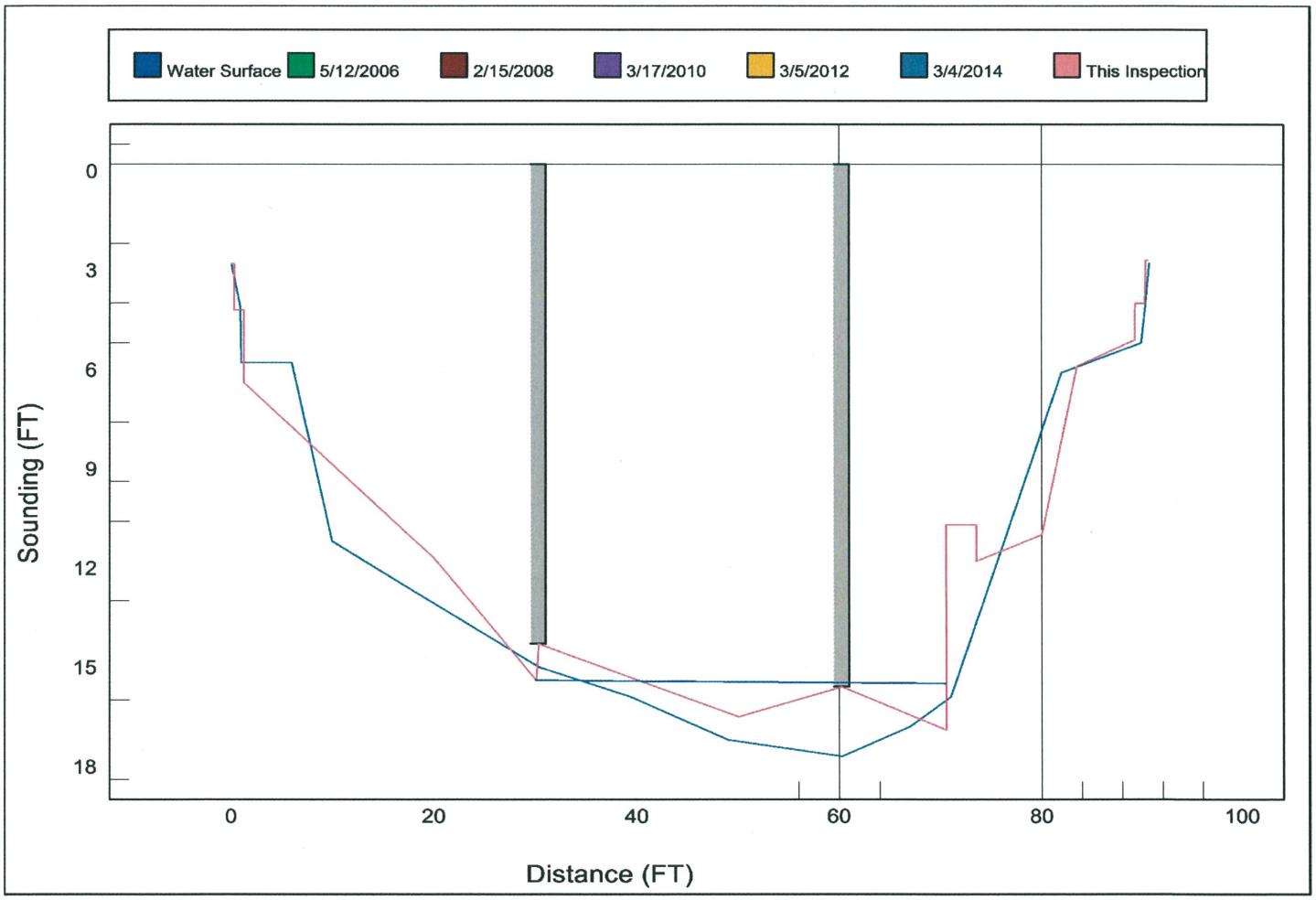
UNDER ROUTES AND CLEARANCES

REMARKS :

Bridge: 540140 County LINCOLN Date:

STREAMBED PROFILE (Downstream)

Top of Rail = 0 FT (Sounding)



D/S STR FOR

540140

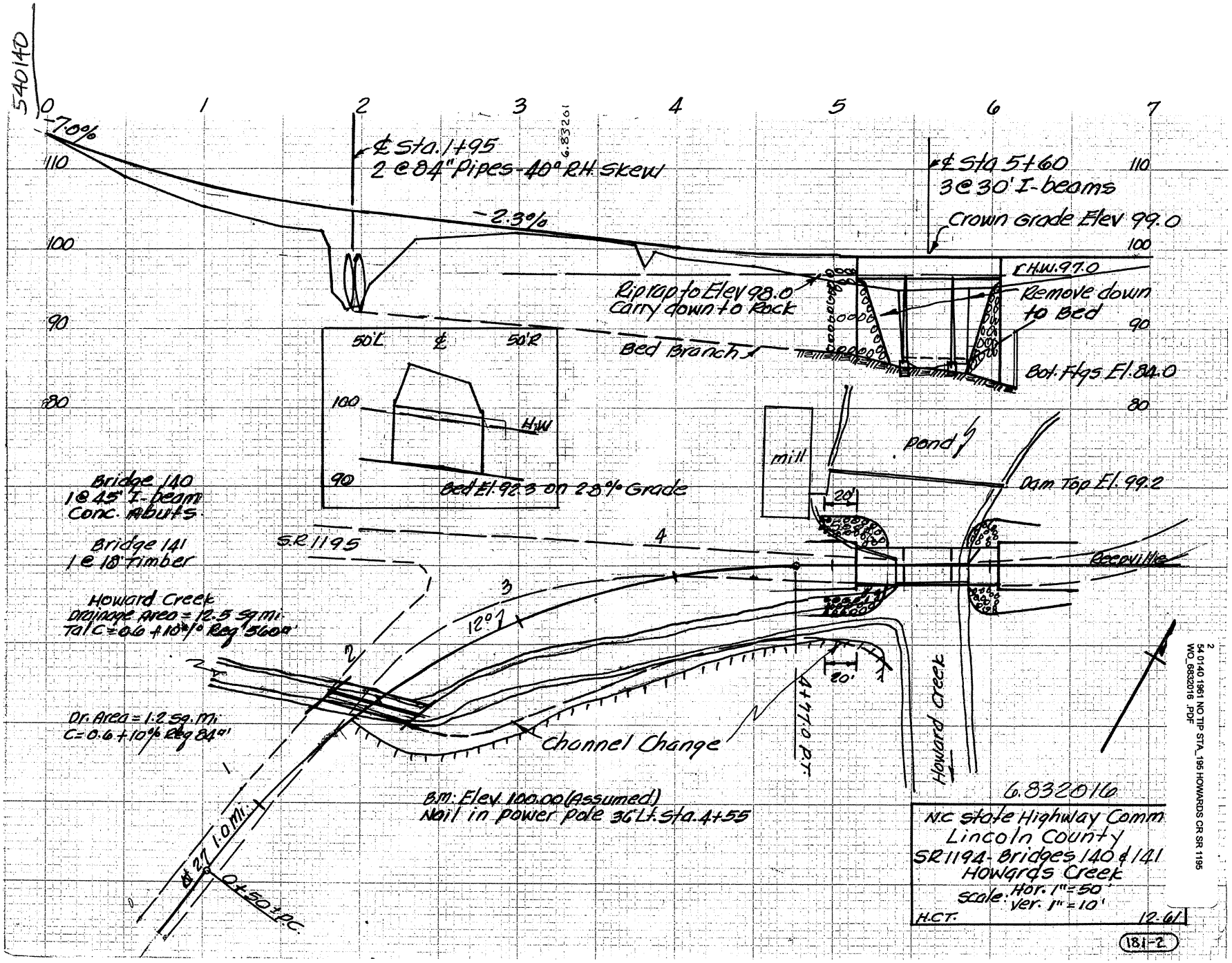
Structure: 540142 County: LINCOLN Date: 11/04/2015 Structure Photos



BENT 1 LOOKING NORTH

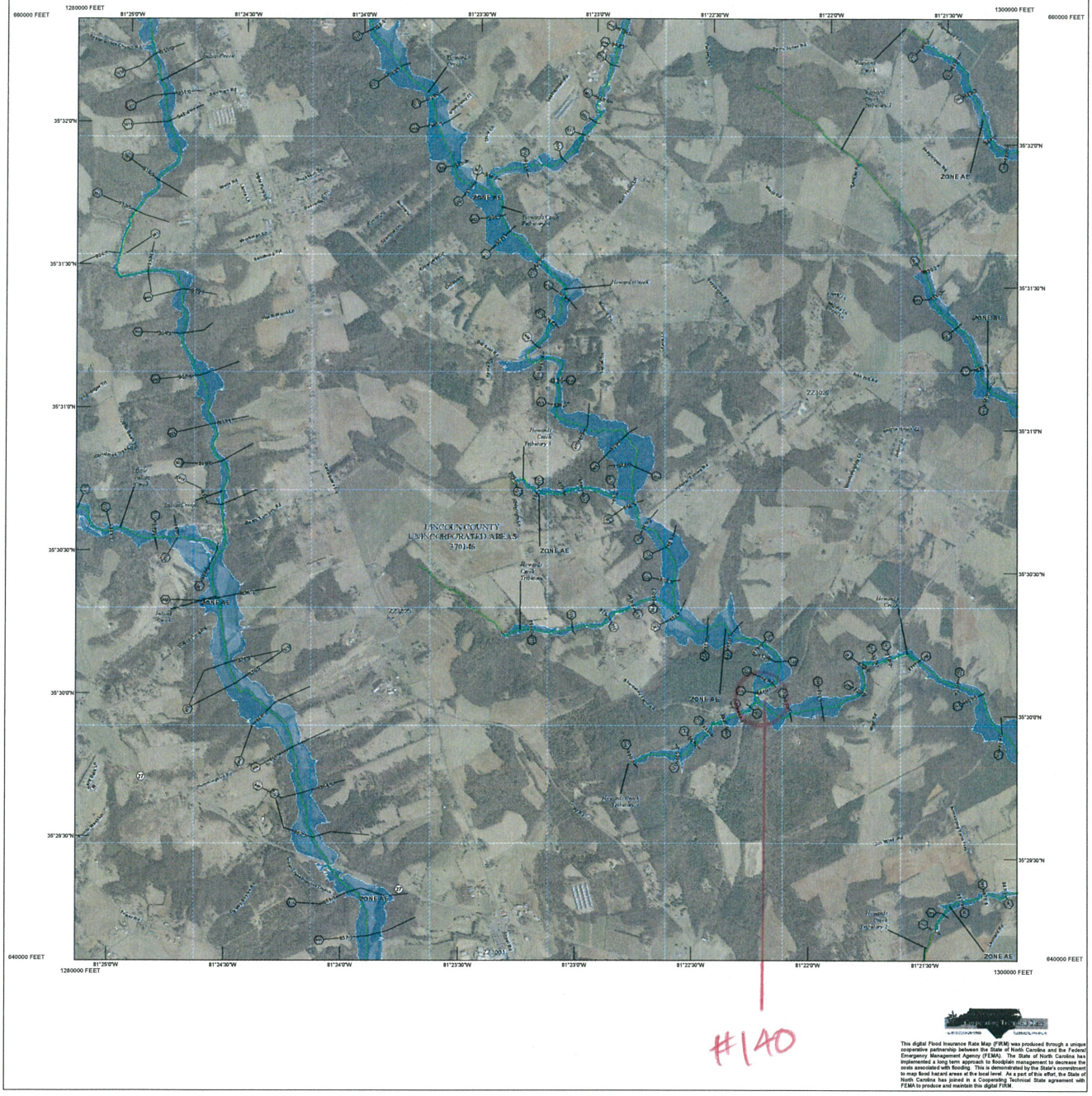


LOOKING EAST



2
54.0140.1961.NO.TIP.STA_195.HOWARDS.CR.SR.1195
WO_6832016 .PDF

540140



This digital Flood Insurance Rate Map (FRM) 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
- Contractor Est. NCFMP Survey bench mark
- 012 18.2 Cross Sections with 1% Annual Chance Water Surface Elevation (BFE)
- (B) 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

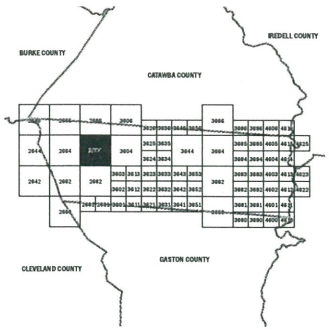
Map Projection:
North Carolina State Plane Projection Feet (Zone 3200)
Datum: NAD 1983 (Horizontal), NAVD 1988 (Vertical)

1 inch = 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 2684

Panel Contains:

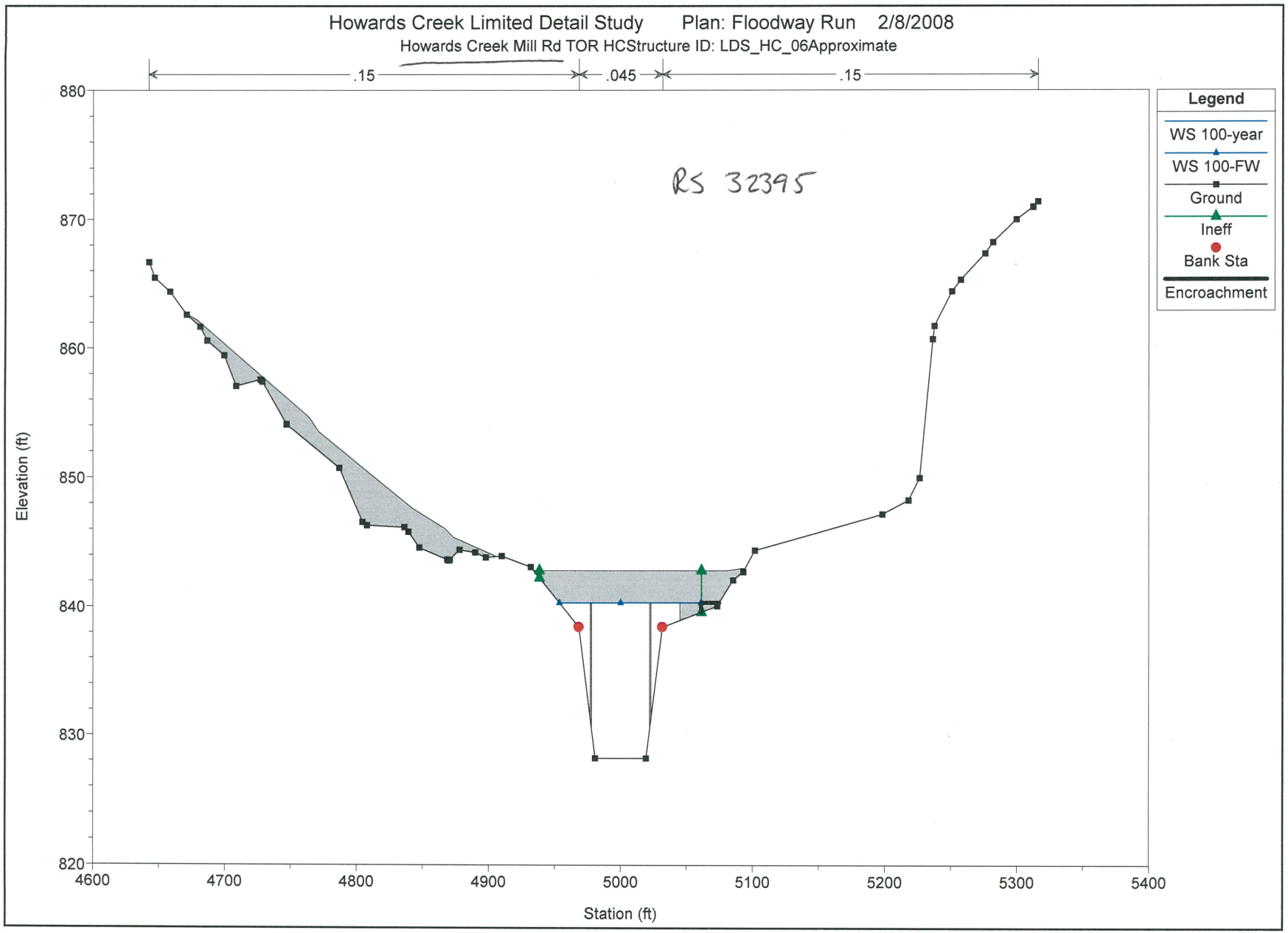
COMMUNITY	CID	PANEL	SUFFIX
LINCOLN COUNTY	370146	2684	J

MAP NUMBER
3710268400J

MAP REVISED
8/16/2007


540140
370
859.8
868.3
865.9
875.3
024
009
004
015
362
858.7
857.3
354
856.7
348
854.0
852.8
340
335
330
849.7
326
841.1
315
833.5
308
830.4
299
826.6
293
822.4
290
820.3
287
818.0
280
811.3
270
808.8
265
803.5
255
801.5
ZONE AE
Howards Creek
Howards Creek Tributary 3
Abernethy Farm Rd
Wise Rd
Grigg Rd
Armstrong Fa
005
848.8
002
849.2
800
013
858.1
017
861.2
865.2
021
032
880.3
N
#140

540140


Howards Creek Limited Detail Study
Plan: Floodway Run
2/8/2008
Howards Creek Mill Rd TOR HCStructure ID: LDS_HC_06Approximate
.15
.045
.15
RS 32395
Legend
WS 100-year
WS 100-FW
Ground
Ineff
Bank Sta
Encroachment
Elevation (ft)
880
870
860
850
840
830
820
4600
4700
4800
4900
5000
5100
5200
5300
5400
Station (ft)