Cover Page

Hydraulics Unit Pre-Design Report (Pre-Scoping) for Structure #: 540121

Date: 10/12/2016

County: Lincoln | Stream: TANYARD CREEK

Road #: SR 1113 | Road Name: REEPSVILLE RD

Division: 12 | Location: 0.1 M E JCT SR 2105

Latitude: 35.51353 | Longitude: -81.33718 Decimal degrees, a min of 5 decimal points

Assigned to:

Prepared By: wsh/ECA

Hydro Mgr: PFF | Hydro Reviewer: MTS

Project Type:

Existing Structure

Structure Type: Bridge | Yr Built: 1974

Span Arrangement: 1 @ 30'3", 1@30',1@30'3" | OAL (ft): 91.0 | Skew: 90 | Abutment Type: PPC cap on timber piles

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

Bed to Crown (ft): 14.0 | Clear Roadway (ft): 24.2 | Water Depth (ft) 1.0 | Superstructure Depth:

ADT: 3700 | Year ADT: 2013 | Scour Code (item113): U | Prior Survey Completed: ☐ | Survey Date:

Drainage Area: 3.1 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): 214308800

Q10 (cfs): | Q25 (cfs): 1,200 | Q50 (cfs): 1,500 | Q100 (cfs): 1,700 | QBFE (cfs):

☐ Structure in Flood Hazard Zone | Panel #: 3604 | 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: CANSLER RD

Structure #: | Route: SR 1197

Latitude: 35.53985 | Longitude: -81.36123

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

Structure Type: UNKNOWN

Span Arrangement: | OAL (ft):

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

Downstream Feature: Confluence w/ Stream(s)

Location: 1.34 MILES D/S ALOMNG FLOW LINE

Structure #: | Route: SR

Latitude: 35.49625 | Longitude: -81.32647

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

Structure Type:

Span Arrangement: | OAL (ft):

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

Preliminary Structure Estimate [Office Estimate]

Structure Type: | Skew:

Dimensions/Spans:

Notes

Stream Assigned #:11-12--4-1

OFFICE ESTIMATE: _____

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

PREDESIGN-SCOPING REPORT

A-21

County LINCOLN (DIV. 12)
Bridge# 540121
Road# SR 1113 REEPSVILLE RD.
Stream TANYARD CRK.

Type Of Request: POC Force Account TIP NCMA

Date 10/10/16 Name WSH
Assigned To PFF/MTS
Checked By ECA 10-12-16
Prior Survey Date NONE (attach copy of prior survey)
BRN. TD 9X10 BK: 6.430 CO. FILE NONE
PDR? NO
Study By Scour Section YES
Flood Zone AE Detail Study LIMITED (HEC-RAS) Date 8/16/07 Panel# 3604
B.M. Info N/A
STREAM STATS DA = 2.99 Sq M. ✓
Quad Map REEPSVILLE Drainage Area 3.05 Sq M. From DASS STA 214308800
Q25 1200 cfs Q50 1500 cfs Q100 1700 cfs Method NEW REG EQU.
LONG: -81.337179
LAT: 35.513526
REGION 1
IA = 0.46

EXISTING BRIDGE INFORMATION

Location 0.1 M E JCT. SR 2105
Average Daily Traffic 3700, (2013) 6% TRK YEAR BUILT: 1974
Length 91' Bed-To Crown 14' Water Depth 1'
Type Structure PRECAST CONC. PRESTRESSED CHANNEL
Type Spans 1@30'3", 1@30', 1@30'3"
Upstream Structure UNNUMBERD PIPE YR. BUILT: UNKNOWN
Location CANSLER RD. / SR 1197 LONG: -81.361233
Bed-To Crown UNKNOWN Prior Survey N/A LAT: 35.539853
Downstream Structure FLOWS INTO HOWARD'S CREEK YR. BUILT: N/A
Location 1.34 MILES D/S ALONG FE
Bed-To Crown N/A Prior Survey N/A LONG: -81.326472
LAT: 35.496250

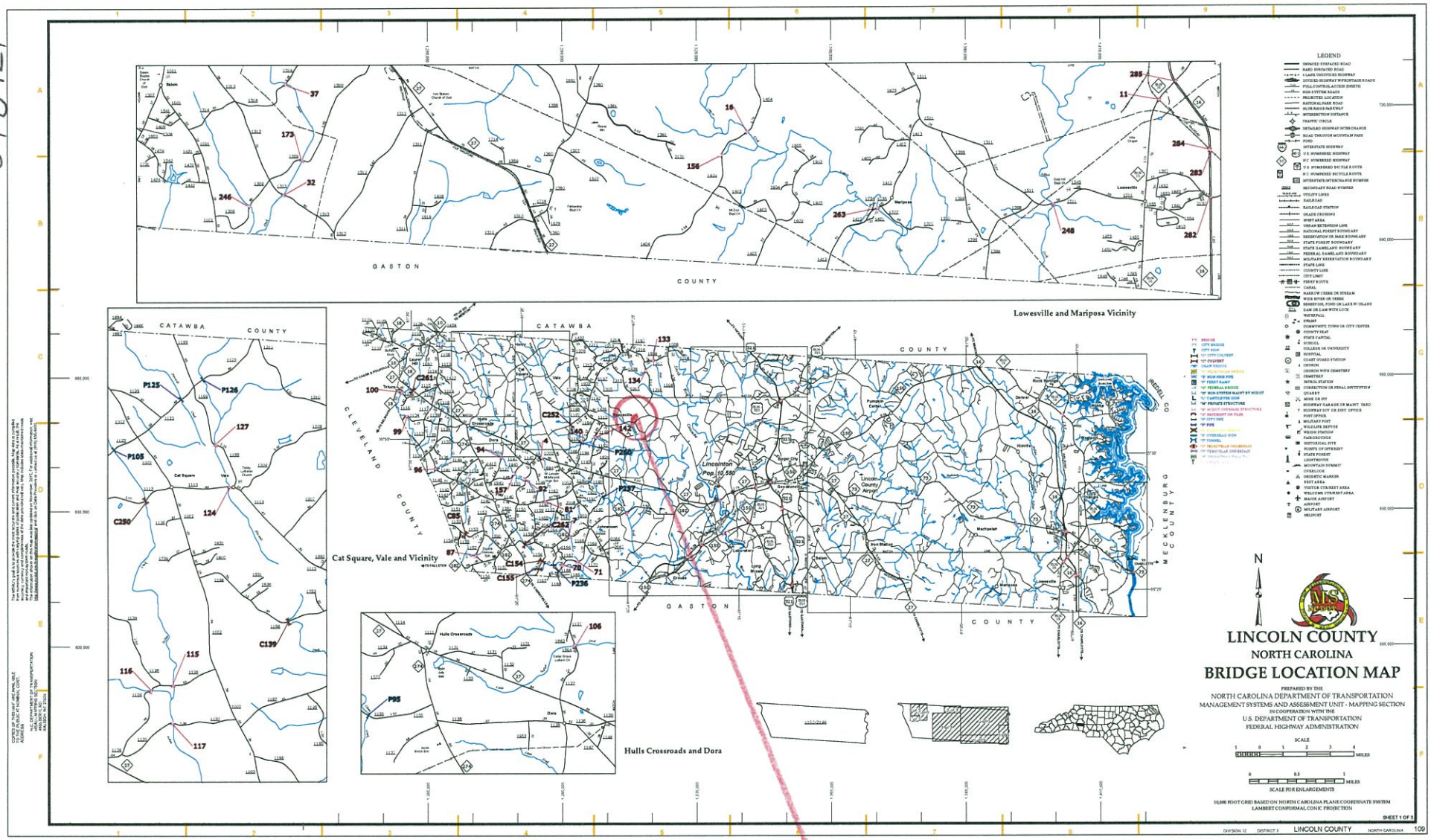
ENVIRONMENTAL TVA: NO ✓

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 #: 11-129-4-1
DENR River Basin Info. CATAWBA ✓

1, 43, 49, 82, ✓

PSR/10-13 (PDR Filed in S Drive) ✓

540121



LINCOLN COUNTY
NORTH CAROLINA
BRIDGE LOCATION MAP

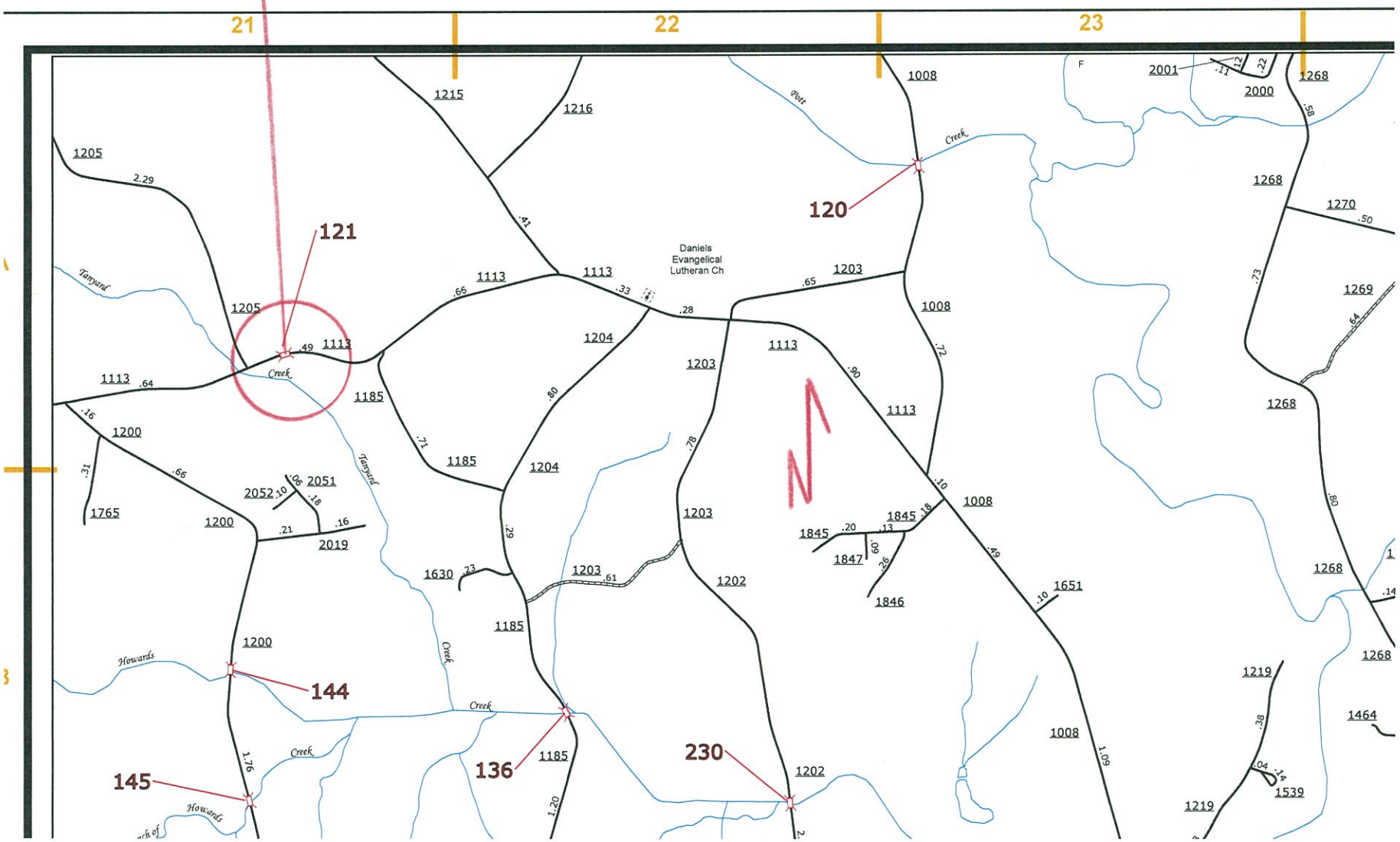
PREPARED BY THE
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
MANAGEMENT SYSTEMS AND ASSESSMENT UNIT - MAPPING SECTION
IN COOPERATION WITH THE
U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

SHEET 1 OF 3

#121

#121

540121


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Daniels Evangelical Lutheran Ch
Tanyard
Creek
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1205
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121

Select on a tool on the toolbar. If the icon remains depressed, click on the map to perform the desired action.

NC Map Layers

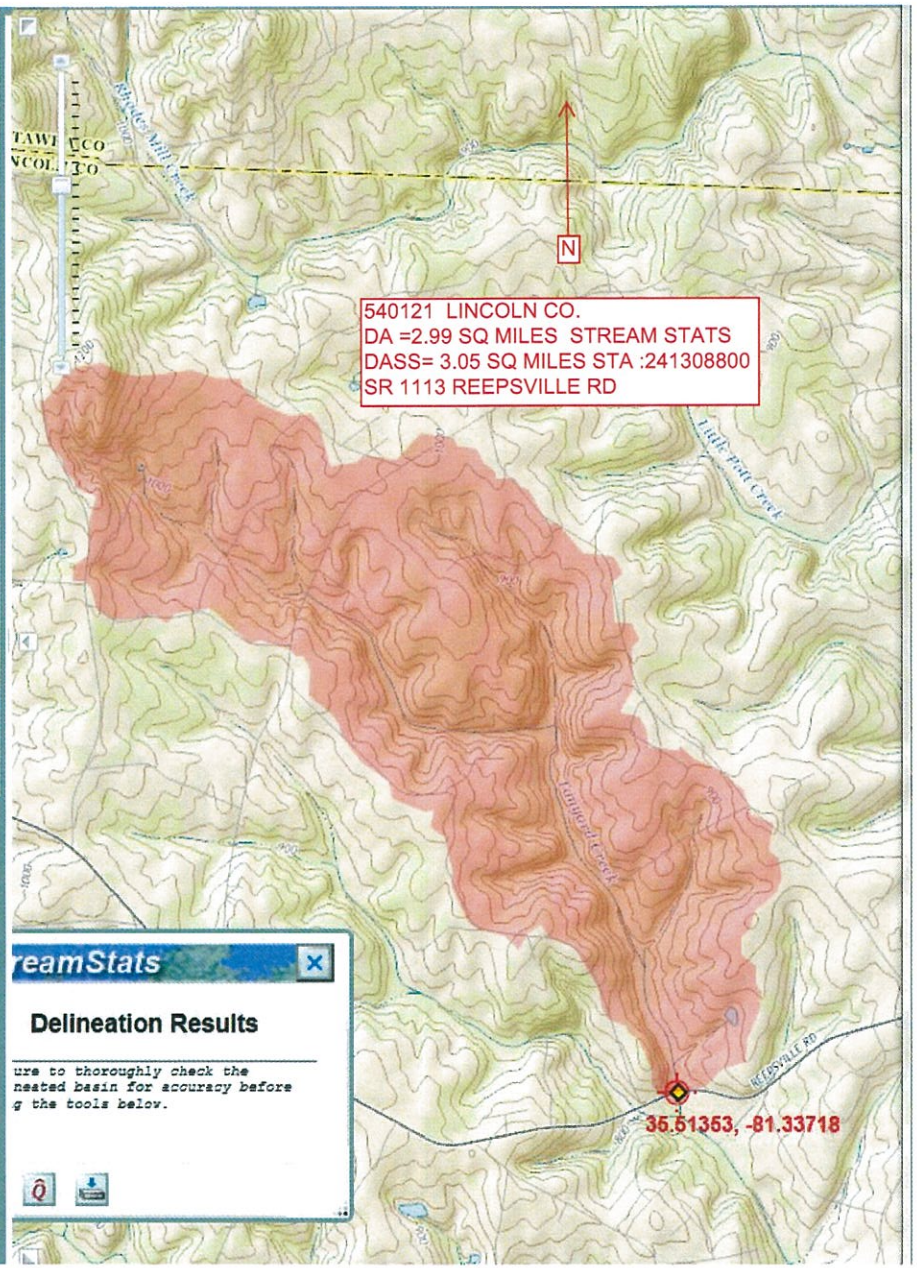
- [x] Streamgages
- [x] Area of limited functionality
- [x] North Carolina
- [x] Stream Grid
- [x] Study Area Bndys

Base Layers

- Imagery
- Street Map
- World Topo
- USA Topo
- Canadian Topo
- (•) TNM Topo

0 0.2 0.4mi
Scale: 1 : 36,112
Latitude: 35.50428
Longitude: -81.38033 SS





Date: Mon Oct 10, 2016 4:31:38 PM GMT-4
Study Area: North Carolina
NAD 1983 Latitude: 35.5135 (35 30 49)
NAD 1983 Longitude: -81.337 (-81 20 14)
Drainage Area: 2.99 mi2

Peak Flows Region Grid Basin Characteristics			
100% Peak Southeast US over 1 sqmi 2009 5158 (2.99 mi2)			
Parameter	Value	Regression Equation Valid Range	
		Min	Max
Drainage Area (square miles)	2.99	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=2.99			
Percent imperviousness of basin area 2006 NLCD=0.46			
100% Region 1 Urban under 3 sqmi 2014 5030 (2.99 mi2)			
Parameter	Value	Regression Equation Valid Range	
		Min	Max
Drainage Area (square miles)	2.99	0.1	3
Percent Impervious NLCD2006 (percent)	0.46	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	323	ft3/s	35		186	561
PK5	586	ft3/s	34		340	1010
PK10	783	ft3/s	35		446	1370
PK25	1040	ft3/s	38		573	1900
PK50	1270	ft3/s	40		679	2390
PK100	1490	ft3/s	42		766	2890
PK200	1700	ft3/s	44		845	3420
PK500	2030	ft3/s	48		961	4280

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					
Statistic	Value	Unit	Prediction	Equivalent	90-Percent Prediction

NC DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
STRUCTURE MANAGEMENT UNIT

ATTENTION: PRIORITY MAINTENANCE, TEMPORARY REPAIR TO CHANNEL GIRDER

Structure Safety Report

Routine Element Inspection - Contract

COUNTY: LINCOLN **STRUCTURE NUMBER:** 540121 **FREQUENCY:** 24 MONTHS

FACILITY CARRIED: SR1113 **MILE POST:**

LOCATION: 0.1 MI. E. JCT. SR1205

FEATURE INTERSECTED: TANYARD CREEK

LATITUDE: 35° 30' 48.57" **LONGITUDE:** 81° 20' 14.14"

SUPERSTRUCTURE: PRECAST PRESTRESSED CONCRETE CHANNELS

SUBSTRUCTURE: END & INTERIOR BENTS:PPC CAPS ON TIMBER PILES,TIM.BULKHEADS

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: Poor **INSPECTION DATE:** 01/14/2016

POSTED SV: 24 **POSTED TTST:** 28

OTHER SIGNS PRESENT: (4) DELINEATORS



Looking 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
JOHN SLOAN	John Sloan	NICOLE BROWN

Structure: 540121 County: LINCOLN Date: 01/14/2016 Structure Photos



Upstream structure profile



Downstream structure profile



Bridge 540121 View : West



Bridge 540121 - Pier 1

X

BRIDGE MANAGEMENT UNIT

DATA ON EXISTING STRUCTURE Run Date: 06/15/2016

COUNTY :	DIVISION :	DISTRICT:	STRUCTURE NUMBER :	LENGTH :
LINCOLN	12	3	540121	91 FEET

ROUTE CARRIED : SR1113

FEATURE INTERSECTED : TANYARD CREEK

LOCATED : 0.1 MI. E. JCT. SR1205

BRIDGE NAME :

CITY :

FUNC. CLASS :	SYST.ON :	SYST.UNDER :	ADT & YR :	RAIL TYPE :
08	NFA	NFA	3700 2013	LT 233 RT 233

BUILT :	BY :	PROJ :	FED.AID PROJ :	DESIGN LOAD :
1974	BMU	5.8351		H 10

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	14 FT	1 FT

SUPERSTRUCTURE : PRECAST PRESTRESSED CONCRETE CHANNELS

SUBSTRUCTURE : END & INTERIOR BENTS:PPC CAPS ON TIMBER PILES,TIM.BULKHEADS

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) :
5 PPCCH,2 AWS		25 FT

CLEAR ROADWAY :	BETWEEN RAILS :	SIDEWALK OR CURB :
24.167 FT	24.917 FT	LT .4 FT RT .4 FT

VERT.CL.OVER : 999.9 FT

INV.RTG. :	OPE.RTG. :	CONTR.MEMBER :	POSTED :
HS-6	HS-17	pile2	SV 24 TTST 28 DATE 10/01/2008

SYSTEM : Secondary S.R. Route

GREEN LINE ROUTE : N

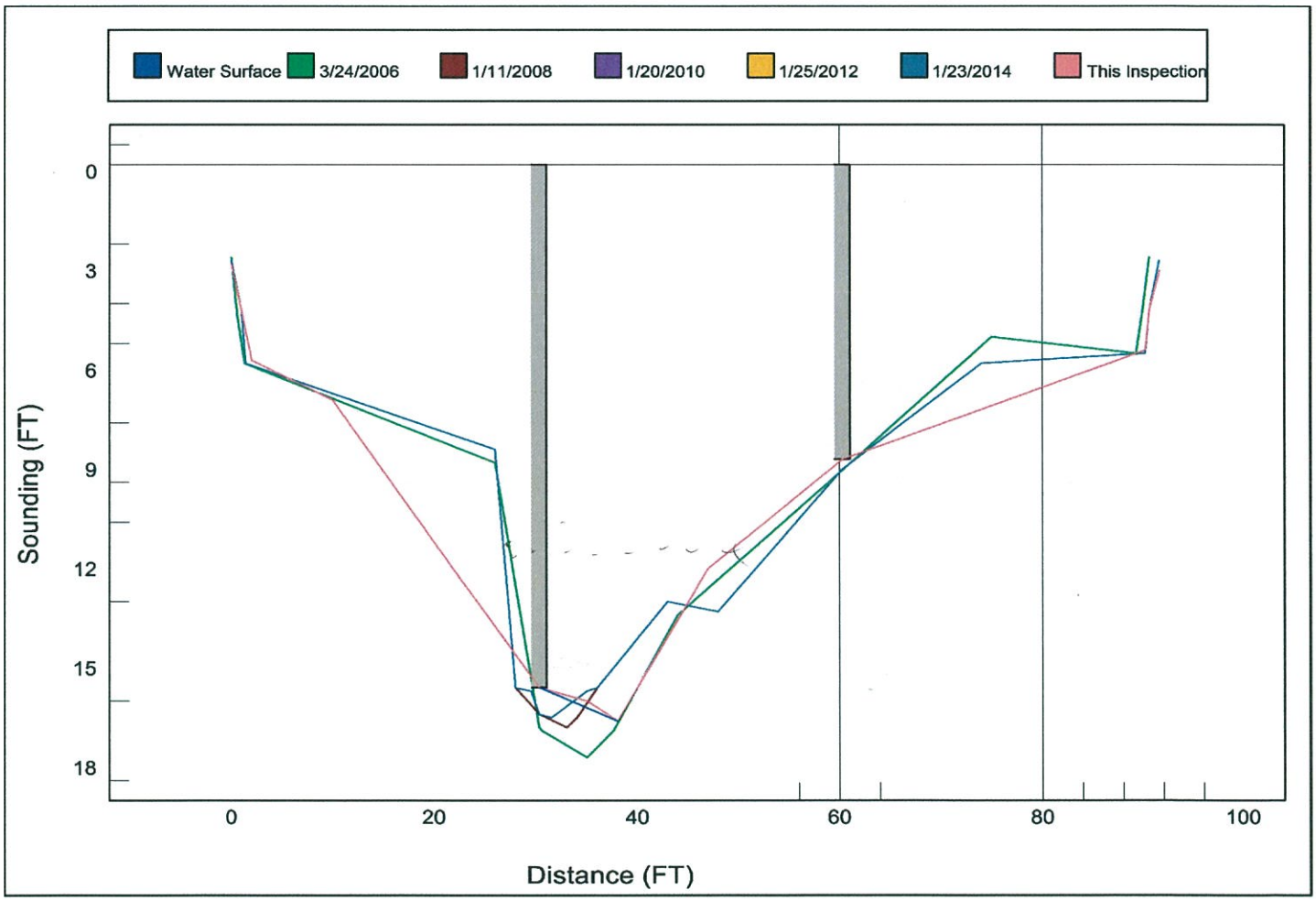
UNDER ROUTES AND CLEARANCES

REMARKS :

Bridge: 540121 County LINCOLN Date:

STREAMBED PROFILE (Downstream)

Top of Rail = 0 FT (Sounding)



540121

c:\scour\forms\brscrpt.doc

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

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

BRIDGE SCOUR REPORT

COUNTY: Lincoln BRIDGE: 121 ROUTE: SR 1113 STREAM CROSSED: Prong Howard's Ck.

ASSESSMENT ✓ EVALUATION ____ BY: JJB DATE 7/6/05

FHWA STRUCTURE INVENTORY & APPRAISAL CODES:

SUBSTRUCTURE CONDITION (ITEM 60)	6
CHANNEL AND CHANNEL PROTECTION (ITEM 61)	6
WATERWAY ADEQUACY (ITEM 71)	6
SCOUR CRITICAL BRIDGES ((ITEM 113)	5

* FULL SCOUR REPORT AVAILABLE IN HYDRAULICS UNIT SCOUR FILE CABINETS/ REPORTS - NCDOT BLGD B. 10-10-16

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):

REQUIRED ACTION:

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

REQUIRED ACTION:

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

REQUIRED ACTION:

INCREASE UNDERWATER INSPECTION CYCLE? YES _____ NO _____ FREQUENCY _____

COUNTERMEASURES:

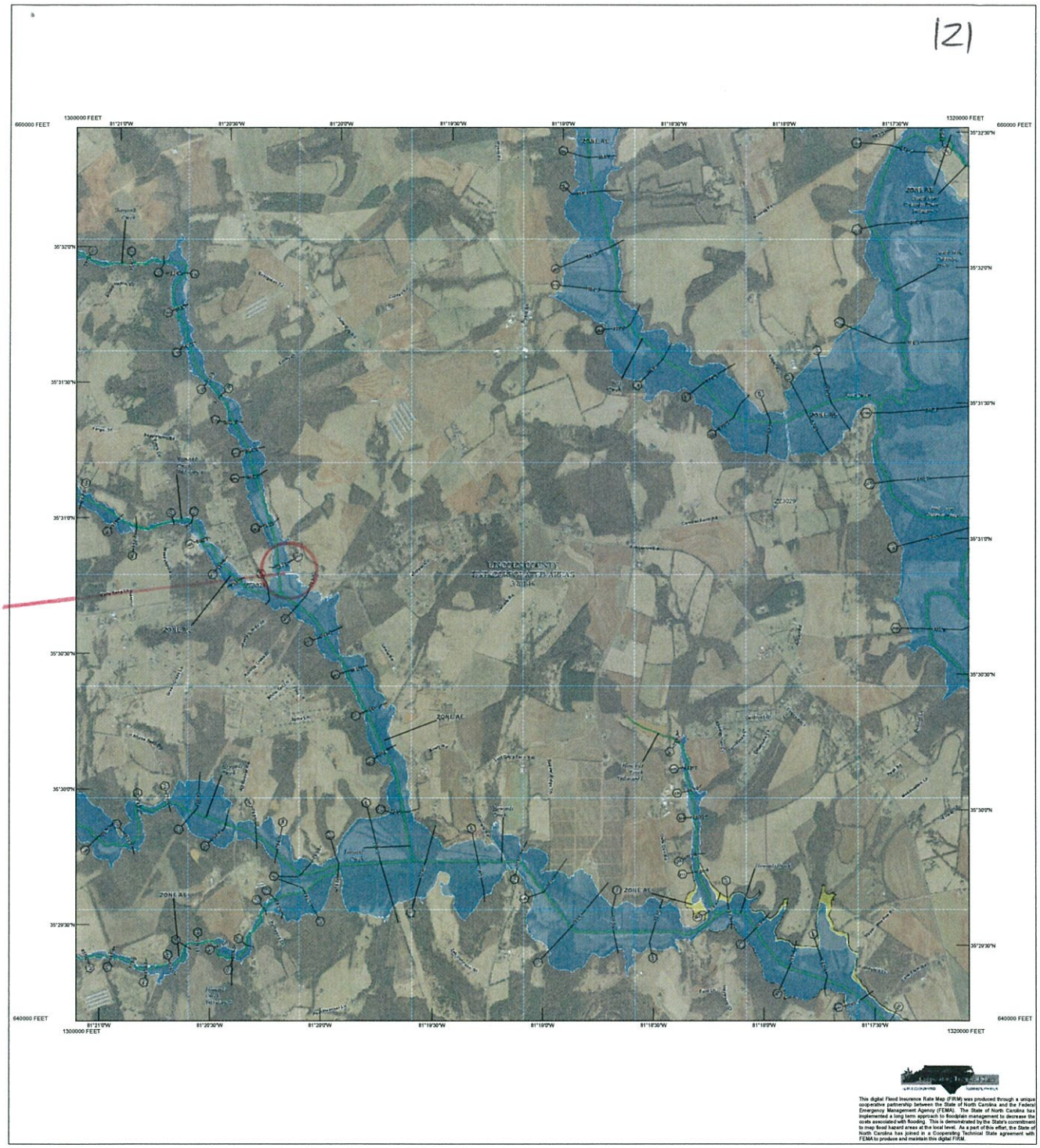
PLAN REQUIRED? YES _____ NO _____
SUMMARY OF PLAN:

CONSTRUCTION COMPLETED DATE _____

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

BRIDGE MAINTENANCE COMMENTS:

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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
- 512 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 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.

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

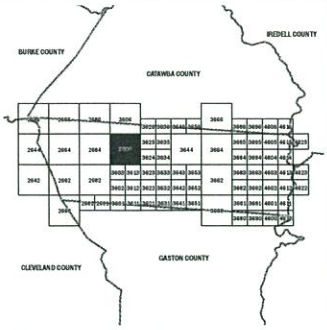
Map Projection:
North Carolina State Plane Projection Feet (Zone 3200)
Datum: NAD 1983 (Horizontal), NAVD 1988 (Vertical)

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:

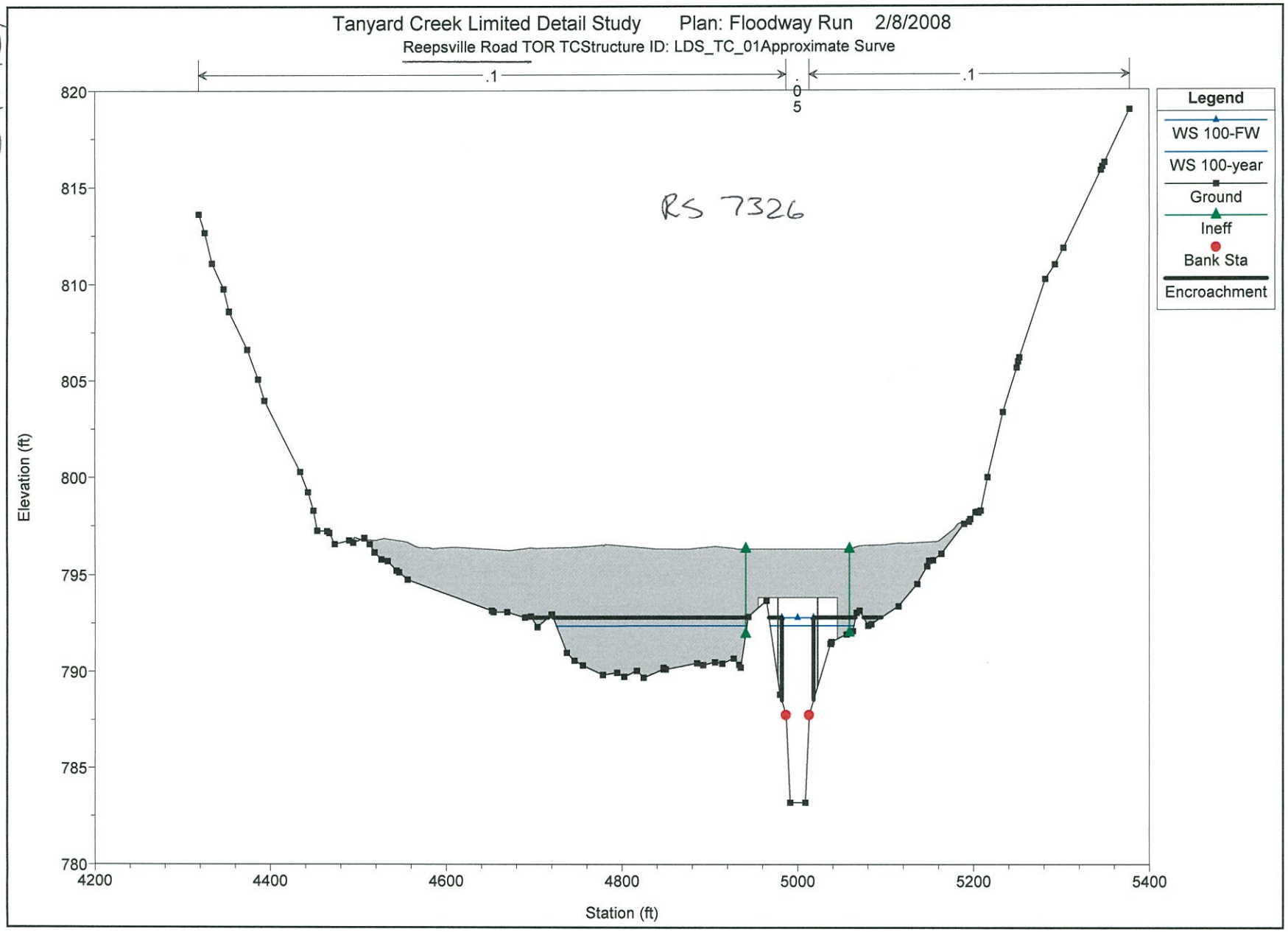
COMMUNITY	CID	PANEL	SUFFIX
LINCOLN COUNTY	370148	3604	J

MAP NUMBER
37103604003

MAP REVISED
8/16/2007

Rock Acre Ln
042
852.8
Meadowview Ln
034
Tributary 1
029
025
800.5
096
798.6
798.5
ZONE AE
Western Hills Ln
ZZ3028
798.7
085
795.9
093
793.6
075
064
789.7
055
788.3
Mintew Cir

#121


Tanyard Creek Limited Detail Study Plan: Floodway Run 2/8/2008
Reepsville Road TOR TCStructure ID: LDS_TC_01Approximate Surve
.1
.05
.1
RS 7326
Legend
WS 100-FW
WS 100-year
Ground
Ineff
Bank Sta
Encroachment
Elevation (ft)
820
815
810
805
800
795
790
785
780
4200
4400
4600
4800
5000
5200
5400
Station (ft)