STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

MICHAEL F. EASLEY
GOVERNOR

LYNDO TIPPETT
SECRETARY

September 28, 2007

U. S. Army Corps of Engineers
Regulatory Field Office
Post Office Box 1890
Wilmington, NC 28402-1890

ATTENTION: Richard Spencer
NCDOT Coordinator

Dear Sir:

Subject: **Application for Section 404 Nationwide 23 Permit** for the replacement of Bridge No. 88 over Ferrells Creek on SR 1525 (River Road), Chatham County. Federal Aid Project Number BRZ-1525 (4), WBS No. 33276.1.1, State Project No. 8.2522101, Division 8, T.I.P No. B-3824.

The North Carolina Department of Transportation (NCDOT) proposes to replace the 116 foot Bridge No. 88 over Ferrells Creek with a new 3 span bridge approximately 144 feet in length. The new structure will be a 45 inch pre-stressed concrete girder bridge with one span at 30 feet, one span at 60 feet and one span at 54 feet. The project will replace the current bridge with a new bridge on its existing location, while using an offsite detour to maintain traffic during construction. The new bridge will span the stream and no bents will be placed in the stream.

Please see the enclosed copies of the permit drawings, half size plan sheets, utility drawings, and the United States Fish and Wildlife (USFWS) concurrence letter. A Programmatic Categorical Exclusion (PCE) document was completed for this project in March 2005 and the Natural Resources Technical Report (NRTR) was completed in September 2003. They were both distributed shortly thereafter. Additional copies available upon request.

IMPACTS TO WATERS OF THE UNITED STATES

The project is located in the Cape Fear River Basin (subbasin 03-06-04). This area is part of Hydrologic Cataloging Unit 03030002. Ferrells Creek, DWQ Index # 16-32, is the only water resource within the project area. Ferrells Creek is assigned a Best Usage Classification of WS-IV NSW. No designated Outstanding Resource Waters (ORW), High Quality Waters (HQW),

MAILING ADDRESS:
NC DEPARTMENT OF TRANSPORTATION
PROJECT DEVELOPMENT AND ENVIRONMENTAL ANALYSIS
NATURAL ENVIRONMENT UNIT
1598 MAIL SERVICE CENTER
RALEIGH NC 27699-1598

TELEPHONE: 919-715-1334 or
919-715-1335

FAX: 919-715-5501

WEBSITE: WWW.NCDOT.ORG

LOCATION:
2728 CAPITAL BLVD. SUITE 240
RALEIGH NC 27604

Water Supply I (WS-I), or Water Supply (WS-II) occur within 1.0 mile of the project area. Ferrells Creek is not listed as a 303(d) stream according to the Final 2006 303(d) list and there are no 303(d) waters that occur within 1.0 mile of the project area.

The wetland is considered riverine based upon its location within the Ferrells Creek floodplain and is classified as a palustrine, seasonally flooded, forested wetland supporting broad-leaved deciduous vegetation (PFO1C, Cowardin classification). A jurisdictional delineation information package was sent on July 6, 2007 to the USACE Wilmington Office followed by Rapanos forms that were sent on August 7, 2007.

Permanent Impacts

There will be 0.06 acres of riverine wetland impacts resulting from construction of roadway/bridge approaches. There will be 0.03 acres of impact resulting from fill and 0.03 acres of impact resulting from mechanized clearing in the riverine wetland.

There are no stream impacts associated with this project.

Utility Impacts

The proposed power poles are being relocated to the south side outside the wetland. However, hand clearing will be necessary through a part of the wetland to allow for a 15 foot zone on each side of the aerial power line to be used for future maintenance. The proposed aerial and buried telephone lines will be relocated to the north side. All telephone line relocations will be aerial except at Ferrells Creek where the telephone lines will be directionally bored under the creek.

The new power pole is shown in the attached utility drawing (Sheet 4 of 4) southwest of the existing pole at Sta. 11+50 55 RT. The utility impact area shown is the area just outside that which will occur due to the road construction. The utility impacts for hand clearing in the wetland for the aerial power line is 0.02 acres.

Bridge Demolition

The existing 3- span bridge was constructed in 1953 and is 116 feet in length. The superstructure consists of an asphalt-wearing surface, timber deck on steel I-beams supported by timber end bents and timber piles. The substructure is composed of timber caps supported by timber piles. Some of the interior bent timber piles do have concrete jackets around the base. Only one of the two interior bents is located in the stream. It is expected that this bent will be pulled out with minimal stream disturbance. Best Management Practices for Bridge Demolition and Removal will be implemented during demolition and construction.

MITIGATION OPTIONS

Avoidance and Minimization and Compensatory Mitigation

The NCDOT is committed to incorporating all reasonable and practicable design features to avoid and minimize jurisdictional impacts, and to provide full compensatory mitigation of all remaining, unavoidable jurisdictional impacts. Avoidance measures were taken during the planning and NEPA compliance stages; minimization measures were incorporated as part of the project design.

According to the Clean Water Act (CWA) §404(b)(1) guidelines, NCDOT must avoid, minimize, and mitigate, in sequential order, impacts to waters of the US. The following is a list of the project's jurisdictional stream avoidance/minimization activities proposed or completed by NCDOT:

Avoidance/Minimization

- Temporary construction impacts due to erosion and sedimentation will be minimized through implementation of stringent erosion control methods and use of Best Management Practices (BMPs).
- Use of 2:1 fill slopes in jurisdictional area (Roadway plans sheets X-2 – X-3 and X-5).
- Best Management Practices for Protection of Surface Waters and for Demolition and Removal will be implemented.
- Traffic will be detoured offsite.
- No staging of construction equipment or storage of construction supplies will be allowed in wetlands or near surface waters.
- No bents will be placed in the channel.
- Limited instream activity.
- A longer bridge will be constructed, which will allow for better floodplain access.

Compensatory Mitigation:

NCDOT has avoided and minimized impacts to jurisdictional resources to the greatest extent possible as described above. The project will only have riverine wetland impacts. However, NCDOT does not propose compensatory mitigation for the 0.08 acres of riverine wetland impacts because wetland impacts are minimal.

FEDERALLY PROTECTED SPECIES

Plants and animals with federal classifications of Endangered (E), Threatened (T), Proposed Endangered (PE), and Proposed Threatened (PT) are protected under provisions of Section 7 and Section 9 of the Endangered Species Act of 1973, as amended. The USFWS lists four species for Chatham County. Table 2 lists the species and their federal status.

Table 2. Federally Protected Species in Chatham County, NC

Common Name	Scientific Name	Federal Status*	Biological Conclusion	Habitat Present
Bald eagle	*Haliaeetus leucocephalus*	Delisted	N/A	No
Cape Fear Shiner	*Notropis mekistocholas*	E	May Affect Not Likely to Adversely Affect	Yes
Harperella	*Picoides borealis*	E	No Effect	No
Red cockaded woodpecker	*Echinacea laevigata*	E	No Effect	No

*E= endangered

Field surveys for the Cape Fear shiner were conducted on June 25, 2003 and May 22, 2007 by NCDOT Biologists. A Biological Conclusion of **"May Affect, Not Likely to Adversely Affect"** was determined for Cape Fear shiner based on presence of habitat, though no individuals were found. Concurrence was received from USFWS on July 19, 2007(see attached letter dated July 17, 2007). A project survey was conducted in March 2002 to establish presence of habitat for harperella, red-cockaded woodpecker, and bald eagle. A Biological Conclusion of **"No Effect"** was given in the NRTR for harperella and red-cockaded woodpecker due to lack of habitat.

The bald eagle has been delisted as of August 8, 2007 and is not subject to Section 7 consultation and a biological conclusion is not required. However, the bald eagle remains protected by the Bald and Golden Eagle Protection Act. The location of the project is in both urban and disturbed areas within the City of Greensboro. No nesting or foraging habitat for bald eagles is present.

SCHEDULE

The project calls for a letting of January 15, 2008 (review date of November 27, 2007) with a date of availability of February 26, 2008. It is expected that the contractor will choose to start construction in February.

REGULATORY APPROVALS

Section 404 Permit: Application is hereby made for the Department of Army Section 404 for the issuance of a Nationwide Permit 23 for the above-described activities.

Section 401 Permit: We also hereby request a 401 General Water Quality Certification (WQC) 3632. The NCDOT will adhere to all general conditions of the WQC. Therefore, written concurrence from the NCDWQ is not required. In accordance with 15A NCAC 2H 0.0501(a) and 15A NCAC 2B 0.200 we are providing two copies of this application to the North Carolina Department of Environment and Natural Resources, Division of Water Quality, as notification.

A copy of this permit application will be posted on the NCDOT Website at: http://www.ncdot.org/doh/preconstruct/pe/. If you have any questions or need additional information, please call Deanna Riffey at (919) 715-1409.

Sincerely,

E. D. Lusk

for Gregory J. Thorpe, Ph.D.
Environmental Management Director, PDEA

w/attachment

Mr. John Hennessy, NCDWQ (2 Copies)
Mr. Travis Wilson, NCWRC
Mr. Gary Jordan, USFWS
Dr. David Chang, P.E., Hydraulics
Mr. Mark Staley, Roadside Environmental
Mr. Greg Perfetti, P.E., Structure Design
Mr. Victor Barbour, Project Services Unit
Mr. Tim Johnson, P.E., Division 8 Engineer
Mr. Art King, Division 8 Environmental Officer

w/o attachment

Mr. Jay Bennett, P.E., Roadway Design
Mr. Majed Alghandour, P. E., Programming and TIP
Mr. Art McMillan, P.E., Highway Design
Mr. Scott McLendon, USACE, Wilmington
Mr. Terry Harris, PDEA

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Raleigh Field Office
Post Office Box 33726
Raleigh, North Carolina 27636-3726

July 17, 2007

Gregory J. Thorpe, Ph.D.
North Carolina Department of Transportation
Project Development and Environmental Analysis
1598 Mail Service Center
Raleigh, North Carolina 27699-1598

Dear Dr. Thorpe:

This letter is in response to your letter of July 13, 2007 which provided the U.S. Fish and Wildlife Service (Service) with the biological determination of the North Carolina Department of Transportation (NCDOT) that the replacement of Bridge No. 88 on SR 1525 over Ferrells Creek in Chatham County (TIP No. B-3824) may affect, but is not likely to adversely affect the federally endangered Cape Fear shiner (*Notropis mekistocholas*). In addition, NCDOT has determined that the proposed project will have no effect on the federally endangered red-cockaded woodpecker (*Picoides borealis*) and harperella (*Ptilimnium nodosum*). These comments are provided in accordance with section 7 of the Endangered Species Act (ESA) of 1973, as amended (16 U.S.C. 1531-1543).

According to information provided, fish surveys were conducted at the project site on June 25, 2003 and May 22, 2007. The surveys extended 100 meters upstream and 400 meters downstream of SR 1525. No specimens of Cape Fear shiners were observed. Based on the survey results and other information available, the Service concurs with your determination that the proposed project may affect, but is not likely to adversely affect the Cape Fear shiner. Also, due to the lack of habitat, the Service concurs with your determination that the proposed project will have no effect on the federally endangered red-cockaded woodpecker and harperella. We believe that the requirements of section 7(a)(2) of the ESA have been satisfied. We remind you that obligations under section 7 consultation must be reconsidered if: (1) new information reveals impacts of this identified action that may affect listed species or critical habitat in a manner not previously considered in this review; (2) this action is subsequently modified in a manner that was not considered in this review; or (3) a new species is listed or critical habitat determined that may be affected by this identified action.

The Service appreciates the opportunity to review this project. If you have any questions regarding our response, please contact Mr. Gary Jordan at (919) 856-4520 (Ext. 32).

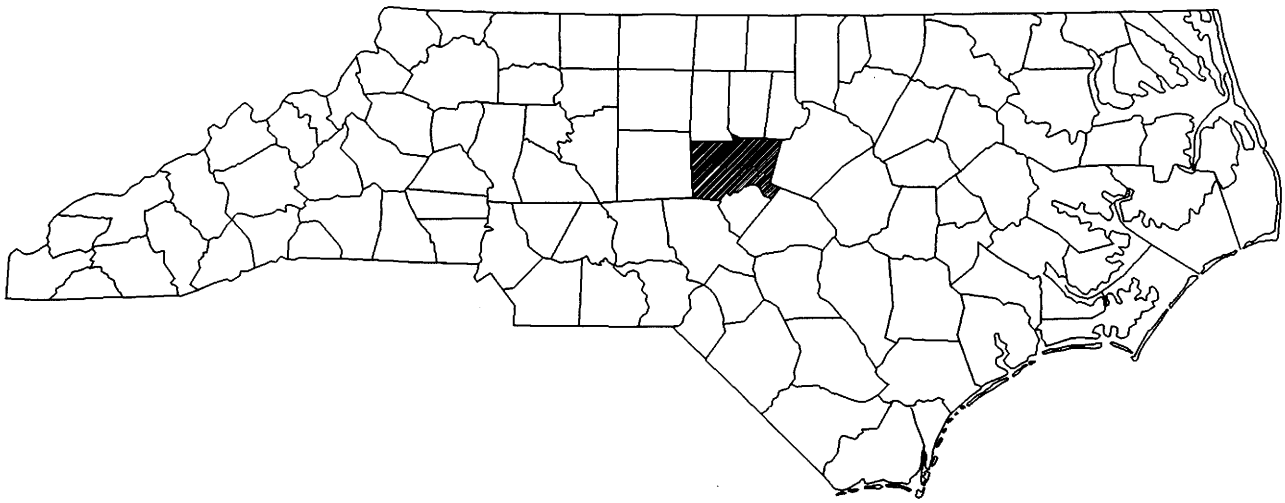
Sincerely,

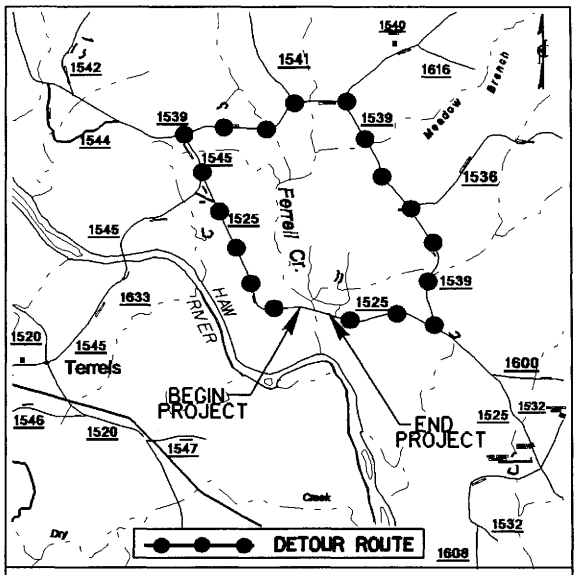
Gary Jordan

for Pete Benjamin
Field Supervisor

cc: Richard Spencer, USACE, Wilmington, NC
Polly Lespinasse, NCDWQ, Mooresville, NC
Travis Wilson, NCWRC, Creedmoor, NC
Chris Militscher, USEPA, Raleigh, NC
John Sullivan, FHWA, Raleigh, NC
David Harris, NCDOT, Raleigh, NC

NORTH CAROLINA





VICINITY MAP SHOWING LOCATION OF PROJECT B-3824

VICINITY MAPS

NCDOT

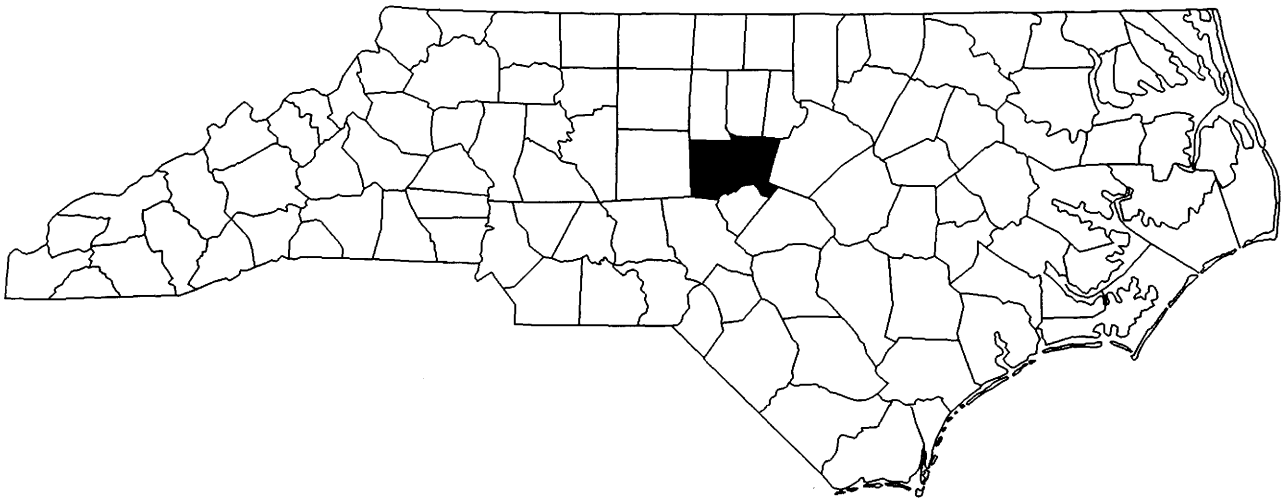
DIVISION OF HIGHWAYS

CHATHAM COUNTY

PROJECT: 33276 (B-3824)

BRIDGE 88 OVER FERRELL'S CREEK ON SR 1525

NORTH CAROLINA



BYNUM QUAD 1"≡2000'

VICINITY MAPS

NCDOT

DIVISION OF HIGHWAYS

CHATHAM COUNTY

PROJECT: 33276 (B-3824)

BRIDGE 88 OVER FERRELL'S CREEK

ON SR 1525

PROPERTY OWNERS

NAMES AND ADDRESSES

PARCEL NO.	NAMES	ADDRESSES
1	Dale Kiser	328 Lashley Rd., Chapel Hill, NC 27516
2	Horace Gordon	1182 River Rd., Pittsboro, NC 27312
3	Daniel Carmichael Jr.	2152 Lakeshore Ct., Chapel Hill, NC 27514
4	Amy Stanton	724 Isleton Dr., Brandon, FL 33511
5	Philip Bizzarri	101 Nicks Bend West, Pittsboro, NC 27312
6	Lenora Ingle	703 Ragsdale Rd., Jamestown, NC 27282

NCDOT

DIVISION OF HIGHWAYS
CHATHAM COUNTY
PROJECT: 33276 (B-3824)
BRIDGE 88 OVER FERRELL'S CREEK
ON SR 1525

WETLAND PERMIT IMPACT SUMMARY

			WETLAND IMPACTS					SURFACE WATER IMPACTS				
Site No.	Station (From/To)	Structure Size / Type	Permanent Fill In Wetlands (ac)	Temp. Fill In Wetlands (ac)	Excavation in Wetlands (ac)	Mechanized Clearing in Wetlands (ac)	Hand Clearing in Wetlands (ac)	Permanent SW impacts (ac)	Temp. SW impacts (ac)	Existing Channel Impacts Permanent (ft)	Existing Channel Impacts Temp. (ft)	Natural Stream Design (ft)
1	12+00 to 13+00 RT		0.027			0.032						
TOTALS:			0.027			0.032						

NC DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

CHATHAM COUNTY
WBS - 33276.1.1 (B-3824)

SHEET 4 of 7 4/11/2007

ATN Revised 4/11/07

PROJECT REFERENCE NO.	SHEET NO.
B-3824	4
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

Permit Drawing
Sheet 5 of 7

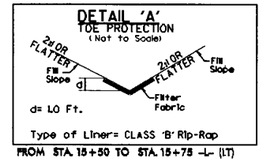
8/17/99

REVISIONS

** Design Exception required for the vertical curve "K" and the stopping sight distance.

NOTES:
SEE SHEET 5 FOR -L- PROFILE
SEE SHEET S- TO S- FOR STRUCTURE PLANS

DETAIL 'A'
TOE PROTECTION
(Not to Scale)



d= 10 Ft.
Type of Liner= CLASS 'B' Rip-Rap
FROM STA. 15+50 TO STA. 15+75 -L- (LT)

-L- POC STA 9+00.00 BEGIN TIP PROJECT B-3824

-L- POT STA 19+00.00 END TIP PROJECT B-3824

PC Sta. 8+91.25

PT Sta. 9+86.96

POT Sta. 8+76.95

POT Sta. 20+97.00

CLASS 'B' RIP RAP W/ FILTER FABRIC LINER EST. 2 TONS EST. 7 SY

CLASS II RIP RAP SEE STRUCTURE PLANS

15" CSP W/ ELBOWS

HIGH WATER MARK DETERMINED FROM EVIDENCE BY FIELD CREW ELEV = 366.02

CLASS 'B' RIP RAP W/ FILTER FABRIC LINER EST. 12 TONS EST. 30 SY SEE DETAIL 'A'

SOIL & GRAVEL DRIVE

REMOVE

15" RCP

18" RCP

SOIL & GRAVEL DRIVE 60' PRIVATE R/W PB 81-246

ABAN. CONC. GAS PUMP ISLAND

1.5 S F O

CONC. CURB

LT. RAIL ROAD SPUR

4" SPLIT RAIL

RIVER ROAD (SR 1525)

N 85° 03' 49.1" E

S 78° 01' 38.3" E

S 74° 35' 17.5" E

S 73° 41' 44.4" E

S 73° 54' 49.2" E

BRIDGE #58
WOOD AND STEEL BENT WITH RIP-RAP
TB 2GI

FERRELLS CREEK

SITE 1 WETLAND IMPACTS

EXISTING R/W

GRASS

WOODS

CLASS 'B' RIP RAP W/ FILTER FABRIC LINER EST. 2 TONS EST. 7 SY

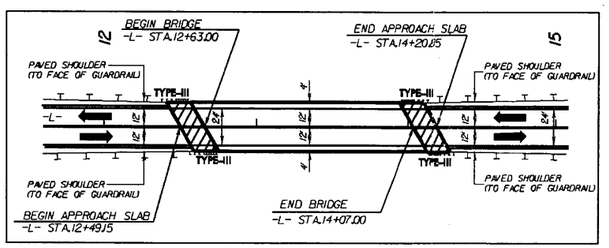
CLASS 'B' RIP RAP W/ FILTER FABRIC LINER EST. 2 TONS EST. 7 SY

CLASS 'B' RIP RAP W/ FILTER FABRIC LINER EST. 2 TONS EST. 7 SY

DENOTES FILL IN WETLAND

DENOTES MECHANIZED CLEARING

SHOULDER BERM GUTTER LOCATION	
BEGIN: -L- Sta. 11+60.00 LT. END: APPROACH SLAB LT.	BEGIN: APPROACH SLAB LT. END: -L- STA. 16+25.00 LT.
BEGIN: -L- Sta. 11+00.00 RT. END: APPROACH SLAB RT.	BEGIN: APPROACH SLAB RT END: -L- STA. 15+10.00 RT.



SKETCH SHOWING RELATIONSHIP OF BRIDGE TO PAVEMENT AND SHOULDERS

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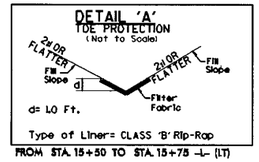
PROJECT REFERENCE NO.	SHEET NO.
B-3824	4
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

S. 6 17

** Design Exception required for the vertical curve "K" and the stopping sight distance.

DETAIL 'A'
TOE PROTECTION
(Not to Scale)



d= 1.0 Ft.

Type of Liner= CLASS 'B' Rip-Rap
FROM STA. 15+50 TO STA. 15+75 -L- (LT)

NOTES:
SEE SHEET 5 FOR -L- PROFILE
SEE SHEET S- TO S- FOR STRUCTURE PLANS

-L- POC STA 9+00.00 BEGIN TIP PROJECT B-3824

-L- POT STA 19+00.00 END TIP PROJECT B-3824

PCSta. 8+91.25

PTSta. 9+96.96

POTSta. 8+76.95

POTSta. 20+97.00

CLASS 'B' RIP RAP W/ FILTER FABRIC LINER EST. 2 TONS EST. 7 SY

CLASS I RIP RAP SEE STRUCTURE PLANS

15" CSP W/ ELBOWS

HIGH WATER MARK DETERMINED FROM EVIDENCE BY FIELD CREW ELEV = 366.02'

CLASS II RIP RAP - SEE STRUCTURE PLANS

CLASS 'B' RIP RAP W/ FILTER FABRIC LINER EST. 12 TONS EST. 30 SY

SEE DETAIL 'A'

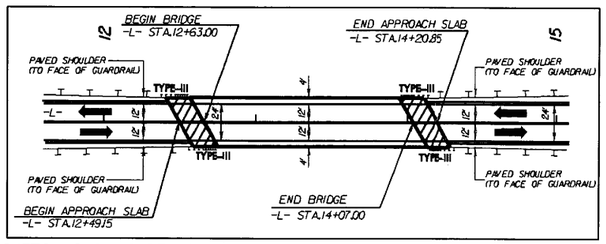
SITE 1 WETLAND IMPACTS

CLASS 'B' RIP RAP W/ FILTER FABRIC LINER EST. 2 TONS EST. 7 SY

DENOTES FILL IN WETLAND

DENOTES MECHANIZED CLEARING

SHOULDER BERM GUTTER LOCATION	
BEGIN: -L- Sta. 11+60.00 LT. END: APPROACH SLAB LT.	BEGIN: APPROACH SLAB LT. END: -L- STA. 16+25.00 LT.
BEGIN: -L- Sta. 11+00.00 RT. END: APPROACH SLAB RT.	BEGIN: APPROACH SLAB RT END: -L- STA. 15+10.00 RT.



SKETCH SHOWING RELATIONSHIP OF BRIDGE TO PAVEMENT AND SHOULDERS

REVISIONS

8/17/93

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paulinus AT HY212400

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PROJECT REFERENCE NO.	SHEET NO.
B-3824	5
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

Permit Drawing Sheet 7 of 7

** Design Exception required for the vertical curve "K" and the stopping sight distance.

-L-

STRUCTURE HYDRAULIC DATA	
DESIGN DISCHARGE	= 2800 CFS
DESIGN FREQUENCY	= 25 YRS
DESIGN HW ELEVATION	= 371.67 FT
BASE DISCHARGE	= 4200 CFS
BASE FREQUENCY	= 100 YRS
BASE HW ELEVATION	= 371.89 FT
OVERTOPPING DISCHARGE	= 6100 CFS
OVERTOPPING FREQUENCY	= 500 YRS
OVERTOPPING ELEVATION	= 379.14 FT

END GRADE
-L- Sta 19+00.00
EL = 406.24'

BEGIN GRADE
-L- Sta 10+00.00
EL = 380.65'

PI = 14+11.12
VC = 820'
EL = 374.07'
K = 100
V = 51 MPH

STA. 13+35 -L- EL=380.85'
45° PRESTRESSED GIRDERS
3 SPANS: 1 @30'-1 @ 60'-1 @ 54'
L=144'
60° SKEW

BM #2 - RR SPIKE IN BASE OF POWER POLE
30.63 FT RT -L- STA. 19+06.88
EL 407.01

END BRIDGE STA 14+07 -L-
BEGIN BRIDGE STA 12+63 -L-
(-)1.80%
(+)5.80%
EXISTING ROAD @ ℄
CLASS II RIP RAP
CLASS II RIP RAP
1.5:1
1.5:1
EMBANKMENT EXCAVATION APPROX. 37,200 CU. FT.
EMBANKMENT EXCAVATION APPROX. 33,750 CU. FT.

BM #1 - RR SPIKE IN BASE OF POWER POLE
36.61 FT RT -L- STA. 11+81.44
EL 368.78

-L- PLAN SHEET 4

420 410 400 390 380 370 360 350 340

9 10 11 12 13 14 15 16 17 18 19 20

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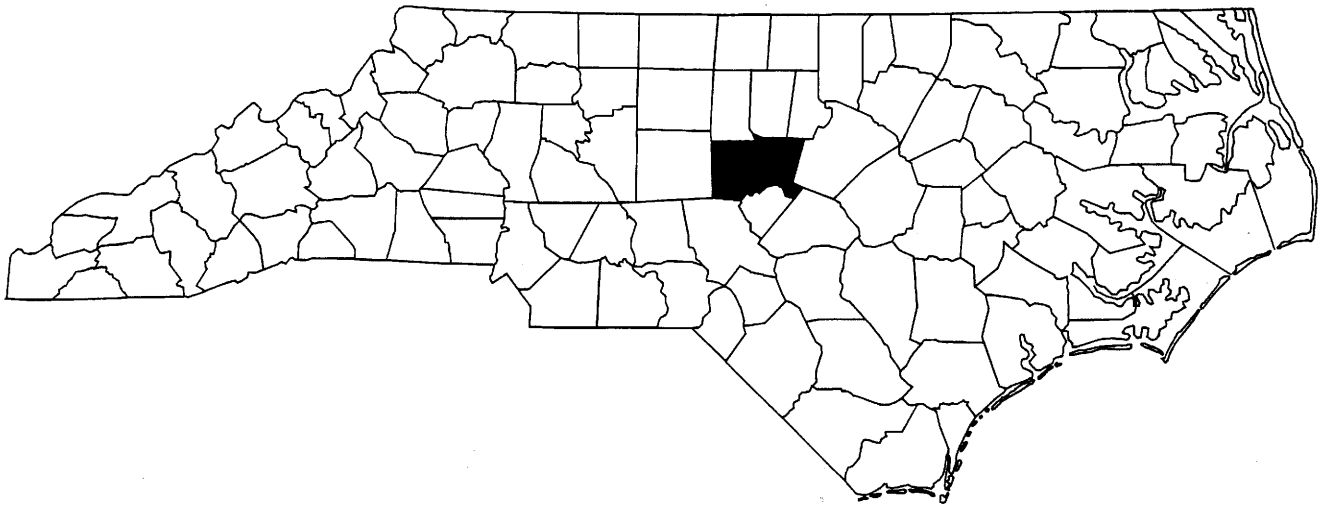
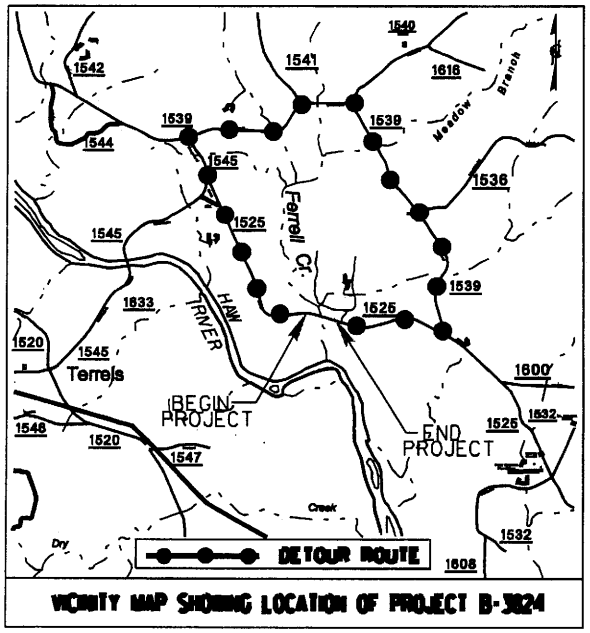
preliminary AT 1"=2'

NORTH CAROLINA





VICINITY MAP SHOWING LOCATION OF PROJECT B-3824

UTILITY DRAWINGS

VICINITY MAPS

NCDOT

DIVISION OF HIGHWAYS

CHATHAM COUNTY

PROJECT: 33276 (B-3824)

BRIDGE 88 OVER FERRELL'S CREEK

ON SR 1525

9/13/07

PROPERTY OWNERS

NAMES AND ADDRESSES

PARCEL NO.	NAMES	ADDRESSES
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2	Horace Gordon	1182 River Rd., Pittsboro, NC 27312
3	Daniel Carmichael Jr.	2152 Lakeshore Ct., Chapel Hill, NC 27514
4	Amy Stanton	724 Isleton Dr., Brandon, FL 33511
5	Philip Bizzarri	101 Nicks Bend West, Pittsboro, NC 27312
6	Lenora Ingle	703 Ragsdale Rd., Jamestown, NC 27282

NCDOT

DIVISION OF HIGHWAYS

CHATHAM COUNTY

PROJECT: 33276 (B-3824)

BRIDGE 88 OVER FERRELL'S CREEK

ON SR 1525

WETLAND LEGEND

WLB — WETLAND BOUNDARY

WETLAND

DENOTES FILL IN WETLAND

DENOTES FILL IN SURFACE WATER

DENOTES FILL IN SURFACE WATER (POND)

DENOTES TEMPORARY FILL IN WETLAND

DENOTES EXCAVATION IN WETLAND

DENOTES TEMPORARY FILL IN SURFACE WATER

DENOTES MECHANIZED CLEARING

DENOTES HAND CLEARING

FLOW DIRECTION

TB — TOP OF BANK

WE — EDGE OF WATER

C — PROP. LIMIT OF CUT

F — PROP. LIMIT OF FILL

PROP. RIGHT OF WAY

NG — NATURAL GROUND

PL — PROPERTY LINE

TDE — TEMP. DRAINAGE EASEMENT

PDE — PERMANENT DRAINAGE EASEMENT

EAB — EXIST. ENDANGERED ANIMAL BOUNDARY

EPB — EXIST. ENDANGERED PLANT BOUNDARY

WATER SURFACE

LIVE STAKES

BOULDER

COIR FIBER ROLLS

PROPOSED BRIDGE

PROPOSED BOX CULVERT

PROPOSED PIPE CULVERT

12"-48" PIPES

54" PIPES & ABOVE

(DASHED LINES DENOTE EXISTNG STRUCTURES)

SINGLE TREE

WOODS LINE

DRAINAGE INLET

ROOTWAD

RIP RAP

5 — ADJACENT PROPERTY OWNER OR PARCEL NUMBER IF AVAILABLE

PREFORMED SCOUR HOLE

LEVEL SPREADER (LS)

DITCH / GRASS SWALE

NCDOT

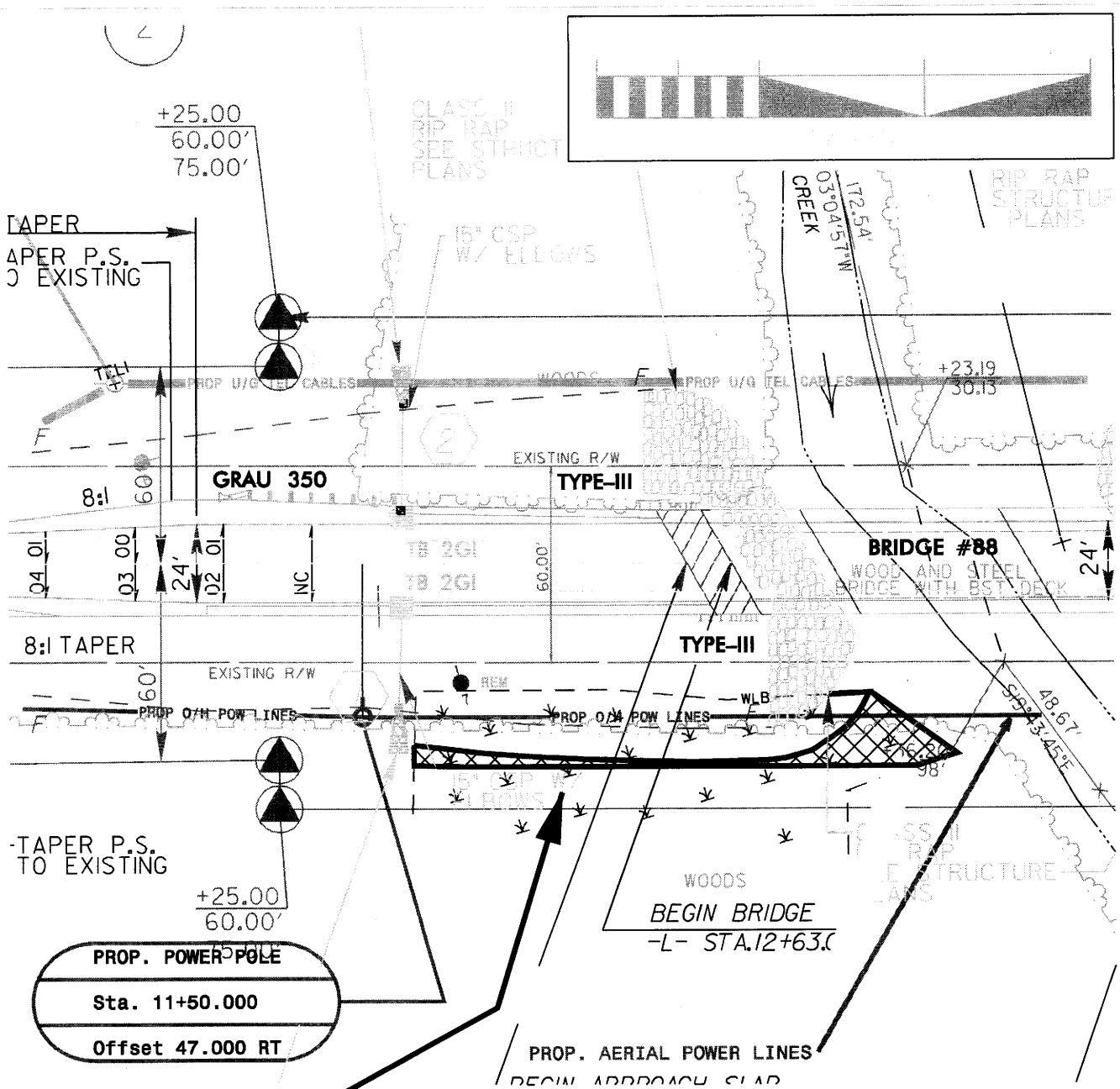
DIVISION OF HIGHWAYS

CHATHAM COUNTY

PROJECT: 8.2522101 (B-3824)

BRIDGE 88 OVER FERRELL'S CREEK ON SR 1525

PLAN VIEW
SITE 1



HAND CLEARING ONLY

872.24 Square Feet (0.02 Acre)

Perimeter 375.5

SITE 1

NCDOT

DIVISION OF HIGHWAYS

CHATHAM COUNTY

PROJECT: 33276 (B-3824)

BRIDGE 88 OVER FERRELL'S CREEK

ON SR 1525

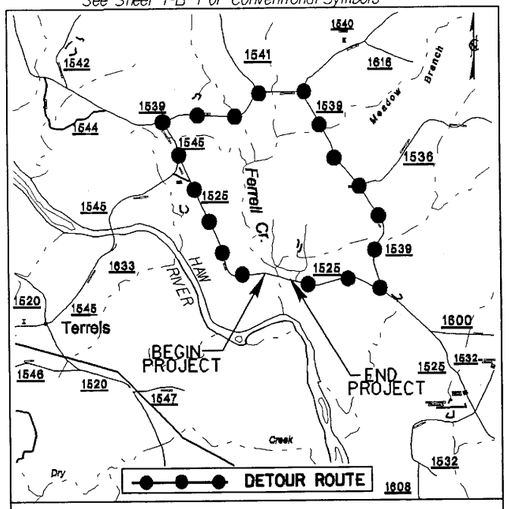
9/13/07

09/08/99

TIP PROJECT: B-3824

CONTRACT:

See Sheet 1-A For Index of Sheets
See Sheet 1-B For Conventional Symbols



VICINITY MAP SHOWING LOCATION OF PROJECT B-3824

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

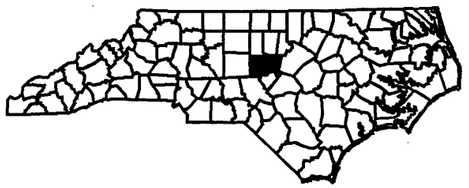
CHATHAM COUNTY

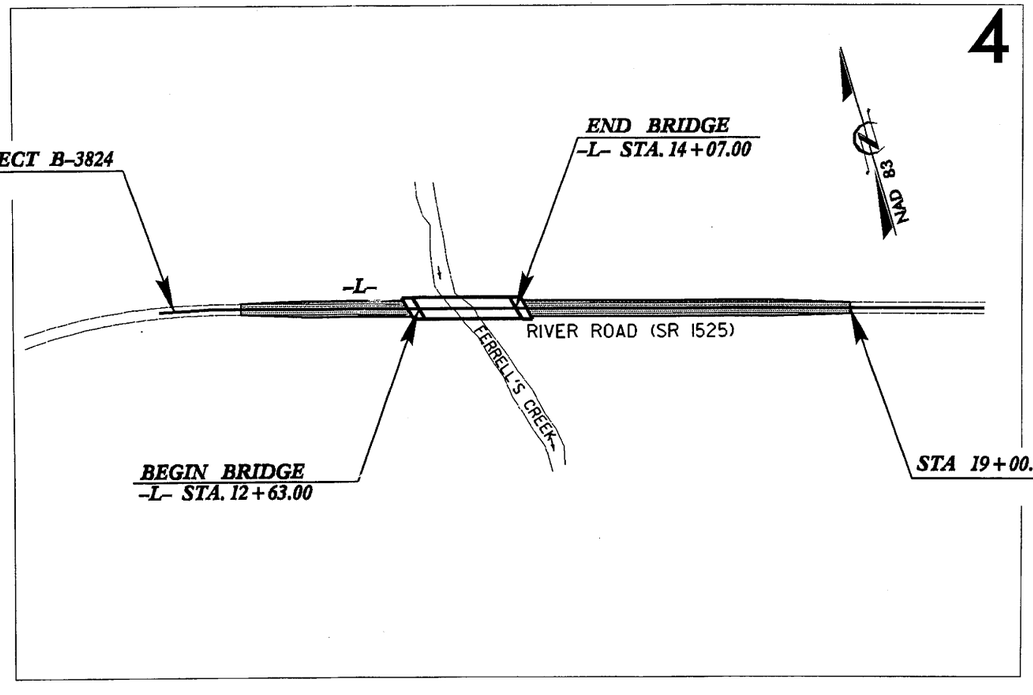
LOCATION: BRIDGE 88 OVER FERRELL'S CREEK ON SR 1525

TYPE OF WORK: GRADING, PAVING, DRAINAGE, AND STRUCTURE

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-3824	1	

STATE PROJ.NO.	F.A. PROJ.NO.	DESCRIPTION
33276.1.1	BRZ-1525(4)	P.E.
33276.2.1	BRZ-1525(4)	ROW & UTIL





THIS PROJECT IS NOT WITHIN ANY MUNICIPAL BOUNDARIES
CLEARING ON THIS PROJECT SHALL BE PERFORMED TO THE LIMITS ESTABLISHED BY METHOD III
** Design Exception required for the vertical curve "K" and the stopping sight distance.

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

GRAPHIC SCALES

50 25 0 50 100
PLANS

50 25 0 50 100
PROFILE (HORIZONTAL)

10 5 0 10 20
PROFILE (VERTICAL)

DESIGN DATA

ADT 2007 = 2616
ADT 2027 = 4376
DHV = 10 %
D = 65 %
T = 3 % *
* *V = 60 MPH
* TTST 1 % DUAL 2 %
FUNC CLASS = RURAL MINOR COLLECTOR

PROJECT LENGTH

LENGTH OF ROADWAY TIP PROJECT B-3824 = 0.162 MILES
LENGTH OF STRUCTURE TIP PROJECT B-3824 = 0.027 MILES
TOTAL LENGTH OF TIP PROJECT B-3824 = 0.189 MILES

Prepared In the Office of:
DIVISION OF HIGHWAYS
1000 Birch Ridge Dr., NC, 27610

2006 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE: April 21, 2006

LETTING DATE: January 15, 2008

TONY HOUSER, PE
PROJECT ENGINEER

LEE ANN MOORE
PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER

SIGNATURE:

ROADWAY DESIGN ENGINEER

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

STATE DESIGN ENGINEER

DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

APPROVED

10/25/05

PROJECT REFERENCE NO.	SHEET NO.
B-3824	1B

Note: Not to Scale

****S.U.E. = Subsurface Utility Engineering***

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

CONVENTIONAL PLAN SHEET SYMBOLS

BOUNDARIES AND PROPERTY:

- State Line
- County Line
- Township Line
- City Line
- Reservation Line
- Property Line
- Existing Iron Pin — EIP
- Property Corner
- Property Monument — ECM
- Parcel/Sequence Number — 123
- Existing Fence Line
- Proposed Woven Wire Fence
- Proposed Chain Link Fence
- Proposed Barbed Wire Fence
- Existing Wetland Boundary — WLB
- Proposed Wetland Boundary — WLB
- Existing Endangered Animal Boundary — EAB
- Existing Endangered Plant Boundary — EPB

BUILDINGS AND OTHER CULTURE:

- Gas Pump Vent or U/G Tank Cap
- Sign — S
- Well — W
- Small Mine
- Foundation
- Area Outline
- Cemetery
- Building
- School
- Church
- Dam

HYDROLOGY:

- Stream or Body of Water
- Hydro, Pool or Reservoir
- Jurisdictional Stream — JS
- Buffer Zone 1
- Buffer Zone 2
- Flow Arrow
- Disappearing Stream
- Spring
- Swamp Marsh
- Proposed Lateral, Tail, Head Ditch — Flow
- False Sump

RAILROADS:

- Standard Gauge — CSX TRANSPORTATION
- RR Signal Milepost — MILEPOST 35
- Switch — SWITCH
- RR Abandoned
- RR Dismantled

RIGHT OF WAY:

- Baseline Control Point
- Existing Right of Way Marker
- Existing Right of Way Line
- Proposed Right of Way Line
- Proposed Right of Way Line with Iron Pin and Cap Marker
- Proposed Right of Way Line with Concrete or Granite Marker
- Existing Control of Access
- Proposed Control of Access
- Existing Easement Line — E
- Proposed Temporary Construction Easement — E
- Proposed Temporary Drainage Easement — TDE
- Proposed Permanent Drainage Easement — PDE
- Proposed Permanent Utility Easement — PUE

ROADS AND RELATED FEATURES:

- Existing Edge of Pavement
- Existing Curb
- Proposed Slope Stakes Cut — C
- Proposed Slope Stakes Fill — F
- Proposed Wheel Chair Ramp — WCR
- Curb Cut for Future Wheel Chair Ramp — CCFR
- Existing Metal Guardrail
- Proposed Guardrail
- Existing Cable Guiderail
- Proposed Cable Guiderail
- Equality Symbol
- Pavement Removal

VEGETATION:

- Single Tree
- Single Shrub
- Hedge
- Woods Line
- Orchard
- Vineyard — Vineyard

EXISTING STRUCTURES:

MAJOR:

- Bridge, Tunnel or Box Culvert — CONC
- Bridge Wing Wall, Head Wall and End Wall — CONC WW

MINOR:

- Head and End Wall — CONC HW
- Pipe Culvert
- Footbridge
- Drainage Box: Catch Basin, DI or JB — CB
- Paved Ditch Gutter
- Storm Sewer Manhole — S
- Storm Sewer — S

UTILITIES:

POWER:

- Existing Power Pole
- Proposed Power Pole
- Existing Joint Use Pole
- Proposed Joint Use Pole
- Power Manhole — P
- Power Line Tower
- Power Transformer
- U/G Power Cable Hand Hole — HH
- H-Frame Pole
- Recorded U/G Power Line — P
- Designated U/G Power Line (S.U.E.*) — P

TELEPHONE:

- Existing Telephone Pole
- Proposed Telephone Pole
- Telephone Manhole — T
- Telephone Booth
- Telephone Pedestal — T
- Telephone Cell Tower
- U/G Telephone Cable Hand Hole — HH
- Recorded U/G Telephone Cable — T
- Designated U/G Telephone Cable (S.U.E.*) — T
- Recorded U/G Telephone Conduit — TC
- Designated U/G Telephone Conduit (S.U.E.*) — TC
- Recorded U/G Fiber Optics Cable — T FO
- Designated U/G Fiber Optics Cable (S.U.E.*) — T FO

WATER:

- Water Manhole — W
- Water Meter
- Water Valve
- Water Hydrant
- Recorded U/G Water Line — W
- Designated U/G Water Line (S.U.E.*) — W
- Above Ground Water Line — A/G Water

TV:

- TV Satellite Dish
- TV Pedestal — C
- TV Tower
- U/G TV Cable Hand Hole — HH
- Recorded U/G TV Cable — TV
- Designated U/G TV Cable (S.U.E.*) — TV
- Recorded U/G Fiber Optic Cable — TV FO
- Designated U/G Fiber Optic Cable (S.U.E.*) — TV FO

GAS:

- Gas Valve
- Gas Meter
- Recorded U/G Gas Line — G
- Designated U/G Gas Line (S.U.E.*) — G
- Above Ground Gas Line — A/G Gas

SANITARY SEWER:

- Sanitary Sewer Manhole
- Sanitary Sewer Cleanout
- U/G Sanitary Sewer Line — SS
- Above Ground Sanitary Sewer — A/G Sanitary Sewer
- Recorded SS Forced Main Line — FSS
- Designated SS Forced Main Line (S.U.E.*) — FSS

MISCELLANEOUS:

- Utility Pole
- Utility Pole with Base
- Utility Located Object
- Utility Traffic Signal Box — S
- Utility Unknown U/G Line — ?U/L
- U/G Tank; Water, Gas, Oil
- A/G Tank; Water, Gas, Oil
- U/G Test Hole (S.U.E.*)
- Abandoned According to Utility Records — AATUR
- End of Information — E.O.I.

6/2/99

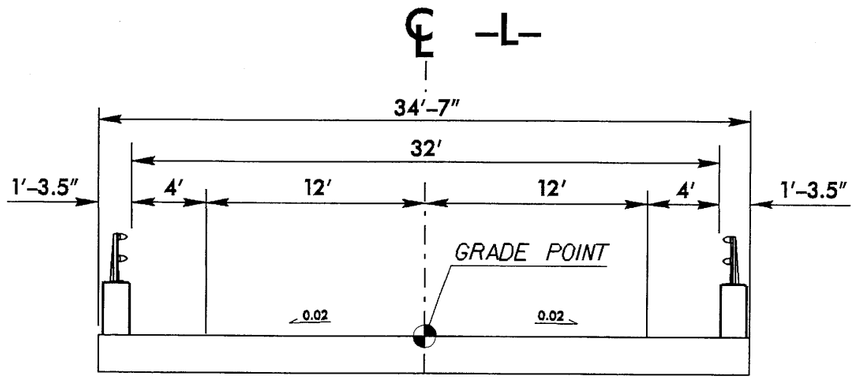
PROJECT REFERENCE NO.	SHEET NO.
B-3824	2
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

PAVEMENT SCHEDULE

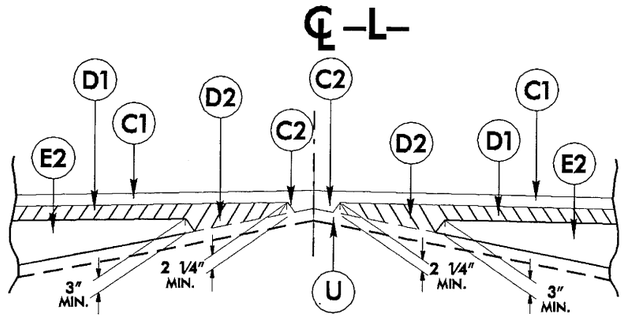
C1	PROP. APPROX. 2½" ASPHALT CONCRETE SURFACE COURSE, TYPE SF9.5A, AT AN AVERAGE RATE OF 137.5 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.
C2	PROP. VAR. DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE SF9.5A, AT AN AVERAGE RATE OF 110 LBS. PER SQ. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NOT TO EXCEED 1½" IN DEPTH.
D1	PROP. APPROX. 2½" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0B, AT AN AVERAGE RATE OF 285 LBS. PER SQ. YD.
D2	PROP. VAR. DEPTH ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0B, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1" DEPTH, TO BE PLACED IN LAYERS NOT LESS THAN 2¼" IN DEPTH OR GREATER THAN 4" IN DEPTH.
E1	PROP. APPROX. 4" ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.
E2	PROP. VAR. DEPTH ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NOT LESS THAN 3" IN DEPTH OR GREATER THAN 5½" IN DEPTH.
R	SHOULDER BERM GUTTER.
T	EARTH MATERIAL.
U	EXISTING PAVEMENT
W	VARIABLE DEPTH ASPHALT PAVEMENT (SEE WEDGING DETAIL)

NOTE: Pavement Edge Slopes Are 1:1 Unless Shown otherwise.

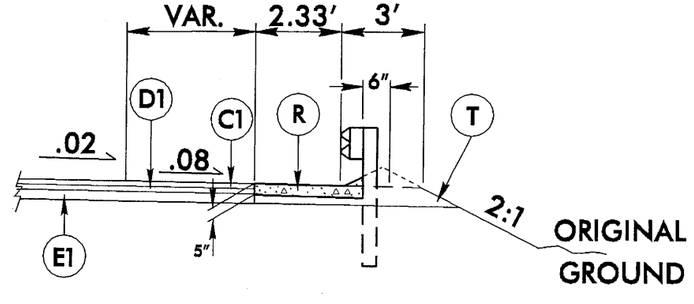


TYPICAL SECTION ON BRIDGE

NOTE: BICYCLE SAFE TWO BAR METAL RAIL
–L– STA. 12+63.00 (BEGIN BRIDGE) TO 14+07.00 (END BRIDGE)



DETAIL SHOWING METHOD OF WEDGING



DETAIL SHOWING PAVED SHOULDER IN RELATION TO GUARDRAIL

USE SHOULDER BERM GUTTER FOR THE FOLLOWING:

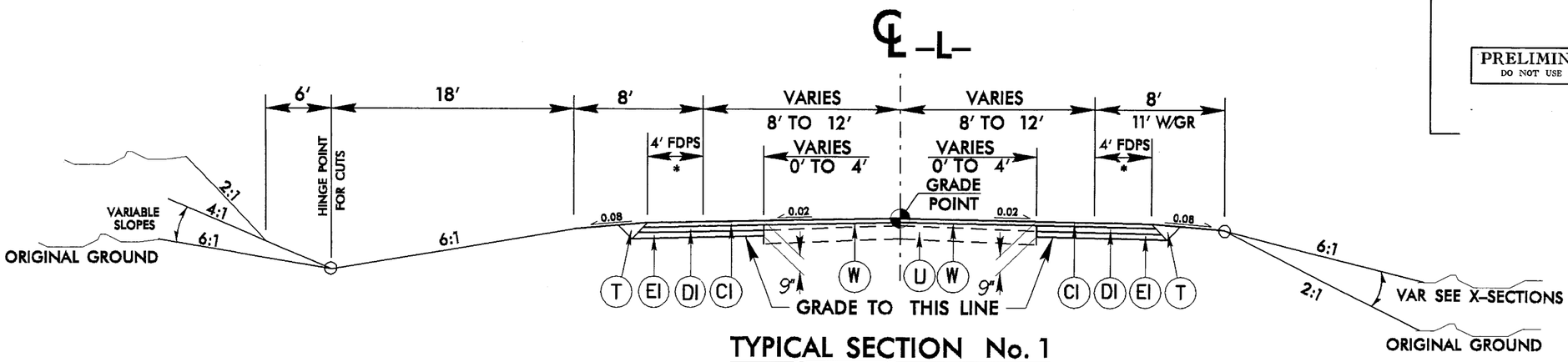
LEFT SHOULDER –L– STA 11+47.01 TO APPROACH SLAB
APPROACH SLAB TO –L– STA 16+25.18

RIGHT SHOULDER –L– STA 11+00.00 TO APPROACH SLAB
APPROACH SLAB TO –L– STA 15+22.99

6/2/99

PROJECT REFERENCE NO.	SHEET NO.
B-3824	2A
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER

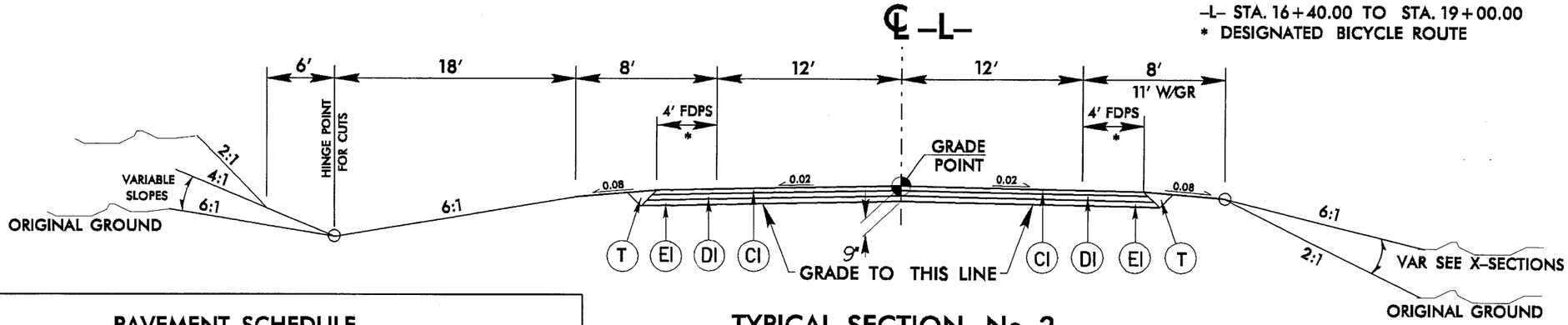
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



TYPICAL SECTION No. 1

USE TYPICAL NO. 1 FOR:

–L– STA. 10+00.00 TO STA. 11+60.00
–L– STA. 16+40.00 TO STA. 19+00.00
* DESIGNATED BICYCLE ROUTE



TYPICAL SECTION No. 2

USE TYPICAL NO. 1 FOR:

–L– STA. 11+60.00 TO STA. 12+63.00 (BEGIN BRIDGE)
–L– STA. 14+07.00 (END BRIDGE) TO STA. 16+40.00
* DESIGNATED BICYCLE ROUTE

PAVEMENT SCHEDULE	
C1	2½" SF9.5A, ASPHALT CONCRETE SURFACE COURSE
D1	2½" I19.0B, ASPHALT CONCRETE INTERMEDIATE COURSE
E1	4" B25.0B, ASPHALT CONCRETE BASE COURSE
T	EARTH MATERIAL.
U	EXISTING PAVEMENT
W	VARIABLE DEPTH ASPHALT PAVEMENT (SEE WEDGING DETAIL)

NOTE: Pavement Edge Slopes Are 1:1 Unless Shown otherwise.

PROJECT REFERENCE NO.	SHEET NO.
B-3824	4
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

** Design Exception required for the vertical curve "K" and the stopping sight distance.

-L-
PI Sta 9+44.13
Δ = 4°13' 53.9" (RT)
D = 4°00' 10.9"
L = 105.71'
T = 52.88'
R = 1,431.32'
RO = see plans
SE = see plans

DETAIL 'A'
TOE PROTECTION
(Not To Scale)

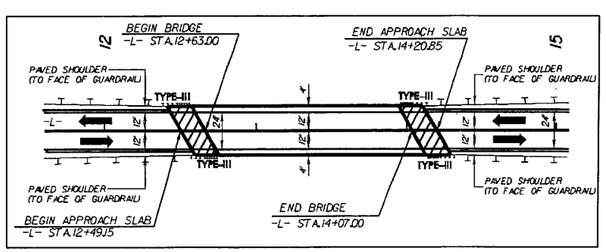
d= 1.0 Ft.
Type of Liner= CLASS 'B' Rip-Rap
FROM STA. 15+50 TO STA. 15+75 -L- (LT)

NOTES:
SEE SHEET 5 FOR -L- PROFILE
SEE SHEET S- TO S- FOR STRUCTURE PLANS

-L- POC STA 9+00.00 BEGIN TIP PROJECT B-3824
PCSta. 8+91.25
PTSta. 9+96.96
POTSta. 8+76.95
-L- POT STA 19+00.00 END TIP PROJECT B-3824
-T- 103 POT 5+00.00
ELEV = 364.56'
REBAR AND CAP SET
-T- 104 PINC 6+13.12
ELEV = 364.39'
REBAR AND CAP SET
-L- STA 13+92.78 11.31' LT
-BL- 101
REBAR AND CAP SET
ELEV = 378.96'
-T- PINC 7+71.74
END BRIDGE
-L- STA 14+07.00
BEGIN BRIDGE
-L- STA 12+63.00
BEGIN APPROACH SLAB
-L- STA 12+49.15
END APPROACH SLAB
-L- STA 14+20.85
-T- 105 POT 10+26.11
ELEV = 362.15'
REBAR AND CAP SET
-BL- 100
PINC 9+43.77
-BL- 102
-L- STA 20+74.04 12.72' LT
BM # 2
-L- 19+07.01
30.80' RIGHT
ELEV. 407.01'
BM # 1
-L- 11+81.02
36.77' RIGHT
ELEV. 368.78'
HIGH WATER MARK DETERMINED FROM EVIDENCE BY FIELD CREW
ELEV = 366.02'
FERRELLS CREEK
S 18° 31' 43.1" E
S 18° 26' 23.9" E
S 8° 43' 16.4" W
S 74° 35' 17.5" E
S 78° 01' 38.3" E
N 69° 03' 49.7" E
S 73° 47' 44.4" E
S 73° 54' 49.2" E
104.23'
N88°08'01"W
94.64'
N55°52'31"W
197.83'
N44°55'44"W
86.12'
N44°55'44"W
264.02'
N22°54'29"E
200.27'
N66°04'55"E
283.39'
S86°36'02"E
79.61'
N66°31'19"W
GRAU 350
REMOVE GRAU 350
TB 2GI
TYPE-III
15" CSP W/ ELBOWS
15" RCP
18" RCP
20' R
10' R
100' TAPER
TAPER P.S. TO EXISTING
27' INC.
8:1 TAPER
+00.00 EXIST 60.00'
+20.00 EXIST 60.00'
+25.00 60.00' 75.00'
+75.00 60.00' 75.00'
+09.45 30.74'
+71.62 30.79'
+23.19 30.15'
+32.07 30.33'
INV=378.39'
INV=376.13'
INV=391.31'
INV= 392.92'
CLASS 'B' RIP RAP W/ FILTER FABRIC LINER EST. 2 TONS EST. 7 SY
CLASS 'B' RIP RAP W/ FILTER FABRIC LINER EST. 12 TONS EST. 50 SY
SEE DETAIL 'A'
CLASS II RIP RAP SEE STRUCTURE PLANS
HORACE PAUL GORDON DB 793 PG 88 PS A-562 PS 87-246
DANIEL M. CARMICHAEL DB 403 PG 204 PS 88-396
PHILIP L. BIZZARRI DB 593 PG 124 PS 88-396
DALE R. KISER DB 643 PG 964 PS 94-210
AMY D. STANTON DB 622 PG 929 PS 87-246
LENORA N. INGLE DB 403 PG 291
GRAVEL DRIVE
SOIL & GRAVEL DRIVE
60' PRIVATE R/W PS 87-246
ABAN. CONC GAS PUMP ISLAND
LS
S P
LIT RAIL ROAD ROCK WALL
4 SPLIT RAIL
RIVER ROAD (SR 1525)
EXISTING R/W
GRASS
WOODS
BRIDGE #58
WOOD AND STEEL WITH CONC ENDS
46.87' SPAN
46.20' 36.98'
320.22' 256.18'
N.F.
EIP
EIP 0.53' OUT
N.F. 0.35' IN
N.F. 0.39' IN
N.F. 0.55' IN
37.71'
S49°58'12"W
75.11'
S28°49'48"W
32.24'
S35°24'19"W
N.F. 0.39'
N.F. 0.35'

SHOULDER BERM GUTTER LOCATION

BEGIN: -L- Sta. 11+60.00 LT. END: APPROACH SLAB LT.	BEGIN: APPROACH SLAB LT. END: -L- STA. 16+25.00 LT.
BEGIN: -L- Sta. 11+00.00 RT. END: APPROACH SLAB RT.	BEGIN: APPROACH SLAB RT END: -L- STA. 15+10.00 RT.



SKETCH SHOWING RELATIONSHIP OF BRIDGE TO PAVEMENT AND SHOULDERS

REVISIONS 8/17/99

MAR-2007 11:26
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$$USERNAME$$

5/14/99

PROJECT REFERENCE NO.	SHEET NO.
B-3824	5
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

** Design Exception required for the vertical curve "K" and the stopping sight distance.

-L-

STRUCTURE HYDRAULIC DATA

DESIGN DISCHARGE	= 2800 CFS
DESIGN FREQUENCY	= 25 YRS
DESIGN HW ELEVATION	= 371.67 FT
BASE DISCHARGE	= 4200 CFS
BASE FREQUENCY	= 100 YRS
BASE HW ELEVATION	= 371.89 FT
OVERTOPPING DISCHARGE	= 6100 CFS
OVERTOPPING FREQUENCY	= 500 YRS
OVERTOPPING ELEVATION	= 379.14 FT

END GRADE
-L- Sta 18+00.00
EL = 406.24'

BEGIN GRADE
-L- Sta 10+00.00
EL = 380.68'

PI = 14+11.12
VC = 820'
EL = 374.07'
K = 100
V = 51 MPH

BM #2 - RR SPIKE IN BASE OF POWER POLE
30.63 FT RT -L- STA. 19+06.88
EL 407.01

STA 13+35 -L- EL=380.83'
45" PRESTRESSED GIRDERS
3 SPANS: 1 @ 30', 1 @ 60', 1 @ 54'
L=144'
60° SKEW

END BRIDGE
STA 14+07 -L-

BEGIN BRIDGE
STA 12+63 -L-

(-)1.60%

(+)6.58%

EXISTING ROAD @ ℄

CLASS II RIP RAP

CLASS II RIP RAP

1.5:1

1.5:1

EMBANKMENT EXCAVATION
APPROX. 57,200 CU. YD.

EMBANKMENT EXCAVATION
APPROX. 55,750 CU. YD.

BM #1 - RR SPIKE IN BASE OF POWER POLE
36.61 FT RT -L- STA. 11+81.44
EL 368.78

-L- PLAN SHEET 4

420 410 400 390 380 370 360 350 340

8 10 11 12 13 14 15 16 17 18 19 20

MAR-2007 16:38
P:\0_NCDOT\B-3824\rdu_prl.dgn
$$$$ENGINEER$$$$

8/23/99

0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	B-3824	X-1

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

379.97
379.76
S.S. 377.30
10+50.00
380.69
380.44
S.S. 377.76
S.S. 376.15
BEGIN GRADE
-L- STA. 10+00.00
10+00.00
381.70
9+50.00
BEGIN CONSTRUCTION
-L- STA. 9+00.00
383.49
9+00.00

-1-

5-MAR-2007 12:02
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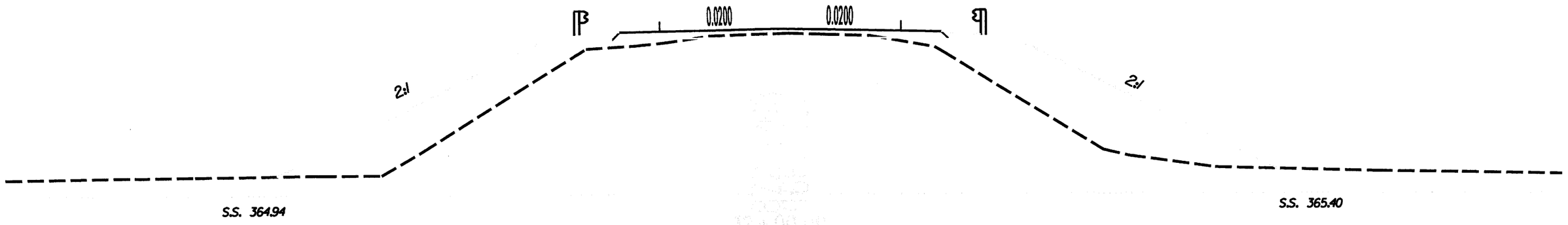
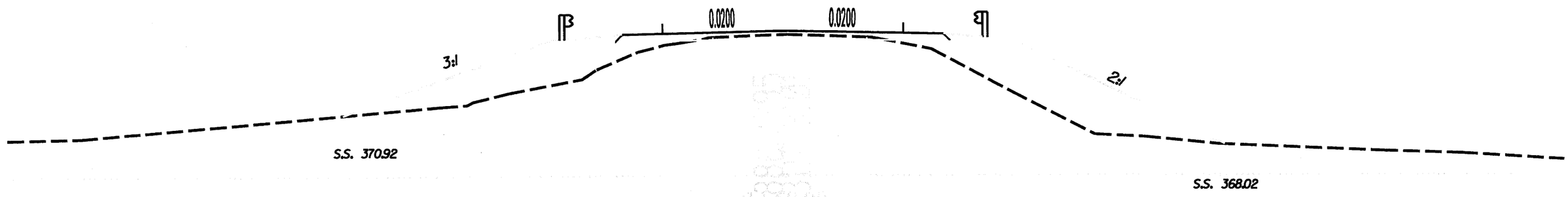
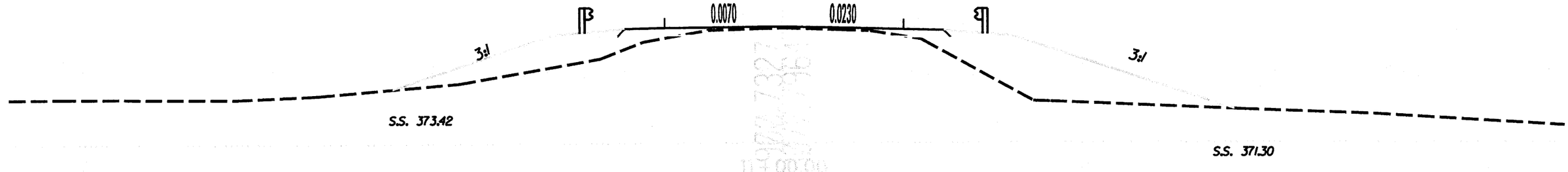
8/23/99

B-3824 X-2







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8/23/99

0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	B-3824	X-3

380.30

362.28

13+00.00

BEGIN BRIDGE
-L- STA. 12+63.00

379.74

379.31

2%

2%

S.S. 363.31

S.S. 365.01

12+50.00

-L-

8/23/99

0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	B-3824	X-5

15+50.00

386.87

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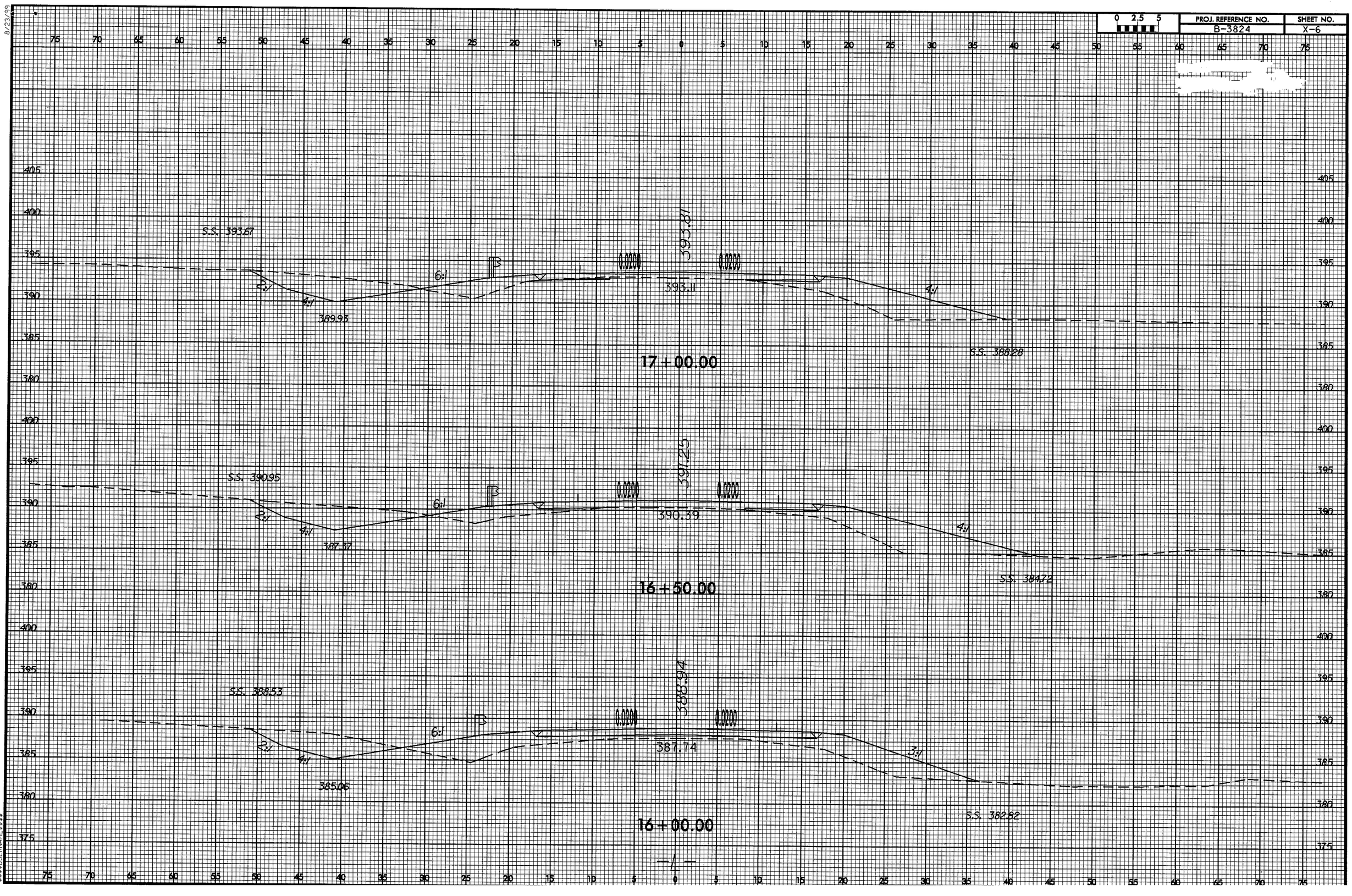

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D.R.Iffey

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MAR 18 2005
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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

MICHAEL F. EASLEY
GOVERNOR

LYNDO TIPPETT
SECRETARY

March 14, 2005

MEMORANDUM TO: Mr. Omar Sultan
Program Development Branch

FROM: Gregory J. Thorpe, PhD
Environmental Management Director, PDEA

SUBJECT: Programmatic Categorical Exclusion Approval for Federal Aid Project BRZ-1525(4), Replacement of Bridge No. 88 on SR 1525, over Ferrell's Creek, Chatham County, WBS 33428.1.1, State Project 8.2522101, TIP No. **B-3824**

Attached are four copies of the subject report, including 2 copies for your files and 1 copy for distribution to FHWA. No significant adverse environmental effects are expected as a result of the project; therefore, no other distribution of the report is necessary.

GJT/dp
Attachment
cc/atta:
Mrs. Deborah M. Barbour
Mr. Art McMillan
Mr. Jay Bennett (2 copies)
Mr. Greg Perfetti (2 copies)
Mr. Victor Barbour
Mr. D. R. Henderson
Mr. N. W. Wainaina (2 copies)
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WEBSITE: WWW.DOH.DOT.STATE.NC.US

LOCATION:
TRANSPORTATION BUILDING
1 SOUTH WILMINGTON STREET
RALEIGH NC

CATEGORICAL EXCLUSION ACTION CLASSIFICATION FORM

TIP Project No.	B-3824
State Project No.	8.2522101
Federal Project No.	BRZ-1525(4)

A. Project Description:

The purpose of this project is to replace Chatham County Bridge No. 88 on SR 1525, over Ferrell's Creek. The replacement structure will be a new bridge of approximately 138 feet in length and 32 feet in width. The bridge will have a 24 foot travelway accommodating two 12 foot lanes, and will have 4 foot offsets on each side. Bicycle design standards will be provided. Traffic will be detoured offsite during construction (see Figure 1).

The roadway grade of the new structure will be approximately the same as the existing grade at this location.

The approach roadway, extending approximately 366 feet to the east and 496 feet to the west of the new bridge, will be widened to a 24 foot pavement width providing two 12 foot lanes. Eight-foot shoulders will be provided on each side (eleven-foot shoulders where guardrail is included). The roadway will be designed as a Rural Minor Collector facility with a 60 mile per hour design speed.

B. Purpose and Need:

Bridge No. 88 includes a 3-span superstructure composed of a timber deck on steel I-beams. The substructure is composed of timber caps and piles.

Bridge Maintenance Unit records indicate the bridge has a sufficiency rating of 19.6 out of a possible 100 for a new structure. The bridge is considered structurally deficient and functionally obsolete according to Federal Highway Administration (FHWA) guidelines. Inspection records show a substructure condition rating of 4 out of 9 (structurally deficient). The bridge is also functionally obsolete due to a deck geometry appraisal of 2 out of 9. The bridge is therefore eligible for FHWA's Highway Bridge Replacement and Rehabilitation Program.

Timber bridge components typically do not last beyond 30 to 40 years of age due to the natural deterioration rates of wood. Past a certain degree of deterioration, structures with timber piles become impractical to maintain and are programmed for replacement, as is the case for this bridge. The bridge is nearing the end of its useful life.

Other considerations such as wear and tear resulting from increasing traffic, aging (51 year old) bridge components, and increasing maintenance costs all justify the replacement of this bridge.

C. Proposed Improvements:

Circle one or more of the following Type II improvements which apply to the project:

1. Modernization of a highway by resurfacing, restoration, rehabilitation, reconstruction, adding shoulders, or adding auxiliary lanes (e.g., parking, weaving, turning, climbing).

   a. Restoring, Resurfacing, Rehabilitating, and Reconstructing pavement (3R and 4R improvements)
   b. Widening roadway and shoulders without adding through lanes
   c. Modernizing gore treatments
   d. Constructing lane improvements (merge, auxiliary, and turn lanes)
   e. Adding shoulder drains
   f. Replacing and rehabilitating culverts, inlets, and drainage pipes, including safety treatments
   g. Providing driveway pipes
   h. Performing minor bridge widening (less than one through lane)

2. Highway safety or traffic operations improvement projects including the installation of ramp metering control devices and lighting.

   a. Installing ramp metering devices
   b. Installing lights
   c. Adding or upgrading guardrail
   d. Installing safety barriers including Jersey type barriers and pier protection
   e. Installing or replacing impact attenuators
   f. Upgrading medians including adding or upgrading median barriers
   g. Improving intersections including relocation and/or realignment
   h. Making minor roadway realignment
   i. Channelizing traffic
   j. Performing clear zone safety improvements including removing hazards and flattening slopes
   k. Implementing traffic aid systems, signals, and motorist aid
   l. Installing bridge safety hardware including bridge rail retrofit

(3.) Bridge rehabilitation, reconstruction, or replacement or the construction of grade separation to replace existing at-grade railroad crossings.

   a. Rehabilitating, reconstructing, or replacing bridge approach slabs
   b. Rehabilitating or replacing bridge decks
   c. Rehabilitating bridges including painting (no red lead paint), scour repair, fender systems, and minor structural improvements
   d. Replacing a bridge (structure and/or fill)

4. Transportation corridor fringe parking facilities.

5. Construction of new truck weigh stations or rest areas.

6. Approvals for disposal of excess right-of-way or for joint or limited use of right-of-way, where the proposed use does not have significant adverse impacts.

7. Approvals for changes in access control.

8. Construction of new bus storage and maintenance facilities in areas used predominantly for industrial or transportation purposes where such construction is not inconsistent with existing zoning and located on or near a street with adequate capacity to handle anticipated bus and support vehicle traffic.

9. Rehabilitation or reconstruction of existing rail and bus buildings and ancillary facilities where only minor amounts of additional land are required and there is not a substantial increase in the number of users.

10. Construction of bus transfer facilities (an open area consisting of passenger shelters, boarding areas, kiosks and related street improvements) when located in a commercial area or other high activity center in which there is adequate street capacity for projected bus traffic.

11. Construction of rail storage and maintenance facilities in areas used predominantly for industrial or transportation purposes where such construction is not inconsistent with existing zoning and where there is no significant noise impact on the surrounding community.

12. Acquisition of land for hardship or protective purposes, advance land acquisition loans under section 3(b) of the UMT Act. Hardship and protective buying will be permitted only for a particular parcel or a limited number of parcels. These types of land acquisition qualify for a CE only where the acquisition will not limit the evaluation of alternatives, including shifts in alignment for planned construction projects, which may be required in the NEPA process. No project development on such land may proceed until the NEPA process has been completed.

D. Special Project Information

Estimated Costs:

Total Construction Cost	$850,000
Right-of-Way and Utilities	32,000
Total Project Cost	$882,000

Estimated Traffic:

Current - 2,000 VPD
Year 2025 - 4,200 VPD

Proposed Typical Roadway Section:

The approach roadway will be 24 feet wide with an 8 foot shoulder (4 foot paved section and 4 foot grassed section) on each side. Shoulder width will be increased by at least 3 feet where guardrail is warranted.

Design Speed:

The design speed will be 60 mph.

Functional Classification:

SR 1525 is classified as a Rural Minor Collector facility in the Statewide Functional Classification System.

Division Office Comments:

The Division 8 Engineer supports road closure and replacement at the existing location.

E. Threshold Criteria

The following evaluation of threshold criteria must be completed for Type II actions.

ECOLOGICAL		YES	NO
(1)	Will the project have a substantial impact on any unique or important natural resource?	☐	X
(2)	Does the project involve any habitat where federally listed endangered or threatened species may occur?	☐	X
(3)	Will the project affect anadromous fish?	☐	X
(4)	If the project involves wetlands, is the amount of permanent and/or temporary wetland taking less than one-tenth (1/10) acre and have all practicable measures to avoid and minimize wetland takings been evaluated?	X	☐
(5)	Will the project require use of U. S. Forest Service lands?	☐	X
(6)	Will the quality of adjacent water resources be adversely impacted by proposed construction activities?	☐	X
(7)	Does the project involve waters classified as Outstanding Resource Waters (ORW) and/or High Quality Waters (HQW)?	☐	X

		YES	NO
(8)	Will the project require fill in waters of the United States in any of the designated mountain trout counties?	☐	X
(9)	Does the project involve any known underground storage tanks (UST's) or hazardous materials sites?	☐	X

PERMITS AND COORDINATION		YES	NO
(10)	If the project is located within a CAMA county, will the project significantly affect the coastal zone and/or any "Area of Environmental Concern" (AEC)?	☐	X
(11)	Does the project involve Coastal Barrier Resources Act resources?	☐	X
(12)	Will a U. S. Coast Guard permit be required?	☐	X
(13)	Will the project result in the modification of any existing regulatory floodway?	☐	X
(14)	Will the project require any stream relocations or channel changes?	☐	X

SOCIAL, ECONOMIC, AND CULTURAL RESOURCES		YES	NO
(15)	Will the project induce substantial impacts to planned growth or land use for the area?	☐	X
(16)	Will the project require the relocation of any family or business?	☐	X
(17)	Will the project have a disproportionately high and adverse human health and environmental effect on any minority or low-income population?	☐	X
(18)	If the project involves the acquisition of right of way, is the amount of right of way acquisition considered minor?	X	☐
(19)	Will the project involve any changes in access control?	☐	X
(20)	Will the project substantially alter the usefulness and/or land use of adjacent property?	☐	X
(21)	Will the project have an adverse effect on permanent local traffic patterns or community cohesiveness?	☐	X

(22)	Is the project included in an approved thoroughfare plan and/ or Transportation Improvement Program (and is, therefore, in conformance with the Clean Air Act of 1990)?	X	☐
(23)	Is the project anticipated to cause an increase in traffic volumes?	☐	X
(24)	Will traffic be maintained during construction using existing roads, staged construction, or on-site detours?	X	☐
(25)	If the project is a bridge replacement project, will the bridge be replaced at its existing location (along the existing facility) and will all construction proposed in association with the bridge replacement project be contained on the existing facility?	X	☐
(26)	Is there substantial controversy on social, economic and environmental grounds concerning aspects of the action?	☐	X
(27)	Is the project consistent with all Federal, State, and local laws relating to the environmental aspects of the project?	X	☐
(28)	Will the project have an "effect" on structures/properties eligible for or listed on the National Register of Historic Places?	☐	X
(29)	Will the project affect any archaeological remains which are important to history or pre-history?	☐	X
(30)	Will the project require the use of Section 4(f) resources (public parks, recreation lands, wildlife and waterfowl refuges, historic sites or historic bridges, as defined in Section 4(f) of the U. S. Department of Transportation Act of 1966)?	☐	X
(31)	Will the project result in any conversion of assisted public recreation sites or facilities to non-recreation uses, as defined by Section 6(f) of the Land and Water Conservation Act of 1965, as amended?	☐	X
(32)	Will the project involve construction in, across, or adjacent to a river designated as a component of or proposed for inclusion in the natural Wild and Scenic Rivers?	☐	X

F. Additional Documentation Required for Unfavorable Responses in Part E

See Item E (2) and attached protected species survey report dated September 19, 2003: The biological conclusion for the Cape Fear shiner was "Not Likely to Adversely Affect." Concurrence from the US Fish and Wildlife Service will be obtained prior to construction of this project.

G. CE Approval

TIP Project No.	B-3824
State Project No.	8.2581001
Federal Project No.	BRZ-1525(2)

Project Description:

NCDOT will replace Bridge No. 88 on SR 1525, over Ferrell's Creek, in Chatham County. Replacement will be at approximately the same location with a new bridge of approximately 135 feet in length and 40 feet in width. The bridge will have a 24 foot travelway and 8 foot offsets on each side. Bicycle design standards will be provided. Traffic will be detoured over existing secondary roads during construction.

Categorical Exclusion Action Classification: (Check one)

_____ TYPE II(A)
__X__ TYPE II(B)

Approved:

11-29-04 Date — Assistant Manager
Project Development and Environmental Analysis Branch

11-29-04 Date — Project Planning Unit Head
Project Development and Environmental Analysis Branch

11-29-04 Date — Project Planning Engineer
Project Development and Environmental Analysis Branch

For Type II(B) projects only:

12/28/04 Date — for Division Administrator
Federal Highway Administration

ENVIRONMENTAL COMMITMENTS:

Chatham County
Bridge No. 88 on SR 1525
over Ferrell's Creek
Federal Aid Project No. BRZ-1525(4)
State Project No. 8.2522101
T.I.P. No. B-3824

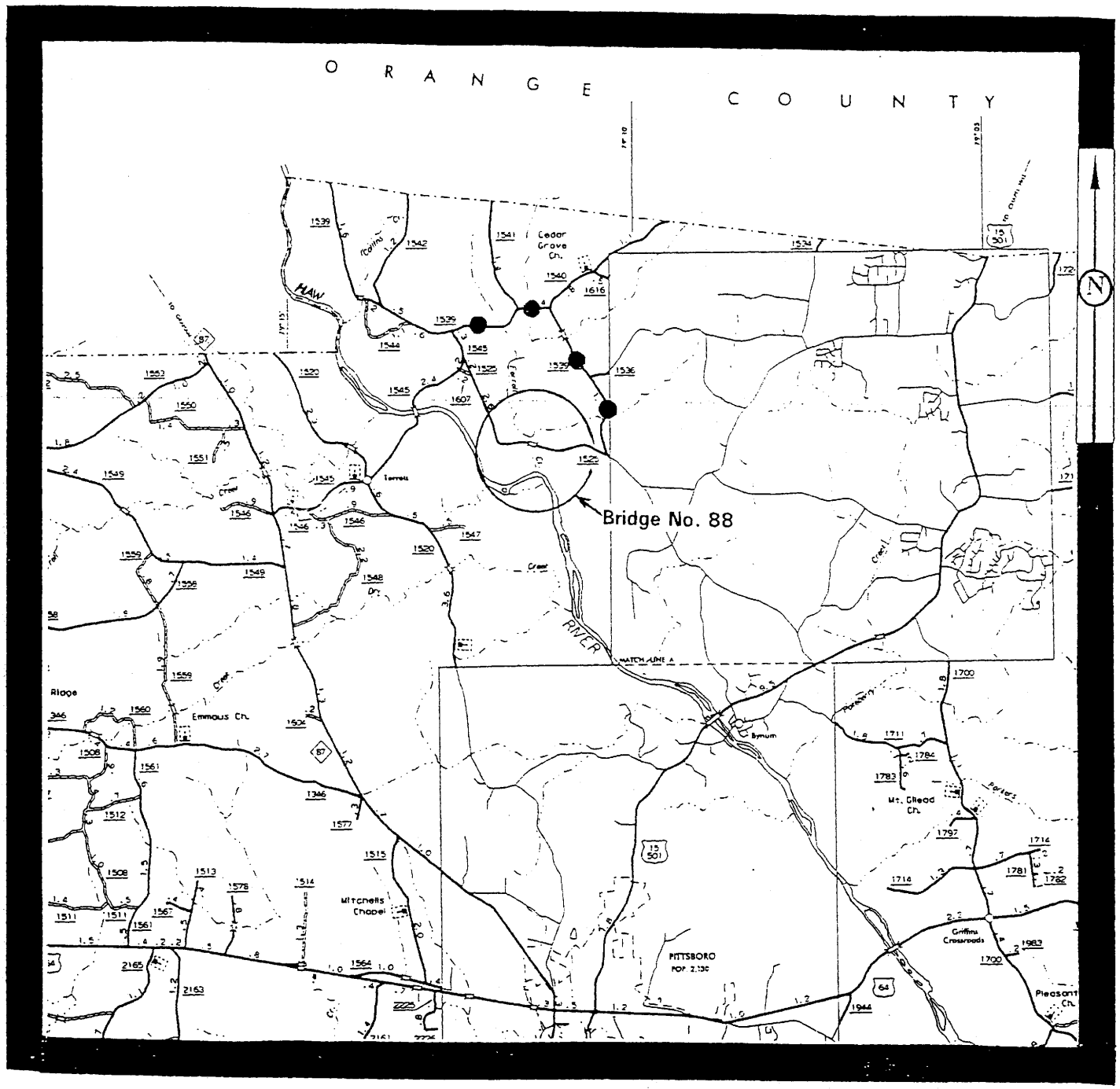
1. Roadway Design Unit, Structure Design Unit, Project Development & Environmental Analysis Branch (Permits), Resident Engineer:

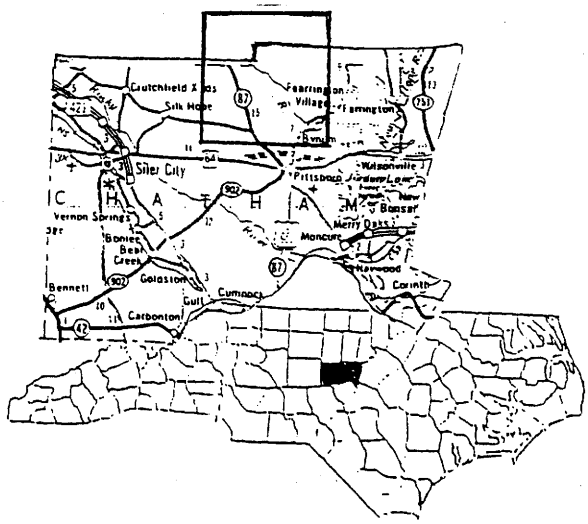
Bridge Demolition:

The existing bridge has an asphalt wearing surface, and the remainder of the bridge, both superstructure and substructure, is composed of timber and steel. The asphalt surface will be removed prior to demolition. The remainder of the bridge will be removed without dropping into Waters of the U.S. During construction, Best Management Practices for Bridge Demolition and Removal will be followed.

Protected Species Concurrence:

Prior to construction, PDEA will obtain concurrence from the US Fish and Wildlife Service for the biological conclusion of "Not Likely to Adversely Affect" for the Cape Fear shiner.





Studied Detour Route

North Carolina Department of Transportation
Division of Highways

Project Development & Environmental Analysis Branch

Chatham County
Replace Bridge No. 88 on SR 1525
Over Ferrell's Creek
B-3824

Figure 1

Pipkin

North Carolina Department of Cultural Resources

James B. Hunt, Jr., Governor
Betty Ray McCain, Secretary

Division of Archives and History
William S. Price, Jr., Director

January 8, 2001

MEMORANDUM

To: William D. Gilmore, P.E., Manager
Project Development and Environmental Analysis Branch

From: David Brook
Deputy State Historic Preservation Officer

Re: Replacement of Bridge No. 88 on SR 1525 over Ferell's Creek,
TIP No. B-3824, Chatham County, ER 01-7910

On November 30, 2000, April Montgomery of our staff met with North Carolina Department of Transportation (NCDOT) staff for a meeting of the minds concerning the above project. She reported our available information on historic architectural and archaeological surveys and resources along with our recommendations. NCDOT provided project area photographs and aerial photographs at the meeting.

Based upon our review of the photographs and the information discussed at the meeting, we offer our preliminary comments regarding this project.

In terms of historic architectural resources we are aware of no historic structures located within the area of potential effect. We recommend that no historic architectural survey be conducted for this project.

There are no known archaeological sites within the proposed project area. We, therefore, recommend that no archaeological investigation be conducted in connection with this project provided that the replacement bridge will be located in the bridge's current location with an off-site detour.

However, if the replacement bridge will be constructed on new location or an on-site detour will be constructed on new location we will require more detailed drawings of the bridge location, replacements and any detours and approach work prior to making our recommendations.

The above comments are made pursuant to Section 106 of the National Historic Preservation Act and the Advisory Council on Historic Preservation's Regulations for Compliance with Section 106 codified at 36 CFR Part 800.

Thank you for your cooperation and consideration. If you have any questions concerning the above comment, contact Renee Gledhill-Earley, Environmental Review Coordinator, at 919 733-4763.

cc: T. Padgett

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

MICHAEL F. EASLEY
GOVERNOR

LYNDO TIPPETT
SECRETARY

September 19, 2003

Memorandum To: Dennis Pipkin, P.E., Project Engineer
Bridge Replacement Unit

Heather Montague, Project Manager
Natural Environmental Project Management Unit

From: Neil Medlin, Environmental Specialist
Natural Environment Biological Survey Unit

Subject: Survey for the Cape Fear shiner in association with the replacement of Bridge No. 88 over Ferrells Creek, Chatham County, TIP No. B-3824.

Background

The project calls for the replacement of Bridge No. 88 over Ferrells Creek. The current simple beam bridge was built in 1953. The new bridge will be approximately on existing alignment, with traffic detoured offsite onto other local roads. The proposed project length will be 400 feet (120m) long and 60 feet (18.3m) wide.

This memo addresses the Cape Fear shiner (*Notropis mekistocholas*) which is Federally Endangered and listed by the U.S. Fish and Wildlife Service for Chatham County. The Cape Fear shiner is a small, moderately stocky minnow. Its body is flushed with a pale silvery yellow, and a black band runs along its sides (Snelson 1971). The fins are yellowish and somewhat pointed. The upper lip is black and the lower lip has a black bar along its margin.

Cape Fear shiner habitat occurs in streams with gravel, cobble, or boulder substrates. It is most often observed inhabiting slow pools, riffles, and slow runs associated with water willow beds. Juveniles can be found inhabiting slackwater, among large rock outcrops and in flooded side channels and pools. The Cape Fear shiner is thought to feed on bottom detritus, diatoms, and other periphytes. Captive specimens feed readily on plant and animal material.

The Cape Fear shiner is limited to three populations in North Carolina. The strongest population of the Cape Fear shiner is in Chatham and Lee Counties from the Locksville dam upstream to the Rocky River and Bear Creek. Another population is

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LOCATION:
TRANSPORTATION BUILDING
1 SOUTH WILMINGTON STREET
RALEIGH NC

located above the Rocky River Hydroelectric Dam in Chatham County, and the third population is found in the Deep River system in Randolph and Moore Counties.

Survey Methods and Results

A fisheries survey was conducted at the project site on June 25, 2003 by NCDOT Environmental Specialists N. Medlin, Rachelle Beauregard, Sharon Snider, and former NCDOT employee Anne Burroughs. The fisheries survey was conducted by pulling a seine through the water in deeper areas of slow flow and by kicking/disturbing the water while moving toward the seine in more shallow areas with faster water velocity. The approximate stream distance covered during the fish survey extended from 150 meters upstream of the bridge to 400 meters below the bridge.

Ferrells Creek in the area surveyed had a predominately sand substrate with a mix of silt in slower flow areas. Some cobble was observed with only occasional sand/gravel riffles. Stream width was estimated to be six (6) meters. Physical water chemistry measurements indicated nothing unusual for this type of stream during the early summer. The results are presented in Table 1.

No Cape Fear Shiners were collected or observed in the vicinity of Bridge No. 88 during the fisheries survey. The 9 fish species that were collected and their relative abundance are listed in Table 2.

Table 1. Physical Water Chemistry for Ferrells Creek at SR 1525, Chatham County, June 25, 2003.

Parameter	Value
Temperature (°C)	22.1
Dissolved Oxygen (mg/l)	6.2
PH (standard units)	6.9
Conductivity (umhos/cm^2)	107

Table 2. Fish Species and Relative Abundance for Ferrells Creek at SR 1525, Chatham County, June 25, 2003. (Relative Abundance: Abundant = A, Common = C, Rare = R).

Species	Relative Abundance
Golden shiner, *Notemigonus crysoleucas*	R
Sandbar shiner, *Notropis scepticus*	C
Spottail shiner, *Notropis hudsonius*	C
Eastern mosquitofish, *Gambusia holbrooki*	A
Redear sunfish, *Lepomis microlophus*	R
Bluegill, *Lepomis macrochirus*	C
Largemouth bass, *Micropterus salmoides*	C
Black crappie, *Pomoxis nigromaculatus*	R
Tessellated darter, *Etheostoma olmstedi*	C

Biological Conclusion: **Not Likely to Adversely Affect**

The results of the fish survey indicated that the Cape Fear shiner is not present in Ferrells Creek in the area near Bridge No. 88. Preferred habitat for the species was also not found in the project area. According to Natural Heritage Program records, the nearest documented occurrence of Cape Fear shiner is in the Haw River at US 15/501. The US 15/501 road crossing is slightly more than four (4) stream miles from Ferrells Creek's confluence with the Haw River. The Bridge No. 88 replacement project is located approximately one-half mile above Ferrells Creek's confluence with the Haw River. Given the results of the fish survey, the lack of preferred habitat, the distance to the nearest known population of Cape Fear shiners, and the use of BMPs throughout project construction, the completion of this project is not likely to adversely affect the species.

Qualifications of Principal Investigators

Investigator:	Neil Medlin, Environmental Specialist
Education:	M.A. Biology, Appalachian State University B.S. Biology, Appalachian State University
Experience:	Environmental Specialist, NCDOT, January 2002 - present Environmental Biologist, NC Division of Water Quality, June 1990 - January 2002 Environmental Biologist, FL Department of Environmental Protection (formerly Department of Environmental Regulation), August 1986 – June 1990
Expertise:	Freshwater fish and benthic macroinvertebrate collection and identification; aquatic habitat evaluations and function; biocriteria and biotic indices evaluations; endangered species (terrestrial/aquatic) surveys

Investigator:	Sharon Snider
Education:	B.S. Horticulture, West Virginia University M.S. Plant Sciences, University of Vermont
Experience:	Environmental Specialist, NCDOT, July 2001-present Research Biologist, USDA, 1990-1991 Field Biologist USDA, 1989
Expertise:	Section 7 field investigations, protected species (terrestrial/aquatic) surveys

Investigator:	Rachelle Beauregard
Education:	B.S. Fisheries and Wildlife Science, North Carolina State University.
Experience:	Biologist, Dr. J.H. Carter III and Associates, Inc., March 1997 – January 2001. Environmental Biologist, NC DOT, March 2001- present.
Expertise:	Endangered species (terrestrial/aquatic) surveys; natural resource investigations; wetland delineation; Section 404/401 permitting.

cc: Bill Goodwin, P.E., Bridge Replacement Unit Head

Natural Resources Technical Report

Proposed Bridge Replacement
Bridge No. 88 on SR 1525 over Ferrells Creek
Chatham County

TIP No. B-3824
State Project No. 8.2522101
FAP No. BRZ-1525(4)

North Carolina Department of Transportation
Division of Highways
Project Development and Environmental Analysis Branch

August 2002

Natural Resources Technical Report

Proposed Bridge Replacement
Bridge No. 88 on SR 1525 over Ferrells Creek
Chatham County

TIP No. B-3824
State Project No. 8.2522101
FAP No. BRZ-1525(4)

Prepared For:

North Carolina Department of Transportation
Division of Highways
Project Development and Environmental Analysis Branch

Issued by:

Earth Tech, Inc.
701 Corporate Center Drive, Suite 475
Raleigh, North Carolina 27607

Earth Tech Project No. 53190

August 2002

TABLE OF CONTENTS

SECTION ..... PAGE

TABLES

FIGURES

1.0 INTRODUCTION

This Natural Resources Technical Report is submitted to the North Carolina Department of Transportation (NCDOT) preliminary to the preparation of a Categorical Exclusion (CE) for the proposed project. The purpose of this technical report is to inventory, catalog, and describe the various natural resources likely to be impacted by the proposed action. The report also attempts to identify and estimate the likely consequences of the anticipated impacts to these resources. These descriptions and estimates are relevant only in the context of the preliminary design concepts. It may become necessary to conduct additional field investigations should design parameters and criteria change.

1.1 Project Description

The proposed project involves the replacement of Bridge No. 88 on SR 2170, which spans Ferrells Creek. The project is located in northern Chatham County about 7.5 miles (12.1 kilometers [km]) north of Pittsboro (**Figure 1**). The existing structure is a simple beam bridge, built in 1953. The existing cross section is a two-lane shoulder section with a 60-foot (18.3 m) right-of-way.

One alternative is being considered for the bridge replacement (**Figure 2**).

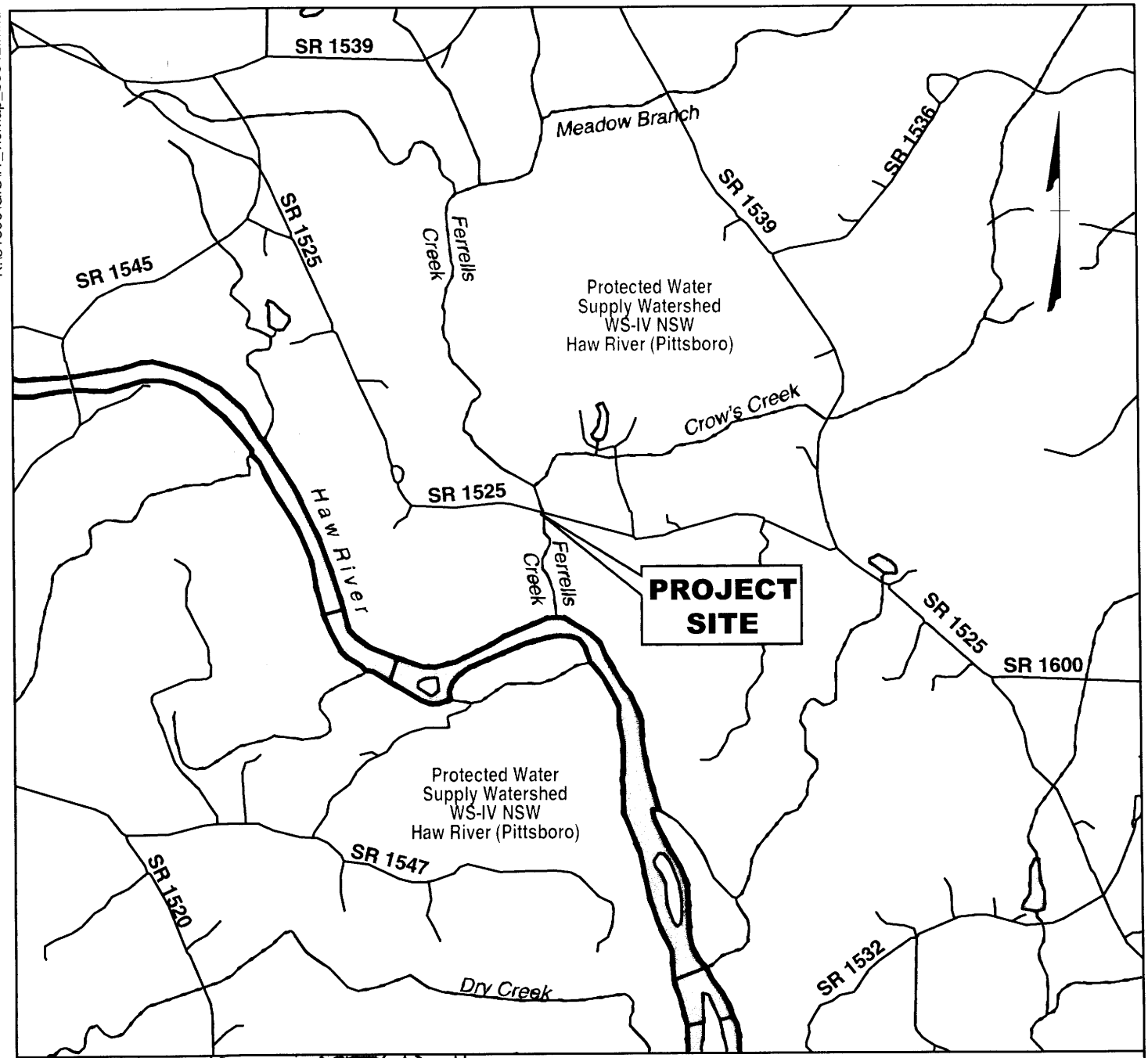
Alternate 1

Replace bridge with a new bridge approximately on existing alignment, and detour traffic offsite onto other local roads. The proposed cross-section and right-of-way will be identical to the existing condition. The proposed project length will be 400 feet (120m) long and 60 feet (18.3 m) wide.

1.2 Methodology

Published information and resources were collected prior to the field investigation. Information sources used to prepare this report include the following:

- United States Geological Survey (USGS) quadrangle map (Bynum, NC, 1968).
- United States Fish and Wildlife Service (USFWS) National Wetlands Inventory (NWI) Map (Bynum, NC, 1983).
- NCDOT aerial photograph of project area (1:1200).
- Draft maps and descriptions of the soils in the project area (Chatham Soil Survey Office, Natural Resources Conservation Service [NRCS]).
- North Carolina Department of Environment and Natural Resources (NCDENR) basin-wide assessment information (NCDENR, 1999).
- USFWS list of protected and candidate species.
- North Carolina Natural Heritage Program (NHP) files of rare species and unique habitats.



North Carolina - Department of Transportation
Division of Highways
Project Development and Environmental Analysis Branch

FIGURE 1
VICINITY MAP

Replacement of Bridge Number 88 on SR 1525
over Ferrells Creek
Chatham County
TIP No. B-3824

0.5 0.25 0 0.5 1 Miles

K:\51390\GIS\f2_b3824.mxd

Legend

- Hardwood Forest
- Maintained Roadside
- Proposed ROW
- Proposed CL
- Wetland Boundary

Ferrells Creek

SR 1525

North Carolina - Department of Transportation
Division of Highways
Project Development and Environmental Analysis Branch

FIGURE 2
NATURAL COMMUNITIES MAP
Replacement of Bridge Number 88 on SR 1525
over Ferrells Creek
Chatham County
TIP No. B-3824

100 50 0 100 Feet

Water resource information was obtained from publications posted on the World Wide Web by NCDENR Division of Water Quality (DWQ). Information concerning the occurrence of federally protected species in the study area was obtained from the USFWS list of protected and candidate species (2002), posted on the World Wide Web by the Ecological Services branch of the USFWS office in North Carolina. Information concerning species under state protection was obtained from the NHP database of rare species and unique habitats. NHP files were reviewed on March 8, 2002 for documented sightings of species on state or federal lists and locations of significant natural areas.

A general field survey was conducted along the proposed project route by Earth Tech biologists on March 21, 2002. Water resources were identified and their physical characteristics were recorded. For the purposes of this study, a brief habitat assessment was performed within the project area of Ferrells Creek. Plant communities and their associated wildlife were identified using a variety of observation techniques, including active searching, visual observations, and identifying characteristic signs of wildlife (sounds, tracks, scats, and burrows). Terrestrial community classifications generally follow Schafale and Weakley (1990) where appropriate and plant taxonomy follows Radford *et al.* (1968). Vertebrate taxonomy follows Conant *et al.* (1991), Potter *et al.* (1980), Martof *et al.* (1980), and Webster *et al.* (1985). Vegetative communities were mapped using aerial photography of the project site. Predictions regarding wildlife community composition involved general qualitative habitat assessment based on existing vegetative communities.

Jurisdictional wetlands, if present, were delineated and evaluated based on criteria established in the *U.S. Army Corps of Engineers Wetlands Delineation Manual* (USACE, 1987). Wetlands were classified based on Cowardin *et al.* (1979).

1.3 Terminology and Definitions

For the purposes of this report, the following terms are used for describing the limits of natural resources investigations. "Project area" denote an area with a width of 60 feet (30.5 m) along the full length of the project alignment. The "project vicinity" is an area extending 1 mile (1.6 km) on all sides of the project area, and "project region" is an area equivalent in size to the area represented by a 7.5-minute USGS quadrangle map (about 61.8 sq miles or 163.3 sq km). When referring to stream banks, "left bank" and "right bank" are relative to an observer facing downstream.

1.4 Qualifications of the Principal Investigators

Investigator:	Daniel Ingram
Education	B.S. Natural Resources, North Carolina State University
Experience	Staff Biologist, Earth Tech 1.5 years
Expertise	Wetland delineation, wetland mitigation

Investigator:	Heather Wallace
Education	B.S. Ecology, Appalachian State University
Experience	Staff Biologist, Earth Tech > 1 year
Expertise	Natural resources surveys, zoology

2.0 PHYSICAL RESOURCES

Soil and water resources that occur in the project area are discussed with respect to possible environmental concerns.

2.1 Regional Characteristics

The project area lies in the central portion of North Carolina within the Piedmont physiographic province. The geology of this area is within the Carolina Slate Belt. Elevations in the project area are approximately 380 feet (143 m) (1927 North American Datum). The topography of the project vicinity is moderately hilly with sharp topographic upland breaks and relatively short valleys.

The proposed project is in a rural area in Chatham County approximately 5.1 miles (8.1 km) southwest of Siler City, NC. Chatham County's major economic resources are manufacturing, retail trade and agriculture. The population of Chatham County in 2000 was 49,329 (North Carolina Office of State Budget, Planning and Management 2001).

2.2 Soils

Information about soils in the project area was taken from draft maps and descriptions provided by the Chatham County Soil Survey Office. The provisional map units in the project area are Chewacla and Wehadkee soils, and Wedowee sandy loam. All of these soils have formed from fine-grained metavolcanic rocks of the Carolina Slate Belt. Chewacla and Wehadkee soils are listed as hydric soils by the NRCS.

- **Chewacla and Wehadkee soils (545B), 0 to 2 % slope,** is mapped along the floodplain of Ferrells Creek within the project area. These soils formed in loamy sediments and occur on floodplains of Piedmont streams. These soils were not separated into individual mapping units because of difficulty in distinguishing them at this mapping scale and similarity in management. Chewacla soils rarely to frequently flood. These are very deep, somewhat poorly drained, with moderate permeability and slow runoff. Wehadkee soils are frequently flooded. The seasonal high water table is 0.5 to 2 feet (0.15 to 0.6 m). These soils are very deep, poorly drained and very poorly drained, with very slow runoff and very slow internal drainage. This soil occurs on floodplains. The seasonal high water table is 0 to 1 foot (0.3 m). Wehadkee soils are listed on the National Hydric Soils list.

- **Wedowee sandy loam (50B), 2 to 15 % slope,** is mapped on the uplands adjacent to both sides of the Ferrells Creek floodplain. These soils occur on narrow ridges and side slopes of uplands. Wedowee soils are very deep and well drained with moderate permeability and medium to rapid runoff. The depth to weathered bedrock is 32 to 60 inches [81 to 152 centimeters (cm)]. The seasonal high water table for this soil is greater than 6.0 feet (2 m), and the soils are never flooded.

Site index is a measure of soil quality and productivity. The index is the average height, in feet, that dominant and co-dominant trees of a given species attain in a specified number of years (typically 50). The site index applies to fully-stocked, even-aged, unmanaged stands. The Chatham county soil survey is incomplete and site index information is not available.

2.3 Water Resources

This section contains information concerning water resources likely to be impacted by the proposed project. Water resources assessments include the physical characteristics likely to be impacted by the proposed project (determined by field survey), best usage classifications, and water quality aspects of the water resources. Probable impacts to surface waters are also discussed, as well as means to minimize impacts.

2.3.1 Physical Characteristics of Surface Waters

The project is located in the Cape Fear River basin (CPF04 sub-basin, HUC 030604). Ferrells Creek originates about 5.2 miles (8.4 km) north of the project area. From the project area, the stream travels in a southerly direction about 0.4 miles (0.6 km) to its confluence with the Haw River.

Ferrells Creek is approximately 16 feet (4.9 m) wide and flows from north to south in the project area. The banks are 3 feet (0.9 m) high, and are moderately steep. Banks are vegetated and are stable. The substrate is sand and gravel. Flow was heavy at the time of the field survey due to recent heavy rains. Water clarity is moderate. The mean depth is unknown due to the heavy flow conditions at the time of the field survey. Three beaver dams are present in the vicinity of Bridge No. 88. An active floodplain is present upstream and downstream of the bridge. This floodplain is vegetated with trees, shrubs, vines, and herbs. The channel flows relatively straight through the project area. The creek is about 80 percent shaded by trees.

2.3.2 Best Usage Classification

Surface waters in North Carolina are assigned a classification by the DWQ that is designed to maintain, protect, and enhance water quality within the state. Ferrells Creek (Index # 16-32) is classified as a *WS-IV NSW* water body (NCDENR, 2002). *WS-IV* water resources are waters protected as sources of potable water where a WS-I, II or III classification is not feasible. These waters are also protected for *Class C* uses. WS-IV

waters are generally in *moderately to highly developed* watersheds or Protected Areas, and involve no categorical restrictions on discharges. *Class C* uses include aquatic life propagation and survival, fishing, wildlife, secondary recreation, and agriculture. Secondary recreation includes wading, boating, and other uses involving human body contact with water where such activities take place in an infrequent, unorganized, or incidental manner. There are no restrictions on watershed development activities. The supplemental *NSW* classification is intended for waters needing additional nutrient management due to their being subject to excessive growth of microscopic or macroscopic vegetation. In general, management strategies for point and nonpoint source pollution control require control of nutrients (nitrogen and/or phosphorus usually) such that excessive growths of vegetation are reduced or prevented and there is no increase in nutrients over target levels. Management strategies are site-specific.

No waters classified as High Quality Water (HQW), Water Supplies (WS-I or WS-II) or Outstanding Resource Waters (ORW) occur within 1.0 miles (1.6 km) of the project study area.

2.3.3 Water Quality

This section describes the quality of the water resources within the project area. Potential impacts to water quality from point and non-point sources are evaluated. Water quality assessments are based upon published resource information and field study observations.

2.3.3.1 General Watershed Characteristics

The project area is in a forested and agricultural, largely undeveloped watershed. However, residential use is growing. Potential threats to stream quality in this area are agricultural and forestry operations as well as development activities that would result in increased sediment and nutrient-laden runoff.

2.3.3.2 Basin-wide Assessment Report

The Environmental Sciences Branch, Water Quality Section of the DWQ, conducts basin-wide water quality assessments. The program has established monitoring stations for sampling selected benthic macroinvertebrates and fish species, which are known to have varying levels of tolerance to water pollution. An index of water quality can be derived from the number of taxa present and the ratio of tolerant to intolerant taxa. Streams can then be given a bioclassification ranging from Poor to Excellent.

There are no benthic monitoring stations on Ferrells Creek. DWQ sampled the fish community near Bridge No. 88 in 1998. The fish community at this site was rated Good-Fair. The absence of any intolerant fish species was the most apparent reason for the rating not being higher (NCDENR 2002).

2.3.3.3 Point Source Discharge Permits

Point source discharges in North Carolina are regulated through the National Pollutant Discharge Elimination System (NPDES) program administered by the DWQ. Not all discharges, nor all dischargers, are required to obtain a permit to discharge. There are no permits issued to discharge in Ferrells Creek as of March 2002 (NCDENR 2002).

2.3.4 Summary of Anticipated Impacts

Any action that affects water quality can adversely affect aquatic organisms. Temporary impacts during the construction phases may result in long-term impacts to the aquatic community. In general, replacing an existing structure in the same location with an off-site detour is the preferred environmental approach. Bridge replacement at a new location results in more severe impacts.

Project construction may result in the following impacts to surface water resources:

- Increased sediment loading and siltation as a consequence of watershed vegetation removal, erosion, and/or construction.
- Decreased light penetration/water clarity from increased sedimentation.
- Changes in water temperature with vegetation removal.
- Changes in the amount of available organic matter because of vegetation removal.
- Increased concentration of toxic compounds from highway runoff, construction activities and construction equipment, and spills from construction equipment.
- Alteration of water levels and flows as a result of interruptions and/or additions to surface and groundwater flow from construction.

Construction impacts may not be restricted to the communities in which the construction activity occurs, but may also affect downstream communities. Efforts will be made to ensure that no sediment leaves the construction site. NCDOT's Best Management Practices for the Protection of Surface Waters will be implemented, as applicable, during the construction phase of the project to ensure that no sediment leaves the construction site.

The removal of the existing bridge has the potential to impact surface waters. NCDOT Best Management Practices for Bridge Demolition and Removal will be adhered to during the removal process. Further information concerning bridge demolition is found in Section 4.1.2.

3.0 BIOTIC RESOURCES

Terrestrial and aquatic communities are included in the description of biotic resources. Living systems described in the following sections include communities of associated plants and animals. These descriptions refer to the dominant flora and fauna in each community and the relationships of these biotic components. Descriptions of the

terrestrial systems are presented in the context of plant community classifications. These classifications follow Schafale and Weakley (1990) where possible. They are also cross-referenced to *The Nature Conservancy International Classification of Ecological Communities: Terrestrial Vegetation of the Southeastern United States* (Weakley *et al.*, 1998), which has recently been adopted as the standard land cover classification by the Federal Geographic Data Committee. Representative animal species that are likely to occur in these habitats (based on published range distributions) are also cited. Scientific nomenclature and common names (when applicable) are used for the plant and animal species described. Subsequent references to the same species are by the common name only.

3.1 Terrestrial Communities

Two terrestrial communities were identified within the project area: maintained roadside, and floodplain forest (**Figure 2**). Dominant faunal components associated with these terrestrial areas will be discussed in each community description. Many species are adapted to the entire range of habitats found along the project alignment, but may not be mentioned separately in each community description.

3.1.1 Maintained Roadside

This community covers the area along the road shoulders and fill slopes in the project area. Species include bahia grass (*Paspalum notatum*), fescue (*Festuca* sp.), plantain (*Plantago* sp.), Japanese honeysuckle (*Lonicera japonica*), golden-rod (*Solidago* sp.), greenbriar (*Smilax rotundifolia*), blackberry (*Rubus* sp.), and multiflora rose (*Rosa multiflora*).

The animal species present in these disturbed habitats are opportunistic and capable of surviving on a variety of resources, ranging from vegetation to both living and dead faunal components. American crow (*Corvus brachyrhynchos*), European starling (*Sturnus vulgaris*), and American robin (*Turdus migratorius*) are birds that use these habitats. The area is also used by the Virginia opossum (*Didelphis virginiana*), various species of mice (*Peromyscus* spp.), eastern garter snake (*Thamnophis sirtalis*), and American toad (*Bufo americanus*).

3.1.2 Floodplain Forest

This community occurs along the banks and floodplain of Ferrells Creek. Canopy species include green ash (*Fraxinus pennsylvanica*), red maple (*Acer rubrum*), sweetgum (*Liquidambar styraciflua*), river birch (*Betula nigra*), American beech (*Fagus grandifolia*), and northern red oak (*Quercus rubra*). The understory includes ironwood (*Carpinus caroliniana*) and box elder (*Acer negundo*). Vines include Japanese honeysuckle, poison ivy (*Toxicodendron radicans*), and greenbriar. Herbaceous species include Japanese grass (*Microstegium vimineum*), spring beauty (*Claytonia virginica*), soft rush (*Juncus effusus*), and wild geranium (*Geranium maculatum*). The hardwood

community extends upslope outside of the floodplain with minor changes in the vegetation assemblage.

This community is classified as a Piedmont/Low Mountain Alluvial Forest, as described by Schafale and Weakley (1990). The TNC classification is most likely I.B.2.N.d.110 *Fraxinus pennsylvanica – Acer rubrum* Temporarily Flooded Forest Alliance.

Carolina wren (*Thryothorus ludovicianus*), American crow, northern cardinal (*Cardinalis cardinalis*), carolina chickadee (*Parus carolinensis*), and tufted titmouse (*Parus bicolor*) were heard or observed here. Other animals that may be found here are upland chorus frog (*Pseudacris triseriata feriarum*), southern copperhead (*Agkistrodon contortrix contortrix*), northern watersnake (*Nerodia sipedon sipedon*), eastern mole (*Scalopus aquaticus*), and golden mouse (*Ochrotomys nuttalli*).

3.2 Aquatic Communities

Within the project area, Ferrells Creek is a mid-gradient, second-order stream. The bed material consists mostly of sand and gravel. On the day of the site visit, the water was slightly turbid due to recent rain events. The riparian community is deciduous trees and shrubs, and is described in Section 3.1.2.

According to communication with Shari Bryant, District 5 Biologist for the North Carolina Wildlife Resources Commission (NCWRC), Ferrells Creek supports a significant sunfish population and was sampled by DWQ in 1998, at Bridge No. 88. During this survey the following species were collected: white sucker (*Castostomus commerconi*), creek chubsucker (*Erymizon oblongus*), redbreast sunfish (*Lepomis auritis*), green sunfish (*Lepomis cyanellus*), pumpkinseed (*Lepomis gibbosus*), warmouth (*Lepomis gulosus*), blue gill (*Lepomis macrochirus*), largemouth bass (*Micropterus salmoides*), satinfin shiner (*Cyprinella analostana*), whitefin shiner (*Cyprinella nivea*), white shiner (*Luxilus albeolus*), bluehead chub (*Nocomis leptocephalus*), golden shiner (*Notemigonous crysoleucas*), spottail shiner (*Notropis hudsonius*), sandbar shiner (*Notropis scepticus*), speckled killifish (*Fundulus rathbuni*), snail bullhead (*Ameiunus brunneus*), tessellated darter (*Etheostoma olmstedi*), mosquitofish (*Gambusia holbrooki*). Before the NCWRC can recommend construction moratorium dates, the actual plans for this project must be reviewed by the Habitat Conservation Division biologists, but tentative moratorium dates are recommended between April 1 and June 15. These dates will protect spawning habitat for most, if not all, the species found in the stream.

3.3 Summary of Anticipated Impacts

Project construction will have various impacts to the previously described terrestrial and aquatic communities. Any construction activities in or near these resources have the potential to impact biological functions. This section quantifies and qualifies potential impacts to the natural communities within the project area in terms of the area impacted

and the plants and animals affected. Temporary and permanent impacts are considered here along with recommendations to minimize or eliminate impacts.

3.3.1 Terrestrial Communities

Terrestrial communities in the project area will be impacted permanently by project construction from clearing and paving. Estimated impacts are based on the length of the alternate and the entire study corridor width. Alternate 1 is 60 feet (18.3 m) wide and 410 feet (125.0 m) long.

Table 1 describes the potential impacts to terrestrial communities by habitat type. Because impacts are based on the entire study corridor width, the actual loss of habitat will likely be less than the estimate.

Table 1. Estimated Area of Impact to Terrestrial Communities

Area of Impact in Acres (Hectares) Alternative 1	
Community	**Permanent**
Maintained Roadside	0.16 (0.07)
Floodplain Forest	0.20 (0.08)
Total Impact	**0.36 (0.14)**

Destruction of natural communities along the project alignment will result in the loss of foraging habitats for the various animal species that utilize the area. Animal species will be displaced into surrounding communities. Adult birds, mammals, and some reptiles are mobile enough to avoid mortality during construction. Young animals and less mobile species, such as many amphibians, may suffer direct loss during construction. The plants and animals that are found in the upland communities are generally common throughout central North Carolina.

Impacts to terrestrial communities, particularly in locations having steep to moderate slopes, can result in the aquatic community receiving heavy sediment loads as a consequence of erosion. Construction impacts may not be restricted to the communities in which the construction activity occurs, but may also affect downstream communities. Efforts should be made to ensure that no sediment leaves the construction site.

3.3.2 Aquatic Communities

Impacts to aquatic communities include fluctuations in water temperatures as a result of the loss of riparian vegetation. Shelter and food resources, both in the aquatic and terrestrial portions of these organisms' life cycles, will be affected by losses in the terrestrial communities. The loss of aquatic plants and animals will affect terrestrial fauna which rely on them as a food source.

Temporary and permanent impacts to aquatic organisms may result from increased sedimentation. Aquatic invertebrates may drift downstream during construction and recolonize the disturbed area once it has been stabilized. Sediments have the potential to affect fish and other aquatic life in several ways, including the clogging and abrading of gills and other respiratory surfaces, affecting the habitat by scouring and filling of pools and riffles, altering water chemistry, and smothering different life stages. Increased sedimentation may cause decreased light penetration through an increase in turbidity.

Wet concrete, which can be toxic to aquatic life, should not come into contact with surface water during bridge construction. Potential adverse effects can be minimized through the implementation of NCDOT *Best Management Practices for Protection of Surface Waters*.

4.0 JURISDICTIONAL TOPICS

This section provides inventories and impact analyses for two federal and state regulatory issues: "Waters of the United States" and rare and protected species.

4.1 Waters of the United States

Wetlands and surface waters fall under the broad category of "Waters of the United States" as defined in 33 CFR § 328.3 and in accordance with provisions of Section 404 of the Clean Water Act (33 U.S.C. 1344). These waters are regulated by the U.S. Army Corps of Engineers (USACE). Any action that proposes to dredge or place fill material into surface waters or wetlands falls under these provisions.

4.1.1 Characteristics of Wetlands and Surface Waters

The Bynum, NC NWI map shows a palustrine - forested - broadleaf deciduous - temporarily flooded wetland 200 feet (61.0 m) wide on the west side of Ferrells Creek within the proposed project area. However, during the field survey no jurisdictional wetlands were found within the proposed project area. A small jurisdictional wetland is located immediately south of the project area on the west floodplain. This wetland will not be impacted by the proposed project. Ferrells Creek meets the definition of surface waters. It is therefore classified as Waters of the United States, and is a jurisdictional perennial stream. The channel is 16 feet (4.9 m) wide within the project area.

4.1.2 Bridge Demolition

Demolition and removal of a highway bridge over Waters of the United States requires a permit from the U.S. Army Corps of Engineers if dropping components of the bridge into the water is the only practical means of demolition. Effective 9/20/99, this permit is included with the permit for bridge reconstruction. The permit application henceforth

will require disclosure of demolition methods and potential impacts to the body of water in the planning document for the bridge reconstruction.

Section 402-2 "Removal of Existing Structures" of NCDOT's Standard Specifications for Roads and Structures stipulates that "excavated materials shall not be deposited....in rivers, streams, or impoundments," and "the dropping of parts or components of structures into any body of water will not be permitted unless there is no other practical method of removal. The removal from the water of any part or component of a structure shall be done so as to keep any resulting siltation to a minimum." To meet these specifications, NCDOT shall adhere to Best Management Practices for the Protection of Surface Waters, as supplemented with Best Management Practices for Bridge Demolition and Removal.

In addition, all in-stream work shall be classified into one of three categories as follows:

Case 1) In-water work is limited to an absolute minimum, due to the presence of Outstanding Resource Waters or threatened and/or endangered species, except for the removal of the portion of the sub-structure below the water. The work is carefully coordinated with the responsible agency to protect the Outstanding Resource Water or T&E species.

Case 2) No work at all in the water during moratorium periods associated with fish migration, spawning, and larval recruitment into nursery areas.

Case 3) No special restrictions other than those outlined in Best Management Practices for Protection of Surface Waters and supplements added by the Bridge Demolition document, dated 9/20/99.

Ferrells Creek in the vicinity of the proposed project is a WS-*IV NSW* water. It is not known to provide habitat for aquatic species on the federal list of threatened and endangered species, however, it is associated with fish migration, spawning or larval recruitment. For these reasons, Case 2 applies to the proposed replacement of Bridge No. 88 over Ferrells Creek. However, if the project is found to either "Not Likely to Adversely Affect" or "Effect" the Cape Fear Shiner, then Case 1 will apply to in-stream bridge demolition and removal activities.

The bridge is composed of an asphalt wearing surface on a timber deck on steel I-beams. All substructure and bents are timber. The asphalt surface will be removed prior to demolition without dropping into Waters of the U.S. All other steel and timber components will be removed without dropping into Waters of the U.S. Thus, no temporary fill in waters is anticipated for this bridge demolition. Best Management Practices for Bridge Demolition and Removal will be followed.

The streambed in the project area is nearly all sand and gravel. Therefore, conditions in the stream do not raise sediment concerns and a turbidity curtain is not recommended.

4.1.3 Summary of Anticipated Impacts

No wetlands were identified within the project area. Project construction cannot be accomplished without infringing on surface waters. Anticipated surface water impacts fall under the jurisdiction of the USACE and the DWQ. Within the project area, Ferrells Creek is 16 feet (4.9 m) wide. Assuming a study corridor of 30 feet (9.1 m) for each side of the bridge, the construction of the new bridge will impact 60 linear feet (18.3 m) of stream, and a total area of 960 sq feet (89.2 sq m) of surface waters.

4.1.4 Permits

Impacts to jurisdictional surface waters are anticipated from the proposed project. Permits and certifications from various state and federal agencies may be required prior to construction activities.

Construction is likely to be authorized by Nationwide Permit (NWP) No. 23, as promulgated under 61 FR 2020, 2082; January 15, 2002. This permit authorizes activities undertaken, assisted, authorized, regulated, funded, or financed in whole or in part, by another Federal agency or department where that agency or department has determined that, pursuant to the Council on Environmental Quality Regulations for Implementing the Procedural Provisions of the National Environmental Policy Act:

- the activity, work, or discharge is categorically excluded from environmental documentation because it is included within a category of actions which neither individually nor cumulatively have a significant effect on the human environment; and
- the Office of the Chief Engineer has been furnished notice of the agency's or department's application for the categorical exclusion and concurs with that determination.

This project will also require a 401 Water Quality Certification No. 3361 or waiver thereof, from the Department of Environment and Natural Resources (DENR) prior to issuance of the NWP 23. Section 401 of the Clean Water Act requires that the state issue or deny water certification for any federally permitted or licensed activity that results in a discharge into Waters of the U.S. Final permit decision rests with the USACE.

4.1.5 Avoidance, Minimization, Mitigation

The function of avoidance, minimization, and mitigation is to restore and maintain the chemical, biological, and physical integrity of waters of the United States by avoiding impacts, minimizing impacts, and rectifying impacts. Each of these three aspects (avoidance, minimization, and compensatory mitigation) must be considered sequentially.

Avoidance mitigation examines all appropriate and practical possibilities of averting impacts to waters of the United States. According to a 1990 Memorandum of Agreement

(MOA) between the Environmental Protection Agency (EPA) and COE, in determining "appropriate and practical" measures to offset unavoidable impacts, such measures should be appropriate to the scope and degree of those impacts and practical in terms of costs, existing technology and logistics in light of overall project purposes.

Minimization includes the examination of appropriate and practical steps to reduce the adverse impacts to waters of the United States. Implementation of these steps will be required through project modifications and permit conditions. Practical means to minimize impacts to surface waters and wetlands impacted by the proposed project include:

- Decreasing the footprint of the proposed project through the reduction of median width, ROW widths, fill slopes and/or road shoulder widths
- Installation of temporary silt fences, earth berms, and temporary ground cover during construction
- Strict enforcement of sedimentation and erosion control BMPs for the protection of surface waters and wetlands
- Reduction of clearing and grubbing activity in and adjacent to water bodies.
- Judicious pesticide and herbicide usage
- Possible use of turbidity curtains during construction of permanent bridge bents
- Implementation of a proposed tentative in-stream construction moratorium from April 1 to June 15 in order to minimize impacts on fish migration, spawning, and larval recruitment into nursery areas

Compensatory mitigation is not normally considered until anticipated impacts to waters of the United States have been avoided and minimized to the maximum extent possible. Appropriate and practicable compensatory mitigation is required for unavoidable adverse impacts that remain after all appropriate and practicable minimization has been required. Compensatory actions often include restoration, creation, and enhancement of waters of the United States. Such actions should be undertaken in areas adjacent to or contiguous to the discharge site (*i.e.*, compensatory on-site mitigation).

Because this project will likely be authorized under a Nationwide Permit, mitigation for impacts to surface waters may or may not be required by the USACE. In accordance with the Division of Water Quality Wetland Rules [15A NCAC 2H .0506 (h)] "Fill or alteration of more than one acre of wetlands will require compensatory mitigation; and fill or alteration of more than 150 linear feet of streams may require compensatory mitigation." Written approval of the final mitigation plan is required from NCDWQ before the regulatory agency issues a Water Quality Certification. Furthermore, in accordance with 67 FR 2020; 2092; January 15, 2002, the US Army Corps of Engineers requires compensatory mitigation when necessary to ensure that adverse effects to the aquatic environment are minimal. The size and type of proposed project impact and function and value of the impacted aquatic resource are factors considered in determining acceptability of appropriate and practicable compensatory mitigation. Final compensatory stream mitigation requirements will be determined by the US Army Corps

of Engineers under the statutory provisions of CWA §404 and the January 15, 2002 Final Notice of Issuance of Nationwide Permits.

A total of 60 linear feet (18.3 m) of Ferrells Creek are located within the study corridor for the proposed project. If the final length of stream impact is greater than 150 linear feet (45.6 m), compensatory mitigation may be required. The environmental regulatory agencies will ultimately provide final permit and compensatory mitigation decisions for the project.

There are no wetland impacts associated with this project. Although impacts to Ferrells Creek are probably unavoidable, impacts to the jurisdictional wetland immediately outside the project right-of-way can be avoided by maintaining the existing Alternative 1 alignment.

4.2 Rare and Protected Species

Some populations of plants and animals are declining either as a result of natural forces or their difficulty competing with humans for resources. Rare and protected species listed for Chatham County, and any likely impacts to these species as a result of the proposed project construction, are discussed in the following sections.

4.2.1 Species Under Federal Protection

Plants and animals with a federal classification of Endangered (E), Threatened (T), Proposed Endangered (PE), and Proposed Threatened (PT) are protected under provisions of Section 7 and Section 9 of the Endangered Species Act of 1973, as amended.

The USFWS lists 4 species under federal protection for Chatham County as of 3/22/01 (USFWS 2001). These species are listed in **Table 2**.

Table 2. Species Under Federal Protection in Chatham County

Common Name	Scientific Name	Federal Status
Vertebrates		
Bald eagle	*Haliaeetus leucocephalus*	T
Cape Fear shiner	*Notropis mekistocholas*	E
Red-cockaded woodpecker	*Picoides borealis*	E
Vascular Plants		
Harperella	*Ptilimnium nodosum*	E

Notes: E Endangered-A species that is threatened with extinction throughout all or a significant portion of its range.
T Threatened-A species that is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range.

A brief description of the characteristics and habitat requirements of each species follows, along with a conclusion regarding potential project impact.

***Haliaeetus leucocephalus* (bald eagle)** **Threatened**

Family: Accipitridae
Date First Listed: March 11, 1967 (Endangered)
Date Down Listed: July 12, 1995 (Threatened)

The bald eagle is a large raptor with a wingspan reaching 7 feet (2.1 m). Adults have a dark brown body with a pure white head and tail, whereas the juvenile plumage is chocolate brown to blackish with white mottling on the tail, belly and underwings. Adult plumage is fully acquired by the fifth or sixth year.

The bald eagle is primarily associated with coasts, rivers, and lakes, usually nesting near large bodies of water where it feeds. It preys primarily on fish, but will feed on birds, mammals, turtles, and carrion when fish are unavailable.

In the southeast, the nesting and breeding season runs from September to December. Large nests up to 6 feet (2 m) across and weighing hundreds of pounds are constructed from large sticks, weeds, cornstalks, grasses, and sod. Preferred nesting sites are usually within one-half mile of water, have an open view of the surrounding area, and are in the largest living tree, usually a pine or cypress. Excessive human activity may exclude an otherwise suitable site from use. Wintering areas generally have the same characteristics as nesting sites, but may be farther from shores.

The bald eagle ranges throughout all of North America. Breeding sites in the southeast are concentrated in Florida, coastal South Carolina, and coastal Louisiana, and sporadically located elsewhere.

Biological Conclusion: **No Effect**

The USFWS has issued Habitat Management Guidelines for the Bald Eagle in the Southeast Region. The project site lies approximately 0.5 miles (0.8 k) from the Rocky River, which could provide potential foraging habitat for the Bald Eagle. Therefore the project site would fall within the secondary management zone for any nest located along the Rocky River. No Bald Eagle nests, or suitable nesting areas were located along the River. Furthermore, no large conifers or other trees suitable for a large nest were noted in the project area. Ferrells Creek is also too small to support suitable eagle foraging habitat. A search of the NHP database found no occurrence of this animal within the project vicinity. It can be concluded that the project will not impact this protected species.

***Notropis mekistocholas*(Cape Fear shiner)** **Endangered**

Vertebrate Family: Cyprinidae
Federally Listed: 1987

The Cape Fear shiner is a small, pale, silvery yellow fish, rarely exceeding 2 in (5 cm) in length, with a black band running along its sides. The fins are yellowish and somewhat pointed. The upper lip is black, and the lower lip bears a thin black bar along its margin. The Cape Fear shiner, unlike most other members of the large genus *Notropis*, feeds extensively on plant material, and its digestive tract is modified for this diet by having an elongated, convoluted intestine (USFWS 1991).

The species is generally associated with clean streams having a substrate of gravel, cobble, and boulder substrates and has been observed to inhabit slow pools, riffles, and slow runs. Side channels and pools with water of good quality and relatively low silt loads are also needed. In these habitats, the species is typically associated with schools of other related species, but it is never the numerically dominant species. Juveniles are often found in slackwater, among large rock outcrops in midstream, and in flooded side channels and pools (Pottern and Huish 1985).

Critical Habitat Designation:

Habitat is considered an important component in the conservation of endangered species and is a pre-requisite to eventual recovery. A geographic area containing essential habitat needed for the conservation and recovery of an endangered species is critical habitat. These areas are determined by the USFWS and the location of the critical habitat is published in the Federal Registry. The designated critical habitat is identified as follows: *Approximately 4.1 miles of the Rocky River from North Carolina State Highway 902 Bridge downstream to Chatham County Road 1010 Bridge; and approximately 0.5 river mile of Bear Creek, from Chatham County Road 2156 Bridge downstream to the Rocky River, then downstream in the Rocky River (approximately 4.2 river miles) to the Deep River, then downstream in the Deep River (approximately 2.6 river miles) to a point 0.3 river mile below the Moncure, North Carolina, U.S. Geological Survey Gaging Station. Constituent elements include clean streams with gravel, cobble, and boulder substrates with pools, riffles, shallow runs and slackwater areas with large rock outcrops and side channels and pools with water of good quality with relatively low silt loads.* The Haw River is not designated as critical habitat.

Biological Conclusion: **Unresolved**

The substrate of Ferrells Creek has sand and gravel substrate, low to medium sediment loads, and appears to have fair quality waters. A search of the NHP records found no occurrence of this species within the project vicinity. The Cape Fear shiner has been documented in the Haw River approximately 2.8 miles (4.5 km) downstream of the Ferrells Creek confluence. Fisheries biologists from NCDOT are

downstream of the Ferrells Creek confluence. Fisheries biologists from NCDOT are aware of Cape Fear Shiner populations occurring in the Haw River approximately one mile upstream of the Ferrells Creek/Haw River confluence. Since the project site occurs only 0.4 miles from this confluence, the Cape Fear Shiner may migrate into the project site to spawn. Project construction activities may impact the stream's aquatic communities downstream of the proposed construction site. Consequently, NCDOT will conduct more a thorough Cape Fear Shiner survey in Ferrells Creek.

***Picoides borealis* (Red-cockaded woodpecker)** **Endangered**

Family: Picidae
Federally Listed: 1970

The red-cockaded woodpecker is a small to medium sized bird 7.4 to 7.9 inches (18 to 20 cm) long with a wingspan of 14 to 15 inches (35 to 38 cm). The back and top of the head are black. The cheek is white. Numerous small white spots arranged in horizontal rows give a ladder-back appearance. The chest is dull white with small black spots on the side. Males and females look alike except males have a small red streak above the cheek.

Among woodpeckers, the red-cockaded has an advanced social system. They live in a group termed a clan. The clan may have from two to nine birds, but never more than one breeding pair. The other adults are usually males and are called helpers. The helpers are usually the sons of the breeding male and can be from 1 to 3 years old. The helpers assist in incubating eggs, feeding young, making new cavities, and defending the clan's area from other red-cockaded woodpeckers.

Roosting cavities are excavated in living pines, and usually in those which are infected with a fungus producing red-heart disease. A clan nests and roosts in a group of cavity trees called a colony. The colony may have one or two cavity trees to more than 12. In most colonies, all the cavity trees are within a circle about 1,500 ft (450 m) wide. Open stands of pines with a minimum age of 80 to 120 years provide suitable nesting habitat. Longleaf pines (*Pinus palustris*) are the most commonly used, but other species of southern pine are also acceptable. Dense stands of pines, or stands that have a dense hardwood understory are avoided. Foraging habitat is provided in pine and pine hardwood stands 30 years or older with foraging preference for pine trees 10 inches (25 cm) or larger in diameter. The woodpeckers diet consists mainly of insects which includes ants, beetles, wood-boring insects, and caterpillars.

Biological Conclusion: **No Effect**

No suitable habitat exists in the project area for the red-cockaded woodpecker. The project area does not have the open mature stand of pines that the red-cockaded woodpecker needs. A search of the NHP database found no occurrence of this bird

***Ptilimnium nodosum* (Harperella)** **Endangered**

Family: Apiaceae
Federally Listed: 1988

Harperella is an annual herb that grows to a height of 6 to 36 inches (0.2 to 1.0 m). The leaves are hollow, quill-like structures. The small, white flowers occur in heads, or umbels, not unlike those of Queen Anne's lace (*Daucus carota*). It is found in pond and riverine habitats. Flowering begins in May in the pond habitats, late June or July in the riverine habitats, and continues until frost. Seed set is apparently profuse and populations in localized areas can achieve a high density and number of individuals each year.

Harperella appears to prefer periodically disturbed sites. It typically occurs in two habitat types: (1) rocky or gravel shoals and margins of clear, swift-flowing stream sections; and (2) edges of intermittent pineland ponds in the coastal plain. It does not compete well with other species without periodic disturbance.

Major factors contributing to the endangered status of this plant are its tolerance and possible requirement of a very specific and unusual water regime. This includes moderately intensive spring floods, which may reduce or eliminate competing vegetation. Harperella is readily eliminated from its habitat by alterations of the water regime resulting from impoundments, water withdrawal, and drainage or deepening of ponds. Other factors such as siltation, pollution, and shoreline development also threaten harperella populations.

Biological Conclusion: **No Effect**

No habitat exists in the project area for harperella. The banks and sandbars of Ferrells Creek are well vegetated and the stream does not have clear margins or rocky shoals. A search of the NHP database and a search of the stream in the project area at the time of the field evaluation found no occurrence of this plant within the project vicinity. It can be concluded that the project will not impact this endangered species.

4.2.2 Federal Species of Concern and State Status

Federal Species of Concern (FSC) are not legally protected under the Endangered Species Act and are not subject to any of its provisions, including Section 7, until they are formally proposed or listed as Threatened or Endangered. **Table 3** includes FSC species listed for Chatham County and their state classifications. Organisms which are listed as Endangered (E), Threatened (T), or Special Concern (SC) on the North Carolina Natural Heritage Program list of Rare Plant and Animal Species are afforded state protection under the State Endangered Species Act and the North Carolina Plant Protection and Conservation Act of 1979. However, the level of protection given to state-listed species does not apply to NCDOT activities.

Table 3. Federal Species of Concern in Chatham County

Common Name	Scientific Name	State Status	Habitat present
Vertebrates			
Bachman's sparrow	*Aimophila aestivalis*	SC	N
Carolina darter- eastern Piedmont pop.	*Etheostoma collis* pop 2	SC	Y
Carolina redhorse	*Moxostoma* sp.	SR	Y
Invertebrates			
Atlantic pigtoe*	*Fusconaia masoni*	T	N
Brook floater	*Alasmidonta varicosa*	T	Y
Septima's clubtail dragonfly	*Gomphus septima*	SR	Y
Yellow lampmussel	*Lampsilis cariosa*	T	Y
Vascular Plants			
Virginia quillwort*	*Isoetes virginica*	C	N

Sources: Amoroso, ed., 2002; LeGrand, Hall, and Finnegan, 2001
Key: T = Threatened, E = Endangered, SC = Special Concern, C = Candidate, SR = Significantly Rare
*=Historic record. The species was last observed in the county more than 50 years ago.

No FSC species were observed during the site visit, and none are recorded at NHP as occurring within 2 miles (3.2 km) of the project area.

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INTERMITTENT CHANNEL EVALUATION FORM

ACTION ID _____ APPLICANT NAME NCDOT DATE 3-21-02

PROPOSED CHANNEL WORK (i.e., culvert, relocation, etc.) _____

WATERBODY/RIVER BASIN Terrel's Creek COUNTY/CITY Chatham County

RECENT WEATHER CONDITIONS rain past 4 Days

P	SP	NP	Observation	Comments or Description
	X		Fish/Shellfish/Crustaceans Present	
	X		Benthic Macro Invertebrates	
X			Amphibians Present/Breeding	
		X	Algae And/Or Fungus (water quality function)	
X			Wildlife Channel Use (i.e. tracks, feces, shells, others)	deer; beaver
		X	Federally Protected Species Present (Discontinue)	
		X	Riffle/Pool Structure	
	X		Stable Streambanks	
X			Channel Substrate (i.e. gravel, cobble, rock, coarse sand)	
	X		Riparian Canopy Present (SP =/> 50% closure)	
X			Undercut Banks/Instream Habitat Structure	
	X		Flow In Channel	
X			Wetlands Adjacent To/Contig. With Channel (Discontinue)	
			Persistent Pools/Saturated Bottom (June through Sept.)	March
			Seeps/Groundwater Discharge (June through Sept.)	March
	X		Adjacent Floodplain Present	
		X	Wrack Material or Drift Lines	
X			Hydrophytic Vegetation in/adjacent to channel	

Important To Domestic Water Supply? Y (N)

Does Channel Appear On A Quad Or Soils Map? (Y) / N **Approx. Drainage Area:** _____

Determination:

- [X] Perennial Channel (stop)
- [ ] Intermittent Channel (proceed)
- [ ] Ephemeral Channel (no jd)
- [ ] Ditch Through Upland (no jd)

- [ ] Important Channel: _____ LF
- [X] Unimportant Channel: _____ LF

(attach map indicating location of important/unimportant channel)

PROJECT MGR. Initials _____

Evaluator's Signature: Heather Wallace
(if other than C.O.E. project manager)

P=Present SP=Stongly Present NP=Not Present

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: B-3824 SR 1525 over Ferrells Cr.	Date: 3-21-2002
Applicant/Owner: NCDOT	County: Chatham
Investigator: Daniel Ingram	State: NC
Do Normal Circumstances exist on the site? (Yes) No	Community ID: WOL
Is the site significantly disturbed (Atypical Situation)? Yes (No)	Transect ID:
Is the area a potential Problem Area? Yes (No)	Plot ID: wetland
(If needed, explain on reverse.)	

VEGETATION

Dominant Plant Species	Stratum	Indicator
1. Fraxinus pennsylvanica	Canopy	FACW
2. Nyssa sylvatica	Canopy	FAC
3. Quercus nigra	Canopy	FAC
4. Ilex ~~americana~~ opaca	Shrub	FAC-
5. Rosa multiflora	Shrub	UPL
6. Lonicera japonica	Vine	FAC-
7. Toxicodendron radicans	Vine	FAC
8. Juncus effusus	Herb	FACW+
9. Micrestegium viminaum	Herb	FAC
10.		
11.		
12.		
13.		
14.		
15.		
16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-). 67

Remarks:

HYDROLOGY

___ Recorded Data (Describe in Remarks):
- ___ Stream, Lake, or Tide Gauge
- ___ Aerial Photographs
- ___ Other

X No Recorded Data Available

Field Observations:

Depth of Surface Water: 0-1 (in.)

Depth to Free Water in Pit: 0 (in.)

Depth to Saturated Soil: 0 (in.)

Wetland Hydrology Indicators:

Primary Indicators:
- X Inundated
- X Saturated in Upper 12 Inches
- ___ Water Marks
- ___ Drift Lines
- ___ Sediment Deposits
- ___ Drainage Patterns in Wetlands

Secondary Indicators (2 or more required):
- ___ Oxidized Root Channels in Upper 12 Inches
- ___ Water-Stained Leaves
- ___ Local Soil Survey Data
- X FAC-Neutral Test
- ___ Other (Explain in Remarks)

Remarks:

SOILS

Map Unit Name
(Series and Phase): _____ Drainage Class: _____

Field Observations

Taxonomy (Subgroup): _____ Confirm Mapped Type? Yes No

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-8		2.5Y 5/2	7.5YR 4/6	30%	clay loam
8-18+		2.5Y 4/2	10YR 4/4	30%	loamy clay

Hydric Soil Indicators:

- ___ Histosol
- ___ Histic Epipedon
- ___ Sulfidic Odor
- ___ Aquic Moisture Regime
- ___ Reducing Conditions
- X Gleyed or Low-Chroma Colors
- ___ Concretions
- ___ High Organic Content in Surface Layer in Sandy Soils
- ___ Organic Streaking in Sandy Soils
- ___ Listed on Local Hydric Soils List
- ___ Listed on National Hydric Soils List
- ___ Other (Explain in Remarks)

Remarks:

WETLAND DETERMINATION

Hydrophytic Vegetation Present? (Yes) No (Circle)
Wetland Hydrology Present? (Yes) No
Hydric Soils Present? (Yes) No

(Circle)
Is this Sampling Point Within a Wetland? (Yes) No

Remarks: