Cover Page

Hydraulics Unit Pre-Design Report (Pre-Scoping) for Structure #: 540054

Date: 10/10/2016

County: Lincoln **Stream:** INDIAN CREEK

Road #: SR 1252 **Road Name:** LABORATORY RD

Division: 12 **Location:** 0.8 M N JCT SR 1239

Latitude: 35.42281 **Longitude:** -81.25922 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: 1955

Span Arrangement: 5@ 40' OAL (ft): 200.0 Skew: 90 Abutment Type: RC CAPS ON STEEL PILE

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

Bed to Crown (ft): 27.0 Clear Roadway (ft): Water Depth (ft) 4.0 Superstructure Depth:

ADT: 1800 Year ADT: 2012 Scour Code (item113): 5 Prior Survey Completed: ☑ Survey Date: 08/01/1954

Drainage Area: 69.8 Sq. Mi. Drainage Area Source: Other Roadway Overtops at Q100: ☐

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

Q10 (cfs): Q25 (cfs): 6,700 Q50 (cfs): 8,100 Q100 (cfs): 9,400 QBFE (cfs):

☐ Structure in Flood Hazard Zone Panel #: 3621 Panel Date: 09/28/2007 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: 0.75 M E JCT SR 1176

Structure #: 540063 Route: NC 150

Latitude: 35.42928 Longitude: -81.28963

Prior Survey Completed: ☐ Survey Date: Bed to Crown (ft): 22.0 Year Built: 2001

Structure Type: Bridge

Span Arrangement: 1 @ 23', 1 @ 66', 1 @ 28' OAL (ft):

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

Downstream Feature: Confluence w/ Stream(s)

Location: 0.88 M ALONG FLOW LINE D/S

Structure #: Route: SR

Latitude: 35.42120 Longitude: -81.24920

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 #:11-129-8-(6.5)

OFFICE ESTIMATE: _____

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

PREDESIGN-~~SCOPING~~ REPORT

F-24

County LINCOLN (DIV. 12) Bridge# 540054
Road# LABORATORY RD. SR 1252
Stream INDIAN CREEK

Type Of Request: POC Force Account TIP NCMA

Date 10/10/16 Name WSH Assigned To PFF/MTS
Checked By ECA 10-10-16
Prior Survey Date 8-'54 (attach copy of prior survey) BRN. BK.: 5@40' 8-54 CO. FILE NO
Study By Scour Section YES - ATTACHED PDR ? NO
Flood Zone AE Detail Study REDELINA (HEC-2) Date 9-28-07 Panel# 3621 X
B.M. Info N/A
Quad Map LINCOLNTON W. Drainage Area 69.8 Sq M From STREAM STATS
Q25 6700 cfs Q50 8100 cfs Q100 9400 cfs Method NEW REG. EQUATIONS
LONG.: -81.259221
LAT.: 35.422805
REGION 1
I.A= 1.8%

EXISTING BRIDGE INFORMATION

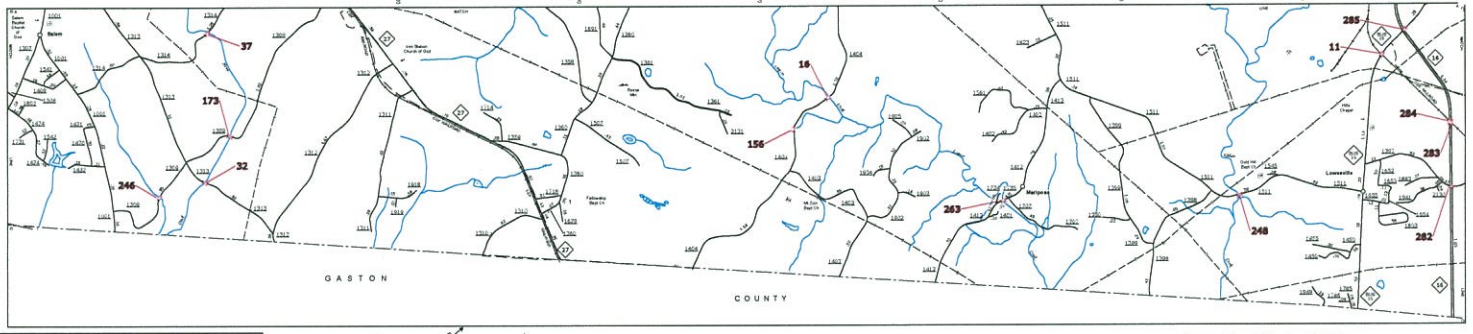
Location 0.8 M. N. JCT. SR 1239
Average Daily Traffic 1800 (2012) 6% TRK YEAR BUILT: 1955
Length 200' Bed- To Crown 27' Water Depth 4'
Type Structure RC DECK ON I BEAMS / RC CAPS ON STEEL PILES
Type Spans 5@40'
Upstream Structure 540063 / RC DECK - PPC GIRDERS YR. BUILT: 2001 (1@23', 1@66', 1@28')
Location NC 150; 0.75 M E JCT SR 1176 LONG: -81.289627
Bed- To Crown 22' (H20 = 2' Deep) Prior Survey N/A LAT: 35.429275
Downstream Structure FLOWS INTO SO. FORK CATAWBA RIVER YR. BUILT: N/A
Location 0.88 MILES ALONG FE D/S
Bed- To Crown N/A Prior Survey N/A LONG: -81.249201
LAT: 35.421197

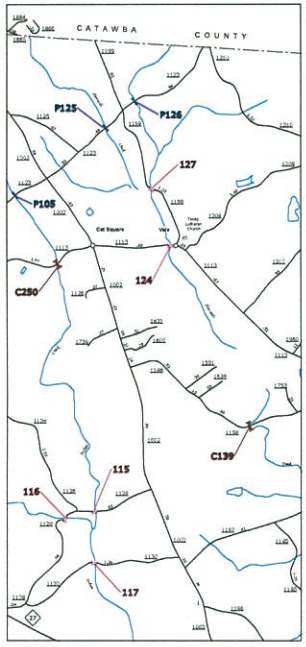
ENVIRONMENTAL TVA: NO ✓

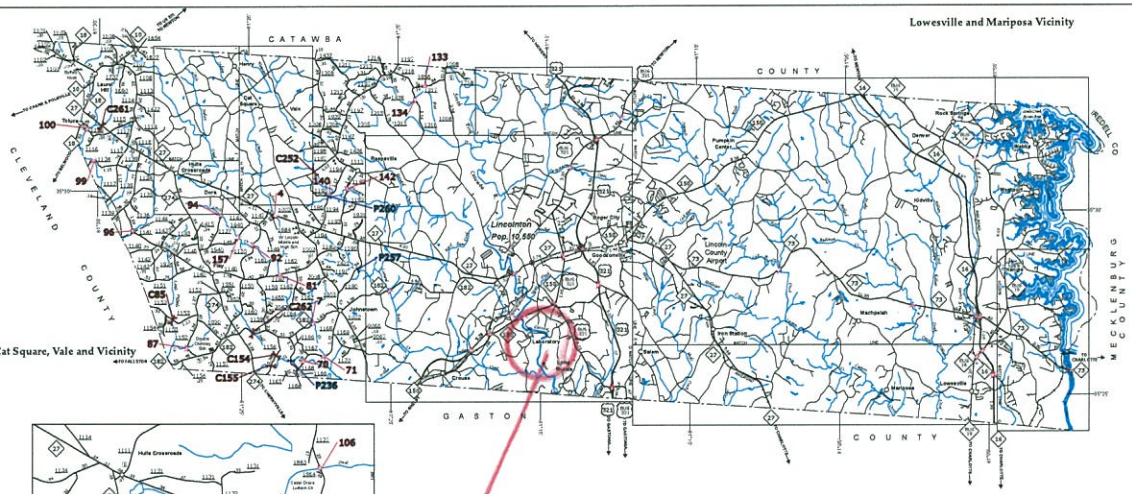
Trout Stream NO ✓ Anadromous Fish NO Primary Nursery Area NO
High Quality Waters NO Nutrient Sensitive Waters NO
Near Water Supply Intake NO CAMA County NO
Stream Classification WS-IV ✓ STREAM #: 11-129-8-(6.5) ✓
DENR River Basin Info. CATAWBA ✓

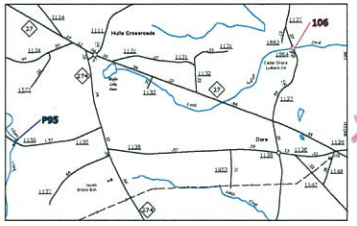
1,84,92,147
U/S 31
PSR PDR in Sdrive

5400054











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

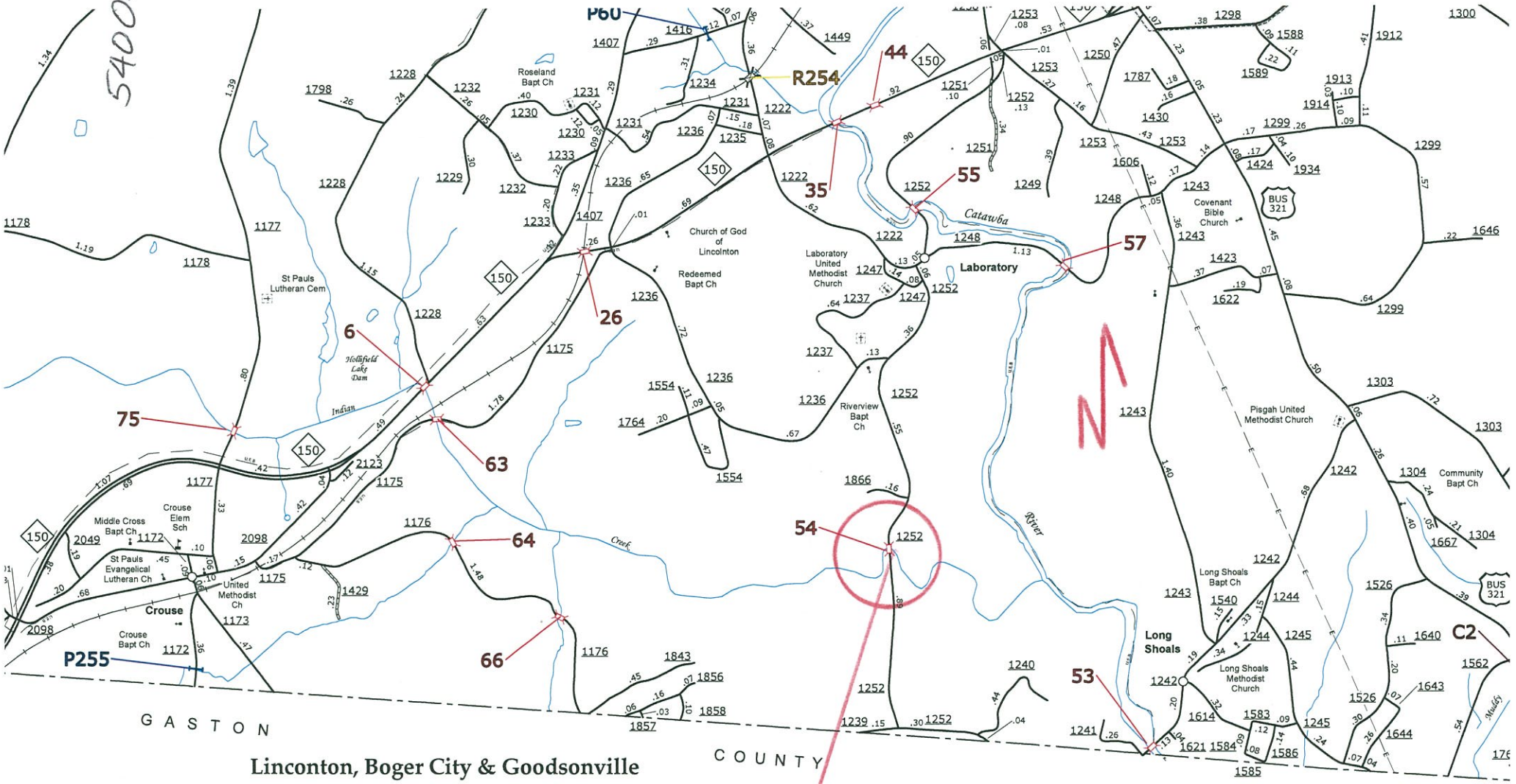
SCALE
1 0 1 2 3 4 MILES
0 0.5 1 MILES
SCALE FOR ENLARGEMENTS

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

SHEET 1 OF 3

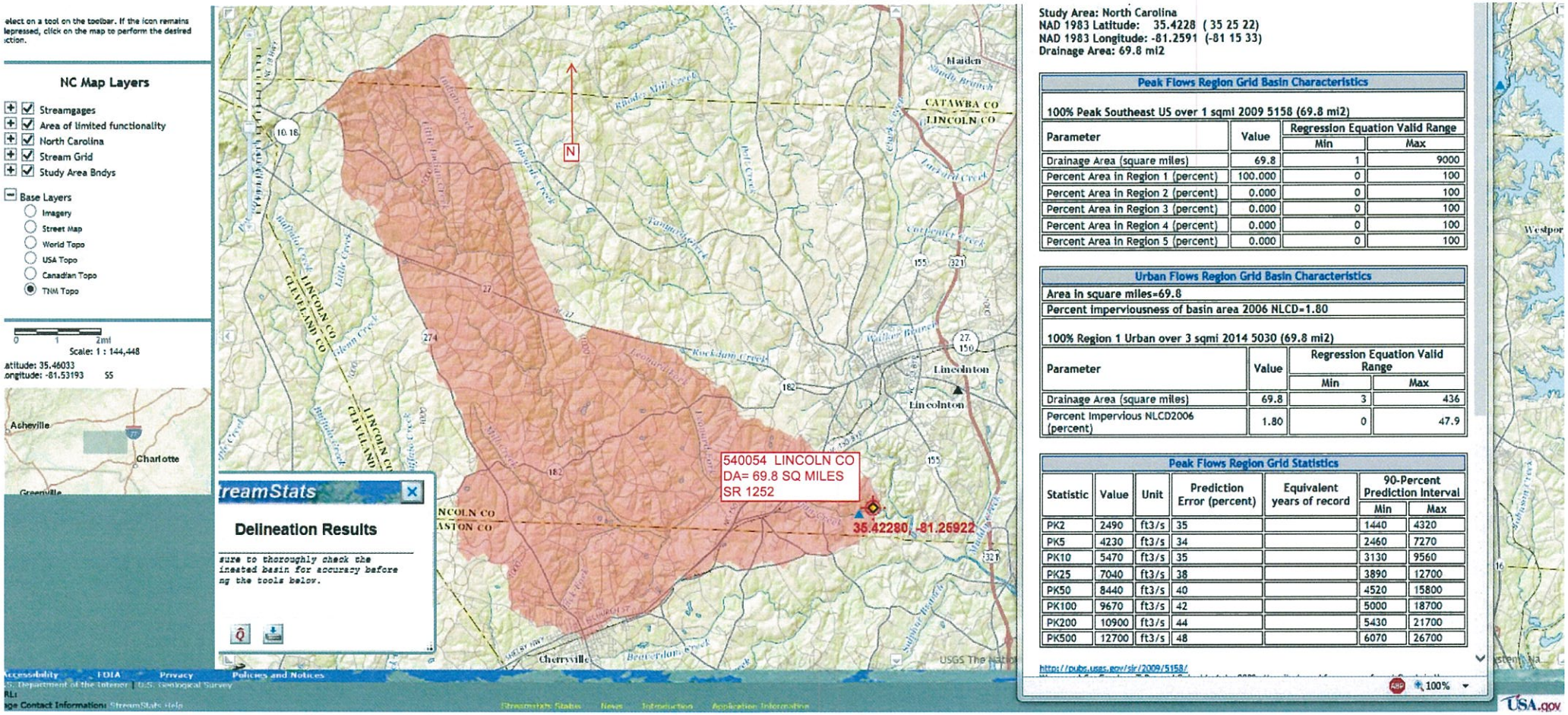
#54

5400054


P60
R254
44
35
55
57
26
6
75
63
64
66
54
53
P255
C2
Catawba
River
Creek
Indian
Hollifield Lake Dam
Roseland Bapt Ch
Church of God of Lincolnton
Redeemed Bapt Ch
Laboratory United Methodist Church
Laboratory
Riverview Bapt Ch
St Pauls Lutheran Cem
Middle Cross Bapt Ch
Crouse Elem Sch
St Pauls Evangelical Lutheran Ch
United Methodist Ch
Crouse
Crouse Bapt Ch
Covenant Bible Church
Pisgah United Methodist Church
Long Shoals Bapt Ch
Long Shoals
Long Shoals Methodist Church
Community Bapt Ch
BUS 321
150
GASTON
COUNTY
Linconton, Boger City & Goodsonville
22
23
24
25

#54

540054



Study Area: North Carolina
NAD 1983 Latitude: 35.4228 (35 25 22)
NAD 1983 Longitude: -81.2591 (-81 15 33)
Drainage Area: 69.8 mi2

Peak Flows Region Grid Basin Characteristics

100% Peak Southeast US over 1 sqmi 2009 5158 (69.8 mi2)

Parameter	Value	Regression Equation Valid Range	
		Min	Max
Drainage Area (square miles)	69.8	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=69.8

Percent imperviousness of basin area 2006 NLCD=1.80

100% Region 1 Urban over 3 sqmi 2014 5030 (69.8 mi2)

Parameter	Value	Regression Equation Valid Range	
		Min	Max
Drainage Area (square miles)	69.8	3	436
Percent Impervious NLCD2006 (percent)	1.80	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	2490	ft3/s	35		1440	4320
PK5	4230	ft3/s	34		2460	7270
PK10	5470	ft3/s	35		3130	9560
PK25	7040	ft3/s	38		3890	12700
PK50	8440	ft3/s	40		4520	15800
PK100	9670	ft3/s	42		5000	18700
PK200	10900	ft3/s	44		5430	21700
PK500	12700	ft3/s	48		6070	26700

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

5400 54

NC DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
STRUCTURE MANAGEMENT UNIT

ATTENTION: HYDROPLATFORM USED , PRIORITY MAINT ITEMS ISSUED ON I BEAMS, PM ISSUED ON DRIFT

Structure Safety Report

Routine Element Inspection - Contract

COUNTY: LINCOLN **STRUCTURE NUMBER:** 540054 **FREQUENCY:** 24 MONTHS

FACILITY CARRIED: SR1252 **MILE POST:**

LOCATION: 0.8 MI. N. JCT. SR1239

FEATURE INTERSECTED: INDIAN CREEK

LATITUDE: 35° 25' 22.02" **LONGITUDE:** 81° 15' 33.35"

SUPERSTRUCTURE: REINFORCED CONCRETE DECK ON I-BEAMS

SUBSTRUCTURE: END & INTERIOR BENTS:RC CAPS ON STEEL PILES

SPANS: 5@40'0" SIMPLE

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

PRESENT CONDITION: Poor **INSPECTION DATE:** 03/08/2016

POSTED SV: 26 **POSTED TTST:** 32

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
RD WI;LLIAMS	B Williams	CARLTON ADAMS

540054

Structure: 540054 County: LINCOLN Date: 03/08/2016 Structure Photos



EAST PROFILE



WEST PROFILE

540054

BRIDGE MANAGEMENT UNIT

DATA ON EXISTING STRUCTURE Run Date: 06/09/2016

COUNTY :	DIVISION :	DISTRICT:	STRUCTURE NUMBER :	LENGTH :
LINCOLN	12	3	540054	200 FEET

ROUTE CARRIED : SR1252

FEATURE INTERSECTED : INDIAN CREEK

LOCATED : 0.8 MI. N. JCT. SR1239

BRIDGE NAME :

CITY :

FUNC. CLASS :	SYST.ON :	SYST.UNDER :	ADT & YR :	RAIL TYPE :
09	NFA	NFA	1800 2012	LT 141 RT 141

BUILT :	BY :	PROJ :	FED.AID PROJ :	DESIGN LOAD :
1955	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	27	FT	4	FT

SUPERSTRUCTURE : REINFORCED CONCRETE DECK ON I-BEAMS

SUBSTRUCTURE : END & INTERIOR BENTS:RC CAPS ON STEEL PILES

SPANS : 5@40'0" SIMPLE

BEAMS OR GIRDERS : 4 LINES OF W27X94 I-BEAMS @ 7'0" CENTERS

FLOOR :	ENCROACHMENT :	DECK (OUT TO OUT) :
6.5" RC SLAB	4 LNS 4" PVC (TEL)	26.417 FT

CLEAR ROADWAY :	BETWEEN RAILS :	SIDEWALK OR CURB :			
24 FT	26.25 FT	LT	1.125 FT	RT	1.125 FT

VERT.CL.OVER : 999.9 FT

INV.RTG. :	OPE.RTG. :	CONTR.MEMBER :	POSTED :				
HS-12	HS-21	Int.bms	SV	26	TTST	32	DATE 09/30/2008

SYSTEM : Secondary S.R. Route

GREEN LINE ROUTE : N

UNDER ROUTES AND CLEARANCES

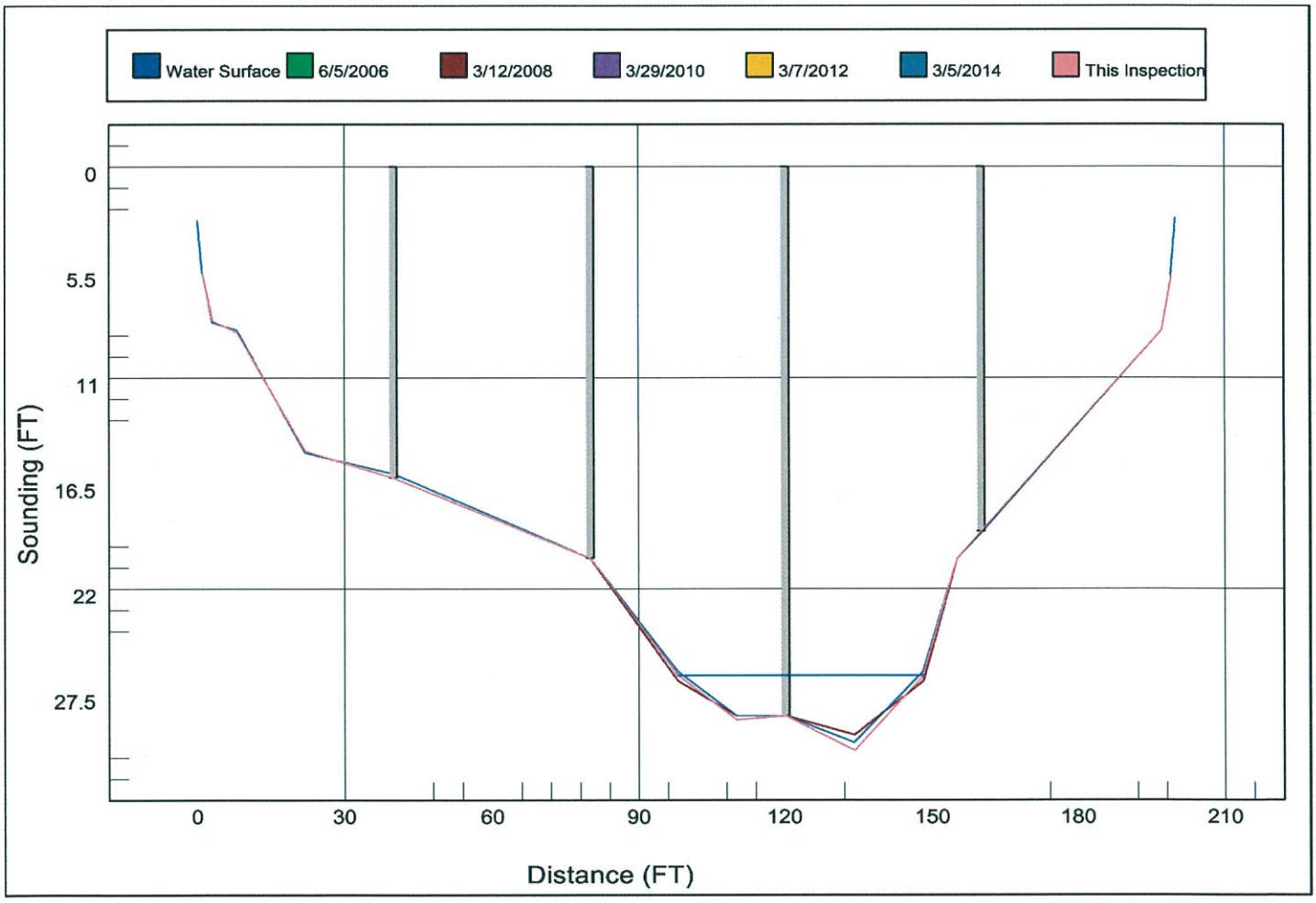
REMARKS :

540054

Bridge: 540054 County LINCOLN Date:

STREAMBED PROFILE (Downstream)

Top of Rail = 0 FT (Sounding)



U/S STR for 540054

Structure: 540063 County: LINCOLN Date: 03/03/2016 Structure Photos

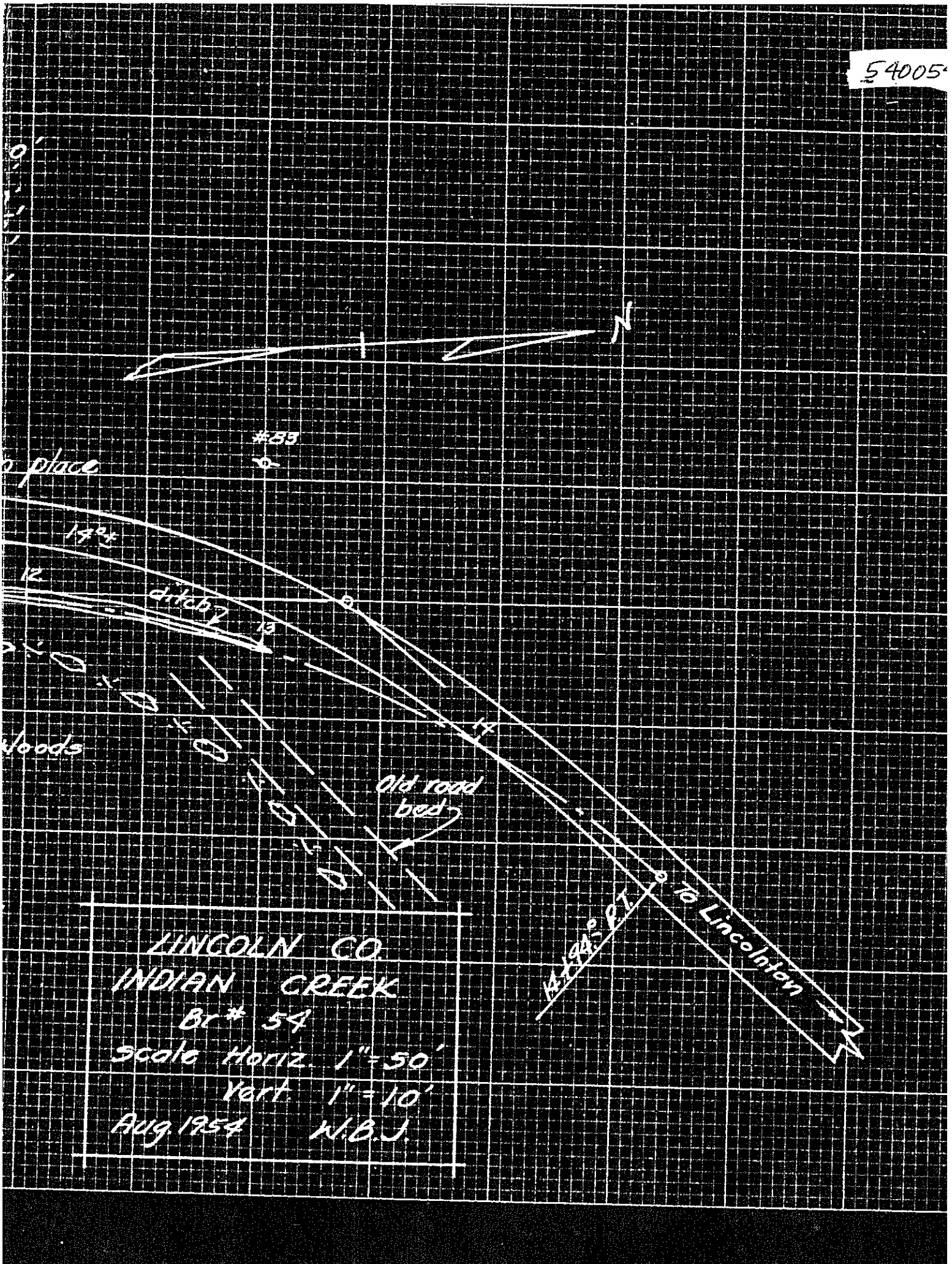


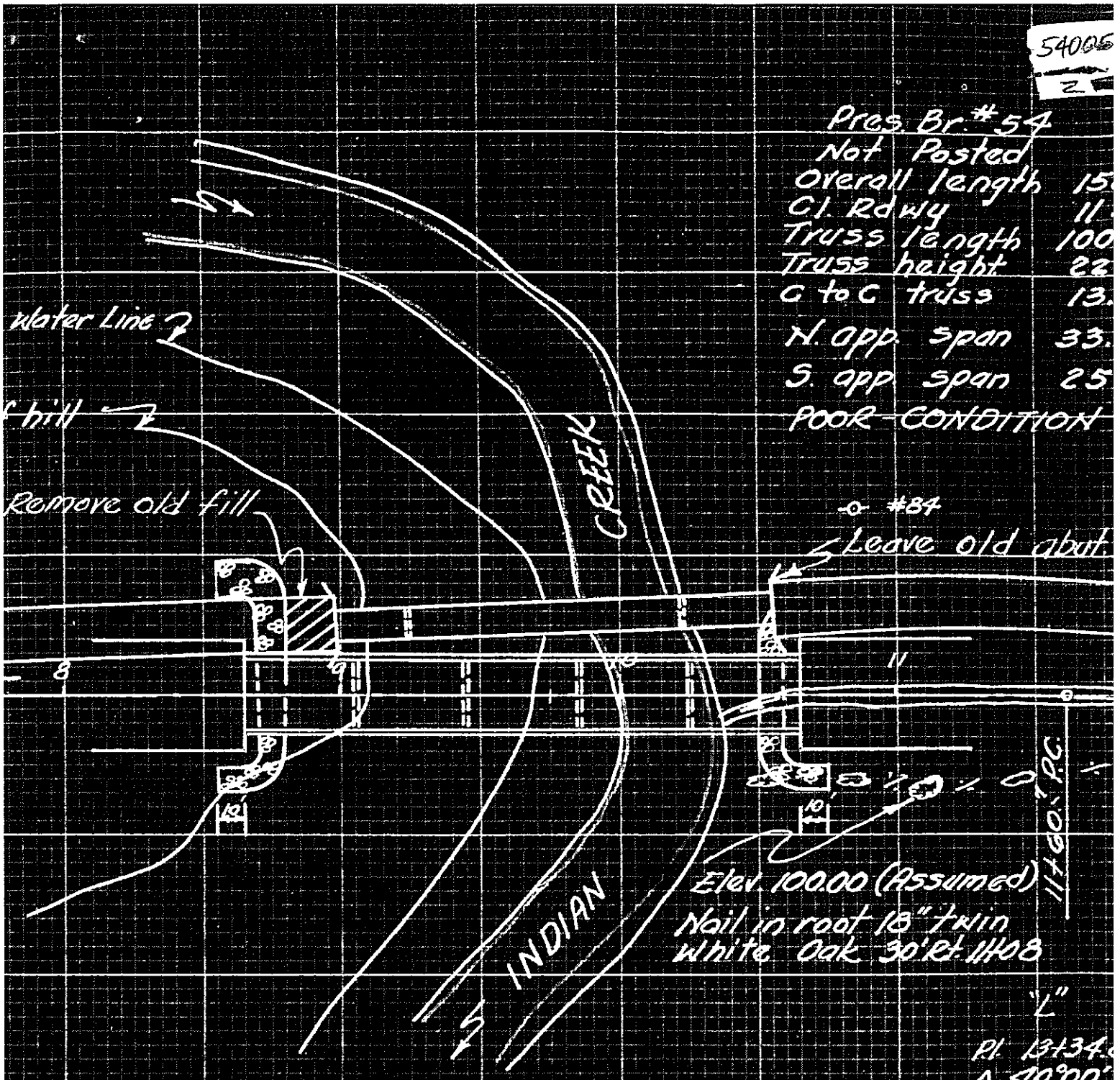
BENT 2



BENT 1

54005


N
#33
place
17
12
ditch
13
woods
17
Old road bed
To Lincolnton
LINCOLN CO.
INDIAN CREEK
Br # 54
Scale Horiz. 1" = 50'
Vert. 1" = 10'
Aug. 1954 W.B.J.



CHARLES BRUNING COMPANY

CROSS SECTION 10 x 10

PRINTED IN U.S.A.

54054

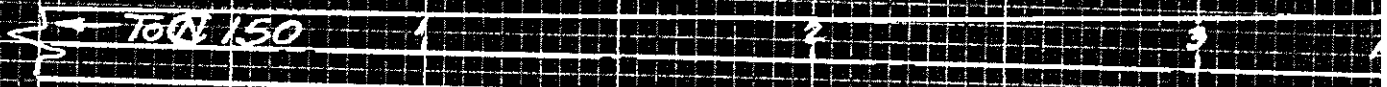
DA 73 Sq.Mi.
Tal C = 0.6
Waterway
Reqd = 1930

com. Line "L"

5 6 7

N4°3

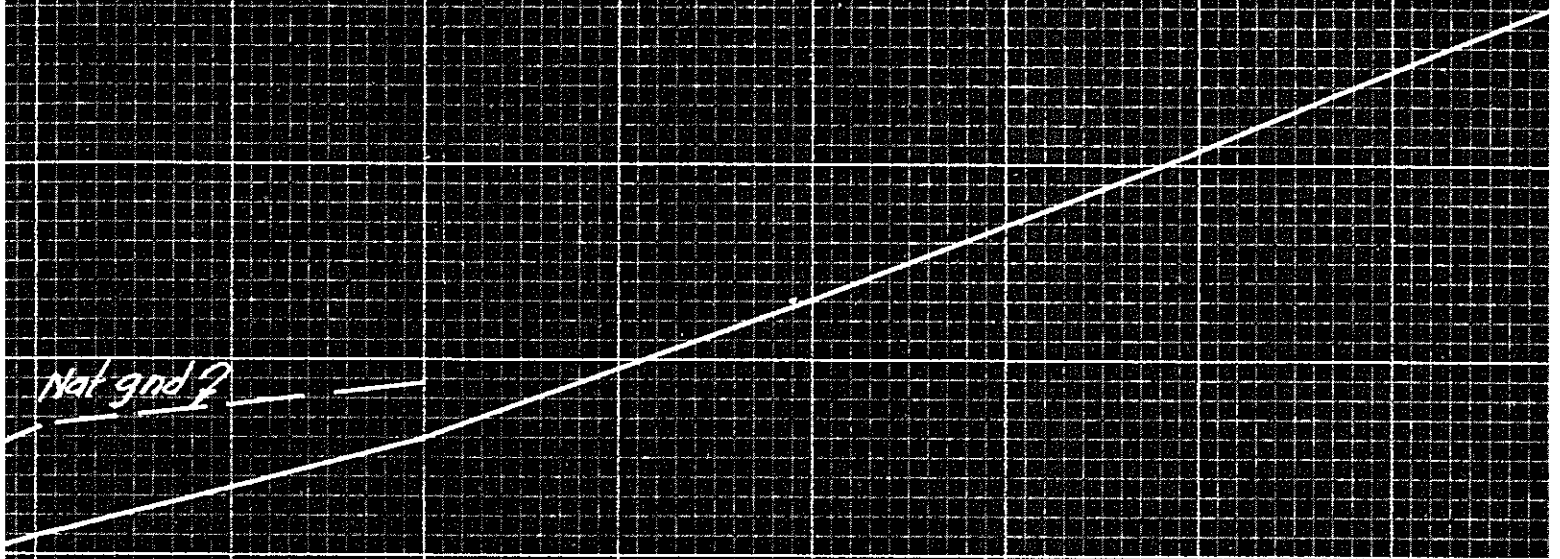
540054
4



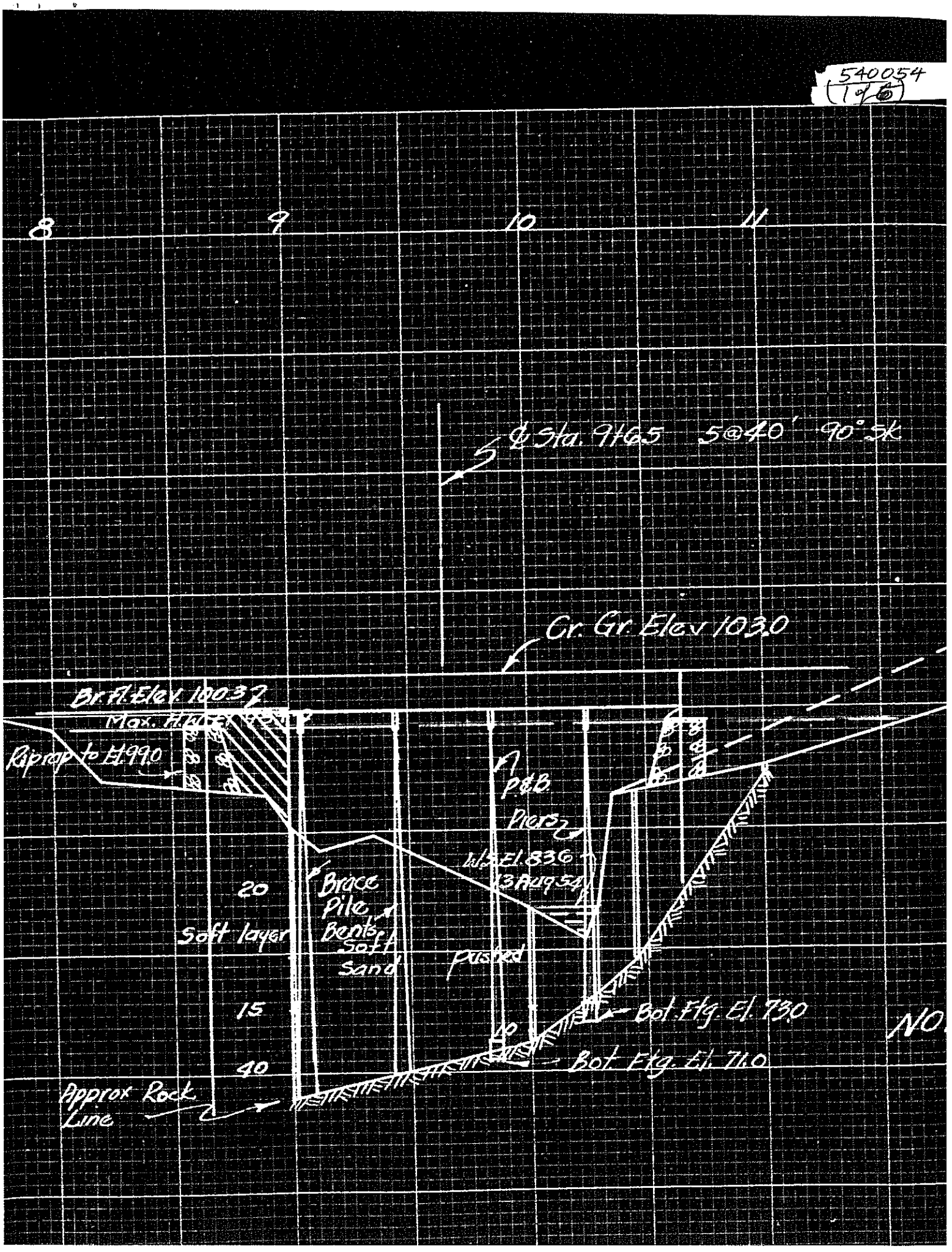
CHARLES BRUNING COMPANY
CROSS SECTION 10 x 10

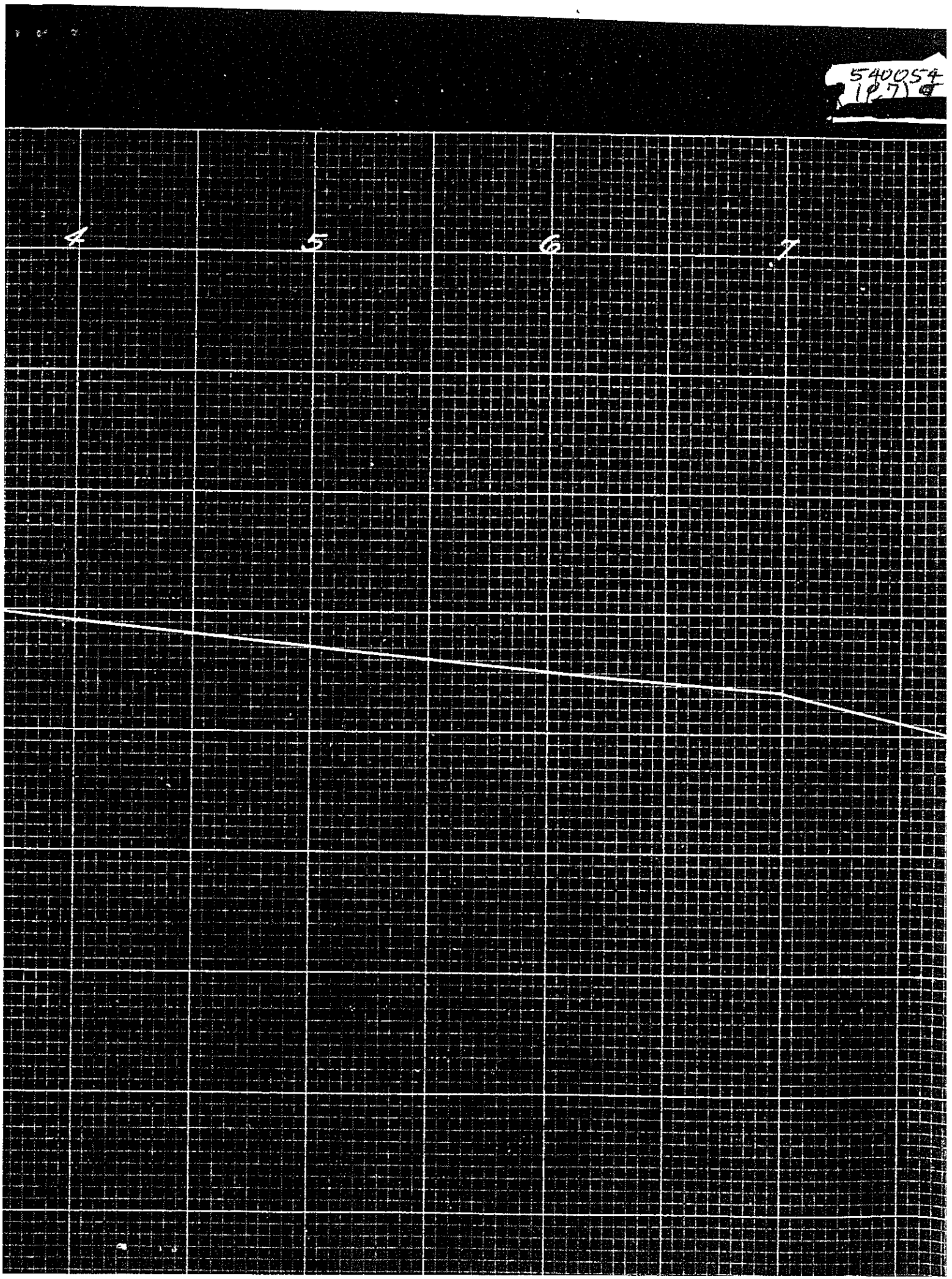
540054
1-5

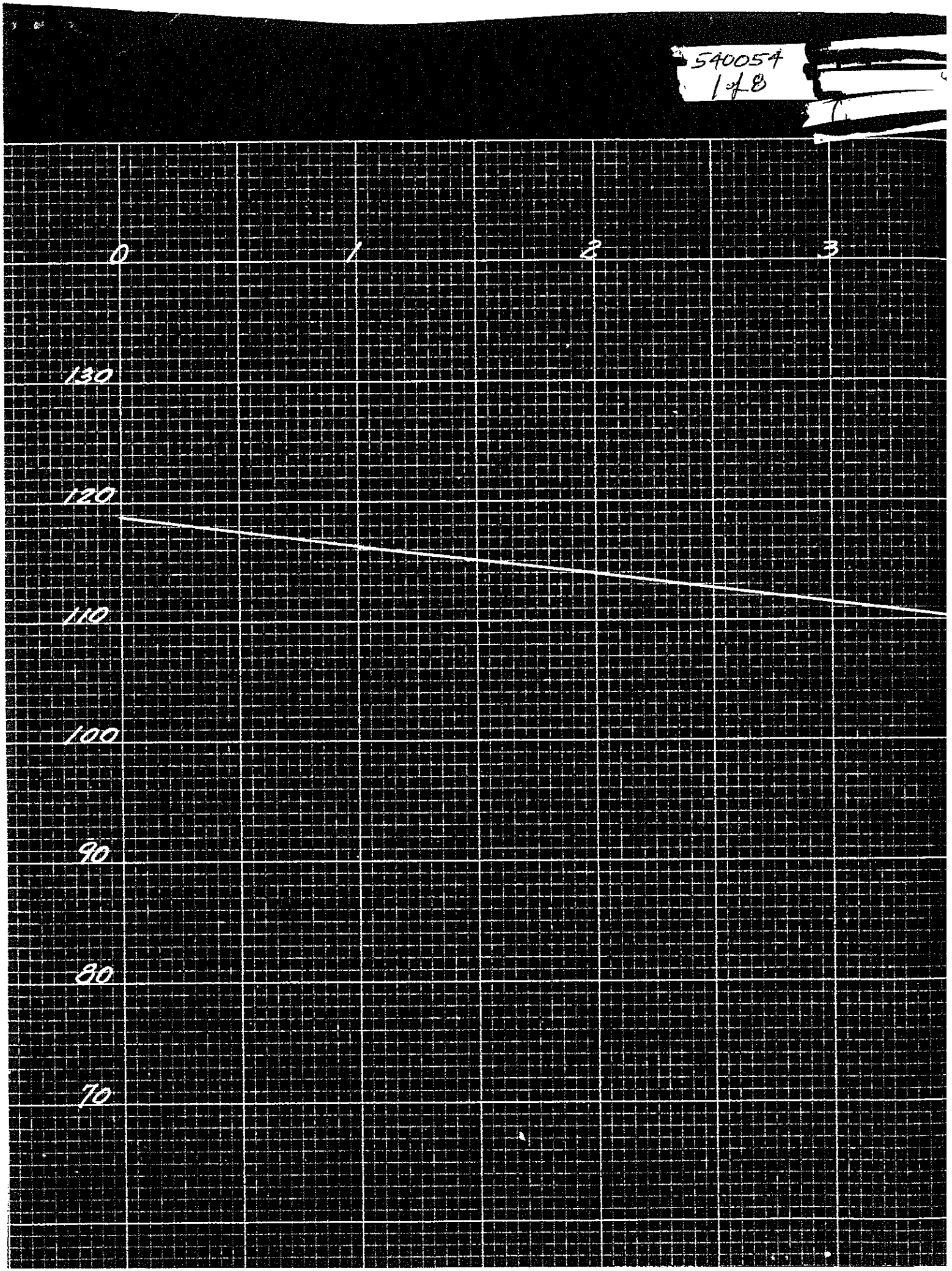
12 13 14 15



If Creosote piles are used
Shoes are req'd for tips


8
9
10
11
℄ Sta. 9+65 5@40' 90° Sk
Cr. Gr. Elev 103.0
Br. Fl. Elev. 100.32
Max. H
Riprap to El. 99.0
P&B
Piers
W.S. El. 83.6
(3 Aug 54)
20
Soft layer
Brace
Pile
Bents
Soft
Sand
Pushed
15
40
Bot. Ftg. El. 73.0
Bot. Ftg. El. 71.0
Approx Rock
Line
NO


5400574
4
5
6
7


540054
1 of 8
0
1
2
3
130
120
110
100
90
80
70

540054

rev. 8/2009

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

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

BRIDGE SCOUR REPORT

COUNTY: Lincoln BRIDGE: 540054 ROUTE: SR 1252 STREAM CROSSED: Indian Creek

ASSESSMENT: Yes EVALUATION: _____ BY: JJB DATE: 5/04/2011

FHWA STRUCTURE INVENTORY & APPRAISAL CODES:

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

* Full Scour Report Available In Hydraulics Unit Scour Files

10-12-16

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 DEPTH (UPSTREAM FACE, FROM TOP OF RAIL):

REQUIRED ACTION: _____

INCREASE UNDERWATER INSPECTION CYCLE? YES_____ NO ✓ FREQUENCY_____

COUNTER MEASURES:

PLAN REQUIRED? YES_____ NO ✓
SUMMARY OF PLAN:

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

BRIDGE MAINTENANCE COMMENTS:

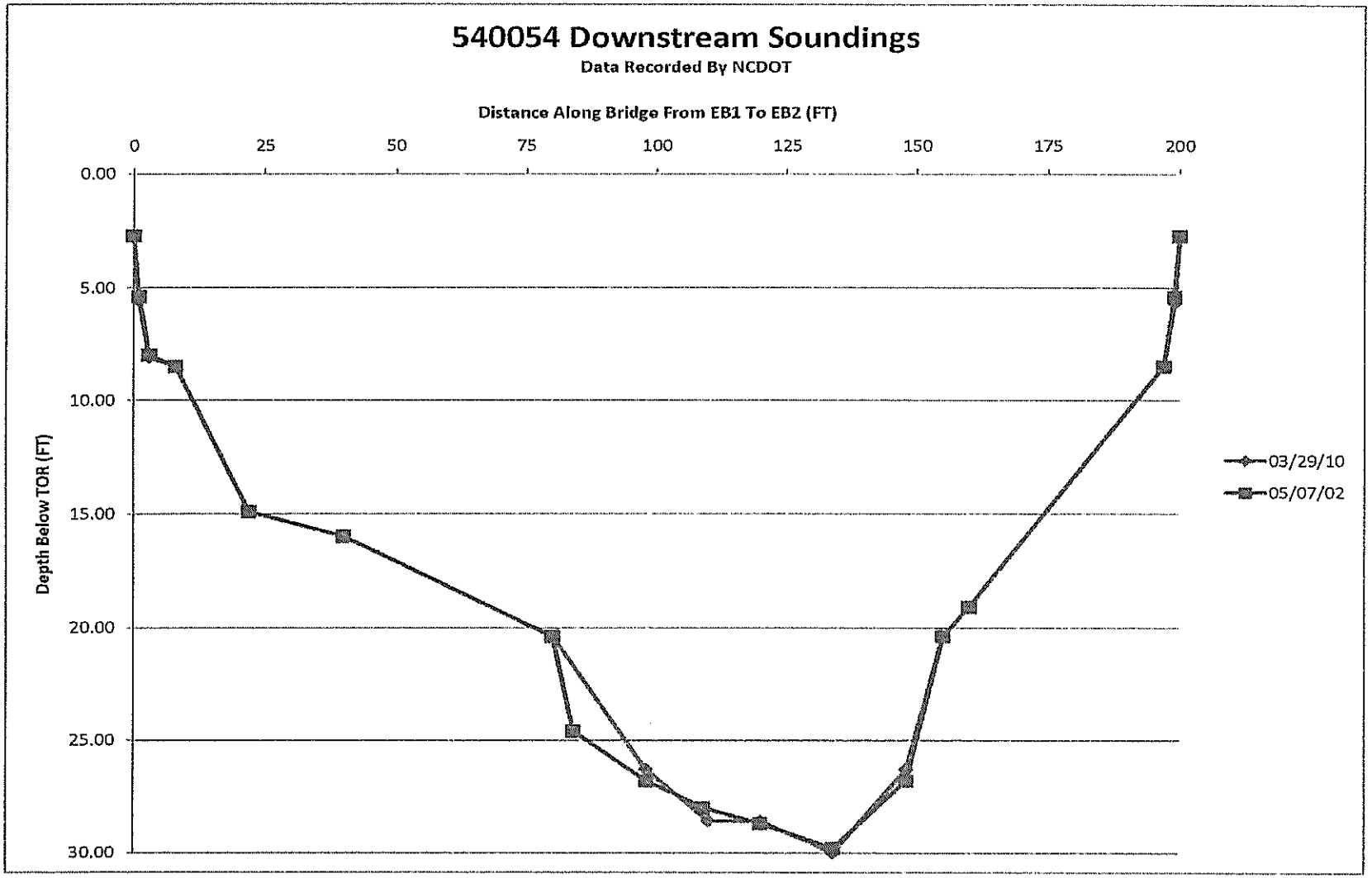
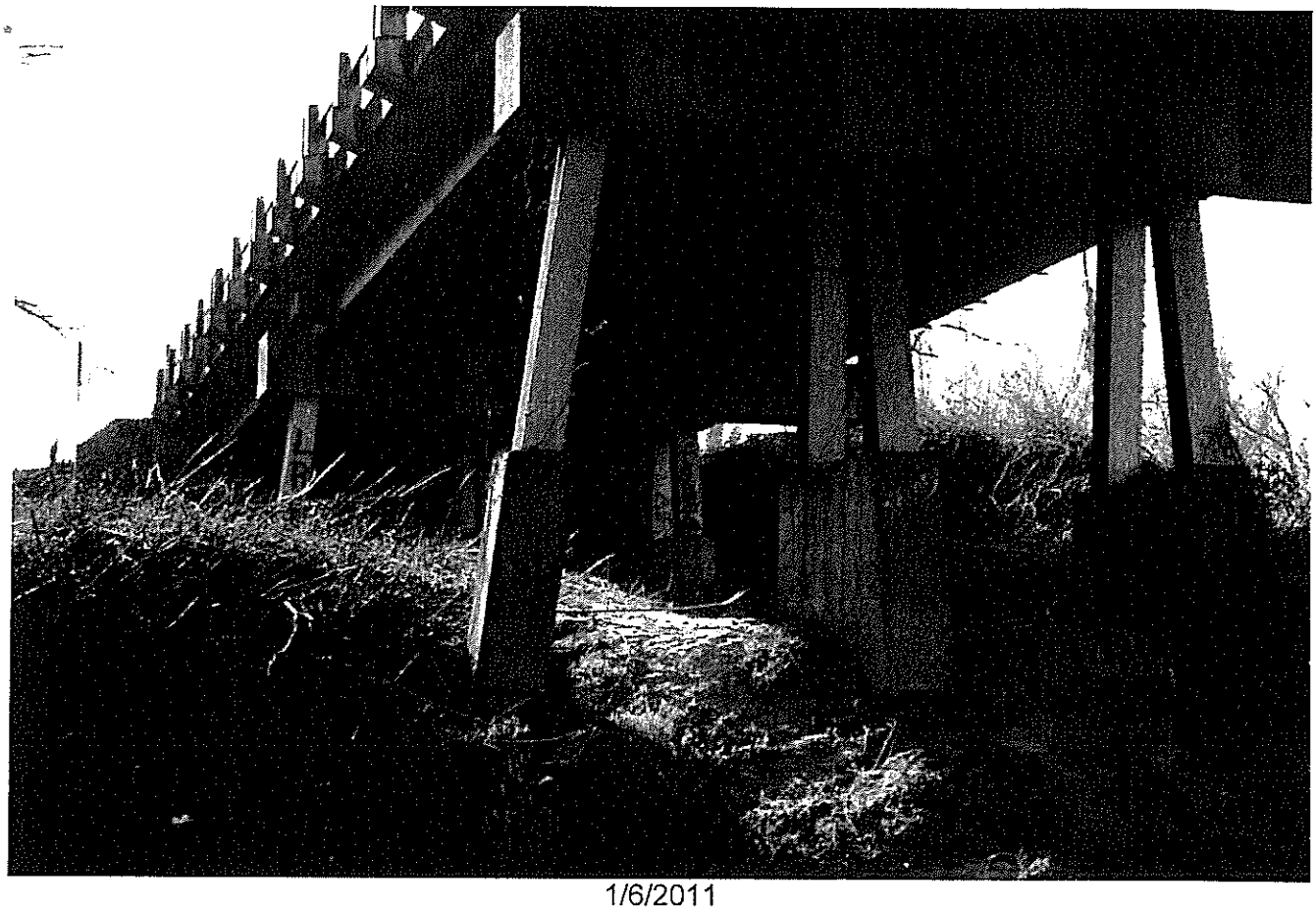


Figure 2: Streambed Profile



1/6/2011
Lincoln County Bridge 540054 - Bents 1 and 2



1/6/2011
Lincoln County Bridge 540054 - Bent 3 Looking Northwest

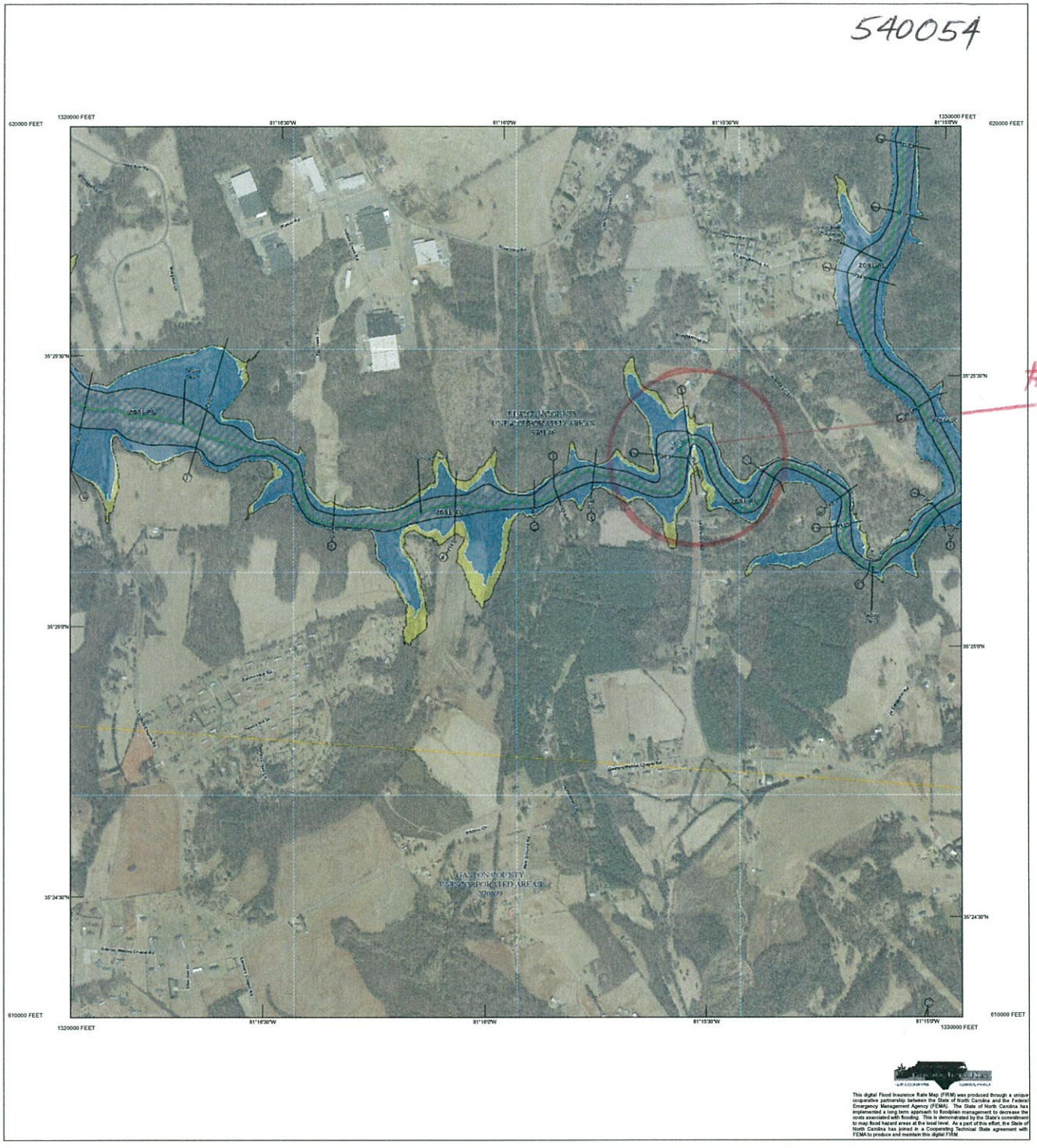


1/6/2011
Lincoln County Bridge 540054 - Looking North at Bents 2 Through 4



1/6/2011
Lincoln County Bridge 540054 - Looking South on the Upstream Side

540054



#54

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
- 513 — 12.2 Cross Sections with 1% Annual Chance Water Surface Elevation (BFE)
- B Coastal Transect

OTHER FEATURES
- Coastal Transect Baseline
- Profile Baseline
- 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 flood proofing 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 flood proofing or other protective measures. For more information on flood insurance, interested parties should visit the FEMA Website at http://www.fema.gov/business/nfip/index.shtm.

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

Limit of Moderate Wave Action (LIMWA)

COASTAL BARRIER RESOURCES SYSTEM (CBRS) NOTE

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

CBRS Area | Otherwise Protected Area

SCALE

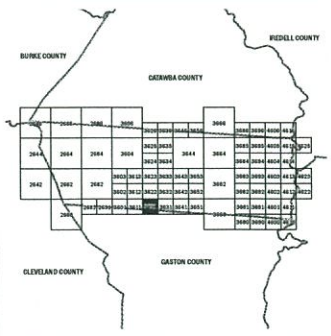
Map Projection:
North Carolina State Plane Projection Feet (Zone 3200)
Datum: NAD 1983 (Horizontal), NAVD 1988 (Vertical)

1 inch = 500 feet 1:6,000

0 250 500 1,000 Feet

0 75 150 300 Meters

PANEL LOCATOR



FEMA

National Flood Insurance Program

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

NORTH CAROLINA

PANEL 3621

FEMA

Panel Contains:

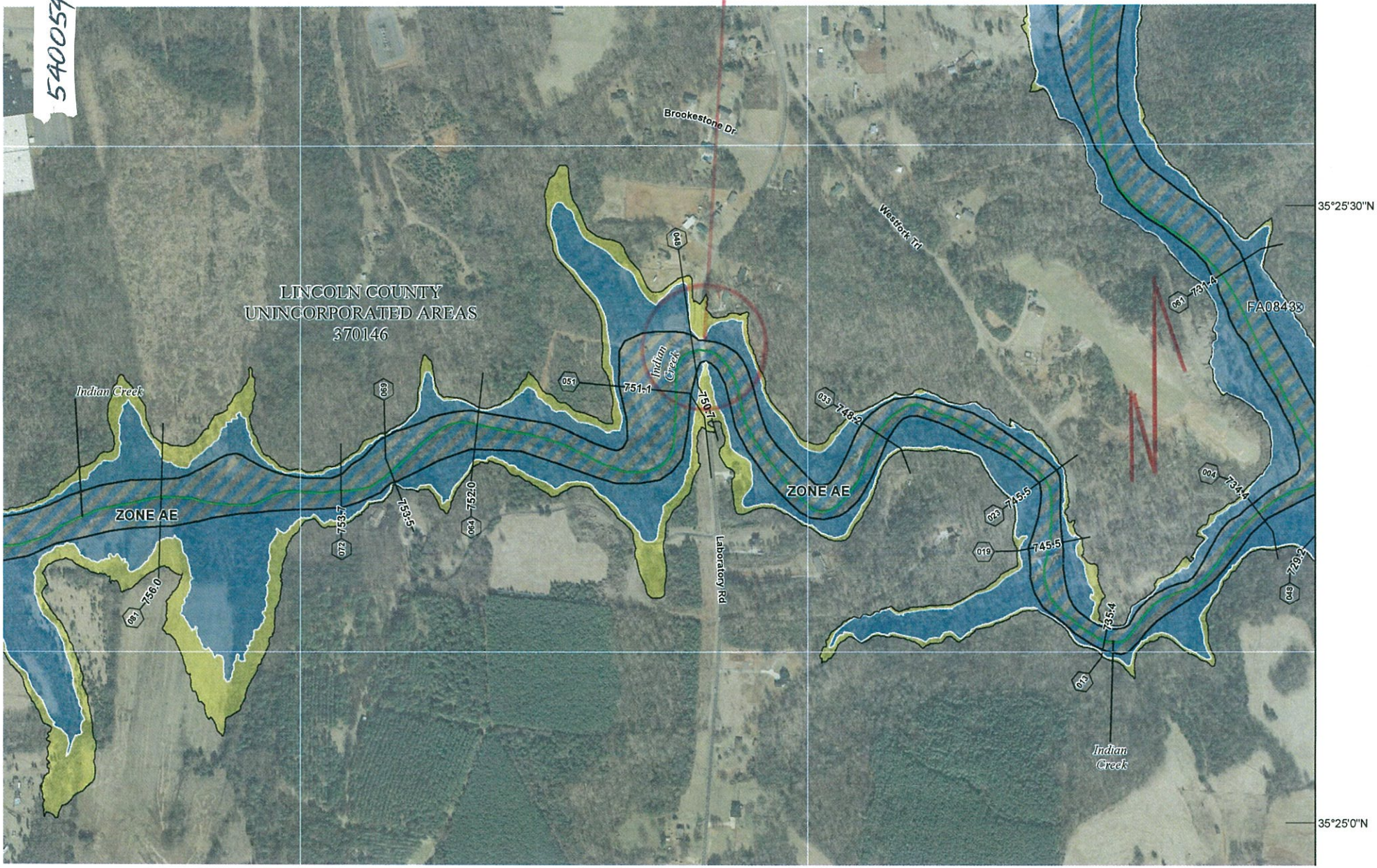
COMMUNITY	CID	PANEL	SUFFIX
GASTON COUNTY	370099	3621	J
LINCOLN COUNTY	370146	3621	J

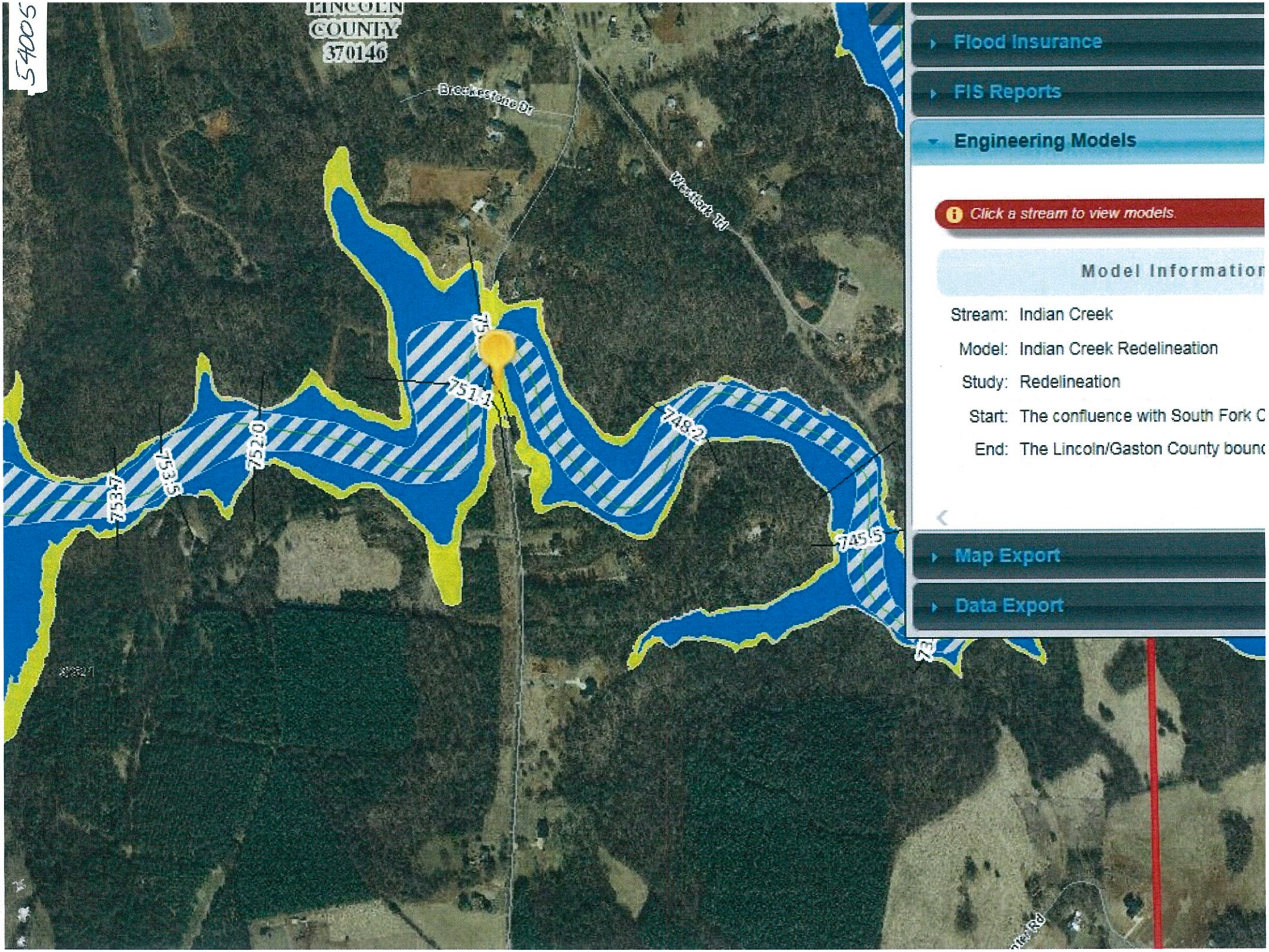
MAP NUMBER
3710362100J

MAP REVISED
9/28/2007

#54

540054


Brookestone Dr
Westfork Trl
LINCOLN COUNTY
UNINCORPORATED AREAS
370146
Indian Creek
Indian Creek
ZONE AE
ZONE AE
Laboratory Rd
FA0843
751.1
750.7
748.2
745.5
745.5
734.4
731.4
729.2
735.4
753.7
753.5
752.0
756.0
35°25'30"N
35°25'0"N


54005
LINCOLN
COUNTY
370146
Brookestone Dr
Westlark Trl
751.1
752.0
753.5
753.7
748.2
745.5
Flood Insurance
FIS Reports
Engineering Models
Click a stream to view models.
Model Information
Stream: Indian Creek
Model: Indian Creek Redelineation
Study: Redelineation
Start: The confluence with South Fork C
End: The Lincoln/Gaston County bound
Map Export
Data Export