STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

BEVERLY EAVES PERDUE
GOVERNOR

EUGENE A. CONTI, JR.
SECRETARY

March 17, 2009

U. S. Army Corps of Engineers
Regulatory Field Office
Post Office Box 1000
Washington, NC 27889-1000

ATTN: Mr. William Wescott
NCDOT Coordinator

Dear Sir,

Subject: **Application for Section 404 Nationwide Permits 13 and 23** for the proposed replacement of Bridge No. 24 over Quankey Creek on SR 1434 in Halifax County. Federal Aid Project No. BRZ-1434(3), WBS Element 33756.1.1, **TIP No. B-4541.**

Please find enclosed the PCN form, permit drawings, and half-size plan sheets for the above referenced project. A Programmatic Categorical Exclusion (PCE) was completed for this project on August 8, 2008, and distributed shortly thereafter. Additional copies are available upon request. The North Carolina Department of Transportation (NCDOT) proposes to replace existing Bridge No. 24 over Quankey Creek on SR 1434, in Halifax County. The project involves replacement of the existing 52-foot structure with a 60-foot bridge at approximately the same location. The proposed bridge will be a single span box beam structure. There will be 74 feet (0.01 acre) of permanent bank stabilization to Quankey Creek and 0.05 acre of permanent impacts to its adjacent wetlands. Traffic will be detoured off-site, on surrounding roads, during construction.

Regulatory Approvals

Section 404 Permit: All aspects of this project are being processed by the Federal Highway Administration as a "Categorical Exclusion" in accordance with 23 CFR 771.115(b). The NCDOT requests that these activities be authorized by a Nationwide Permit 23 (72 CFR; 11092-11198, March 12, 2007). We are also requesting the issuance of a Nationwide Permit 13 for the bank stabilization of Quankey Creek (72 CFR; 11092-11198, March 12, 2007).

Section 401 Water Quality Certification: We anticipate 401 General Certification numbers 3701 and 3689 will apply to this project. All general conditions of the Water Quality

MAILING ADDRESS:
NC DEPARTMENT OF TRANSPORTATION
PROJECT DEVELOPMENT AND ENVIRONMENTAL ANALYSIS
1598 MAIL SERVICE CENTER

TELEPHONE: 919-431-2000
FAX: 919-431-2002
WEBSITE: WWW.NCDOT.ORG

LOCATION:
4701 ATLANTIC AVENUE
SUITE 116
RALEIGH NC 27604

Certifications will be met. In accordance with 15A NCAC 2H, Section .0500(a), we are providing two copies of this application to the NCDWQ for their review.

A copy of this application will be posted on the NCDOT website at:
http://www.ncdot.org/doh/preconstruct/pe/neu/permit.html

Thank you for your time and assistance with this project. Please contact Veronica Barnes at vabarnes@ncdot.gov or (919) 431-6758 if you have any questions or need additional information.

Sincerely,

E. L. Lusk

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

W/attachment
Mr. Brian Wrenn, NCDWQ (2 Copies)

W/o attachment (see website for attachments)
Dr. David Chang, P.E., Hydraulics
Mr. Greg Perfetti, P.E., Structure Design
Mr. Victor Barbour, P.E., Project Services Unit
Mr. Mark Staley, Roadside Environmental
Mr. Richard E. Greene , P.E. Div. 4 Engineer
Mr. Chad Coggins, Div. 4 Environmental Officer
Mr. Scott McLendon, USACE, Wilmington
Mr. Gary Jordan, USFWS
Mr. Travis Wilson, NCWRC
Mr. Ron Sechler, NMFS
Ms. Anne Deaton, NCDMF
Mr. Jay Bennett, P.E., Roadway Design
Mr. Majed Alghandour, P. E., Programming and TIP
Mr. Art McMillan, P.E., Highway Design
Ms. Pam Williams, PDEA

Office Use Only:
Corps action ID no. _____
DWQ project no. _____
Form Version 1.3 Dec 10 2008

Pre-Construction Notification (PCN) Form

A. Applicant Information

1. Processing

1a. Type(s) of approval sought from the Corps:	☒ Section 404 Permit ☐ Section 10 Permit	
1b. Specify Nationwide Permit (NWP) number: 13 23	or General Permit (GP) number:	
1c. Has the NWP or GP number been verified by the Corps?	☒ Yes	☐ No
1d. Type(s) of approval sought from the DWQ (check all that apply): ☐ 401 Water Quality Certification – Regular ☐ Non-404 Jurisdictional General Permit ☐ 401 Water Quality Certification – Express ☐ Riparian Buffer Authorization		
1e. Is this notification solely for the record because written approval is not required?	For the record only for DWQ 401 Certification: ☒ Yes ☐ No	For the record only for Corps Permit: ☐ Yes ☒ No
1f. Is payment into a mitigation bank or in-lieu fee program proposed for mitigation of impacts? If so, attach the acceptance letter from mitigation bank or in-lieu fee program.	☐ Yes	☒ No
1g. Is the project located in any of NC's twenty coastal counties. If yes, answer 1h below.	☐ Yes	☒ No
1h. Is the project located within a NC DCM Area of Environmental Concern (AEC)?	☐ Yes	☒ No

2. Project Information

2a. Name of project:	Bridge No. 24 over Quankey Creek on SR 1434 (Sam Powell Dairy Rd.)
2b. County:	Halifax
2c. Nearest municipality / town:	Roanoke Rapids
2d. Subdivision name:	not applicable
2e. NCDOT only, T.I.P. or state project no:	B-4541

3. Owner Information

3a. Name(s) on Recorded Deed:	North Carolina Department of Transportation
3b. Deed Book and Page No.	
3c. Responsible Party (for LLC if applicable):	not applicable
3d. Street address:	PDEA-NEU, 4701-116 Atlantic Avenue
3e. City, state, zip:	Raleigh, NC 27604
3f. Telephone no.:	(919) 431-6758
3g. Fax no.:	(919) 431-2002
3h. Email address:	vabarnes@ncdot.gov

4. Applicant Information (if different from owner)	
4a. Applicant is:	☐ Agent ☐ Other, specify:
4b. Name:	not applicable
4c. Business name (if applicable):	
4d. Street address:	
4e. City, state, zip:	
4f. Telephone no.:	
4g. Fax no.:	
4h. Email address:	
5. Agent/Consultant Information (if applicable)	
5a. Name:	not applicable
5b. Business name (if applicable):	
5c. Street address:	
5d. City, state, zip:	
5e. Telephone no.:	
5f. Fax no.:	
5g. Email address:	

B. Project Information and Prior Project History		
1. Property Identification		
1a. Property identification no. (tax PIN or parcel ID):		
1b. Site coordinates (in decimal degrees):	Latitude: 36.428833 (DD.DDDDDD)	Longitude: - 77.727166 (-DD.DDDDDD)
1c. Property size:	1.9 acres	
2. Surface Waters		
2a. Name of nearest body of water (stream, river, etc.) to proposed project:	Quankey Creek	
2b. Water Quality Classification of nearest receiving water:	C	
2c. River basin:	Roanoke	
3. Project Description		
3a. Describe the existing conditions on the site and the general land use in the vicinity of the project at the time of this application: General land use in the area is agriculture and forested land.		
3b. List the total estimated acreage of all existing wetlands on the property: 0.47ac		
3c. List the total estimated linear feet of all existing streams (intermittent and perennial) on the property: 110 ft		
3d. Explain the purpose of the proposed project: To replace a structurally deficient and functionally obsolete bridge.		
3e. Describe the overall project in detail, including the type of equipment to be used: The project involves replacing a structurally deficient bridge with a single-span box beam bridge on pile end bents with embedded sheet piles for abutments. The existing structure is a three-span bridge with a reinforeced concrete floor on timber joists with timber piles and caps. Standard road building equipment will be used.		
4. Jurisdictional Determinations		
4a. Have jurisdictional wetland or stream determinations by the Corps or State been requested or obtained for this property / project (including all prior phases) in the past? Comments: Action ID SAW-2008-00562	☒ Yes	☐ No ☐ Unknown
4b. If the Corps made the jurisdictional determination, what type of determination was made?	☐ Preliminary	☒ Final
4c. If yes, who delineated the jurisdictional areas? Name (if known): Steven Busbee, PWS and Rhett Baggett	Agency/Consultant Company: STV/Ralph Whitehead Assoc. Other:	
4d. If yes, list the dates of the Corps jurisdictional determinations or State determinations and attach documentation. October 21, 2008		
5. Project History		
5a. Have permits or certifications been requested or obtained for this project (including all prior phases) in the past?	☐ Yes	☒ No ☐ Unknown
5b. If yes, explain in detail according to "help file" instructions.		
6. Future Project Plans		
6a. Is this a phased project?	☐ Yes	☒ No
6b. If yes, explain.		

C. Proposed Impacts Inventory

1. Impacts Summary

1a. Which sections were completed below for your project (check all that apply):

☒ Wetlands ☒ Streams - tributaries ☐ Buffers

☐ Open Waters ☐ Pond Construction

2. Wetland Impacts

If there are wetland impacts proposed on the site, then complete this question for each wetland area impacted.

2a. Wetland impact number – Permanent (P) or Temporary (T)	2b. Type of impact	2c. Type of wetland (if known)	2d. Forested	2e. Type of jurisdiction (Corps - 404, 10 DWQ – non-404, other)	2f. Area of impact (acres)
W1 ☒ P ☐ T	Mechanized Clearing	Riparian	☒ Yes ☐ No	☒ Corps ☐ DWQ	<0.01
W2 ☒ P ☐ T	Permanent fill and mechanized clearing	Riparian	☐ Yes ☒ No	☒ Corps ☐ DWQ	0.04
W3 ☐ P ☐ T			☐ Yes ☐ No	☐ Corps ☐ DWQ	
W4 ☐ P ☐ T			☐ Yes ☐ No	☐ Corps ☐ DWQ	
W5 ☐ P ☐ T			☐ Yes ☐ No	☐ Corps ☐ DWQ	
W6 ☐ P ☐ T			☐ Yes ☐ No	☐ Corps ☐ DWQ	
				2g. **Total wetland impacts**	0.05

2h. Comments:

3. Stream Impacts

If there are perennial or intermittent stream impacts (including temporary impacts) proposed on the site, then complete this question for all stream sites impacted.

3a. Stream impact number - Permanent (P) or Temporary (T)	3b. Type of impact	3c. Stream name	3d. Perennial (PER) or intermittent (INT)?	3e. Type of jurisdiction (Corps - 404, 10 DWQ – non-404, other)	3f. Average stream width (feet)	3g. Impact length (linear feet)
S1 ☒ P ☐ T	Bank Stbilization	Quankey Creek	☒ PER ☐ INT	☒ Corps ☐ DWQ	30	74
S2 ☐ P ☐ T			☐ PER ☐ INT	☐ Corps ☐ DWQ		
S3 ☐ P ☐ T			☐ PER ☐ INT	☐ Corps ☐ DWQ		
S4 ☐ P ☐ T			☐ PER ☐ INT	☐ Corps ☐ DWQ		
S5 ☐ P ☐ T			☐ PER ☐ INT	☐ Corps ☐ DWQ		
S6 ☐ P ☐ T			☐ PER ☐ INT	☐ Corps ☐ DWQ		
				3h. **Total stream and tributary impacts**		74

3i. Comments:

4. Open Water Impacts

If there are proposed impacts to lakes, ponds, estuaries, tributaries, sounds, the Atlantic Ocean, or any other open water of the U.S. then individually list all open water impacts below.

4a. Open water impact number – Permanent (P) or Temporary (T)	4b. Name of waterbody (if applicable)	4c. Type of impact	4d. Waterbody type	4e. Area of impact (acres)
O1 ☐ P ☐ T				
O2 ☐ P ☐ T				
O3 ☐ P ☐ T				
O4 ☐ P ☐ T				
			4f. Total open water impacts	

4g. Comments:

5. Pond or Lake Construction

If pond or lake construction proposed, then complete the chart below.

5a. Pond ID number	5b. Proposed use or purpose of pond	5c. Wetland Impacts (acres)			5d. Stream Impacts (feet)			5e. Upland (acres)
		Flooded	Filled	Excavated	Flooded	Filled	Excavated	Flooded
P1								
P2								
	5f. Total							

5g. Comments:

5h. Is a dam high hazard permit required?	☐ Yes ☒ No If yes, permit ID no:
5i. Expected pond surface area (acres):	
5j. Size of pond watershed (acres):	
5k. Method of construction:	

6. Buffer Impacts (for DWQ)

If project will impact a protected riparian buffer, then complete the chart below. If yes, then individually list all buffer impacts below. If any impacts require mitigation, then you **MUST** fill out Section D of this form.

6a. Project is in which protected basin?	☐ Neuse ☐ Tar-Pamlico ☐ Other: ☐ Catawba ☐ Randleman

6b. Buffer impact number – Permanent (P) or Temporary (T)	6c. Reason for impact	6d. Stream name	6e. Buffer mitigation required?	6f. Zone 1 impact (square feet)	6g. Zone 2 impact (square feet)
B1 ☐ P ☐ T			☐ Yes ☐ No		
B2 ☐ P ☐ T			☐ Yes ☐ No		
B3 ☐ P ☐ T			☐ Yes ☐ No		
		6h. **Total buffer impacts**			

6i. Comments:

D. Impact Justification and Mitigation		
1. Avoidance and Minimization		
1a. Specifically describe measures taken to avoid or minimize the proposed impacts in designing project. The proposed bridge is longer than the existing bridge, the number of bents in the water has been reduced from 2 to zero, rip-rap stabilization is limited to stream banks, there will be no fill in the stream bed, and minimum widths were used for structures and approaches.		
1b. Specifically describe measures taken to avoid or minimize the proposed impacts through construction techniques. NCDOT Best Management Practices will be implemented during concstruction. Additionally, an offsite detour will be utilized and 3:1 fill slopes will be used where practicable.		
2. Compensatory Mitigation for Impacts to Waters of the U.S. or Waters of the State		
2a. Does the project require Compensatory Mitigation for impacts to Waters of the U.S. or Waters of the State?	☐ Yes ☒ No	
2b. If yes, mitigation is required by (check all that apply):	☐ DWQ ☐ Corps	
2c. If yes, which mitigation option will be used for this project?	☐ Mitigation bank ☐ Payment to in-lieu fee program ☐ Permittee Responsible Mitigation	
3. Complete if Using a Mitigation Bank		
3a. Name of Mitigation Bank: not applicable		
3b. Credits Purchased (attach receipt and letter)	Type	Quantity
3c. Comments:		
4. Complete if Making a Payment to In-lieu Fee Program		
4a. Approval letter from in-lieu fee program is attached.	☐ Yes	
4b. Stream mitigation requested:	linear feet	
4c. If using stream mitigation, stream temperature:	☐ warm ☐ cool ☐ cold	
4d. Buffer mitigation requested (DWQ only):	square feet	
4e. Riparian wetland mitigation requested:	acres	
4f. Non-riparian wetland mitigation requested:	acres	
4g. Coastal (tidal) wetland mitigation requested:	acres	
4h. Comments:		
5. Complete if Using a Permittee Responsible Mitigation Plan		
5a. If using a permittee responsible mitigation plan, provide a description of the proposed mitigation plan.		

6. Buffer Mitigation (State Regulated Riparian Buffer Rules) – required by DWQ				
6a. Will the project result in an impact within a protected riparian buffer that requires buffer mitigation?			☐ Yes	☒ No
6b. If yes, then identify the square feet of impact to each zone of the riparian buffer that requires mitigation. Calculate the amount of mitigation required.				
Zone	6c. Reason for impact	6d. Total impact (square feet)	Multiplier	6e. Required mitigation (square feet)
Zone 1			3 (2 for Catawba)	
Zone 2			1.5	
		6f. **Total buffer mitigation required:**		
6g. If buffer mitigation is required, discuss what type of mitigation is proposed (e.g., payment to private mitigation bank, permittee responsible riparian buffer restoration, payment into an approved in-lieu fee fund).				
6h. Comments:				

E. Stormwater Management and Diffuse Flow Plan (required by DWQ)	
1. Diffuse Flow Plan	
1a. Does the project include or is it adjacent to protected riparian buffers identified within one of the NC Riparian Buffer Protection Rules?	☐ Yes ☒ No
1b. If yes, then is a diffuse flow plan included? If no, explain why. Comments: N/A	☐ Yes ☐ No
2. Stormwater Management Plan	
2a. What is the overall percent imperviousness of this project?	%
2b. Does this project require a Stormwater Management Plan?	☐ Yes ☐ No
2c. If this project DOES NOT require a Stormwater Management Plan, explain why:	
2d. If this project DOES require a Stormwater Management Plan, then provide a brief, narrative description of the plan:	
2e. Who will be responsible for the review of the Stormwater Management Plan?	☐ Certified Local Government ☐ DWQ Stormwater Program ☐ DWQ 401 Unit
3. Certified Local Government Stormwater Review	
3a. In which local government's jurisdiction is this project?	not applicable
3b. Which of the following locally-implemented stormwater management programs apply (check all that apply):	☐ Phase II ☐ NSW ☐ USMP ☐ Water Supply Watershed ☐ Other:
3c. Has the approved Stormwater Management Plan with proof of approval been attached?	☐ Yes ☐ No
4. DWQ Stormwater Program Review	
4a. Which of the following state-implemented stormwater management programs apply (check all that apply):	☐ Coastal counties ☐ HQW ☐ ORW ☐ Session Law 2006-246 ☐ Other:
4b. Has the approved Stormwater Management Plan with proof of approval been attached?	☐ Yes ☐ No
5. DWQ 401 Unit Stormwater Review	
5a. Does the Stormwater Management Plan meet the appropriate requirements?	☐ Yes ☐ No
5b. Have all of the 401 Unit submittal requirements been met?	☐ Yes ☐ No

F. Supplementary Information		
1. Environmental Documentation (DWQ Requirement)		
1a. Does the project involve an expenditure of public (federal/state/local) funds or the use of public (federal/state) land?	☒ Yes	☐ No
1b. If you answered "yes" to the above, does the project require preparation of an environmental document pursuant to the requirements of the National or State (North Carolina) Environmental Policy Act (NEPA/SEPA)?	☒ Yes	☐ No
1c. If you answered "yes" to the above, has the document review been finalized by the State Clearing House? (If so, attach a copy of the NEPA or SEPA final approval letter.) Comments:	☒ Yes	☐ No
2. Violations (DWQ Requirement)		
2a. Is the site in violation of DWQ Wetland Rules (15A NCAC 2H .0500), Isolated Wetland Rules (15A NCAC 2H .1300), DWQ Surface Water or Wetland Standards, or Riparian Buffer Rules (15A NCAC 2B .0200)?	☐ Yes	☒ No
2b. Is this an after-the-fact permit application?	☐ Yes	☒ No
2c. If you answered "yes" to one or both of the above questions, provide an explanation of the violation(s): N/A		
3. Cumulative Impacts (DWQ Requirement)		
3a. Will this project (based on past and reasonably anticipated future impacts) result in additional development, which could impact nearby downstream water quality?	☐ Yes	☒ No
3b. If you answered "yes" to the above, submit a qualitative or quantitative cumulative impact analysis in accordance with the most recent DWQ policy. If you answered "no," provide a short narrative description. N/A		
4. Sewage Disposal (DWQ Requirement)		
4a. Clearly detail the ultimate treatment methods and disposition (non-discharge or discharge) of wastewater generated from the proposed project, or available capacity of the subject facility. not applicable		

5. Endangered Species and Designated Critical Habitat (Corps Requirement)		
5a. Will this project occur in or near an area with federally protected species or habitat?	☐ Yes	☒ No
5b. Have you checked with the USFWS concerning Endangered Species Act impacts?	☒ Yes	☐ No
5c. If yes, indicate the USFWS Field Office you have contacted.	☒ Raleigh ☐ Asheville	
5d. What data sources did you use to determine whether your site would impact Endangered Species or Designated Critical Habitat? The USFWS list of Threatened and Endangered Species of Halifax County (updated January 31, 2008) was consulted to determine which specie may occur in the area. The most up-to-date Natural Heritage Program databases were searched for known occurences of species and habitat. Surveys for species with potential habitat in the area were conducted on October 26, 2006. It was determined that the project are did not have suitable habitat and therefore would have NO EFFECT on any of the species listed for Halifax County.		
6. Essential Fish Habitat (Corps Requirement)		
6a. Will this project occur in or near an area designated as essential fish habitat?	☐ Yes	☒ No
6b. What data sources did you use to determine whether your site would impact Essential Fish Habitat? Index of Counties in which EFH Waterbodies are found.		
7. Historic or Prehistoric Cultural Resources (Corps Requirement)		
7a. Will this project occur in or near an area that the state, federal or tribal governments have designated as having historic or cultural preservation status (e.g., National Historic Trust designation or properties significant in North Carolina history and archaeology)?	☐ Yes	☒ No
7b. What data sources did you use to determine whether your site would impact historic or archeological resources? Physical surveys were conducted by the Human Environment Unit of NCDOT.		
8. Flood Zone Designation (Corps Requirement)		
8a. Will this project occur in a FEMA-designated 100-year floodplain?	☐ Yes	☐ No
8b. If yes, explain how project meets FEMA requirements:		
8c. What source(s) did you use to make the floodplain determination?		

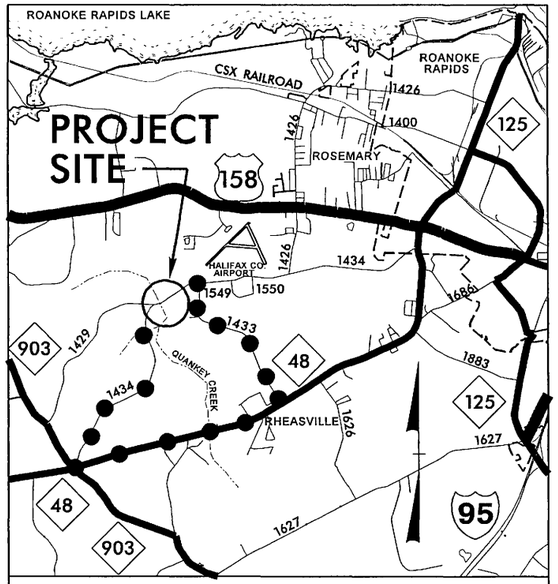
E.L. Lusk Applicant/Agent's Printed Name	E.L. Lusk Applicant/Agent's Signature (Agent's signature is valid only if an authorization letter from the applicant is provided.)	3.17.09 Date

09/08/99

TIP PROJECT: B-4541

CONTRACT:

See Sheet 1-A For Index of Sheets



VICINITY MAP
OFFSITE DETOUR

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

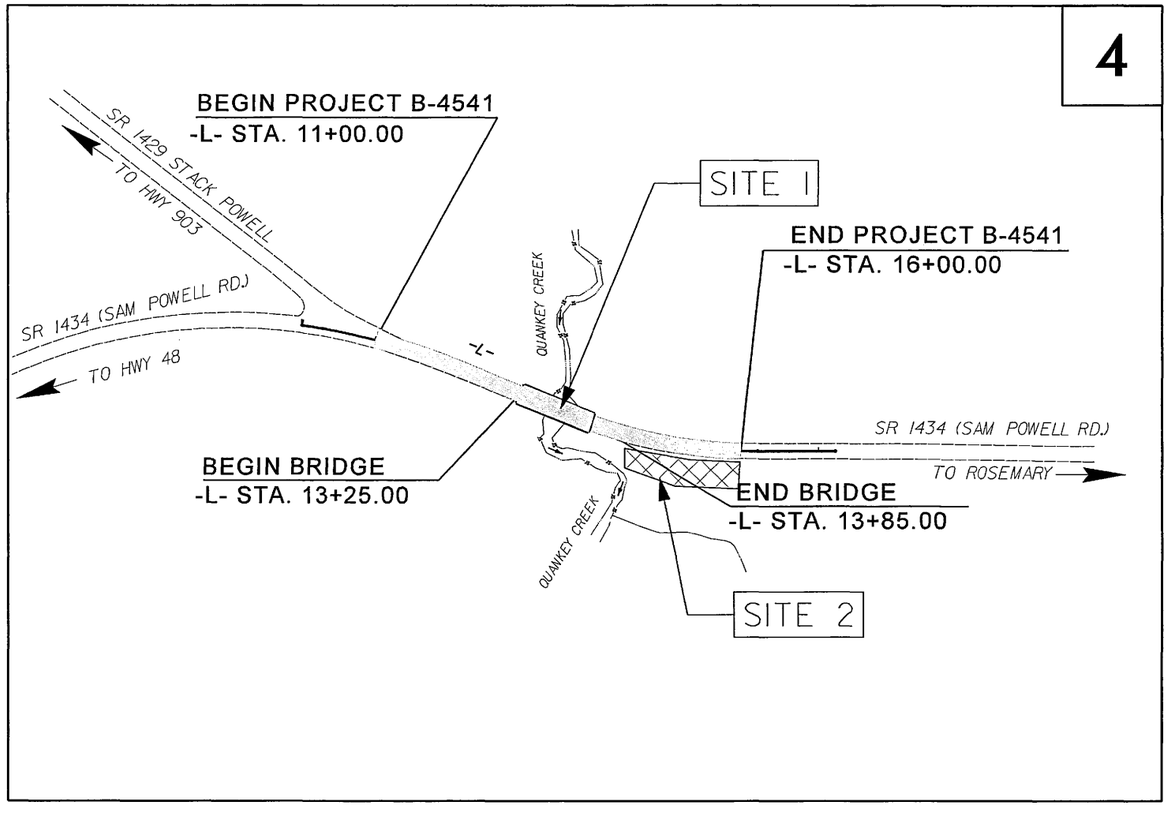
HALIFAX COUNTY

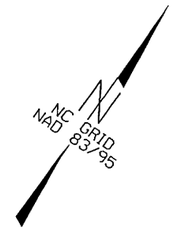
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-4541	1	

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
33756.1.1	BRZ-1434(3)	P.E.
33756.2.1	BRZ-1434(3)	ROW /UTIL

LOCATION: BRIDGE No. 24 ON SR 1434 (SAM POWELL RD.) OVER QUANKEY CREEK

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





WETLAND/ STREAM IMPACTS

CLEARING ON THIS PROJECT SHALL BE PERFORMED TO THE LIMITS ESTABLISHED BY METHOD III

THIS PROJECT IS NOT WITHIN ANY MUNICIPAL BOUNDARIES.

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 2008 = 1385
ADT 2030 = 2200
DHV = 10 %
D = 60 %
T = 3 % *
V = 50 MPH
FUNC. CLASS = LOCAL
* TTST 1% DUAL 2%

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT B-4541 = 0.084 MI

LENGTH STRUCTURE TIP PROJECT B-4541 = 0.011 MI

TOTAL LENGTH OF TIP PROJECT B-4541 = 0.095 MI

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

2006 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
NOVEMBER 18, 2008

LETTING DATE:
NOVEMBER 17, 2009

JASON MOORE, PE
PROJECT ENGINEER

BRYAN KEY, PE
PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER

P.E.
SIGNATURE:

ROADWAY DESIGN ENGINEER

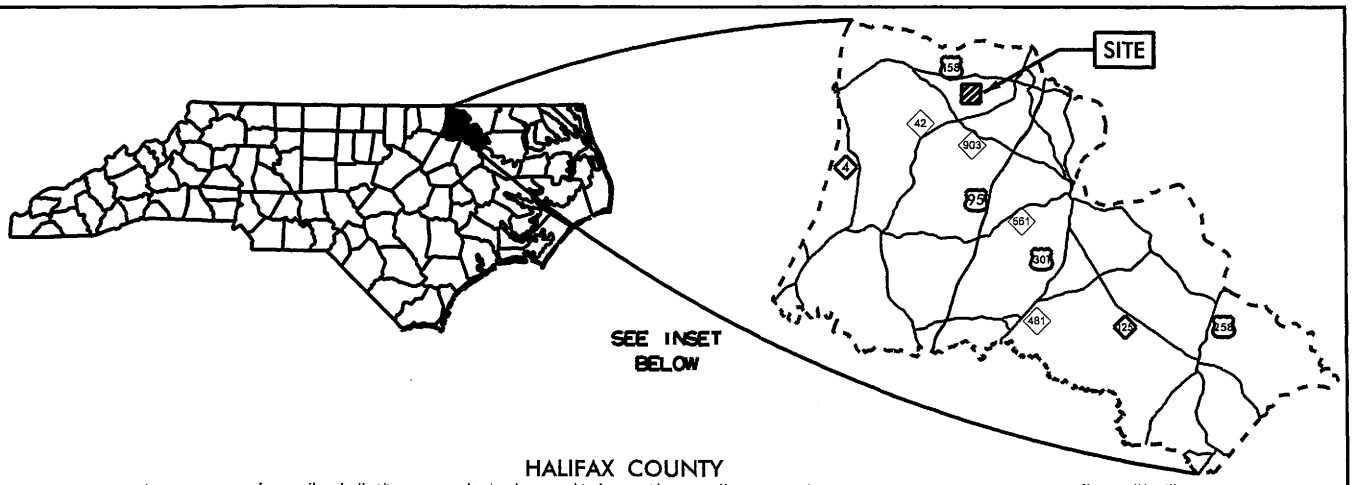
P.E.
SIGNATURE:

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

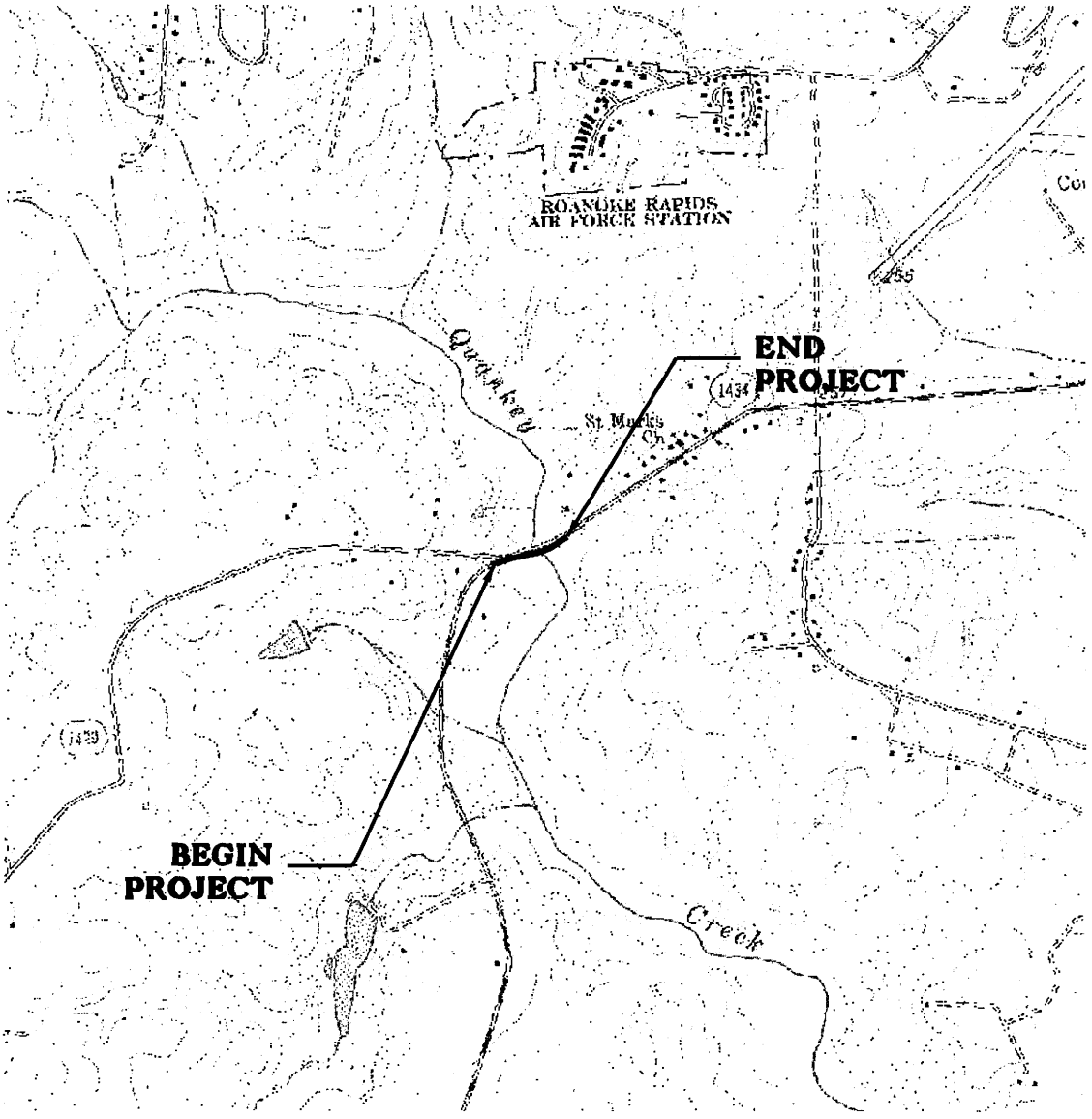
Permit Drawing
Sheet 1 of 10

STATE HIGHWAY DESIGN ENGINEER

$$$$$$$SYSTIME$$$$$$
$$$$$$$$$$$$$$$$$$$$DGN$$$$$$$$$$$$$$$$$$$$
$$$$$USERNAME$$$$



HALIFAX COUNTY



WETLAND IMPACTS

N.C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS

HALIFAX COUNTY
PROJECT:33756.1.1 (B-4541)
BRIDGE NO. 24 OVER
OUANKEY CREEK ON SR 1434
(SAM POWELL ROAD)

SHEET ___ OF ___ 1-7-09

Permit Drawing
Sheet 2 of 10

PROPERTY OWNERS

NAMES AND ADDRESSES

PARCEL NO.	NAMES	ADDRESSES
4	JAMES E. KERR II	ADDRESSES

N.C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS

HALIFAX COUNTY
PROJECT:33756.1.1 (B-4541)
BRIDGE NO. 24 OVER
QUANKEY CREEK ON SR 1434
(SAM POWELL ROAD)

SHEET ___ OF ___ 1-7-09

Permit Drawing
Sheet 3 of 10

WETLAND PERMIT IMPACT SUMMARY

Site No.	Station (From/To)	Structure Size / Type	WETLAND IMPACTS					SURFACE WATER IMPACTS				
			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	13+36/13+72 -L-	BRIDGE				<.01		0.01		74		
2	14+59/17+00 -L-	ROADWAY	0.01			0.04						
TOTALS:			0.01			0.04		0.01		74		

NC DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

HALIFAX COUNTY
PROJECT: 33756.1.1 (B-4541)

SHEET 1/7/2009

ATN Revised 3/31/05

Permit Drawing
Sheet 4 of 10

PROJECT REFERENCE NO.	SHEET NO.
B-4541	4
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

-L- SR 1434

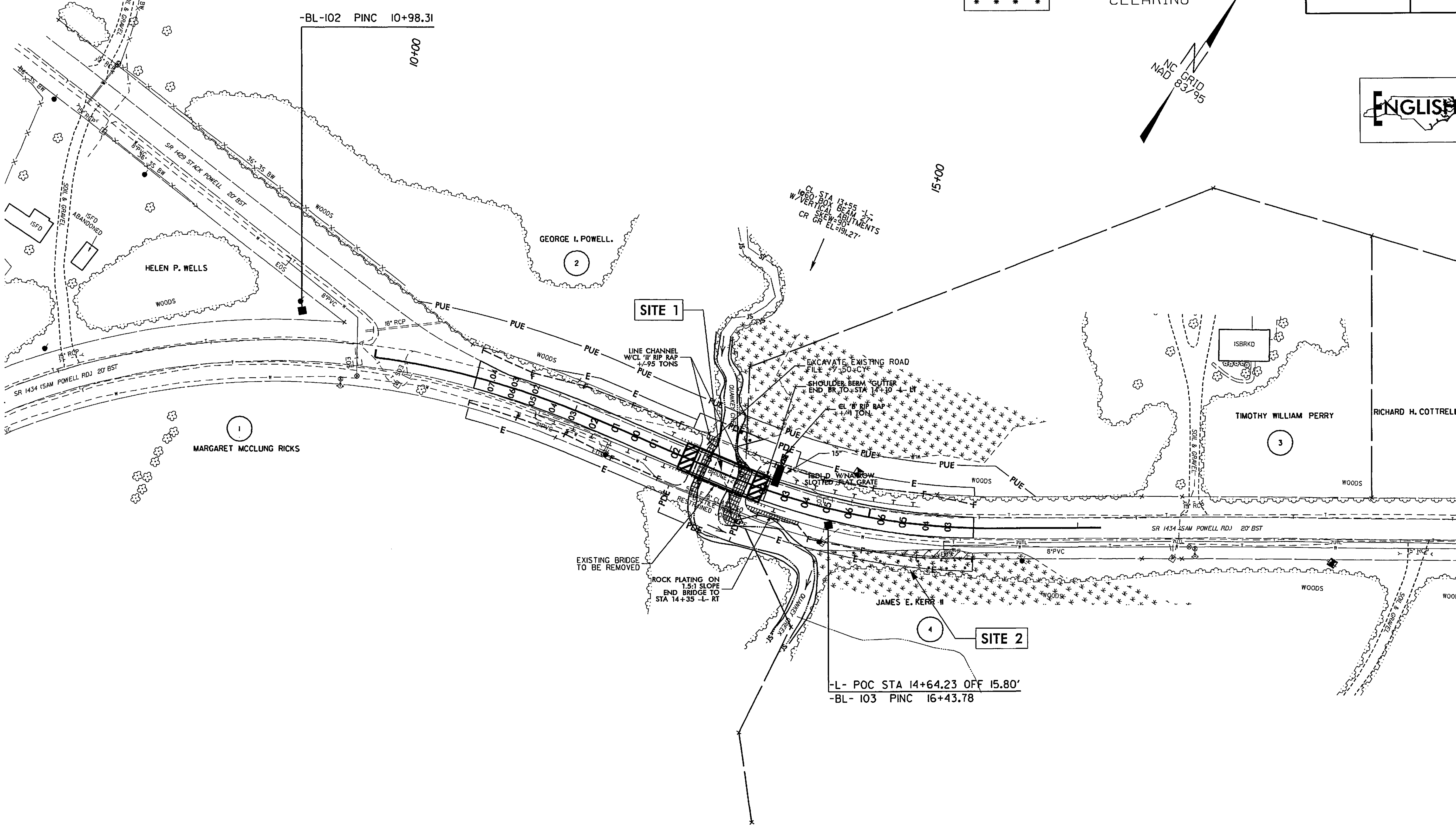
PI Sta 11+05.57
Δ = 15° 36' 49.6" (RT)
D = 7° 26' 27.6"
L = 209.83'
T = 105.57'
R = 770.00'
SE = EXIST.

PI Sta 14+94.00
Δ = 23° 03' 33.2" (LT)
D = 8° 54' 38.5"
L = 258.78'
T = 131.17'
R = 643.00'
SE = .06
V_0 = 45mph

F / F — DENOTES FILL IN WETLAND

S / S — DENOTES IMPACTS IN SURFACE WATER

* * * — DENOTES MECHANIZED CLEARING



-BL-102 PINC 10+98.31
10+00
15+00
NC GRID NAD 83/95
ENGLISH
SR 1429 STACK POWELL 20' BST
SR 1434 (SAM POWELL RD) 20' BST
HELEN P. WELLS
GEORGE I. POWELL
MARGARET MCCLUNG RICKS
TIMOTHY WILLIAM PERRY
RICHARD H. COTTRELL
JAMES E. KERR II
ISFD ABANDONED
ISBRKD
WOODS
SITE 1
SITE 2
CL STA 13+55 -L- 1@60' BOX BEAM 27" W/VERTICAL ABUTMENTS SKEW=90° CR GR EL=19.27'
LINE CHANNEL W/CL 'II' RIP RAP +/-95 TONS
EXCAVATE EXISTING ROAD FILL +/-350 CY
SHOULDER BERM GUTTER END BR TO STA 14+10 -L- LT
CL 'B' RIP RAP +/-4 TON
EXISTING BRIDGE TO BE REMOVED
ROCK PLATING ON 1.5:1 SLOPE END BRIDGE TO STA 14+35 -L- RT
-L- POC STA 14+64.23 OFF 15.80'
-BL- 103 PINC 16+43.78
PUE

SEE SHEET 5 FOR -L- PROFILE
SEE SHEET S-1 THRU S-_ FOR STRUCTURE PLANS

Permit Drawing
Sheet 5 of 10

REVISIONS

8/17/99

8/17/99

REVISIONS

PROJECT REFERENCE NO.	SHEET NO.
B-4541	4
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

-L- SR 1434

PI Sta 11+05.57
Δ = 15° 36′ 49.6″ (RT)
D = 7° 26′ 27.6″
L = 209.83′
T = 105.57′
R = 770.00′
SE = EXIST.

PI Sta 14+94.00
Δ = 23° 03′ 33.2″ (LT)
D = 8° 54′ 38.5″
L = 258.78′
T = 131.17′
R = 643.00′
SE = .06
V_0 = 45mph

F ▨ F	DENOTES FILL IN WETLAND
S ▨ S	DENOTES IMPACTS IN SURFACE WATER
* * *	DENOTES MECHANIZED CLEARING

SEE SHEET 5 FOR -L- PROFILE
SEE SHEET S-1 THRU S-_ FOR STRUCTURE PLANS

Permit Drawing
Sheet 12 of 10

$$$$SYSTIME$$$$
$$$$$$$$$$$DGN$$$$$$$$$$$$$$$$$
$$$$USERNAME$$$$

8/17/99

REVISIONS

PROJECT REFERENCE NO.	SHEET NO.
B-4541	4
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

ENGLISH

F F DENOTES FILL IN WETLAND

S S DENOTES IMPACTS IN SURFACE WATER

DENOTES MECHANIZED CLEARING

SEE SHEET 5 FOR -L- PROFILE
SEE SHEET S-1 THRU S-_ FOR STRUCTURE PLANS

$$$$$$SYSTIME$$$$$
$$$$$$$$$$$DGN$$$$$$$$$$$$$$$$$
$$$$USERNAME$$$$

Permit Drawing
Sheet 7 of 1

PROJECT REFERENCE NO.	SHEET NO.
B-4541	4
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

ENGLISH

8/17/99

REVISIONS

CL STA 13+55 -L-
160' BOX BEAM 27"
W/VERTICAL ABUTMENTS
SKEW=90°
CR GR EL=191.27'

15+00

GEORGE I. POWELL

2

SITE 1

NC GRID
NAD 83/96

18" RCP
INV.=191.23

21' INC

LINE CHANNEL
W/CL 'II' RIP RAP
+/-95 TONS

WOODS

GRAU 350

EXCAVATE EXISTING ROAD
FILL +/-50 CY

SHOULDER BERM GUTTER
END BR TO STA 14+10 -L- LT

CL 'B' RIP RAP
+/-1 TON

PUE

PDE

15"

TBDI_D W/NARROW
SLOTTED FLAT GRATE

8"PVC

JS

ST

B-77

BRIDGE 27

REMAINING PORTION OF EXISTING BRIDGE TO BE REMOVED BY CLASS 50 DUCTILE IRON JOINT

EXISTING BRIDGE
TO BE REMOVED

ROCK PLATING ON
1.5:1 SLOPE
END BRIDGE TO
STA 14+35 -L- RT

JAMES E. KERR II

4

SITE 2

F F DENOTES FILL IN WETLAND

S S DENOTES IMPACTS IN SURFACE WATER

DENOTES MECHANIZED CLEARING

50 25 0 50 100

PLANS

SEE SHEET 5 FOR -L- PROFILE
SEE SHEET S-1 THRU S-_ FOR STRUCTURE PLANS

Permit Drawing
Sheet 4 of 15

5/14/99

PROJECT REFERENCE NO.	SHEET NO.
B-4541	5

ROADWAY DESIGN ENGINEER

HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

-L- SR 1804

-L-

BM #1
R/R SPIKE IN BASE OF 10" GUM
-BL- STA 5+33.33 O/S 20.75' LT
EL = 226.44'

BM #2
R/R SPIKE IN BASE OF 15" GUM
-L- STA 14+81.22 OFF 40.25' LT
EL = 188.08'

BM #3
R/R SPIKE IN BASE OF TELEPHONE POLE
-BL- STA. 21+23.71 OS 25.10' RT
EL = 205.10'

BRIDGE HYDRAULIC DATA

DESIGN DISCHARGE	*= 1200*	*CFS*
DESIGN FREQUENCY	*= 25*	*YRS*
DESIGN HW ELEVATION	*= 190.3*	*FT*
BASE DISCHARGE	*= 1800*	*CFS*
BASE FREQUENCY	*= 100*	*YRS*
BASE HW ELEVATION	*= 190.9*	*FT*
OVERTOPPING DISCHARGE	*= <1800*	*CFS*
OVERTOPPING FREQUENCY	*= <100*	*YRS*
OVERTOPPING ELEVATION	*= 190.8*	*FT*
DATE OF SURVEY	*= 8/8/08*	
W.S. ELEVATION AT DATE OF SURVEY	*= 296*	*SF*

SEE SHEET 4 FOR -L- PLAN VIEW

$$$$$$SYSTIME$$$$$
$$$$$$$$$$$$$$$$$$DGN$$$$$$$$$$$$$$$$$$
$$$$USERNAME$$$$

Permit Drawing
Sheet 9 of 10

8/23/99

PROJ. REFERENCE NO. B-4541 | SHEET NO. X-3

0 2.5 5

75 70 65 60 55 50 45 40 35 30 25 20 15 10 5 0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75

195 190 185 180

191.48

17+00.00

190.86

16+50.00

FILL IN WETLAND MECHANIZED CLEARING

3:1 EXIST. EXIST. 3:1

190.46

S.S. 188.294 S.S. 185.992

SITE 2

16+00.00

FILL IN WETLAND MECHANIZED CLEARING

3:1 0.044 0.044 3:1

190.34

S.S. 186.229 S.S. 186.087

15+50.00

MECHAIZED CLEARING

3:1 0.060 0.060 3:1

190.31

S.S. 186.499 S.S. 186.172

15+00.00

-4-

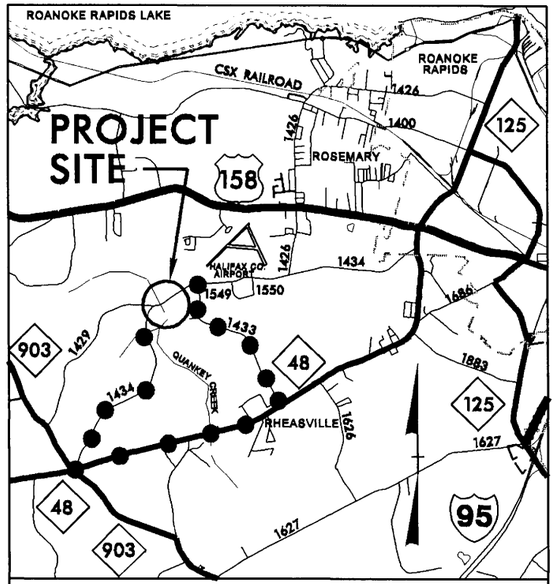
Permit Drawing

09/08/99

TIP PROJECT: B-4541

CONTRACT: C202234

See Sheet 1-A For Index of Sheets



VICINITY MAP
OFFSITE DETOUR

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

HALIFAX COUNTY

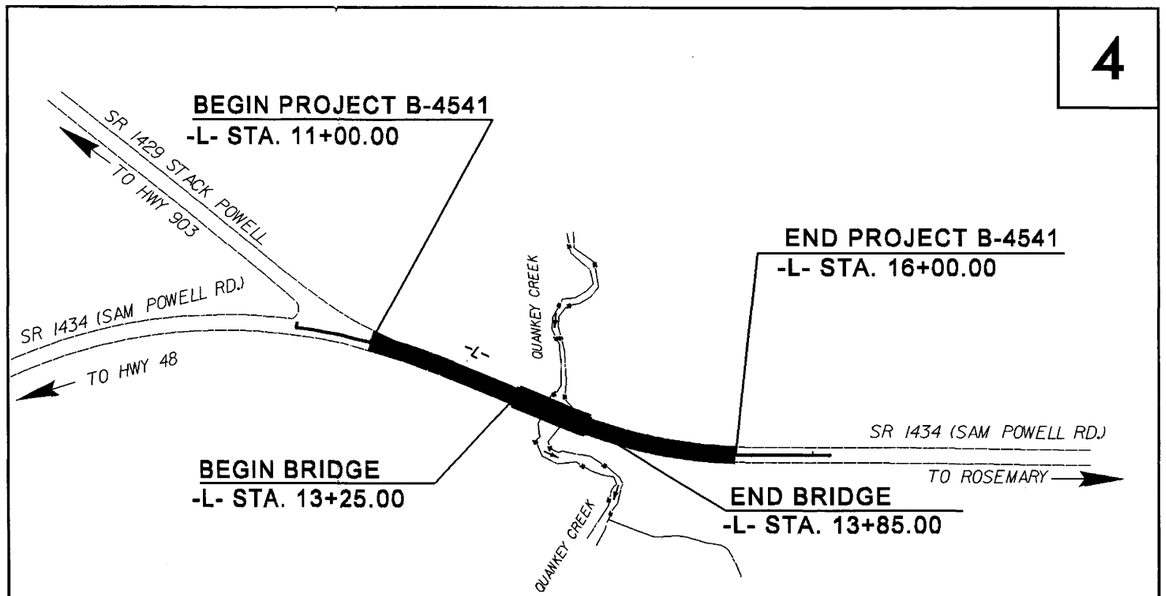
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-4541	1	

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
33756.1.1	BRZ-1434(3)	P.E.
33756.2.1	BRZ-1434(3)	ROW /UTIL

LOCATION: BRIDGE No. 24 ON SR 1434 (SAM POWELL RD.) OVER QUANKEY CREEK

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

4



NC GRID NAD 83/95

CLEARING ON THIS PROJECT SHALL BE PERFORMED TO THE LIMITS ESTABLISHED BY METHOD III

THIS PROJECT IS NOT WITHIN ANY MUNICIPAL BOUNDARIES.

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 2008 = 1385
ADT 2030 = 2200
DHV = 10 %
D = 60 %
T = 3 % *
V = 50 MPH
FUNC. CLASS = LOCAL
* TTST 1% DUAL 2%

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT B-4541 = 0.084 MI

LENGTH STRUCTURE TIP PROJECT B-4541 = 0.011 MI

TOTAL LENGTH OF TIP PROJECT B-4541 = 0.095 MI

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

2006 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
NOVEMBER 18, 2008

LETTING DATE:
NOVEMBER 17, 2009

JASON MOORE, PE
PROJECT ENGINEER

BRYAN KEY, PE
PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER

P.E.
SIGNATURE:

ROADWAY DESIGN ENGINEER

P.E.
SIGNATURE:

DIVISION OF HIGHWAYS STATE OF NORTH CAROLINA

P.E.
STATE HIGHWAY DESIGN ENGINEER

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$$$$USERNAME$$$$

3/15/96

PROJECT REFERENCE NO.	SHEET NO.
B-4541	1-B

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 — BZ 1
- Buffer Zone 2 — BZ 2
- Flow Arrow
- Disappearing Stream
- Spring
- Wetland
- 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 — CA
- 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
- 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 — TV
- 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

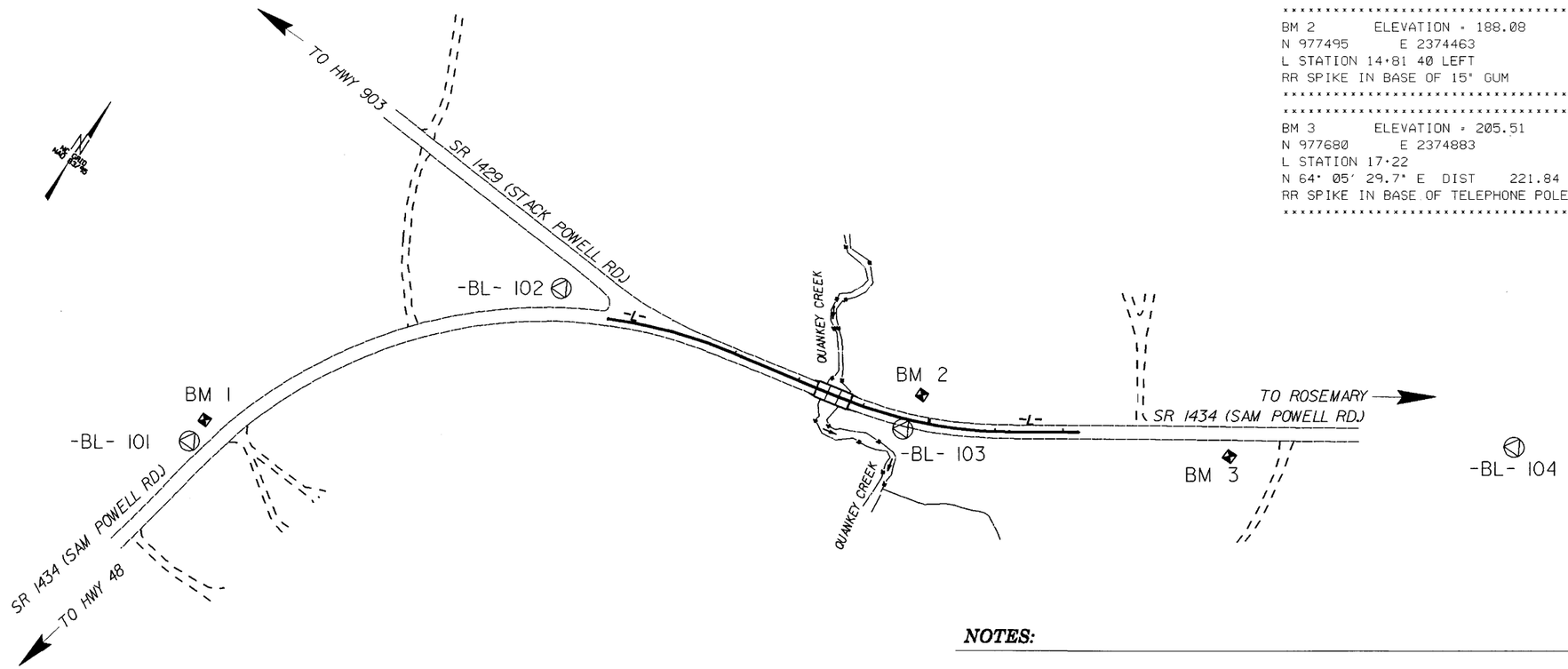
PROJECT REFERENCE NO.	SHEET NO.
B-4541	1-C
Location and Surveys	

SURVEY CONTROL SHEET B-4541

BASELINE DATA

BL

POINT	DESC.	NORTH	EAST	ELEVATION	L STATION	OFFSET
101	BL-101	976813.6060	2373613.2180	222.62	OUTSIDE PROJECT LIMITS	
102	BL-102	977317.3320	2373936.0640	208.01	OUTSIDE PROJECT LIMITS	
103	BL-103	977437.2310	2374468.1990	190.42	14+64.74	15.30 RT
104	BL-104	977930.5440	2375216.4800	233.96	OUTSIDE PROJECT LIMITS	



BENCHMARK DATA

```
**************************************
BM 1       ELEVATION = 226.44
N 976853      E 2373614
L STATION 10+00
S 40° 55' 19.7" W  DIST    618.67
RR SPIKE IN BASE OF 10" GUM
**************************************
**************************************
BM 2       ELEVATION = 188.08
N 977495      E 2374463
L STATION 14+81 40 LEFT
RR SPIKE IN BASE OF 15" GUM
**************************************
**************************************
BM 3       ELEVATION = 205.51
N 977680      E 2374883
L STATION 17+22
N 64° 05' 29.7" E  DIST    221.84
RR SPIKE IN BASE OF TELEPHONE POLE
**************************************
```

DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCDOT FOR MONUMENT ""GPS B4541-1"" WITH NAD 83/95 STATE PLANE GRID COORDINATES OF NORTHING: 978377.164(ft) EASTING: 2375811.797(ft) THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 1.00007714 THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM ""GPS B4541-1"" TO -L- STATION 10+00.00 IS S 59°28'53" W 2081.12 FT. ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES VERTICAL DATUM USED IS NAVD 88

NOTES:

1. *THE CONTROL DATA FOR THIS PROJECT CAN BE FOUND ELECTRONICALLY BY SELECTING PROJECT CONTROL DATA AT: HTTP://WWW.NCDOT.ORG/DOH/PRECONSTRUCT/HIGHWAY/LOCATION/PROJECT/*

   THE FILES TO BE FOUND ARE AS FOLLOWS: B4541_LS_CONTROL_080715.TXT

   SITE CALIBRATION INFORMATION HAS NOT BEEN PROVIDED FOR THIS PROJECT. IF FURTHER INFORMATION IS NEEDED, PLEASE CONTACT THE LOCATION AND SURVEYS UNIT.

⊘ *INDICATES GEODETIC CONTROL MONUMENTS USED OR SET FOR HORIZONTAL PROJECT CONTROL BY THE NCDOT LOCATION AND SURVEYS UNIT.*

PROJECT CONTROL ESTABLISHED USING GLOBAL POSITIONING SYSTEM. NETWORK ESTABLISHED FROM NGS ONLINE POSITIONING SERVICE (OPUS)

NOTE: DRAWING NOT TO SCALE

16-JAN-2009 14:35
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6/2/99

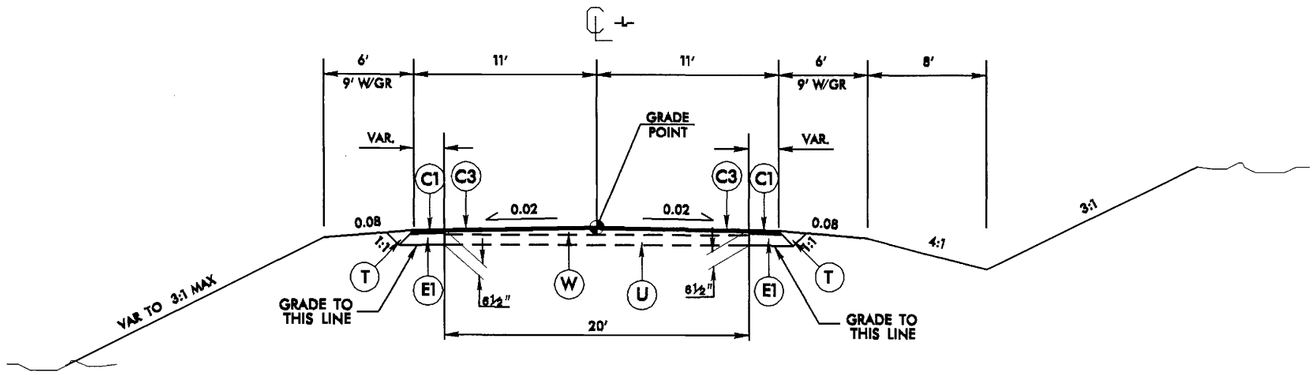
PROJECT REFERENCE NO.	SHEET NO.
B-4541	2
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

FINAL PAVEMENT SCHEDULE

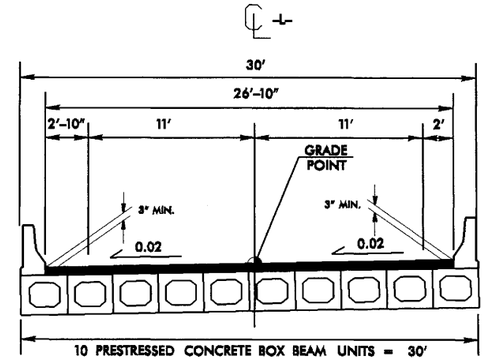
C1	PROP. APPROX. 2½" ASPHALT CONCRETE SURFACE COURSE, TYPE SF9.5A, AT AN AVERAGE RATE OF 112 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.	E2	PROP. VAR. DEPTH ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NOT LESS THAN 3" IN DEPTH OR GREATER THAN 5½" IN DEPTH.
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.	T	EARTH MATERIAL.
C3	PROP. APPROX. 1¼" ASPHALT CONCRETE SURFACE COURSE, TYPE SF9.5A, AT AN AVERAGE RATE OF 112 LBS. PER SQ. YD.	U	EXISTING PAVEMENT.
E1	PROP. APPROX. 4" ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.	W	VARIABLE DEPTH ASPHALT PAVEMENT (SEE STANDARD WEDGING DETAIL)

NOTE: PAVEMENT EDGE SLOPES ARE 1:1 UNLESS SHOWN OTHERWISE.



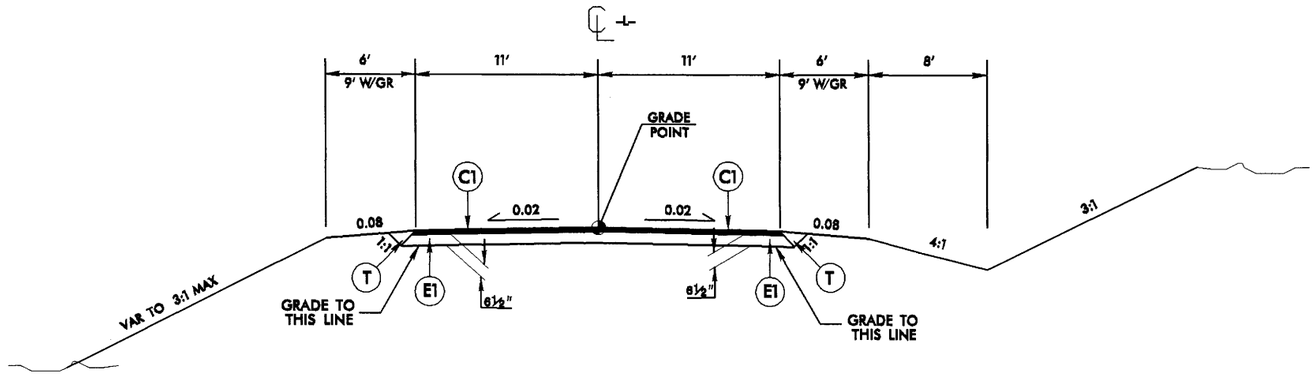
TYPICAL SECTION NO. 1

USE TYPICAL SECTION NO. 1
℄ STA. 11+00.00 TO 11+50.00
℄ STA. 14+50.00 TO 16+00.00



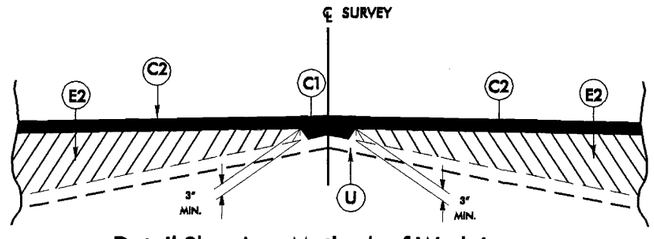
TYPICAL SECTION ON STRUCTURE

℄ STA. 13+25.00 TO 13+85.00



TYPICAL SECTION NO. 2

USE TYPICAL SECTION NO. 2
℄ STA. 11+50.00 TO 13+25.00 (BEGIN BRG)
℄ STA. 13+85.00 (END BRG) TO 14+50.00



Detail Showing Method of Wedging

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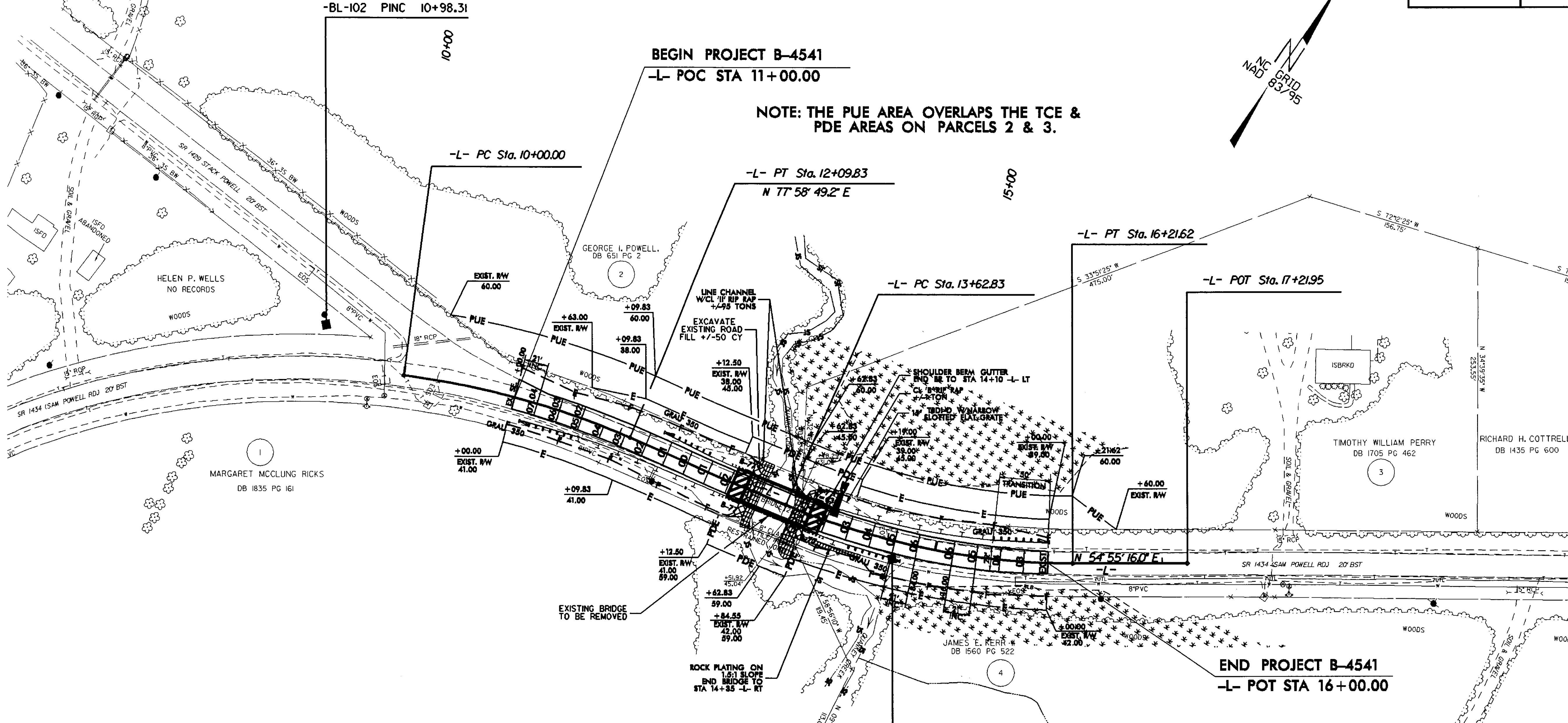
PROJECT REFERENCE NO.	SHEET NO.
B-4541	4

R/W SHEET NO.

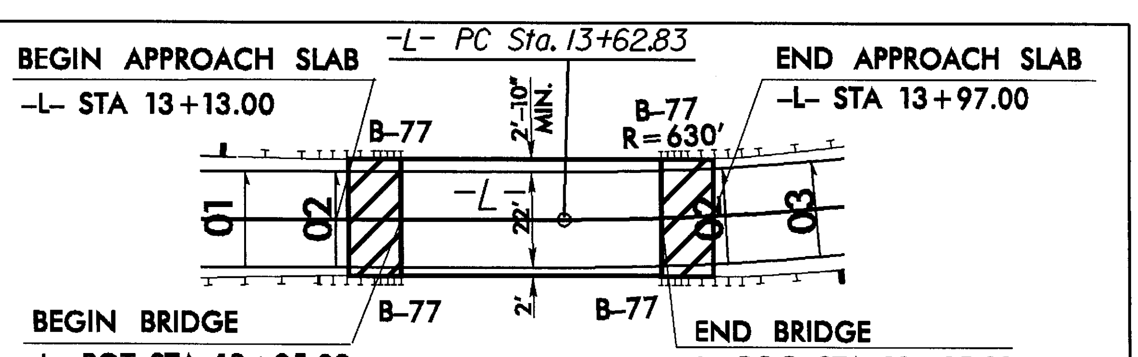
ROADWAY DESIGN ENGINEER — HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

-L- SR 1434	
PI Sta 11+05.57	PI Sta 14+94.00
Δ = 15° 36' 49.6" (RT)	Δ = 23° 03' 33.2" (LT)
D = 7° 26' 27.6"	D = 8° 54' 38.5"
L = 209.83'	L = 258.78'
T = 105.57'	T = 131.17'
R = 770.00'	R = 643.00'
SE = EXIST.	SE = .06
	V_D = 45mph



SKETCH SHOWING BRIDGE/PAVEMENT RELATIONSHIP



NOT TO SCALE

SEE SHEET 5 FOR -L- PROFILE
SEE SHEET S-1 THRU S-_ FOR STRUCTURE PLANS

REVISIONS

8/17/99

16-JAN-2009 14:35
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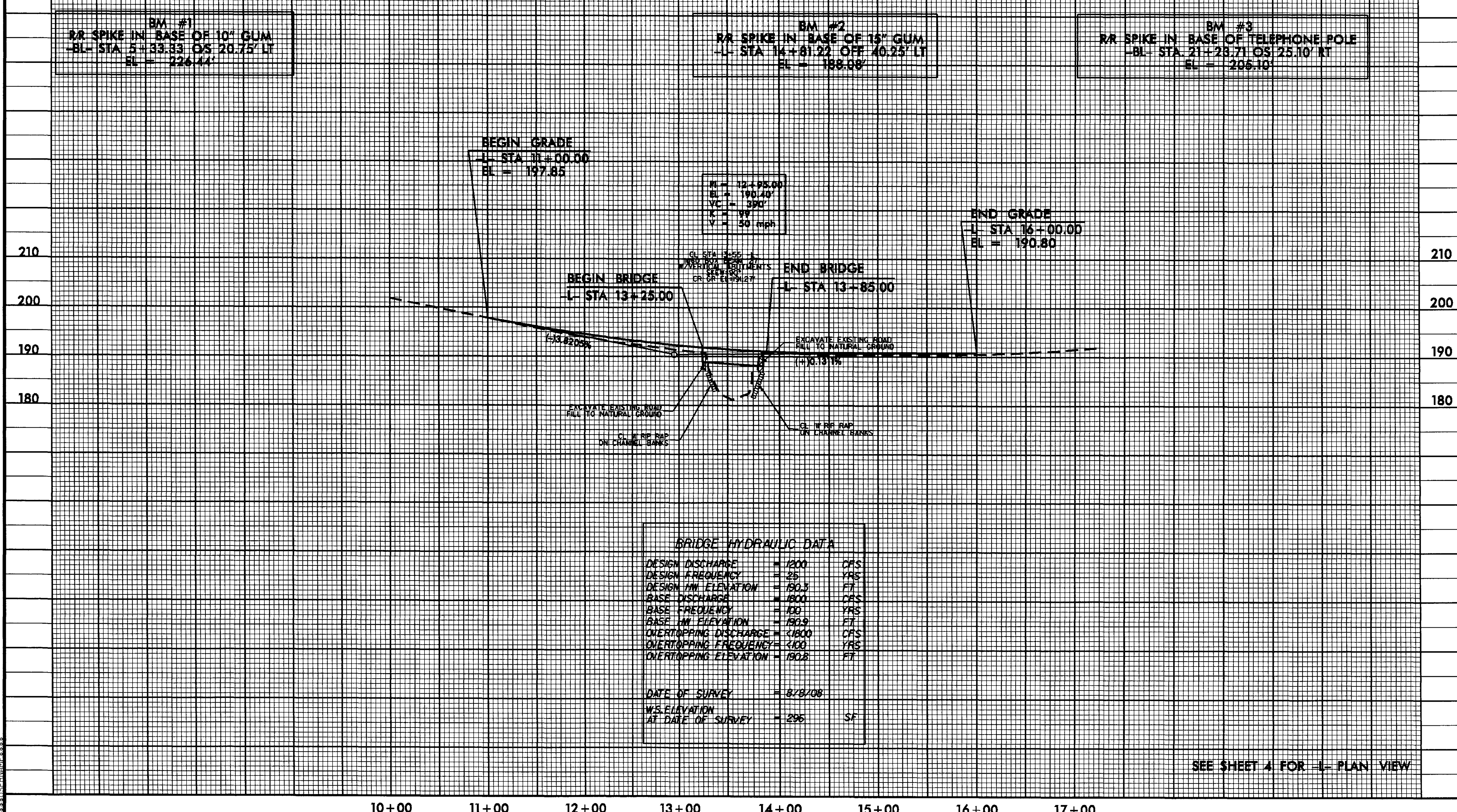
PROJECT REFERENCE NO.	SHEET NO.
B-4541	5
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

-L- SR 1804

-L-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R/R SPIKE IN BASE OF 10" GUM
-BL- STA 5+33.33 OS 20.75' LT
EL = 226.44'
BM #2
R/R SPIKE IN BASE OF 15" GUM
-L- STA 14+81.22 OFF 40.25' LT
EL = 188.08'
BM #3
R/R SPIKE IN BASE OF TELEPHONE POLE
-BL- STA. 21+23.71 OS 25.10' RT
EL = 205.10'
BEGIN GRADE
-L- STA 11+00.00
EL = 197.85
PI = 12+95.00
EL = 190.40'
VC = 390'
K = 99
V = 50 mph
END GRADE
-L- STA 16+00.00
EL = 190.80
BEGIN BRIDGE
-L- STA 13+25.00
END BRIDGE
-L- STA 13+85.00
(-)3.8205%
(+)0.131%
EXCAVATE EXISTING ROAD
FILL TO NATURAL GROUND
CL 'II' RIP RAP
ON CHANNEL BANKS
210
200
190
180
10+00
11+00
12+00
13+00
14+00
15+00
16+00
17+00

BRIDGE HYDRAULIC DATA

DESIGN DISCHARGE	=	1200	CFS
DESIGN FREQUENCY	=	25	YRS
DESIGN HW ELEVATION	=	190.3	FT
BASE DISCHARGE	=	1800	CFS
BASE FREQUENCY	=	100	YRS
BASE HW ELEVATION	=	190.9	FT
OVERTOPPING DISCHARGE	=	<1800	CFS
OVERTOPPING FREQUENCY	=	<100	YRS
OVERTOPPING ELEVATION	=	190.8	FT
DATE OF SURVEY	=	8/8/08	
W.S. ELEVATION AT DATE OF SURVEY	=	296	SF

SEE SHEET 4 FOR -L- PLAN VIEW

5/14/99

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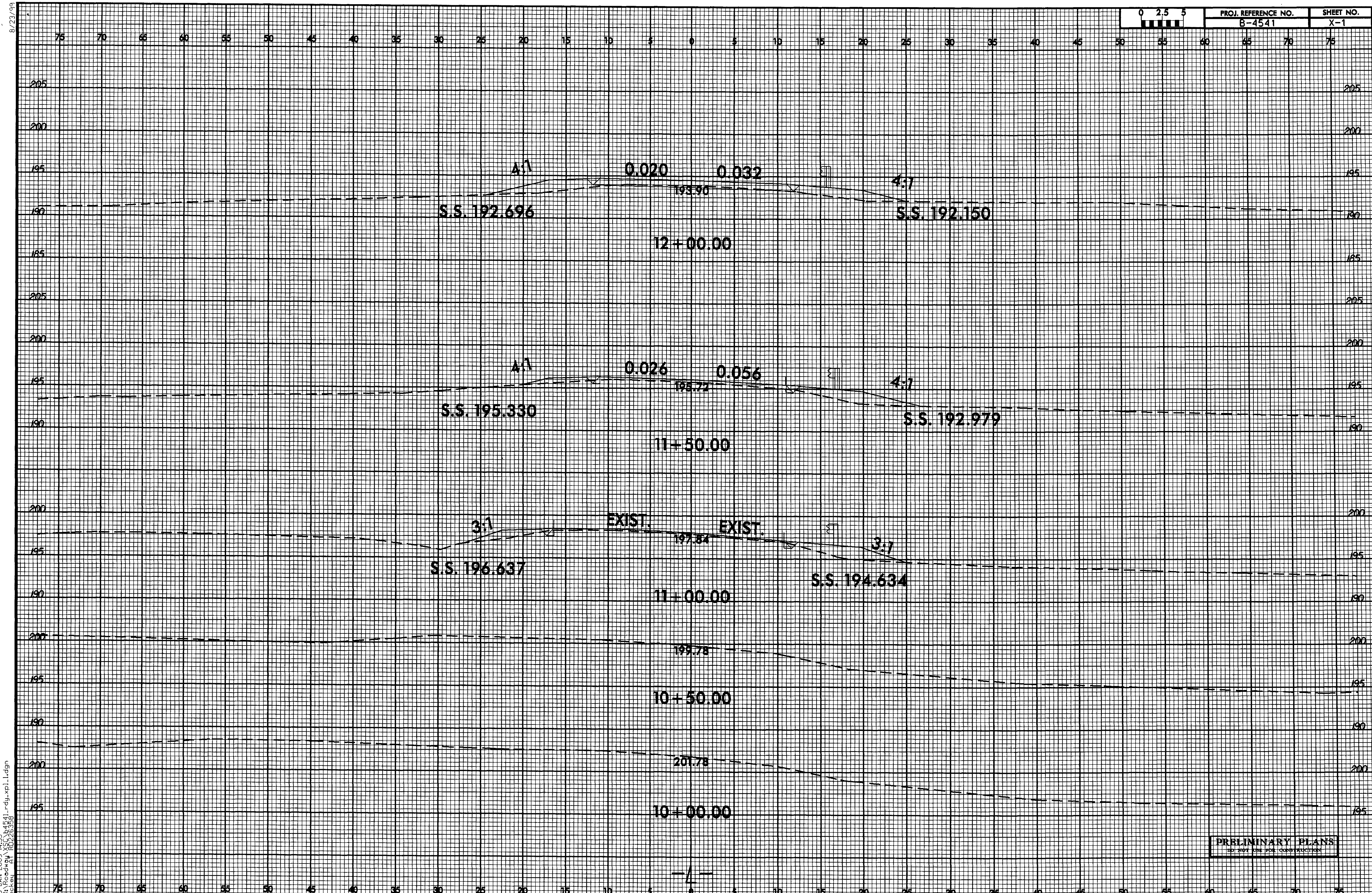

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S.S. 190.591 S.S. 190.897

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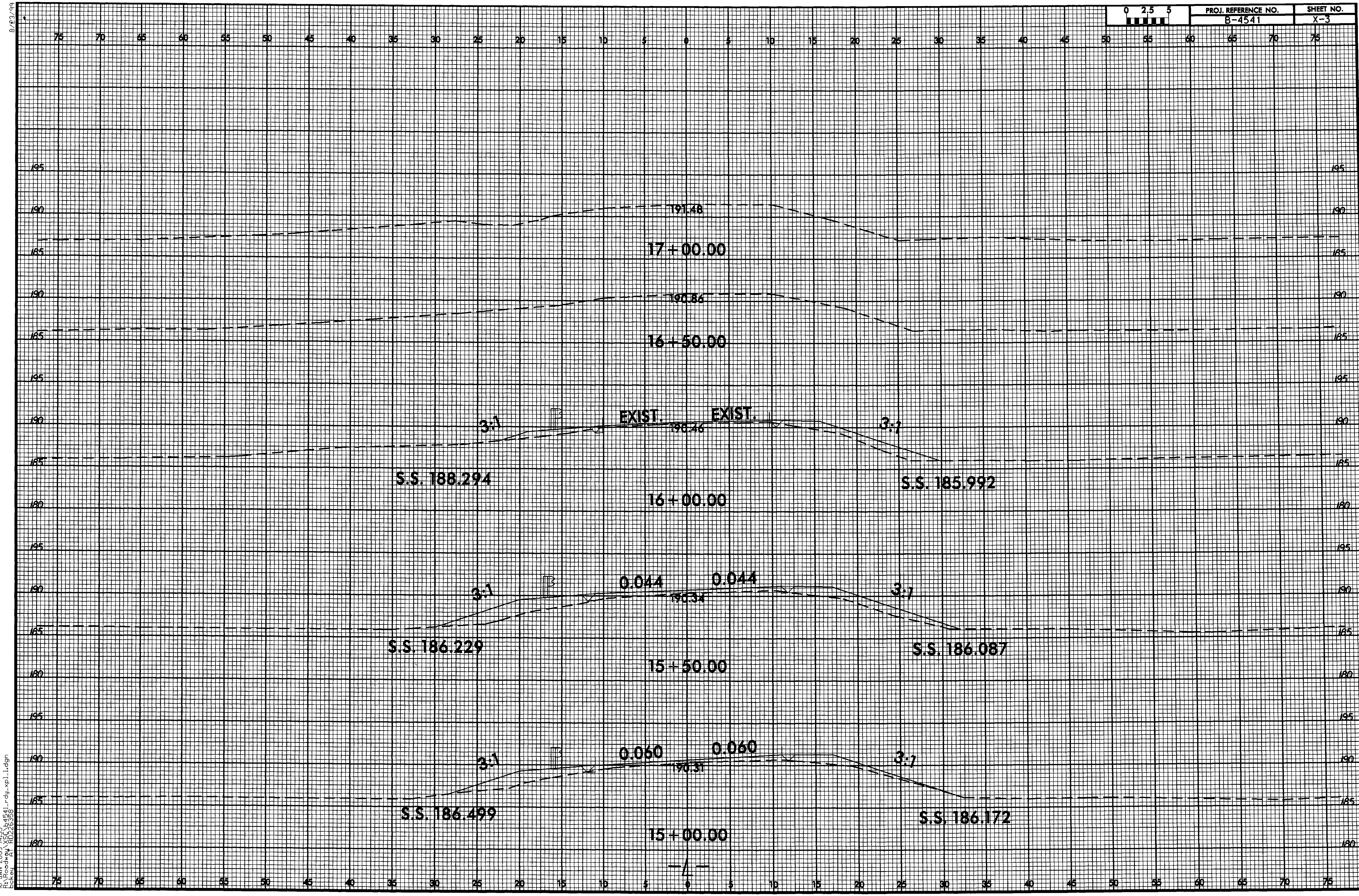

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CATEGORICAL EXCLUSION ACTION CLASSIFICATION FORM

TIP Project No.	**B-4541**
State Project No.	**8.2302101**
W.B.S. No.	**33756.1.1**
Federal Project No.	**BRZ-1434(3)**

A. Project Description:

The purpose of this project is to replace Halifax County Bridge No. 24 on SR 1434 (Sam Powell Road) over Quankey Creek. Bridge No. 24 is 52 feet in length and has a clear roadway width of 24 feet. The existing approach roadway consists of two 10-foot lanes and 6-foot grass shoulders. The replacement structure will be a bridge approximately 75 feet long, providing a minimum 26 feet clear deck width. The bridge will include two 11-foot travel lanes and 2-foot offsets. The bridge length is based on preliminary design information and is set by hydraulic requirements. The roadway grade of the new structure will be approximately the same as the existing structure.

The approach roadway will extend approximately 200 feet from the west end of the new bridge and 200 feet from the east end of the new bridge. The approaches will include a 22-foot pavement width providing two 11-foot travel lanes and 6-foot shoulders. The roadway will be designed as a Rural Local Route using NCDOT's Sub Regional Tier Design Guidelines for Bridge Projects with a 50 mile per hour design speed.

Traffic will be detoured off-site during construction (see Figure 1).

B. Purpose and Need:

NCDOT Bridge Management Unit records indicate Bridge No. 24 has a sufficiency rating of 26 out of a possible 100 for a new structure.

The bridge is considered structurally deficient due to substructure condition rating of 3 out of 9, according to Federal Highway Administration (FHWA) standards and therefore was deemed eligible for FHWA's Highway Bridge Program. It also met the requirement for being functionally obsolete due to a structural evaluation appraisal of 3 out 9. The bridge has continued to deteriorate over the years, including areas of notable decay. In 1999, decayed sections of the timber substructure required prompt attention and had to be immediately replaced.

The superstructure and substructure of Bridge No. 24 have remaining timber elements that are fifty-four years old. Timber components have a typical life expectancy between 40 to 50 years due to the natural deterioration rate of wood. Rehabilitation of a timber structure is generally practical only when a few elements are damaged or prematurely deteriorated. However, past a certain degree of deterioration, most timber elements become impractical to maintain and

upon eligibility are programmed for replacement. Timber components of bridge No. 24 are experiencing an increasing degree of deterioration that can no longer be addressed by reasonable maintenance activities. The bridge is approaching the end of its useful life. The posted weight limit on the bridge is down to 18 tons for single vehicles and 25 tons for truck-tractor semi-trailers.

Bridge No. 24 currently carries 1,400 vehicles per day with 2,200 vehicles per day projected for 2030. The bridge does not meet current acceptable safety standards for the bridge width, railing, and approach guardrail. Replacement of the bridge will result in safer traffic operations.

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)
    i. Slide Stabilization
    j. Structural BMP's for water quality improvement

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.

13. Acquisition and construction of wetland, stream and endangered species mitigation sites.

14. Remedial activities involving the removal, treatment or monitoring of soil or groundwater contamination pursuant to state or federal remediation guidelines.

D. Special Project Information:

The estimated costs, based on 2008 prices, are as follows:

Structure	$ 260,000
Roadway Approaches	$ 224,000
Structure Removal	$ 26,000
Misc. & Mob.	$ 92,000
Eng. & Contingencies	$ 98,000
Total Construction Cost	$ 700,000
Right-of-way Costs	$ 10,000
Utility Costs	$ 34,000
Total Project Cost	$ 744,000

Estimated Traffic:

Current (2008)	-	1400 vpd
Year 2030	-	2200 vpd
TTST	-	1%
Dual	-	2%

Posted Speed: 45 mph (posted)

Accidents: Traffic Engineering has evaluated a recent three year period and found two accidents occurring in the vicinity of the project. None were associated with the geometry of the bridge or its approach roadways.

Design Exceptions: There are no anticipated design exceptions for this project.

Bridge Demolition: Bridge No. 24 is constructed of reinforced concrete flooring on timber joists with a substructure of timber caps on timber piles. The concrete flooring, bridge railings, and the timber piles will be removed without dropping their components into waters of the U.S.

Alternatives Discussion:

No Build – The no build alternative would result in eventually closing the road which is unacceptable given the volume of traffic served by SR 1434.

Rehabilitation – The bridge was constructed in 1954 and the timber materials within the bridge are reaching the end of their useful life. Rehabilitation would require replacing the timber components which would constitute effectively replacing the bridge.

Offsite Detour – Bridge No. 24 will be replaced on the existing alignment. Traffic will be detoured offsite (see Figure 1) during the

construction period. NCDOT Guidelines for Evaluation of Offsite Detours for Bridge Replacement Projects considers multiple project variables beginning with the additional time traveled by the average road user resulting from the offsite detour. The offsite detour for this project would include SR 1433 and NC 48. The majority of traffic on the road is through traffic. The detour for the average road user would result in approximately 3 minutes additional travel time (2.0 miles additional travel). Up to 9-month duration of construction is expected on this project.

Based on the Guidelines, the criteria above indicate that on the basis of the delay alone the detour alone is acceptable. Halifax County Emergency Services along with Halifax County Schools Transportation have also indicated that the detour is acceptable. NCDOT Division 4 has indicated that the condition of all roads, bridges, and intersections on the offsite detour are acceptable without improvement and concurs with the use of the detour.

Onsite Detour – An onsite detour was evaluated but eliminated due to the presence of an acceptable offsite detour.

Staged Construction – Staged construction was not considered because of the availability of an acceptable offsite detour.

New Alignment – A new alignment was evaluated but was eliminated because the existing alignment for SR 1434 is acceptable.

Other Agency Comments:

The **N.C. Division of Water Quality, N.C. Wildlife Resource Commission** and **U.S. Fish & Wildlife Service** had no special concerns for the project.

Public Involvement:

A letter was sent by the Location & Surveys Unit to all property owners affected directly by this project. Property owners were invited to comment. No comments have been received to date.

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 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) of an acre and have all practicable measures to avoid and minimize wetland takings been evaluated?	X	
(5)	Will the project require the 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 Water Resources (OWR) and/or High Quality Waters (HQW)?		X
(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

		YES	NO
(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, or environmental grounds concerning the project?		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 National System of Wild and Scenic Rivers?	☐	X

F. Additional Documentation Required for Unfavorable Responses in Part E

Response to Question 2: Habitat for dwarf wedgemussel does occur in Halifax County. A survey was conducted on October 26, 2006 and no fresh water mussels of any species were encountered. Habitat at the site was marginal for the mussels in question, and there is currently no indication that the species has even been collected in the Roanoke River Basin. The biological conclusion is "no effect".

G. CE Approval

TIP Project No.	**B-4541**
State Project No.	**8.2302101**
W.B.S. No.	**33756.1.1**
Federal Project No.	**BRZ-1434(3)**

Project Description:

The purpose of this project is to replace Halifax County Bridge No. 24 on SR 1434 (Sam Powell Road) over Quankey Creek. Bridge No. 24 is 52 feet in length and has a clear roadway width of 24 feet. The existing approach roadway consists of two 10-foot lanes and 6-foot grass shoulders. The replacement structure will be a bridge approximately 75 feet long, providing a minimum 26 feet clear deck width. The bridge will include two 11-foot travel lanes and 2-foot offsets. The bridge length is based on preliminary design information and is set by hydraulic requirements. The roadway grade of the new structure will be approximately the same as the existing structure.

The approach roadway will extend approximately 200 feet from the west end of the new bridge and 200 feet from the east end of the new bridge. The approaches will include a 22-foot pavement width providing two 11-foot travel lanes and 6-foot shoulders. The roadway will be designed as a Rural Local Route using NCDOT's Sub Regional Tier Design Guidelines for Bridge Projects with a 50 mile per hour design speed.

Traffic will be detoured off-site during construction (see Figure 1).

Categorical Exclusion Action Classification:

____ TYPE II(A)
_X_ TYPE II(B)

Approved:

8/4/08 — Date
Bridge Project Development Engineer
Project Development & Environmental Analysis Branch

8/04/08 — Date
Project Engineer
Project Development & Environmental Analysis Branch

8/4/08 — Date
Project Planning Engineer
Project Development & Environmental Analysis Branch

7/31/2008 — Date
Consultant Project Manager
STV/Ralph Whitehead Associates

For Type II(B) projects only:

8/8/08 — Date
John F. Sullivan, III, PE, Division Administrator
Federal Highway Administration

PROJECT COMMITMENTS:

Halifax County
Bridge No. 24 on SR 1434
Over Quankey Creek
Federal Aid Project No. BRZ-1434(3)
State Project No. 8.2302101
W.B.S. No. 33756.1.1
T.I.P. No. B-4541

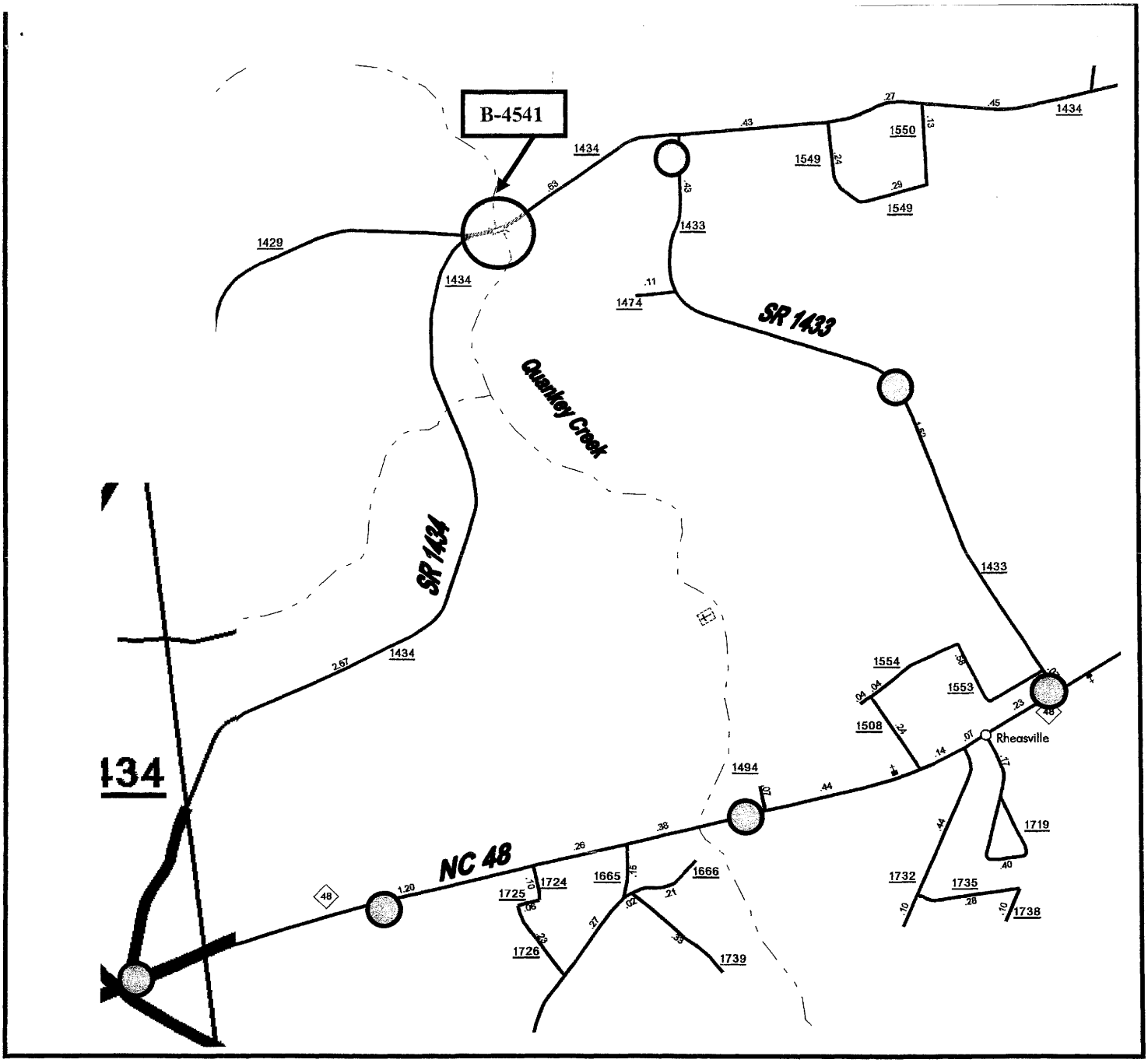
Division Four Construction, Resident Engineer's Office – Offsite Detour

In order to have time to adequately reroute school busses, Halifax County Schools should be contacted at (252) 583-2381 at least one month prior to road closure.

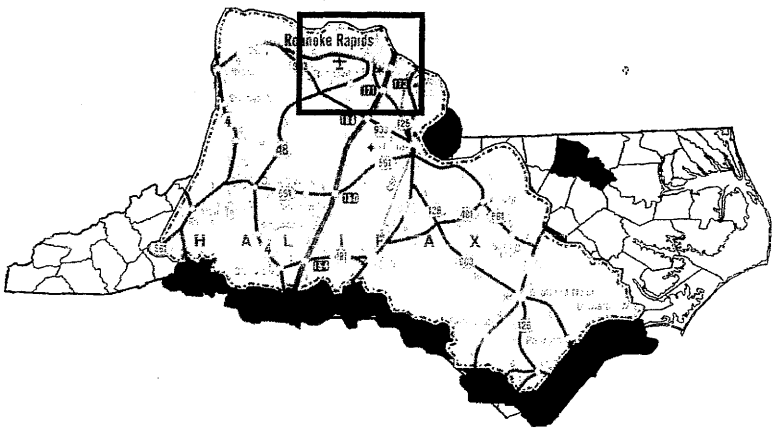
Halifax County Emergency Services needs to be contacted at (252) 583-2088 at least one month prior to road closure to make the necessary temporary reassignments to primary response units.

Roadway Design

The Sub Regional Tier Design Guidelines for Bridge Projects will be applicable to this project and will be incorporated into the development of the final design reducing the width, environmental impacts and overall cost of the project.



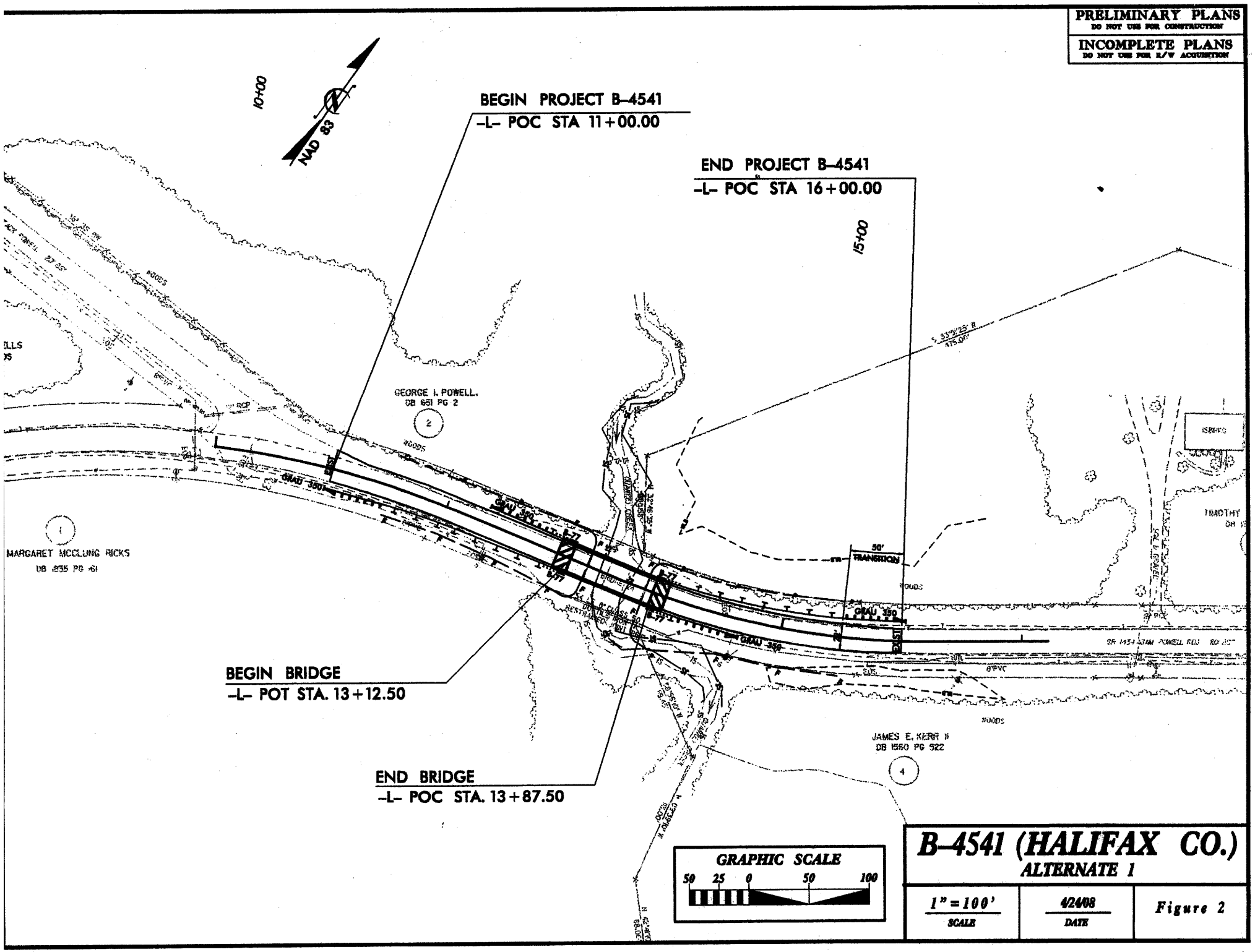
Studied Offsite Detour



NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
PROJECT DEVELOPMENT &
ENVIRONMENTAL ANALYSIS BRANCH

HALIFAX COUNTY
REPLACE BRIDGE NO. 24 ON SR 1434
OVER QUANKEY CREEK
B-4541

Figure 1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INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION
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-L- POC STA 16+00.00
BEGIN BRIDGE
-L- POT STA. 13+12.50
END BRIDGE
-L- POC STA. 13+87.50
GEORGE I. POWELL
DB 651 PG 2
MARGARET MCCLUNG RICKS
DB 835 PG 61
JAMES E. KERR II
DB 1560 PG 922
50' TRANSITION
GRAU 350
WOODS
GRAPHIC SCALE
50 25 0 50 100
B-4541 (HALIFAX CO.)
ALTERNATE 1
1" = 100'
SCALE
4/2408
DATE
Figure 2

CH65

North Carolina Department of Cultural Resources

State Historic Preservation Office

Peter B. Sandbeck, Administrator

Michael F. Easley, Governor
Lisbeth C. Evans, Secretary
Jeffrey J. Crow, Deputy Secretary

Office of Archives and History
Division of Historical Resources
David Brook, Director

October 10, 2006

MEMORANDUM

TO: Matt Wilkerson
NCDOT - Office of Human Environment

FROM: Peter Sandbeck Peter Sandbeck

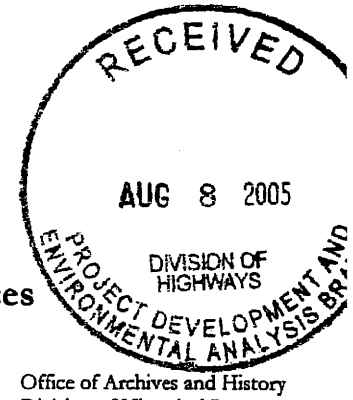
SUBJECT: Archaeological Survey for the Replacement of Bridge No.24 on SR 1434 (Sam Powell Road) over Quankey Creek, B-4541, Halifax County, ER 05-1196

Thank you for your letter of September 22, 2006, transmitting the archaeological survey report for the above project.

The report author noted that no significant cultural resources were discovered within the Area of Potential Effect (APE) during the archaeological survey and that no further cultural resources investigations are necessary and/or warranted. We concur with this recommendation.

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 considerations. If you have any questions concerning the above comment, please contact Renee Gledhill-Earley, environmental review coordinator, at 919.733.4763. In all future communication concerning this project, please cite the above referenced tracking number.



North Carolina Department of Cultural Resources

State Historic Preservation Office

Peter B. Sandbeck, Administrator

Office of Archives and History
Division of Historical Resources
David Brook, Director

July 29, 2005

MEMORANDUM

TO: Greg Thorpe, Manager
Project Development and Environmental Analysis Branch
NCDOT Division of Highways

FROM: Peter Sandbeck PBS for Peter Sandbeck

SUBJECT: Replacement of Bridge on SR 1434 over Quankey Creek, State Project No. 8.2302101, WBS Element 33756.1.1, F.A. No. BRZ 1434(3), TIP No. B-4541, Halifax County, ER 05-1196

Thank you for your letter of May 20, 2005, concerning the above project. Before our office can adequately review and address your request(s), we will require a detailed and legible United States Geological Survey Quadrangle(s) showing the location and boundaries of the proposed undertaking. In addition, we will also require specific bridge construction information detailing the location of the proposed bridge and any on-site detours.

We have determined that the project as proposed will not affect any historic structures.

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 considerations. If you have any questions concerning the above comment, please contact Renee Gledhill-Earley, environmental review coordinator, at 919.733.4763. In all future communication concerning this project, please cite the above referenced tracking number.

cc: Colista Freeman, NCDOT/PDEA
Mary Pope Furr, NCDOT

	Location	Mailing Address	Telephone/Fax
ADMINISTRATION	507 N. Blount Street, Raleigh NC	4617 Mail Service Center, Raleigh NC 27699-4617	(919)733-4763/733-8653
RESTORATION	515 N. Blount Street, Raleigh NC	4617 Mail Service Center, Raleigh NC 27699-4617	(919)733-6547/715-4801
SURVEY & PLANNING	515 N. Blount Street, Raleigh, NC	4617 Mail Service Center, Raleigh NC 27699-4617	(919)733-6545/715-4801

BRIDGE NO. 24 ON SR 1434 (SAM POWELL ROAD) OVER QUANKEY CREEK T.I.P. No. B-4541

BRIDGE REPLACEMENT HALIFAX COUNTY, NORTH CAROLINA

NATURAL RESOURCES TECHNICAL REPORT

December 2007

Prepared For:

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

AND

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

BRIDGE NO. 24 ON SR 1434 (SAM POWELL ROAD) OVER QUANKEY CREEK T.I.P. No. B-4541

BRIDGE REPLACEMENT HALIFAX COUNTY, NORTH CAROLINA

NATURAL RESOURCES TECHNICAL REPORT

December 2007

Prepared By:

STV/ Ralph Whitehead Associates

STV/RALPH WHITEHEAD ASSOCIATES, INC.
Contact: Michael Iagnocco, P.W.S.
(704) 372-1885

TABLE OF CONTENTS

1.0 INTRODUCTION

1.1 Project Description

The North Carolina Department of Transportation (NCDOT) proposes replacement of Bridge No. 24 on SR 1434 (Sam Powell Road) over Quankey Creek in Halifax County, NC (Appendix A, Figure 1 and Figure 2). The proposed project is included in the 2006-2012 North Carolina Transportation Improvement Program (T.I.P.) and is scheduled for right-of-way acquisition in fiscal year 2007 and construction in fiscal year 2008. The project is identified as T.I.P. No. B-4541.

Bridge No. 24 was originally constructed in 1954 and has an overall length of 52 feet (ft.) with a sufficiency rating of 26 out of a possible 100 for a new structure. SR 1434 (Sam Powell Road) currently has a posted speed limit of 45 miles per hour (MPH) at the bridge location. The bridge currently has a superstructure with reinforced concrete flooring on timber joists and a substructure with timber caps and timber piles (Appendix B, Photograph 1). At the Bridge No. 24 crossing, Quankey Creek is approximately 30 feet wide. The waterway is bordered by dense mixed hardwood and mixed pine/hardwood forest.

Possible alternatives currently being evaluated include:

- Alternative 1- Replace Bridge No. 24 in place with off-site detour;
- No-build.

STV/Ralph Whitehead Associates, Inc. (STV/RWA) has been contracted to provide a natural resources assessment for the replacement of Bridge No. 24 on SR 1434 (Sam Powell Road) over Quankey Creek. For purposes of this assessment, the project study area reviewed was comprised of a corridor approximately 1,875 feet long along SR 1434 (Sam Powell Road), and includes the intersection with SR 1429 (Stack Powell Road) and approximately 340 feet of SR 1429 (Stack Powell Road). Corridor widths range from approximately 375 feet wide at the west end of the project, 220 feet wide at Bridge No. 24, and tapers to 125 feet at the eastern end of the project.

This Natural Resources Technical Report (NRTR) summarizes the results of the natural resources assessment.

1.2 Purpose

The purpose of this NRTR is to provide an evaluation of natural resources within the Bridge No. 24 Bridge Replacement project study area. In addition to summarizing pre-field and field survey efforts, other principal tasks performed for this study include:

- An assessment of biological features within the project study area including descriptions of wildlife, vegetation, protected species, water quality and wetlands;

- An evaluation of probable impacts resulting from the proposed bridge replacement alternatives including temporary impacts associated with construction;
- A preliminary determination of permit requirements.

1.3 Methods

Prior to beginning fieldwork, available literature was reviewed to gain an understanding of the project vicinity. National Wetlands Inventory (NWI) maps (Roanoke Rapids Quadrangle), U.S. Geological Survey (USGS) topographic maps (Roanoke Rapids 7.5 Minute Quadrangle), infrared aerial photographs, the U.S. Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) Soil Survey of Halifax, and NCDOT aerial photography were reviewed to determine the potential presence and likelihood of waters of the U.S., including wetlands, within the project study area. The U.S. Fish and Wildlife Service (USFWS) records and North Carolina Natural Heritage Program (NCNHP) database of rare species and habitats were also reviewed to determine protected species known to occur within Halifax County. The Roanoke River Basinwide Assessment Report (NCNENR, DWQ, 2005), Roanoke River Basinwide Water Quality Plans (NCNENR, DWQ, 1996, 2001), and preliminary plans for the proposed bridge construction were reviewed for water quality information and potential impacts to Quankey Creek and the surrounding aquatic and terrestrial communities.

The site was visited on September 29, 2005. The project study area was walked and visually surveyed for significant features, including but not limited to, potential habitat for protected species, wetlands/waters of the U.S., terrestrial communities, and water quality in Quankey Creek. The boundaries of potentially jurisdictional waters of the U.S. were delineated and flagged in the field at that time. Wetlands in the project study area were determined using the Routine On-Site Determination Method as defined in the Corps of Engineers Wetland Delineation Manual (Environmental Laboratory, 1987). Flagged waters of the U.S. were geo-referenced in the field using a Trimble GeoXT GPS handheld unit capable of sub-meter accuracy. The GeoXT was used to collect point features, using a five-second logging interval. The GeoXT settings used included an HDOP of 5.0, an elevation mask of 15-degrees and a minimum SNR of 38.0. A minimum of four positions per point was gathered unless satellite coverage was poor. GPS coordinates were validated using GPS Analyst and ArcView 9.0 software. The size of the project study area was determined by anticipated construction corridors provided by NCDOT and by preliminary bridge design efforts.

1.4 Qualifications

STV/RWA Environmental Scientists Steven Busbee, PWS, and Rhett Baggett reviewed the project study area for the presence of wetlands and other jurisdictional waters of the U.S., community types, and protected species habitat.

Mr. Busbee, PWS, has six years of experience in ecological studies and environmental assessment throughout the southeastern United States. Mr. Busbee has a Master's Degree in Forest Resources and a Bachelor's Degree in Aquaculture, Fisheries, and Wildlife Biology from Clemson University. His experience includes stream and wetland determinations, delineations, functional assessments, natural resource and feasibility studies, preparation of Clean Water Act

Section 404 permit documents, compensatory wetland mitigation design, planning and monitoring, protected plant and animal species surveys, invasive plant species management, water quality monitoring, and regulatory agency reporting and coordination.

Mr. Baggett has over four years of experience in surface- and groundwater hydrological studies and environmental assessments. Mr. Baggett has a Master's Degree in Earth Science (Hydrology concentration) from the University of North Carolina at Charlotte and a Bachelors Degree in Biology (Ecology concentration) from the University of Tennessee. His experience includes environmental assessments (Phase I and II), jurisdictional stream and wetland determinations, delineations, and functional assessments, Section 404/401 permitting, watershed modeling, hydrological and sediment transport analysis, and water quality monitoring.

Further information regarding the qualifications of personnel involved in the NRTR can be found in Appendix C.

1.5 Definitions

Definitions for area descriptions used throughout this NRTR are as follows:

- *Project Study Area* denotes the area bounded by the proposed construction limits and is the area identified for detailed assessment;
- *Project Vicinity* denotes an area extending 1.0 mile on all sides of the project study area;
- *Project Region* denotes an area equivalent in size to the area represented by a 7.5 minutes USGS quadrangle map (about 61.8 square miles) with the project study area occupying the center of the project region.

2.0 PHYSICAL RESOURCES

The project region for T.I.P. No. B-4541 is located in the Piedmont Physiographic Province that consists of gently rolling topography. Halifax County, located in eastern North Carolina, is approximately 84 miles northeast of Raleigh, the state's capital. Halifax County's surface generally consists of level to gently rolling uplands with broad bottoms along the rivers and some creeks. The largest waterway, the Roanoke River, bounds the northeastern portion of the county as it flows in a southeastward direction. The county consists of eight municipalities including Halifax, the county seat. Roanoke Rapids is the largest municipality in the county and is located four and one-half miles northeast of the project study area. Sixty-five percent of the county contains forested lands and twenty-eight percent is cultivated cropland.

Based on the review of the USGS Roanoke Rapids, NC quadrangle elevations within the project study area are approximately 150 to 200 feet above National Geodetic Vertical Datum (NGVD). Drainage in the project vicinity is generally towards Quankey Creek/Roanoke River. Surrounding properties include undeveloped wooded areas bordering the northeast portion of the project study area, with agricultural, residential, and vacant fields comprising the remainder of the project study area. Approximately one mile east of the project study area but within the project vicinity is Halifax County Airport. Interstate 95 is located approximately six miles to the east of

the project study area, within the project region. The town of Roanoke Rapids is located approximately four and one-half miles northeast of the project study area, within the project region.

2.1 Soils

The project study area consists of Piedmont soils, which are dominantly clayey soils. According to the USDA Soil Survey of Halifax County, North Carolina (USDA, 2001), four different soil types are found within the project study area (Appendix A, Figure 3):

- Emporia-Wedowee Complex (EwB) 2 to 6 percent slopes
- Pacolet coarse sandy loam (PaB), 2 to 6 percent slopes
- Wedowee coarse sandy loam (WeB), 2 to 6 percent slopes
- Wedowee coarse sandy loam (WeC), 6 to 10 percent slopes

EwB, PaB, and WeB soils are gently sloping, very deep, and well-drained. WeC soils are moderately sloping, very deep, and well-drained. EwB soils are found on upland ridges and side slopes in the Fall Line region of the upper Coastal Plain. PaB, WeB, and WeC soils are found on upland ridges and side slopes of the Piedmont. EwB soils have a moderately low to moderate permeability in the upper part of the subsoil and a moderately low permeability in the lower part. There is a relatively high water table (3- 4.5 feet from November through April, more than 6 feet from April through October) and medium level of surface runoff exhibited by EwB soils. PaB and WeB soils have a moderate permeability and moderate available water capacity. Each has a mean high water table of more than 6 feet and a medium level of surface runoff. WeC soils have a moderate permeability and moderate available water capacity. There is a mean high water table of more than 6 feet and medium level of surface runoff exhibited by WeC soils. None of these soil types are considered hydric (USDA, 2007).

According to the USDA Soil Survey of Halifax County, North Carolina, the map units for Emporia-Wedowee Complex soils and Pacolet soils are mostly used for cropland. Wedowee soils are mostly used for woodland. As per *Table 6, Woodland Management and Productivity*, of the Halifax County Soil Survey, all of the aforementioned soils were found to have a slight erosion hazard[1] and seedling mortality rate. None of these soils were noted as having any significant restrictions or limitations affecting forest use and management (USDA, 2001).

The potential productivity of common trees is also found in the aforementioned Table 6 in the order of their observed occurrence along with their respective site index number. The site index is a designation of the quality of a forest site based on the height of the dominant stand (species) of an arbitrarily chosen age. "The first tree listed for each soil is the indicator species for that soil. An indicator species is a tree that is common in the area and is generally the most productive on a given soil" (USDA, 2001). Potential productivity is the volume or yield to be produced by the most important trees, expressed in cubic meters per hectare per year (m^3/ha/yr). Potential productivity found within Emporia-Wedowee Complex soils is between 7 and 9 m^3/ha/yr and includes loblolly pine (*Pinus taeda*) and southern red oak (*Quercus falcata*). The

[1] Ratings of erosion hazard indicate the probability that damage may occur if site preparation or harvesting activities expose the soil (USDA Soil Survey of Halifax County, North Carolina (USDA, 2001). This rating should not be mistaken for the h*azard of water erosion,* which is a "natural" erosion rating.

site index for loblolly pine found within Emporia-Wedowee Complex soils is 75 feet. Suggested trees to plant include loblolly pine and sweetgum (*Liquidambar styraciflua*). Potential productivity found within Pacolet soils was approximately 8 m^3/ha/yr and includes loblolly pine, yellow poplar *(Liriodendron tulipifera),* Virginia pine (*P. virginiana)*, northern red oak (*Q. rubra)*, hickory (*Carya* sp.), and white oak (*Q. alba*). The site index for loblolly pine found within Pacolet soils is 85 feet. Suggested trees to plant include loblolly pine. Potential productivity found within Wedowee soils was approximately 9 m^3/ha/yr and includes loblolly pine, southern red oak, northern red oak, and white oak. The site index for loblolly pine found within Wedowee soils is 87 feet. Suggested plantings include loblolly pine USDA, 2001).

Based on preliminary designs, replacing Bridge No. 24 via Alternative 1 would have minimal impacts to the abovementioned soils.

2.2 Water Resources

The primary surface water feature in the project study area is Quankey Creek, which drains into the Roanoke River east of Halifax, NC, approximately 13 miles downstream of the project study area. At the Bridge No. 24 site, Quankey Creek is approximately 30 feet wide with bank heights varying between 3 and 6 feet. Streamflow, is generally toward the southeast; however, at the time of the site visit, no visible stream flow was observed. The lack of water negated observations of clarity and relative water depths. At Bridge No. 24, stream banks were comprised mostly of loams and fine sands. The streambed was comprised of a comparable mixture of fine and coarse sands, and also contained gravel and cobble within occasional riffles. Quankey Creek is surrounded by dense mature forest on the north (upstream) and south (downstream) side of the bridge (Appendix B, Photographs 2 and 3). A natural levee is located on the north side of the east bank, and the west bank on the north side is comprised of steep banks. Adjacent land consists of undeveloped wooded areas and agricultural fields (Appendix B, Photograph 4). In general, Quankey Creek possesses some qualities of both a coastal stream as well as a swamp (NCDENR, 2005).

The project study area is located in sub-basin 03-02-08 of the Roanoke River Basin (not in the Neuse River Basin, as indicated in correspondence from NC Division of Water Quality, dated June 17, 2005) and is within USGS Hydrologic Unit 03010107 of the South Atlantic-Gulf Region (NCDENR, 2005). Note: The hydrologic unit is used by USGS to relate bodies of water in the U.S. to each other and watershed. The headwaters of the Roanoke River are located in the Blue Ridge Mountains of Virginia and flow southeasterly for 400 miles before emptying into Albemarle Sound. The 03-02-08 sub-basin drains from Deep Creek/Roanoke River (Warren County, NC) to the end of the Roanoke River in Bertie County, NC (NCDENR, 2001). According to the Final 2004 303(d) list, Quankey Creek in the project study area is not an impaired water. No waters listed on the 303(d) list occur within one mile of the project study area. A portion of Quankey Creek located approximately ten miles downstream of Bridge No. 24 is listed as impaired from its confluence with Little Quankey Creek to the Roanoke River, a total distance of 3.4 miles. This lower section of Quankey Creek has impaired aquatic life uses due to biological integrity impairment, with potential sources that include hydromodification and minor municipal point source discharges (NCDENR, 2004).

Currently there are fourteen wastewater National Pollutant Discharge Elimination System (NPDES) permit discharges within this Roanoke River sub-basin, with the largest discharges, going into the Roanoke River. Seven of the fourteen facilities are also required to monitor their discharge's toxicity (NCDENR, 2005). None of the facilities with wastewater NPDES permits are located within the project vicinity. The closest discharge, Halifax Town Waste Water Treatment Plant (WWTP) is located approximately eleven miles downstream of the project study vicinity.

In addition to NPDES permit discharges found within this Roanoke River sub-basin, non-point source (NPS) pollution is an equally important water quality concern. Sedimentation, a NPS pollutant, is the major contributing cause of water quality impairment in the Roanoke River Basin. It is estimated that 38 miles of major streams within the basin are impaired by sedimentation. The major sources include construction, urban development, agriculture, forestry, and mining (NCDENR, 1996). According to the 2001 Basinwide Assessment Report for the Roanoke River Basin, most of the land is forested (65%) or in agriculture (30%). Most of the agricultural land is cultivated cropland, but many animal operations were identified in the report as well. Except for a few pastures and crop fields within the project vicinity, no NPS pollutants of concern were identified within the project study area.

Water quality for the project study area is summarized in the Roanoke River Basinwide Water Quality Plan (NCDENR, 2001). Quantitative water quality sampling was not conducted as part of this project. The North Carolina Department of Water Quality (NCDWQ) currently monitors two sites referred to as B-5 (located approximately five miles downstream at NC 903) and B-6 (located approximately twelve miles downstream at NC 561). Benthic macroinvertebrates sampling data from a 2004 sample indicates a rating of "Natural" at the NC 903 location. The site at NC 561 was not sampled for benthic macroinvertebrates due to unnecessary redundancy with two sites above the town of Halifax WWTP. Sampling data indicates that the "Fair" bioclassification is a result of habitat degradation as opposed to organic or nutrient loading (NCDENR, 2001).

The State of North Carolina currently assigns all water classifications, which are based on the existing or contemplated best usage of these waters within the basin. The North Carolina Department of Environment and Natural Resources (NCDENR) classifies Quankey Creek, stream index number 23-30, as Class C water from its source to the Roanoke River (NCDENR, 2005). The 'best usage' of these waters, for which they must be protected, includes secondary recreation, fishing, wildlife, fish and aquatic life propagation and survival, agriculture and other suitable uses. 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 (NCDENR, 2005).

In addition to this primary classification, the NCDWQ in cooperation with the NC Center for Geographic Information and Analysis developed a GIS data set to identify Supplemental Classifications. High Quality Waters (HQW), Outstanding Resource Water (ORW) Management Zones, Trout Waters (Tr), Swamp Waters (Sw), and Nutrient Sensitive Waters (NSW) were identified to provide special protection to sensitive or highly valued resource waters. Currently, no portion of Quankey Creek or tributaries to Quankey Creek is listed as a HQW, ORW, Tr, Sw, or NSW water by the NCDWQ (2001) within one mile of the project study area. In addition, review of the NCDWQ Surface Water Classifications revealed that no Water Supply (WS) I or

WS II waters or Critical Areas (CA) are located within one mile of the project study area (NCDENR, 2007).

Given the nature of the project and the location of surface waters, impacts to surface waters (Quankey Creek) are unavoidable. The goal of preliminary design efforts would be to maintain the current hydrologic regime and stream integrity and minimize long-term impacts to the aquatic environment. As such, it is anticipated that the proposed bridge will largely span the creek and that direct impacts to surface waters will be minimal. Additionally, stormwater discharge from the bridge deck into Quankey Creek will also be avoided per NCDOT policy. However, short-term impacts to water quality, such as sedimentation and turbidity, can be anticipated from construction-related activities. These temporary impacts can be minimized by using best management practices (BMPs) during construction and through adherence to NCDOT's bridge demolition policies. BMPs are activities, practices and procedures undertaken to prevent or reduce water pollution. The proposed project will be subject to applicable BMPs contained in NCDOT's Best Management Practices for Protection of Surface Waters (NCDOT, 1997).

3.0 BIOTIC RESOURCES

3.1 Terrestrial Communities

According to the Ecoregions of North Carolina and South Carolina Map, the project study area is located within the Piedmont (Level III) Ecoregion of North Carolina (Griffith, et al., 2002). The Piedmont Ecoregion consists of the area between the mountainous ecoregion to the west and the flat coastal ecoregion to the east. Specifically, the project study area is part of a smaller ecoregion subdivision (Level IV) referred to as the Northern Outer Piedmont. The Northern Outer Piedmont is described as the area where Piedmont rocks occur on the same landscape with Coastal Plain sediments.

Vegetative terrestrial communities in the project study area were distinguished by plant species, location in the landscape, past disturbances, and hydrologic characteristics. For the purpose of this report, only habitats directly within the project study area are summarized.

Based on the field review, eight terrestrial habitat community types, namely mixed hardwood forest, mixed pine/hardwood forest, pine plantation, maintained and disturbed roadside, maintained field, residential, palustrine forested wetland, and linear wetland were identified within the proposed bridge replacement project study area. In accordance with the "Classification of the Natural Communities of North Carolina" by M.P. Schafale and A.S. Weakley (Schafale, 1990), a natural community is defined as a community 'whose characteristics and functioning are shaped by the process of evolution and ecological interactions of long periods of time, without the overriding influence of modern human activities.' Based on this 'naturalness' definition, and for purposes of this discussion, areas that are roadsides, actively managed/planted, or disturbed areas are not applicable for natural community classification. All of the community types are depicted in Appendix A – Figure 4. Reference Table 2 below for a summary of terrestrial community habitat types, including wetlands, by area and percent coverage within the project study area. A brief summary of the terrestrial habitat communities found within the project study area follows:

Mixed Hardwood Forest – This community type includes two areas located within the project study area. One area is located north of SR 1434 (Sam Powell Road) and is adjacent to the east bank of Quankey Creek. Included within this community type is a natural levee area, which separates a palustrine forested wetland (see Section 4.1) from Quankey Creek. The other area includes a small portion of the project study area located south of SR 1434 (Sam Powell Road) and adjacent to the west bank of Quankey Creek. Both of these areas include riparian forests associated with Quankey Creek. Elements of Low Elevation Mesic Forest and Coastal Plain Levee Forest habitats, as defined by Schafale and Weakley, were observed within this community type. Dominant vegetation observed within the mixed hardwood forest community included river birch (*Betula nigra*), red maple (*Acer rubrum*), swamp chestnut oak (*Q. michauxii*), ironwood (*Carpinus caroliniana*), trumpet creeper (*Campsis radicans*), sweetgum, poison ivy (*Toxicodendron radicans*), Chinese privet (*Ligustrum sinense*), giant cane (*Arundinaria gigantea*), and greenbrier (*Smilax rotundifolia*). Representative photographs of the mixed hardwood forest are included in Appendix B, Photograph 4 and Photograph 5.

Mixed Pine/Hardwood Forest – This community type includes two areas located within the project study area. One area is located north of SR 1434 (Sam Powell Road) and SR 1429 (Stack Powell Road) and includes a large portion of the project study area adjacent to the west bank of Quankey Creek and the maintained and disturbed roadside associated with SR 1434 (Sam Powell Road) and SR 1429 (Stack Powell Road). The other area is located south of SR 1434 (Sam Powell Road) and is adjacent to the east bank of Quankey Creek. Both of these areas include riparian forests associated with Quankey Creek. Elements of Basic Mesic Forest, as defined by Schafale and Weakley, were observed within these areas. Dominant vegetation observed within the mixed pine/hardwood forest community included loblolly pine, willow oak (*Q. phellos*), red maple, sweetgum, poison ivy, and greenbrier. Representative photographs of the mixed pine/hardwood forest are included in Appendix B, Photograph 6 and Photograph 7.

Pine Plantation – This community type includes an area located south of the SR 1434 (Sam Powell Road)/SR 1429 (Stack Powell Road) intersection and is adjacent to mixed hardwood forest to the east and residential properties to the south. Dominant vegetation within this community type included planted loblolly pine. Other species observed within the pine plantation included sweetgum and eastern false willow (*Baccharis halimifolia*). A representative photograph of the pine plantation is included in Appendix B, Photograph 8.

Maintained and Disturbed Roadside - This community type consists of areas along the roadside, including grassed shoulders and utility line rights-of-way (R/W). This community type is located throughout the entire project study area alongside SR 1434 (Sam Powell Road) and SR 1429 (Stack Powell Road). Dominant vegetation observed within the grassed shoulders included Bahia grass (*Paspalum notatum*), Bermuda grass (*Cynodon dactylon*), and poison ivy. Dominant vegetation observed within the utility line R/Ws included sweetgum, blackberry (*Rubus* sp.), poison ivy, deer tongue witch-grass (*Dicanthelium clandestinum*), fennel (*Eupatorium capillifolium*), and goldenrod (*Solidago* sp.). Representative photographs of the maintained and disturbed roadside are included in Appendix B, Photographs 5, 6, and 7.

Maintained Field - This community type includes two small areas located north of the SR 1434 (Sam Powell Road)/SR 1429 (Stack Powell Road) intersection and adjacent to mixed pine/hardwood forest in the northwest quadrant of the project study area. Dominant vegetation

within the maintained field consisted of broomsedge (*Andropogon virginicus*) and fescue (*Festuca* sp.).

Residential - This community type includes three areas located in the northeast corner, southwest corner, and western quadrant of the project study area. Features found within this community type in the project study area include driveways and landscaped lawns. These areas are located adjacent to the maintained and disturbed roadside communities. Dominant vegetation within the residential communities included various cultivated plant species.

No fauna was observed in the project study area. Common fauna expected to be present in the project study area, as summarized below in Table 1, includes white-tailed deer (*Odocoileus virginianus*), opossum (*Didelphis virginiana*), eastern box turtle (*Terrapene carolina*), and copperhead (*Agkistrodon contortrix*).

Table 1
Project Study Area Fauna

Species	Likelihood of Occurrence
White-tailed deer	Not observed. High potential to occur in mixed pine/hardwood forest and pine plantation. May occur in maintained/disturbed roadsides, maintained fields, and residential area to forage.
Opossum	Not observed. High potential to occur in mixed pine/hardwood forest. Could potentially occur in pine plantation habitats. Low potential to occur in maintained/disturbed roadsides, maintained fields, and residential areas.
Eastern box turtle	Not observed. High potential to occur in mixed pine/hardwood forest and pine plantation. May occur in maintained/disturbed roadsides, maintained fields, and residential areas, particularly along the forest edges.
Copperhead	Not observed. High potential to occur in mixed pine/hardwood forest. May occur in maintained/disturbed roadsides, maintained fields, and residential areas, particularly along the forest edge.

According to the National Wetland Inventory (NWI) map, Quankey Creek and the surrounding wetland communities within the project study area are identified as a freshwater palustrine emergent, persistent, seasonally flooded wetlands (PEM1C) (USFWS, 2005). Wetland communities delineated in the project study area during the site visit included one palustrine forested wetland (Wetland A) and one potential linear wetland (Wetland B) (Appendix A, Figure 5). Routine Wetland Determination data forms are include in Attachment E. Descriptions of these wetlands and the associated community types are as follows:

Palustrine Forested Wetland – The palustrine forested wetland, identified herein as Wetland A, encompassing approximately 0.4 acre, is included in this community type and is located north of SR 1434 (Sam Powell Road). A natural levee feature, approximately 20-25 feet wide, separates Wetland A from Quankey Creek. Wetland A is surrounded by mixed hardwood forest. Dominant vegetation observed in Wetland A included green ash (*Fraxinus pennsylvanica*), sweetgum, red maple, swamp chestnut oak, ironwood, poison ivy, greenbrier, trumpet creeper, spice bush (*Lindera benzoin*), lizard's tail (*Saururus cernuus*), and various sedges (*Carex* spp.). Elements of Coastal Plain Bottomland Hardwood Forest and Coastal Plain Levee Forest habitats,

as defined by Schafale and Weakley, were observed within this community type. A representative photograph of Wetland A is included in Appendix B, Photograph 9.

Linear Wetland – The linear wetland, identified herein as Wetland B, encompasses approximately 0.07 acre, and is located south of SR 1434 (Sam Powell Road) in the southeast quadrant of the project study area adjacent to maintained and disturbed roadside and mixed pine/hardwood forest. Wetland B appears to be a man-made channelized feature with an ephemeral connection to Quankey Creek. Wetland B contains all three components (hydric soils, hydrophytic vegetation, and wetland hydrology) of a wetland, thus is included as a potential jurisdictional wetland. Dominant vegetation observed in Wetland B included arrowleaf tearthumb (*Polygonum sagittatum*), swamp rose (*Rosa palustris*), soft rush (*Juncus effusus*), sweetgum, red maple, and jewelweed (*Impatiens capensis*). A representative photograph of Wetland B is included in Appendix B, Photograph 10.

A summary of the size and percent coverage of each of the terrestrial community types within the 8.3-acre project study area is included in Table 2.

Table 2
Terrestrial Community Types Within the Project Study Area

Terrestrial Communities	Area	Percent Coverage
Mixed Hardwood Forest	0.61 acre	7%
Mixed Pine/Hardwood Forest	2.12 acres	25%
Pine Plantation	0.96 acre	12%
Maintained and Disturbed Roadside	2.10 acres	25%
Maintained Field	0.10 acre	1%
Residential	0.80 acre	10%
Palustrine Forested Wetland	0.40 acre	5%
Linear Wetland	0.07 acre	1%
TOTAL	**7.16 acres**	**86%***

* Note: Remaining 14% cover (1.14 acres) comprised of roadway (12%) and Quankey Creek (2%).

3.2 Aquatic Communities

Aquatic communities located within the project study area include Quankey Creek (Appendix B, Photographs 2 and 3). At the time of the site visit, the creek bed of Quankey Creek was dry with only a few scattered pools, possibly due to the drought conditions experienced during the latter half of the summer of 2005. According to the NWI map, Quankey Creek and the surrounding wetland communities within the project study area are identified as a freshwater palustrine emergent, persistent, seasonally flooded wetlands (PEM1C) (USFWS, 2005). Quankey Creek extends for a distance of approximately 350 linear feet (0.14 acre) within the project study area. A summary of aquatic community types within the project study area is included in Table 3. Wetland communities delineated in the project study area were previously presented in Section 3.1. As previously stated in Section 2.3, Quankey Creek is currently listed as "impaired" from its confluence with Little Quankey Creek, approximately ten miles downstream of Bridge No. 24, to the Roanoke River, a total distance of 3.4 miles. This section of Quankey Creek has impaired biological integrity. Quankey Creek possesses qualities of both a coastal stream as well as a

swamp (NCDENR, 2005). Correspondence from the NCWRC does not indicate the presence of anadromous species in this portion of Quankey Creek (Appendix D).

Aquatic biota were not observed in the vicinity of Bridge No. 24 at the time of the September 29, 2005 site visit, and no efforts to sample for fish or other aquatic biota were undertaken. Based on a study conducted by the NCDENR DWQ Environmental Science Branch, fish species that could be expected to frequent the project study area include rosyside dace (*Clinostomus funduloides*), golden shiner (*Notemigonus crysoleucas*), margined madtom (*Noturus insignis*), eastern mudminnow (*Umbra pygmaea*), bluespotted sunfish (*Enneacanthus gloriosus*), swallowtail shiner (*Notropis procne*), spottail shiner (*N. hudsonius*), mosquito fish (*Gambusia holbrooki*), redbreasted sunfish (*Lepomis auritus*), bluegill (*L. macrochirus*), sea lamprey (*Petromyzon marinus*), pirate perch (*Aphredoderus sayanus*), satinfin shiner (*Cyprinella analostana*), tessellated darter (*Etheostoma olmstedi*), crescent shiner (*Luxilus cerasinus*), eel (*Anguilla rostrata*), bluehead chub (*Nocomis leptocephalus*), eastern silvery minnow (*Hybognathus regius*), and brown bullhead (*Ameriurus nebulosus*) (NCDENR, 2000).

No aquatic species, including fish, amphibian, or reptile, were observed during the field assessment primarily due to lack of persistent water and sufficient habitat. Potential impacts to aquatic resources are summarized in Section 3.3.

Reference Table 3 below for a summary of the aquatic community habitat types, specifically Quankey Creek, by area and percent coverage within the project study area.

Table 3
Aquatic Community Types Within the Project Study Area

Jurisdictional Stream	Hydrology	Area (acres)	Length (linear feet)	Percent Coverage
Quankey Creek	Perennial*	0.14	350	2%

* The stream lacked water at the time of the site visit.

3.3 Anticipated Impacts

One build alternative has been considered for the proposed project. Alternative 1 proposes replacing Bridge No. 24 in place with an off-site detour. Terrestrial and aquatic community impacts for the proposed replacement of Bridge No. 24 were calculated via integration of Microstation™ design files, including anticipated construction limits, into ArcView™ 9.2 software. A summary of potential community impacts is presented below.

Table 4
Proposed Impacts (in Acres) Within the Project Study Area

Communities	Alternative 1 (Existing Location)	
Terrestrial Communities	**Permanent**	**Temporary**
Mixed Hardwood Forest	0.046	0
Mixed Pine/Hardwood Forest	0.011	0
Pine Plantation	0.008	0
Maintained and Disturbed Roadside	0.418	0
Maintained Field	0	0
Residential	0	0
Total	**0.492**	**0**
Wetland Communities		
Palustrine Forested Wetland	0	0
Linear Wetland	0.013	0
Total	**0.013**	**0**
Jurisdictional Stream		0
Quankey Creek	0	0
Total	**0**	**0**
Total Project Impacts	**0.505**	**0**

Two types of impacts can generally be expected for terrestrial and aquatic communities within a roadway project corridor: 1) permanent disturbances due to proposed limits of cut and fill and 2) temporary disturbance during construction. Based on preliminary designs, replacing Bridge No. 24 would result in permanent impacts to mixed hardwood forest, mixed pine/hardwood forest, pine plantation, and maintained and disturbed roadside, as well as linear wetland. No temporary construction-related disturbances would occur to terrestrial or aquatic communities. Wildlife may be temporarily impacted by noise and other construction-related activities during the construction of the proposed bridge.

From an ecological perspective, the terrestrial impacts of Alternative 1 which would replace Bridge No. 24 in place with an off site detour would be minimal. Permanent impacts to terrestrial communities as a result of the proposed bridge replacement are generally restricted to narrow strips adjacent to the existing bridge and roadway approach segments. The total potential permanent impact to terrestrial communities within the cut-and-fill boundaries utilizing Alternative 1 is 0.505 acre, including 0.013 acre of linear wetland. Most of this area, 0.418 acre, is maintained and disturbed roadside.

Additional right-of-way (R/W) and construction easements may be required on both sides of SR 1434 (Sam Powell Road) within the project limits. Potential impacts to terrestrial vegetative communities associated with Alternative 1 will depend on final cut/fill lines and construction limits. Potential project impacts to jurisdictional waters of the U.S., including Quankey Creek, are discussed below.

It is anticipated that the proposed bridge will largely span Quankey Creek. The goal of preliminary design efforts, currently underway, would be to locate end bents outside Quankey Creek and place interior bents, as needed, outside the main channel. This will maintain the current hydrologic regime and stream integrity and minimize long-term impacts to the aquatic environment. In addition, stormwater discharge from the bridge deck into Quankey Creek will also be avoided per NCDOT policy. However, short-term impacts to water quality, such as sedimentation and turbidity, can be anticipated from construction-related activities. These temporary impacts can be minimized by using best management practices (BMPs) during construction and through adherence to NCDOT's bridge demolition policies. BMPs are activities, practices and procedures undertaken to prevent or reduce water pollution. The proposed project will be subject to applicable BMPs contained in NCDOT's Best Management Practices for Protection of Surface Waters (March, 1997). The contractor will also be required to follow contract specifications pertaining to erosion control measures as outlined in 23 CFR 650 Subpart B and Article 107-13 entitled "Control of Erosion, Siltation, and Pollution" (NCDOT, Specifications for Roads and Structures). These measures include but are not limited to 1) the use of dikes, berms, silt basins, and other containment measures to control runoff; 2) elimination of construction staging areas in floodplains and adjacent to waterways; 3) re-seeding of herbaceous cover on disturbed sites; 4) management of chemicals; and 5) avoidance of direct discharges into streams through the use of catch basins and roadside vegetation. In addition, all state highway projects are subject to the rules and regulations established by the N.C. Sedimentation Control Commission, which is responsible for implementation of the Sedimentation Pollution Control Act of 1973.

4.0 JURISDICTIONAL TOPICS

4.1 Waters of the U.S.

Jurisdictional waters of the U.S. are defined by 33 CFR 328.3(b) and are protected by Section 404 of the Clean Water Act (33 U.S.C. 1344), which is administered and enforced in North Carolina by the U.S. Army Corps of Engineers (USACE), Wilmington District. The term "waters of the U.S., is defined in 33 CFR Part 328, and includes waters such as intrastate lakes, rivers, streams (including intermittent streams) and wetlands.

Jurisdictional wetlands are defined in the field as areas that exhibit positive evidence of three environmental parameters: hydrophytic vegetation, wetland hydrology, and hydric soils. The results of the on-site field review indicate that there is one jurisdictional stream channel (Quankey Creek) and two potential jurisdictional wetland areas (Wetlands A and B) within the project study area (See Appendix A – Figure 5). Potential jurisdictional boundaries were delineated and flagged in the field. Flagged locations were collected with a GPS unit and mapped using GIS software. Waters of the U.S. are depicted on Figure 5 in Appendix A.

Jurisdictional streams within the project study area include Quankey Creek, which is approximately 30 feet wide at the SR 1434 (Sam Powell Road) Bridge No. 24 crossing (Appendix B, Photographs 2 and 3). Approximately 350 linear feet (0.14 acre) of stream channel is contained within the project study area. The two potential wetland areas located within the

project study area were classified as palustrine forested wetland community and linear wetland community types. Reference Section 3.1 for detailed descriptions of these wetland features.

Wetlands were assessed utilizing the DWQ's current guidance document for assessing wetland values (NCDEHNR, 1995). The parameters assessed included water storage capacity, bank and shoreline stabilization, pollutant/sediment removal, wildlife habitat, aquatic life value, and recreation and education. Reference Table 5 below for a summary of the findings of the assessments. Reference Attachment E for Wetland Rating Worksheets.

Table 5
Wetland Functions/Values Assessment Rating

		Rated Value						
	Wetland Type*	**Water Storage**	**Bank Stabilization**	**Pollutant Removal**	**Wildlife Habitat**	**Aquatic Life Value**	**Recreation/ Education**	**Total Score**
Wetland A	Palustrine Forested Wetland	16	8	25	8	20	3	**80**
Wetland B	Linear Wetland	8	0	5	2	8	1	**24**
Max. Score Possible	-	20	20	30	10	20	5	**105**

* Wetland Type follows that defined in Cowardin (1979)

The project study area is located within the Roanoke River Watershed Basin. The Roanoke Watershed Basin does not have buffer rules therefore the B-4541 project is not subject to buffer regulations (Note: Correspondence from NCDWQ, dated June 17, 2005 [Appendix D], indicates that this project is located in the Neuse River Basin. However, this project is located within the Roanoke River Basin, per Surface Water Classification data and various Basinwide Assessment Reports.).

Project alignments are being developed to avoid as much of the wetlands as practicable. Given the nature of the project and the location of Quankey Creek and associated wetlands, impacts to these waters are unavoidable. The goal of preliminary design efforts would be to maintain the current hydrologic regime and stream integrity and minimize long-term impacts to the aquatic environment. As such, it is anticipated that the proposed bridge will largely span the creek and that direct impacts to surface waters will be minimal.

4.2 Permit Issues

Depending on the impact to waters of the U.S., including wetlands, Section 404 permitting requirements can range from activities that are considered exempt or preauthorized, to those requiring pre-construction notification (PCN) for a Nationwide Permit (NWP), a Regional General Permit (RGP), or requiring a Section 404 Individual Permit (IP) from the USACE.

As previously described, based on preliminary design, minor impact to linear wetland (Wetland B) would be expected as a result of Bridge Replacement Alternative 1. Direct impacts to Quankey Creek, as a result of Alternative 1 are not anticipated.

Impacts to waters of the U.S., including wetlands, resulting from the proposed bridge replacement project would likely be permitted pursuant to RGP No. 198200031. This RGP authorizes the discharge of dredged or fill material in waters of the U.S. associated with the construction of bridges, particularly as it relates to work conducted by NCDOT. Written confirmation that the proposed work complies with this RGP must be received from the Wilmington District Engineer prior to the commencement of any work. NCDWQ has promulgated Section 401 General Water Quality Certification (WQC) No. 3704 to correspond with RGP 198200031. This WQC requires a PCN to NCDWQ for any impacts to perennial stream channel. Since this project is being processed as a Categorical Exclusion (CE) pursuant to Federal Highway Administration guidelines, NWP No. 23, "*Approved Categorical Exclusions*" may also be applicable to permit this project. NCDWQ has promulgated WQC No. 3701 for NWP No. 23. This General WQC also requires a PCN to the NCDWQ. Although temporary impacts are not anticipated, should construction easements be required and result in temporary impacts, NWP No. 33 *"Temporary Construction, Access and Dewatering"* may be applicable. NWP No. 33 requires a PCN to the USACE, as well as a PCN to the NCDWQ for WQC No. 3688. The PCN must include a delineation of affected waters of the U.S., as well as a description of impact avoidance and minimization strategies, compensatory mitigation, and an alternatives analysis.

The Council on Environmental Quality (CEQ) has defined mitigation in 40 CFR Part 1508.20 to include: avoiding impacts, minimizing impacts, rectifying impacts, reducing impacts over time, and compensating for impacts. Three general types of mitigation include avoidance, minimization and compensatory mitigation. Compensatory mitigation consists usually of the restoration of existing degraded wetlands or waters, or the creation of waters of the U.S. of equal or greater value than the waters to be impacted. This type of mitigation is only undertaken after avoidance and minimization actions are exhausted and should be undertaken, when practicable, in areas near the impact site (i.e., on-site compensatory mitigation).

Given the location of the jurisdictional waters of the U.S., and the need to replace the existing bridge, project impacts associated with the proposed bridge replacement (Alternative 1) are unavoidable. The build alternative being designed involves replacement of the existing bridge in place while utilizing an off-site detour during construction. This alternative will largely minimize impacts to wetlands and waters of the U.S. located in the project study area. As previously described in Section 3.3, the goal of preliminary design efforts would be to locate end bents outside Quankey Creek and place interior bents outside the main channel. In a further effort to minimize impacts to waters of the U.S., approach work has been limited to only those adjustments necessary to facilitate bridge replacement. This overall design approach will minimize long-term impacts to jurisdictional waters of the U.S.

Following the implementation of impact avoidance and minimization design strategies, compensatory mitigation would be required for all remaining permanent impacts to streams and wetlands on the project site. On-site mitigation potential will be investigated by NCDOT's On-Site Mitigation Group. In accordance with the "Memorandum of Agreement Among the North Carolina Department of Environment and Natural Resources, the North Carolina Department of Transportation, and the U.S. Army Corps of Engineers, Wilmington District" (MOA), July 22, 2003, the NCDENR Ecosystem Enhancement Program (EEP) will be requested to provide off-site mitigation to satisfy the federal Clean Water Act compensatory mitigation requirements in the event that mitigation is required for this project and on-site mitigation opportunities are not available. A

final determination regarding mitigation to the waters of the U.S. rests with the USACE and DWQ, and compensatory mitigation for impacts will be resolved during the permitting phase.

NCDOT recognizes that dropping debris into waters of the U.S. is an undesirable activity. It is anticipated that work scheduled to be performed in Quankey Creek would not require special restrictions other than those outlined in *Best Management Practices for Protection of Surface Waters*. Estimated impacts to Quankey Creek will be minimal. The bridge is 52 ft in length. The superstructure consists of a reinforced concrete flooring on timber joists with asphalt wearing surface and concrete bridge railings. The substructure consists of timber caps and timber piles. The asphalt wearing surface, bridge railings, and the timber piles will be removed without dropping their components into Waters of the United States. There is potential for components of the concrete flooring to be dropped into the Waters of the United States during construction. The resulting temporary fill associated with flooring is approximately 22.6 cubic yards. Best Management Practices for Bridge Demolition and Removal will be followed during construction.

It is anticipated that the demolition/removal of this bridge will occur with minimal debris being dropped into the creek. The utilization of BMPs and adherence to NCDOT bridge demolition policies will largely mitigate potential impacts to the stream channel. Although not available at the time of this writing, data concerning proposed bridge materials and temporary fills will be included in the pending CE document. Temporary impacts to Quankey Creek and adjacent lands associated with the construction activities would be mitigated by removal of temporary fill material and replanting disturbed areas with native riparian plant species upon project completion.

4.3 Protected Species

The Federal Endangered Species Act (ESA) of 1973, as amended, is the federal regulatory tool that serves to administer permits, implement recovery plans, and monitor listed endangered and threatened species. The USFWS and the National Marine Fisheries Service administer the ESA.

Species with the federal classification of Endangered (E) or Threatened (T), Proposed (P) for such listing, or Threatened due to Similarity of Appearance (T [S/A]) are protected under the ESA, as amended (16 U.S.C. 1531 *et seq.*). The term "Endangered species" is defined as "any species which is in danger of extinction throughout all or a significant portion of its range", and the term "Threatened species" is defined as "any species which is likely to become an Endangered species within the foreseeable future throughout all or a significant portion of its range" (16 U.S.C. 1532). The term "Proposed" is defined as "any species proposed for official listing as Endangered or Threatened." "Federal species of concern" (FSC) is defined as "a species that may or may not be listed in the future; or a species under consideration for listing for which there is insufficient information to support listing." "Candidate" (C) species are taxons under consideration for which there is insufficient information to support a listing. The FSC and C designation are afforded no federal protection under the ESA.

A search of the USFWS and North Carolina Natural Heritage Program (NCNHP) databases provided existing information concerning the potential occurrence of federally threatened or endangered species within Halifax County. This database indicates that there are four federally endangered or threatened species known to exist in Halifax County as listed in Table 6 below.

Table 6
Federally Endangered/Threatened Species – Halifax County

Common Name	Scientific Name	Federal Status	List Date	County Occurrence	Potential Habitat (y/n)	Biological Conclusion
Dwarf Wedgemussel	*Alasmidonta heterodon*	E	1990	Current	No	No Effect
Tar River Spinymussel	*Elliptio steinstansana*	E	1985	Current	No	No Effect
Bald Eagle	*Haliaeetus leucocephalus*	De-listed*	1995	Current	No	No Effect
Red-Cockaded Woodpecker	*Picoides borealis*	E	1970	Current	No	No Effect

* *Bald Eagle was de-listed, effective on August 8, 2007*
T = Threatened, E = Endangered, PD = Proposed De-Listed
Reference: North Carolina Natural Heritage Program database, Accessed May 2007.

The list of federally endangered and threatened species known to occur in Halifax County was reviewed, and evaluations were performed to determine the likelihood of the presence of each species within the project study area. Field reviews were conducted on September 29, 2005, and areas in the project study area that matched descriptions of preferred habitat for the federally protected species listed in the above table were classified as potential protected species habitat. On-site field reviews, encompassing approximately ten man hours, revealed that the majority of the project study area consists of mixed hardwood forest, mixed pine/hardwood forest, young pine plantation, and maintained and disturbed roadside. The protected species habitat field review revealed that none of the above-listed species is likely to occur in the project study area. A summary of habitat preferences and findings for the above-listed species is as follows:

Dwarf wedgemussel (*Alasmidonta heterodon*) – The dwarf wedgemussel is a federally and state listed endangered species. The mussel rarely exceeds 45 mm in length. Young shells are typically greenish-brown in color with greenish rays, while older shells usually appear black or brown (NCWRC, 2005). The shell is relatively thin, but tends to thicken with age toward the anterior end (NCWRC, 2005). The preferred habitat of this species includes clay banks along root systems of trees, mixed substrates of cobble, gravel, and sand, and occasionally soft silt substrates. Stream banks are stable, having extensive root systems and mature riparian buffers. Water quality within the rivers and streams where the dwarf wedgemussel is found is good to excellent (NCWRC, 2005).

Dwarf wedgemussel once occurred in rivers and streams from New Brunswick, Canada to North Carolina. North Carolina supports the greatest number of known occurrences within the Neuse River Basin (Orange County, Wake County, Johnston County, Wilson County, Nash County), and the Tar River Basin (Person County, Granville County, Vance County, Franklin County, Warren County, Nash County, and Halifax County) (NCWRC, 2005).

A field review was conducted on September 29, 2005. The portion of Quankey Creek within the project study area exhibited no flow and a homogenous silt and sand substrate. The preferred habitat of this species includes clay banks along root systems or trees, mixed substrates of cobble, gravel and sand, and occasionally soft silt substrates. Water quality should be good to excellent.

The lack of persistent water and suitable substrate, limits the potential for dwarf wedgemussel to be present in the project study area.

According to a memorandum from NCDOT dated August 21, 2007, a survey for the dwarf wedgemussel was conducted by NCDOT personnel on October 25, 2006 (reference Attachment D). According to the memorandum, no freshwater mussels of any species were encountered during the field survey, and the habitat was characterized as marginal for dwarf wedgemussel. The memorandum concluded that the proposed project will have no effect on this species.
BIOLOGICAL CONCLUSION: ***No Effect***

Tar River spinymussel (*Elliptio steinstansana*) – The Tar River spinymussel is a federally and state listed endangered species. The average adult mussel is 2.5 inches in length. Juvenile mussels contain twelve spines and have an outer shell surface that is orange-brown with greenish rays. Adult mussels tend to lose their spines as they mature and have a darker outer surface with inconspicuous rays. The inner shell of both the juvenile and adult mussel is yellow or pinkish at one end and bluish-white at the other end (NCNHP, 2001). This species is typically observed in unconsolidated beds of gravel and coarse sand in relatively fast flowing water. The water quality of the stream is good to excellent. Stream banks are usually stable, having extensive root systems (NCWRC, 2005). The Tar River spinymussel is known to occur in Edgecombe County within the Swift Creek subbasin and the Tar River (NCWRC, 2005). This mussel has also been observed within Johnston County (Little River Subbasin-Neuse River Basin), Nash County (Swift Creek Subbasin and Tar River), Franklin County (Shocco and Sandy Creek subbasins), and Halifax County (Little Fishing Creek Subbasin) (NCWRC, 2005).

A field review was conducted on September 29, 2005. The portion of Quankey Creek within the project study area exhibited no flow and a homogenous silt and sand substrate. This species is typically observed in unconsolidated beds of gravel and coarse sand in relatively fast flowing water. The water quality of the stream is good to excellent. Very limited potential habitat is present. The lack of persistent water and suitable substrate limits the potential for the Tar River spinymussel to be present in the project study area.

According to a memorandum from NCDOT dated August 21, 2007, a survey for the Tar River spinymussel was conducted by NCDOT personnel on October 25, 2006 (reference Attachment D). According to the memorandum, no freshwater mussels of any species were encountered during the field survey, and the habitat was characterized as marginal for Tar River spinymussel. The memorandum concluded that the proposed project will have no effect on this species.
BIOLOGICAL CONCLUSION: ***No Effect***

Bald eagle (*Haliaeetus leucocephalus*) – The bald eagle has been delisted as a federally threatened species, effective August 8, 2007. The bald eagle is protected pursuant to the Bald and Golden Eagle Protection Act.

Female bald eagles are approximately 35 to 37 inches long while the male bald eagles are approximately 30 to 34 inches. Adults tend to have a blackish-brown back and breast with a white neck, head, and tail and a yellow bill. Juveniles tend to be brown and white with a black bill. This bird nests in mature live pines or cypress trees in the transition zone between mature forests and large bodies of water. Nests are very large, up to six feet in width, and constructed of large sticks and soft materials such as dead vegetation, grasses, and pine needles (USFWS, 1992). Nesting

trees are usually less than two miles from open water. Winter roosts are usually in mature trees, similar to nesting trees, but may be somewhat farther from water.

A field review was conducted on September 29, 2005. No individuals of this species were observed during the field survey. This bird nests in mature live pines or cypress trees in the transition zone between mature forests and large bodies of water. The survey revealed a lack of large bodies of water in the project vicinity and no suitable nesting or roosting habitat within the project study area. Therefore, based on the habitat requirements for bald eagle and the lack of available preferred habitat identified within the project study area, the proposed project should have no effect on this species.
BIOLOGICAL CONCLUSION: ***No Effect***

Red-cockaded woodpecker (*Picoides borealis*) – The red-cockaded woodpecker (RCW) is a federally and state listed endangered species. The adult bird is approximately 7 to 8.5 inches long with a black cap and nape, a prominent cheek patch, and a back barred with black and white. The male's tiny red cockade is just behind the eye, but is often absent or difficult to see (Potter, et al., 1980). The bird is native to southern pine forests and typically nests in open pine stands containing trees 60 years or older (NCNHP, 2001). Roosting cavities are excavated within live pines, which are often infected with red-heart disease (NCNHP, 2001). Foraging may occur in pine and/or mixed pine stands with trees greater than 10" diameter at breast height (dbh).

A field review was conducted on September 29, 2005. No individuals of this species were observed during the field survey. The survey revealed no suitable nesting or foraging habitat within the project study area. The project study area contains a relatively thick, well-developed understory and the size of the trees, generally less than 10" dbh, does not meet typical foraging requirements. Therefore, based on the habitat requirements for red-cockaded woodpecker and the lack of available preferred habitat identified within the project study area, the proposed project should have no effect on this species.
BIOLOGICAL CONCLUSION: ***No Effect***

In addition to on-site field reviews, information was requested from the USFWS regarding protected species information within the project study area. In a letter dated June 10, 2005, the USFWS indicated that their records do not indicate the known presence of any federally protected species within or near the project study area (Appendix D).

A search of the NCNHP database also provided existing information concerning the potential occurrence of federal species of concern (FSC) within Halifax County. This database indicates that there are twelve species known to exist or that have historically existed in Halifax County, as listed below in Table 7. The potential presence of habitat for each of these species as ascertained during field review efforts is also noted.

Table 7
Federal Species of Concern – Halifax County

Common Name	Scientific Name	State Status	Federal Status	County Status	Potential Habitat Present
Yellow Lance	*Elliptio lanceolata*	E	FSC	Current	N
Atlantic Pigtoe	*Fusconaia masoni*	E	FSC	Current	N
Yellow Lampmussel	*Lampsilis cariosa*	E	FSC	Current	N
Green Floater	*Lasmigona subviridis*	E	FSC	Current	N
Chowanoke Crayfish	*Orconectes virginiensis*	SC	FSC	Current	Y
Carolina Least Trillium	*Trillium pusillum* var. *pusillum*	E	FSC	Current	Y
Bog St. John's-Wort	*Hypericum adpressum*	SR-T	FSC	Historic	N
Southeastern Myotis	*Myotis austroriparius*	SC	FSC	Current	N
Bachman's Sparrow	*Aimophila aestivalis*	SC	FSC	Historic	N
Cerulean Warbler	*Dendroica cerulean*	SR	FSC	Current	N
Roanoke Bass	*Ambloplites cavifrons*	SR	FSC	Current	N
Carolina Madtom	*Notorus furiosus*	SC (PT)	FSC	Current	N

FSC = Federal Species of Concern, T = Threatened, E = Endangered, SR = Significantly Rare, SC = Special Concern, PT = Proposed Threatened
Reference: North Carolina Natural Heritage Program, Accessed May 2007.

None of the above-listed species of concern were observed in the project study area during field review efforts.

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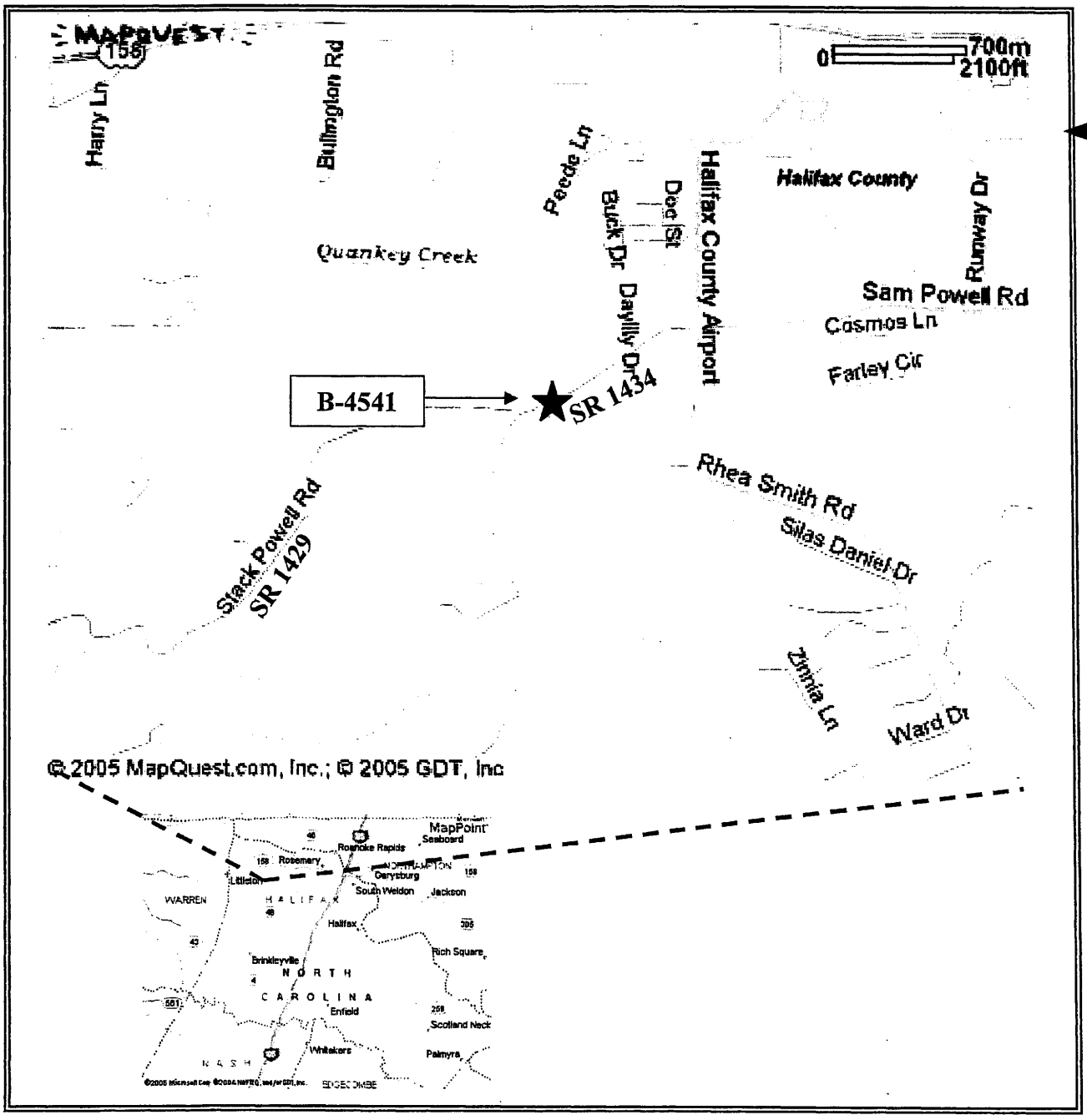
APPENDIX A
FIGURES



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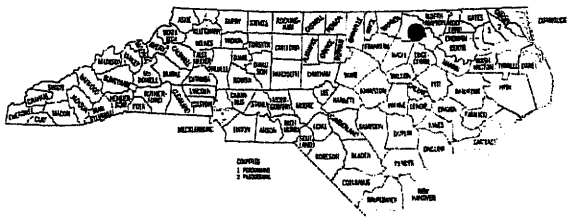
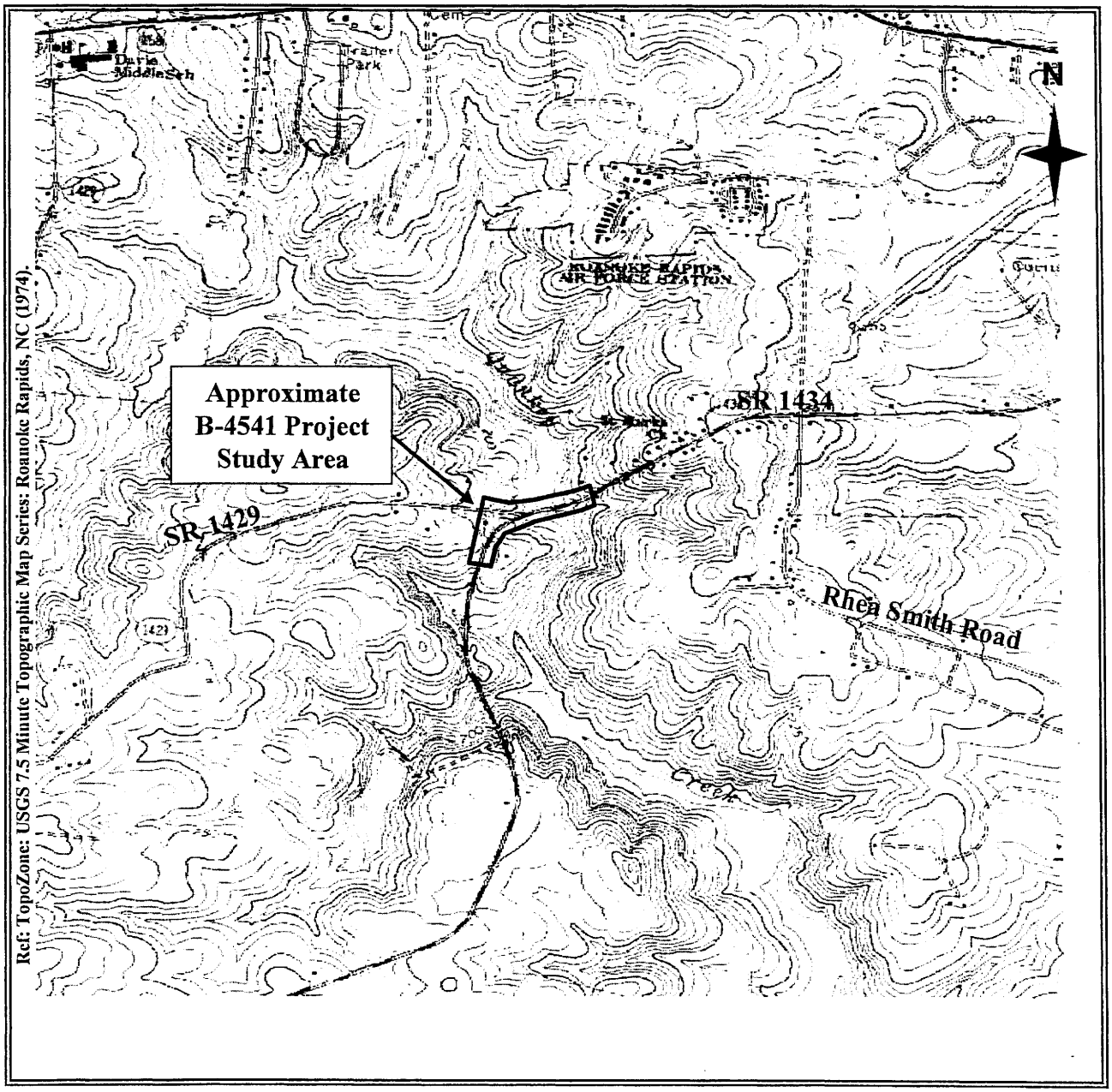


North Carolina Vicinity Map

SR 1434 (Sam Powell Road) Bridge Replacement over Quankey Creek **Bridge No. 24** **T.I.P. No. B-4541** **Halifax County, North Carolina**	**Site Location** **FIGURE 1**



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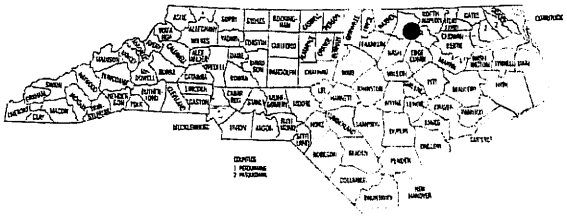
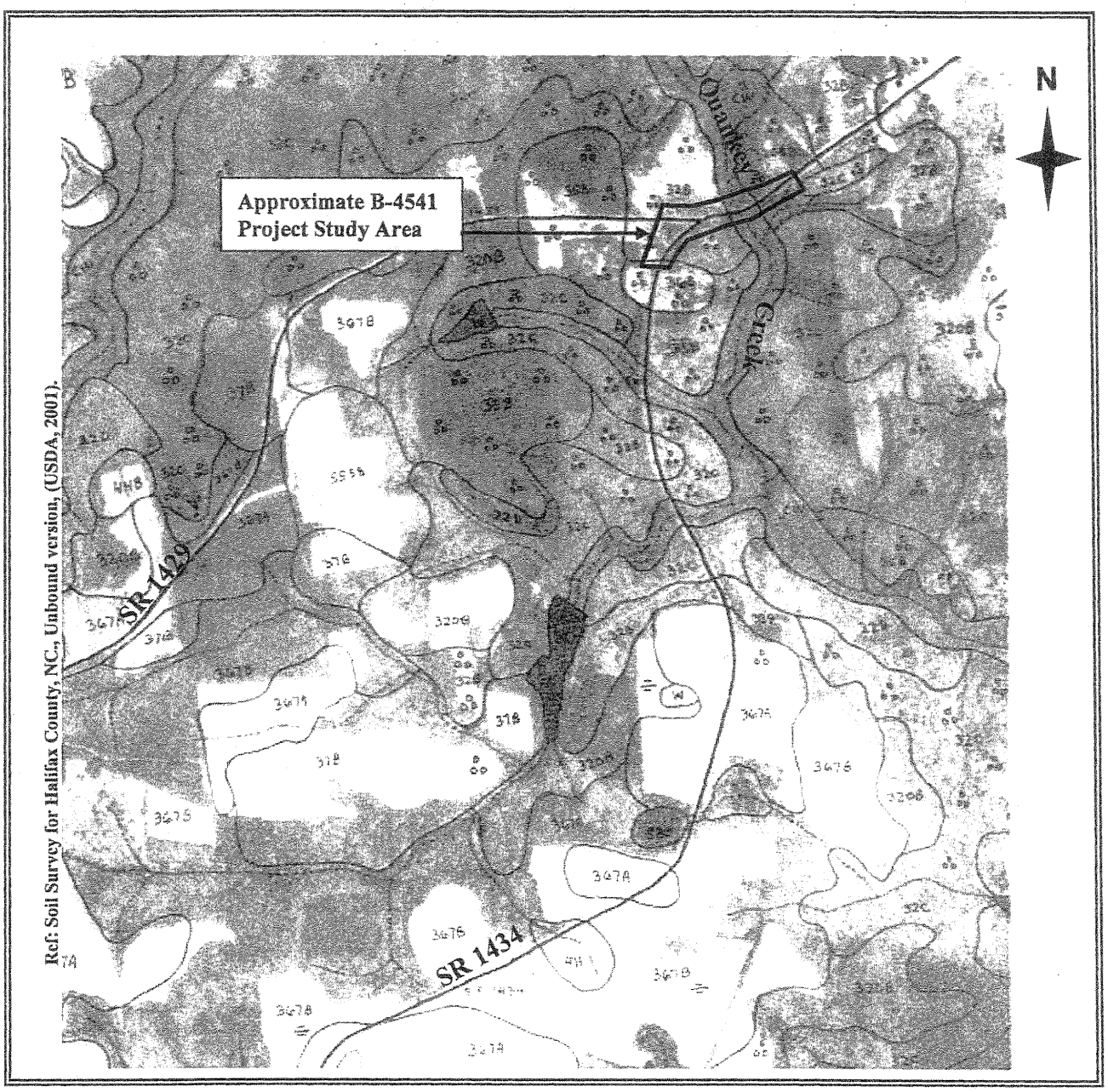


North Carolina Vicinity Map

SR 1434 (Sam Powell Road) Bridge Replacement over Quankey Creek Bridge No. 24 T.I.P. No. 4541 Halifax County, North Carolina	**USGS Quad FIGURE 2**



Not to Scale

Mapped Soil Units in Project Study Area

Emporia-Wedowee Complex (320B, EwB)

Pacolet coarse sandy loam (32B, PaB)

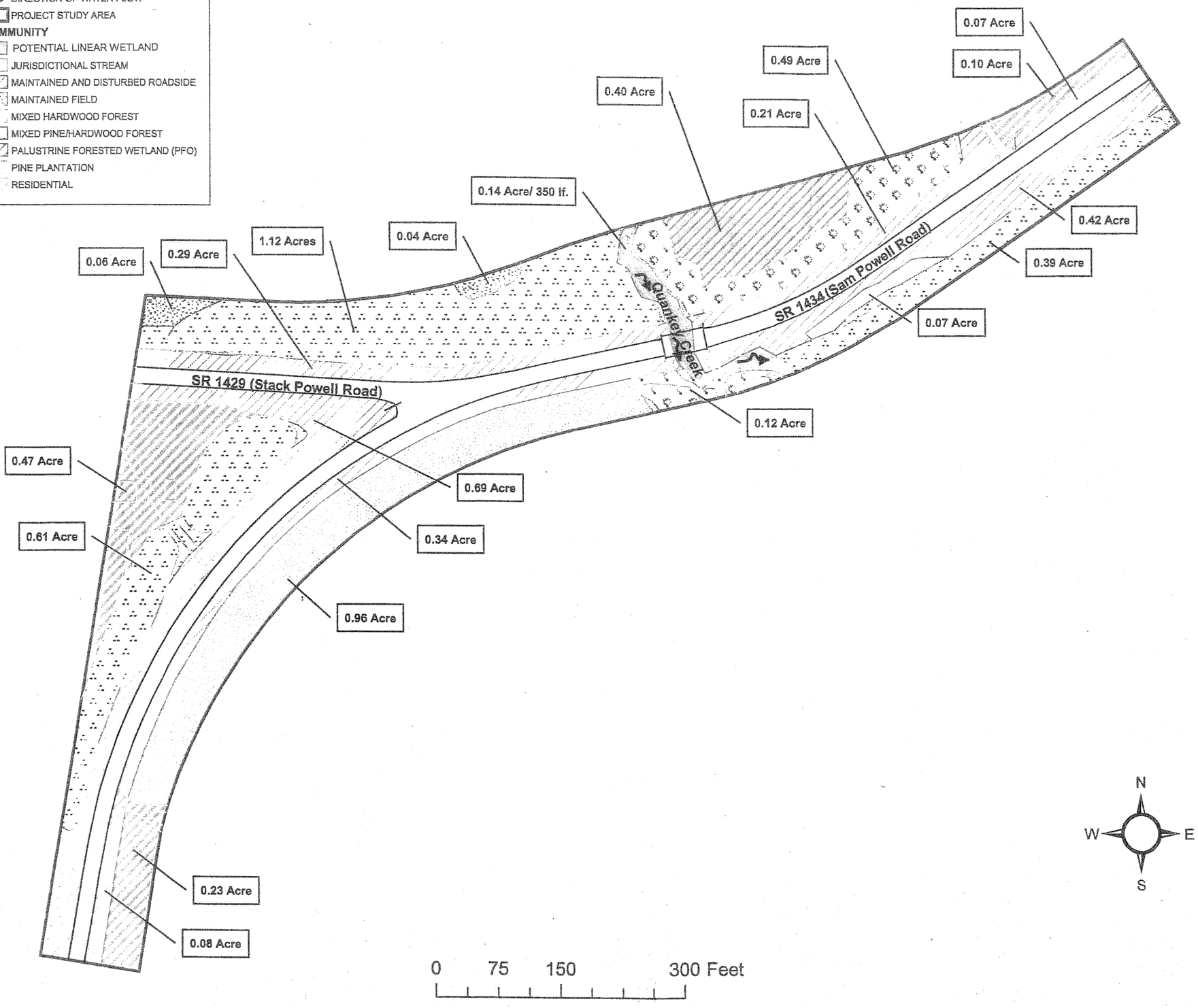
Wedowee coarse sandy loam (35B, 32C, WeB and WeC)

SR 1434 (Sam Powell Road) Bridge Replacement over Quankey Creek Bridge No. 24 T.I.P. No. 4541 Halifax County, North Carolina	**Soil Survey Map FIGURE 3**

SR 1434 Bridge Replacement
Bridge No. 24 over Quankey Creek
Halifax County, North Carolina
T.I.P. No. B-4541

LEGEND
- ROAD
- PLANIMETRICS
- DIRECTION OF WATER FLOW
- PROJECT STUDY AREA

COMMUNITY
- POTENTIAL LINEAR WETLAND
- JURISDICTIONAL STREAM
- MAINTAINED AND DISTURBED ROADSIDE
- MAINTAINED FIELD
- MIXED HARDWOOD FOREST
- MIXED PINE/HARDWOOD FOREST
- PALUSTRINE FORESTED WETLAND (PFO)
- PINE PLANTATION
- RESIDENTIAL



N
W E
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STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

Community Map

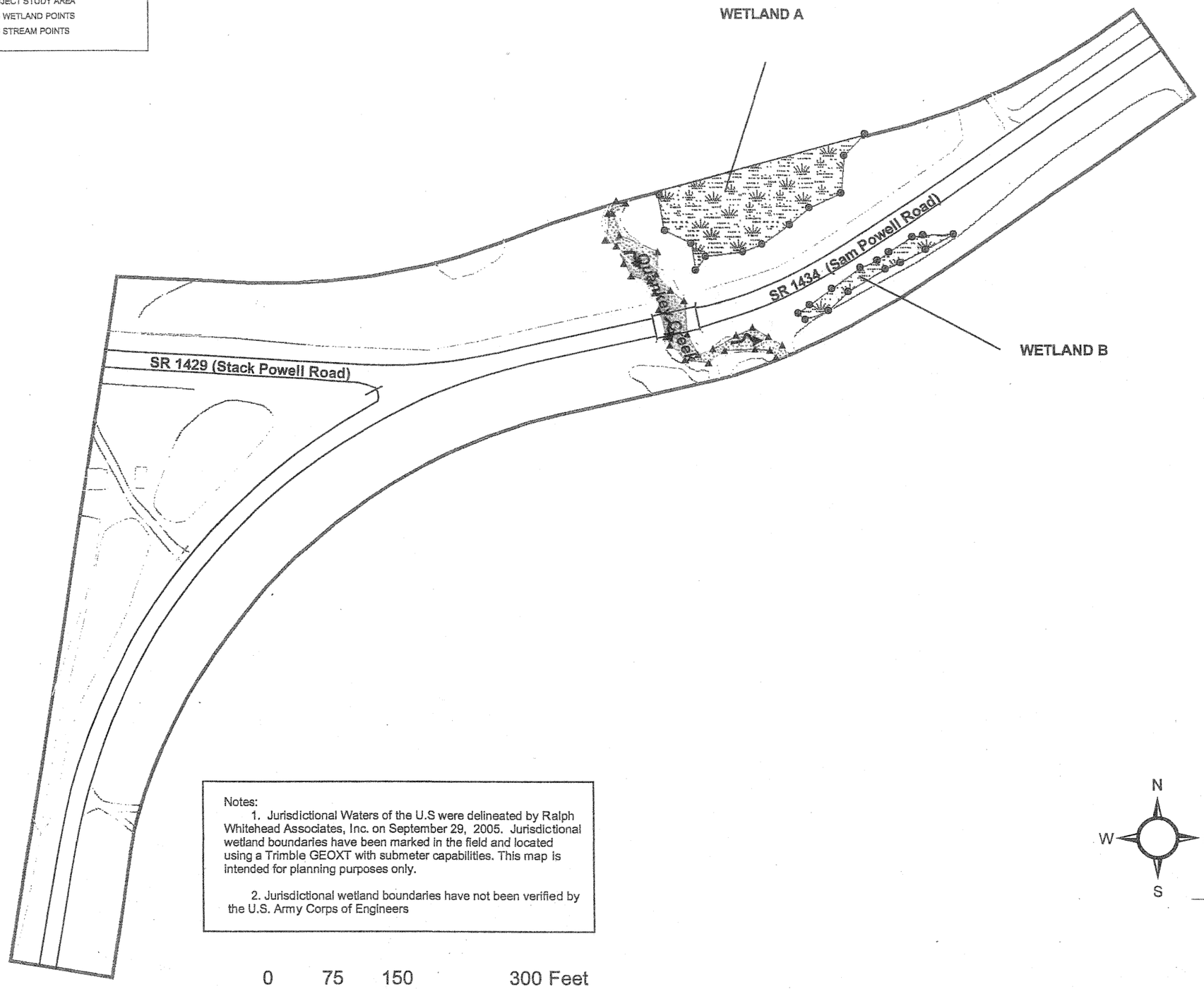
FIGURE 4

SURVEYED BY	PREPARED BY	CHECKED BY	APPROVED BY	DATE
	ARB			10.05.05

JOB NO.	SCALE	GIS/ CAD FILE PATH	SHEET	OF
3194-102	1" = 125'		1	1

SR 1434 Bridge Replacement
Bridge No. 24 over Quankey Creek
Halifax County, North Carolina
T.I.P. No. B-4541

LEGEND
- POTENTIAL JURISDICTIONAL WETLAND
- POTENTIAL JURISDICTIONAL STREAM
- ROAD
- DIRECTION OF WATER FLOW
- PLANIMETRICS
- PROJECT STUDY AREA
- GPS WETLAND POINTS
- GPS STREAM POINTS



Notes:
1. Jurisdictional Waters of the U.S were delineated by Ralph Whitehead Associates, Inc. on September 29, 2005. Jurisdictional wetland boundaries have been marked in the field and located using a Trimble GEOXT with submeter capabilities. This map is intended for planning purposes only.

2. Jurisdictional wetland boundaries have not been verified by the U.S. Army Corps of Engineers

0 75 150 300 Feet

N W E S

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

Approximate Waters of the U.S. and Wetlands Boundary Map

FIGURE 5

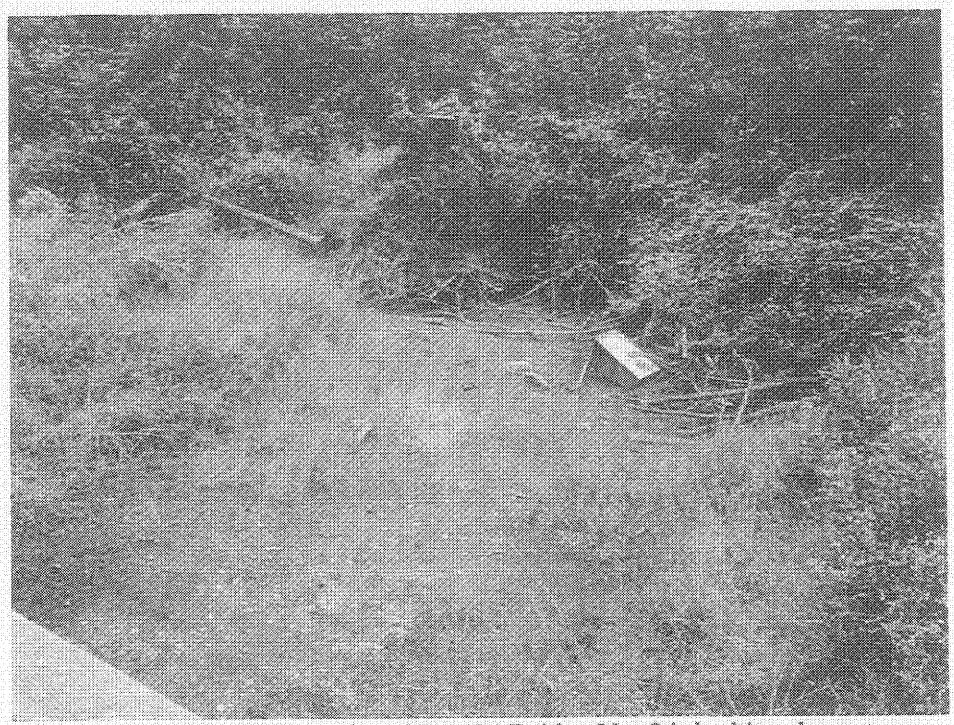
SURVEYED BY	PREPARED BY	CHECKED BY	APPROVED BY	DATE
	ARB			10.18.05

JOB NO.	SCALE	GIS/ CAD FILE PATH	SHEET	OF
3194-102	1" = 125'		1	1

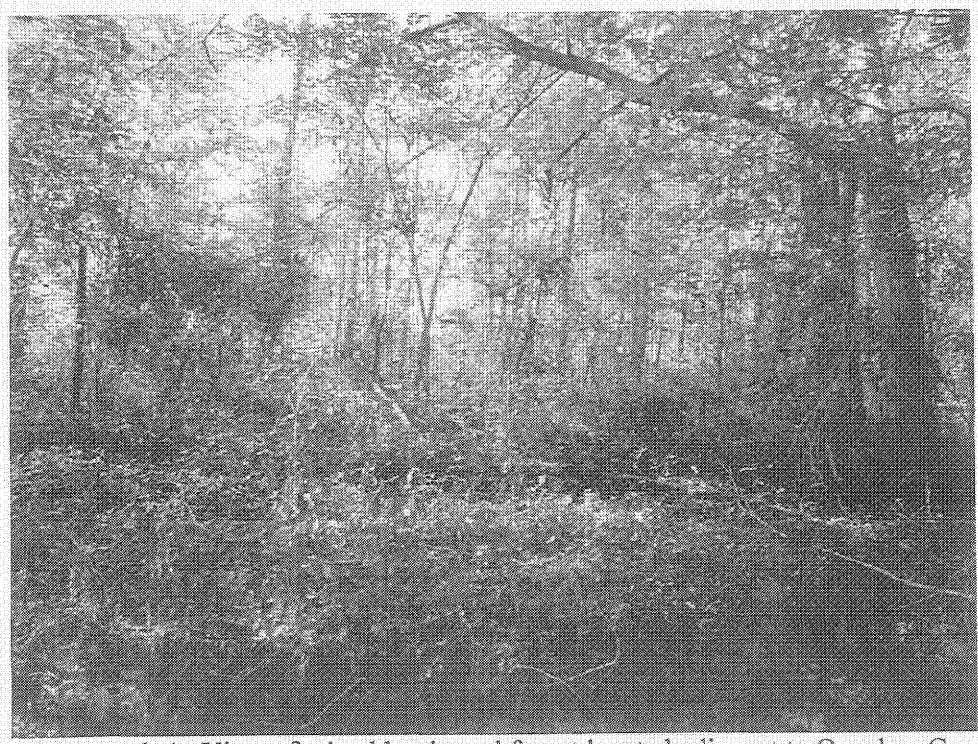
APPENDIX B
PHOTOGRAPHS

Photograph 1: Bridge No. 24 on SR 1434 looking east

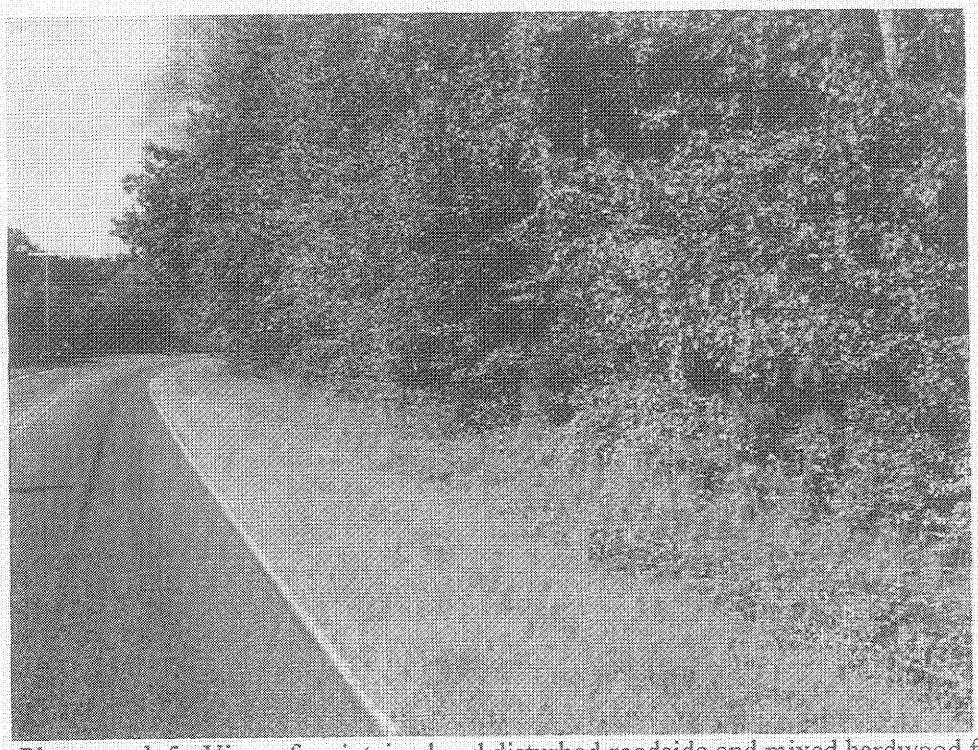
Photograph 2: Quankey Creek at SR 1434 Bridge No. 24, looking upstream (northwest).



Photograph 3: Quankey Creek at SR 1434 Bridge No. 24, looking downstream (southeast).



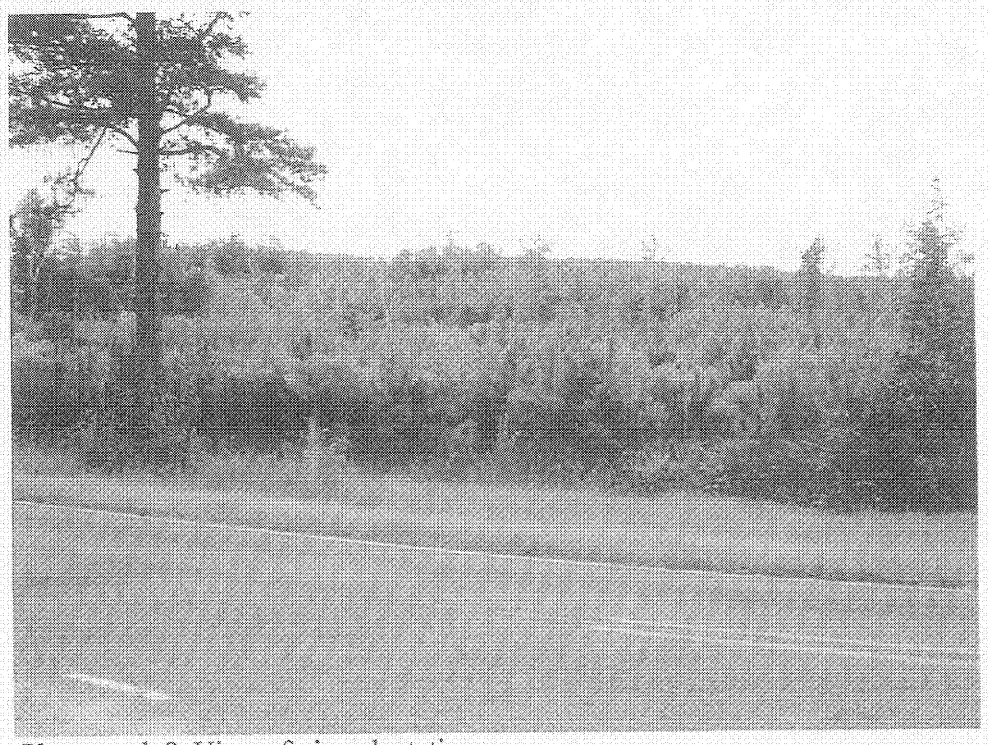
Photograph 4: View of mixed hardwood forest located adjacent to Quankey Creek.



Photograph 5: View of maintained and disturbed roadside and mixed hardwood forest.

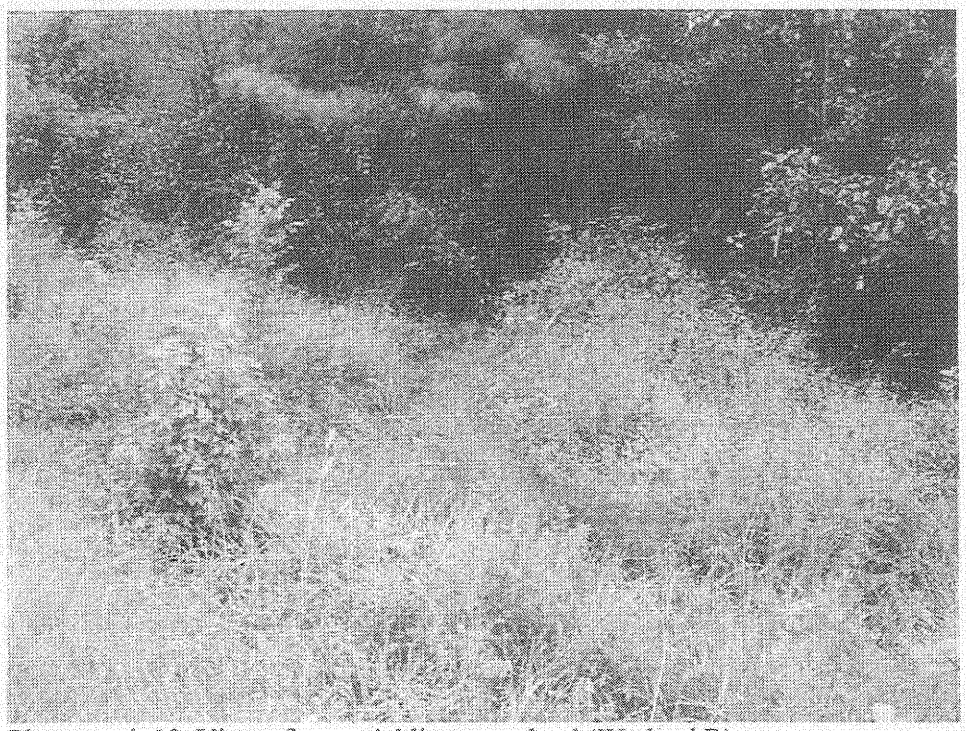
Photograph 6: View of maintained and disturbed roadside and mixed pine/hardwood forest in the northwest quadrant.

Photograph 7: View of maintained and disturbed roadside and mixed pine/hardwood forest.



Photograph 8: View of pine plantation

Photograph 9: View of palustrine forested wetland (Wetland A).



Photograph 10: View of potential linear wetland (Wetland B).

APPENDIX C
PERSONNEL QUALIFICATIONS

The following STV/RWA employees were responsible for the preparation of this document:

Michael A. Iagnocco, P.W.S., Senior Environmental Scientist
B.S. Biological Sciences
Mr. Iagnocco has over 26 years of experience in performing environmental studies and managing the preparation of environmental documents, including assessments and impact statements, at federal and state levels. Mr. Iagnocco also has extensive experience in wetland assessment, delineation, and permitting; the development of comprehensive mitigation plans involving restoration, creation, and enhancement; and natural resource inventories.

Adam H. Karagosian, P.W.S., Senior Environmental Specialist
B.S. Environmental Studies (Biological Sciences concentration)
Mr. Karagosian has over 13 years of experience in ecological studies and environmental assessment. His experience includes wetland and stream delineations on more than 12,000 acres of land, functional assessments, wetland classifications, all aspects of Section 404/401 permitting, compensatory mitigation planning, vegetation inventories, water quality monitoring, agency coordination, and regulatory negotiation.

Jennifer L. Schwaller, NEPA Project Planner
B.S. Organismal Biology
Ms. Schwaller has over nine years of experience in ecological studies and environmental assessment. She is well versed in National Environmental Policy Act (NEPA) and State (North Carolina) Environmental Policy Act (SEPA) compliance, and has served as the primary author on numerous environmental documents, including environmental assessments. She has completed coursework towards earning a NEPA Certificate from Duke University's Environmental Leadership Program. In addition, Ms Schwaller has attended several workshops sponsored by the USFWS, which focused on rare plant identification within the Carolinas. These workshops have included instruction on Schwenitz's sunflower (*Helianthus schweinitzii*), dwarf-flowered heartleaf (*Hexastylis naniflora*), bunched arrowhead (*Sagittaria fasciculata*), mountain sweet pitcher plant (*Sarracenia jonesii*), and swamp pink (*Helonias bullata*).

Steven Busbee, Project Environmental Scientist
M.S. Forest Resources
B.S. Aquaculture, Fisheries, and Wildlife Biology
Mr. Busbee, P.W.S. has seven years of experience in ecological studies and environmental assessment throughout the southeastern United States. Mr. Busbee has a Master's Degree in Forest Resources and a Bachelor's Degree in Aquaculture, Fisheries, and Wildlife Biology, both from Clemson University. His experience includes stream and wetland determinations, delineations, functional assessments, natural resource and feasibility studies, preparation of Clean Water Act Section 404 permit documents, compensatory wetland mitigation design, planning and monitoring, protected plant and animal species surveys, invasive plant species management, water quality monitoring, and regulatory agency reporting and coordination.

Melissa M. Bell, Environmental Scientist
B.S. Environmental Science
Ms. Bell has over two years of experience in environmental assessments. Her qualifications include National Environmental Policy Act (NEPA) compliance. Her experience includes Phase I environmental assessments, indoor air quality analysis, and environmental assessments.

Rhett Baggett, Environmental Scientist
M.S. Earth Science, Hydrology
B.S. Biology, Ecology
Mr. Baggett has over four years of experience in surface and groundwater hydrological studies and environmental assessments. His experience includes environmental assessments (Phase I and II), jurisdictional stream and wetland determinations, delineations, and functional assessments, Section 404/401 permitting, watershed modeling, hydrological and sediment transport analysis, and water quality monitoring.

Alexis Baker, GIS Analyst
B.A. Environmental Studies
Working towards M.A. Geography
Ms. Baker has four years of experience in geographical information science. Her background has ranged from work with wetlands and endangered species surveys to community planning, hazard mitigation planning, and utilities management.

APPENDIX D
CORRESPONDENCE

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

MICHAEL F. EASLEY
GOVERNOR

LYNDO TIPPETT
SECRETARY

August 21, 2007

TO: Pam Williams, Project Planning Engineer

CC: John Merritt, Natural Environment Project Management Group

FROM: Jason W. Mays, Natural Environment Biological Surveys Group

SUBJECT: TIP B-4541 Bridge 24, SR 1434, over Quankey Creek in Halifax County

Transportation Improvement Project B-4541 proposes the replacement of Bridge # 24 on SR 1434 (Raleigh Road) over Quankey Creek in Halifax County. The US Fish and Wildlife Service lists the federally Endangered species; dwarf wedgemussel (*Alasmidonta heterodon*) and Tar River spinymussel (*Elliptio steinstansana*), as a species occurring in Halifax County. This project site was visited by NCDOT personnel: Logan Williams, Karen Lynch, Mike Sanderson, on October 25, 2006 for the purposes of habitat assessment and surveys for this species. The group spent approximately 2.0 person/hours of effort searching for mussels using visual and tactile methods as well as additional time spent doing general habitat assessment and searching for additional habitat types. No freshwater mussels of any species were encountered during these efforts and the habitat can be characterized as unsuitable for the species in question.

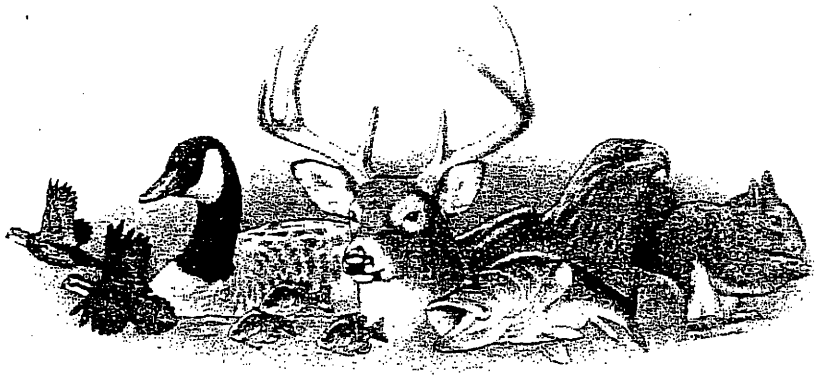
Habitat at this site can best be characterized as marginal for dwarf wedgemussel and Tar River spinymussel, but the lack of other mussel species at this site is a good indicator that they do not occur here. Furthermore, there is currently no indication that either species has ever been collected from the Roanoke River Basin. Under these circumstances it is appropriate to state that B-4541 will have **no effect** on either species.

MAILING ADDRESS:
NC DEPARTMENT OF TRANSPORTATION
PROJECT DEVELOPMENT AND ENVIRONMENTAL ANALYSIS
1548 MAIL SERVICE CENTER
RALEIGH NC 27699-1548

TELEPHONE: 919-733-3141
FAX: 919-733-9794

WEBSITE: WWW.DOH.DOT.STATE.NC.US

LOCATION:
TRANSPORTATION BUILDING
1 SOUTH WILMINGTON STREET
RALEIGH NC



North Carolina Wildlife Resources Commission

Richard B. Hamilton, Executive Director

MEMORANDUM

TO: Ms. Colista S. Freeman, P.E.
Project Development and Environmental Analysis Branch, NCDOT

FROM: Travis Wilson, Highway Project Coordinator
Habitat Conservation Program

DATE: June 10, 2005

SUBJECT: NCDOT Bridge Replacements in Wayne, Wilson, Nash, Johnston, Halifax, and Edgecombe counties. TIP Nos. B-4672, B-4673, B-4680, B-4682, B-4588, B-4589, B-4555, B-4556, B-4558, B-4559, B-4541, B-4503.

Biologists with the N. C. Wildlife Resources Commission (NCWRC) have reviewed the information provided and have the following preliminary comments on the subject project. Our comments are provided in accordance with provisions of the National Environmental Policy Act (42 U.S.C. 4332(2)(c)) and the Fish and Wildlife Coordination Act (48 Stat. 401, as amended; 16 U.S.C. 661-667d).

Our standard recommendations for bridge replacement projects of this scope are as follows:

1. We generally prefer spanning structures. Spanning structures usually do not require work within the stream and do not require stream channel realignment. The horizontal and vertical clearances provided by bridges allows for human and wildlife passage beneath the structure, does not block fish passage, and does not block navigation by canoeists and boaters.

2. Bridge deck drains should not discharge directly into the stream.

3. Live concrete should not be allowed to contact the water in or entering into the stream.

4. If possible, bridge supports (bents) should not be placed in the stream.

5. If temporary access roads or detours are constructed, they should be removed back to original ground elevations immediately upon the completion of the project. Disturbed areas should be seeded or mulched to stabilize the soil and native tree species should be planted with a spacing of not more than 10'x10'. If possible, when using temporary structures the area should be cleared but not grubbed. Clearing the area with chain saws, mowers, bush-hogs, or other mechanized equipment and leaving the stumps and root mat intact, allows the area to revegetate naturally and minimizes disturbed soil.

6. A clear bank (riprap free) area of at least 10 feet should remain on each side of the steam underneath the bridge.

7. In trout waters, the N.C. Wildlife Resources Commission reviews all U.S. Army Corps of Engineers nationwide and general '404' permits. We have the option of requesting additional measures to protect trout and trout habitat and we can recommend that the project require an individual '404' permit.

8. In streams that contain threatened or endangered species, NCDOT biologist Mr. Logan Williams should be notified. Special measures to protect these sensitive species may be required. NCDOT should also contact the U.S. Fish and Wildlife Service for information on requirements of the Endangered Species Act as it relates to the project.

9. In streams that are used by anadromous fish, the NCDOT official policy entitled "Stream Crossing Guidelines for Anadromous Fish Passage (May 12, 1997)" should be followed.

10. In areas with significant fisheries for sunfish, seasonal exclusions may also be recommended.

11. Sedimentation and erosion control measures sufficient to protect aquatic resources must be implemented prior to any ground disturbing activities. Structures should be maintained regularly, especially following rainfall events.

12. Temporary or permanent herbaceous vegetation should be planted on all bare soil within 15 days of ground disturbing activities to provide long-term erosion control.

13. All work in or adjacent to stream waters should be conducted in a dry work area. Sandbags, rock berms, cofferdams, or other diversion structures should be used where possible to prevent excavation in flowing water.

14. Heavy equipment should be operated from the bank rather than in stream channels in order to minimize sedimentation and reduce the likelihood of introducing other pollutants into streams.

15. Only clean, sediment-free rock should be used as temporary fill (causeways), and should be removed without excessive disturbance of the natural stream bottom when construction is completed.

16. During subsurface investigations, equipment should be inspected daily and maintained to prevent contamination of surface waters from leaking fuels, lubricants, hydraulic fluids, or other toxic materials.

If corrugated metal pipe arches, reinforced concrete pipes, or concrete box culverts are used:

1. The culvert must be designed to allow for aquatic life and fish passage. Generally, the culvert or pipe invert should be buried at least 1 foot below the natural streambed (measured from the natural thalweg depth). If multiple barrels are required, barrels other than the base flow barrel(s) should be placed on or near stream bankfull or floodplain bench elevation (similar to Lyonsfield design). These should be reconnected to floodplain benches as appropriate. This may be accomplished by utilizing sills on the upstream and downstream ends to restrict or divert flow to the base flow barrel(s). Silled barrels should be filled with sediment so as not to cause noxious or mosquito breeding conditions. Sufficient water depth should be provided in the base flow barrel(s) during low flows to accommodate fish movement. If culverts are longer than 40-50 linear feet, alternating or notched baffles should be installed in a manner that mimics existing stream pattern. This should enhance aquatic life passage: 1) by depositing sediments in the barrel, 2) by maintaining channel depth and flow regimes, and 3) by providing resting places for fish and other aquatic organisms. In essence, base flow barrel(s) should provide a continuum of water depth and channel width without substantial modifications of velocity.

2. If multiple pipes or cells are used, at least one pipe or box should be designed to remain dry during normal flows to allow for wildlife passage.

3. Culverts or pipes should be situated along the existing channel alignment whenever possible to avoid channel realignment. Widening the stream channel must be avoided. Stream channel widening at the inlet or outlet end of structures typically decreases water velocity causing sediment deposition that requires increased maintenance and disrupts aquatic life passage.

4. Riprap should not be placed in the active thalweg channel or placed in the streambed in a manner that precludes aquatic life passage. Bioengineering boulders or structures should be professionally designed, sized, and installed.

In most cases, we prefer the replacement of the existing structure at the same location with road closure. If road closure is not feasible, a temporary detour should be designed and located to avoid wetland impacts, minimize the need for clearing and to avoid destabilizing stream banks. If the structure will be on a new alignment, the old structure should be removed and the approach fills removed from the 100-year floodplain. Approach fills should be removed down to the natural ground elevation. The area should be stabilized with grass and planted with native tree species. If the area reclaimed was previously wetlands, NCDOT should restore the area to wetlands. If successful, the site may be utilized as mitigation for the subject project or other projects in the watershed.

Project specific comments:

1. B-4672, Wayne County, SR 1537 over Nahunta Swamp. Anadromous species are found in this portion of Nahunta Swamp. NCDOT should follow all stream crossing guidelines for anadromous fish passage, including an in-water work moratorium from February 15 to June 15. We recommend replacing this bridge with a bridge. Standard recommendations apply.

2. B-4673, Wayne County, SR 1728 over Walnut Creek. Anadromous species are found in this portion of Walnut Creek. NCDOT should follow all stream crossing guidelines for

anadromous fish passage, including an in-water work moratorium from February 15 to June 15. We recommend replacing this bridge with a bridge. Standard recommendations apply.

3. B-4680, Wilson County, SR 1507 over Whiteoak Swamp. We recommend replacing this bridge with a bridge. Standard recommendations apply.

4. B-4682, Wilson County, SR 1628 over Contentnea Creek. We recommend replacing this bridge with a bridge. Standard recommendations apply.

5. B-4588, Nash County, SR 167 over Stoney Creek. Our records indicate Federal and State listed mollusk have been observed upstream and downstream of this site, including the Federally endangered Dwarf Wedge mussel. NCDOT should conduct a mussel survey at this site prior to construction. We recommend replacing this bridge with a bridge. Standard recommendations apply.

6. B-4589, Nash County, SR 1945 over Toisnot Swamp. We recommend replacing this bridge with a bridge. Standard recommendations apply.

7. B-4555, Johnston County, US 70 over Norfolk Southern Railroad. We recommend replacing this bridge with a bridge. Standard recommendations apply.

8. B-4556, Johnston County, NC 50 over Black Creek. Anadromous species are found in this portion of Black Creek. NCDOT should follow all stream crossing guidelines for anadromous fish passage, including an in-water work moratorium from February 15 to June 15. We recommend replacing this bridge with a bridge. Standard recommendations apply.

9. B-4558, Johnston County, SR 1330 over Stoney Fork Creek. Anadromous species are found in this portion of Stoney Fork Creek. NCDOT should follow all stream crossing guidelines for anadromous fish passage, including an in-water work moratorium from February 15 to June 15. We recommend replacing this bridge with a bridge. Standard recommendations apply.

10. B-4559, Johnston County, SR 1330 over Black Creek. Anadromous species are found in this portion of Black Creek. NCDOT should follow all stream crossing guidelines for anadromous fish passage, including an in-water work moratorium from February 15 to June 15. We recommend replacing this bridge with a bridge. Standard recommendations apply.

11. B-4541, Halifax County, SR 1434 over Quankey Creek. We recommend replacing this bridge with a bridge. Standard recommendations apply.

12. B-4503, Edgecombe County, SR 1250 over Tar River. Anadromous species are found in this portion of the Tar River. NCDOT should follow all stream crossing guidelines for anadromous fish passage, including an in-water work moratorium from February 15 to June 15. We recommend replacing this bridge with a bridge. Standard recommendations apply.

NCDOT should routinely minimize adverse impacts to fish and wildlife resources in the vicinity of bridge replacements. Restoring previously disturbed floodplain benches should narrow and deepen streams previously widened and shallowed during initial bridge installation.

NCDOT should install and maintain sedimentation control measures throughout the life of the project and prevent wet concrete from contacting water in or entering into these streams. Replacement of bridges with spanning structures of some type, as opposed to pipe or box culverts, is recommended in most cases. Spanning structures allow wildlife passage along streambanks and reduce habitat fragmentation.

If you need further assistance or information on NCWRC concerns regarding bridge replacements, please contact me at (919) 528-9886. Thank you for the opportunity to review and comment on these projects.

Cc: Gary Jordan, U.S. Fish and Wildlife Service, Raleigh

United States Department of the Interior

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

June 10, 2005

Ms. Colista S. Freeman, P.E.
NCDOT, Project Development & Environmental Analysis
1548 Mail Service Center
Raleigh, North Carolina 27699-1548

Dear Ms. Freeman:

This letter is in response to Dr. Gregory Thorpe's request for comments from the U.S. Fish and Wildlife Service (Service) on the potential environmental effects of the proposed replacement of the bridge on SR 1434 crossing Quankey Creek (TIP No. B-4541) in Halifax County, North Carolina. These comments provide scoping information in accordance with provisions of the Fish and Wildlife Coordination Act (16 U.S.C. 661-667d) and section 7 of the Endangered Species Act (ESA) of 1973, as amended (16 U.S.C. 1531-1543).

For bridge replacement projects, the Service recommends the following general conservation measures to avoid or minimize environmental impacts to fish and wildlife resources:

1. Wetland, forest and designated riparian buffer impacts should be avoided and minimized to the maximum extent practical;

2. If unavoidable wetland or stream impacts are proposed, a plan for compensatory mitigation to offset unavoidable impacts should be provided early in the planning process. Opportunities to protect mitigation areas in perpetuity via conservation easements, land trusts or by other means should be explored at the outset;

3. Off-site detours should be used rather than construction of temporary, on-site bridges. For projects requiring an on-site detour in wetlands or open water, such detours should be aligned along the side of the existing structure which has the least and/or least quality of fish and wildlife habitat. At the completion of construction, the detour area should be entirely removed and the impacted areas be planted with appropriate vegetation, including trees if necessary;

4. Wherever appropriate, construction in sensitive areas should occur outside fish spawning and migratory bird nesting seasons. In waterways that may serve as travel corridors for fish, in-water work should be avoided during moratorium periods associated with migration, spawning and sensitive pre-adult life stages. The general moratorium period for anadromous fish is February 15 - June 30;

5. New bridges should be long enough to allow for sufficient wildlife passage along stream corridors;

6. Best Management Practices (BMP) for Protection of Surface Waters should be implemented;

7. Bridge designs should include provisions for roadbed and deck drainage to flow through a vegetated buffer prior to reaching the affected stream. This buffer should be large enough to alleviate any potential effects from run-off of storm water and pollutants;

8. The bridge designs should not alter the natural stream and stream-bank morphology or impede fish passage. To the extent possible, piers and bents should be placed outside the bank-full width of the stream;

9. Bridges and approaches should be designed to avoid any fill that will result in damming or constriction of the channel or flood plain. If spanning the flood plain is not feasible, culverts should be installed in the flood plain portion of the approach to restore some of the hydrological functions of the flood plain and reduce high velocities of flood waters within the affected area.

Section 7(a)(2) of the Endangered Species Act requires that all federal action agencies (or their designated non-federal representatives), in consultation with the Service, insure that any action federally authorized, funded, or carried out by such agencies is not likely to jeopardize the continued existence of any federally-listed threatened or endangered species. A biological assessment/evaluation may be prepared to fulfill the section 7(a)(2) requirement and will expedite the consultation process. To assist you, a county-by-county list of federally protected species known to occur in North Carolina and information on their life histories and habitats can be found on our web page at http://nc-es.fws.gov/es/countyfr.html .

Although the North Carolina Natural Heritage Program (NCNHP) database does not indicate any known occurrences of listed species near the project vicinity, use of the NCNHP data should not be substituted for actual field surveys if suitable habitat occurs near the project site. The NCNHP database only indicates the presence of known occurrences of listed species and does not necessarily mean that such species are not present. It may simply mean that the area has not been surveyed. If suitable habitat occurs within the project vicinity for any listed species, surveys should be conducted to determine presence or absence of the species.

If you determine that the proposed action may affect (i.e., likely to adversely affect or not likely to adversely affect) a listed species, you should notify this office with your determination, the results of your surveys, survey methodologies, and an analysis of the effects of the action on listed species, including consideration of direct, indirect, and cumulative effects, before conducting any activities that might affect the species. If you determine that the proposed action will have no effect (i.e., no beneficial or adverse, direct or indirect effect) on listed species, then you are not required to contact our office for concurrence.

We reserve the right to review any federal permits that may be required for this project, at the public notice stage. Therefore, it is important that resource agency coordination occur early in the planning process in order to resolve any conflicts that may arise and minimize delays in project implementation. In addition to the above guidance, we recommend that the

environmental documentation for this project include the following in sufficient detail to facilitate a thorough review of the action:

1. A clearly defined and detailed purpose and need for the proposed project;

2. A description of the proposed action with an analysis of all alternatives being considered, including the "no action" alternative;

3. A description of the fish and wildlife resources, and their habitats, within the project impact area that may be directly or indirectly affected;

4. The extent and acreage of waters of the U.S., including wetlands, that are to be impacted by filling, dredging, clearing, ditching, or draining. Acres of wetland impact should be differentiated by habitat type based on the wetland classification scheme of the National Wetlands Inventory (NWI). Wetland boundaries should be determined by using the 1987 Corps of Engineers Wetlands Delineation Manual and verified by the U.S. Army Corps of Engineers;

5. The anticipated environmental impacts, both temporary and permanent, that would be likely to occur as a direct result of the proposed project. The assessment should also include the extent to which the proposed project would result in secondary impacts to natural resources, and how this and similar projects contribute to cumulative adverse effects;

6. Design features and construction techniques which would be employed to avoid or minimize impacts to fish and wildlife resources, both direct and indirect, and including fragmentation and direct loss of habitat;

7. If unavoidable wetland or stream impacts are proposed, project planning should include a compensatory mitigation plan for offsetting the unavoidable impacts.

The Service appreciates the opportunity to comment on this project. Please continue to advise us during the progression of the planning process, including your official determination of the impacts of this project. If you have any questions regarding our response, please contact Mr. Gary Jordan at (919) 856-4520, ext. 32.

Sincerely,

Pete Benjamin
Ecological Services Supervisor

cc: Bill Biddlecome, USACE, Washington, NC
Nicole Thomson/Christina Breen, NCDWQ, Raleigh, NC
Travis Wilson, NCWRC, Creedmoor, NC
Chris Militscher, USEPA, Raleigh, NC

William G. Ross Jr., Secretary
North Carolina Department of Environment and Natural Resources
Alan W. Klimek, P.E. Director
Division of Water Quality

June 17, 2005

MEMORANDUM

TO: Colista Freeman, P.E., NCDOT Project Development & Environmental Analysis

FROM: Christina Breen, NC Division of Water Quality

SUBJECT: Scoping Review of NCDOT's proposed bridge replacement projects: B-4541

In reply to your correspondence dated May 20, 2005 (received May 31, 2005) in which you requested comments for the referenced projects, the NC Division of Water Quality has the following comments:

I. Project-Specific Comments

B-4541 Bridge over Quankey Creek, Halifax Co.

1. Quankey Creek are class C waters of the State. Quankey Creek is on the 303(d) list for impaired use for aquatic life due to impaired biological integrity. DWQ is very concerned with sedimentation and erosion impacts that could result from this project. DWQ recommends that the most protective sedimentation and erosion control BMPs be implemented to reduce the risk of nutrient runoff to Quankey Creek. DWQ requests that road design plans provide treatment of the storm water runoff through best management practices as detailed in *Best Management Practices for the Protection of Surface Waters*. Refer to 15A NCAC 2B .0224(2) and 15A NCAC 2H .1006.

2. This project is within the Neuse River Basin. Riparian buffer impacts should be avoided and minimized to the greatest extent possible. Refer to 15A NCAC 2B .0233 for a table of allowable uses.

II. General Comments Regarding Bridge Replacement Projects

1. If corrugated metal pipe arches, reinforced concrete pipes, or concrete box culverts are used to replace the bridge, then DWQ recommends the use of Nationwide Permit No. 14 rather than Nationwide Permit 23.

2. If the old bridge is removed, no discharge of bridge material into surface waters is preferred. Strict adherence the Corps of Engineers guidelines for bridge demolition will be a condition of the 401 Water Quality Certification.

3. DWQ prefers spanning structures. Spanning structures usually do not require work within the stream and do not require stream channel realignment. The horizontal and vertical clearances provided by bridges allows for human and wildlife passage beneath the structure, does not block fish passage, and does not block navigation by canoeists and boaters.

4. Bridge deck drains should not discharge directly into the stream; stormwater should be directed across the bridge and pre-treated through site-appropriate means (grassed swales, pre-formed scour holes, vegetated buffers, etc.) before entering the stream. Please refer to NCDOT Best Management Practices for the Protection of Surface Waters

Transportation Permitting Unit
1650 Mail Service Center, Raleigh, North Carolina 27699-1650
2321 Crabtree Boulevard, Suite 250, Raleigh, North Carolina 27604
Phone: 919-733-1786 / FAX 919-733-6893 / Internet: http://h2o.enr.state.nc.us/ncwetlands

5. Live concrete should not be allowed to contact the water in or entering into the stream. Concrete is mostly made up of lime (calcium carbonate) and when in a dry or wet state (not hardened) calcium carbonate is very soluble in water and has a pH of approximately 12. In an unhardened state concrete or cement will change the pH of fresh water to very basic and will cause fish and other macroinvertebrate kills.

6. If possible, bridge supports (bents) should not be placed in the stream.

7. If temporary access roads or detours are constructed, they should be removed back to original ground elevations immediately upon the completion of the project. Disturbed areas should be seeded or mulched to stabilize the soil and native tree species should be planted with a spacing of not more than 10'x10'. If possible, when using temporary structures the area should be cleared but not grubbed. Clearing the area with chain saws, mowers, bush-hogs, or other mechanized equipment and leaving the stumps and root mat intact, allows the area to re-vegetate naturally and minimizes disturbed soil.

8. A clear bank (rip rap-free) area of at least 10 feet should remain on each side of the steam underneath the bridge.

9. Sedimentation and erosion control measures sufficient to protect water resources must be implemented prior to any ground disturbing activities. Structures should be *maintained regularly*, especially following rainfall events.

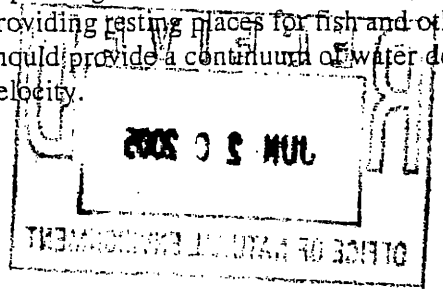
10. Bare soil should be stabilized through vegetation or other means as quickly as feasible to prevent sedimentation of water resources.

11. All work in or adjacent to stream waters should be conducted in a dry work area. Sandbags, rock berms, cofferdams, or other diversion structures should be used where possible to prevent excavation in flowing water.

12. Heavy equipment should be operated from the bank rather than in stream channels in order to minimize sedimentation and reduce the likelihood of introducing other pollutants into streams. This equipment should be inspected daily and maintained to prevent contamination of surface waters from leaking fuels, lubricants, hydraulic fluids, or other toxic materials.

III. General Comments if Replacing the Bridge with a Culvert

1. The culvert must be designed to allow for aquatic life and fish passage. Generally, the culvert or pipe invert should be buried at least 1 foot below the natural streambed (measured from the natural thalweg depth). If multiple barrels are required, barrels other than the base flow barrel(s) should be placed on or near stream bankfull or floodplain bench elevation (similar to Lyonsfield design). These should be reconnected to floodplain benches as appropriate. This may be accomplished by utilizing sills on the upstream end to restrict or divert flow to the base flow barrel(s). Sufficient water depth should be provided in the base flow barrel during low flows to accommodate fish movement. If culverts are longer than 40-50 linear feet, alternating or notched baffles should be installed in a manner that mimics existing stream pattern. This should enhance aquatic life passage: 1) by depositing sediments in the barrel, 2) by maintaining channel depth and flow regimes, and 3) by providing resting places for fish and other aquatic organisms. In essence, the base flow barrel(s) should provide a continuum of water depth and channel width without substantial modifications of velocity.



2. If multiple pipes or cells are used, at least one pipe or box should be designed to remain dry during normal flows to allow for wildlife passage.

3. Culverts or pipes should be situated along the existing channel alignment whenever possible to avoid channel realignment. Widening the stream channel should be avoided. Stream channel widening at the inlet or outlet end of structures typically decreases water velocity causing sediment deposition that requires increased maintenance and disrupts aquatic life passage.

4. Riprap should not be placed in the active thalweg channel or placed in the streambed in a manner that precludes aquatic life passage. Bioengineering boulders or structures should be professionally designed, sized, and installed.

In most cases, we prefer the replacement of the existing structure at the same location with road closure. If road closure is not feasible, a temporary detour should be designed and located to avoid wetland impacts, minimize the need for clearing and to avoid destabilizing stream banks. If the structure will be on a new alignment, the old structure should be removed and the approach fills removed from the 100-year floodplain. Approach fills should be removed down to the natural ground elevation. The area should be stabilized with grass and planted with native tree species. Tall fescue should not be used in riparian areas. If the area that is reclaimed was previously wetlands, NCDOT should restore the area to wetlands. If successful, the site may be used as wetland mitigation for the subject project or other projects in the watershed.

Thank you for requesting our input at this time. The DOT is reminded that issuance of a 401 Water Quality Certification requires that appropriate measures be instituted to ensure that water quality standards are met and designated uses are not degraded or lost. If you have any questions or require additional information, please contact Christina Breen at (919) 733-9604.

cc: Eric Alsmeyer, USACE Raleigh Field Office
Chris Militscher, USEPA
Travis Wilson, NCWRC
Gary Jordan, USFWS
File Copy

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

MICHAEL F. EASLEY
GOVERNOR

LYNDO TIPPETT
SECRETARY

December 1, 2005

TO: Pam Williams, Project Planning Engineer

CC: John Merritt, Natural Environment Project Management Group

FROM: Jason W. Mays, Natural Environment Biological Surveys Group

SUBJECT: TIP B-4541 Bridge 24, SR 1434, over Quankey Creek in Halifax County

Transportation Improvement Project B-4541 proposes the replacement of Bridge # 24 on SR 1434 (Raleigh Road) over Quankey Creek in Halifax County. The US Fish and Wildlife Service lists the federally Endangered dwarf wedgemussel (*Alasmidonta heterodon*) as a species occurring in Halifax County. This project site was visited by NCDOT personnel: Logan Williams, Karen Lynch, Mike Sanderson, on October 25, 2006 for the purposes of habitat assessment and surveys for this species. The group spent approximately 2.0 person/hours of effort searching for mussels using visual and tactile methods as well as additional time spent doing general habitat assessment and searching for additional habitat types. No freshwater mussels of any species were encountered during these efforts and the habitat can be characterized as unsuitable for the species in question.

Habitat at this site can best be characterized as marginal for dwarf wedgemussel, but the lack of other mussel species at this site is a good indicator that they do not occur here. Furthermore, there is currently no indication that the species has ever been collected from the Roanoke River Basin, despite no obvious reason that it should not occur there. Under these circumstances it is appropriate to state that B-4541 will have **no effect** on this species.

MAILING ADDRESS:
NC DEPARTMENT OF TRANSPORTATION
PROJECT DEVELOPMENT AND ENVIRONMENTAL ANALYSIS
1548 MAIL SERVICE CENTER
RALEIGH NC 27699-1548

TELEPHONE: 919-733-3141
FAX: 919-733-9794

WEBSITE: WWW.DOH.DOT.STATE.NC.US

LOCATION:
TRANSPORTATION BUILDING
1 SOUTH WILMINGTON STREET
RALEIGH NC

APPENDIX E
WETLAND DATA FORMS

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

Project/Site:	**T.I.P. No. B-4541**		Date:	**09/29/05**
Applicant/Owner:	**NCDOT**		County:	**Halifax**
Investigator(s):	**Steven Busbee, PWS and Rhett Baggett**		State:	**NC**
Do Normal Circumstances exist on the site?	(Yes)	No	Community ID:	Wetland A
Is the site significantly disturbed (Atypical Situation)?	Yes	(No)	Transect ID:	
Is the area a potential Problem Area? (If needed, explain on reverse.)	Yes	(No)	Plot ID:	**DP1**

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1 *Toxicodendron radicans*	herb	FAC	9 *Smilax rotundifolia*	vine	FAC
2 *Toxicodendron radicans*	vine	FAC	10 *Liquidambar styraciflua*	tree	FAC+
3 *Acer rubrum*	tree	FAC	11 *Liquidambar styraciflua*	shrub	FAC+
4 *Carex* sp.	herb	-	12 *Fraxinus pennsylvanica*	tree	FACW
5 *Carpinus caroliniana*	tree	FAC	13 *Campsis radicans*	vine	FAC
6 *Carpinus caroliniana*	shrub	FAC	14 *Lindera benzoin*	shrub	FACW
7 *Quercus michauxii*	tree	FACW-	15 *Saururus cernuus*	herb	OBL
8 *Quercus michauxii*	shrub	FACW-	16		

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

14/14 = 100%

All of the dominant plant species are FAC or wetter.

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: **N/A** (in.)

Depth to Free Water in Pit: **>12** (in.)

Depth to Saturated Soil: **>12** (in.)

Wetland Hydrology Indicators:
Primary Indicators:
___ Inundated
___ Saturated in Upper 12 Inches
___ Water Marks
X Drift Lines
X Sediment Deposits (on leaves)
X Drainage Patterns in Wetlands
Secondary Indicators (2 or more required):
___ Oxidized Root Channels in Upper 12 Inches
X Water-Stained Leaves
___ Local Soil Survey Data
X FAC-Neutral Test
___ Other (Explain in Remarks)

Remarks:
Two or more primary and secondary indicators of wetland hydrology are present. No inundation or saturation within 12 inches was observed possibly due to the extended period of drought in the region.

SOILS

DP1 Continued

Map Unit Name
(Series and Phase): **Emporia-Wedowee Complex, 1-6% slopes (EwB)** Drainage Class **well drained**
Reference: USDA Halifax County Soil Survey (1974)
Taxonomy (Subgroup): **Typic Hapludults and Typic Kanhapludults** Indicate 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->12	B	2.5Y 5/2	5YR 5/8	moderate/faint	silty loam

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

Remarks:

Indicators of hydric soils are present.

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	(Yes)	No (Circle)		
Wetland Hydrology Present?	(Yes)	No		(Circle)
Hydric Soils Present?	(Yes)	No	Is this Sampling Point Within a Wetland?	(Yes) No

Remarks:

Data point is representative of a jurisdictional wetland area.

Approved by HQUSACE 2/92

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

Project/Site:	**T.I.P. No. B-4541**		Date:	**09/29/05**
Applicant/Owner:	**NCDOT**		County:	**Halifax**
Investigator(s):	**Steven Busbee, PWS and Rhett Baggett**		State:	**NC**
Do Normal Circumstances exist on the site?	(Yes)	No	Community ID:	Upland
Is the site significantly disturbed (Atypical Situation)?	Yes	(No)	Transect ID:	
Is the area a potential Problem Area? (If needed, explain on reverse.)	Yes	(No)	Plot ID:	**DP2**

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1 *Toxicodendron radicans*	herb	FAC	9 *Campsis radicans*	vine	FAC
2 *Toxicodendron radicans*	vine	FAC	10		
3 *Acer rubrum*	tree	FAC	11		
4 *Liquidambar styraciflua*	tree	FAC+	12		
5 *Carpinus caroliniana*	tree	FAC	13		
6 *Carpinus caroliniana*	shrub	FAC	14		
7 *Quercus michauxii*	tree	FACW-	15		
8 *Smilax rotundifolia*	vine	FAC	16		

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

9/9 = 100%

All of the dominant plant species are FAC or wetter.

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:	**N/A**	(in.)
Depth to Free Water in Pit:	**>12**	(in.)
Depth to Saturated Soil:	**>12**	(in.)

Wetland Hydrology Indicators:

Primary Indicators:
- ____ Inundated
- ____ Saturated in Upper 12 Inches
- ____ Water Marks
- ____ Drift Lines
- ____ Sediment Deposits (on leaves)
- ____ 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:

Area contains only one secondary indicator of hydrology, therefore wetland hydrology is not present.

SOILS **DP2 Continued**

Map Unit Name
(Series and Phase): **Emporia-Wedowee Complex, 1-6% slopes (EwB)** Drainage Class **well drained**
Reference: USDA Halifax County Soil Survey (1974)
Taxonomy (Subgroup): **Typic Hapludults and Typic Kanhapludults** Indicate Mapped Type? Yes No

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-6	B1	10YR 5/6	N/A	N/A	loamy silt
6->12	B2	10YR 5/6	7.5YR 5/8	many/distinct	loamy silt

___ Histosol
___ Histic Epipedon
___ Sulfidic Odor
___ Aquic Moisture Regime
___ Reducing Conditions
___ 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 (Inclusions)
___ Listed on National Hydric Soils List
___ Other (Explain in Remarks)

Remarks:

Indicators of hydric soils are not present.

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	(Yes)	No (Circle)	
Wetland Hydrology Present?	Yes	(No)	
Hydric Soils Present?	Yes	(No)	Is this Sampling Point Within a Wetland? (Circle) Yes (No)

Remarks:

Data point taken adjacent to Wetland B. Only one wetland parameter (vegetation) is present, therefore data point is representative of a non-jurisdictional upland area.

Approved by HQUSACE 2/92

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

Project/Site:	**T.I.P. No. B-4541**		Date:	**09/29/05**
Applicant/Owner:	**NCDOT**		County:	**Halifax**
Investigator(s):	**Steven Busbee, PWS and Rhett Baggett**		State:	**NC**
Do Normal Circumstances exist on the site?	(Yes)	No	Community ID:	Wetland B
Is the site significantly disturbed (Atypical Situation)?	Yes	(No)	Transect ID:	
Is the area a potential Problem Area? (If needed, explain on reverse.)	Yes	(No)	Plot ID:	**DP3**

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1 *Polygonum sagittatum*	herb	OBL	9		
2 *Liquidambar styraciflua*	shrub	FAC+	10		
3 *Acer rubrum*	shrub	FAC	11		
4 *Carex* sp.	herb	-	12		
5 *Impatiens capensis*	herb	FACW	13		
6 *Juncus effusus*	herb	FACW+	14		
7 *Rosa palustris*	herb	OBL	15		
8			16		

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

6/6 = 100%

All of the dominant plant species are FAC or wetter.

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: **N/A** (in.)

Depth to Free Water in Pit: **>12** (in.)

Depth to Saturated Soil: **11** (in.)

Wetland Hydrology Indicators:
Primary Indicators:
___ Inundated
X Saturated in Upper 12 Inches
___ Water Marks
___ Drift Lines
___ Sediment Deposits (on leaves)
___ Drainage Patterns in Wetlands
Secondary Indicators (2 or more required):
X Oxidized Root Channels in Upper 12 Inches
___ Water-Stained Leaves
___ Local Soil Survey Data
X FAC-Neutral Test
___ Other (Explain in Remarks)

Remarks:

Wetland hydrology indicators are present.

SOILS **DP3 Continued**

Map Unit Name
(Series and Phase): **Emporia-Wedowee Complex, 1-6% slopes (EwB)** Drainage Class **well drained**
Reference: USDA Halifax County Soil Survey (1974)
Taxonomy (Subgroup): **Typic Hapludults and Typic Kanhapludults** Indicate 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->12	B	5Y 5/1	5YR 4/6	many/distinct	loamy clay

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

Remarks:

Indicators of hydric soils are present.

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	(Yes)	No	(Circle)	
Wetland Hydrology Present?	(Yes)	No		(Circle)
Hydric Soils Present?	(Yes)	No	Is this Sampling Point Within a Wetland?	(Yes) No

Remarks:

Data point is representative of a jurisdictional wetland area.

Approved by HQUSACE 2/92

WETLAND RATING WORKSHEET Fourth Version

Project name B-4541 Wetland A Nearest road Sam Powell Rd (SR 1934)
County Halifax Wetland area ~2 acres Wetland width ~300 feet
Name of evaluator SB/RB Date 9-29-05

Wetland location

- ☐ on pond or lake
- ☑ on perennial stream
- ☑ on intermittant stream
- ☐ within interstream divide
- ☐ other

Soil series Rains-Wehadkee complex

- ☐ predominantly organic = humus, muck, or peat
- ☑ predominantly mineral = non-sandy
- ☐ predominantly sandy

Hydraulic factors

- ☐ steep topography
- ☐ ditched or channelized
- ☑ total wetland width ≥100 feet

Adjacent land use (within 1/2 mile upstream, upslope, or radius)

- ☑ forested/natural vegetation 75 %
- ☑ agriculture, urban/suburban 20 %
- ☑ impervious surface 5 %

Dominant vegetation

(1) Quercus michauxii
(2) Acer rubrum
(3) Carpinus caroliniana

Flooding and wetness

- ☐ semipermanently to permanently flooded or inundated
- ☑ seasonally flooded or inundated
- ☐ intermittantly flooded or temporary surface water
- ☐ no evidence of flooding or surface water

Wetland type (select one)*

- ☑ Bottomland hardwood forest
- ☐ Headwater forest
- ☐ Swamp forest
- ☐ Wet flat
- ☐ Pocosin
- ☐ Bog forest
- ☐ Pine savanna
- ☐ Freshwater marsh
- ☐ Bog/fen
- ☐ Ephemeral wetland
- ☐ Carolina Bay
- ☐ Other

*The rating system cannot be applied to salt or brackish marshes or stream channels

RATING

		weight		
Water storage	4	x 4.00	=	16
Bank/Shoreline stabilization	2	x 4.00	=	8
Pollutant removal	5 *	x 5.00	=	25
Wildlife habitat	4	x 2.00	=	8
Aquatic life value	5	x 4.00	=	20
Recreation/Education	3	x 1.00	=	3

Wetland Score: 80

* Add 1 point if in sensitive watershed and > 10% nonpoint disturbance within 1/2 mile upstream, upslope, or radius

WETLAND RATING WORKSHEET Fourth Version

Project name B-4541 Wetland B Nearest road Sam Powell Rd (SR1439)
County Halifax Wetland area < 0.5 acres Wetland width ~ 10-15 feet
Name of evaluator Date

Wetland location

- ☐ on pond or lake
- ☐ on perennial stream
- ☐ on intermittant stream
- ☐ within interstream divide
- ☑ other Roadside Swale/Ditch

Soil series Rapidan-Wehadkee Complex

- ☐ predominantly organic = humus, muck, or peat
- ☑ predominantly mineral = non-sandy
- ☐ predominantly sandy

Hydraulic factors

- ☐ steep topography
- ☑ ditched or channelized
- ☐ total wetland width >100 feet

Adjacent land use (within 1/2 mile upstream, upslope, or radius)

- ☑ forested/natural vegetation 75 %
- ☑ agriculture, urban/suburban 20 %
- ☑ impervious surface 5 %

Dominant vegetation

(1) Polygonum Sagittatum
(2) Juncus effusus
(3) Carex sp.

Flooding and wetness

- ☐ semipermanently to permanently flooded or inundated
- ☑ seasonally flooded or inundated
- ☐ intermittantly flooded or temporary surface water
- ☐ no evidence of flooding or surface water

Wetland type (select one)*

- ☐ Bottomland hardwood forest
- ☐ Headwater forest
- ☐ Swamp forest
- ☐ Wet flat
- ☐ Pocosin
- ☐ Bog forest
- ☐ Pine savanna
- ☑ Freshwater marsh
- ☐ Bog/fen
- ☐ Ephemeral wetland
- ☐ Carolina Bay
- ☐ Other

*The rating system cannot be applied to salt or brackish marshes or stream channels

RATING

		weight		
Water storage	2	x 4.00	=	8
Bank/Shoreline stabilization	0	x 4.00	=	0
Pollutant removal	1 *	x 5.00	=	5
Wildlife habitat	1	x 2.00	=	2
Aquatic life value	2	x 4.00	=	8
Recreation/Education	1	x 1.00	=	1

Wetland Score: 24

* Add 1 point if in sensitive watershed and > 10% nonpoint disturbance within 1/2 mile upstream, upslope, or radius