STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

BEVERLY EAVES PERDUE
GOVERNOR

EUGENE A. CONTI, JR.
SECRETARY

March 25, 2009

U. S. Army Corps of Engineers
Regional Field Office
3331 Heritage Trace Drive, Suite 105
Wake Forest, NC 27587

ATTN: Mr. Andy Williams
NCDOT Coordinator, Division 7

Subject: **Application for Section 404 Nationwide Permit 23, 33, Section 401 Water Quality Certification, and Neuse Riparian Buffer Authorization** for the replacement of Bridge No. 66 over Strouds Creek on SR 1002 (St. Mary's Road) in Orange County, Federal Aid Project No. BRSTP-1002 (12); WBS No. 33562.1.1; State Project No. 8.2502201; Division 7; TIP No. B-4216

$240.00 debit from WBS 33562.1.1

Dear Sir:

The North Carolina Department of Transportation (NCDOT) proposes to replace Bridge No. 66 on SR 1002 (St. Mary's Road) over Strouds Creek. There will be approximately 52 linear feet of temporary impacts to Strouds Creek due to the construction of a temporary workpad. Less than 0.01 acres of permanent impacts to Strouds Creek will occur due to a bent replacement. There will also be approximately 8,183 (5,143 for Zone 1, 3,040 for Zone 2) square feet of Neuse buffer impacts.

Please see the enclosed copies of the permit drawings, Stormwater Management Plan, buffer drawings, design plans, and Pre-Construction Notification (PCN) for the subject project. A Categorical Exclusion (CE) was completed for this project in May 2008 and distributed shortly thereafter. Additional copies are available upon request.

This project is currently scheduled for letting on January 19, 2010 (review date of December 1, 2009).

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

TELEPHONE: 919-431-2000
FAX: 919-431-2001
WEBSITE: WWW.NCDOT.ORG

LOCATION:
4701 Atlantic Ave.,
Suite 116
Raleigh, NC 27604

A copy of this permit application will be posted on the NCDOT Website at: http://www.ncdot.org/doh/preconstruct/pe/. If you have any questions or need additional information, please call Greg Price at (919) 431-1587.

Sincerely,

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

w/attachment
Mr. Brian Wrenn, NCDWQ (5 Copies)

w/o attachment (see permits 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. J. M. Mills, P.E., Division 7 Engineer
Mr. Jerry Parker, Division 7 Environmental Officer
Mr. Jay Bennett, P.E., Roadway Design
Mr. Majed Alghandour, P. E., Programming and TIP
Mr. Art McMillan, P.E., Highway Design
Ms. Theresa Ellerby, PDEA Project Planning Engineer
Mr. Scott McLendon, USACE, Wilmington
Mr. Gary Jordan, USFWS
Mr. Travis Wilson, NCWRC

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: 23 33	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 ☐ 401 Water Quality Certification – Express ☐ Non-404 Jurisdictional General Permit ☒ 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:	Replace Bridge No. 66 over Strouds Creek on SR 1002
2b. County:	Orange
2c. Nearest municipality / town:	Hillsborough
2d. Subdivision name:	*not applicable*
2e. NCDOT only, T.I.P. or state project no:	B-4216

3. Owner Information

3a. Name(s) on Recorded Deed:	North Carolina Department of Transportation
3b. Deed Book and Page No.	*not applicable*
3c. Responsible Party (for LLC if applicable):	*not applicable*
3d. Street address:	4701 Atlantic Ave., Suite 116
3e. City, state, zip:	Raleigh, NC 27604
3f. Telephone no.:	(919) 431-1587
3g. Fax no.:	(919) 431-2002
3h. Email address:	gwprice@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):	*not applicable*
1b. Site coordinates (in decimal degrees):	Latitude: 36.8745 (DD.DDDDDD) Longitude: - 79.06495 (-DD.DDDDDD)
1c. Property size:	1.87 acres
2. Surface Waters	
2a. Name of nearest body of water (stream, river, etc.) to proposed project:	Strouds Creek
2b. Water Quality Classification of nearest receiving water:	C-NSW
2c. River basin:	Neuse
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: Mostly forested and residential	
3b. List the total estimated acreage of all existing wetlands on the property: 0	
3c. List the total estimated linear feet of all existing streams (intermittent and perennial) on the property: 130 feet	
3d. Explain the purpose of the proposed project: To replace a structurally deficient and/ or functionally obsolete bridge.	
3e. Describe the overall project in detail, including the type of equipment to be used: The project involves replacing a 50-foot bridge with a 100-foot, 2-span bridge on the existing alignment with an off-site detour. Standard road building equipment, such as trucks, dozers, and cranes 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:	☐ 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):	Agency/Consultant Company: Other:
4d. If yes, list the dates of the Corps jurisdictional determinations or State determinations and attach documentation.	
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			☐ Yes ☐ No	☐ Corps ☐ DWQ	
W2 ☐ P ☐ T			☐ Yes ☐ No	☐ Corps ☐ DWQ	
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**	X Permanent X Temporary

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	Fill	Strouds Creek	☒ PER ☐ INT	☒ Corps ☐ DWQ	25	52
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**	0 Perm 52 Temp

3i. Comments: Less than 0.01 acres of permanent impacts due to bent replacement.

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	X Permanent X Temporary

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	Bridge	Strouds Creek	☐ Yes ☒ No	4,173	345
B2 ☒ P ☐ T	Road impacts	Strouds Creek	☐ Yes ☒ No	970	2,695
B3 ☐ P ☐ T			☐ Yes ☐ No		
		6h. **Total buffer impacts**		5,143	3,040
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. Dissipator pads and pre-formed scour holes are proposed outside of Buffer Zone areas to prevent erosion.		
1b. Specifically describe measures taken to avoid or minimize the proposed impacts through construction techniques.		
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: See Permit Drawings	☒ Yes ☐ No
2. Stormwater Management Plan	
2a. What is the overall percent imperviousness of this project?	n/a %
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: See enclosed 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):		
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.		
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? NC Natural Heritage Program database, USFWS website, NCDOT field surveys		
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? NMFS County Index		
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? NEPA Documentation (CE)		
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: Hydraulics coordinating with FEMA		
8c. What source(s) did you use to make the floodplain determination? FEMA flood maps		

Gregory J. Thorpe, Ph.D Applicant/Agent's Printed Name	E. L. Lush Applicant/Agent's Signature (Agent's signature is valid only if an authorization letter from the applicant is provided.)	3.30.09 Date

STORMWATER MANAGEMENT PLAN

Project: 33562.1.1
TIP No. B-4216
Graham County 03/24/2009

Hydraulics Project Manager: Jeffrey Reck, P.E. (Mulkey Engineers & Consultants),
Marshal Clawson, P.E. (NCDOT Hydraulics Unit)

ROADWAY DESCRIPTION

The project B-4216 consists of constructing a 2 span (2@50') 21" cored slab bridge, to replace the existing bridge #66 in Orange County on SR-1002 over Stroud's Creek. The total project length is 0.123 miles. The project creates impacts to Stroud's Creek, which is located in the Neuse River Basin. The project drainage systems consist of roadside ditches and a small storm drain system.

Jurisdiction Stream: Stroud's Creek

ENVIRONMENTAL DESCRIPTION

The project is located within the Neuse River Basin in Orange County. The stream is a class C, as well as nutrient sensitive waters. The Neuse River Riparian Buffer rules apply to this project.

BEST MANAGEMENT PRACTICES AND MAJOR STRUCTURES

The primary goal of Best Management Practices (BMPs) is to prevent degradation of the states surface waters by the location, construction and operation of the highway system. The BMPs are activities, practices and procedures taken to prevent or reduce stormwater pollution. The BMP measures used on this project to reduce stormwater impacts are:

- Concentrated flows diffused outside of the Neuse River Riparian Buffer. Three dissipater pads and one performed scour are utilized to diffuse the flow.

Major Structure:

- A bridge will be placed from –L- Station 18+05 to –L- Station 19+05. In accordance with current guidelines, the bridge is designed so that the spill-thru abutments are located a minimum of 10 feet from the top of bank. The bridge is also designed so that all bridge drainage will be picked up in a storm drain system at the end of the bridge in order to stop any direct discharges into Stroud's Creek. The storm drain system is discharged into a performed scour hole.

TOPO MAP

SCALE: 1" : 1500'

NCDOT

DIVISION OF HIGHWAYS
ORANGE COUNTY
PROJECT: B-4216 (BRIDGE #66)
BRIDGE NO. 66 OVER
STROUDS CREEK
ON SR 1002
(ST MARYS ROAD)

SHEET 1 OF 7 2/2/2009

PROPERTY OWNERS

NAMES AND ADDRESSES

	NAMES	ADDRESSES
1	Alexander G. Baldwin	102 Cornell Lane Oak Ridge, TN 37830
2	State of North Carolina	N/A
3	Hyla S. Cohen	1927 St Marys Road Hillsborough, NC 27278

NCDOT

DIVISION OF HIGHWAYS
ORANGE COUNTY
PROJECT: B-4216 (BRIDGE #66)
BRIDGE NO. 66 OVER
STROUDS CREEK
ON SR 1002
(ST MARYS ROAD)

2/2/2009

WETLAND PERMIT IMPACT SUMMARY

			WETLAND IMPACTS					SURFACE WATER IMPACTS				
Site No.	Station (From/To)	Structure Size / Type	Permanent Fill In Wetlands (ac)	Temp. Fill In Wetlands (ac)	Excavation in Wetlands (ac)	Mechanized Clearing in Wetlands (ac)	Hand Clearing in Wetlands (ac)	Permanent SW impacts (ac)	Temp. SW impacts (ac)	Existing Channel Impacts Permanent (ft)	Existing Channel Impacts Temp. (ft)	Natural Stream Design (ft)
1	18+55 -L- +/-	Causeway							0.02		52	
TOTALS:								0.01	0.02	0	52	

NOTE: PER STRUCTURES THE SURFACE WATER IMPACTS AS A RESULT OF THE PROPOSED BENT FOOTINGS ARE 127 SF (0.003 Ac).

NC DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
Orange County
Project: B-4216 (Bridge #66)
(B-4216 - B-66)

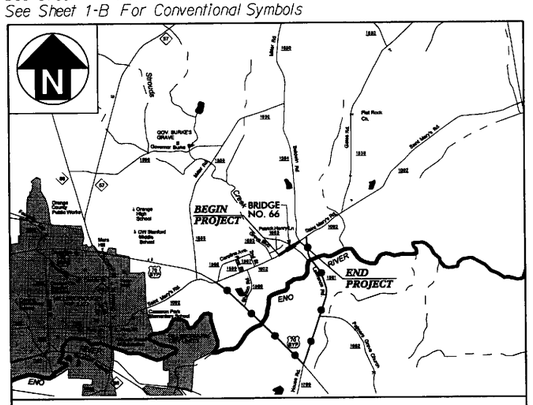
SHEET 3 OF 7 2/24/2009

ATN Revised 3/31/05

09/08/09

TIP PROJECT: B-4216

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



VICINITY MAP — DETOUR ROUTE

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

ORANGE COUNTY

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-4216	1	

W.B. ELEMENT	F.A. PROJ. NO.	DESCRIPTION
33562.1.1	BRSTP-1002(12)	P.E.
33562.2.1	BRSTP-1002(12)	R/W, UTIL

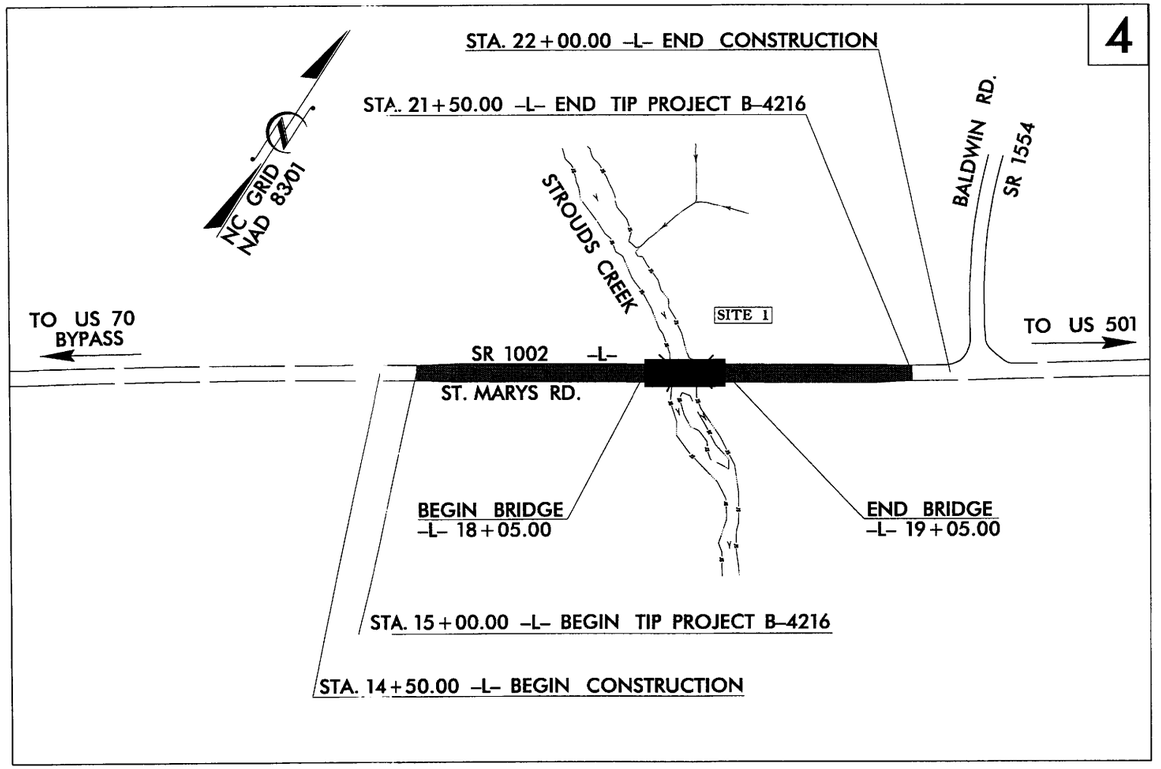
Permit Drawing Sheet 4 of 7

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

LOCATION: BRIDGE NO. 66 OVER STROUDS CREEK ON SR 1002

TYPE OF WORK: GRADING, DRAINAGE, PAVING AND STRUCTURE

4



WETLAND PERMIT DRAWINGS

MULKEY
ENGINEERS & CONSULTANTS
PO Box 33127
Raleigh, N.C. 27636
(919) 851-1912
(919) 851-1918 (FAX)
www.mulkeyinc.com

THIS PROJECT IS NOT WITHIN ANY MUNICIPAL BOUNDARIES.
CLEARING ON THIS PROJECT SHOULD BE PERFORMED TO THE LIMITS ESTABLISHED BY METHOD II.

CONTRACT:

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 2009 = 11,000
ADT 2030 = 18,700
DHV = 10 %
D = 65 %
T = 4 %*
V = 50 MPH

* TTST 1% DUAL 3%

FUNC. CLASS. = COLLECTOR

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT B-4216 = 0.104 MILES
LENGTH STRUCTURE TIP PROJECT B-4216 = 0.019 MILES
TOTAL LENGTH TIP PROJECT B-4216 = 0.123 MILES

Prepared in the Office of:
MULKEY
ENGINEERS & CONSULTANTS
FOR THE NORTH CAROLINA DEPT. OF TRANSPORTATION

2006 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE: JANUARY 16, 2009

LETTING DATE: JANUARY 19, 2010

TIM JORDAN, PE
ROADWAY PROJECT ENGINEER

JEFF RECK, PE
HYDRAULIC PROJECT ENGINEER

DOUG TAYLOR, PE
NCDOT ROADWAY DESIGN PROJECT 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

2/12/2009
R:\Hydraulics\Permit\b4216_rdy_tsh_wet.dgn
9:50:48 AM

STREAM & WETLAND IMPACTS

MULKEY
ENGINEERS & CONSULTANTS
PO Box 33127
RALEIGH, NC 27636
(919) 851-1212
(919) 851-1213 (FAX)
WWW.MULKEYINC.COM

PROJECT REFERENCE NO.	SHEET NO.
B-4216	4
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

Permit Drawing
Sheet 5 of 7

DENOTES TEMPORARY IMPACTS IN SURFACE WATER

DENOTES IMPACTS IN SURFACE WATER

ENGLISH

NAD 83/01 NC GRID

CAUSEWAY QUANTITIES

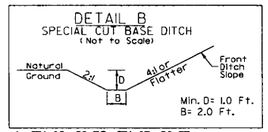
TOTAL VOLUME OF CLASS II RIP RAP BELOW ORDINARY HIGH WATER= 100 YD³

CAUSEWAY #1 WILL BE REMOVED PRIOR TO THE CONSTRUCTION OF CAUSEWAY #2

DETAIL A
SPECIAL CUT BASE DITCH
(Not to Scale)

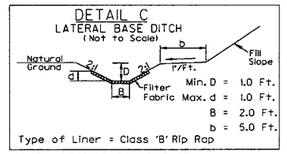
-L- STA. 15+00 TO STA. 15+50 RT
-L- STA. 15+00 TO STA. 16+00 LT

DETAIL B
SPECIAL CUT BASE DITCH
(Not to Scale)



-L- STA. 15+50 TO STA. 17+20 RT

DETAIL C
LATERAL BASE DITCH
(Not to Scale)



-L- STA. 16+00 TO STA. 17+50 LT

LAURA GRACE BALDWIN
ALEXANDER G. BALDWIN
HISTORIC PROPERTY

WILLIAM E. WILSON JR.
MARCIA N. WILSON

WILLIAM L. McKINLEY
PAULA J. McKINLEY

JULIETTE R. ROBERTS

GARRY C. WHICKER
SYLVIA S. WHICKER

DONN K. JARRELL
BEVERLY K. JARRELL

HYLA S. COHEN

STATE OF NORTH CAROLINA
(ENO STATE PARK)

NATIONAL REGISTER - ELIGIBLE HISTORIC PROPERTY BOUNDARY

SITE 1

CAUSEWAY #1

CAUSEWAY #2

SR 1002 ST.MARY'S RD 20' BST

TO SR 1653 CHURTON GROVE BLVD

TO SR 1561 LAWRENCE RD

BALDWIN RD - SR 1554 19' BST

LATERAL BASE DITCH
SEE DETAIL D
EST. DDE = 16 CY
EST. 78 TON RIP RAP
EST. 119 SY FIL. FAB.

DISSIPATOR PAD
CLASS 'I' RIP RAP
EST. 22 TONS
EST. 24 SY FIL. FAB.
SEE DETAIL H

DISSIPATOR PAD
CLASS 'B' RIP RAP
EST. 9 TONS
EST. 14 SY FIL. FAB.
SEE DETAIL H

CLASS 'II' RIP RAP
W/FIL. FAB.
STRUCTURE PAY ITEM

BEGIN SHLD. BERM GUTTER +64

LATERAL BASE DITCH
SEE DETAIL C
EST. DDE = 27 CY
EST. 68 TON RIP RAP
EST. 190 SY FIL. FAB.

SPECIAL CUT BASE DITCH
SEE DETAIL A
EST. 45 TONS RIP RAP
EST. 127 SY FIL. FAB.

SPECIAL CUT BASE DITCH
SEE DETAIL A
EST. 23 TONS RIP RAP
EST. 63 SY FIL. FAB.

SPECIAL CUT BASE DITCH
SEE DETAIL B

SPECIAL CUT BASE DITCH
SEE DETAIL E
EST. 133 TON RIP RAP
EST. 207 SY FIL. FAB.

PREFORMED SCOUR HOLE
SEE DETAIL F

DISSIPATOR PAD
CLASS 'B' RIP RAP
EST. 9 TONS
EST. 14 SY FF
SEE DETAIL H

CLASS 'B' RIP RAP
EST. 1 TON
EST. 7 SY FIL. FAB.

CLASS 'II' RIP RAP
EST. 20 TONS
EST. 25 SY FIL. FAB.
SEE DETAIL G

APPROXIMATE LOCATION NITRIFICATION FIELD PER PB 39 PG 153

SEPTIC

STONE RETAINING WALL

SCULPTURE

RIP-RAP

24" RCP RETAIN

12" RCP REMOVE

12" CMP REMOVE

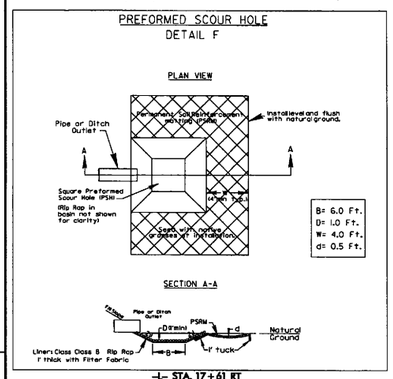
10" CMP

12" CONC

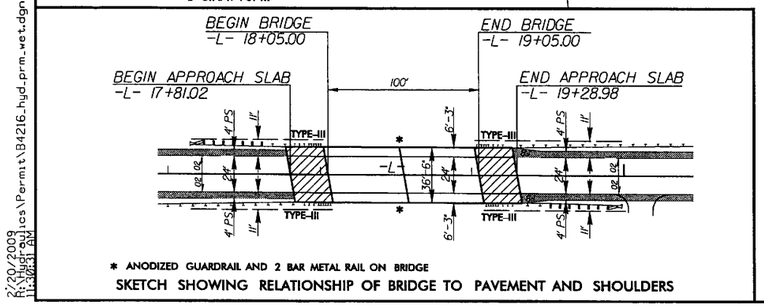
15+00

20+00

PREFORMED SCOUR HOLE
DETAIL F

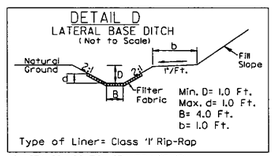


-L- STA. 17+61 RT



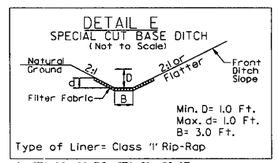
SKETCH SHOWING RELATIONSHIP OF BRIDGE TO PAVEMENT AND SHOULDERS

DETAIL D
LATERAL BASE DITCH
(Not to Scale)



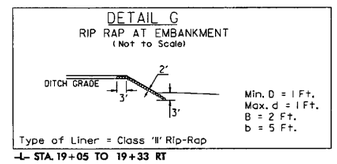
-L- STA. 19+20 TO STA. 20+00 LT

DETAIL E
SPECIAL CUT BASE DITCH
(Not to Scale)



-L- STA. 20+00 TO STA. 21+50 LT

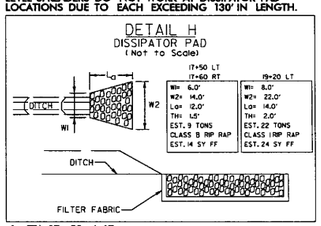
DETAIL G
RIP RAP AT EMBANKMENT
(Not to Scale)



-L- STA. 19+05 TO 19+33 RT

NOTE:
LEVEL SPREADERS DO NOT WORK AT DISSIPATOR PAD LOCATIONS DUE TO EACH EXCEEDING 130' IN LENGTH.

DETAIL H
DISSIPATOR PAD
(Not to Scale)



-L- STA. 17+50+/- LT
-L- STA. 17+60+/- RT
-L- STA. 19+20+/- LT

REVISIONS

8/17/99

2/20/2009
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STREAM & WETLAND IMPACTS

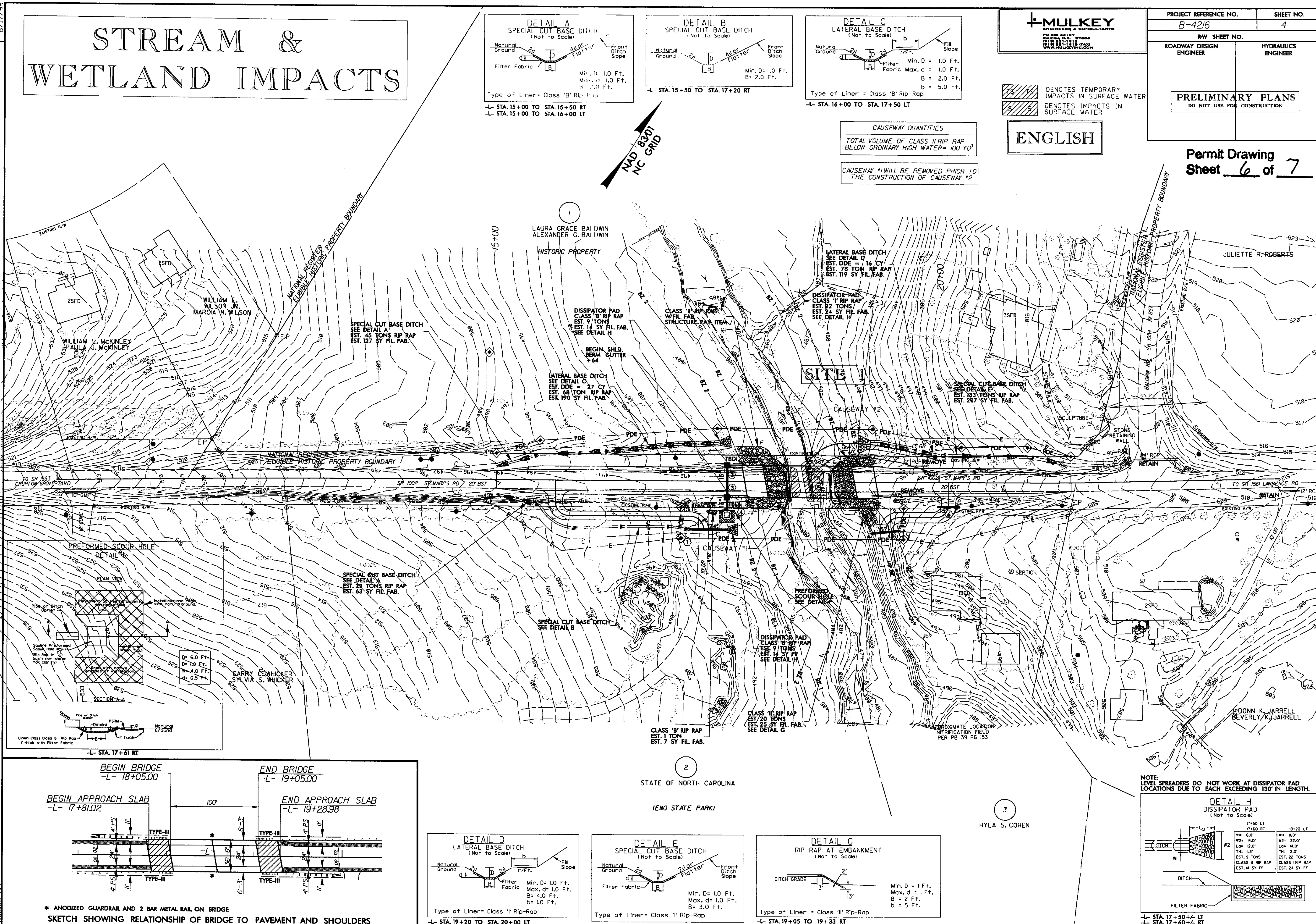
PROJECT REFERENCE NO.	SHEET NO.
B-4216	4
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

MULKEY ENGINEERS & CONSULTANTS

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

ENGLISH

Permit Drawing
Sheet 6 of 7



REVISIONS

8/17/99

2/20/2003

5/28/99

MULKEY
ENGINEERS & CONSULTANTS
PO Box 33127
Raleigh, NC 27636
(919) 851-7912
(919) 851-7918 (FAX)
WWW.JMULKEY.COM

PROJECT REFERENCE NO.	SHEET NO.
B-4216	5
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

ENGLISH

Permit Drawing
Sheet 7 of 7

-BL-1
-L- 11+15.30 17.09' LT
EL = 509.65'

-BL-2
-L- 18+18.90 14.02' LT
EL = 491.90'

BM-#1
RAILROAD SPIKE IN 20" OAK TREE
-L- 18+95.00 233.74' RT
EL = 482.87'

-BL-3
-L- 22+85.13 14.53' LT
EL = 508.43'

DENOTES TEMPORARY IMPACTS IN SURFACE WATER

-L-

FOR -L- PLAN VIEW SEE SHEET 4

BRIDGE HYDRAULIC DATA

DESIGN DISCHARGE	= 2430 CFS
DESIGN FREQUENCY	= 50 YRS
DESIGN HW ELEVATION	= 490.2 FT
BASE DISCHARGE	= 3629 CFS
BASE FREQUENCY	= 100 YRS
BASE HW ELEVATION	= 492.1 FT
OVERTOPPING DISCHARGE	= 4500 CFS
OVERTOPPING FREQUENCY	= 100+ YRS
OVERTOPPING ELEVATION	= 493.3 FT
DATE OF SURVEY	= 3/22/06
W.S. ELEVATION AT DATE OF SURVEY	= 482.3 FT

PI = 18+25.00
EL = 489.20'
VC = 550'
K = 79
DS = 45 mph

BEGIN SP DITCH RT
-L- 15+50.00
EL = 492.53

END SP DITCH RT
-L- 17+20.00
EL = 490.07

PI SP DITCH RT
-L- 16+50.00
EL = 491.50

BEGIN BRIDGE
-L- 18+05 +/-

END BRIDGE
-L- 19+05 +/-

(-)1.10300%
(-)2.33400%
(-)6.02000%
(-)2.04294%
(-)10.80000%
(-)12.17709%
(+)4.75217%
(+)8.00000%
(+)4.60000%
(+)6.68000%

BEGIN CONSTRUCTION
-L- 15+00.00

BEGIN GRADE
-L- 15+50.00
EL = 495.17

BEGIN SP DITCH LT
-L- 15+50.00
EL = 492.22

PI SP DITCH LT
-L- 16+50.00
EL = 489.88

PI SP DITCH LT
-L- 17+00.00
EL = 488.87

END SP DITCH LT
-L- 17+50.00
EL = 486.47

APPROX. TOP
ELEV 485.0
NWS. ELEV.=
482.3 (3-22-06)

TEMPORARY CAUSEWAY
CLASS I RIP RAP
W/ GEOTEXTILE FABRIC
USE COURSE AGGEGATE
SURFACE AS NEEDED

EXCAVATION
(STRUCTURE
PAY ITEM)

SITE 1

BEGIN SP DITCH LT
-L- 19+20.00
EL = 487.80

APPROX. TOP
ELEV 484.0

PI SP DITCH LT
-L- 20+00.00
EL = 494.20

PI SP DITCH LT
-L- 21+00.00
EL = 490.80

END SP DITCH LT
-L- 21+50.00
EL = 502.14

END GRADE
-L- 21+00.00
EL = 502.27

END CONSTRUCTION
-L- 21+50.00

BLEND TO EXIST

BLEND TO EXIST

520 510 500 490 480 470 460 450

10 11 12 13 14 15 16 17 18 19 20 21 22 23

-DR1-

BEGIN GRADE
-DR1- 10+12.00
EL = 494.56'

(-)12.03120%

END GRADE
-DR1- 12+09.34
EL = 490.55'

-DR2-

PI = 10+90.00
EL = 493.50'
VC = 40'

(-)16.15382%

(-)14.52091%

BEGIN GRADE
-DR2- 10+12.00
EL = 498.30'

END GRADE
-DR2- 11+14.11
EL = 492.41'

500 490 480 470 460 450

10 11 12

10 11

STREAM &
WETLAND IMPACTS

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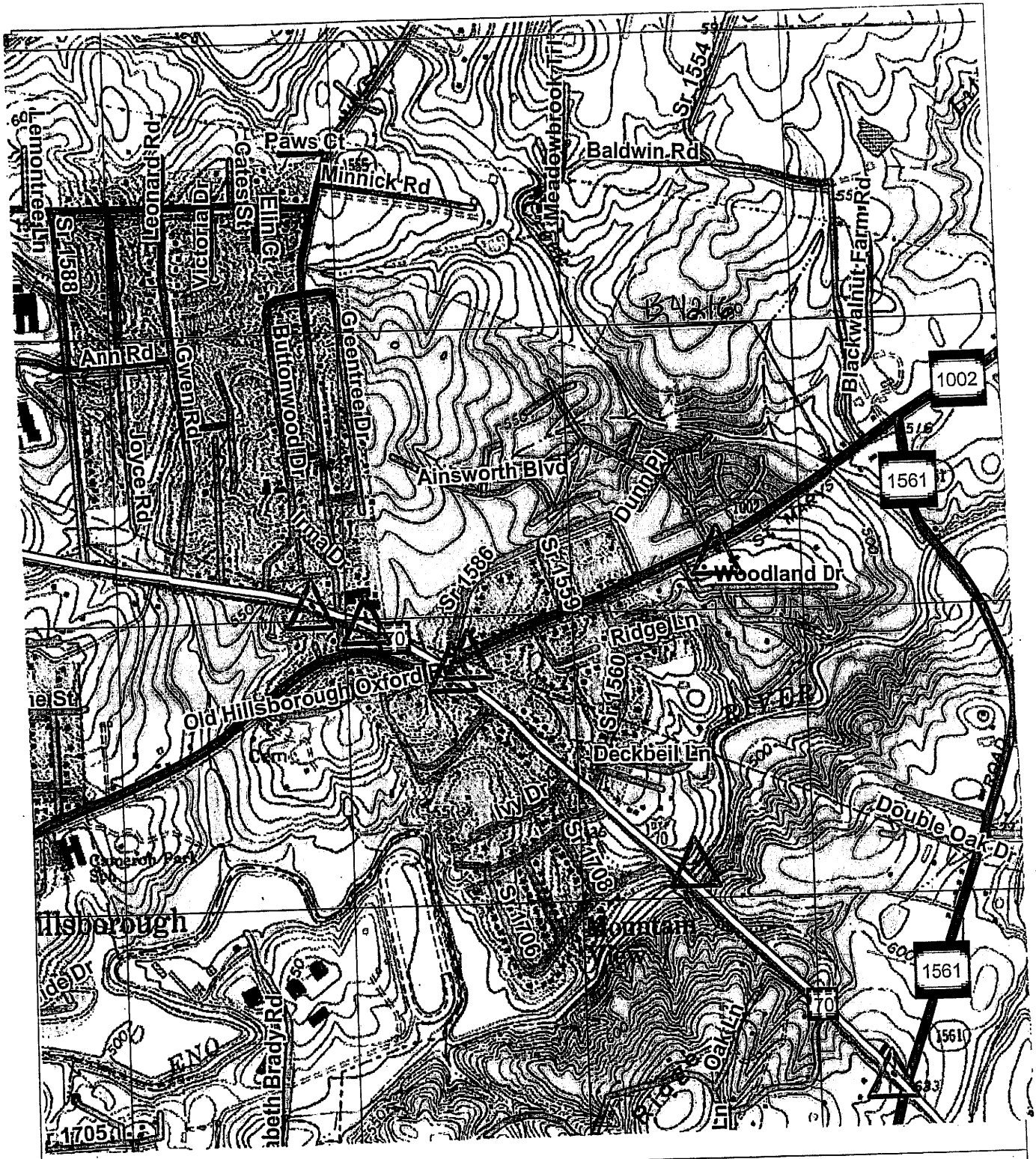


BUFFER IMPACTS

TOPO MAP

SCALE: 1" : 1500'

NCDOT

DIVISION OF HIGHWAYS
ORANGE COUNTY
PROJECT: B-4216 (BRIDGE #66)
BRIDGE NO. 66 OVER
STROUDS CREEK
ON SR 1002
(ST MARYS ROAD)

SHEET 1 OF 5 2/2/2009

PROPERTY OWNERS

NAMES AND ADDRESSES

	NAMES	ADDRESSES
1	Alexander G. Baldwin	102 Cornell Lane Oak Ridge, TN 37830
2	State of North Carolina	N/A
3	Hyla S. Cohen	1927 St Marys Road Hillsborough, NC 27278

NCDOT

DIVISION OF HIGHWAYS
ORANGE COUNTY
PROJECT: B-4216 (BRIDGE #66)
BRIDGE NO. 66 OVER
STROUDS CREEK
ON SR 1002
(ST MARYS ROAD)

SHEET 2 OF 5 2/2/2009

BUFFER IMPACTS SUMMARY

			IMPACT									BUFFER REPLACEMENT	
			TYPE			ALLOWABLE			MITIGABLE				
SITE NO.	STRUCTURE SIZE / TYPE	STATION (FROM/TO)	ROAD CROSSING	BRIDGE	PARALLEL IMPACT	ZONE 1 (ft^2)	ZONE 2 (ft^2)	TOTAL (ft^2)	ZONE 1 (ft^2)	ZONE 2 (ft^2)	TOTAL (ft^2)	ZONE 1 (ft^2)	ZONE 2 (ft^2)
1	Roadway	17+61 to 18+05	X			789	1605	2394					
	Bridge/21" Cored Slab	18+05 to 19+05		X		4173	345	4518					
	Roadway	19+05 to 19+54	X			181	1090	1271					
TOTAL:						5143	3040	8183					

N.C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS

ORANGE COUNTY
PROJECT: B-4216
REPLACEMENT OF BRIDGE NO. 66
OVER STROUDS CREEK ON SR 1002
2/2/2009
SHEET 3 OF 5

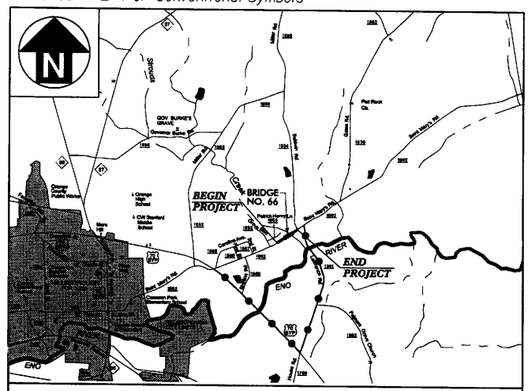
Rev. May 2006

09/08/09

TIP PROJECT: B-4216

CONTRACT:

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



VICINITY MAP — DETOUR ROUTE

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

ORANGE COUNTY

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-4216	1	

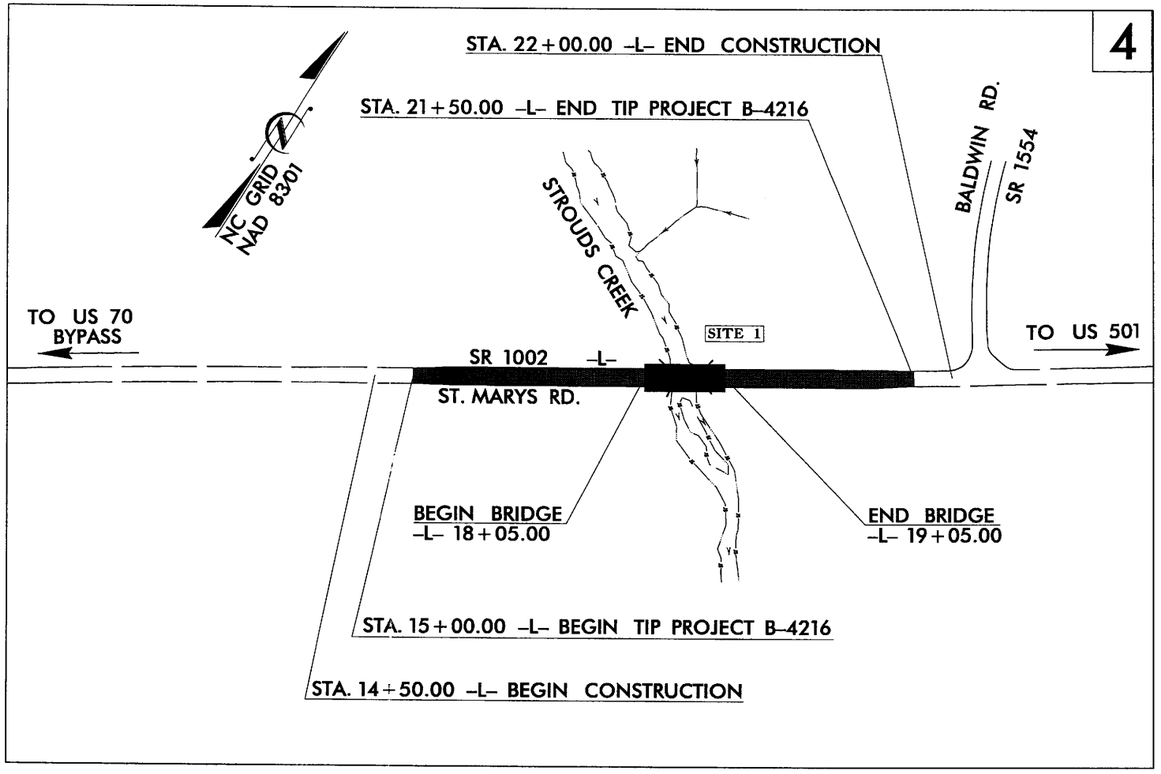
W.B. ELEMENT	F.A. PROJ. NO.	DESCRIPTION
33562.1.1	BRSTP-1002(12)	P.E.
33562.2.1	BRSTP-1002(12)	R/W, UTIL

LOCATION: BRIDGE NO. 66 OVER STROUDS CREEK ON SR 1002

TYPE OF WORK: GRADING, DRAINAGE, PAVING AND STRUCTURE

Buffer Drawing Sheet 4 of 5

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



BUFFER IMPACTS

MULKEY
ENGINEERS & CONSULTANTS
PO Box 33127
RALEIGH, N.C. 27636
(919) 851-1912
(919) 851-1918 (FAX)
WWW.MULKEYINC.COM

THIS PROJECT IS NOT WITHIN ANY MUNICIPAL BOUNDARIES.
CLEARING ON THIS PROJECT SHOULD BE PERFORMED TO THE LIMITS ESTABLISHED BY METHOD II.

GRAPHIC SCALES

PLANS: 50 25 0 50 100

PROFILE (HORIZONTAL): 50 25 0 50 100

PROFILE (VERTICAL): 10 5 0 10 20

DESIGN DATA

ADT 2009 = 11,000
ADT 2030 = 18,700
DHV = 10 %
D = 65 %
T = 4 %*
V = 50 MPH

* TTST 1% DUAL 3%

FUNC. CLASS. = COLLECTOR

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT B-4216 = 0.104 MILES
LENGTH STRUCTURE TIP PROJECT B-4216 = 0.019 MILES
TOTAL LENGTH TIP PROJECT B-4216 = 0.123 MILES

Prepared In the Office of:
MULKEY
ENGINEERS & CONSULTANTS
FOR THE NORTH CAROLINA DEPT. OF TRANSPORTATION

2006 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE: JANUARY 16, 2009

LETTING DATE: JANUARY 19, 2010

TIM JORDAN, PE
ROADWAY PROJECT ENGINEER

JEFF RECK, PE
HYDRAULIC PROJECT ENGINEER

DOUG TAYLOR, PE
NCDOT ROADWAY DESIGN PROJECT ENGINEER

HYDRAULICS ENGINEER

SIGNATURE: *P.E.*

ROADWAY DESIGN ENGINEER

SIGNATURE: *P.E.*

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

STATE HIGHWAY DESIGN ENGINEER *P.E.*

2/20/2009
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8/17/99

BUFFER IMPACTS

PROJECT REFERENCE NO.	SHEET NO.
B-4216	4
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

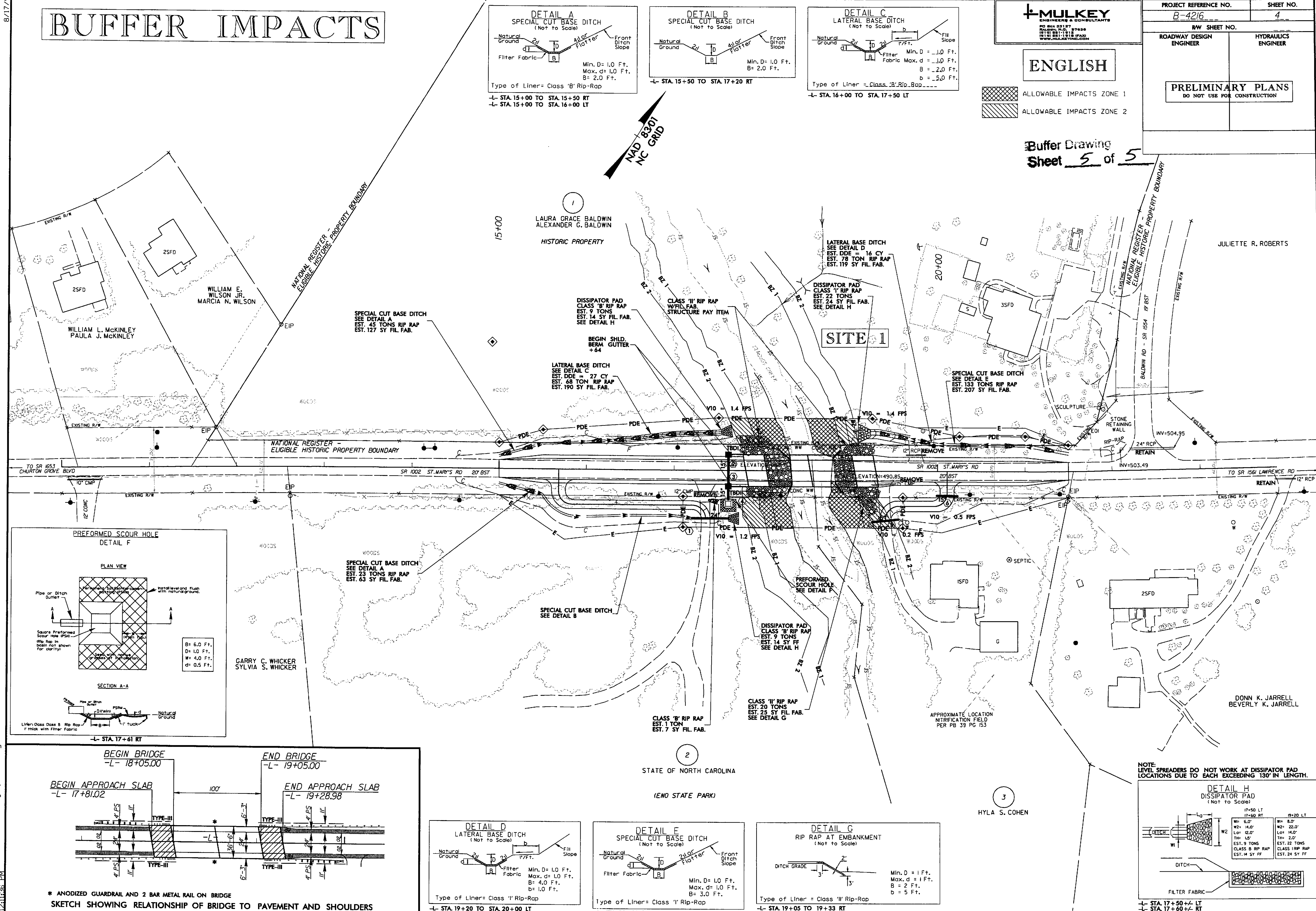
MULKEY ENGINEERS & CONSULTANTS

ENGLISH

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

ALLOWABLE IMPACTS ZONE 1
ALLOWABLE IMPACTS ZONE 2

Buffer Drawing
Sheet 5 of 5



2/20/2009
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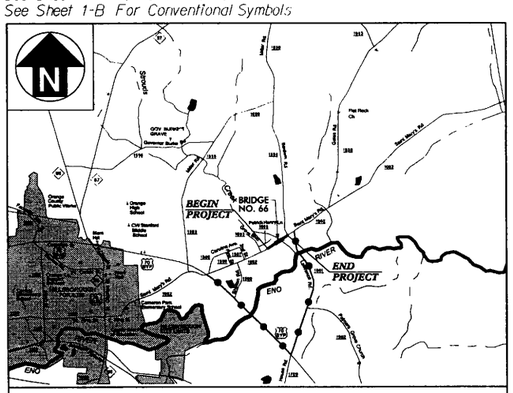
09/08/09

TIP PROJECT: B-4216

CONTRACT:

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



VICINITY MAP —●—●—● DETOUR ROUTE

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

ORANGE COUNTY

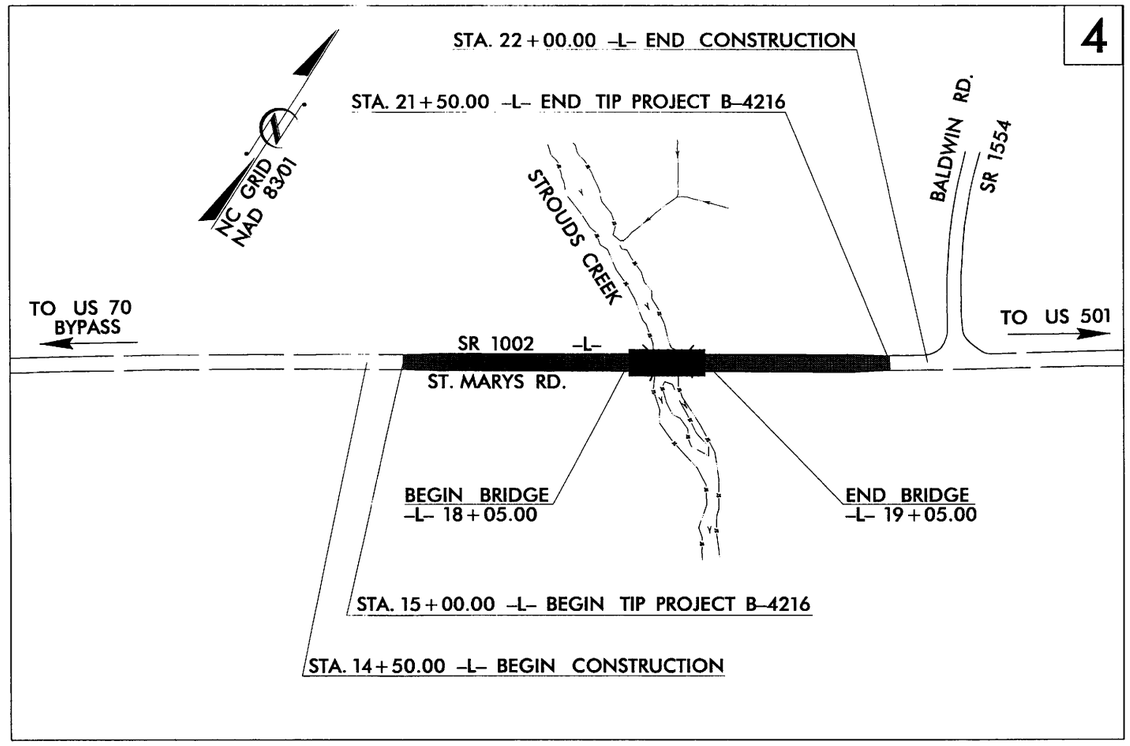
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-4216	1	

W.B.S. ELEMENT	F. A. PROJ. NO.	DESCRIPTION
33562.1.1	BRSTP-1002(12)	P.E.
33562.2.1	BRSTP-1002(12)	R/W, UTIL

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

LOCATION: BRIDGE NO. 66 OVER STROUDS CREEK ON SR 1002

TYPE OF WORK: GRADING, DRAINAGE, PAVING AND STRUCTURE



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RALEIGH, N.C. 27636
(919) 851-1912
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WWW.MULKEYINC.COM

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CLEARING ON THIS PROJECT SHOULD BE PERFORMED TO THE LIMITS ESTABLISHED BY METHOD II.

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 2009 = 11,000
ADT 2030 = 18,700
DHV = 10 %
D = 65 %
T = 4 %*
V = 50 MPH

* TTST 1% DUAL 3%

FUNC. CLASS. = COLLECTOR

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT B-4216 = 0.104 MILES
LENGTH STRUCTURE TIP PROJECT B-4216 = 0.019 MILES
TOTAL LENGTH TIP PROJECT B-4216 = 0.123 MILES

Prepared in the Office of:
MULKEY
ENGINEERS & CONSULTANTS
FOR THE NORTH CAROLINA DEPT. OF TRANSPORTATION

2006 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
JANUARY 16, 2009

LETTING DATE:
JANUARY 19, 2010

TIM JORDAN, PE
ROADWAY PROJECT ENGINEER

JEFF RECK, PE
HYDRAULIC PROJECT ENGINEER

DOUG TAYLOR, PE
NCDOT ROADWAY DESIGN PROJECT ENGINEER

HYDRAULICS ENGINEER

P.E.
SIGNATURE:

ROADWAY DESIGN ENGINEER

P.E.
SIGNATURE:

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

STATE HIGHWAY DESIGN ENGINEER *P.E.*

2/11/2009
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5/14/99

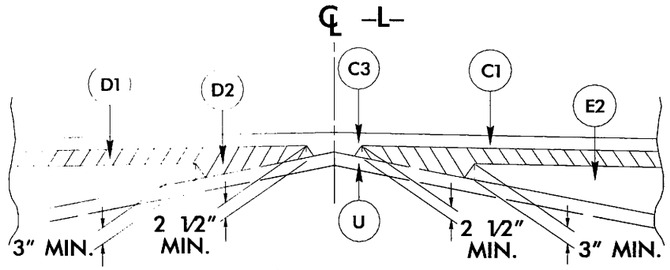
PROJECT REFERENCE NO.	SHEET NO.
B-4216	2
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

PAVEMENT SCHEDULE
(FINAL PAVEMENT DESIGN)

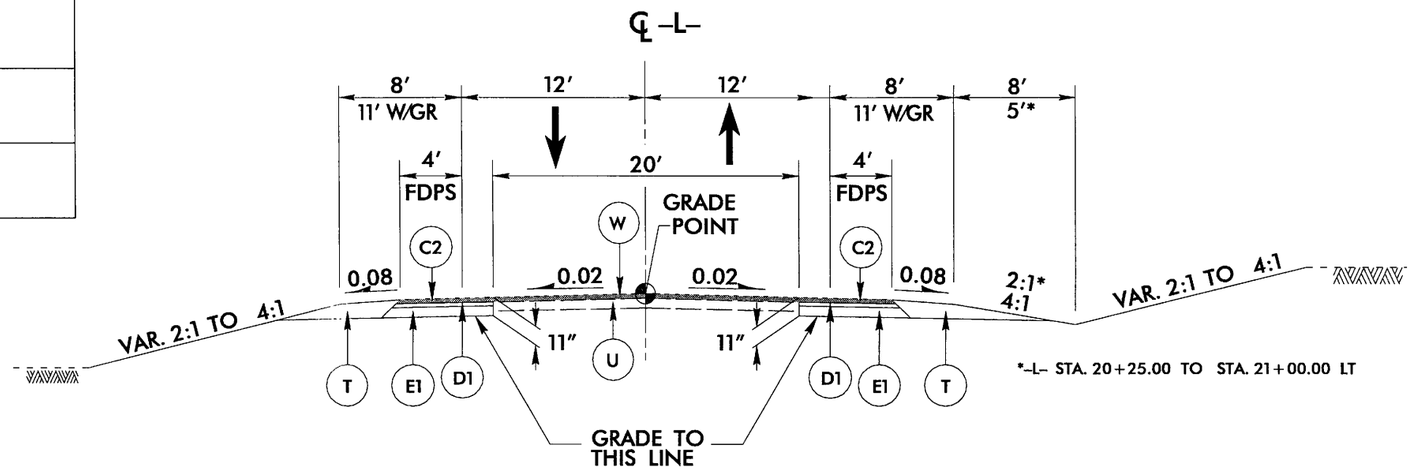
A	CONCRETE WEARING SURFACE (STRUCTURE PAY ITEM)
C1	PROP. APPROX. 1½" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD.
C2	PROP. APPROX. 3" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.
C3	PROP. VAR. DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 112 LBS. PER SQ. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NOT LESS THAN 1½" IN DEPTH OR GREATER THAN 2" IN DEPTH.
D1	PROP. APPROX. 2½" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0B, AT AN AVERAGE RATE OF 285 LBS. PER SQ. YD.
D2	PROP. VAR. DEPTH ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0B, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NOT LESS THAN 2½" IN DEPTH OR GREATER THAN 4" IN DEPTH.
E1	PROP. APPROX. 5½" ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 627 LBS. PER SQ. YD.
E2	PROP. VAR. DEPTH ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NOT LESS THAN 3" IN DEPTH OR GREATER THAN 5½" IN DEPTH.
J1	PROP. 6" AGGREGATE BASE COURSE
T	EARTH MATERIAL.
U	EXISTING PAVEMENT.
W	VARIABLE DEPTH ASPHALT PAVEMENT (SEE STANDARD WEDGING DETAIL)

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



DETAIL SHOWING METHOD OF WEDGING

USE IN CONJUCTION WITH TYPICAL SECTION NO. 1



TYPICAL SECTION NO. 1

USE TYPICAL SECTION NO. 1
AT THE FOLLOWING LOCATIONS

TRANSITION FROM EXISTING TO T.S. NO. 1 FROM
–L– STA. 15+00.00 TO STA. 15+50.00

–L– STA. 15+50.00 TO STA. 16+75.00
–L– STA. 20+25.00 TO STA. 21+00.00

TRANSITION FROM T.S. NO. 1 TO EXISTING
–L– STA. 21+00.00 TO STA. 21+50.00

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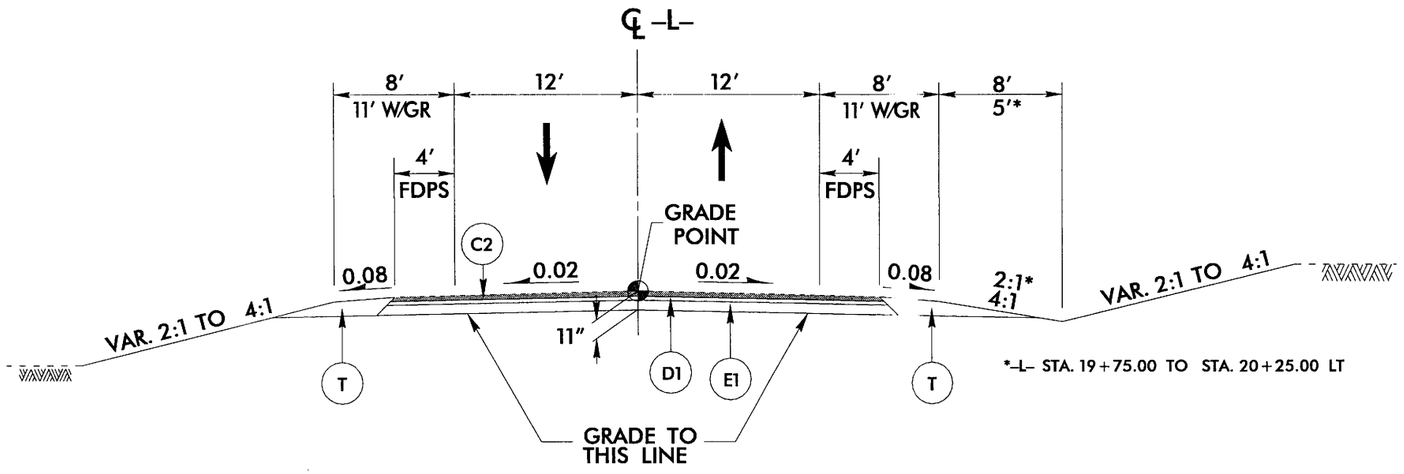
PROJECT REFERENCE NO.	SHEET NO.
B-4216	2-A
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

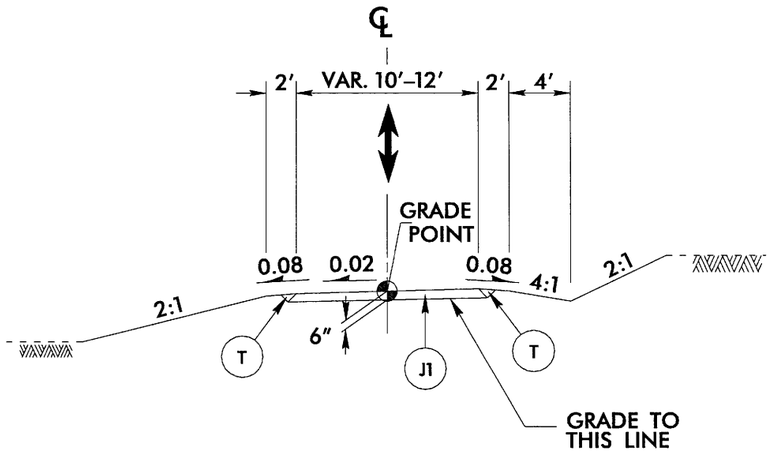


*–L– STA. 19+75.00 TO STA. 20+25.00 LT

TYPICAL SECTION NO. 2

USE TYPICAL SECTION NO. 2
AT THE FOLLOWING LOCATIONS

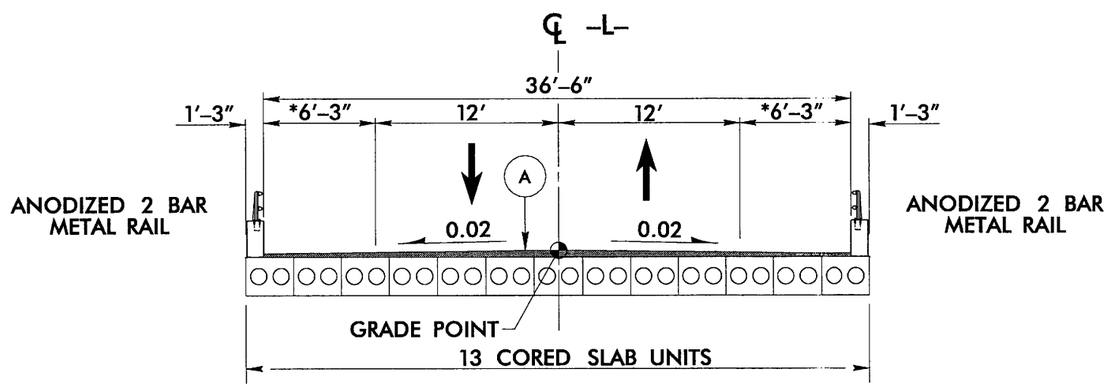
–L– STA. 16+75.00 TO STA. 18+05 (BEGIN BRIDGE)
–L– STA. 19+05 (END BRIDGE) TO STA. 20+25.00



TYPICAL SECTION NO. 3

USE TYPICAL SECTION NO. 3
AT THE FOLLOWING LOCATIONS

–DR1– STA. 10+12.00 TO STA. 12+09.34
–DR2– STA. 10+12.00 TO STA. 11+11.11



DETAIL OF BRIDGE

–L– STA 18+05.00 TO STA 19+05.00

* WIDENED FOR HYDRAULIC SPREAD ON STRUCTURE

PAVEMENT SCHEDULE (FINAL PAVEMENT DESIGN)	
A	CONC. WEAR SURF.
C2	3″ S9.5B
C3	VAR. S9.5B
D1	2½″ I19.0B
E1	5½″ B25.0B
J1	6″ ABC
T	EARTH MATERIAL

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REVISIONS

-DR1-

PI Sta 10+40.00
△ = 90° 00' 00.0" (LT)
D = 38° 58' 18.7"
L = 23.56'
T = 15.00'
R = 15.00'
SE = 02

PI Sta 12+00.77
△ = 90° 10' 44.0" (RT)
D = 38° 58' 18.7"
L = 23.61'
T = 15.05'
R = 15.00'
SE = 02

-L-

PI Sta 12+67.24
△ = 1° 05' 19.4" (RT)
D = 0° 27' 40.6"
L = 236.02'
T = 118.01'
R = 12,421.00'
SE = NC
DS = 50 mph

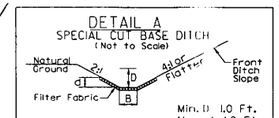
PI Sta 21+45.38
△ = 1° 28' 42.0" (LT)
D = 1° 45' 17.5"
L = 84.24'
T = 42.12'
R = 3,265.00'
SE = 04
DS = 50 mph

-DR2-

PI Sta 10+40.00
△ = 90° 11' 01.0" (RT)
D = 38° 58' 18.7"
L = 23.61'
T = 15.05'
R = 15.00'
SE = 02

PI Sta 11+05.59
△ = 94° 14' 18.5" (LT)
D = 38° 58' 18.7"
L = 24.67'
T = 16.15'
R = 15.00'
SE = 02

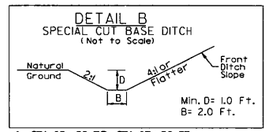
DETAIL A
SPECIAL CUT BASE DITCH
(Not to Scale)



Type of Liner= Class 'B' Rip-Rap

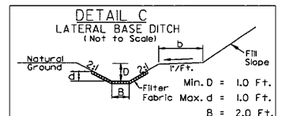
-L- STA. 15+50 TO STA. 15+50 RT
-L- STA. 15+00 TO STA. 16+00 LT

DETAIL B
SPECIAL CUT BASE DITCH
(Not to Scale)



-L- STA. 15+50 TO STA. 17+20 RT

DETAIL C
LATERAL BASE DITCH
(Not to Scale)



Type of Liner = Class 'B' Rip Rap

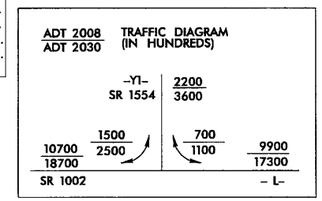
-L- STA. 16+00 TO STA. 17+50 LT

MULKEY
ENGINEERS & CONSULTANTS
PO Box 33127
Raleigh, NC 27636
(919) 851-1212
(919) 851-1213 (FAX)
WWW.MULKEYINC.COM

PROJECT REFERENCE NO.	SHEET NO.
B-4216	4
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

ADT 2008 / ADT 2030 TRAFFIC DIAGRAM (IN HUNDREDS)



FOR -L- PROFILE SEE SHEET 5

-BL-1 POT 5+00.00
(-L- 11+15.30 17.09' LT)

-BL-2 PINC 12+03.91
(-L- 18+18.90 14.02' LT)

-BL-3 PINC 16+69.74
(-L- 22+85.13 14.53' LT)

-L- POT Sta.20+10.93
-DR2- POT Sta.10+00.00
S 33° 05' 13.8" E

-L- PT Sta.21+87.50

-L- PC Sta.21+03.26

-L- POT Sta.15+68.04
-DRI- POT Sta.10+00.00
S 32° 54' 12.8" E

-L- POT Sta.23+87.30
-EL- POT Sta.23+87.30

NAD 83/01 NC GRID

NATIONAL REGISTER - ELIGIBLE HISTORIC PROPERTY BOUNDARY

LAURA GRACE BALDWIN
ALEXANDER G. BALDWIN
DB 3716 PG 9
HISTORIC PROPERTY

WILLIAM L. McKINLEY
PAULA J. McKINLEY
DB 3438 PG 248
PB 85 PG 12

WILLIAM E. WILSON JR.
MARCIA N. WILSON
DB 3411 PG 583
PB 85 PG 12

JULIETTE R. ROBERTS
DB 3730 PG 138
PB 97 PG 76

GARRY C. WHICKER
SYLVIA S. WHICKER
DB 922 PG 599
PB 41 PG 181
PB 57 PG 33

DONN K. JARRELL
BEVERLY K. JARRELL
DB 3462 PG 52
PB 53 PG 36

STATE OF NORTH CAROLINA
DB 3878 PG 461
PB 98 PG 11
(ENO STATE PARK)

HYLA S. COHEN
DB 2555 PG 153
DB 619 PG 485
PB 39 PG 153

BEGIN PROJECT B-4216
-L- POT Sta.15+00.00

BEGIN CONSTRUCTION
-L- POT Sta.14+50.00

-L- POT Sta.10+00.00

-L- PC Sta.11+49.22

-L- PT Sta.13+85.24

-DRI- PC Sta.10+25.00

-DRI- PT Sta.10+48.56

-DRI- PC Sta.11+85.73

-DRI- PT Sta.12+09.34

-DR2- PC Sta.10+24.95

-DR2- PT Sta.10+48.56
S 57° 05' 47.2" W

-DR2- PT Sta.11+14.11

-DR2- PC Sta.10+89.44

END CONSTRUCTION
-L- POC Sta.22+00.00

END PROJECT B-4216
-L- POC Sta.21+50.00

BM #1
-BL- STA 12+77.82
248.42' RIGHT
ELEV.482.87'

SPECIAL CUT BASE DITCH
SEE DETAIL A
EST. 45 TONS RIP RAP
EST. 127 SY FIL. FAB.

SPECIAL CUT BASE DITCH
SEE DETAIL A
EST. 23 TONS RIP RAP
EST. 63 SY FIL. FAB.

SPECIAL CUT BASE DITCH
SEE DETAIL B

LATERAL BASE DITCH
SEE DETAIL C
EST. DDE = 27 CY
EST. 68 TON RIP RAP
EST. 190 SY FIL. FAB.

DISSIPATOR PAD
CLASS 'B' RIP RAP
EST. 9 TONS
EST. 14 SY FIL. FAB.
SEE DETAIL H

CLASS 'I' RIP RAP
W/FIL FAB.
STRUCTURE PAY ITEM

BEGIN SHLD. BERM GUTTER
+64

LATERAL BASE DITCH
SEE DETAIL D
EST. DDE = 16 CY
EST. 78 TON RIP RAP
EST. 119 SY FIL. FAB.

DISSIPATOR PAD
CLASS 'I' RIP RAP
EST. 22 TONS
EST. 24 SY FIL. FAB.
SEE DETAIL H

SPECIAL CUT BASE DITCH
SEE DETAIL E
EST. 133 TONS RIP RAP
EST. 207 SY FIL. FAB.

PREFORMED SCOUR HOLE
SEE DETAIL F

DISSIPATOR PAD
CLASS 'B' RIP RAP
EST. 9 TONS
EST. 14 SY FF
SEE DETAIL H

CLASS 'II' RIP RAP
EST. 20 TONS
EST. 25 SY FIL. FAB.
SEE DETAIL G

CLASS 'B' RIP RAP
EST. 1 TON
EST. 7 SY FIL. FAB.

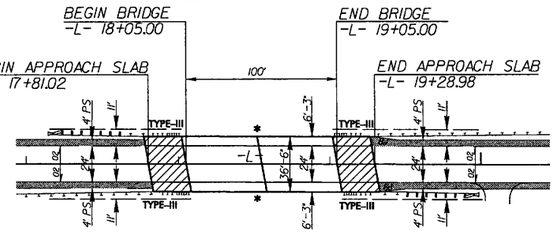
BEGIN BRIDGE
-L- 18+05.00

END BRIDGE
-L- 19+05.00

BEGIN APPROACH SLAB
-L- 17+81.02

END APPROACH SLAB
-L- 19+28.98

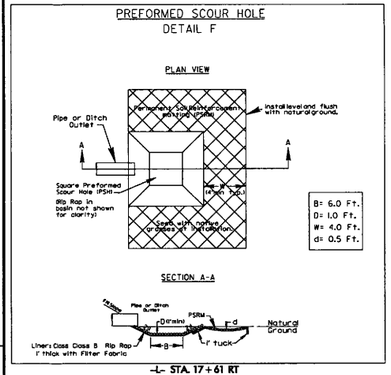
100'



* ANODIZED GUARDRAIL AND 2 BAR METAL RAIL ON BRIDGE

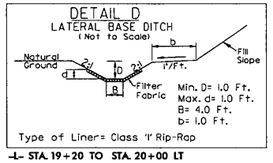
SKETCH SHOWING RELATIONSHIP OF BRIDGE TO PAVEMENT AND SHOULDERS

PREFORMED SCOUR HOLE
DETAIL F



-L- STA. 17+61 RT

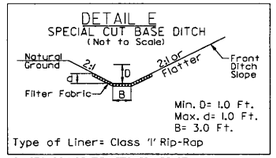
DETAIL D
LATERAL BASE DITCH
(Not to Scale)



Type of Liner= Class 'I' Rip-Rap

-L- STA. 19+20 TO STA. 20+00 LT

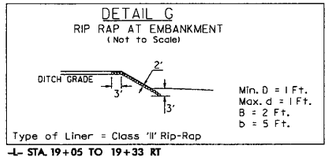
DETAIL E
SPECIAL CUT BASE DITCH
(Not to Scale)



Type of Liner= Class 'I' Rip-Rap

-L- STA. 20+00 TO STA. 21+50 LT

DETAIL G
RIP RAP AT EMBANKMENT
(Not to Scale)

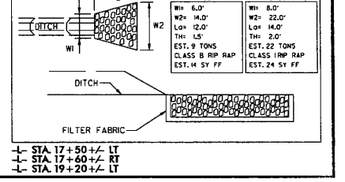


Type of Liner = Class 'II' Rip-Rap

-L- STA. 19+05 TO 19+33 RT

NOTE:
LEVEL SPREADERS DO NOT WORK AT DISSIPATOR PAD LOCATIONS DUE TO EACH EXCEEDING 130' IN LENGTH.

DETAIL H
DISSIPATOR PAD
(Not to Scale)



-L- STA. 17+50+/- LT
-L- STA. 17+60+/- RT
-L- STA. 19+20+/- LT

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MULKEY ENGINEERS & CONSULTANTS

PROJECT REFERENCE NO.	SHEET NO.
B-4216	5
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

-L-

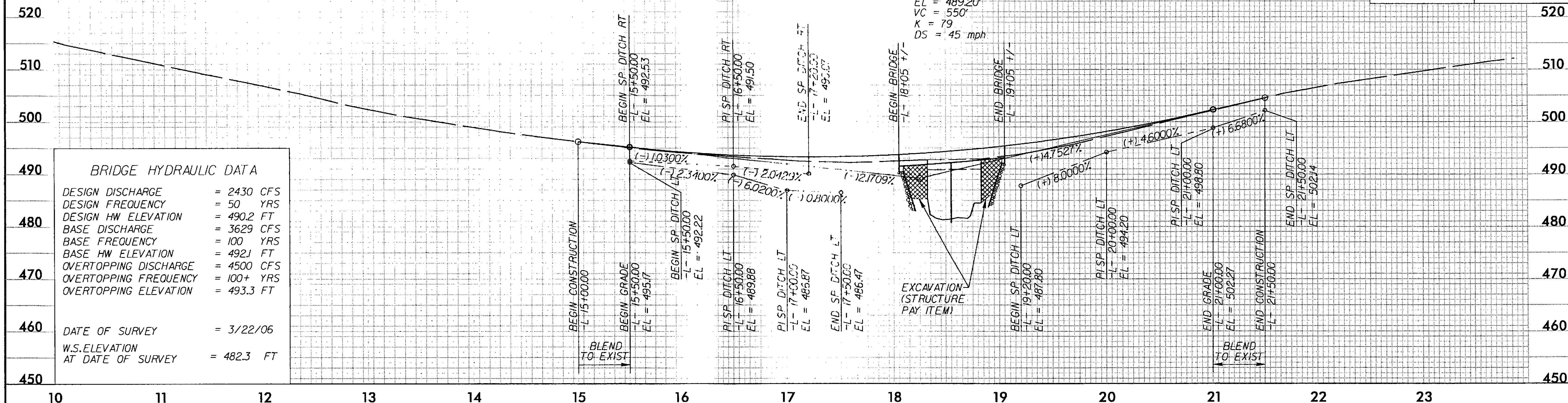
FOR -L- PLAN VIEW SEE SHEET 4

-BL-1
-L- 11+15.30 17.09' LT
EL = 509.65'

-BL-2
-L- 18+18.90 14.02' LT
EL = 491.90'

BM-#1
RAILROAD SPIKE IN 20" OAK TREE
-L- 18+95.00 233.74' RT
EL = 482.87'

-BL-3
-L- 22+85.13 14.53' LT
EL = 508.43'



BRIDGE HYDRAULIC DATA

DESIGN DISCHARGE	= 2430 CFS
DESIGN FREQUENCY	= 50 YRS
DESIGN HW ELEVATION	= 490.2 FT
BASE DISCHARGE	= 3629 CFS
BASE FREQUENCY	= 100 YRS
BASE HW ELEVATION	= 492.1 FT
OVERTOPPING DISCHARGE	= 4500 CFS
OVERTOPPING FREQUENCY	= 100+ YRS
OVERTOPPING ELEVATION	= 493.3 FT
DATE OF SURVEY	= 3/22/06
W.S. ELEVATION AT DATE OF SURVEY	= 482.3 FT

-DR1-

-DR2-

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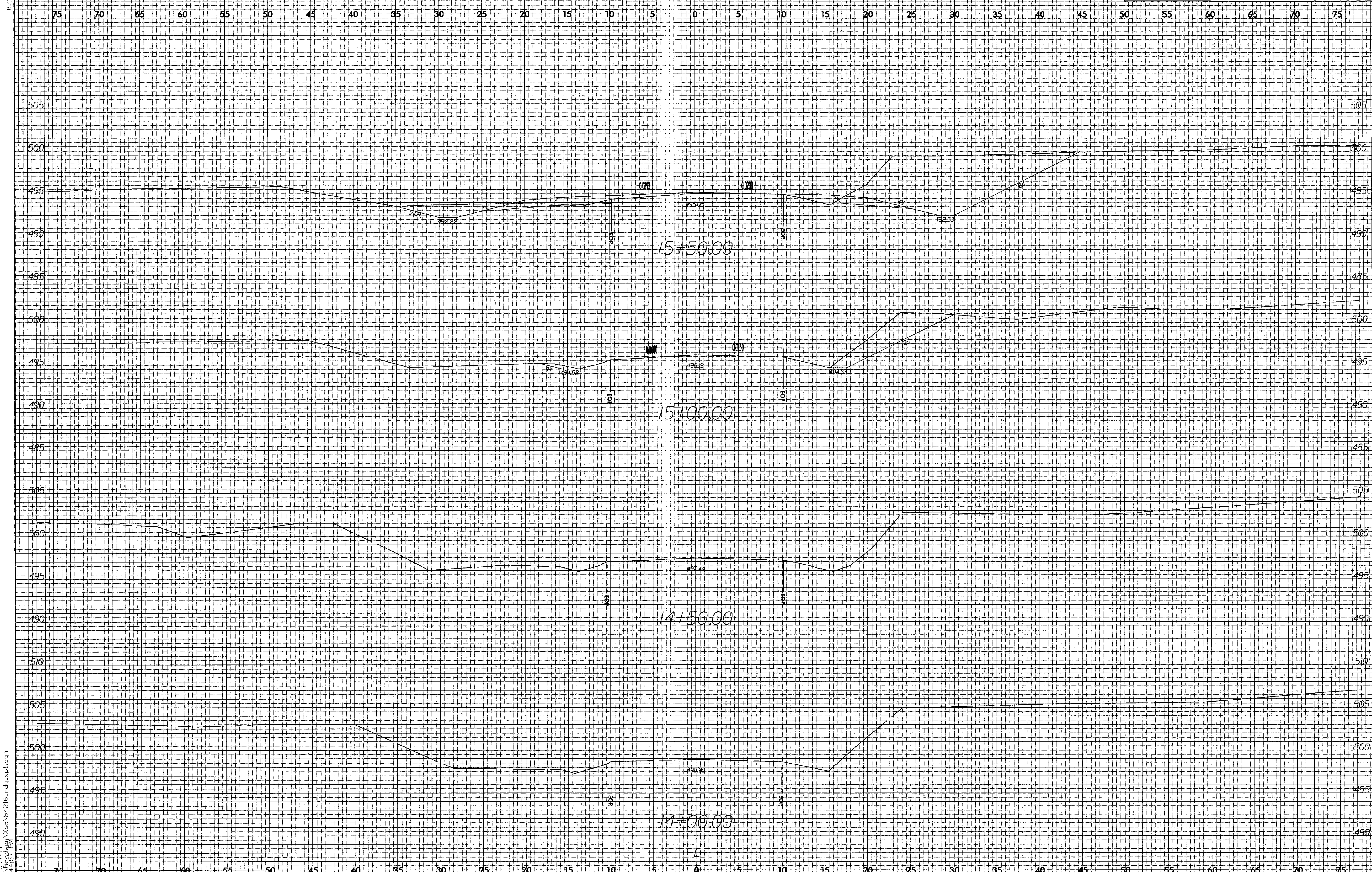
0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	B-4216	X-2



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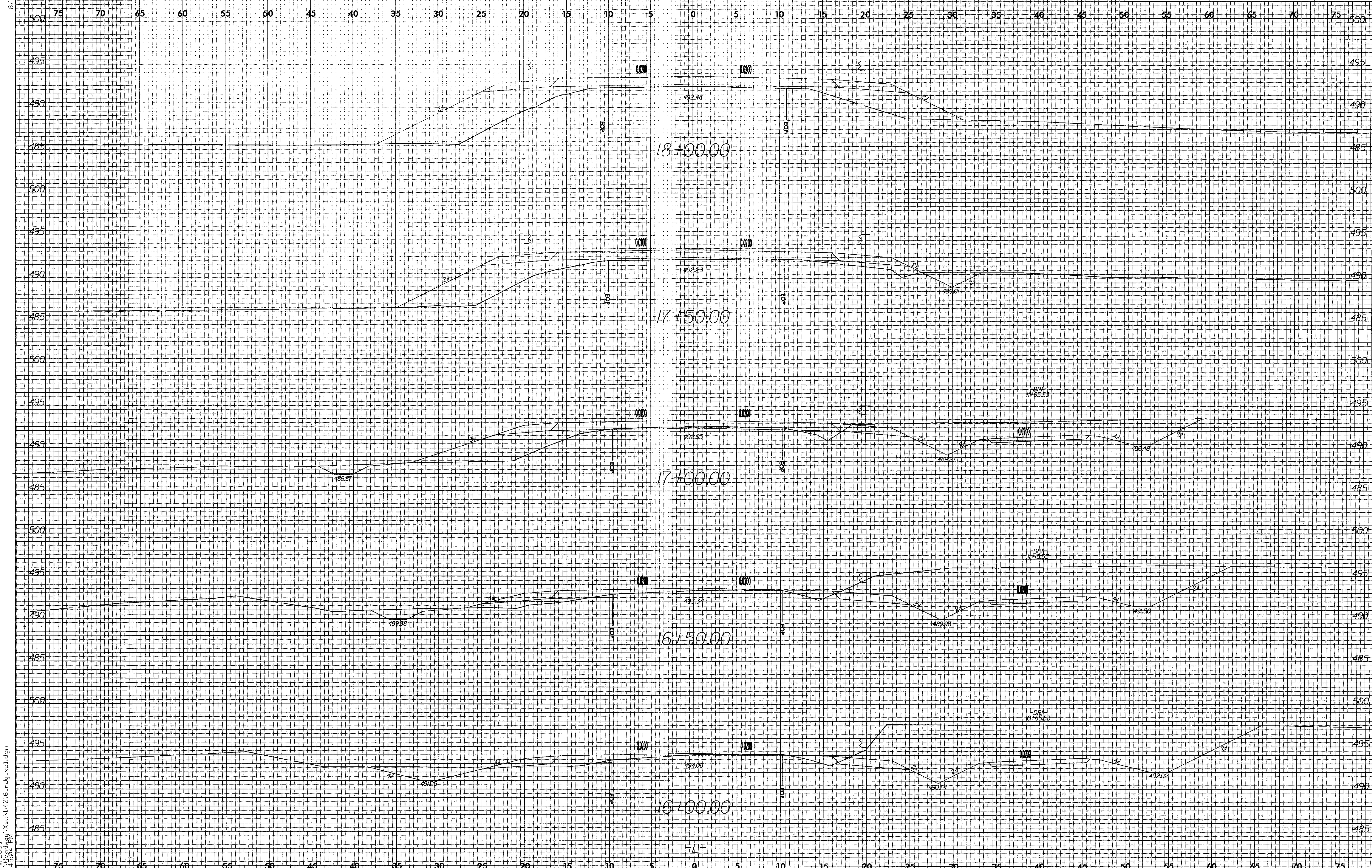
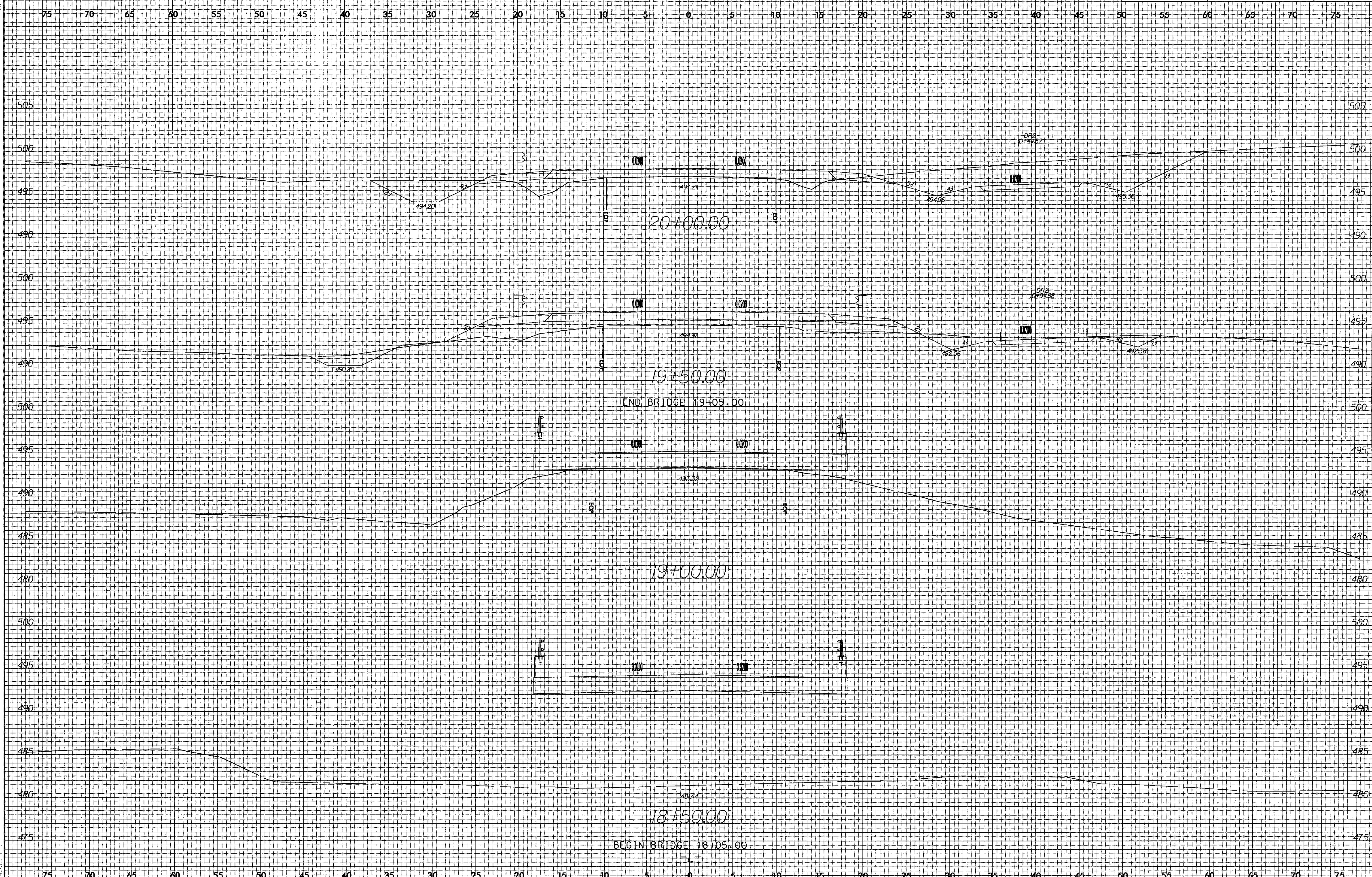
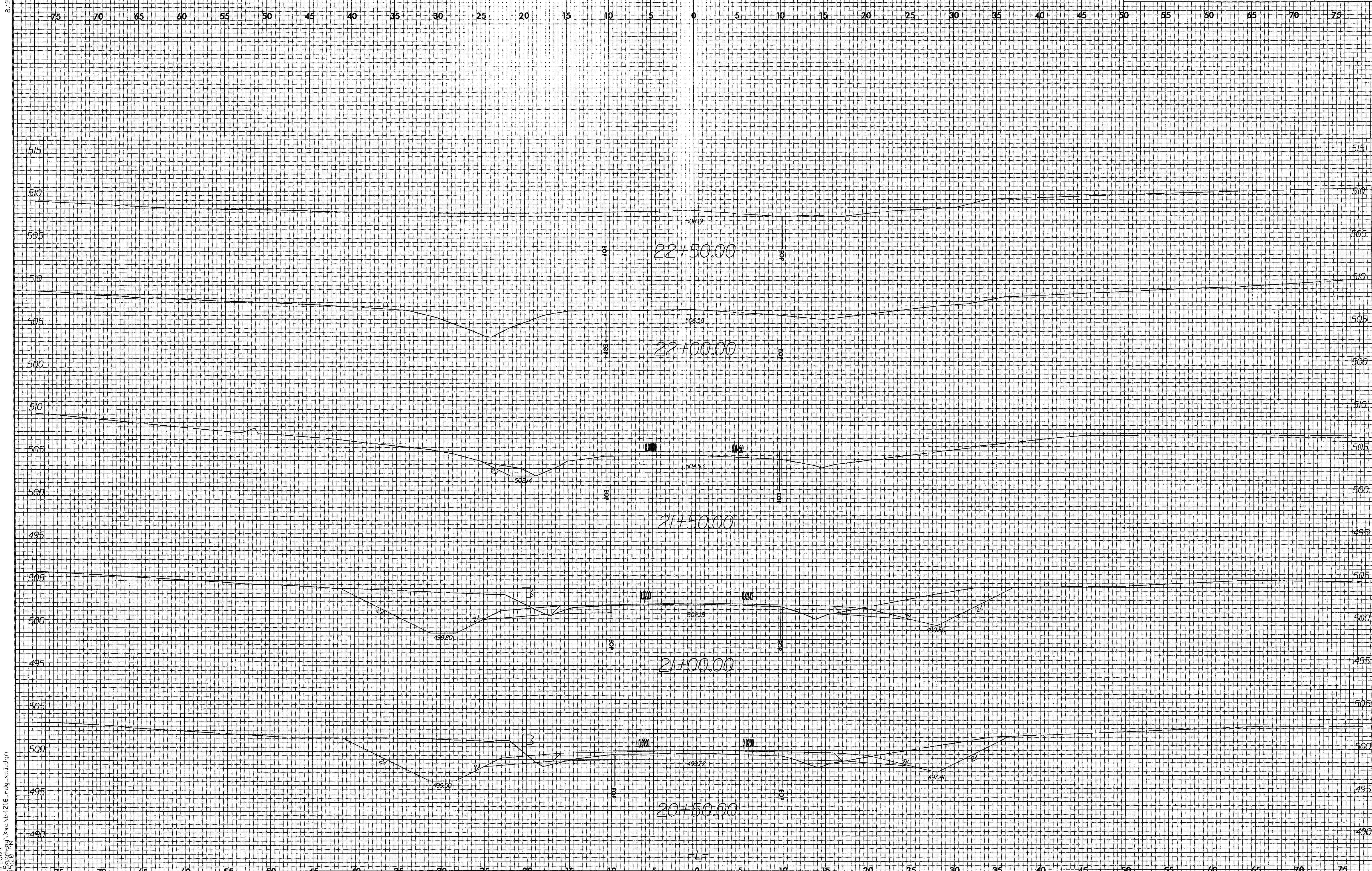
PROJ. REFERENCE NO.	SHEET NO.
B-4216	X-3



0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	B-4216	X-4



0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	B-4216	X-5



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ORANGE COUNTY
BRIDGE NO. 66 ON SR 1002 (ST. MARY'S ROAD)
OVER STROUDS CREEK
FEDERAL-AID PROJECT NO. BRSTP-1002(12)
STATE PROJECT NO. 8.2502201
WBS NO. 33562.1.1
T.I.P. NO. B-4216

CATEGORICAL EXCLUSION

AND

PROGRAMMATIC SECTION 4(F) EVALUATION

UNITED STATES DEPARTMENT OF TRANSPORTATION

FEDERAL HIGHWAY ADMINISTRATION

AND

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

DIVISION OF HIGHWAYS

APPROVED:

05/05/08
Date

for Gregory J. Thorpe, Ph.D.
Manager, Project Development and Environmental Analysis Branch
North Carolina Department of Transportation

05/07/08
Date

for John F. Sullivan, III, P.E.
Division Administrator
Federal Highway Administration

ORANGE COUNTY
BRIDGE NO. 66 ON SR 1002 (ST. MARY'S ROAD)
OVER STROUDS CREEK
FEDERAL-AID PROJECT NO. BRSTP-1002(12)
STATE PROJECT NO. 8.2502201
WBS NO. 33562.1.1
T.I.P. NO. B-4216

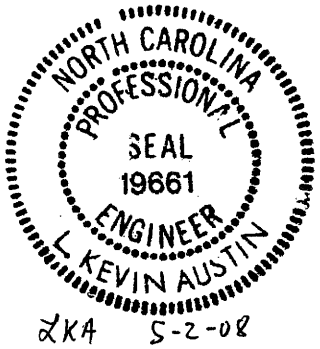
CATEGORICAL EXCLUSION

AND

PROGRAMMATIC SECTION 4(F) EVALUATION

MAY 2008

DOCUMENT PREPARED BY:
MULKEY ENGINEERS & CONSULTANTS
CARY, NORTH CAROLINA



LKA 5-2-08

5-2-08
Date

L. Kevin Austin
L. Kevin Austin, P.E.
Principal

5-2-08
Date

Nicole H. Bennett
Nicole H. Bennett, AICP
Project Manager

FOR THE NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

5-2-08
Date

Theresa Ellerby
Theresa Ellerby
Project Manager
Consultant Engineering Group

Project Commitments

Orange County
Bridge No. 66 on SR 1002 (St. Mary's Road)
Over Strouds Creek
Federal-Aid Project No. BRSTP-1002(12)
State Project No. 8.2502201
WBS No. 33562.1.1
T.I.P. No. B-4216

Structures

Anodized two-bar metal railing will be provided on the bridge.

Bicycle safe bridge railing will be provided.

Roadside Environmental/Roadway Design

A landscape plan will be developed with the property owner of the historic John Berry-Baldwin House (Sunnyside) and NCDOT. The Historic Preservation Office (HPO) will review the resultant plan.

Division Engineer

Coordinate construction scheduling with T.I.P. Project B-4592 along the proposed detour to insure that only one bridge is closed at any given time.

Coordinate with Orange County Public Schools prior to any road closures.

The Neuse River Riparian Buffer rules will be implemented during design, construction and maintenance of the project.

Roadway Design/Hydraulics

Anodized guardrail will be provided on the bridge approaches.

The driveway off St. Mary's Road into the Eno River State Park will connect back to the existing driveway.

ORANGE COUNTY
BRIDGE NO. 66 ON SR 1002 (ST. MARY'S ROAD)
OVER STROUDS CREEK
FEDERAL-AID PROJECT NO. BRSTP-1002(12)
STATE PROJECT NO. 8.2502201
WBS NO. 33562.1.1
T.I.P. NO. B-4216

INTRODUCTION: The replacement of Bridge No. 66 is included in the 2006-2012 North Carolina Department of Transportation (NCDOT) Transportation Improvement Program (T.I.P.) and in the Federal-Aid Bridge Replacement Program. The location is shown in Figure 1. No substantial environmental impacts are anticipated. The project is classified as a Federal "Categorical Exclusion."

I. PURPOSE AND NEED STATEMENT

Bridge Maintenance Unit records indicate that Bridge No. 66 has a sufficiency rating of 13 out of a possible 100 for a new structure. The bridge is considered structurally deficient. Replacement of this inadequate structure will result in safer, more efficient traffic operations.

II. EXISTING CONDITIONS

Bridge No. 66 is located on SR 1002 (St. Mary's Road) in Orange County, approximately two miles east of Hillsborough, North Carolina. The statewide functional classification system classifies SR 1002 as a Rural Major Collector. At its western terminus, SR 1002 connects to US 70 Business and extends northeast from Hillsborough to the Orange County line. Land use in the project area is mostly wooded and residential.

The John Berry-Baldwin House (Sunnyside), located in the northeast quadrant of the project area, was identified as eligible for the National Register of Historic Places. The property is accessed from SR 1544 (Baldwin Road). St. Mary's Road Rural Historic District is included on the state Study List (it is not locally designated as a historic district). Bridge No. 66 is located at the southwestern edge of the district, and the John Berry-Baldwin House is a contributing building within the district (#692 in Figure 6).

The Eno River State Park is located in the southeast quadrant of the project area and along Strouds Creek (Figure 2).

Bridge No. 66 is approximately 1,300 feet from the confluence of Strouds Creek and the Eno River.

The estimated 2008 average daily traffic (ADT) volume is 10,700 vehicles per day (vpd). The projected 2030 ADT is 18,700 vpd. The percentages of truck traffic are three percent dual-tired vehicles and one percent truck-tractor semi trailer (TTST). The posted speed limit on SR 1002 in the vicinity of the project is 45 miles per hour (mph).

Bridge No. 66 was built in 1953. It is a tangent two-lane structure with a clear roadway width of 24.5 feet (Figure 3). The bridge has two spans and totals 50 feet in length. The superstructure is composed of a timber deck on I-beams with timber railing. The substructure consists of reinforced

concrete end bents and interior bent. The height from crown to streambed is 11 feet. Bridge No. 66 is posted at 17 tons for single vehicles and 21 tons for TTSTs.

The approach roadway is a two-lane facility with nine-foot wide travel lanes and six-foot grass shoulders.

Overhead utility lines are located on the north side of SR 1002 and overhead telephone lines are located on the south side of SR 1002. A well and septic field are located in the northeast quadrant of the project area. Utility impacts are anticipated to be low.

There are approximately 40 school bus crossings on Bridge No. 66 each day.

No accidents were reported in the project area during the period from October 1, 2004 to September 30, 2007.

This section of SR 1002 is designated as a Secondary Priority Route in accordance with the Orange County Proposed Bicycle Transportation Route Map.

III. ALTERNATIVES

A. PROJECT DESCRIPTION

Based on preliminary hydraulic analysis, the recommended replacement structure is a bridge approximately 100 feet in length. The new bridge will be approximately 36 feet, five inches wide and will provide two 12-foot travel lanes with six-foot, two and one-half inch shoulders (Figure 4A). Standard bicycle safe bridge railing 54 inches in height will be provided. The guardrail and bridge railing will be anodized metal railing. The existing vertical clearance will be maintained. A minimum 0.3 percent grade is recommended to facilitate bridge deck drainage. The length of the new structure may increase or decrease as necessary to accommodate peak flows as determined by further hydrologic studies.

The approach roadway will provide two 12-foot travel lanes with eight-foot shoulders, including four-foot paved shoulders (Figure 4A). The design speed will be 50 mph.

B. BUILD ALTERNATIVES

Two build alternatives were studied for this project. They are described below.

Alternative A (preferred) replaces the structure at the existing location (Figure 5A). During construction, traffic will be maintained by an off-site detour along SR 1561 (Lawrence Road) and US 70 Bypass, approximately three miles in length. User costs are estimated at $12,000 per day for a four-month road closure. The detour would result in approximately 3 minutes additional travel time. No substantial impacts are anticipated to emergency services and school bus routes (Appendix). The NCDOT will coordinate with Orange County Public Schools prior to any road closures. NCDOT Division 7 concurs with the use of this detour.

The construction schedule for the replacement of Bridge No.66 will be coordinated with the replacement of Bridge No.64 (B-4592) over the Eno River on SR 1561 to insure only one bridge is closed at any given time.

Alternative B replaces the structure at the existing location (Figure 5B). During construction, traffic would be maintained with an on-site detour south (downstream) of the existing bridge. The detour structure would provide two 12-foot travel lanes with two-foot shoulders (Figure 4B). The approach roadway would provide two 12-foot travel lanes with eight-foot grass shoulders, and a design speed of 40 mph. This alternative is not recommended because of higher cost, greater impacts to the Eno River State Park, and greater impacts to land from the St. Mary's Road Rural Historic District.

C. Alternatives Eliminated From Further Study

Alignments on new location within the project area were eliminated because additional right-of-way would be required from historic resources and the Eno River State Park.

The No-Build (or "do-nothing") alternative will eventually necessitate closure of the bridge. This is not desirable due to the traffic service provided by SR 1002 on Bridge No. 66.

Investigation of the existing structure by the NCDOT's Bridge Maintenance Unit indicates that "rehabilitation" of this bridge is not feasible because of its age and deteriorated condition.

D. Preferred Alternative

Alternative A, replacing the bridge on existing alignment while maintaining traffic with an off-site detour, is the preferred alternative. Alternative A was selected because it minimizes impacts to the John Berry-Baldwin property, St. Mary's Road Rural Historic District, and Eno River State Park, and it is more economical than Alternative B.

The Division Engineer concurs with Alternative A as the preferred alternative.

E. Design Exception

No design exceptions are anticipated.

IV. ESTIMATED COST

Table 1 shows estimated costs based on current prices.

Table 1. Estimated Costs

	Alternative A (preferred)	Alternative B
Structure Removal (Existing)	$ 19,000	$ 19,000
Proposed Structure	390,000	390,000
Roadway Approaches	172,000	172,000
Temporary Detour Bridge	0	134,400
Detour Approaches	0	242,100
Miscellaneous and Mobilization	140,000	267,500
Engineering Contingencies	129,000	175,000
ROW/Const. Easements/Utilities	91,000	113,500
Total	$941,000	$1,513,500

The estimated cost of the project as shown in the Draft 2009-2015 Transportation Improvement Program is $1,125,000, including $150,000 in prior years, $100,000 for right-of-way, and $875,000 for construction.

V. NATURAL RESOURCES-HAROLD UPDATING

A. METHODOLOGY

Field investigations in the project area were conducted by qualified biologists on January 15, 2004. Field surveys were undertaken to determine natural resource conditions and to document natural communities, wildlife, and the presence of protected species or their habitats.

Published information regarding the project area and region was derived from a number of resources including: United States Geological Survey (USGS) 7.5-minute topographical quadrangle map (Hillsborough, North Carolina), US Fish and Wildlife Service (USFWS) National Wetlands Inventory (NWI) maps, NCDOT aerial photomosaics of the project area, and Natural Resources Conservation Service (NRCS) soil survey maps of Orange County. Water resources information was obtained from publications of the North Carolina Division of Water Quality (NCDWQ). Information concerning the occurrence of federal and state protected species within the project area and vicinity was gathered from the USFWS list of protected species and the North Carolina Natural Heritage Program (NCNHP) database of rare species and unique habitats.

Dominant plant species were identified in each stratum for all natural communities encountered. Plant community descriptions are based on those classified in Schafale and Weakley (1990), where applicable. Names and descriptions of plant species generally follow Radford *et al.* (1968), unless

more current information was available. Animal names and descriptions follow Bogan (2002), Conant and Collins (1998), Lee *et al.* (1980 *et seq.*), Martof *et al.* (1980), Stokes (1966), and Webster *et al.* (1985). Scientific names and common names (when applicable) are provided for each plant and animal species listed. Subsequent references to the same organism include the common name only.

During field surveys, wildlife identification involved a variety of observation techniques: active searching and capture, visual observations (both with and without the use of binoculars), and observing the characteristic signs of wildlife (sounds, scat, tracks, and burrows). Any organisms that may have been captured during these searches were identified and released without injury. Quantitative water sampling was not undertaken to support existing data.

Jurisdictional wetland determinations were performed using the three-parameter approach as prescribed in the 1987 *Corps of Engineers Wetlands Delineation Manual.* Supplementary technical literature describing the parameters of hydrophytic vegetation, hydric soils, and hydrological indicators were also utilized. Wetland functions were evaluated according to the NCDWQ's rating system, fourth version. Surface waters in the project area were evaluated and classified based on a preponderance of perennial stream characteristics as defined in NCDWQ's *Stream Classification Method*, second version, as well as, the United States Army Corps of Engineers (USACE) Stream Quality Assessment Worksheet.

B. Physiography and Soils

The project area is located in eastern Orange County approximately two miles east of the town of Hillsborough. Orange County is situated in the north-central part of the state in the Piedmont physiographic province. The geography of Orange County consists predominantly of rolling hills, with steep areas following major streams. Narrow, nearly level floodplains exist along most of the streams. Elevations in the project area range from approximately 490 feet above mean sea level (msl) along Strouds Creek to approximately 530 feet above msl at the far western end of the project.

The geology underlying the project area is part of the Eastern Slate Belt and consists primarily of metamorphic rock. Two geologic outcroppings are present within the project area: felsic metavolcanic rock and a phyllite and schist formation. The felsic metavolcanic rock formation is comprised of metamorphosed dacitic to rhyolitic flows and tuffs. The phyllite and schist formation consists of the nominal minerals with biotite, pyrite, phyllonite, fine-grained meta-sediment, and meta-volcanic rock.

Five soil series are represented within the project area; Chewacla, Congaree, Georgeville, Herndon, and Tatum. Soil mapping units within the study corridor include: Chewacla loam (*Fluvaquentic Dystrochrepts*), Congaree fine sandy loam (*Oxyaquic Udifluvents*), Georgeville silt loam (*Typic Kanhapludults*), Herndon silt loam (*Typic Kanhapludults*), and Tatum silt loam (*Typic Hapludults*). Characteristics are presented below.

Chewacla loam soils are somewhat poorly drained and are found along small to medium-sized waterways throughout the area. These soils have a moderate permeability and a shallow depth to the seasonal high water table (within 12 inches); therefore, both overbank and groundwater flooding can occur and persist for many days. Chewacla soils are found on the far northern portion of the project area along Strouds Creek.

Congaree fine sandy loam soils are well drained and are found along medium to large-sized streams and rivers. Congaree soils have a moderate permeability and a seasonal high water table at approximately 30 inches from the soil surface. Even though the seasonal high water table is relatively deep, over bank flooding is not uncommon. Congaree silt loam is found within the project area immediately adjacent to Strouds Creek.

Georgeville silt loam soils are well drained and typically found on broad upland ridges. This soil has a moderate permeability and a deep seasonal high water table. Two soil mapping units of Georgeville silt loam are represented within the project area, one with two to six percent slopes, and one with six to 10 percent slopes. A potential erosion hazard exists due to Georgeville's position on the landscape. Georgeville soil types are found on uplands on both sides of the project area.

Herndon silt loam soils are well drained and are typically found on broad upland ridges. These soils have a moderate permeability and a deep seasonal high water table. The series is found at the far western end of the project area atop a wide ridge.

Tatum silt loam soils are well drained and are typically located on side slopes in upland areas. Tatum soils have a moderate permeability and strongly acidic subsoil. This soil series is found as a small area on the southern side of Saint Mary's Road on the steep slopes along the eastern side of Strouds Creek.

Hydric soils are defined as soils that are saturated, flooded, or ponded long enough during the growing season to develop anaerobic conditions that favor the growth and regeneration of hydrophytic vegetation. Soils referred to as "Hydric A" are completely hydric throughout the mapped soil unit. "Hydric B" soils are non-hydric soils that contain inclusions of hydric soils, usually in depressional areas or along the border with other soil units. Two Hydric B soil map units occur in the project area: Chewacla loam and Congaree fine sandy loam. No hydric inclusions were found in these soil map units within the project area.

C. WATER RESOURCES

1. Waters Impacted

Streams, creeks, and tributaries within the project vicinity are completely within the Neuse River Basin. Strouds Creek is a perennial stream flowing in a southerly direction toward the Eno River, which is located approximately 1,800 feet from the Bridge No. 66 crossing. Strouds Creek is within Neuse River Subbasin 03-04-01. The NCDWQ stream index number for the creek is 27-2-9 and the USGS 8-digit hydrologic unit is 03020201.

2. Water Resource Characteristics

The NCDWQ classifies surface waters of the state based on their intended best uses. Strouds Creek is classified as "C-NSW." The class "C" designation denotes freshwaters protected for secondary recreation, fishing, wildlife, fish and aquatic life propagation and survival, and other uses. Strouds Creek is also considered Nutrient Sensitive Waters (NSW). This is a supplemental surface water

classification intended for waters needing additional nutrient management due to their being subject to excessive growth of microscopic or macroscopic vegetation. The Eno River, including the confluence with Strouds Creek, is classified as a WS-IV drinking water supply watershed. The WS-IV classification places minor restrictions on discharges into the watershed. No Outstanding Resource Waters (ORW), High Quality Waters (HQW), or 303(d) waters occur within a one-mile radius of the project area.

The Ambient Monitoring System (AMS) is a network of stream, lake, and estuarine water-quality monitoring stations strategically located for the collection of physical and chemical water-quality data. The AMS determines the "use support" status of waterbodies, meaning how well a waterbody supports its designated uses. There is an AMS monitoring station on the Eno River approximately nine miles east of the project area. The Eno River at this station has a use support rating of "Fully Supporting." Strouds Creek is rated "Support Threatened" (ST) for use support in the project area. An "ST" rating is given to water bodies that support their designated uses but have a lower water quality than do the "Fully Supporting" streams.

The North Carolina Index of Biotic Integrity (NCIBI) is used to assess the biological integrity of streams by examining the structure and health of the fish community. Data collected in 2000 indicated this site had an "Excellent" rating. Previous samples taken from 1984 to 1990 generated "Good" ratings.

Bioclassification criteria have been developed that are based on the number and type of benthic macroinvertebrates (primarily Orders: Ephemeroptera, Plecoptera, and Tricoptera) present in streams and rivers because they are very sensitive to the effects of water pollution. A benthic macroinvertebrate sampling site is located on the Eno River at SR 1569, approximately three miles southeast and downstream from the project area. This site was last sampled in 2000 and was given a bioclassification rating of "Excellent."

Point source dischargers throughout North Carolina are regulated through the National Pollutant Discharge Elimination System (NPDES) program. Dischargers are required by law to register for a permit. There are no currently permitted dischargers on Strouds Creek.

A classification system for stream channels based on fluvial geomorphologic principles and landscape position was used for stream analysis. Based on this method and field observations made during the site visit, Strouds Creek appears to be a C5 type channel at the bridge site. The stream has a moderate flow over a substrate of silt to cobble, with moderately embedded sand and cobble. Approximate stream dimensions are shown in Table 2.

Table. 2. Approximate Dimensions of Strouds Creek

Characteristic	Dimension
Bankfull width	20 to 25 feet
Channel width	15 to 20 feet
Bank height	2 to 3 feet
Water depth in riffles	3 to 9 inches
Water depth in pools	1 to 2 feet

3. Anticipated Impacts to Water Resources

Short-term impacts to water quality from construction-related activities include increased sedimentation and turbidity. Long-term construction-related impacts to water resources include substrate destabilization, bank erosion, increased turbidity, altered flow rates, and possible temperature fluctuations within the channel due to removal of streamside vegetation. No adverse long-term impacts to water resources are expected to result from the alternative under consideration. The proposed project will replace the bridge at the existing location, which will allow for continuation of present stream flow within the existing channel, thereby protecting stream integrity. Precautions will be taken to minimize impacts to water resources from runoff and erosion in the project area.

4. Impacts Related to Bridge Demolition and Removal

The bridge deck and railing will be removed without dropping components into Waters of the U.S. There is potential for components of the substructure to be dropped into Waters of the U.S. during construction. The resulting temporary fill associated with the concrete bents is approximately 35 cubic yards.

D. Biotic Resources

1. Plant Communities

The field survey team observed three plant communities in the project area: Piedmont alluvial forest, mixed pine/hardwood forest, and urban/disturbed community. These communities are described below.

a. Piedmont Alluvial Forest

The Piedmont alluvial forest community occurs along river and stream floodplains in the Piedmont of North Carolina with small, indistinguishable fluvial landforms and vegetation zones. It is best classified as a variation of Schafale and Weakley's Piedmont Alluvial Forest type. This vegetative community is situated immediately adjacent to Strouds Creek in the project area and has been

disturbed in the past by activities such as agriculture, forest management, and beaver dams. The canopy and understory are somewhat open throughout.

Dominant species observed in the canopy and understory layers include sycamore (*Platanus occidentalis*), green ash (*Fraxinus pennsylvanica*), red maple (*Acer rubrum*), sweetgum (*Liquidambar styraciflua*), and yellow poplar (*Liriodendron tulipifera*). Shrubs and vines present within the project area include privet (*Ligustrum sinense*), eastern red cedar (*Juniperus virginiana*), silky dogwood (*Cornus amomum*), black willow (*Salix nigra*), greenbrier (*Smilax rotundifolia*), Japanese honeysuckle (*Lonicera japonica*), and poison ivy (*Toxicodendron radicans*). The herbaceous community is very diverse, with dominant species including goldenrod (*Solidago* spp.), multiflora rose (*Rosa multiflora*), Christmas fern (*Polystichum acrostichoides*), rushes (*Juncus effusus*), and creeping grass (*Microstegium vimineum*).

b. Mixed Pine/Hardwood Forest

The mixed pine/hardwood forest community is located upslope of the alluvial forest. This community appears to be a variation of the Mesic Mixed Hardwood Forest (Piedmont Subtype) identified by Schafale and Weakley, with an increased amount of pine. These communities typically occur on acidic soils in lower slopes, steep north-facing slopes, ravines, and occasionally well-drained small stream bottoms. Under natural conditions they are uneven-aged with old trees present; however, there are few older trees present within the project area, likely due to past disturbance activities such as agriculture and forest management.

Dominant canopy and subcanopy species within the mixed pine-hardwood forest community include Virginia pine (*Pinus virginiana*), hackberry (*Celtis laevigata*), pignut hickory (*Carya glabra*), yellow poplar, white oak (*Quercus alba*), American beech (*Fagus grandifolia*), sourwood (*Oxydendrum arboreum*), sweetgum, and loblolly pine (*Pinus taeda*). Shrubs and vines include flowering dogwood (*Cornus florida*), highbush blueberry (*Vaccinium corymbosum*), strawberry bush (*Euonymus americana*), blackberry (*Rubus* spp.), greenbrier, and Japanese honeysuckle. The herbaceous vegetation consists primarily of creeping grass, partridge berry (*Mitchella repens*), wild ginger (*Hexastylis* spp.), and muscadine grape (*Vitis rotundifolia*).

c. Urban/Disturbed Community

The urban/disturbed community is the most dominant vegetative community within the project area. Typically, this community is characterized by areas that are periodically maintained by human influences, such as roadside and power line rights-of-way, regularly mowed lawns, and open areas. Within the project area, agricultural fields and residences are present throughout. They are especially prevalent on the western side of the project area. This area is dominated by herbaceous vegetation such as multiflora rose, blackberry, foxtail grass (*Setaria* spp.), goldenrod, and rice-cut grass (*Leersia* spp.). Trees present within the maintained yards include loblolly pine, flowering dogwood, white oak, and American holly (*Ilex opaca*).

2. Wildlife

The forested and man-dominated communities in the project area offer mild diversity of foraging, nesting, and cover habitat for many species of amphibians, reptiles, birds, and mammals. Species that may be associated with these types of communities are described below. An asterisk (*) indicates the species that were directly observed or for which evidence was noted during field reconnaissance.

Reptile species associated with the project area may include snakes such as the rough green snake (*Opheodrys aestivus*), eastern milk snake (*Lampropeltis triangulum triangulum*), and mole kingsnake (*L. calligaster rhombomaculata*). These animals inhabit fields, woodlands, river bottoms, and stream edges of the Piedmont and lower mountains in North Carolina. No reptiles were observed during the site visit.

Many bird species may inhabit or migrate through the project area. Inhabitants may include red-bellied woodpecker (*Melanerpes carolinus*), hairy woodpecker (*Picoides villosus*), downy woodpecker (*P. pubescens*), blue jay (*Cyanocitta cristata*), Carolina chickadee* (*Parus carolinensis*), tufted titmouse* (*P. bicolor*), white-breasted nuthatch (*Sitta carolinensis*), American robin* (*Turdus migratorius*), northern cardinal* (*Cardinalis cardinalis*), northern mockingbird* (*Mimus polyglottos*), house finch (*Carpodacus mexicanus*), Carolina wren* (*Thryothorus ludovicianus*), dark-eyed junco* (*Junco hyemalis*), American goldfinch* (*Carduelis tristis*), and brown-headed cowbird (*Molothrus ater*). Predatory species may include red-tailed hawk (*Buteo jamaicensis*), eastern screech owl (*Otus asio*), and barred owl (*Strix varia*).

A wide variety of mammals are expected to inhabit the project area and surrounding landscape. Virginia opossum (*Didelphis virginiana*), woodchuck (*Marmota monax*), gray squirrel* (*Sciurus carolinensis*), eastern harvest mouse (*Reithrodontomys humulis*), raccoon (*Procyon lotor*), eastern spotted skunk (*Spilogale putorius*), white-tailed deer* (*Odocoileus virginianus*), beaver* (*Castor canadensis*) and muskrat (*Ondatra zibethicus*) are species mostly likely to be found. Bats such as the eastern pipistrelle (*Pipistrellus subflavus*), the eastern red (*Lasiurus borealis*), and the evening bat (*Nycticeius humeralis*) may be present in the project area.

3. Aquatic Communities

Minor bank erosion was observed along Strouds Creek. A primary reason for the minimal erosion is the presence of several existing beaver dams upstream of the project area and evidence of historic beaver dams within the project area. These structures act as grade control for the stream and slow the water during large rain events. During a cursory visual macroinvertebrate survey of Strouds Creek, several stoneflies (Order: Plecoptera) and caddisflies (Order: Tricoptera) were observed, especially at a large riffle immediately downstream of Bridge No. 66.

The project area likely has a limited amphibian population, which may include salamanders and frogs. Spring peepers (*Hyla crucifer*) and pickerel frogs (*Rana palustris*) are two species that may be present.

Reptiles that spend the majority of their lives in aquatic communities and are somewhat common throughout this portion of North Carolina include the snapping turtle (*Chelydra serpentina*), eastern

musk turtle (*Sternotherus odoratus*), yellowbelly slider (*Chrysemys scripta*), and northern water snake (*Nerodia sipedon*).

Fish that are likely to utilize Strouds Creek include yellow bullhead (*Ameiurus natalis*), largemouth bass (*Micropterus salmoides*), American eel (*Anguilla rostrata*), rosyside dace (*Clinostomus funduloides*), and creek chub (*Semotilus atromaculatus*). According to information provided by the North Carolina Wildlife Resources Commission (NCWRC), Strouds Creek contains a large sunfish population that includes redbreast sunfish (*Lepomis auritus*), bluegill (*Lepomis macrochirus*), green sunfish (*Lepomis cyanellus*), and warmouth (*Lepomis gulosus*).

4. Anticipated Impacts to Biotic Communities

a. Terrestrial Communities

Table 3 shows permanent impacts to terrestrial biotic communities. These impacts were estimated based upon the approximate construction limits of the two alternatives.

Table 3. Estimated Impacts to Terrestrial Communities

Vegetative Community	Alternative A (preferred) (acres)	Alternative B (acres)
Piedmont Alluvial Forest	0.18	0.48
Mixed Pine/Hardwood Forest	0.82	1.33
Urban/Disturbed Community	0.88	1.62
Totals	1.88	3.43

Temporary fluctuation in populations of animal species that utilize terrestrial areas is anticipated during construction. Slow-moving, burrowing, and subterranean organisms will be directly impacted by construction activities, while mobile organisms will be displaced to adjacent communities. Habitat reduction may occur when an ecosystem is disturbed.

b. Aquatic Communities

Aquatic organisms are very sensitive to the discharges and inputs resulting from construction activities. Impacts usually associated with in-stream construction include increased channelization and scouring of the streambed. In-stream construction alters the substrate and impacts adjacent stream-side vegetation. Such disturbances within the substrate lead to increased siltation, which can clog the gills and feeding mechanisms of benthic organisms, fish, and amphibian species.

Appropriate measures will be taken to avoid spillage of construction materials and control runoff. Such measures include an erosion and sedimentation control plan, provisions for disposal and handling of waste materials and storage, stormwater management measures, and appropriate road maintenance measures. NCDOT's *Best Management Practices for Protection of Surface Waters* (BMP-PSW) and Sedimentation Control guidelines will be enforced during the construction stages of the project.

The removal of stream-side vegetation and placement of fill material during construction contributes to erosion and possible sedimentation. Quick revegetation of these areas helps to reduce the impacts by supporting the underlying soils. Erosion and sedimentation may carry soils, toxic compounds, trash, and other materials into the aquatic communities at the construction site. As a result, sand bars may be formed both at the site and downstream. Increased light penetration from the removal of stream-side vegetation may increase water temperatures. Warmer water contains less oxygen, thus reducing aquatic life that depends on high oxygen concentrations.

E. SPECIAL TOPICS

1. "Waters of the United States:" Jurisdictional Issues

Surface waters and wetlands within the project area are subject to jurisdictional consideration under Section 404 of the Clean Water Act (CWA) as "Waters of the United States." At the Federal Level the USACE has the responsibility for implementation, permitting, and enforcement of the provision of the CWA. The USACE regulatory program is defined in 33 CFR 320-330. At the state level NCDWQ has the responsibility for implementation, permitting, and enforcement of the provisions of the CWA.

Jurisdictional surface waters include perennial and intermittent streams and certain impoundments. Strouds Creek occurs as a perennial surface water in the study area.

Wetlands, defined in 33 CFR 328.3, are those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. No jurisdictional wetlands occur within the project area.

2. Permits

Permits will be required for roadway encroachment into surface waters. The USACE issues Section 404 Nationwide 23 permits for activities that are categorically excluded from environmental documentation because they are included within a category of actions that do not have a significant effect on the environment. Regional conditions also require compliance with General Condition 13 concerning notification and coordination with the USACE for permit applications for projects with greater than 150 total linear feet of impacts.

The USACE issues Nationwide Permit 33 when construction activities necessitate the use of temporary structures such as cofferdams, placement of access fill material, or dewatering of the construction site. In addition to the requirements for NWP 23, any work below the ordinary high water mark must be permanently stabilized at the earliest practicable date and a restoration plan of reasonable measures to avoid and minimize adverse effects to aquatic resources must be submitted.

A Section 401 General Water Quality Certification is necessary for projects that require Section 404 permits. The State has General Certifications that will match the permit type authorized by the USACE. The NCDWQ must issue the 401 Certification before the USACE will issue the 404 Permit. Compensatory mitigation may be required when more than 150 linear feet of stream and/or

more than one acre of wetland impacts occur. Written concurrence from the NCDWQ is not required.

Due to a lack of jurisdictional wetlands within the project area, permits involving activities that discharge fill into jurisdictional wetlands and surface waters are not anticipated to be required.

The bridge demolition activities associated with this replacement will follow NCDOT's *Best Management Practices for Construction and Maintenance.* All methods of demolition shall be considered and implemented where practical, other than dropping the bridge in the water. The timber deck and timber bridge railing can be removed without being dropped into Waters of the US; however, there is potential for components of the substructure to be dropped into Waters of the US. Permitting will be coordinated such that any permit needed for bridge construction will address issues related to bridge demolition. If there is a practical alternative to dropping bridge components into the water, that alternative will be followed.

3. Buffer Rules

The Neuse River Riparian Buffer Rule applies to 50-foot wide riparian buffers directly adjacent to perennial and intermittent surface waters in the Neuse River Basin. This rule does not apply to portions of the riparian buffer where a use is existing and ongoing. Any change in land use within the riparian buffer is characterized as an impact. The Nutrient Sensitive Waters Management Strategy for the Protection and Maintenance of Riparian Buffers (15 A NCAC 2B .0233) provides a designation for uses that cause impacts to riparian buffers within the Neuse Basin. Neuse River Buffers are divided into two zones. Zone 1 includes the first 30 feet out from the water and essentially must remain undisturbed. Zone 2 consists of the landward 20 feet which must be vegetated, but allows for certain land uses. Grading and replanting in Zone 2 is allowed provided that the health of the vegetation in Zone 1 is not compromised.

Table 4 shows anticipated Neuse River Buffer impacts for the proposed project.

Table 4. Estimated Neuse River Buffer Impacts

Proposed Alternatives	Zone 1 (acres)	Zone 2 (acres)	Total Neuse River Buffer Impacts (acres)
Alternative A (preferred)	0.06	0.08	0.14
Alternative B	0.14	0.11	0.25

Simple perpendicular bridge crossings are designated Allowable within the riparian buffer. The Allowable designation means that the intended uses may proceed within the riparian buffer provided that there are no practical alternates. Allowable with Mitigation buffer impacts for bridge replacement projects are addressed when parallel impacts to jurisdictional waters occur. Allowable and Allowable with Mitigation buffer impacts require written authorization from the Division of

Water Quality prior to project development. Both of the proposed alternatives are expected to have only Allowable buffer impacts.

4. Mitigation

Mitigation of impacts has been defined by the Council on Environmental Quality to include avoidance, minimization, and compensation. These activities must be considered in sequential order.

Avoidance examines all appropriate and practicable possibilities of averting impacts to Waters of the US. Bridge No. 66 is structurally deficient; avoiding replacement is not a feasible option.

Minimization includes the examination of appropriate and practicable steps to reduce adverse impacts to Waters of the US. Both alternatives minimize the amount of in-stream impacts by replacing the existing bridge with another bridge instead of a culvert or pipe. The proposed alternatives are longer than the existing bridge, thereby minimizing floodplain impacts. By replacing the bridge in-place and having an off-site detour, Alternative A further minimizes impacts to the floodplain associated with Strouds Creek.

Compensatory mitigation includes restoration, enhancement, creation, or preservation of stream functions and values that are lost when these systems are converted to other uses. The USACE usually requires compensatory mitigation for activities authorized under Section 404 of the Clean Water Act when there are unavoidable impacts to perennial or intermittent streams.

Because there are no anticipated impacts to jurisdictional wetlands or streams, compensatory stream and wetland mitigation is not expected to be required for either of the proposed alternatives.

F. Rare and Protected Species

Federal law (under the provisions of Section 7 of the Endangered Species Act [ESA] of 1973, as amended) requires that any action likely to adversely affect a species classified as federally-protected be subject to review by the USFWS. Other species may receive additional protection under separate laws.

1. Federally Protected Species

Species which are listed, or are proposed for listing, as endangered or threatened are recorded in Section 4 of the ESA. As of the latest list dated January 31, 2008, the USFWS identified four endangered species known to occur in Orange County (Table 5). Species descriptions and biological conclusions are provided below. The North Carolina Natural Heritage Program (NCNHP) maps were reviewed on February 12, 2008 utilizing data updated on September 28, 2007 to determine if any protected species have been identified near the project area. This map review confirmed that no species identified as endangered or threatened by the USFWS have been identified within a one-mile radius of the project area. It should be noted that the bald eagle (*Haliaeetus leucocephalus*) was formerly listed as a Threatened species for Orange County; however, as of August 8, 2007 it has been formally delisted. Information regarding the bald eagle is included in Section F.3.

Table 5. Federally Protected Species for Orange County

Common Name	Scientific Name	Federal Status
Red-cockaded woodpecker	*Picoides borealis*	Endangered
Dwarf wedge mussel	*Alasmidonta heterodon*	Endangered
Michaux's sumac	*Rhus michauxii*	Endangered
Smooth coneflower	*Echinacea laevigata*	Endangered

Red-cockaded woodpecker (*Picoides borealis)*
Federal Status: Endangered
State Status: Endangered
Date Listed: October 13, 1970

This bird is a small, seven- to eight-inch tall woodpecker with a black and white barred back and conspicuous large white cheek surrounded by a black cap, nape, and throat. Males have a very small red mark at the upper edge of the white cheek and just behind the eye. The red-cockaded woodpecker (RCW) is found in open pine forests in the southeastern United States. The RCW uses open old growth stands of southern pines, particularly longleaf pine (*Pinus palustris*), for foraging and nesting habitat. A forested stand optimally should contain at least 50 percent pine and lack a thick understory. The RCW is unique among woodpeckers because it nests almost exclusively in living pine trees. These birds excavate nests in pines greater than 60 years old that are contiguous with pine dominated, foraging habitat. The foraging range of the RCW may extend 500 acres and must be contiguous (separated by no more than 330 linear feet) with suitable nesting sites.

Living pines infected with red-heart disease (*Formes pini*) are often selected for cavity excavation because the inner heartwood is usually weakened. Cavities are located from 12 to 100 feet above ground level and below live branches. These trees can be identified by "candles," a large encrustation of running sap that surrounds the tree. Colonies consist of one to many of these candle trees. The RCW lays its eggs in April, May, and June; the eggs hatch approximately 10 to 12 days later.

Biological Conclusion: *NO EFFECT*

Suitable habitat for the RCW consisting of open, mature stands of southern pines does not exist within the project area. The pines that are present in the project area are young (<30 years old), mixed with various hardwoods, and the forests contain a thick understory. Proposed project construction is not expected to impact this species. Based upon this consideration, the proposed project will have **NO EFFECT** on the RCW.

Dwarf wedge mussel (*Alasmidonta heterodon*)
Federal Status: Endangered
State Status: Endangered
Date Listed: March 14, 1990

The dwarf wedge mussel is relatively small, rarely exceeding 1.5 inches in length. The shell's outer surface is usually brown or yellowish brown in color, with faint green rays that are most noticeable in young specimens. Unlike some mussel species, the male and female shells differ slightly, with the female being wider to allow greater space for egg development. A distinguishing characteristic of this mussel is its dentition pattern: the right valve possesses two lateral teeth, while the left valve has only one. This trait is opposite of all other North American species having lateral teeth. This mussel inhabits creeks and rivers that have a slow to moderate current with a sand, gravel, or muddy bed. These streams must be nearly silt free in order to support dwarf wedge mussels.

The dwarf wedge mussel is considered to be a long-term brooder, with gravid females reportedly observed in fall months. Like other freshwater mussels, this species' eggs are fertilized in the female by sperm that are taken in through their siphons as they respire. The eggs develop within the female's gills into larvae (glochidia). The females later release these glochidia, which then attach to the gills or fins of specific host fish species. Based on anecdotal evidence, such as dates when gravid females are present or absent, it appears that release of glochidia occurs primarily in April in North Carolina. While the USFWS notes that the host fish species is unknown, evidence indicates that an anadromous fish which migrates from ocean waters to fresh waters for spawning may be the likely host species. However, recent research has confirmed at least three potential fish host species for the dwarf wedge mussel in North Carolina: the tessellated darter, Johnny darter, and mottled sculpin. These fish species are found in Atlantic coast drainages of North Carolina.

Biological Conclusion: *MAY AFFECT, NOT LIKELY TO ADVERSELY AFFECT*

Suitable habitat for the dwarf wedge mussel consisting of nearly silt-free streams, with slow to moderate currents exists within the project area. However, the Strouds Creek watershed currently exhibits a moderate silt load resulting from residential development upstream, and therefore, does not provide exceptional habitat for the dwarf wedge mussel.

A freshwater mussel survey was conducted on March 25, 2004. According to the report, three species of freshwater mussels were observed: elliptio mussels (*Elliptio* spp.), creeper (*Strophitus undulatus*), and notched rainbow (*Villosa constricta*). No dwarf wedge mussel individuals were observed during the surveys, and the report gave a recommended biological conclusion of **MAY AFFECT, NOT LIKELY TO ADVERSELY AFFECT**. The USFWS concurred with the findings and biological conclusion in a letter dated December 15, 2004. A copy of the USFWS concurrence letter is included in the Appendix. According to the Natural Environment Unit, a resurvey for dwarf wedge mussel is planned for 2008.

Michaux's sumac (*Rhus michauxii*)
Federal Status: Endangered
State Status: Endangered-Special Concern
Date Listed: September 28, 1989

Michaux's sumac is a rhizomatous, densely hairy shrub, with erect stems from one to three feet in height. The compound leaves contain evenly serrated, oblong to lanceolate, acuminate leaflets. Most plants are unisexual; however, more recent observations have revealed plants with both male and female flowers on one plant. The flowers are small, borne in a terminal, erect, dense cluster, and colored greenish yellow to white. Flowering usually occurs from June to July; while the fruit, a red drupe, is produced through the months of August to October. Only 36 extant populations are known, with 31 in North Carolina, three in Virginia, and two populations in Georgia.

Michaux's sumac grows in sandy or rocky open woods in association with basic soils. It spreads by producing cloning shoots from the roots of mature plants. Apparently, this plant survives best in areas where some form of periodic disturbance provides open areas. At least twelve of the plant's populations in North Carolina are on highway rights-of way, roadsides, or on the edges of artificially maintained clearings.

Biological Conclusion: *NO EFFECT*

Suitable habitat for Michaux's sumac consisting of sandy or rocky open woods does not exist in the project area. The mapped soil units throughout the project area contain soils with textures of silty loam to silty clay. Since Michaux's sumac spreads by clonal shoots from root systems, the firm soils in these areas would not provide suitable habitat for this plant. Based upon this assessment, the project would have **NO EFFECT** on Michaux's sumac.

Smooth coneflower (*Echinacea laevigata*)
Federal Status: Endangered
State Status: Endangered
Date Listed: October 8, 1992

Smooth coneflower is a rhizomatous perennial herb that grows up to five feet tall from a vertical root stock. The stems are smooth, with few leaves. The largest leaves are the basal leaves, which reach eight inches in length and three inches in width, have long stems, and are elliptical to broadly lanceolate, tapering to the base, and smooth to slightly rough. Mid-stem leaves have shorter stems or no stems and are smaller in size than the basal leaves. The rays of the flowers (petal-like structures) are light pink to purplish, usually drooping, and two to just over three inches long. Flower heads are usually solitary, with flowering occurring from May through July. The species is now known to survive only in Virginia, North Carolina, South Carolina, and Georgia. Six populations survive in North Carolina, and are located in Durham and Granville Counties.

The habitat of smooth coneflower is open woods, cedar barrens, roadsides, clearcuts, dry limestone bluffs, and power line rights-of-way, usually on magnesium- and calcium-rich soils associated with limestone (in Virginia), gabbro (in North Carolina and Virginia), diabase (in North Carolina and South Carolina), and marble (in South Carolina and Georgia). Optimal sites are characterized by

abundant sunlight and little competition in the herbaceous layer. Natural fires, as well as large herbivores, are part of the history of the vegetation in this species' range.

Biological Conclusion: ***NO EFFECT***

Suitable habitat for the smooth coneflower consisting of open and disturbed areas within regions containing a gabbro or diabase geology is present within the project area. The USFWS has established the late May to October period as an appropriate bloom-time survey window for this species. A pedestrian survey for the smooth coneflower was conducted on September 24, 2004 and again on June 6, 2006. No smooth coneflower individuals were observed during either survey. The USFWS concurred with the findings and biological conclusion **MAY AFFECT, NOT LIKELY TO ADVERSELY AFFECT**, the smooth coneflower in a letter dated October 8, 2004. A copy of the USFWS concurrence letter is included in the Appendix. Based on current protocol, smooth coneflower would receive a **NO EFFECT** biological conclusion. Due to the date of the last survey and the Let date of the project, a re-survey for smooth coneflower will be conducted in 2008.

2. Federal Species of Concern

Federal Species of Concern (FSC) are not legally protected under the Endangered Species Act and are not subject to any of its provisions, including Section 7. Species designated as FSC are defined as taxa, which may or may not be listed in the future. These species were formerly Candidate 2 (C2) species or species under consideration for listing for which there is insufficient information to support listing. The USFWS lists 11 FSCs that are known to occur in Orange County. NCNHP maps were reviewed on February 12, 2008 utilizing information updated on September 28, 2007, to determine if any protected species have been identified near the project area. According to the NCNHP information, a population of Atlantic pigtoe, FSC mussel species listed in Orange County, is located approximately 0.25 miles southeast of the study area in the Eno River. NCNHP does not depict any other populations of FSC's within one-mile of the project area.

Species identified as Endangered, Threatened, or Special Concern by the State of North Carolina are afforded state protection under the State Endangered Species Act and the North Carolina Plant Protection and Conservation Act of 1979. Orange County FSCs per the September 2007 NCNHP database, their state status, and the existence of suitable habitat within the project area are shown in Table 6.

Several state protected species have been identified at various locations within one mile of the project area. These include Yellow lampmussel (*Lampsilis cariosa*), creeper (*Strophitus undulates*), and Neuse River waterdog (*Necturus lewisi*). In addition, three areas mapped as NCNHP Identified Priority Areas (IPA) are located within three miles of the project area. These IPAs are the Eno River Aquatic Habitat, located throughout the Eno River; the Poplar Ridge Slopes, located along the southern side of the Eno River; and an Upland Depression Swamp Forest, a small area found 2.5 miles southeast of the project area.

Table 6. Federal Species of Concern, State Status, and Potential Habitat

Common Name	Scientific Name	State Status	Habitat Available
American eel	*Anguilla rostrata*	None	Yes
Carolina darter	*Etheostoma collis lepidinion*	SC	No
Common Name	**Scientific Name**	**State Status**	**Habitat Available**
Roanoke bass	*Ambloplites cavifrons*	SR	No
Atlantic pigtoe	*Fusconaia masoni*	E	Yes
Brook floater	*Alasmidonta varicosa*	E	Yes
Green floater	*Lasmigona subviridis*	E	Yes
Savanna lilliput	*Toxolasma pullus*	E	Yes
Yellow lampmussel	*Lampsilis cariosa*	E	Yes
Butternut	*Juglans cinerea*	None	Yes
Creamy tick-trefoil	*Desmodium ochroleucum*	SR-T	No
Sweet pinesap	*Monotropsis odorata*	SR-T	No
Torrey's mountain mint	*Pycnanthemum torrei*	SR-T	No

Notes:
E-Endangered, SC-Special Concern, SR-Significantly Rare, -T-Throughout

3. Bald Eagle Status and Concerns

As of August 8, 2007 the bald eagle has been delisted (formerly Threatened) from the USFWS Endangered Species list. According to the December 20, 2007 USFWS list of federally protected species for Orange County, the bald eagle receives protection from the Bald and Golden Eagle Protection Act (BGPA). This federal law prohibits "taking" -- killing, selling or otherwise harming eagles, their nests or eggs. Due to the bald eagle's current delisted status, a biological conclusion is no longer necessary for this species.

Suitable habitat for the bald eagle consisting of large bodies of open water does not exist within the project area or within 0.5 mile of the project area. Strouds Creek is too small to support and sustain bald eagles for nesting or foraging. The Eno River, located approximately 1,800 feet downstream of Bridge No. 66, does not provide suitable habitat for the bald eagle until the back waters of Falls Lake approximately 12.5 miles east of Bridge No. 66. In addition, NCNHP does not list any occurrences of the bald eagle within a one-mile radius of the project area. Therefore, it is anticipated that the proposed project construction will not impact bald eagles or their habitat.

VI. CULTURAL RESOURCES

A. COMPLIANCE GUIDELINES

This project is subject to compliance with Section 106 of the National Historic Preservation Act of 1966, as amended, and implemented by the Advisory Council on Historic Preservation's Regulations for Compliance with Section 106, codified at 36 CFR Part 800. Section 106 requires federal agencies to take into account the effect of their undertakings (federally funded, licensed, or permitted) on properties listed in or eligible for the National Register of Historic Places, and to afford the Advisory Council on Historic Preservation a reasonable opportunity to comment on such undertakings.

B. HISTORIC ARCHITECTURE

A field survey of the Area of Potential Effects (APE) was conducted on July 28, 2004. All structures within the APE were photographed, and later reviewed by NCDOT architectural historians and staff at the State Historic Preservation Office (HPO). The John Berry-Baldwin House (Sunnyside) was identified as eligible for the National Register of Historic Places. The house is eligible under Criterion B for its nineteenth century builder-architect, John Berry, and Criterion C for its architecture. The John Berry-Baldwin House is also a contributing building to the St. Mary's Road Historic District (Figure 6). In a letter dated March 5, 2004, the HPO concurred that the John Berry-Baldwin House is individually eligible for the National Register of Historic Places and is listed in the State Study List.

In a concurrence form dated August 30, 2004, the HPO concurred with the NCDOT and FHWA determination that Alternative A would have no adverse effect on the John Berry-Baldwin House and the St. Mary's Road Rural Historic District with the following conditions: use of anodized two-bar metal railing and guardrail, on the new bridge, and the preparation of a landscape plan, in consultation with the property owner and HPO, for the St. Mary's Road frontage affected by the proposed permanent drainage easement. The HPO concurred with the NCDOT and FHWA's determination that Alternative B would have an adverse effect.

After efforts to further minimize harm to the historic property, the HPO, in a concurrence form dated January 28, 2008, concurred that Alternative A would have no adverse effect on the historic property with the condition that a landscape plan be prepared in consultation with the historic property owner. The FHWA used the HPO's concurrence as a basis for a "de minimis" finding for the historic property. As a result, no further evaluation is necessary for the John Berry-Baldwin property.

Both concurrence forms are included in the Appendix.

NCDOT and HPO staff met with the owner of the John Berry-Baldwin House on January 22, 2004 and agreed to the joint development of a landscape plan. NCDOT Roadway Design will coordinate with the property owner, and HPO will review the resultant plan.

C. ARCHAEOLOGY

In a memorandum dated March 4, 2004, the HPO recommended that "no archaeological investigation be conducted in connection with this project." A copy of the memorandum is included in the Appendix.

VII. ENVIRONMENTAL EFFECTS

The project is a Federal "Categorical Exclusion" due to its limited scope and lack of substantial environmental consequences.

The bridge replacement will not have an adverse effect on the quality of the human or natural environment with the use of current NCDOT standards and specifications.

The project is not in conflict with any plan, existing land use, or zoning regulation. No substantial change in land use is expected to result from construction of the project.

No adverse impact on families or communities is anticipated. Right-of-way acquisition will be limited. No relocations of residents or businesses are expected with implementation of the proposed alternative.

In compliance with Executive Order 12898 (Federal Actions to Address Environmental Justice in Minority Populations and Low Income Populations) a review was conducted to determine whether minority or low-income populations were receiving disproportionately high and adverse human health or environmental impacts as a result of this project. The investigation determined the project would not disproportionately impact any minority or low-income populations.

No adverse effect on public facilities or services is anticipated. The project is not expected to adversely affect social, economic, or religious opportunities in the area.

There are no wildlife and waterfowl refuges of national, state, or local significance in the immediate project area.

The Eno River State Park proposes to expand park boundaries westward along the Eno River to US 70 Bypass. The NC Division of Parks and Recreation purchased a 22-acre parcel in 2004 with State Parks & Recreation Trust Funds. The parcel is located in the southeast quadrant of the project area and along Strouds Creek down to the Eno River, approximately 1,300 feet. Since the proposed project will require a permanent drainage easement on property from a publicly owned recreational facility, an evaluation is required in accordance with Section 4(f) of the US Department of Transportation Act of 1966 (23 CFR 771.135). See Section IX for the Section 4(f) Evaluation.

The Farmland Protection Policy Act requires all federal agencies or their representatives to consider the potential impacts to prime and important farmland soils by all land acquisition and construction projects. Prime and important farmland soils are defined by the Natural Resources Conservation Service. Since the proposed bridge will be replaced at the existing location, the Farmland Protection Policy does not apply.

The project is located in Orange County, which has been determined to be in compliance with the National Ambient Air Quality Standards. Therefore, 40 CFR Parts 51 and 93 are not applicable, because the proposed project is located in an attainment area. This project is not anticipated to create any adverse effects on the air quality of this attainment area.

The purpose of this project is to replace Bridge No. 64 by constructing a new structure. The project will not result in any meaningful changes in traffic volumes, vehicle mix, location of the existing facility, or any other factor that would cause an increase in emissions impacts relative to the No-Build alternative. As such, FHWA has determined that this project will generate minimal air quality impacts for Clean Air Act criteria pollutants and has not been linked with any special mobile source air toxic (MSAT) concerns. Consequently, this effort is exempt from analysis for MSATs.

EPA regulations for vehicle engines and fuels will cause overall MSATs to decline significantly over the next 20 years. FHWA predicts MSATs will decline in the range of 57 to 87 percent, from 2000 to 2020, based on regulations now in effect, even with a projected 64 percent increase in vehicle miles traveled (VMT). Therefore, both the background level of MSATs and the possibility of even minor MSAT emissions from this project will be reduced.

The project is located in Orange County, which is within the Raleigh-Durham-Chapel Hill nonattainment area for ozone (O_3). The area was designated nonattainment for O_3 under the eight-hour ozone standard effective June 15, 2004. Section 176(c) of the CAAA requires that transportation plans, programs, and projects conform to the intent of the state air quality implementation plan (SIP). The current SIP does not contain any transportation control measures for Orange County. The Durham-Chapel Hill-Carrboro Metropolitan Planning Organization (MPO) 2030 Long Range Transportation Plan (LRTP), the Burlington Graham MPO 2030 LRTP and the 2004-2010 Metropolitan Transportation Improvement Programs (MTIPs) conform to the intent of the SIP (or base year emissions, in areas where no SIP is approved or found adequate). The USDOT made conformity determinations on the Durham-Chapel Hill-Carrboro MPO LRTP, the Burlington Graham MPO LRTP and Orange County projects from the State Transportation Improvement Program (STIP) on June 15, 2005.

For the donut area of Orange County, the projects from the 2006-2012 STIP conform to the intent of the SIP (or base year emissions, in areas where no SIP is approved or found adequate). The current conformity determinations are consistent with the final conformity rule found in 40 CFR Parts 51 and 93. There are no significant changes in the project's design concept of scope, as used in the conformity analyses.

This project is an air quality "neutral" project, so it is not required to be included in the regional emission analysis (if applicable) and a project level CO analysis is not required.

Traffic volumes will not increase or decrease because of this project. The project's impact on noise and air quality will not change.

Noise levels could increase during construction but will be temporary. If vegetation is disposed of by burning, all burning shall be done in accordance with applicable local laws and regulations of the North Carolina State Implementation Plan (SIP) for air quality in compliance with 15 NCAC 2D.0520. This evaluation completes the assessment requirements for highway traffic noise (23 CFR

772) and for air quality (1990 CAAA and NEPA) and no additional reports are required. The proposed project is not considered a Type 1 project per 23 CFR 772.5 (h).

An examination of records at the North Carolina Department of Environment and Natural Resources, Division of Water Quality, Groundwater Section and the North Carolina Division of Solid Waste Management revealed no hazardous waste sites in the project area. A field reconnaissance survey was performed and no underground storage tank (UST) sites were found within the project area. If any unregulated USTs or any potential source of contamination is discovered during right-of-way initial contacts with impacted property owners, then an assessment will be conducted to determine the extent of any contamination at that time.

The drainage area of Strouds Creek at the proposed crossing is approximately nine square miles. Orange County is currently participating in the National Flood Insurance Program. The project site is located in a FEMA Special Flood Hazard Zone. It is not anticipated that a floodway modification will be required since the bridge will be an "in kind" replacement. The Flood Insurance Rate Map (Figure 7) shows the approximate limits of the 100-year floodplain in the vicinity of the project. This stream is not included on the 303(d) list for impaired streams

On the basis of the above discussion, it is concluded that no significant adverse environmental effects will result from implementation of the project.

VIII. Public Involvement

Scoping letters were sent early in the planning process to involve local officials and agency representatives in the development of this project.

A combined Citizens Informational Workshop for B-4216 and B-4592 was held on September 27, 2004 at C. W. Stanford Middle School. Residents, property owners, and business owners had the opportunity to take part in project development, ask questions, and voice concerns. Bridge No. 66 proposed Alternatives A and B were displayed along with alternatives for Bridge No. 64 (B-4592). Seventeen citizens attended the meeting and eight comment sheets were received. Five citizens preferred Alternative A for Bridge No. 66.

An informational newsletter was mailed to area residents and appropriate officials in March 2006 identifying Alternative A as the preferred alternative. No comments were received in response to the newsletter.

IX. Section 4(f) of the Department of Transportation Act of 1966

The North Carolina Department of Transportation (NCDOT) in coordination with the Federal Highway Administration (FHWA) proposes a transportation action to replace Bridge No. 66 on SR 1002 (St. Mary's Road) over Strouds Creek. One historic property and one public recreation area are located along SR 1002 in the project area. The historic property and the public recreation area require an evaluation in accordance with Section 4(f) of the US Department of Transportation Act of 1966 and the federal regulations 23 CRF 771.135.

Part 23 CFR 771.135 Section 4(f) (49 U.S.C. 303) states that "The Administrator may not approve the use of land from a significant publicly owned public park, recreation area, or wildlife and waterfowl refuge, or any significant historic site unless a determination is made that:

(i) There is no feasible and prudent alternative to the use of land from the property; and
(ii) The action includes all possible planning to minimize harm to the property resulting from such use."

A. Proposed Action

The proposed action includes the replacement of the existing bridge with a new bridge approximately 100 feet in length. The new bridge will be approximately 36 feet wide and will provide two 12-foot travel lanes with six-foot shoulders (Figure 4A). Standard bicycle safe bridge railing 54 inches in height will be provided. The guardrail and bridge railing will be anodized metal railing. The existing vertical clearance will be maintained.

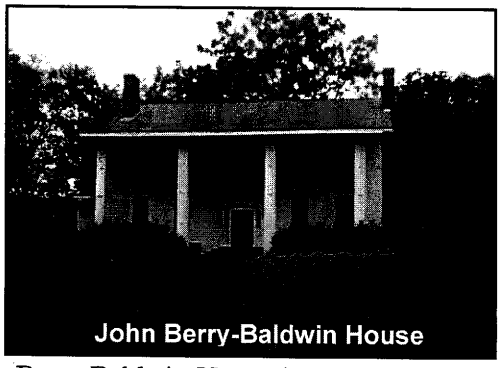
The approach roadway will provide two 12-foot travel lanes with eight-foot shoulders, including four-foot paved (Figure 4A). The existing 60-foot right-of-way will be maintained and a temporary construction easement will be required for construction and the park driveway connection.

The purpose of this project is to replace an older, functionally obsolete structure with a wider structure that will carry the standard loads.

B. Description of 4(f) Resource

Within the project area, there is one property eligible for the National Register of Historic Places and one publicly owned recreational facility that qualify as Section 4(f) resources.

1. John Berry-Baldwin House


John Berry-Baldwin House

The John Berry-Baldwin House (Sunnyside), located in the northwest quadrant of Bridge No. 66 (Figure5A), is eligible for the National Register of Historic Places. The property is accessed off of SR 1544 (Baldwin Road). The house is eligible under Criterion B for its nineteenth-century builder-architect, John Berry, and Criterion C for its architecture. The John Berry-Baldwin House is a contributing building to the St. Mary's Road Rural Historic District, listed on the State Study List in 2001 (Figure 6). In a letter dated March 5, 2004, the State Historic Preservation Office (HPO) concurred that the John Berry-Baldwin House is individually eligible the National Register of Historic Places and is listed in the State Study List.

The National Register boundary (Figure 6) follows the existing right-of-way on St. Mary's Road and the existing right-of-way on Baldwin Road. It includes approximately 16 acres.

2. Eno River State Park

The property is in the southwest quadrant of the project area and along Strouds Creek. It is within the Eno River State Park (Figure 2). The Eno River State Park consists of the river and over 2,731

acres of riparian land. It is within the Eno River Valley in Orange and Durham counties, northwest of the City of Durham. Acquisition of additional land is planned to protect the river valley and its significant natural resources and to provide new outdoor recreation and environmental education opportunities. In 2004, 22 acres on St. Mary's Road along Strouds Creek were acquired with State Parks & Recreation Funds. The funds used are not Section 6(f) funds from the Land and Water Conservation Funds. The existing access to the property is approximately 80 feet from the existing bridge. No park amenities exist.

C. Impacts to Section 4(f) Property

The project proposes to replace the existing 24-foot wide bridge with a 36-foot wide bridge and provide guardrail on the approaches. The replacement structure will be approximately 100 feet long compared to 50 feet for the existing structure. Access to the park will be moved approximately 160 feet west to provide for the bridge approach guardrail. Temporary construction easements and permanent drainage easements will be necessary for the improvements. Table 7 shows impacts to the park property and the John Berry Baldwin property.

Table 7. Summary of Impacts to Section 4(f) Resources

	Temporary	Permanent
Baldwin Property	0.03	0.30
Eno River State Park	0.18	0.13

During the preliminary design of the recommended alternative, the minimum standard shoulder section was incorporated into the design to minimize harm to the Section 4(f) property.

D. Avoidance Alternatives

Several preliminary alternatives were considered for the project, including the No-Build Alternative, rehabilitation, and new alignment. Each of these alternatives was eliminated from further study because they did not meet the purpose and need for the project.

1. The No-Build alternative will eventually necessitate closure of the bridge. This is not desirable due to the traffic service provided by SR 1002 on Bridge No. 66.

2. Investigation of the existing structure by the NCDOT's Bridge Maintenance Unit indicates that rehabilitation of this bridge is not feasible because of its age and deteriorated condition.

3. Alignments on new location within the project area were eliminated because additional right-of-way would be required from the Section 4(f) resources.

E. Additional Measures to Minimize Harm

Measures to minimize harm were incorporated during the design for both the historic resource and the park property. These are described below.

1. John Berry-Baldwin House

1. Maintaining the existing horizontal and vertical alignments.
2. Use of an off-site detour during construction of the new bridge.
3. Minimizing the standard shoulder and ditch section to avoid right-of-way acquisition.
4. Providing anodized two-bar metal railing on the bridge and anodized guardrail on the roadway approaches.
5. Commitment to develop a landscape plan with the owner of the historic John Berry-Baldwin property, HPO, and NCDOT.

2. Eno River State Park

1. Maintaining the existing vertical clearance.
2. Use of an off-site detour during construction of the new bridge.
3. Minimizing the standard shoulder and ditch section to avoid right-of-way acquisition.
4. Providing anodized two-bar metal railing on the bridge and anodized guardrail on the roadway approaches.
5. Connecting the relocated driveway to the existing driveway.

F. Coordination

Early coordination for the project was initiated with the Historic Preservation Office (HPO) during project scoping. Additional coordination with the HPO was held during the development of the project to obtain concurrence with the eligibility of properties over 50 years old and to obtain the determination of effects to the eligible properties in accordance with Section 106 of the National Historic Preservation Act. NCDOT and HPO staff met with the owner of the John Berry-Baldwin House on January 22, 2004 and agreed to the joint development of a landscape plan. NCDOT Roadway Design will coordinate with the property owner, and HPO will review the resultant plan.

In a concurrence form dated August 30, 2004, the HPO concurred with the NCDOT and FHWA determination that Alternative A would have no adverse effect on the John Berry-Baldwin House and the St. Mary's Road Rural Historic District with the following conditions: use of anodized two-bar metal railing and guardrail, and preparation of a landscape plan with the property owner, HPO, and the NCDOT. The HPO concurred with the NCDOT and FHWA's determination that Alternative B would have an adverse effect.

After efforts to further minimize harm to the historic property, the HPO, in a concurrence form dated January 28, 2008, concurred that Alternative A would have no adverse effect on the historic property with the condition that a landscape plan be prepared in consultation with the historic property owner. The FHWA indicated its intention to use the HPO's concurrence as a basis for a

"de minimis" finding for the historic property. As a result, no further evaluation is necessary for the John Berry-Baldwin property.

Both concurrence forms are included in the Appendix.

During project development, the property in the southwest quadrant of the project area was purchased by the Division of Parks and Recreation, and coordination with the Division of Parks and Recreation was initiated. A meeting was held on May 10, 2006 to review the proposed roadway designs. The Division of Parks and Recreation requested that the vertical clearance on the bridge be maintained, the bridge provide for animal crossings underneath, and that the access to the park be designed to connect to the existing driveway.

In January 2007, the Division of Parks and Recreation reviewed the project plans and determined that the project would have no adverse effect on the park property. In January 2008, after it was determined that a permanent drainage easement would be necessary, the Division of Parks and Recreation reviewed the project plans again. In a letter sent January 28, 2008 (Appendix), the Division agreed that the project plans were acceptable as proposed.

G. Summary and Recommendation

Planning to minimize harm to the public recreation area and historic resource has been performed as an integral part of this project. No additional right-of-way is required and permanent impacts are limited to drainage easements.

In coordination with the Division of Parks and Recreation, measures to minimize harm incorporated into the project include maintaining the existing vertical clearance, providing for animal crossing under the bridge, and providing a new access to the park that connects to its existing driveway. In a letter dated January 28, 2008, the Division of Parks and Recreation agreed that the plans were acceptable as proposed. The approved Final Nationwide Section 4(f) Evaluation and Approval for Federally-Aided Highway Projects with Minor Involvement with Public Parks, Recreation Lands, and Wildlife and Waterfowl refuges follows.

Based on the above considerations and since the project meets the criteria set forth in the Federal Register (December 23, 1986), a Programmatic Section 4(f) Evaluation for the park property satisfies the requirements of the Section 4(f) Evaluation.

NORTH CAROLINA DIVISION
FINAL NATIONWIDE SECTION 4(f) EVALUATION AND APPROVAL
FOR FEDERALLY-AIDED HIGHWAY PROJECTS WITH MINOR INVOLVEMENT WITH
PUBLIC PARKS, RECREATION LANDS, AND WILDLIFE AND
WATERFOWL REFUGES

F. A. Project BRSTP-1002(12)

State Project 8.2502201

T. I. P. No. B-4216

DESCRIPTION:
Replace Bridge No. 66 on SR 1002 (St. Mary's Road) over Strouds Creek in Orange County.

		Yes	No
1.	Is the proposed project designed to improve the operational characteristics, safety, and/or physical condition of existing highway facilities on essentially the same location?	X	☐
2.	Is the project on new location?	☐	X
3.	Is the Section 4(f) land a publicly owned public park, recreation land, or wildlife and waterfowl refuge located adjacent to the existing highway?	X	☐
4.	Does the amount and location of the land to be used impair the use of the remaining Section 4(f) land, in whole or in part, for its intended purpose? (See chart below)	☐	X

Total size of section 4(f) site Maximum to be acquired

less than 10 acres	.....	10 percent of site
10 acres-100 acres	.....	1 acre
greater than 100 acres	.....	1 percent of site

		Yes	No
5.	Do the proximity impacts of the project (e.g., noise, air and water pollution, wildlife and habitat effects, aesthetic values) on the remaining Section 4(f) land impair the use of such land for its intended purpose?	☐	X
6.	Do the officials having jurisdiction over the Section 4(f) land agree, in writing, with the assessment of the impacts of the proposed project on, and the proposed mitigation for, the Section 4(f) lands?	X	☐
7.	Does the project use land from a site purchased or improved with funds under the Land and Water Conservation Act (Section 6(f)), the Federal Aid in Fish Restoration Act (Dingell-Johnson Act), the Federal Aid in Wildlife Act (Pittman-Robertson Act), or similar laws, or are the lands otherwise encumbered with a Federal interest (e.g., former Federal surplus property)?	☐	X
8.	If the project involves lands described in Item 7 above, does the appropriate Federal Agency object to the land conversion or transfer?	N/A	
9.	Does the project require preparation of an EIS?	☐	X

ALTERNATIVES CONSIDERED AND FOUND NOT TO BE FEASIBLE AND PRUDENT

	Yes	No
The following alternatives were evaluated and found not to be feasible and prudent:	X	

1. Do-nothing.

   Does the "do nothing" alternative:

		Yes	No
	(a) correct capacity deficiencies?		X
or	(b) correct existing safety hazards?		X
or	(c) correct deteriorated conditions?		X
and	(d) create costs, unusual problems, or impacts of extraordinary measure?	X	

2. Improvement of the highway without using the adjacent public park, recreational land, or wildlife waterfowl refuge. — X

   (a) Have minor alignment shifts, changes in standards, use of retaining walls, etc., or traffic management measures been evaluated? — X

   (b) The items in 2(a) would result in (circle, as appropriate)

   (i) substantial adverse community impact

   or (ii) substantial increased costs

   or (iii) unique engineering, transportation, maintenance, or safety problems

   or (iv) substantial social, environmental, or economic impacts

   (or (v)) a project which does not meet the need

and (vi) impacts, costs, or problems which are extraordinary magnitude

	Yes	No
3. Build an improved facility on new location without using the public park, recreational land, or wildlife and waterfowl refuge. (This would be a localized "run around.")	X	☐

(a) An alternate on new location would result in: (circle, as appropriate)

(i) a project which does not solve the existing problems

or (ii) substantial social, environmental, or economic impacts

or (iii) a substantial increase in project cost or engineering difficulties

and (iv) such impacts, costs, or difficulties of truly unusual or unique or extraordinary magnitude

MINIMIZATION OF HARM

	Yes	No
1. The project includes all possible planning to minimize harm.	X	☐

2. Measures to minimize harm include the following:

   (circle those which are appropriate)

   a. Replacement of lands used with lands of reasonably equivalent usefulness and location and of at least comparable value.
   b. Replacement of facilities impacted by the project including sidewalks, paths, benches, lights, trees, and other facilities.
   c. Restoration and landscaping of disturbed areas.
   d. Incorporation of design features and habitat features, where necessary, to reduce or minimize impacts to the Section 4(f) property.
   e. Payment of the fair market value of the land and improvements taken or improvements to the remaining Section 4(f) site equal to the fair market value of the land and improvements taken.
   f. Additional or alternative mitigation measures as determined necessary based on consultation with the officials having jurisdiction over the parkland, recreation area, or wildlife or waterfowl refuge.

3. A discussion of specific mitigation measures is provided as follows:
   1. Maintain existing vertical clearances
   2. Use of an off-site detour during construction of the new bridge
   3. Connect the new park access to the existing driveway.
   4. Minimize shoulder and ditch section to avoid right-of-way acquisition
   5. Provide anodized two-bar metal railing and anodized guardrail.

Note: Any response in a box requires additional information prior to approval. Consult Nationwide 4(f) evaluation.

COORDINATION

The proposed project has been coordinated with the following (attach correspondence):

a. Officials having jurisdiction over the Section 4(f) Land	X
b. Local/State/Federal Agencies	X
c. US Coast Guard (for bridges requiring bridge permits)	N/A
d. DOI, if Section 6(f) lands are involved	N/A

SUMMARY AND APPROVAL

The project meets all criteria included in the programmatic 4(f) evaluation approved on December 23, 1986.

All required alternatives have been evaluated and the findings made are clearly applicable to this project. There are no feasible or prudent alternatives which avoid use of the Section 4(f) land.

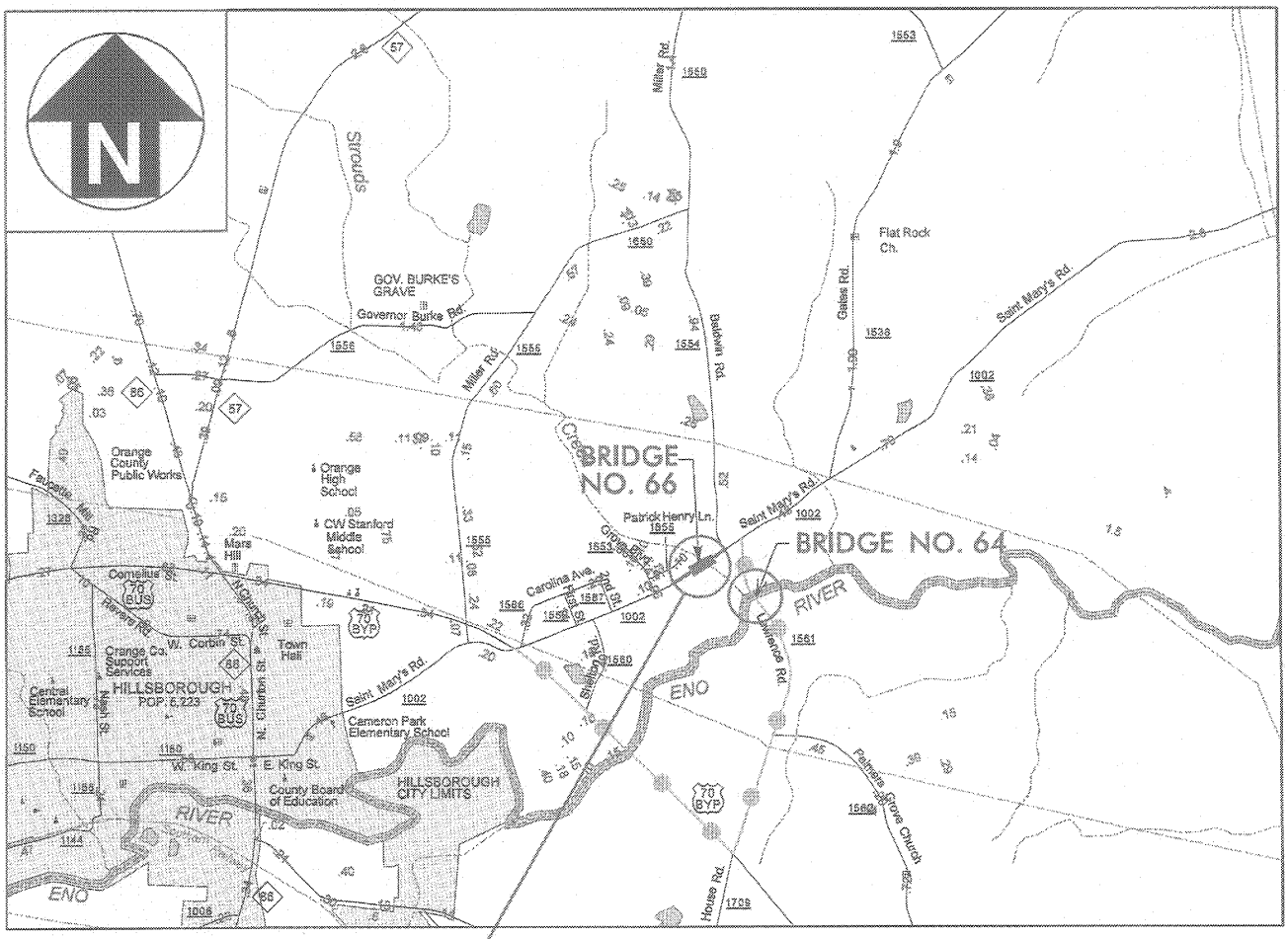
The project includes all possible planning to minimize harm, and there are assurances that the measures to minimize harm will be incorporated in the project.

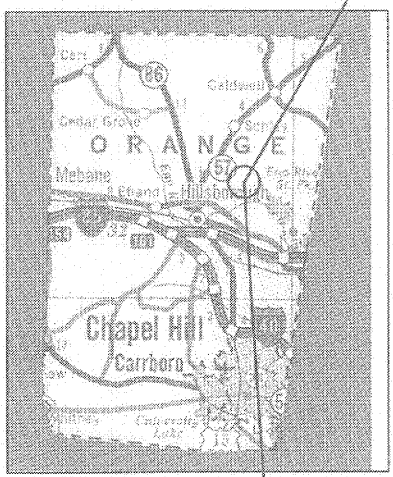
All appropriate coordination has been successfully completed.

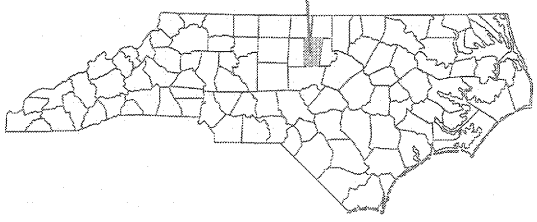
Approved:

05/05/08 Date — Environmental Management Director
Project Development and Environmental Analysis Branch, NCDOT

05/07/08 Date — for Division Administrator
FHWA





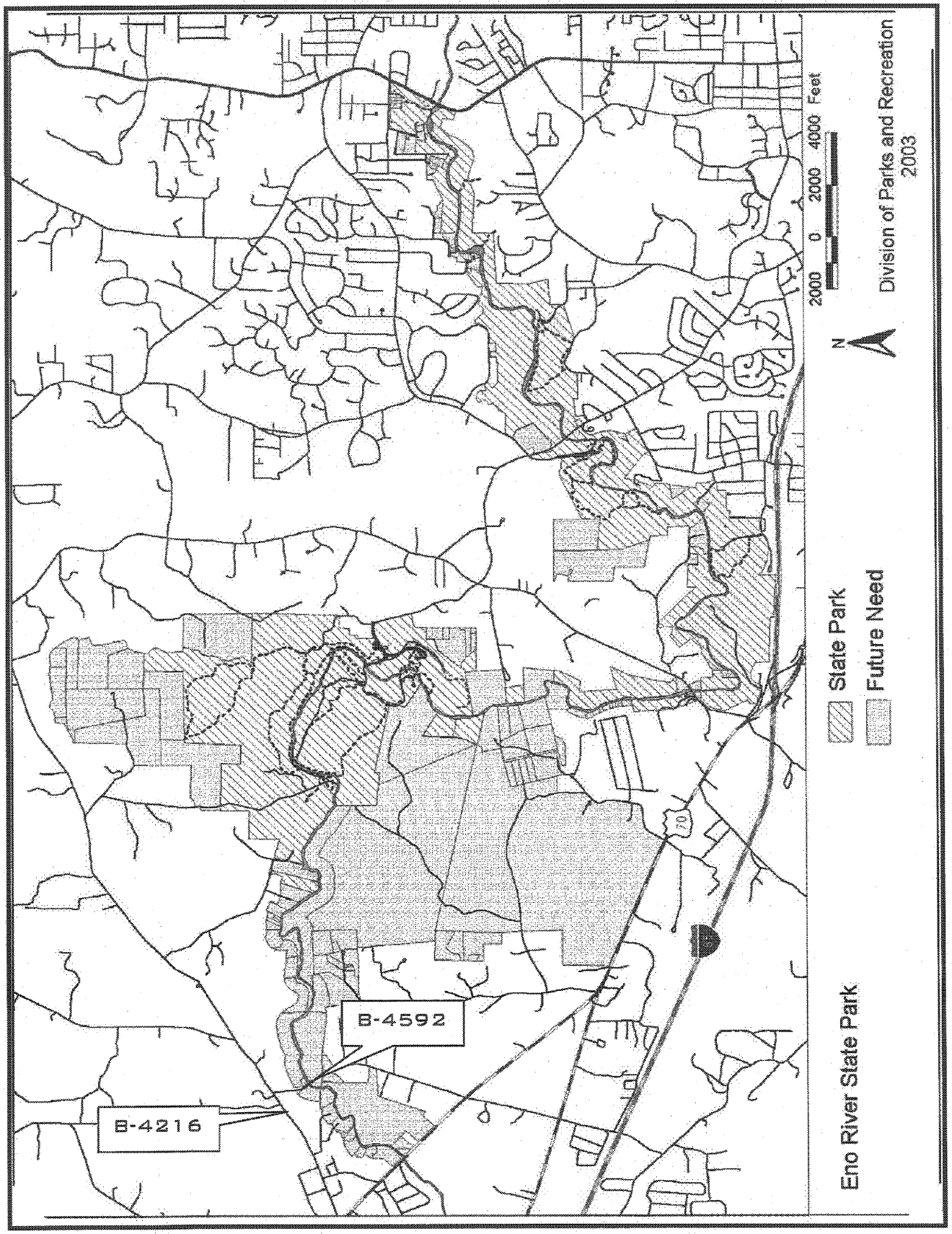


DETOUR ROUTE

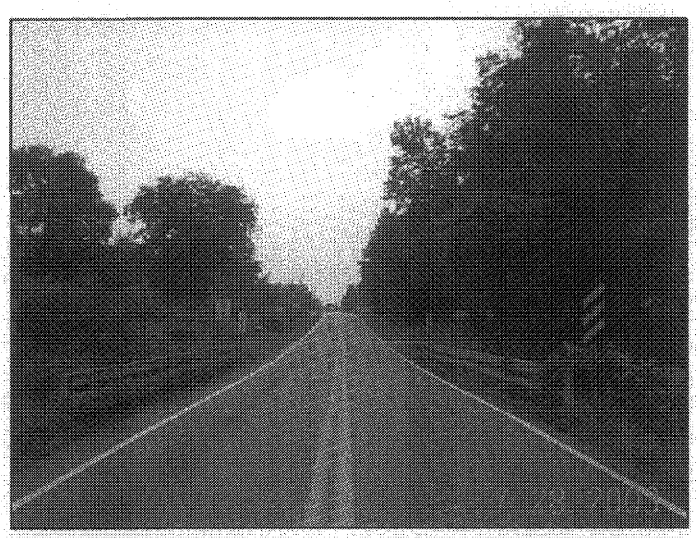
North Carolina Department of Transportation
Project Development & Environmental Analysis

ORANGE COUNTY
BRIDGE NO. 66 ON SR 1002
OVER STROUDS CREEK
B-4216

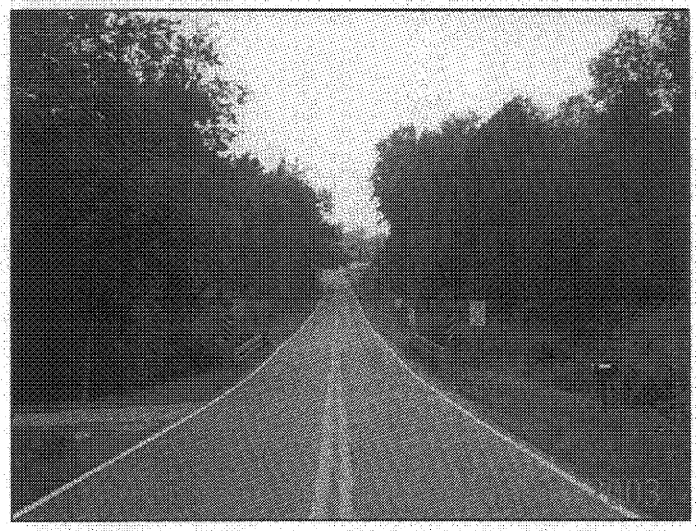
FIGURE 1



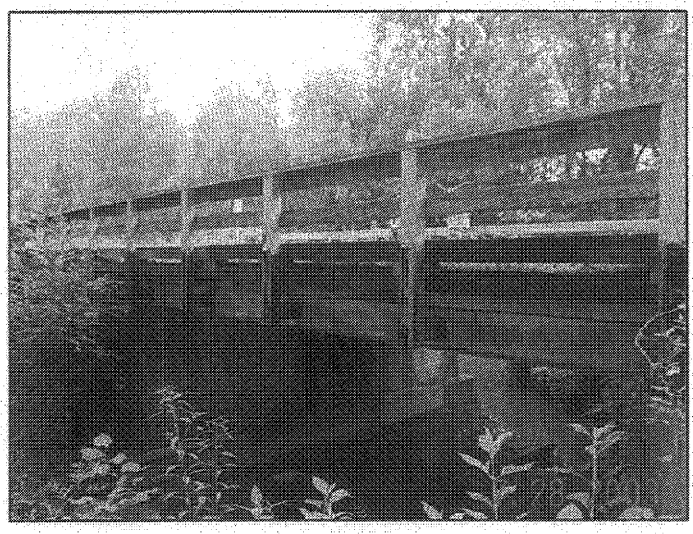
Eno River State Park Land Proposed Boundary. **FIGURE 2**



View of east approach from Bridge No. 66.



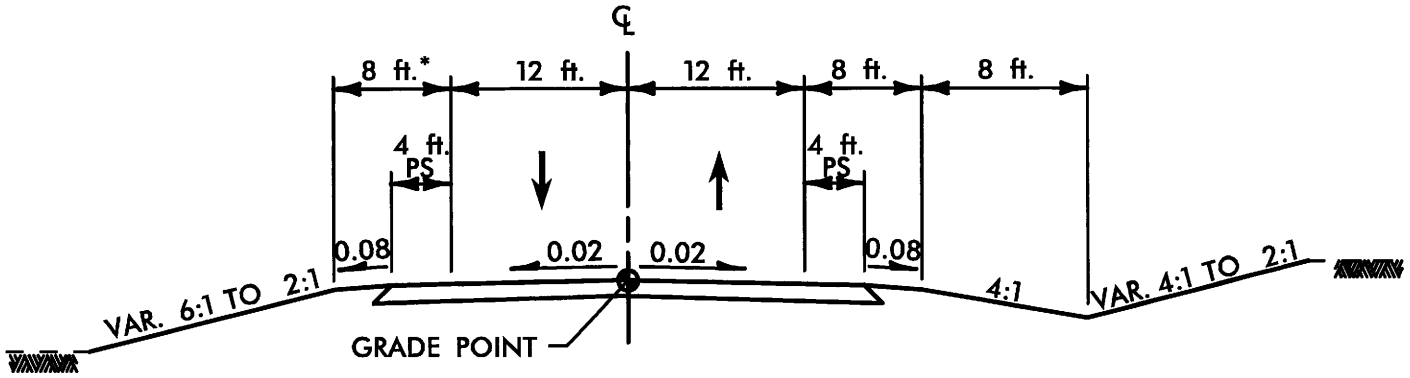
View of west approach from Bridge No. 66.



Bridge No. 66 side view.

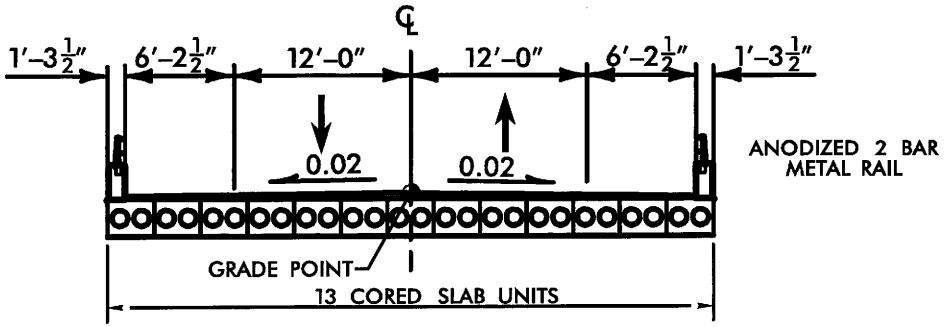
Figure 3

B-4216 Bridge No. 66 on SR 1002 over Strouds Creek



TYPICAL APPROACH SECTION
(PROPOSED)

* 11 ft. IF GUARDRAIL IS WARRANTED



TYPICAL BRIDGE SECTION
(PROPOSED)

TRAFFIC DATA

(CONST. YR.) 2008 ADT = 10,700
(DESIGN YR.) 2030 ADT = 18,700
DUAL 3%
TTST 1%

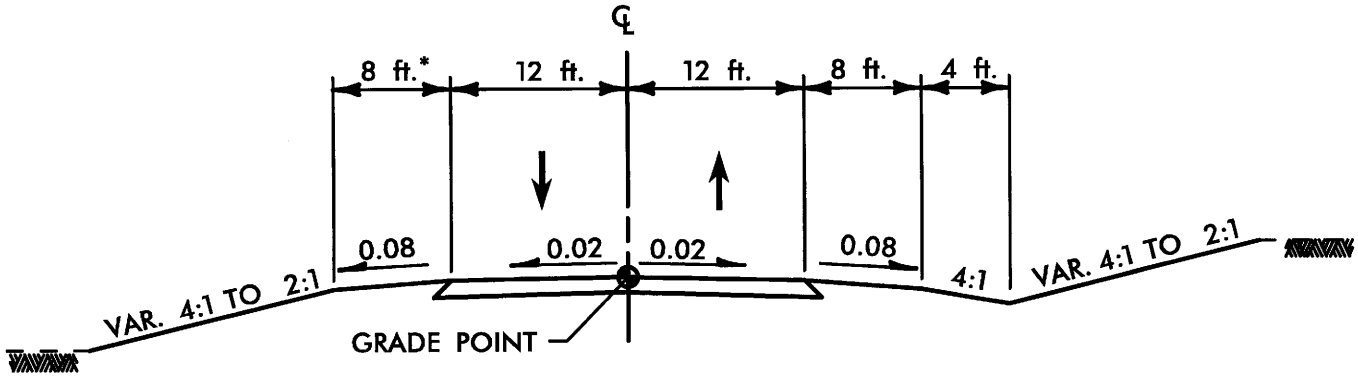
FUNCTIONAL CLASSIFICATION :
MAJOR COLLECTOR – RURAL

EXISTING BRIDGE LENGTH = 50 ft.

North Carolina Department Of Transportation
Project Development & Environmental Analysis

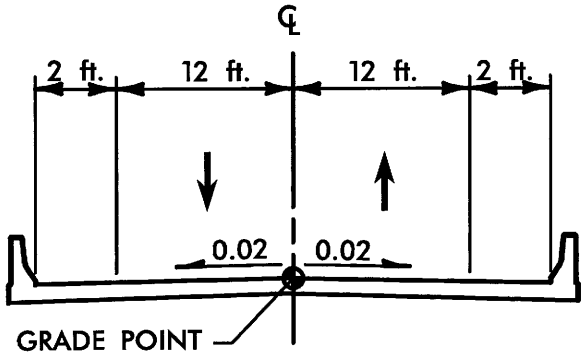
ORANGE COUNTY
BRIDGE NO. 66 ON SR 1002
(ST. MARY'S RD)
OVER STROUDS CREEK
TIP NO: B–4216

FIGURE 4A



TYPICAL APPROACH SECTION
(DETOUR)

* 10 ft. WITH GUARDRAIL IS WARRANTED



TYPICAL BRIDGE SECTION
(DETOUR)

TRAFFIC DATA

(CONST. YR.)	2008 ADT =	10,700
(DESIGN YR.)	2030 ADT =	18,700
DUAL	3%	
TTST	1%	

FUNCTIONAL CLASSIFICATION :
MAJOR COLLECTOR – RURAL

North Carolina Department of Transportation
Project Development & Environmental Analysis

ORANGE COUNTY
BRIDGE NO. 66 ON SR 1002
(ST. MARY'S RD)
OVER STROUDS CREEK
TIP NO: B-4216

FIGURE 4B

ALTERNATE A (PREFERRED)

B-4216
ORANGE COUNTY
SR 1002 BRIDGE NO. 66
OVER STROUDS CREEK

BEGIN PROJECT

TO 70 BYP

ST. MARY'S RD.
SR 1002

STROUDS CREEK

ST. MARY'S ROAD RURAL HISTORIC DISTRICT

BRIDGE NO. 66

NEW ROAD

JOHN BERRY-BALDWIN HOUSE

BALDWIN RD.
SR 1954

END PROJECT

SR 1002
ST. MARY'S RD.

ENO RIVER STATE PARK

ST. MARY'S ROAD RURAL HISTORIC DISTRICT

50 0 50 100
SCALE

North Carolina Department Of Transportation
Project Development & Environmental Analysis

B-4216
FIGURE 5A

ALTERNATE B

B–4216
ORANGE COUNTY
SR 1002 BRIDGE NO. 66
OVER STROUDS CREEK

BEGIN PROJECT

TO I-40 BYP

ST. MARY'S RD.
SR 1002

STROUDS CREEK

ST. MARY'S ROAD RURAL HISTORIC DISTRICT

BRIDGE NO. 66

ENO RIVER STATE PARK

JOHN BERRY BALDWIN HOUSE

BALDWIN RD.
SR 1454

END PROJECT

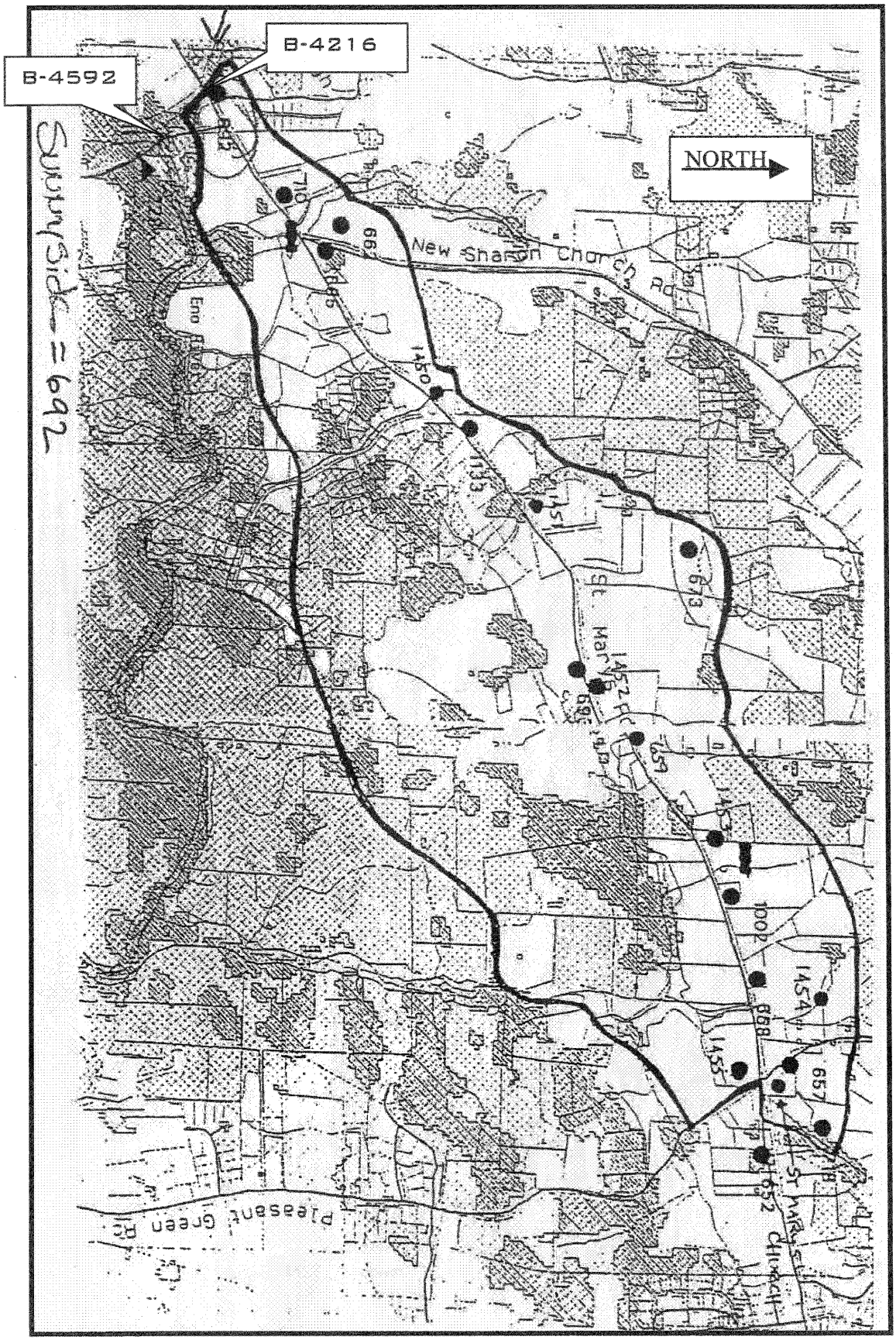
SR 1002
ST. MARY'S RD.

ST. MARY'S ROAD RURAL HISTORIC DISTRICT

50 0 50 100
SCALE

North Carolina Department Of Transportation
Project Development & Environmental Analysis

B–4216
FIGURE 5B



Proposed Boundaries for a St. Mary's Road Rural Historic District (SL 2001)

FIGURE 6

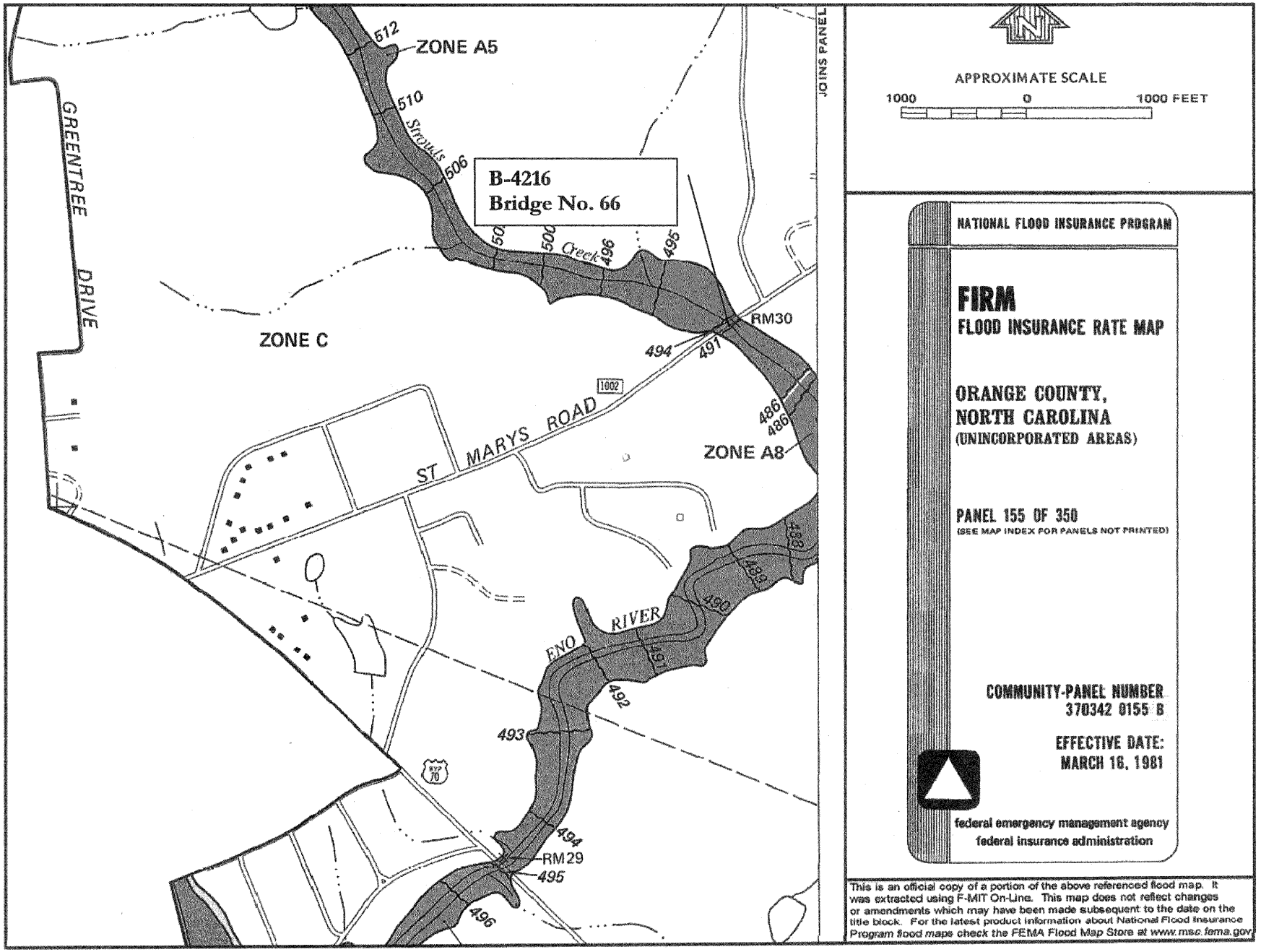

ZONE A5
ZONE C
ZONE A8
B-4216
Bridge No. 66
GREENTREE DRIVE
ST MARYS ROAD
1002
Strouds Creek
ENO RIVER
RM30
RM29
JOINS PANEL
512
510
506
500
496
495
494
491
492
493
490
486
APPROXIMATE SCALE
1000 0 1000 FEET
NATIONAL FLOOD INSURANCE PROGRAM
FIRM
FLOOD INSURANCE RATE MAP
ORANGE COUNTY,
NORTH CAROLINA
(UNINCORPORATED AREAS)
PANEL 155 OF 350
(SEE MAP INDEX FOR PANELS NOT PRINTED)
COMMUNITY-PANEL NUMBER
370342 0155 B
EFFECTIVE DATE:
MARCH 16, 1981
federal emergency management agency
federal insurance administration
This is an official copy of a portion of the above referenced flood map. It was extracted using F-MIT On-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at www.msc.fema.gov

Figure 7

APPENDIX

United States Department of the Interior

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

December 15, 2004

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

Dear Dr. Thorpe:

This letter is in response to your letter of December 6, 2004 which provided the U.S. Fish and Wildlife Service (Service) with the biological determination of the North Carolina Department of Transportation that the replacement of Bridge No. 66 on SR 1002 over Strouds Creek in Orange County (TIP No. B-4216) may affect, but is not likely to adversely affect the federally endangered dwarf wedgemussel (*Alasmidonta heterodon*). These comments are provided in accordance with section 7 of the Endangered Species Act (ESA) of 1973, as amended (16 U.S.C. 1531-1543).

According to the information provided, a mussel survey was conducted at the project site on March 25, 2004. The survey extended 100 meters upstream and 400 meters downstream of SR 1002. No specimens of dwarf wedgemussel were observed. Based on the information provided and other information available, the Service concurs with your determination that the proposed bridge replacement may affect, but is not likely to adversely affect the dwarf wedgemussel. We believe that the requirements of section 7(a)(2) of the ESA have been satisfied. We remind you that obligations under section 7 consultation must be reconsidered if: (1) new information reveals impacts of this identified action that may affect listed species or critical habitat in a manner not previously considered in this review; (2) this action is subsequently modified in a manner that was not considered in this review; or (3) a new species is listed or critical habitat determined that may be affected by this identified action.

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

Sincerely,

Tom Augspurger
Acting Ecological Services Supervisor

cc: John Thomas, USACE, Raleigh, NC
Beth Barnes, NCDWQ, Raleigh, NC
Travis Wilson, NCWRC, Creedmoor, NC
Chris Militscher, USEPA, Raleigh, NC

United States Department of the Interior

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

October 8, 2004

Harold Brady
Mulkey Engineers & Consultants
P.O. Box 33127
Raleigh, North Carolina 27636

Dear Mr. Brady:

This letter is in response to your letter of September 28, 2004 which provided the U.S. Fish and Wildlife Service (Service) with the biological determination of the North Carolina Department of Transportation that the replacement of Bridge No. 66 on SR 1002 over Strouds Creek in Orange County (TIP No. B-4216) may affect, but is not likely to adversely affect the federally endangered smooth coneflower (*Echinacea laevigata*). These comments are provided in accordance with section 7 of the Endangered Species Act (ESA) of 1973, as amended (16 U.S.C. 1531-1543).

According to the information you submitted, a plant survey was conducted at the project site on September 28, 2004. No specimens of smooth coneflower were observed. Based on the information provided and other information available, the Service concurs with your determination that the proposed bridge replacement may affect, but is not likely to adversely affect the smooth coneflower. We believe that the requirements of section 7(a)(2) of the ESA have been satisfied for this species. We remind you that obligations under section 7 consultation must be reconsidered if: (1) new information reveals impacts of this identified action that may affect listed species or critical habitat in a manner not previously considered in this review; (2) this action is subsequently modified in a manner that was not considered in this review; or (3) a new species is listed or critical habitat determined that may be affected by this identified action.

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

Sincerely,

John Hammond
Acting Ecological Services Supervisor

cc: John Thomas, USACE, Raleigh, NC
Beth Barnes, NCDWQ, Raleigh, NC
Travis Wilson, NCWRC, Creedmoor, NC
Chris Militscher, USEPA, Raleigh, NC

United States Department of the Interior

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

February 18, 2004

Gregory J. Thorpe, Ph.D.
North Carolina Department of Transportation
Project Development and Environmental Analysis
1548 Mail Service Center
Raleigh, NC 27699-1548

Dear Dr. Thorpe:

This letter is in response to your request for comments from the U.S. Fish and Wildlife Service (Service) on the potential environmental impacts of the proposed replacement of the following ten bridges:

- B-4002, Alamance County, Bridge No. 96 on SR 2116 over Meadow Creek
- B-4063, Chatham County, Bridge No. 20 on NC 902 over Sandy Branch
- B-4109, Durham County, Bridge No. 120 on SR 1303 over Mud Creek
- B-4216, Orange County, Bridge No. 66 on SR 1002 over Strouds Creek
- B-4300, Wake County, Bridge No. 29 on SR 1007 over Clarks Creek
- B-4301, Wake County, Bridge No. 229 on SR 1007 over Poplar Creek
- B-4302, Wake County, Bridge No. 336 on SR 1301 over Terrible Creek
- B-4303, Wake County, Bridge No. 102 on SR 1844 over Lower Bartons Creek
- B-4304, Wake County, Bridge No. 143 on SR 2217 over Beaver Dam Creek
- B-4592, Orange County, Bridge No. 64 on SR 1561 over Eno River

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 impacts are proposed, every effort should be made to identify compensatory mitigation sites in advance. Project planning should include a detailed compensatory mitigation plan for offsetting unavoidable wetland impacts. 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.

A list of federally protected species for each county in North Carolina can be found at http://nc-es.fws.gov/es/countyfr.html . Additional information about the habitats in which each species is often found can also be found at http://endangered.fws.gov . Please note, the use of the North Carolina Natural Heritage Program data should not be substituted for actual field surveys if suitable habitat occurs near the project site. If suitable habitat exists in the project area, we recommend that biological surveys for the listed species be conducted and submitted to us for review. All survey documentation must include survey methodologies and results.

We reserve the right to review any federal permits that may be required for these projects, 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 these projects 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 the fragmentation or direct loss of wildlife habitat and waters of the US;

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

The Service appreciates the opportunity to comment on these projects. 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,

John E. Ellis

for Garland B. Pardue, Ph.D.
Ecological Services Supervisor

cc: Eric Alsmeyer, USACE, Raleigh, NC
John Thomas, USACE, Raleigh, NC
Richard Spencer, USACE, Wilmington, NC
John Hennessy, NCDWQ, Raleigh, NC
Travis Wilson, NCWRC, Creedmoor, NC
Chris Militscher, USEPA, Raleigh, NC

Federal Aid #: **BRSTP-1102(2)** *TIP#:* **B-4216** *County:* **Orange**

CONCURRENCE FORM FOR ASSESSMENT OF EFFECTS

Project Description: **Replace Bridge No. 66 on SR 1002 (St. Mary's Road)**

On **January 28, 2008** representatives of the

X North Carolina Department of Transportation (NCDOT)
X Federal Highway Administration (FHWA)
X North Carolina State Historic Preservation Office (HPO)
☐ Other

Reviewed the subject project and agreed

☐ There are no effects on the National Register-listed property/properties located within the project's area of potential effect and listed on the reverse.

☐ There are no effects on the National Register-eligible property/properties located within the project's area of potential effect and listed on the reverse.

☒ There is an effect on the National Register-listed property/properties located within the project's area of potential effect. The property/properties and the effect(s) are listed on the reverse.

☐ There is an effect on the National Register-eligible property/properties located within the project's area of potential effect. The property/properties and effect(s) are listed on the reverse.

Signed:

Vanessa E. Patrick 1-28-08
Representative, NCDOT Date

1-28-08
FHWA, for the Division Administrator, or other Federal Agency Date

Representative, HPO Date

Renee Gledhill-Earley 1-28-08
State Historic Preservation Officer Date

Federal Aid #: BRSTP-1102(2) *TIP#:*B-4216 *County:* Orange

Properties within the area of potential effect for which there is no effect. Indicate if property is National Register-listed (NR) or determined eligible (DE).

Properties within the area of potential effect for which there is an effect. Indicate property status (NR or DE) and describe the effect.

John Berry - Baldwin House (DOE)

permanent drainage easement
St. Mary's Road frontage
no adverse w/ condition - landscaping
in consultation w/ property owner

Reason(s) why the effect is not adverse (if applicable).

Initialed: NCDOT VEP FHWA DB HPO RGZ

FHWA intends to use SHPO's concurrence as a basis of a "de minimis" finding for the following properties, pursuant to Section 4(f): John Berry Baldwin House

NCDENR

North Carolina Department of Environment and Natural Resources
Division of Parks and Recreation

Michael F. Easley, Governor | William G. Ross Jr., Secretary | Lewis R. Ledford, Director

January 28, 2008

Ms. Theresa Ellerby
North Carolina Department of Transportation
Project Development and Environmental Analysis Branch
1548 Mail Service Center
Raleigh, NC 27599-1548

Dear Ms. Ellerby:

I am writing in regards to the proposed bridge replacement on St. Mary's Road in Hillsborough, NC (B-4216) over Stroud's Creek. The Division has reviewed the plans (plans received 1/28/08) and they are acceptable as proposed. I would recommend the following be implemented during construction:

- Best management practices (BMP's) for the control of erosion and sedimentation should follow the stands for High Quality Waters.
- Compliance with the BMP's and other mitigation measures should be closely monitored.
- No heavy equipment should be used within the streambed. Top down construction methods would be preferred.
- No wet concrete should be allowed to come into contact with the water.
- Weep holes should not be places above the steam channel.
- There should be 25 feet of bare earth left on each side of the stream beneath the bridge and Rip-rap should not be placed where it would obstruct wildlife movements.

The Division appreciated this opportunity to comment on the proposed bridge replacement project. If you have any further questions you can contact me at (919) 715-8711

Sincerely,

Brian L. Strong
Head, Natural Resources Program

cc: Dave Cook, Eno River State Park Superintendent
Nicole H. Bennett, Mulkey Engineers & Consultants
Sue Regier, NC Division of Parks and Recreation

1615 Mail Service Center, Raleigh, North Carolina 27699-1615
Phone: 919-733-4181 • FAX: 919-715-3085 • Internet: www.ncsparks.net

North Carolina Department of Environment and Natural Resources
Division of Parks and Recreation

Michael F. Easley, Governor | William G. Ross Jr., Secretary | Lewis R. Ledford, Director

January 2, 2007

Nicole H. Bennett, AICP
Mulkey Engineers & Consultants
6750 Tryon Road
Cary, NC 27518

Dear Ms. Bennett:

I am responding to your e-mail dated December 21, 2006 regarding plans for B-4216 in Orange County. I have reviewed your e-mail and the attached preliminary plans. I would concur that the bridge replacement will cause no adverse impacts to the Eno River State Park. However, I look forward to receiving additional information that details the project and any mitigation measures to minimize resource impacts. If you have any questions regarding these comments please don't hesitate to contact me at (919) 715-8711.

Sincerely,

Brian L. Strong
Head, Natural Resources Program

1615 Mail Service Center, Raleigh, North Carolina 27699-1615
Phone: 919-733-4181 • FAX: 919-715-3085 • Internet: www.ncsparks.net

Federal Aid # **BRSTP-1102(2)** *TIP #* **B-4216** *County*: **Orange**

CONCURRENCE FORM FOR ASSESSMENT OF EFFECTS

Project Description: **Replace Bridge No. 66 on SR 1002 (St. Mary's Road)**

On **Aug. 30, 2004** representatives of

- ☒ North Carolina Department of Transportation (NCDOT)
- ☒ Federal Highway Administration (FHWA)
- ☒ North Carolina State Historic Preservation Office (HPO)
- ☐ Other

Reviewed the subject project and agreed

- ☐ There are no effects on the National Register-listed property/properties located within the project's area of potential effect and listed on the reverse.
- ☐ There are no effects on the National Register-eligible property/properties located within the project's area of potential effect and listed on the reverse.
- ☐ There is an effect on the National Register-listed property/properties located within the project's area of potential effect. The property/properties and the effect(s) are listed on the reverse.
- ☑ There is an effect on the National Register-eligible property/properties located within the project's area of potential effect. The property/properties and effect(s) are listed on the reverse.

Signed:

R S Lumm — 8/30/2004
Representative, NCDOT — Date

[signature] — 8/30/04
FHWA, for the Division Administrator, or other Federal Agency — Date

Erin O. Kane — 8/30/04
Representative, HPO — Date

Renee Gledhill-Earley — 8/30/04
State Historic Preservation Officer — Date

Federal Aid # **BRSTP-1002(2)** *TIP #* **B-4216** *County*: **Orange**

Properties within the area of potential effect for which there is no effect. Indicate if property is National Register-listed (NR) or determined eligible (DE).

Properties within the area of potential effect for which there is an effect. Indicate property status (NR or DE) and describe the effect.

John Berry - Baldwin House (DE)
St. Mary's RHD

2 – Page RHA

ALT-A NAE w/ Conditions
1) Annodized * Bar Railing for Bikes + Guard rail
2) Landscape Plan w/ Prop Owner, SHPO, NCDOT

ALT-B ADVERSE EFFECT

Reason(s) why the effect is not adverse (if applicable).

Initialed: NCDOT RLS FHWA RHA HPO EOK

North Carolina Department of Cultural Resources
State Historic Preservation Office

Michael F. Easley, Governor
Lisbeth C. Evans, Secretary
Jeffrey J. Crow, Deputy Secretary
Office of Archives and History

Division of Historical Resources
David L. S. Brook, Director

March 5, 2004

MEMORANDUM

TO: Greg Thorpe, Ph.D., Director
Project Development and Environmental Analysis Branch
NCDOT Division of Highways

FROM: David Brook P.S.Z. for David Brook

SUBJECT: Historic Architectural Resources Survey Report, Replace Bridge 66 on SR 1002 over Strouds Creek, B-4216, Orange County, ER04-0392

Thank you for your letter of February 9, 2004, transmitting the survey report by Richard Silverman. We appreciate the extensive research Mr. Silverman has conducted regarding the history and evaluation of the John Berry-Baldwin House. His report will be a useful resource on the builder-architect John Berry and his house "Sunnyside."

For purposes of compliance with Section 106 of the National Historic Preservation Act, we concur that the following property is individually eligible and is listed in the State Study List for the National Register of Historic Places under the criterion cited:

> John Berry-Baldwin House (Sunnyside) northwest corner of the intersection of SR 1002, (St. Mary's Road) and SR 1554 (Baldwin Road), Hillsborough vicinity, is eligible for the National Register under Criteria B and C. The house is the home of builder-architect John Berry who lived in the residence during his productive years. Berry constructed some of North Carolina's significant 19th-century buildings and contributed to the construction and development of many of the Piedmont's regional institutions. The property is also significant as a very rare example of a house designed by and for a 19th-century builder-architect. We concur with the proposed National Register boundaries as described and delineated in the survey report.
>
> The John Berry-Baldwin House is also a contributing building to the St. Mary's Rural Road Historic District, listed in the State Study List in 2001. We regret that this information was not included in the State Historic Preservation Office's National Register and Study List Roster. We will update our roster immediately to include the district listing.

We are enclosing a map of the St. Mary's Road Rural Historic District proposed boundaries. Please schedule an effects meeting between SHPO and NCDOT to discuss the potential effects of this project upon the properties within the St. Mary's Rural Road Historic District.

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

Thank you for your cooperation and consideration. If you have questions concerning the above comment, 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.

Enclosure

cc: Mary Pope Furr, NCDOT

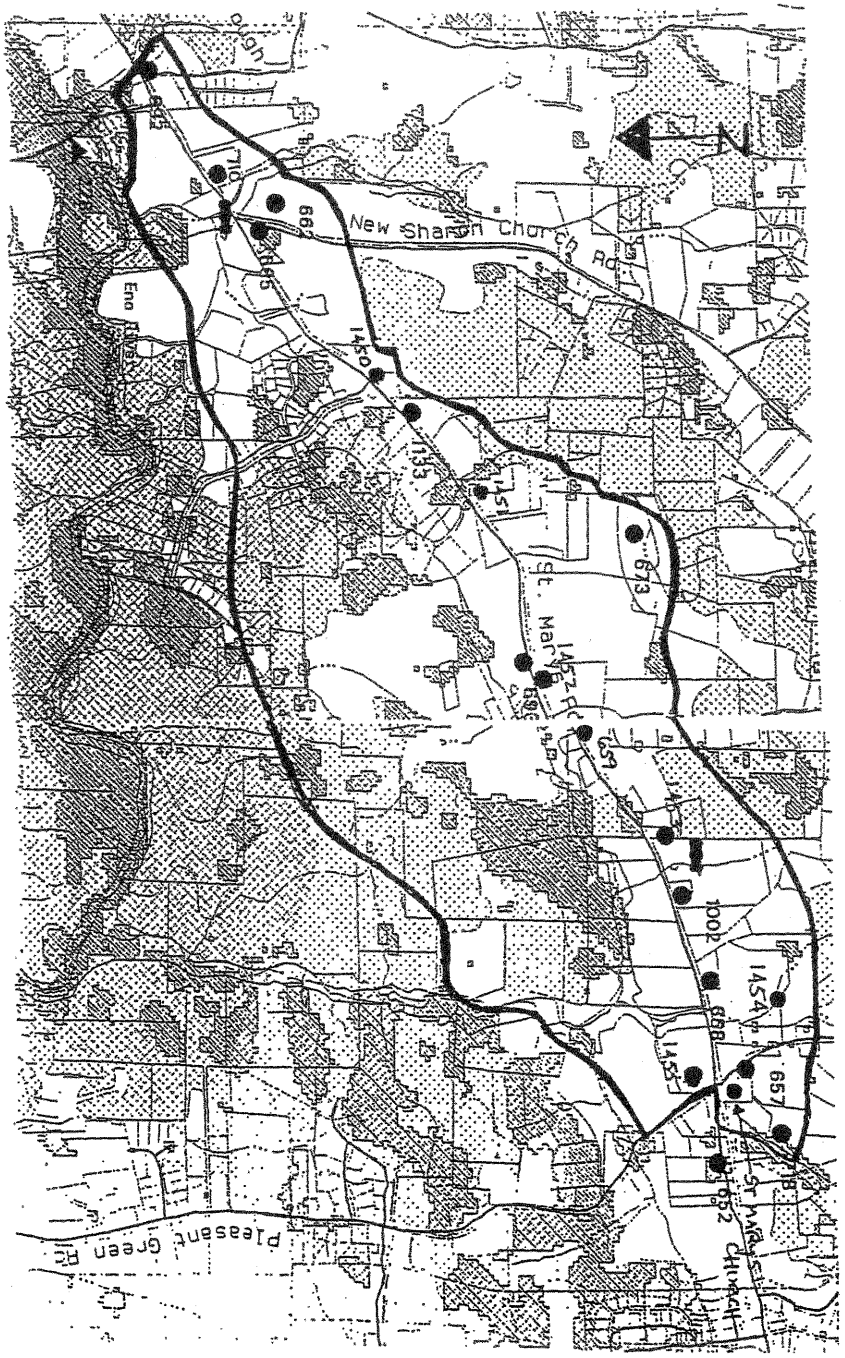


Figure 5 Proposed Boundaries for a St. Mary's Road Rural Historic District

North Carolina Department of Cultural Resources
State Historic Preservation Office

Michael F. Easley, Governor
Lisbeth C. Evans, Secretary
Jeffrey J. Crow, Deputy Secretary
Office of Archives and History

Division of Historical Resources
David L. S. Brook, Director

March 4, 2004

MEMORANDUM

TO: Stacey Baldwin
Project Development and Environmental Analysis Branch
NCDOT Division of Highways

FROM: David Brook for David Brook

SUBJECT: Request for comments on Bridge Replacement projects
B-4002, Alamance County
B-4063, Chatham County
B-4109, Durham County
B-4216, Orange County
B-4300, Wake County
B-4301, Wake County
B-4302, Wake County
B-4303, Wake County
B-4304, Wake County
B-4592, Orange County
ER03-0389 through ER03-0398

Thank you for your letters of February 5, 2004, concerning the above projects.

We are unable to comment on the potential effect of these projects on historic resources until we receive further information.

Please forward a labeled 7.5 minute USGS quadrangle map for each of the above projects clearly indicating the project vicinity, location, and termini. In addition, please include the name of the quadrangle map.

There are no known archaeological sites within the proposed project area. Based on our knowledge of the area, it is unlikely that any archaeological resources that may be eligible for conclusion in the National Register of Historic Places will be affected by the project. We, therefore, recommend that no archaeological investigation be conducted in connection with this project.

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

Thank you for your cooperation and consideration. If you have 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: Mary Pope Furr, NCDOT
Matt Wilkerson, NCDOT

North Carolina Wildlife Resources Commission

Charles R. Fullwood, Executive Director

MEMORANDUM

TO: Gregory J. Thorpe
Environmental Management Director, PDEA

FROM: Travis Wilson, Highway Project Coordinator
Habitat Conservation Program

DATE: February 27, 2004

SUBJECT: NCDOT Bridge Replacements in Alamance, Chatham, Durham, Orange, and Wake counties. TIP Nos. B-4002, B-4063, B-4109, B-4216, B-4300, B-4301, B-4302, B-4303, B-4304, and B-4592.

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.

Mailing Address: Division of Inland Fisheries • 1721 Mail Service Center • Raleigh, NC 27699-1721
Telephone: (919) 733-3633 ext. 281 • **Fax:** (919) 715-7643

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. Hal Bain 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-4002, Alamance County, Bridge No. 96 over Meadow Creek on SR 2116. We recommend replacing this bridge with a bridge. Standard recommendations apply.

2. B-4063, Chatham County, Bridge No. 20 over Sandy Branch on NC 902. We recommend replacing this bridge with a bridge. Standard recommendations apply.

3. B-4109, Durham County, Bridge No. 120 over Mud Creek on SR 1303. We recommend replacing this bridge with a bridge. Standard recommendations apply.

4. B-4216, Orange County, Bridge No. 66 over Strouds Creek on SR 1002. We recommend replacing this bridge with a bridge. Due to the close proximity of the Eno River we request conducting a survey for the following state endangered and federal species of concern mussels: Yellow lampmussel and Atlantic pigtoe. Also, a significant fishery for sunfish exists at this site, therefore we request an in-water work moratorium for sunfish from April 1 to June 30. Standard recommendations apply.

5. B-4300, Wake County, Bridge No. 29 over Clarks Creek on SR 1007. We recommend replacing this bridge with a bridge. NCDOT should follow all stream crossing guidelines for anadromous fish passage, including an in-water work moratorium from February 15 to June 30. Standard recommendations apply.

6. B-4301, Wake County, Bridge No. 229 over Poplar Creek on SR 1007. We recommend replacing this bridge with a bridge. NCDOT should follow all stream crossing guidelines for anadromous fish passage, including an in-water work moratorium from February 15 to June 30. Standard recommendations apply.

7. B-4302, Wake County, Bridge No. 336 over Terrible Creek on SR 1301. We recommend replacing this bridge with a bridge. Standard recommendations apply.

8. B-4303, Wake County, Bridge No. 102 over Lower Bartons Creek on SR 1844. We recommend replacing this bridge with a bridge. Standard recommendations apply.

9. B-4304, Wake County, Bridge No. 143 over Beaver Dam Creek on SR 2217. We recommend replacing this bridge with a bridge. Standard recommendations apply.

10. B-4592, Orange County, Bridge No. 64 over the Eno River on SR 1561. We recommend replacing this bridge with a bridge. We request conducting a survey for the following state endangered and federal species of concern mussels: Yellow lampmussel and Atlantic pigtoe. Also, a significant fishery for sunfish exists at this site, therefore we request an in-water work moratorium for sunfish from April 1 to June 30. 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

NCDENR

North Carolina Department of Environment and Natural Resources

Michael F. Easley, Governor

William G. Ross Jr., Secretary

February 27, 2004

Dr. Gregory J. Thorpe
N.C. Department of Transportation
Project Development and Environmental Analysis
1548 MSC
Raleigh, NC 27699-1548

Subject: Replacement of Bridges in Alamance, Chatham, Durham, Orange, and Wake counties

Dear Dr. Thorpe:

The Natural Heritage Program has no record of rare species, significant natural communities, or priority natural areas at the site nor within a mile of the project area, for the projects listed below:

B-4002, Alamance County, Bridge No. 96 over Meadow Creek on SR 2116 (Preacher Holmes Road)
B-4063, Chatham County, Bridge No. 20 over Sandy Branch on NC 902
B-4109, Durham County, Bridge No. 120 over Mud Creek on SR 1303 (Pickett Road)
B-4300, Wake County, Bridge No. 29 over Clarks Creek on SR 1007 (Poole Road)
B-4301, Wake County, Bridge No. 229 over Poplar Creek on SR 1007 (Poole Road)
B-4302, Wake County, Bridge No. 336 over Terrible Creek on SR 1301 (Sunset Lake Road).

Our Program does have records of rare species, significant natural communities, or priority natural areas at the site or within a mile of the project area, for the projects listed below:

B-4216, Orange County, Bridge No. 66 over Strouds Creek on SR 1002 (St. Marys Road). This site lies just upstream of the Eno River, where there are numerous rare aquatic animal species. Species recorded at the confluence of Strouds Creek and the river (at Lawrence Road) are –

yellow lampmussel (*Lampsilis cariosa*), State Endangered and Federal Species of Concern
eastern lampmussel (*Lampsilis radiata radiata*), State Threatened
notched rainbow (*Villosa constricta*), State Special Concern
Neuse River waterdog (*Necturus lewisi*), State Special Concern

1601 Mail Service Center, Raleigh, North Carolina 27699-1601
Phone: 919-733-4984 \ FAX: 919-715-3060 \ Internet: www.enr.state.nc.us/ENR/

B-4303, Wake County, Bridge No. 102 over Lower Bartons Creek on SR 1844 (Mt. Vernon Church Road). The Lower Barton Creek Ultramafic Slopes natural area lies on the south side of the road; this is an unprotected site of Local significance. Just downstream of the bridge is the following –

Carolina ladle crayfish (*Cambarus davidi*), State Significantly Rare

B-4304, Wake County, Bridge No. 143 over Beaver Dam Creek on SR 2217 (Old Milburnie Road). There is a vague, historic record of the following, just downstream –

veined skullcap (*Scutellaria nervosa*), State Significantly Rare

B-4592, Orange County, Bridge No. 64 over the Eno River on SR 1561 (Lawrence Road). See comments for project B-4216. This site is a few miles above Eno River State Park. Also, a tract just upstream of the bridge has been recently acquired, or is in the process of being acquired. In addition, the section of the Eno River from Hillsborough to the confluence with the Neuse River is a Nationally significant aquatic habitat, for many additional rare species than those listed above.

Our program recommends that NC DOT enact strong sedimentation controls to ensure that populations of these rare species, and particularly the water quality of the Eno River, not be impacted during the bridge replacements. The use of Natural Heritage Program data should not be substituted for actual field surveys, particularly if the project area contains suitable habitat for rare species, significant natural communities, or priority natural areas.

You may wish to check the Natural Heritage Program database website at <www.ncsparks.net/nhp/search.html> for a listing of rare plants and animals and significant natural communities in the county and on the topographic quad map. Please do not hesitate to contact me at 919-715-8697 if you have questions or need further information.

Sincerely,

Harry E. LeGrand, Jr.

Harry E. LeGrand, Jr., Zoologist
Natural Heritage Program

HEL/hel

cc: Brian Strong, Division of Parks and Recreation, Resource Management Program
David Cook, Superintendent, Eno River State Park

NCDENR

North Carolina Department of Environment and Natural Resources
Division of Parks and Recreation

Michael F. Easley, Governor William G. Ross, Jr., Secretary Philip K. McKnelly, Director

MEMORANDUM

TO: William T. Goodwin, Jr., PE, Bridge Replacement Unit
Department of Transportation

FROM: Brian Strong, Environmental Review Coordinator 324
DENR, Division of Parks and Recreation

DATE: September 6, 2002

SUBJECT: Review of Department of Transportation Bridge Replacement Projects

The purpose of this memorandum is to transmit comments prepared by the Division of Parks and Recreation (Division) on a number of proposed bridge replacement projects. These projects were received from Mr. William T. Goodwin (dated April 24, 2002) and John Williams (received June 25, 2002).

Prior to discussing individual comments on specific projects I would like to make one general comment. A number of projects are listed as replacement of bridges with culverts. The Division would like to express concern with this type of replacement. As you know, culverts are often beset by a number of persistent problems associated with their installation and maintenance. Culverts are frequently the focus of restoration projects as either culvert removal or mitigation efforts designed to remediate their destabilizing influence. Since culverts are often used in lieu of bridges as a cost savings alternative, the proper design of the culvert is often not factored into the cost of the project. Impacts of improper design and installation include the angle of insertion (too high or too low), sizing of culverts, culvert placement (too low or too high), and lack of culvert maintenance resulting in degradation of streams. In addition, culvert are often insufficiently designed to handle fish passage due to inadequate depth of water at time of passage, inappropriate water velocity, inadequate resting places above and below the stream structure, and physical obstructions to passage. Culverts have been identified as one of the greatest sources of stream morphology change in the United States. In general, the Division recommends that bridges be used in all instances where practical.

Enclosure 1 presents the bridge replacement projects were potential environmental impacts were identified. The majority of the impacts involve impacts to significant natural heritage areas, rare plant and animal species. Other impacts include proximity to state trails, state parks, and natural heritage aquatic habitats. Enclosure 2 presents the accompanying maps discussed in Enclosure 1.

Please let me know if there is any further information you need or if you have any questions regarding the enclosed material, my telephone number is (919) 715-8711.

Bridge Replacement Project	Potential Impact
Durham County Replace Bridge No. 120 on SR 1303 over Mud Creek B-4109 PEF	Impacts to SNHA: Regional significance
Harnett County Rehabilitate Bridge Deck No. 46 on US 401 over Cape Fear River B-4138 Johnson	Impacts several rare mussel species
Jackson County Replace Bridge No. 108 on SR 1002 over Tuckasegee Creek B-4159 Williams	Impacts to SNHA river: National significance
Jackson County Replace Bridge No. 82 on SR 1002 over Tuckasegee River B-4160 Williams	Impacts to SNHA river: National significance
Montgomery County Replace Bridge No. 28 on NC 109 over Rock Creek B-4204 PEF	Impacts to SNHA: State significance
Montgomery County Replace Bridge No. 128 on SR 1315 over Densons Creek B-4206 Pipkin	Impacts to SNHA: State significance
Orange County Replace Bridge No. 66 on SR 1002 over Strounds Creek B-4216 PEF	Trib is located 250 yards from Eno River State Park and 450 yards from the Eno River
Rutherford County Replace Bridge Nol 41 on SR 1549 over Cathey's Creek B-4263 Young	Impacts to rare fish
Sampson County Replace Bridge No. 90 on SR 1214 over Little Coharie Creek B-4269 Johnson	Impacts to rare mussel

Nicole Bennett

From: Nicole Bennett
Sent: Friday, April 11, 2008 9:18 AM
To: Nicole Bennett
Subject: FW: NCDOT Projects B-4592 and B-4216

From: Mike Tapp [mailto:mtapp@co.orange.nc.us]
Sent: Friday, April 11, 2008 8:51 AM
To: Laura Willon
Cc: Gwen Snowden
Subject: RE: NCDOT Projects B-4592 and B-4216

Based on the descriptions of these projects, there will certainly be impacts to Emergency Services, however, we do not believe they will be significant ones. The project may increase response times to access the area northeast of the project due to the need to use alternate routes to reach areas northeast of the project. If you need additional information, please contact us.

Mike Tapp
Deputy Director/Fire Marshal
Orange County Emergency Services
P.O. Box 8181
Hillsborough, NC 27278
phone: 919-968-2050
fax: 919-968-4066
pager: 919-216-9580

From: Nicole Bennett
Sent: Tuesday, March 25, 2008 3:56 PM
To: 'gsnowden@co.orange.nc.us'; 'mtapp@co.orange.nc.us.'
Subject: FW: NCDOT Projects B-4592 and B-4216

Major Snowden and Major Tapp:

My firm is preparing a planning document for the replacement of Bridge No. 66 on St. Mary's Road. I contacted Major Kent McKenzie in December 2006 to receive comments regarding potential impacts to emergency services. I was following up on the correspondence and was given your names to contact instead. I have included the previous e-mails to make you aware of the project.

I have attached a map showing the project location and proposed detour route. I need to know from you if you believe the proposed project would have substantial impacts on emergency services. This needs to be included in the appendix for my report. You can reply by mail or via e-mail, whichever is most convenient for you.

If you have questions, or need additional information, please call me at 919-858-1921 or e-mail me.

Thank you for your assistance.

Nicole Bennett

From: Nicole Bennett
Sent: Tuesday, March 25, 2008 3:49 PM

To: 'Kent McKenzie'
Subject: RE: NCDOT Projects B-4592 and B-4216

Major McKenzie:

We are about to finalize our document for project B-4216, the replacement of Bridge No. 55 on St. Mary's Road over the Eno River. (B-4592 has been completed.) Were you able to consult with the affected fire departments to discuss anticipated impacts to emergency services during construction of the project? We have been asked to include written correspondence from your office in the appendix of our documenting stating whether or not there will be significant impacts to emergency services.

I have attached a map showing the location of the project and the proposed detour route. As a reminder, the preferred alternative for this project would require an off-site detour using Lawrence Road.

Please let me know if you have questions or need additional information. If you could send me your correspondence at your earliest convenience, I would appreciate it. We are trying to finalize the planning document in the next few weeks.

Thank you,
Nicole Bennett

From: Kent McKenzie [mailto:kmckenzie@co.orange.nc.us]
Sent: Thursday, December 14, 2006 12:46 PM
To: Nicole Bennett
Cc: Gwen Snowden; Mike Tapp
Subject: FW: NCDOT Projects B-4592 and B-4216

Ms. Bennett,

Colonel Ball is no longer with Orange County Emergency Management, and I am serving as the Interim EM Director. I received the text of your email to Col Ball, but unfortunately the attachments did not come through. Based on your text descriptions of these projects, there will certainly be impacts to Emergency Services, but I don't believe they will be insurmountable ones. The area involved covers two different fire districts, and the project may increase response times for some locations. If you can please re-send the attachments to us, we will consult with both of the Fire Departments that these projects will affect and get our response back to you.

Thanks,

Kent McKenzie

Major Kent McKenzie
Interim Emergency Management Director;
Emergency Management Deputy Director for EMS
Orange County North Carolina
P.O. Box 8181
Hillsborough, NC 27278

Office 919-968-2050
24-hour 919-933-2600

From: Jack Ball
Sent: Thursday, December 14, 2006 11:54 AM
To: Kent McKenzie
Subject: FW: NCDOT Projects B-4592 and B-4216

From: Nicole Bennett[SMTP:NBENNETT@MULKEYINC.COM]
Sent: Thursday, December 14, 2006 11:53:42 AM
To: Jack Ball
Subject: NCDOT Projects B-4592 and B-4216
Auto forwarded by a Rule

Colonel Ball:

I am working on the Planning Documents for two bridge replacement projects in Orange County: B-4592 is for the replacement of Bridge No. 64 on Lawrence Road over the Eno River and B-4216 is the replacement of Bridge No. 66 on St. Mary's Road over the Eno River. The proposed recommended alternatives for each of these projects calls for an offsite detour during construction. For B-4592, the offsite detour uses ST. Mary's Road and US 70 Bypass. It would be approximately 2 miles long. For B-4216, the offsite detour uses Lawrence Road for the detour route.

Do you anticipate either of these detours to present a problem from an emergency services perspective?

I have attached the vicinity maps for each project, both of which show the detour routes. If you need additional information, please let me know.

Thank you,
Nicole Bennett

Nicole H. Bennett, AICP
Senior Planner
Mulkey Engineers & Consultants
6750 Tryon Road
Cary, North Carolina 27518
Direct: 919-858-1921
Fax: 919-851-1918

Nicole Bennett

From: Robert Miller [Robert.Miller@orange.k12.nc.us]
Sent: Thursday, March 27, 2008 11:28 AM
To: Nicole Bennett
Cc: Sharon Linster; Lora Worsham; George McFarley
Subject: RE: NCDOT Project B-4216 Replacement of Bridge No. 66 on St. Mary's Road

Follow Up Flag: Follow up
Flag Status: Flagged

We have five buses that cross the bridge twice a day but we will just have to deal with it. Do you think this could be done while school is out? Thanks

---

From: Nicole Bennett [mailto:nbennett@mulkeyinc.com]
Sent: Thursday, March 27, 2008 10:11 AM
To: Robert Miller
Subject: NCDOT Project B-4216 Replacement of Bridge No. 66 on St. Mary's Road

Good morning, Mr. Miller:

My firm is preparing a planning document for the North Carolina Department of Transportation for replacement of Bridge No. 66 over Strouds Creek on St. Mary's Road. The preferred alternative includes an approximate 2-mile off-site detour during construction. The detour would use Lawrence Road. I have attached a map that shows the location of the project and the proposed detour route.

Could you please tell me 1) how many buses cross this bridge daily and 2) if you anticipate significant disruption to school bus operations as a result of the detour?

If you have questions, please call me at 919-858-1921 or e-mail me if you prefer.

Thanks so much for your assistance!
Nicole

Nicole H. Bennett, AICP
Project Manager
Mulkey Engineers & Consultants
6750 Tryon Road
Cary, North Carolina 27518
Direct: 919-858-1921
Fax: 919-851-1918

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