STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

MICHAEL F. EASLEY
GOVERNOR

LYNDO TIPPETT
SECRETARY

March 5, 2004

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

ATTENTION: Mr. Mike Bell
NCDOT Coordinator

Dear Sir:

Subject: **Nationwide 23 Permit Application** for the Replacement of Bridge No. 24 over Northeast Cape Fear River on NC 403, Wayne/Duplin Counties, Federal Aid Project No. BRSTP-403(3), State Project No. 8.1331801, TIP B-4320, Division 4.

Please find enclosed three copies of the project planning report for the above referenced project. Bridge No. 24 will be replaced in the existing location with a cored slab bridge, approximately 105 feet in length with a 40-foot clear roadway width. The structure will provide two 12-foot travel lanes with eight feet of lateral clearance on each side. The new approach roadway will provide two 12-foot travel lanes with eight feet grass shoulders. A design speed of 60 mph will be provided.

There are jurisdictional wetlands associated with this project with impacts totaling 0.13 acres. Of these impacts, 0.12 acres is mechanized clearing, and mitigation is required. Surface waters will not be impacted by the construction of the bridge.

The Stream Crossing Guidelines for Anadromous Fish Passage will be implemented, as applicable.

The bridge will be built using top-down construction. No causeway or work pad will be needed, and thus there will be no temporary impacts from construction access.

During construction, traffic will be maintained by an off-site detour. This detour will utilize SR 1937/1558, SR 1559, NC 55, and NC 403.

Bridge Demolition

Bridge Demolition: The superstructure of Bridge No. 24 is a reinforced concrete deck on timber joists. The substructure consists of end bents and three interior bents all consisting of timber caps on timber piles. Four of the piles on all the bents have concrete jackets. The existing four-span structure is 70 feet long with a 24-foot clear roadway width.

There is the potential for pieces of the concrete deck and the concrete jackets to be dropped into the "Waters of the United States". The resulting temporary fill associated with the replacement of Bridge No. 24 is approximately 40.4 cubic yards. Best Management Practices for Bridge Demolition and Removal will be implemented.

As noted in the project's CE document, NCDOT will observe an in-stream construction moratorium from February 15 to June 15.

Compensatory Mitigation

The necessary compensatory mitigation to offset unavoidable impacts to waters that are jurisdictional under the federal Clean Water Act will be provided by the Ecosystem enhancement program (EEP). The offsetting mitigation will derive from an inventory of assets already in existence within the same 8-digit cataloguing unit. The NCDOT has avoided and minimized impacts to jurisdictional resources to the greatest extent possible. The remaining, unavoidable impacts to 0.13 acres of jurisdictional wetlands will be offset by compensatory mitigation provided by the EEP program.

Federally Protected Species

Plants and animals with federal classifications of Endangered, Threatened, Proposed Endangered and Proposed Threatened are protected under provisions of Section 7 and Section 9 of the endangered Species Act of 1973, as amended. As of January 29, 2003, the U. S. Fish and Wildlife Service (FWS) lists the following federally-protected species for Wayne and Duplin Counties (Table 1).

Table 1. Federally-protected Species for Wayne/Duplin Counties

Common Name	Scientific Name	County	Conclusion	Status
Red-cockaded woodpecker	*Picoides borealis*	Wayne & Duplin	No Effect	Endangered
American alligator	*Alligator mississippiensis*	Duplin	N/A	T(S/A)

Endangered – A taxon "which is in danger of extinction throughout all or a significant portion of its range" (Endangered Species Act, Section 3).
T(S/A) – Indicates the species is threatened due to similarity of appearance.

Regulatory Approvals

Section 404 Permit: This project is being processed by the Federal Highway Administration as a "Categorical Exclusion" in accordance with 23 CFR 771.115(b). Therefore, we do not anticipate requesting an individual permit but propose to proceed under a Nationwide 23 as authorized by a Nationwide Permit 23 (67 FR 2020; January 15, 2002).

Section 401 Permit: We anticipate 401 General Certification number 3403 will apply to this project. In accordance with 15A NCAC 2H, Section .0500(a) we are providing two copies of this application to the North Carolina Department of Environmental and Natural Resources, Division of Water Quality, for their review.

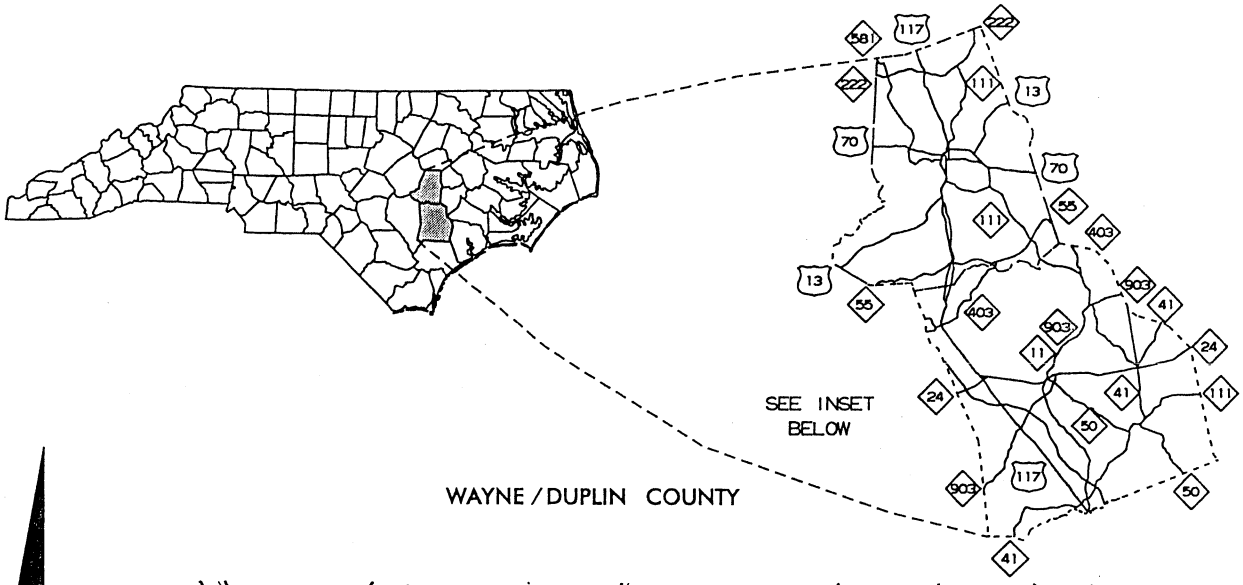
A copy of this permit application will be posted on the DOT website at: http://www.ncdot.org/planning/pe/naturalunit/Permit.html.

If you have any questions or need additional information, please contact Mr. Chris Underwood at (919) 715-1451.

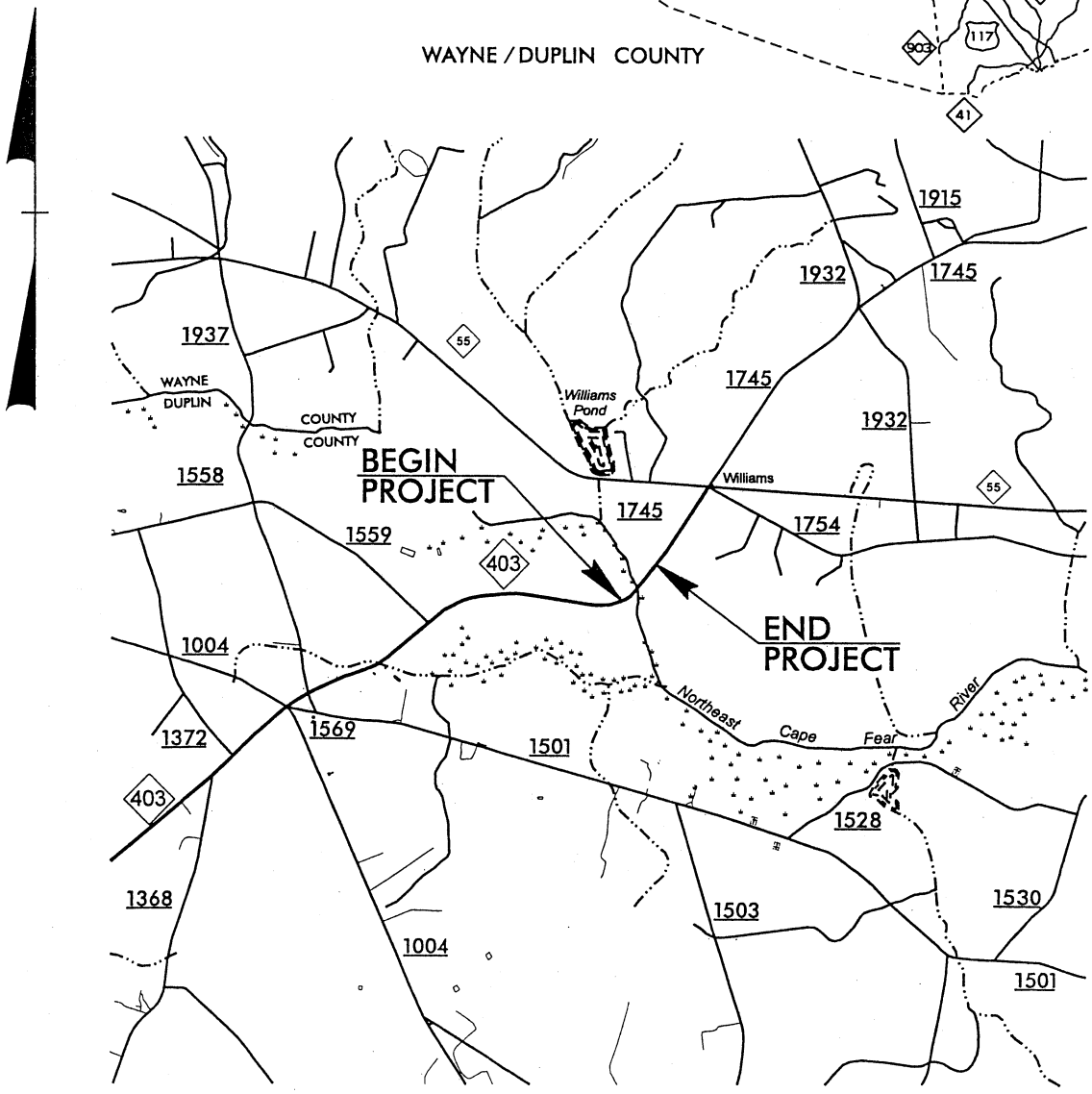
Sincerely,

Gregory J. Thorpe, PhD, Environmental Management Director
Project Development and Environmental Analysis Branch

cc: w/attachment
Mr. John Hennessy, Division of Water Quality (2 copies)
Mr. Travis Wilson, NCWRC
Mr. Gary Jordan, USFWS
Mr. Greg Perfetti, P.E., Structure Design
w/o attachment
Mr. David Franklin, USACE, Wilmington
Mr. Jay Bennett, P.E., Roadway Design
Mr. Omar Sultan, Programming and TIP
Mr. Art McMillan, P.E., Highway Design
Mr. David Chang, P.E., Hydraulics
Mr. Mark Staley, Roadside Environmental
Mr. John Sullivan, FHWA
Mr. Anthony W. Roper, P.E., Division Engineer
Mr. Jamie Shern, DEO
Ms. Stacy Baldwin, Project Planning Engineer



WAYNE / DUPLIN COUNTY



SCALE

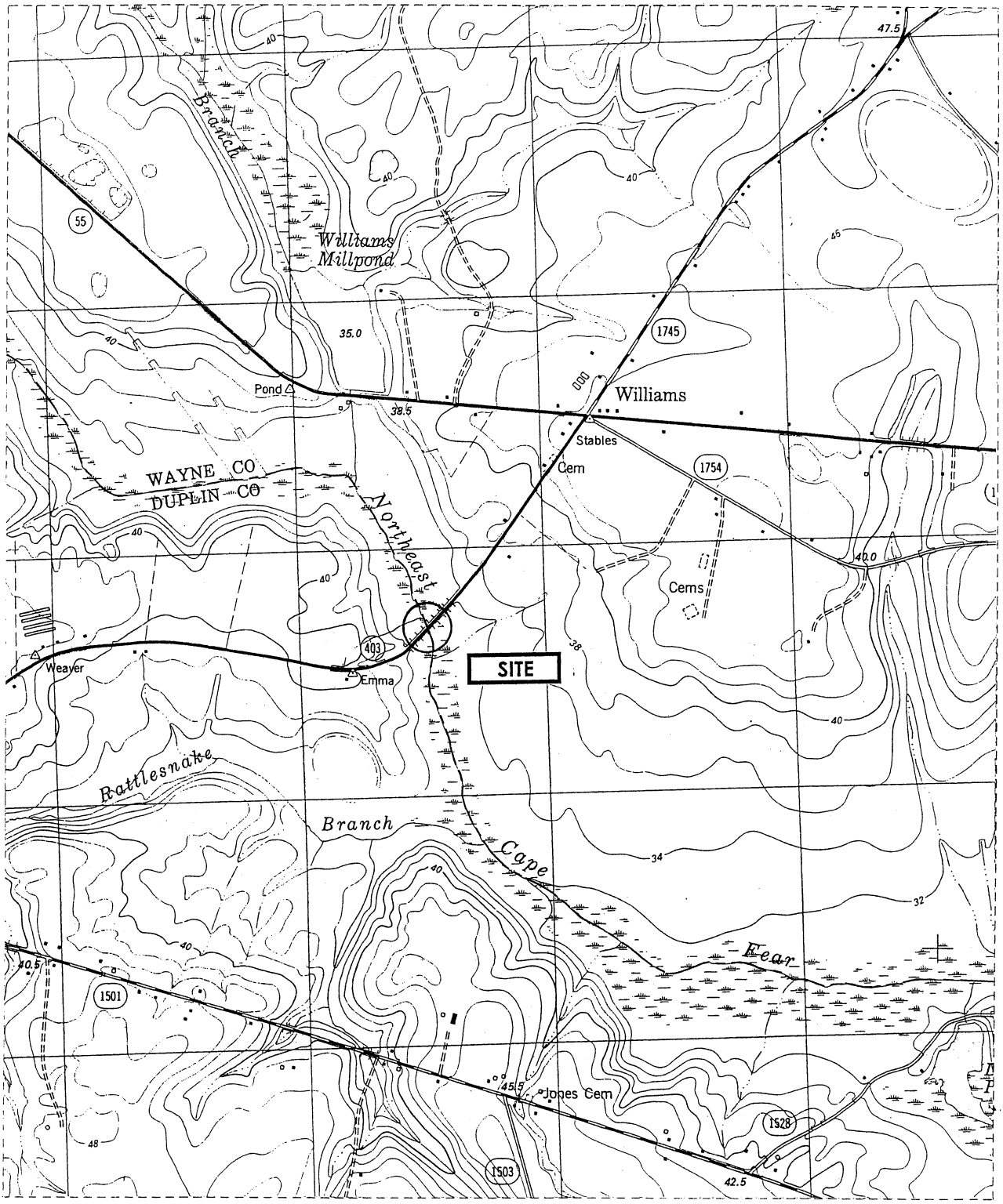
.5 0 1 Mile

N.C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS

WAYNE / DUPLIN COUNTY

PROJECT: 8.1331801 (B-4320)
BRIDGE NO. 24
ON NC 403 OVER
NE CAPE FEAR RIVER

SHEET 1 OF 7 9 / 23 / 03



1000 0 2000

N.C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS

WAYNE / DUPLIN COUNTY

PROJECT: 8.1331801 (B-4320)
BRIDGE NO. 24
ON NC 403 OVER
NE CAPE FEAR RIVER

SHEET 2 OF 7 09 / 23 / 03

LEGEND

---WLB---- WETLAND BOUNDARY

WLB / WLB — WETLAND

F F — DENOTES FILL IN WETLAND

S S — DENOTES FILL IN SURFACE WATER

P P — DENOTES FILL IN SURFACE WATER (POND)

T T — DENOTES TEMPORARY FILL IN WETLAND

E E — DENOTES EXCAVATION IN WETLAND

TS TS — DENOTES TEMPORARY FILL IN SURFACE WATER

DENOTES MECHANIZED CLEARING

— BZ — RIPARIAN BUFFER ZONE

FLOW DIRECTION

TB — TOP OF BANK

WE — EDGE OF WATER

C — PROP. LIMIT OF CUT

F — PROP. LIMIT OF FILL

PROP. RIGHT OF WAY

— NG — NATURAL GROUND

PL — PROPERTY LINE

— TDE — TEMP. DRAINAGE EASEMENT

— PDE — PERMANENT DRAINAGE EASEMENT

— EAB — EXIST. ENDANGERED ANIMAL BOUNDARY

— EPB — EXIST. ENDANGERED PLANT BOUNDARY

▽ WATER SURFACE

X X X — LIVE STAKES

BOULDER

COIR FIBER ROLLS

PROPOSED BRIDGE

PROPOSED BOX CULVERT

PROPOSED PIPE CULVERT

(DASHED LINES DENOTE EXISTNG STRUCTURES)

SINGLE TREE

WOODS LINE

DRAINAGE INLET

ROOTWAD

RIP RAP

5 — ADJACENT PROPERTY OWNER OR PARCEL NUMBER IF AVAILABLE

RIP RAP ENERGY DISSIPATOR BASIN

N.C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS

WAYNE / DUPLIN COUNTY

PROJECT: 8.1331801 (B-4320)
BRIDGE NO. 24
ON NC 403 OVER
NE CAPE FEAR RIVER

SHEET 3 OF 7

9/23/03

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

MICHAEL F. EASLEY
GOVERNOR

LYNDO TIPPETT
SECRETARY

March 5, 2004

Mr. William D. Gilmore, P.E.
EEP Transition Manager
Ecosystem Enhancement Program
1652 Mail Service Center
Raleigh, NC 24699-1652

Dear Sir:

Subject: The Replacement of Bridge No. 24 over Northeast Cape Fear River on NC 403, Wayne/Duplin Counties, Federal Aid Project No. BRSTP-403(3), State Project No. 8.1331801, TIP B-4320, Division 4.

NCDOT requests that the North Carolina Ecosystem Enhancement Program (EEP) provide confirmation that we are willing to provide compensatory mitigation for the above-mentioned project in accordance with the Memorandum of Agreement (MOA) signed July 22, 2003 by the USACE, the NCDENR, and the NCDOT. Bridge No. 24 will be replaced in the existing location with a cored slab bridge, approximately 105 feet in length with a 40-foot clear roadway width. The structure will provide two 12-foot travel lanes with eight feet of lateral clearance on each side. The new approach roadway will provide two 12-foot travel lanes with eight feet grass shoulders. A design speed of 60 mph will be provided.

There are jurisdictional wetlands associated with this project with impacts totaling 0.13 acres. Of these impacts, 0.12 acres is mechanized clearing, and mitigation is required. Surface waters will not be impacted by the construction of the bridge.

We have avoided and minimized the impacts to jurisdictional resources to the greatest extent possible as described in the permit application. A copy of the permit application can be found at http://www.ncdot.org/planning/pe/naturalunit/Applications.html. The remaining impacts to jurisdictional resources will be compensated for by mitigation provided by the EEP program. We estimate that 0.13 acres of coastal plain, bottomland hardwood, riverine wetlands will be impacted.

The project is located in the coastal plain Physiographic Province in Wayne/Duplin Counties in the Cape Fear River basin in Hydrological Cataloguing Unit 03030007.

Please send the letter of confirmation to Mike Bell at U. S. Army Corps of Engineers Washington Regulatory Field Office, P.O. Box 1000, Washington, NC 27889-1000. Mr. Bell's

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

TELEPHONE: 919-733-3141
FAX: 919-733-9794
WEBSITE: WWW.NCDOT.ORG

LOCATION:
TRANSPORTATION BUILDING
1 SOUTH WILMINGTON STREET
RALEIGH NC

In order to satisfy regulatory assurances that mitigation will be performed, the NCDWQ requires a formal letter from EEP indicating their willingness and ability to provide the mitigation work requested by NCDOT. The NCDOT requests such a letter of confirmation be addressed to Mr. John Hennessy of NCDWQ with copies submitted to NCDOT.

If you have any questions or need additional information, please contact Mr. Chris Underwood at (919) 715-1451.

Sincerely,

Gregory J. Thorpe, PhD, Environmental Management Director
Project Development and Environmental Analysis Branch

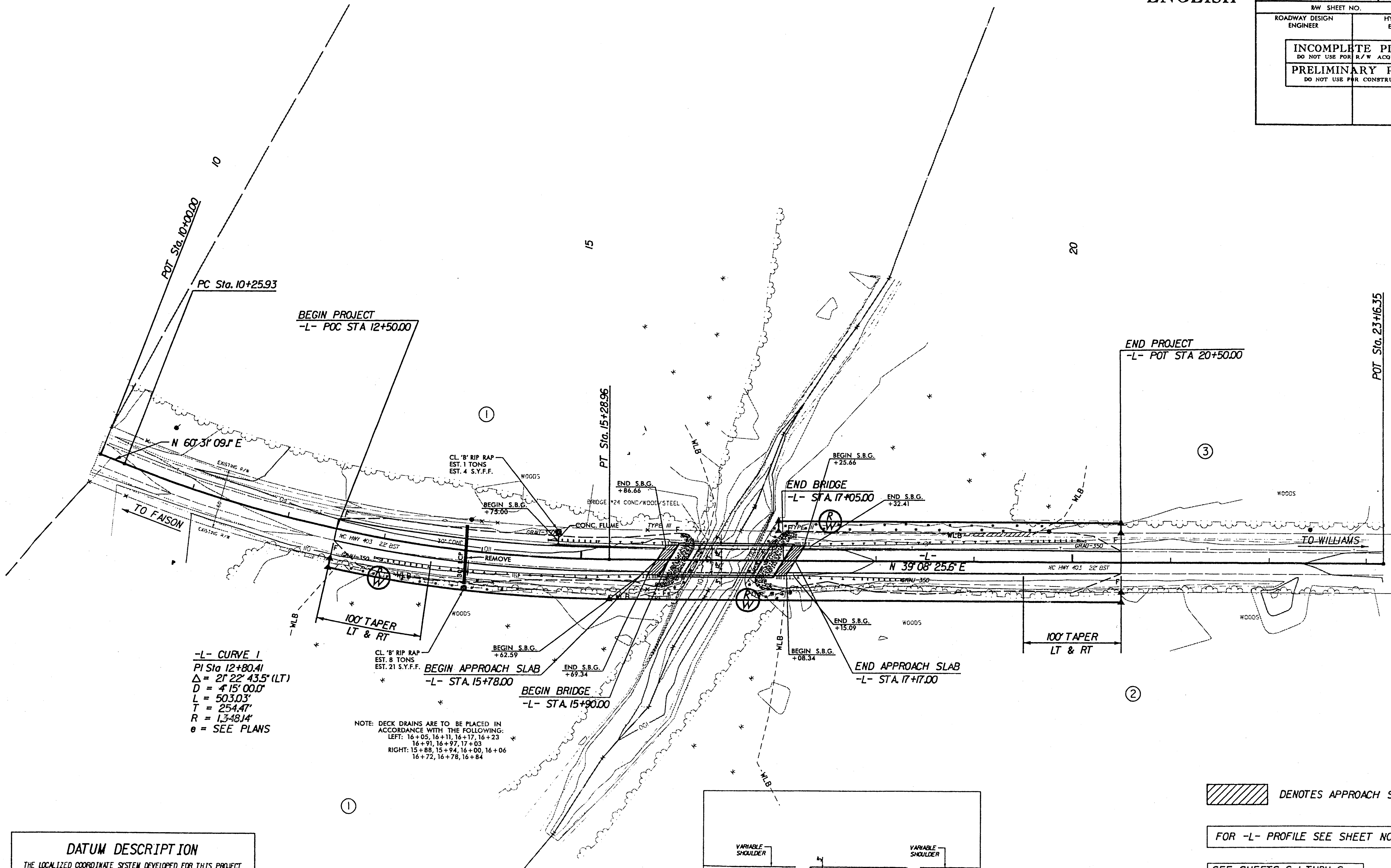
cc: w/attachment
Mr. John Hennessy, Division of Water Quality (2 copies)
Mr. Travis Wilson, NCWRC
Mr. Gary Jordan, USFWS
Mr. Greg Perfetti, P.E., Structure Design
w/o attachment
Mr. David Franklin, USACE, Wilmington
Mr. Jay Bennett, P.E., Roadway Design
Mr. Omar Sultan, Programming and TIP
Mr. Art McMillan, P.E., Highway Design
Mr. David Chang, P.E., Hydraulics
Mr. Mark Staley, Roadside Environmental
Mr. John Sullivan, FHWA
Mr. Anthony W. Roper, P.E., Division Engineer
Mr. Jamie Shern, DEO
Ms. Stacy Baldwin, Project Plann

ENGLISH

PROJECT REFERENCE NO.	SHEET NO.
B-4320	4
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

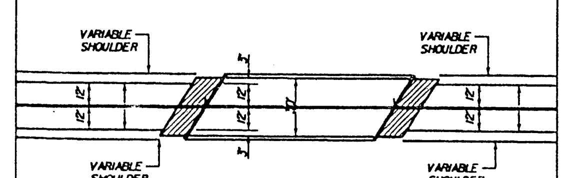


DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCDOT FOR MONUMENT "B4320-2"
WITH NAD 1983/95 STATE PLANE GRID COORDINATES OF NORTHING: 520828.5679(ft) EASTING: 2303701.173(ft)
THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.99987273O
THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "B4320-2" TO -L- STATION 12+50.00 IS N64°39'51"E AND 683.03'
ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES
VERTICAL DATUM USED IS NAVD 88

DENOTES FILL IN WETLANDS

DENOTES MECHANIZED CLEARING



SKETCH SHOWING ROADWAY IN RELATION TO STRUCTURE

DENOTES APPROACH SLAB

FOR -L- PROFILE SEE SHEET NO.5

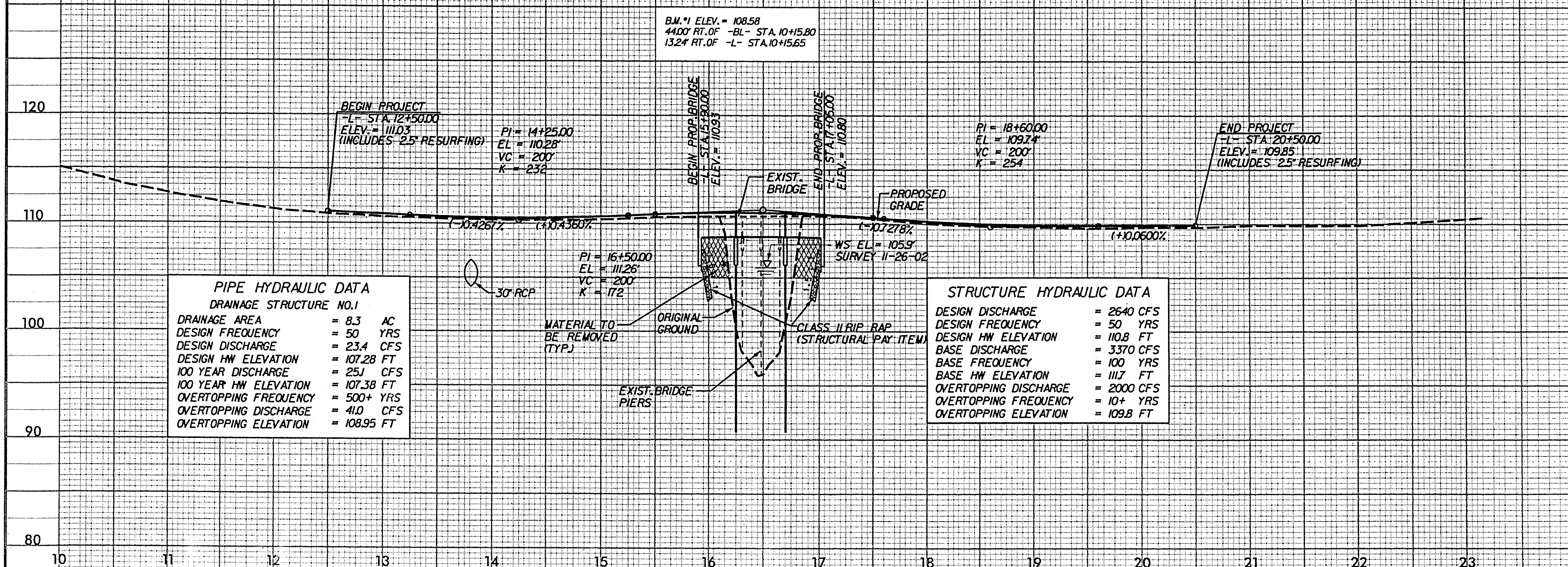
SEE SHEETS S-1 THRU S- FOR STRUCTURE PLANS

Ramey Kemp & Associates, Inc.
Transportation Consulting Engineers
4928-A Windy Hill Drive Raleigh, North Carolina 27609

PROJECT REFERENCE NO.	SHEET NO.
B-4320	5
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION



PIPE HYDRAULIC DATA

DRAINAGE STRUCTURE NO.1

DRAINAGE AREA	= 8.3	AC
DESIGN FREQUENCY	= 50	YRS
DESIGN DISCHARGE	= 23.4	CFS
DESIGN HW ELEVATION	= 107.28	FT
100 YEAR DISCHARGE	= 25.1	CFS
100 YEAR HW ELEVATION	= 107.38	FT
OVERTOPPING FREQUENCY	= 500+	YRS
OVERTOPPING DISCHARGE	= 41.0	CFS
OVERTOPPING ELEVATION	= 108.95	FT

STRUCTURE HYDRAULIC DATA

DESIGN DISCHARGE	= 2640	CFS
DESIGN FREQUENCY	= 50	YRS
DESIGN HW ELEVATION	= 110.8	FT
BASE DISCHARGE	= 3370	CFS
BASE FREQUENCY	= 100	YRS
BASE HW ELEVATION	= 111.7	FT
OVERTOPPING DISCHARGE	= 2000	CFS
OVERTOPPING FREQUENCY	= 10+	YRS
OVERTOPPING ELEVATION	= 109.8	FT

DRAINAGE AREA = 8.3 AC

-L-

(FOR PLAN, SEE SHEET NO. 4)

Ramey Kemp & Associates, Inc.
Transportation Consulting Engineers
4928-A Windy Hill Drive Raleigh, North Carolina 27609
(919) 872-5115 fax (919) 878-5416

Project No. 8.1331801 (B-4320)

Property Owner List

Parcel Number	Name	Address
1	Alonza J. Davis, III	514 W. Main St. Mt. Olive, NC 28365-1904
2	William H. Farmer, Jr.	235 Pineview Cemetary Rd. Mt. Olive, NC 28365
3	Norwood Odom	401 Henderson St. Mt. Olive, NC 28365

N.C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
WAYNE / DUPLIN COUNTY

PROJECT: 8.1331801 (B-4320)
BRIDGE NO. 24
ON NC 403 OVER
NE CAPE FEAR RIVER

9 / 23 / 03

WETLAND PERMIT IMPACT SUMMARY

Site No.	Station (From/To)	Structure Size / Type	WETLAND IMPACTS				SURFACE WATER IMPACTS				
			Fill In Wetlands (ac)	Temp. Fill In Wetlands (ac)	Excavation In Wetlands (ac)	Mechanized Clearing (Method III) (ac)	Fill In SW (Natural) (ac)	Fill In SW (Pond) (ac)	Temp. Fill In SW (ac)	Existing Channel Impacted (ft)	Natural Stream Design (ft)
1	-L- 12+65 / 19+80		0.0090			0.1200					
TOTALS:			0.0090	0.0000	0.0000	0.1200	0.0000	0.0000	0.0000	0.0	0.0

N.C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS

WAYNE / DUPLIN COUNTY

PROJECT 8.1331801 (B-4320)
BRIDGE NO. 24 ON NC 403 OVER
NE CAPE FEAR RIVER

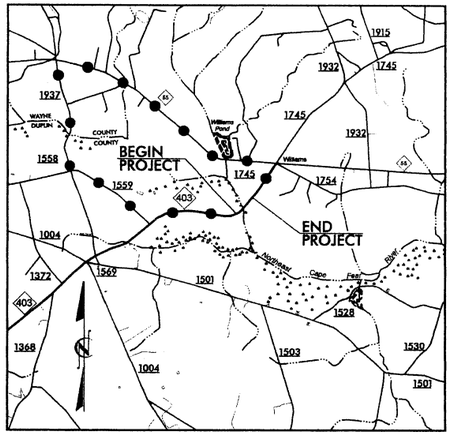
SHEET 7 OF 7

9/23/2003

Form Revised 1/21/03

CONTRACT: TIP PROJECT: B-4320

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



DENOTES OFF-SITE DETOUR

VICINITY MAP

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

WAYNE /DUPLIN COUNTIES

LOCATION: REPLACE BRIDGE NO. 24 AND APPROACHES ON NC 403 OVER NE CAPE FEAR RIVER

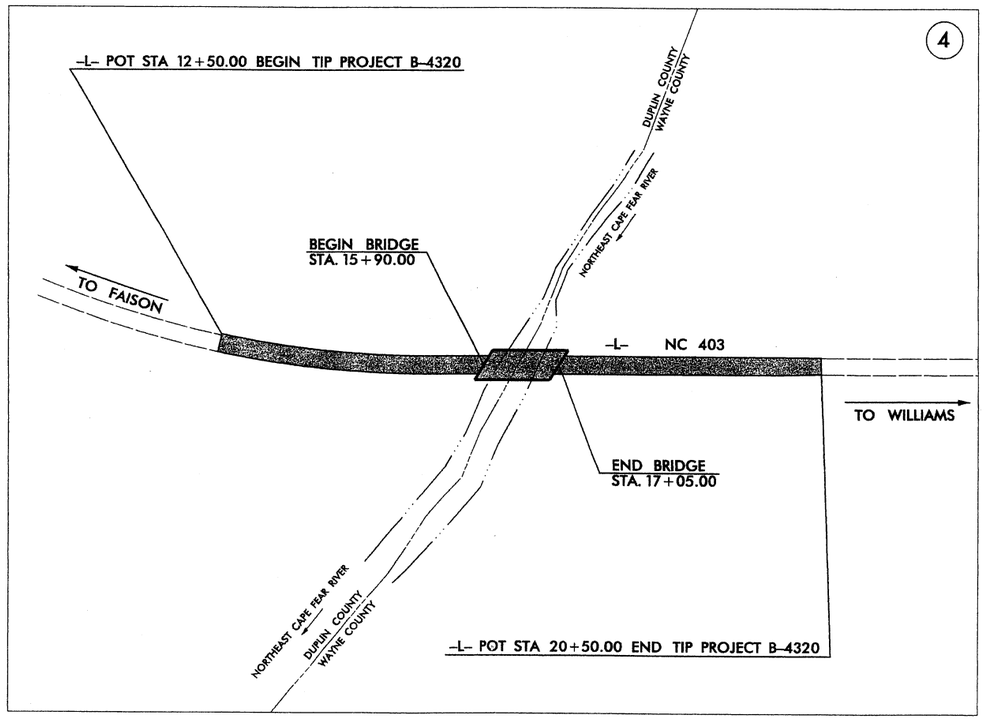
TYPE OF WORK: GRADING, PAVING, DRAINAGE AND STRUCTURE

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-4320	1	

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
33657.1.1	BRSTP-403(3)	P.E.
33657.2.2	BRSTP-403(3)	R /W, UTIL

SUBMITTAL: R/W PLANS

8/22/03



NOTE: THIS PROJECT IS NOT WITHIN ANY MUNICIPAL BOUNDARIES.

NOTE: CLEARING OF THIS PROJECT SHALL BE PERFORMED TO LIMITS ESTABLISHED BY METHOD III.

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

GRAPHIC SCALES

50 25 0 50 100
PLANS

50 25 0 50 100
PROFILE (HORIZONTAL)

10 5 0 10 20
PROFILE (VERTICAL)

DESIGN DATA

ADT 2003 = 1,700
ADT 2025 = 2,800
DHV = 10 %
D = 55 %
T = 4 % *
V = 60 MPH

* TTST 2 % DUAL 2 %

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT B-4320 = 0.130 mi
LENGTH STRUCTURE TIP PROJECT B-4320 = 0.022 mi
TOTAL LENGTH OF TIP PROJECT B-4320 = 0.152 mi

Plans prepared in the office of:
Ramey Kemp & Associates, Inc.
4928-A Windy Hill Drive
Raleigh, North Carolina 27609
(919) 872-5115 fax (919) 878-5416

for the North Carolina Department of Transportation

2002 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE: AUGUST 26, 2003

LETTING DATE: SEPTEMBER 21, 2004

N.C.D.O.T. CONTACT:
VIRGINIA MABRY
PROJECT DESIGN ENGINEER
DESIGN SERVICES

HYDRAULICS ENGINEER

SIGNATURE: P.E.

ROADWAY DESIGN ENGINEER

SIGNATURE: P.E.

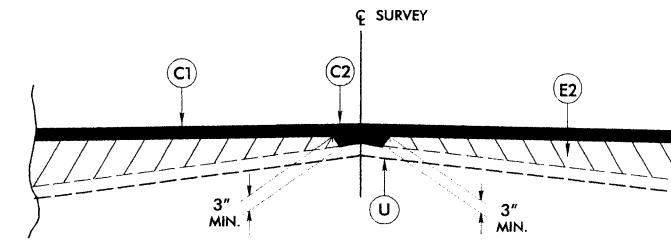
DIVISION OF HIGHWAYS STATE OF NORTH CAROLINA

STATE DESIGN ENGINEER P.E.

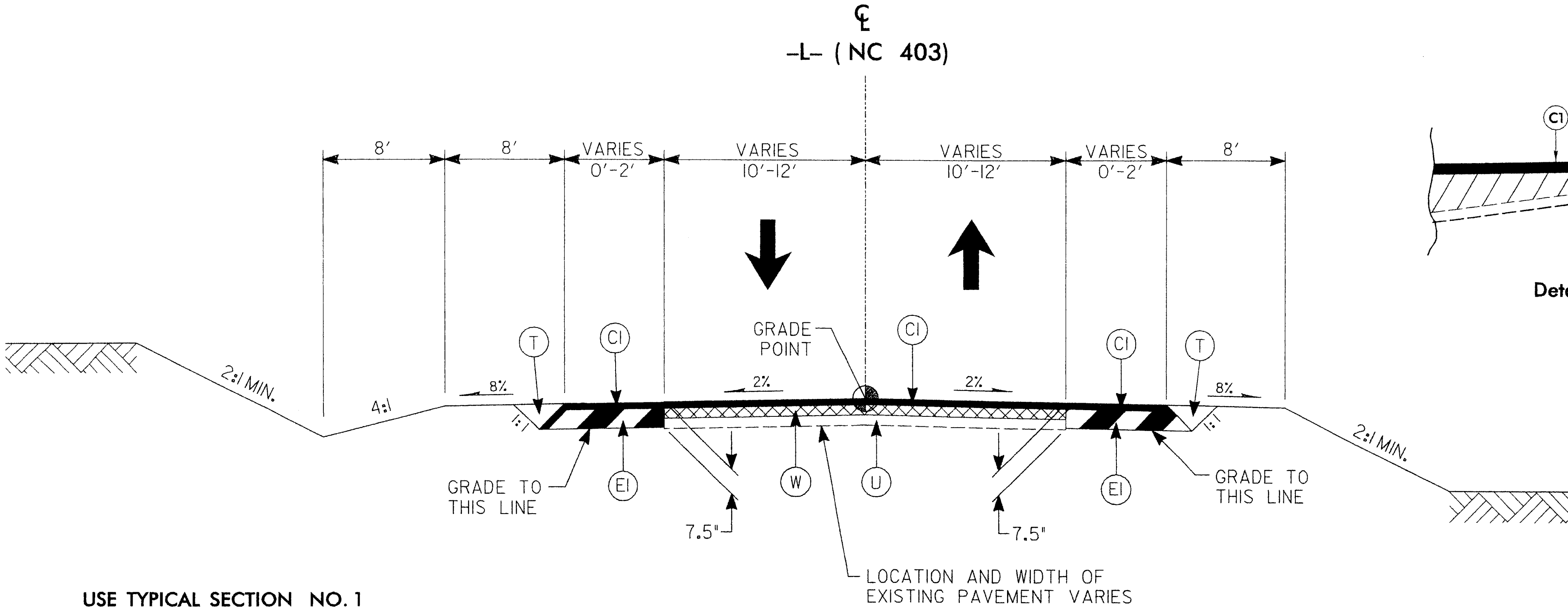
DEPARTMENT OF TRANSPORTATION FEDERAL HIGHWAY ADMINISTRATION

APPROVED
DIVISION ADMINISTRATOR DATE

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



Detail Showing Method of Wedging



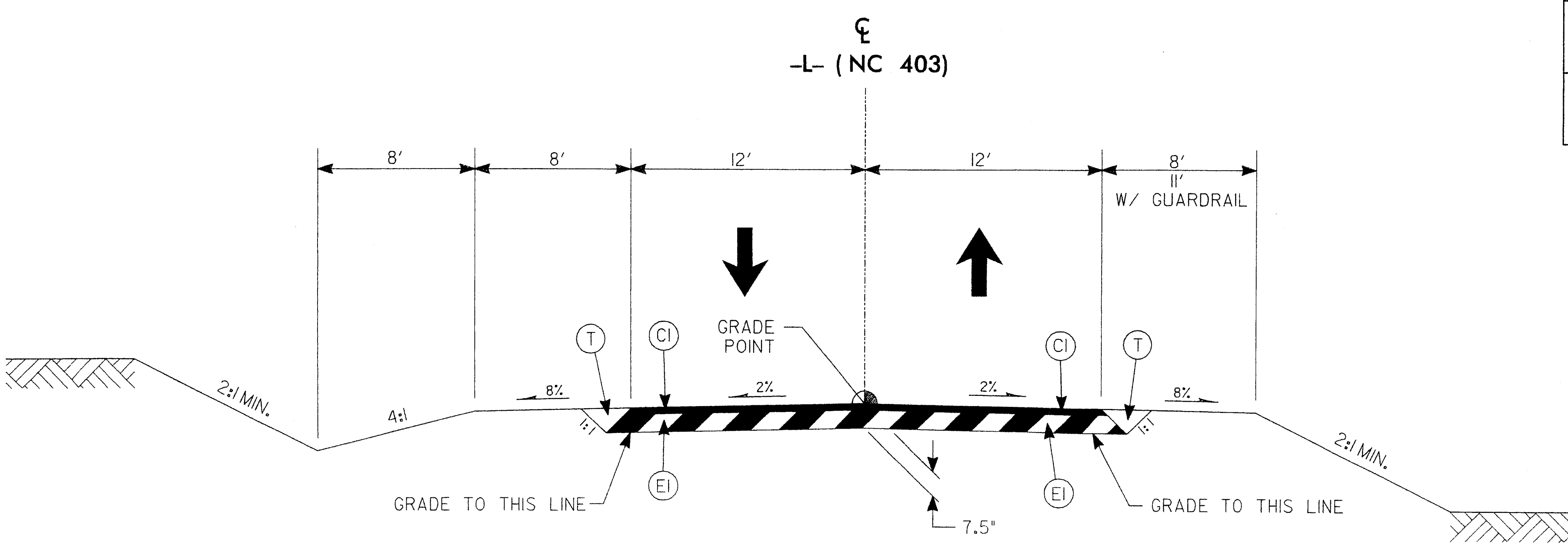
USE TYPICAL SECTION NO. 1

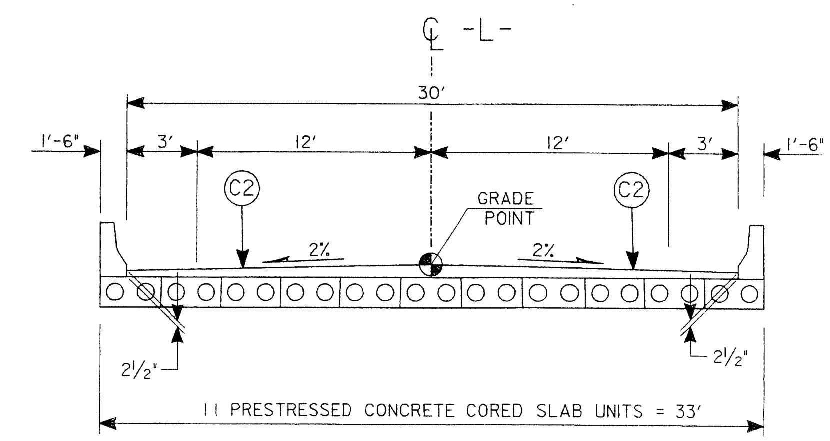
-L- STA. 12+50.00 TO STA. 14+85.00
-L- STA. 18+15.00 TO STA. 20+50.00

TYPICAL SECTION NO. 1

	PAVEMENT SCHEDULE
C1	PROP. APPROX. 2 1/2" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5A, AT AN AVERAGE RATE OF 140 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.
C2	PROP. VAR. DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5A, AT AN AVERAGE RATE OF 112 LBS. PER SQ. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NOT TO EXCEED 1 1/2" IN DEPTH.
E1	PROP. APPROX. 5" ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 570 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 PLACED IN LAYERS NOT LESS THAN 3" IN DEPTH OR GREATER THAN 5 1/2" IN DEPTH.
T	EARTH MATERIAL.
U	EXISTING PAVEMENT.
W	VARIABLE DEPTH ASPHALT PAVEMENT (SEE WEDGING DETAIL THIS SHEET)

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





CORED SLAB DETAIL

USE TYPICAL SECTION NO. 2

-L- STA. 14+85.00 TO 15+90.00 (BEGIN BRIDGE)
-L- STA. 17+05.00 (END BRIDGE) TO 18+15.00

TYPICAL SECTION NO. 2

Ramey Kemp & Associates, Inc.
Transportation Consulting Engineers
4928-A Windy Hill Drive Raleigh, North Carolina 27609
(919) 872-5115 fax (919) 878-5416

A. YOUNG	DATE:
A. COPPLE	DATE:

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

PROJECT REFERENCE NO.	SHEET NO.
B-4320	3-A

RIGHT OF WAY AREA DATA

	PROPERTY OWNERS NAMES	TOTAL ACREAGE	AREA TAKEN	AREA REMAINING RT.	AREA REMAINING LT.	PROPOSED RIGHT OF WAY	TEMP. CONST. EASE.	PERM. DRAIN. EASE.	TEMP. DRAIN. EASE.
	ALONZA J. DAVIS III	44.45 Ac	4037 SQ. FT.	28.05	16.31	4037 SQ. FT.			
	WILLIAM H. FARMER JR.	36.28 Ac	4230 SQ. FT.	36.18		4230 SQ. FT.			
3	NORWOOD ODOM	19.0 Ac	3500 SQ. FT.		18.92	3500 SQ. FT.			

ASPHALT PAVEMENT REMOVAL SUMMARY

STATION TO STATION	SQUARE YARDS
-L- STA. 14+85 STA. 16+13	958
-L- STA. 16+84 STA. 18+15	334
PROJECT TOTAL	1292
SAY	1300

NOTE: APPROXIMATE QUANTITIES ONLY. UNCLASSIFIED EXCAVATION, BORROW EXCAVATION, SHOULDER BORROW, FINE GRADING, CLEARING AND GRUBBING, BREAKING OF EXISTING PAVEMENT, AND REMOVAL OF EXISTING PAVEMENT WILL BE PAID FOR AT THE CONTRACT LUMP SUM PRICE FOR "GRADING".

SUMMARY OF EARTHWORK

STATION TO STATION	UNCLASSIFIED EXCAVATION (cu. yds)	UNDERCUT (cu. yds)	ROADWAY EMBANKMENT +25% (cu. yds)	BORROW (cu. yds)	WASTE (cu. yds)
SUMMARY #1 -L- STA. 12+50 -L- STA. 15+90.00 (BEGIN BRIDGE)	63		313	281	32
SUMMARY #2 -L- STA. 17+05.00 (END BRIDGE) -L- STA. 20+50	144		413	341	72
SUBTOTAL (SUMMARIES 1-2)	207		726	622	104
EST. FOR SHOULDER CONSTRUCTION					
GRAND TOTAL	207		726	622	104
SAY	210		730	630	110
EST. UNDERCUT = 150 CY					

NOTE: APPROXIMATE QUANTITIES ONLY. UNCLASSIFIED EXCAVATION, BORROW EXCAVATION, SHOULDER BORROW, FINE GRADING, CLEARING AND GRUBBING, BREAKING OF EXISTING PAVEMENT, AND REMOVAL OF EXISTING PAVEMENT WILL BE PAID FOR AT THE CONTRACT LUMP SUM PRICE FOR "GRADING".

"N" = DISTANCE FROM EDGE OF LANE TO FACE OF GUARDRAIL.
TOTAL SHOULDER WIDTH = DISTANCE FROM EDGE OF TRAVEL LANE TO SHOULDER BREAK POINT.
FLARE LENGTH = DISTANCE FROM LAST SECTION OF PARALLEL GUARDRAIL TO END OF GUARDRAIL.
W = TOTAL WIDTH OF FLARE FROM BEGINNING OF TAPER TO END OF GUARDRAIL.

GUARDRAIL SUMMARY

SURVEY LINE	BEG. STA.	END STA.	LOCATION	LENGTH STRAIGHT	LENGTH SHOP CURVED	LENGTH DOUBLE FACED	WARRANT POINT APPROACH END	WARRANT POINT TRAILING END	"N" DIST. FROM E.O.L.	TOTAL SHOUL. WIDTH	FLARE LENGTH APPROACH END	FLARE LENGTH TRAILING END	W APPROACH END	W TRAILING END	ANCHORS XI MOD	XI	GRAU 350	M-350	XIII	CAT-A	VI MOD	BIC	TYPE III	IMPACT ATTENUATOR TYPE 350	SINGLE FACED GUARDRAIL	REMOVE EXISTING GUARDRAIL	REMOVE AND STOCKPILE EXISTING GUARDRAIL	REMARKS
-L-	12+80.52	15+80.52	RT.	300.00'				15+80.52	3'	11'		281.25		4.62			1						1					
-L-	14+61.98	15+99.48	LT.	137.50'			15+99.48		3'	11'	118.75		2.38				1						1					
-L-	16+95.52	18+33.02	RT.	137.50'			16+95.52		3'	11'	118.75		2.38				1						1					
-L-	17+14.48	20+14.48	LT.	300.00'				17+14.48	3'	11'		281.25		4.62			1						1					
											5 ADDITIONAL GUARDRAIL POSTS																	
SUBTOTAL				875.00'			DEDUCTIONS FOR ANCHOR UNITS:																					
DEDUCTION	FOR ANCHOR UNITS			275.00'			4 GRAU-350 @ 50.00' = 200.00'																					
							4 TYPE III @ 18.75' = 75.00'																					
	TOTAL			600.00'			TOTAL 275.00'										4						4					
	SAY			600.00'													4						4					

LIST OF PIPES, ENDWALLS, ETC. (FOR PIPES 48" & UNDER)

STATION	LOCATION (LT,RT, OR CL)	STRUCTURE NO. FROM	STRUCTURE NO. TO	TOP ELEVATION	INVERT ELEVATION	INVERT ELEVATION	SLOPE CRITICAL	CLASS III R.C. PIPE (UNLESS NOTED OTHERWISE) 12"	15"	18"	24"	30"	36"	42"	48"	BITUMINOUS COATED C.S. PIPE TYPE B (UNLESS NOTED OTHRWISE) 12" .064	15" .064	18" .064	24" .064	30" .079	36" .079	42" .109	48" .109	15" SIDE DRAIN PIPE	18" SIDE DRAIN PIPE	24" SIDE DRAIN PIPE	ENDWALLS STD. 838.01 OR STD. 838.11 (UNLESS NOTED OTHERWISE) CU. YDS. R.C.P.	C.S.P.	QUANTITIES FOR DRAINAGE STRUCTURES * TOTAL L.F. FOR PAY QUANTITY SHALL BE COL. 'A' + (1.3 X COL.'B') PER EACH (0' THRU 5.0')	LIN. *FT. A 5.0' THRU 10.0'	B 10.0' AND ABOVE	C.B. STD. 840.01 OR STD. 840.02	FRAME, GRATES AND HOOD STANDARD 840.03 TYPE OF GRATE E	F	G	CONC. FLUME	PIPE REMOVAL	REMARKS
SIZE																																						
THICKNESS OR GAUGE																																						
13+84	CL	1			104.80	104.00						60																									53	
14+75	LT	2																																		1		
TOTALS												60																								1	53	

ABBREVIATIONS

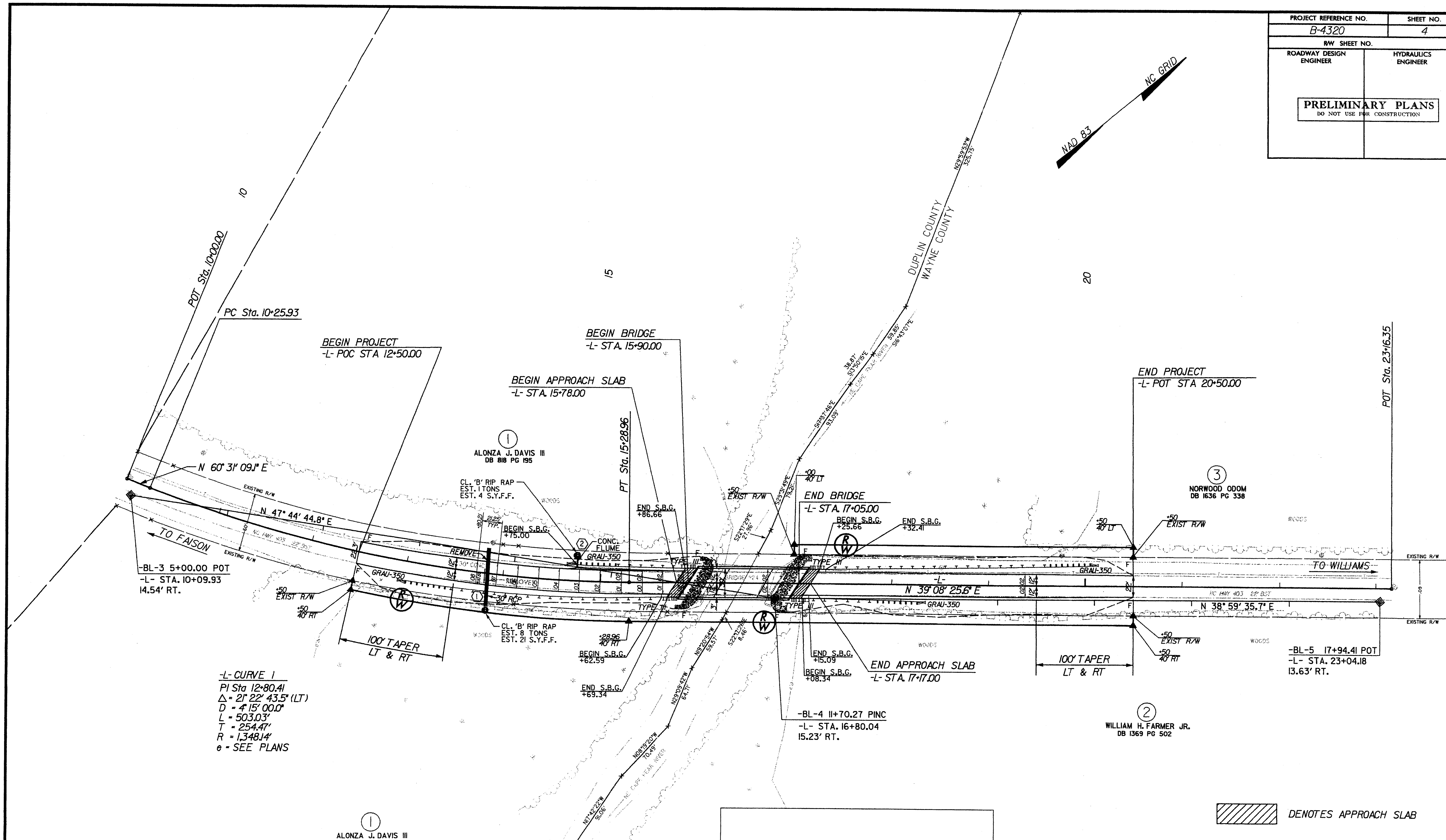
C.B.	CATCH BASIN
N.D.I.	NARROW DROP INLET
D.I.	DROP INLET
M.D.I.	MEDIAN DROP INLET
M.D.I. (N.S.)	MEDIAN DROP INLET (NARROW SLOT)
J.B.	JUNCTION BOX
M.H.	MANHOLE
T.B.D.I.	TRAFFIC BEARING DROP INLET
T.B.J.B.	TRAFFIC BEARING JUCTION BOX

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

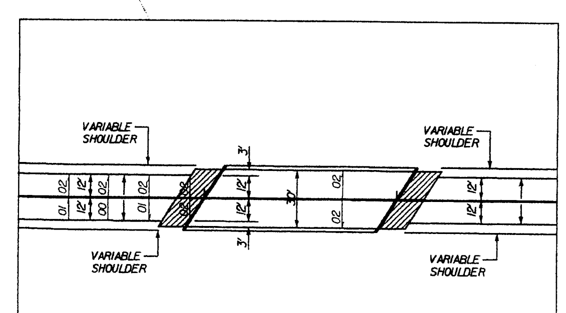
Ramey Kemp & Associates, Inc.
Transportation Consulting Engineers
4928-A Windy Hill Drive Raleigh, North Carolina 27609
(919) 872-585 fax (919) 878-5416

PROJECT REFERENCE NO.	SHEET NO.
B-4320	4
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



NAD 83
NC GRID
POT Sta. 10+00.00
PC Sta. 10+25.93
BEGIN PROJECT
-L- POC STA 12+50.00
BEGIN BRIDGE
-L- STA. 15+90.00
BEGIN APPROACH SLAB
-L- STA. 15+78.00
PT Sta. 15+28.96
END BRIDGE
-L- STA. 17+05.00
END APPROACH SLAB
-L- STA. 17+17.00
END PROJECT
-L- POT STA 20+50.00
POT Sta. 23+16.35
DUPLIN COUNTY
WAYNE COUNTY
ALONZA J. DAVIS III
DB 818 PG 195
NORWOOD ODOM
DB 1636 PG 338
WILLIAM H. FARMER JR.
DB 1369 PG 502
N 60° 31' 09.1" E
N 47° 44' 44.8" E
N 39° 08' 25.6" E
N 38° 59' 35.7" E
TO FAISON
TO WILLIAMS
-BL-3 5+00.00 POT
-L- STA. 10+09.93
14.54' RT.
-BL-4 11+70.27 PINC
-L- STA. 16+80.04
15.23' RT.
-BL-5 17+94.41 POT
-L- STA. 23+04.18
13.63' RT.
CL. 'B' RIP RAP
EST. 1 TONS
EST. 4 S.Y.F.F.
CL. 'B' RIP RAP
EST. 8 TONS
EST. 21 S.Y.F.F.
CONC. FLUME
GRAU-350
TYPE III
100' TAPER
LT & RT
-L- CURVE 1
PI Sta 12+80.41
Δ = 21° 22' 43.5" (LT)
D = 4° 15' 00.0"
L = 503.03'
T = 254.47'
R = 1,348.14'
e = SEE PLANS
BEGIN S.B.G. +75.00
END S.B.G. +86.66
BEGIN S.B.G. +62.59
END S.B.G. +69.34
BEGIN S.B.G. +25.66
END S.B.G. +32.41
END S.B.G. +15.09
BEGIN S.B.G. +08.34
EXIST R/W
EXISTING R/W
WOODS
30" RCP
REMOVE



SKETCH SHOWING ROADWAY IN RELATION TO STRUCTURE

DENOTES APPROACH SLAB

FOR -L- PROFILE SEE SHEET NO.5

SEE SHEETS S-1 THRU S- FOR STRUCTURE PLANS

DATUM DESCRIPTION

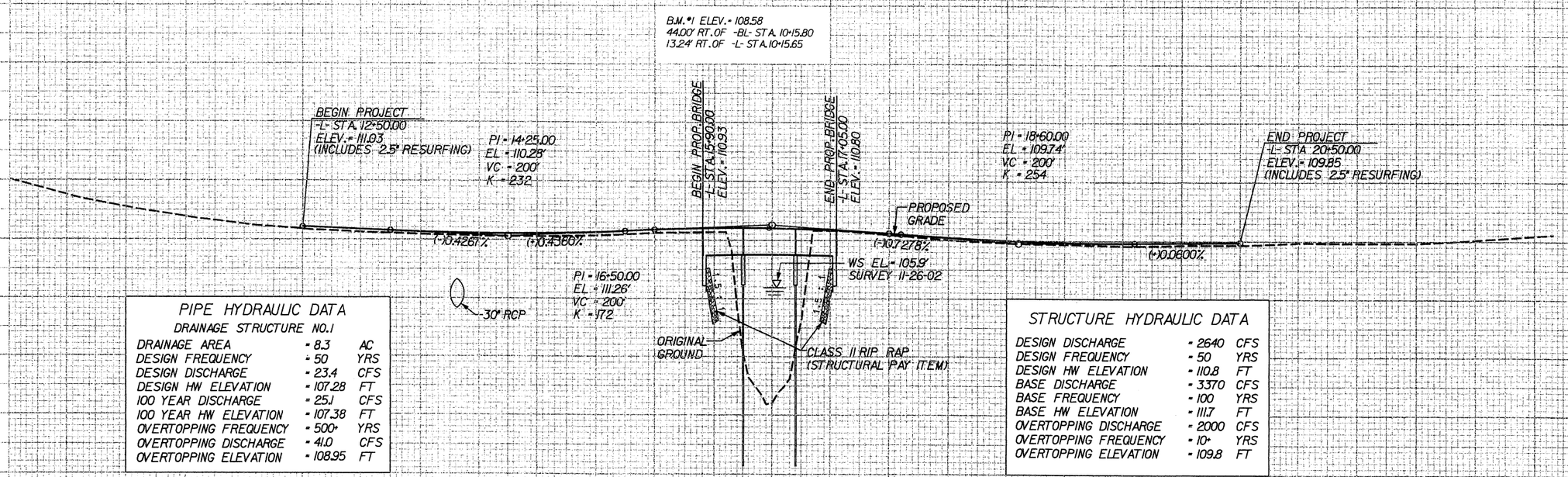
THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCDOT FOR MONUMENT "B4320-2"
WITH NAD 1983/95 STATE PLANE GRID COORDINATES OF NORTHING: 520828.5679(ft) EASTING: 2303701.173(ft)
THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.999872730
THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "B4320-2" TO -L- STATION 12+50.00 IS N64°39'51"E AND 683.03'
ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES
VERTICAL DATUM USED IS NAVD 88

Ramey Kemp & Associates, Inc.
Transportation Consulting Engineers
4928-A Windy Hill Drive Raleigh, North Carolina 27609
(919) 872-5115 fax (919) 878-5416

PROJECT REFERENCE NO.	SHEET NO.
B-4320	5
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

B.M.#1 ELEV.= 108.58
44.00' RT. OF -BL- STA. 10+15.80
13.24' RT. OF -L- STA. 10+15.65



PIPE HYDRAULIC DATA

DRAINAGE STRUCTURE NO.1

DRAINAGE AREA	= 8.3	AC
DESIGN FREQUENCY	= 50	YRS
DESIGN DISCHARGE	= 23.4	CFS
DESIGN HW ELEVATION	= 107.28	FT
100 YEAR DISCHARGE	= 25.1	CFS
100 YEAR HW ELEVATION	= 107.38	FT
OVERTOPPING FREQUENCY	= 500+	YRS
OVERTOPPING DISCHARGE	= 41.0	CFS
OVERTOPPING ELEVATION	= 108.95	FT

STRUCTURE HYDRAULIC DATA

DESIGN DISCHARGE	= 2640	CFS
DESIGN FREQUENCY	= 50	YRS
DESIGN HW ELEVATION	= 110.8	FT
BASE DISCHARGE	= 3370	CFS
BASE FREQUENCY	= 100	YRS
BASE HW ELEVATION	= 111.7	FT
OVERTOPPING DISCHARGE	= 2000	CFS
OVERTOPPING FREQUENCY	= 10+	YRS
OVERTOPPING ELEVATION	= 109.8	FT

-L-

(FOR PLAN, SEE SHEET NO.4)

Ramey Kemp & Associates, Inc.
Transportation Consulting Engineers
4928-A Windy Hill Drive Raleigh, North Carolina 27609
(919) 872-5115 fax (919) 878-5416

PROJ. REFERENCE NO.	SHEET NO.
B-4320	X-1

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

CROSS-SECTION SUMMARY

NOTE: EMBANKMENT COLUMN INCLUDES BACKFILL FOR UNDERCUT

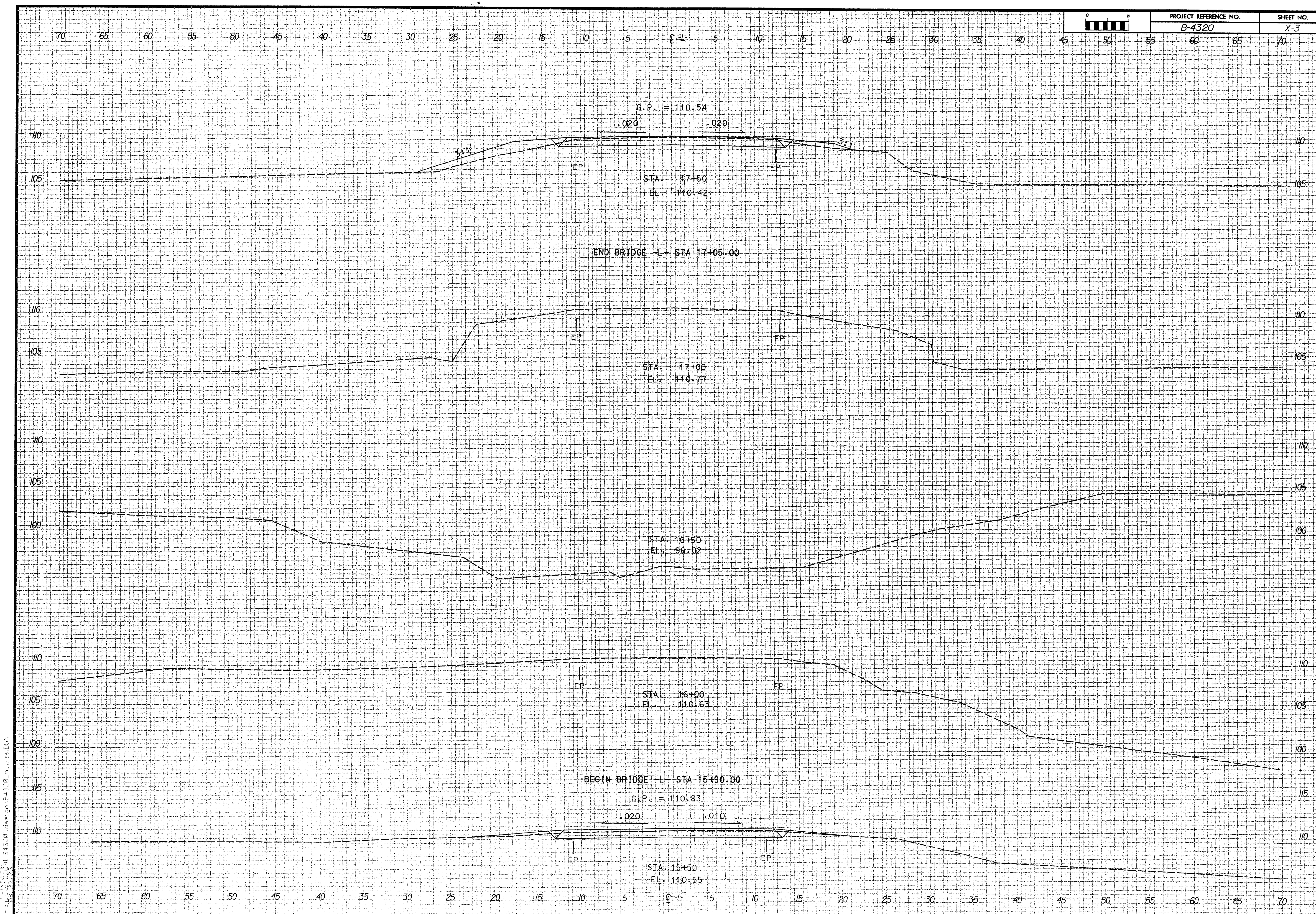
Station	Uncl. Exc. (cu. yd.)	Embt (cu. yd.)
-L-		
12+50.00	0	0
13+00.00	2	32
13+50.00	4	71
14+00.00	4	70
14+50.00	3	41
15+00.00	4	18
15+50.00	19	10
15+90.00 (BEG. BRIDGE)	28	8
17+05.00 (END BRIDGE)	36	27
17+50.00	36	27
18+00.00	38	38
18+50.00	20	55
19+00.00	4	56
19+50.00	4	45
20+00.00	4	54
20+50.00	2	28
TOTAL	207	580

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

Approximate quantities only. Unclassified Excavation, Borrow Excavation, Shoulder Borrow, Fine Grading, Clearing and Grubbing, Breaking of Existing Pavement, and Removal of Existing Pavement will be paid for at the contract lump sum price for "Grading."

Ramey Kemp & Associates, Inc.
Transportation Consulting Engineers
4928-A Windy Hill Drive Raleigh, North Carolina 27609
(919) 872-5115 fax (919) 878-5416

PROJECT REFERENCE NO.	SHEET NO.
B-4320	X-3



0 5	PROJECT REFERENCE NO.	SHEET NO.
	B-4320	X-4

70 65 60 55 50 45 40 35 30 25 20 15 10 5 ℄ -L- 5 10 15 20 25 30 35 40 45 50 55 60 65 70

END PROJECT -L- STA 20+50.00

G.P. = 109.85

110 105

MATCH EXIST

EP EP

STA. 20+50
EL. 109.64

G.P. = 109.82

.020 .020

3:1 3:1

EP EP

STA. 20+00
EL. 109.63

G.P. = 109.79

.020 .020

3:1 3:1

EP EP

STA. 19+50
EL. 109.55

G.P. = 109.83

.020 .020

3:1 3:1

EP EP

STA. 19+00
EL. 109.67

G.P. = 109.97

.020 .020

3:1 3:1

EP EP

STA. 18+50
EL. 109.76

G.P. = 110.20

.020 .020

3:1 3:1

EP EP

STA. 18+00
EL. 110.00

70 65 60 55 50 45 40 35 30 25 20 15 10 5 ℄ -L- 5 10 15 20 25 30 35 40 45 50 55 60 65 70

WAYNE / DUPLIN COUNTIES
BRIDGE NO. 24 ON NC 403
OVER NORTHEAST CAPE FEAR RIVER

FEDERAL-AID PROJECT NO. BRSTP-403(3)
STATE PROJECT NO. 8.1331801
TIP NO. B-4320

CATEGORICAL EXCLUSION

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
AND
N.C. DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

APPROVED:

01-13-03
DATE

Gregory J. Thorpe, Ph.D.
Environmental Management Director
Project Development & Environmental Analysis Branch
North Carolina Department of Transportation

1-15-03
DATE

for Nicholas L. Graf, P.E., Division Administrator
Federal Highway Administration

WAYNE / DUPLIN COUNTIES
BRIDGE NO. 24 ON NC 403
OVER NORTHEAST CAPE FEAR RIVER

FEDERAL-AID PROJECT NO. BRSTP-403(3)
STATE PROJECT NO. 8.1331801
TIP NO. B-4320

CATEGORICAL EXCLUSION

DECEMBER 2002

Document Prepared by Ramey Kemp & Associates, Inc.
4928-A Windy Hill Dr.
Raleigh, NC 27609

Montell W. Irvin, P.E., PTOE, Project Manager
Ramey Kemp & Associates, Inc.

12/13/02
Date

For the North Carolina Department of Transportation
Project Development and Environmental Analysis Branch

Theresa Ellerby, Project Development Engineer
Project Development and Environmental Analysis Branch

PROJECT COMMITMENTS

WAYNE / DUPLIN COUNTIES
BRIDGE NO. 24 ON NC 403
OVER NORTHEAST CAPE FEAR RIVER

FEDERAL-AID PROJECT NO. BRSTP-403(3)
STATE PROJECT NO. 8.1331801
TIP NO. B-4320

In addition to the standard Nationwide Permit #23 Conditions, the General Nationwide Permit Conditions, Section 404 Only Conditions, Regional Conditions, State Consistency Conditions, NCDOT's Guidelines for Best Management Practices for the Protection of Surface Waters, NCDOT's Guidelines for Best Management Practices for Bridge Demolition and Removal, General Certification Conditions, and Section 401 Conditions of Certification, the following special commitments have been agreed to by NCDOT:

NCDOT Division 4

1.) The NCDOT will observe a moratorium on in-water work between February 15 through June 15 to protect fish spawning. The NCDOT will follow the "Stream Crossing Guidelines for Anadromous Fish Passage".

WAYNE / DUPLIN COUNTIES
BRIDGE NO. 24 ON NC 403
OVER NORTHEAST CAPE FEAR RIVER

FEDERAL-AID PROJECT NO. BRSTP-403(3)
STATE PROJECT NO. 8.1331801
TIP NO. B-4320

INTRODUCTION

Bridge No. 24, located on NC 403 over the Northeast Cape Fear River, in Wayne and Duplin Counties, is listed in the Draft 2004-2010 North Carolina Department of Transportation (NCDOT) Transportation Improvement Program (TIP) as B-4320 and in the Federal-Aid Bridge Replacement Program as BRSTP-403(3). The location is shown in Figures 1 and 8.

No substantial environmental impacts are anticipated. The project is classified as a Federal "Categorical Exclusion".

I. PURPOSE AND NEED

The NCDOT Bridge Maintenance Unit records indicate Bridge No. 24 has a sufficiency rating of 32.7 out of a possible 100 for a new structure. The bridge is considered functionally obsolete and structurally deficient. The replacement of this inadequate structure will result in safer and more efficient traffic operations.

II. EXISTING CONDITIONS

Bridge No. 24 is located on NC 403 approximately 0.6 miles (0.97 km) south of NC 55. The Wayne/Duplin County line follows the Northeast Cape Fear River in this area and is located on Bridge No. 24. Refer to Figure 1 and 8 for the project location and Figures 2 and 3 for photos of the existing project area.

Bridge No. 24 was constructed in 1952. The bridge is currently posted to restrict weight limits at 19 tons (17.2 metric tons) for single vehicles and 28 tons (25.5 metric tons) for truck-tractor semi-trailers. The overall length of the four-span bridge is 70.0 ft (21.3 m). It has a clear roadway width of 24.0 ft (7.3 m) that includes two travel lanes over the bridge. The deck width out-to-out is 25.4 ft (7.7 m). The superstructure of Bridge No. 24 is a reinforced concrete deck on timber joists. The substructure of the bridge consists of timber caps on timber piles. Four of the piles on all of the bents have concrete jackets. The roadway (bridge deck) is approximately 17 ft (5.2 m) above the creek bed.

NC 403 is classified as a Rural Major Collector in the Statewide Functional Classification System. The 2002 average daily traffic (ADT) volume on NC 403 is estimated to be 1,650 vehicles per day (vpd). The percentages of truck traffic are 2 percent TTST vehicles and 2 percent dual-tired vehicles. The projected 2025 ADT volume is expected to be 2,800 vpd.

The two-lane facility measures approximately 18 ft (5.4 m) in clear roadway width and has a 7 ft (2.1 m) grassed shoulder on the east side and a 9 ft (2.7 m) grassed shoulder on the west side of the roadway. The

vertical alignment is generally flat within the project area and the horizontal alignment is generally straight except for a curve that begins approximately 40 ft (12.2 m) off the south end of the bridge. The speed limit in the immediate vicinity of the bridge is posted at 55 miles per hour (mph) (88 km/h). Existing right-of-way is approximately 60 ft (18.3 m) in width.

There are overhead power lines located along the west side of NC 403. There is a fire hydrant on the east side of NC 403 approximately 1200 ft (366 m) north of Bridge No. 24. However, there is no evidence that the water line continues south into the project area. There are no other apparent utilities. Utility impacts are expected to be minimal.

This section of NC 403 is not part of a designated bicycle route nor is it listed in the Transportation Improvement Program as needing incidental bicycle accommodations. There is no indication that an unusual number of bicyclists use this roadway.

Land use within the project area is primarily swampy wooded areas. There is a fairly large residence on the east side of NC 403 approximately 1500 ft (457 m) north of Bridge No. 24. No other structures are in the vicinity of the project.

The Department of Public Instruction was contacted by letter on June 21, 2001. No buses for either Wayne or Duplin Counties cross Bridge No. 24.

There were two crashes reported on NC 403 in the vicinity of Bridge No. 24 during the period from August 1, 1999 to July 31, 2002. Both accidents involved vehicles running off the road. There were no fatalities or injuries reported.

III. ALTERNATIVES

A. Project Description

Based upon the preliminary hydraulics report, the proposed replacement structure for Bridge No. 24 will provide a 105 ft (32.0 m) spill-through bridge with a 40 ft (12.2 m) clear roadway width. The structure will provide two 12-ft (3.6 m) travel lanes with 8 ft (2.4 m) of lateral clearance on each side of the bridge.

The length and opening size of the proposed structure may increase or decrease as necessary to accommodate peak flows, as determined by a more detailed hydraulic analysis to be performed during the final design phase of the bridge.

The roadway approaches will provide two 12 ft (3.6 m) travel lanes with 8 ft (2.4 m) grass shoulders. The proposed grade will be approximately the same as the existing grade. The design speed is 60 mph (100 km/h).

B. Build Alternatives

Three alternatives for replacing Bridge No. 24 are described below:

Alternative A (Preferred)
This alternative consists of replacing the bridge in-place with a new bridge. During construction, traffic will be maintained by an off-site detour. Traffic will be detoured via SR 1937/1558 (Graham Road), SR 1559 (Jones Turner Road), NC 55, and NC 403. The off-site detour is to be resurfaced prior to its use. There is a non-posted culvert on SR 1558 and a new bridge on NC 55. The detour is estimated to be 7.2 miles (11.5 km) long (Refer to Figure 4).

The total length of roadway approach work for this alternative is approximately 450 ft (137 m). Refer to Figure 5 for illustration of the alternative.

Alternative B
This alternative consists of replacing the bridge in-place with a new bridge. During construction, traffic will be maintained by an on-site detour east of NC 403. The total length of permanent roadway approach work for this alternative is approximately 450 ft (137 m). Refer to Figures 6A and 6B for illustration of this alternative.

The on-site detour will be located approximately 15 ft (4.6 m) from the south side of the proposed bridge. The temporary structure will be approximately 72 ft (21.9 m) in length and will have a clear roadway width of 28 ft (8.6 m) including two 11 ft (3.1 m) travel lanes and 3 ft (1.0 m) of lateral clearance on each side of the bridge. The detour roadway approaches will provide two 11 ft (3.3 m) travel lanes and 6 ft (1.8 m) wide shoulders on each side. The length of the temporary detour will be approximately 1628 ft (496 m).

Alternative B was not selected as the preferred because of the higher cost associated with the temporary detour and greater wetland impacts.

Alternative C
This alternative consists of replacing the bridge with a new bridge on new alignment east of NC 403. During construction, the existing bridge will be used to maintain traffic. The total length of roadway approach work for this alternative is approximately 2433 ft (742 m). Refer to Figures 7A and 7B for illustration of this alternative.

Alternative C was not selected as the preferred because of the higher cost and greater wetland impacts.

C. Alternatives Eliminated From Further Consideration

The "Do-Nothing" alternative will eventually necessitate closure of the bridge due to its poor condition. This is not desirable due to the traffic service provided by NC 403.

Investigation of the existing structure by the NCDOT Bridge Maintenance Unit indicates that rehabilitation of the bridge is not feasible due to its deteriorated condition. Bridge No. 24 has decayed caps, piles, and bulkheads. The "Rehabilitation" alternative was eliminated from further consideration.

D. Preferred Alternative (Alternative A)

Alternative A consists of replacing the bridge in-place using an off-site detour to maintain traffic during construction. This alternative was selected as the preferred alternative because it has fewer impacts to wetlands and significantly lower total cost.

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

IV. ESTIMATED COSTS

The estimated costs for each alternative, based on current dollars, are shown below:

TABLE 1
ESTIMATED PROJECT COSTS

	Alternative A (Preferred)	Alternative B	Alternative C
Structure Removal (Existing)	$14,400	$14,400	$14,400
Structure Proposed	$273,000	$273,000	$294,000
Off-Site Detour Resurfacing	$175,000	$0	$0
Roadway Approaches	$87,718	$87,718	$701,152
Detour Structure & Approaches	$0	$566,436	$0
Miscellaneous and Mobilization	$168,882	$423,446	$454,448
Engineering and Contingencies	$81,000	$210,000	$236,000
Right-of-Way/Easement and Utilities	$28,200	$41,200	$72,000
Total Project Cost	**$828,200**	**$1,616,200**	**$1,772,000**

The estimated cost of the project, as shown in the Draft 2004-2010 NCDOT Transportation Improvement Program is $750,000, including $200,000 spent in prior years, $50,000 for right-of-way and $500,000 for construction.

V. NATURAL RESOURCES

Natural resources within the project study area were evaluated to provide: 1) an assessment of existing vegetation, wildlife, protected species, streams, wetlands, and water quality; 2) an evaluation of probable impacts resulting from construction; and 3) a preliminary determination of permit needs.

A. Methodology

Materials and research data in support of this investigation have been derived from a number of sources. The Williams, NC, United States Geological Survey (USGS) 7.5-minute topographic quadrangle map (USGS 1980) was consulted to determine the physiographic relief and to assess landscape characteristics. Additional resources utilized include U.S. Fish and Wildlife Service (USFWS) National Wetlands Inventory mapping, the *Soil Survey of Duplin County, North Carolina* (USDA 1959), and the *Soil Survey of Wayne County, North Carolina* (USDA 1974).

Recent aerial photography (scale 1:2400) was reviewed prior to starting the field investigation. Plant community patterns were identified from available mapping sources and then field verified in May 2001. Plant community descriptions are based on a classification system utilized by the NC Natural Heritage Program (NHP) (Schafale and Weakley 1990). When appropriate, community classifications were modified to better reflect field observations. Vascular plant names typically follow nomenclature found in Radford *et al.* (1968).

Jurisdictional wetland areas were identified using the three parameter approach (hydrophytic vegetation, hydric soils, wetland hydrology) following U.S. Army Corps of Engineers (COE) delineation guidelines (DOA 1987). Jurisdictional areas were characterized according to a classification scheme established by Cowardin *et al.* (1979). Jurisdictional stream channels were identified using criteria outlined by the COE and the NC Division of Water Quality (DWQ).

Water resource information for the Northeast Cape Fear River was derived from the most recent versions of the *Cape Fear River Basinwide Water Quality Plan* (DWQ 2000), *Basinwide Assessment Report-Cape Fear River Basin* (DWQ 1999) and several DWQ internet resources. Quantitative sampling was not undertaken to support existing data.

The most current USFWS list of federal protected species with ranges extending into Duplin and Wayne Counties was reviewed prior to initiation of the May 2001 field investigation. Currently, the most recent USFWS list is dated May 31, 2002. No additional species have been listed for either Duplin or Wayne Counties. In addition, NHP records documenting the presence of federal or state listed species within the project study area were consulted before commencing the field investigation and an updated records search was performed on December 20, 2001, April 12, 2002 and December 10. 2002.

Direct observations of terrestrial and aquatic wildlife were documented. Expected population distributions were determined through observations of available habitat and review of supportive documentation found in Martof *et al.* (1980), Webster *et al.* (1985), Menhinick (1991), Hamel (1992), Rohde *et al.* (1994), Potter *et al.* (1980), and Palmer and Braswell (1995).

Quantative calculations were based on the worst-case scenario using the 100-foot (30-meter) right of way limits (minus the existing right of way), the width and length of the replacement structure, the width of the stream for aquatic impacts, and the length of the project approaches. The actual construction impacts should be less, but without specific replacement structure design information, the worst case was assumed for the impact calculations.

B. Physiography and Soils

The project study area is located in the Coastal Plain physiographic province of North Carolina. The topography in the project study area is generally characterized as nearly level to gently sloping. Elevations in the project study area range from 33 to 40 feet (10 to 12 m) above mean sea level (MSL) (USGS 1980). The project study area consists of forested land, agricultural land, and maintained/disturbed areas. The project vicinity contains undisturbed forest, successional land, agricultural land, residential homes, and other maintained/disturbed areas.

The project study area crosses seven soil mapping units (USDA 1959, 1974). The hydric soils located within the project study area consist of the Bibb (*Typic Fluvaquents*), Johnston (*Cumulic Humaquepts*), Weston

(*Typic Ochracuults*), Pamlico (*Terric Medisaprists*), and Lumbee (*Typic Ochraquults)* series. The Bibb and Johnston series are grouped together and represent one soil mapping unit. Non-hydric soils within the project study area that may contain hydric soil inclusions include the Johns (*Aquic Hapludults*), Autryville (*Arenic Paleudults*), and Marvyn (*Typic Hapludults*) series. Non-hydric soils include the Wagram (*Arenic Paleudults*) series.

C. Water Resources

C.1. Waters Impacted

The project study area is located within sub-basin 03-06-21 of the Cape Fear River Basin (DWQ 1999, DWQ 2000) and is part of USGS hydrologic unit 03030007 (USGS 1974). The Northeast Cape Fear River originates south of SR 1004 near the Town of Mount Olive in southern Wayne County. The Northeast Cape Fear River has been assigned Stream Index Number (SIN) 18-74-(1) by DWQ from its source to Muddy Creek (DENR 2002a).

C.2. Water Resource Characteristics

The portion of the Northeast Cape Fear River within the project study area is a perennial stream with slow flow over substrate consisting of organic material and silt. Water clarity at the time of the site inspection was moderate with heavy tannic acid content. The channel is approximately 50 ft (15 m) wide and greater than 12 ft (3.6 m) deep. A geomorphic characterization of the stream section within the project study area indicates that the subject reach of the Northeast Cape Fear River is a "DA" type stream channel (Rosgen 1996). This stream type has multiple channels and occurs in an area with very little relief and has extensive well-vegetated floodplains and associated wetlands. It is characterized by low gradient and having highly variable width/depth ratios and sinuosity (Rosgen 1996). The main channel of the Northeast Cape Fear River located within the project study area was surrounded by flooded wetlands at the time of the field investigation.

This portion of the Northeast Cape Fear River has been assigned a Best Usage Classification of **C Sw** (DEM 1993, DENR 2002a). The **C** designation indicates fresh waters that support aquatic life propagation and survival, fishing, wildlife, secondary recreation, and agriculture. Secondary recreation is any activity involving human body contact with water on an infrequent or incidental basis. Point source discharges of treated wastewater are permitted in these waters, pursuant to Rules .0104 and .0211 of 15A NCAC 2B; however, local programs to control non-point source and stormwater discharge of pollution are required. The **Sw** designation refers to Swamp Waters, which have low velocities and other natural characteristics that are different from adjacent streams.

No Outstanding Resource Waters (**ORW**), High Quality Waters (**HQW**), **WS-I**, or **WS-II** Waters occur within 3.0 miles (4.8 km) upstream or downstream of the project study area (DEM 1993, DENR 2002a). The Northeast Cape Fear River is not designated as a North Carolina Natural and Scenic River, or as a National Wild and Scenic River.

One method used by DWQ to monitor water quality is through long-term monitoring of macroinvertebrates. The Northeast Cape Fear River within the project study area was sampled for benthic macroinvertebrates in 1993 and received a bio-classification of Good-Fair (DWQ 2000).

Another measure of water quality being used by the DWQ is the North Carolina Index of Biotic Integrity (NCIBI), which assesses biological integrity using the structure and health of the fish community. No NCIBI samples have been collected within 5.0-miles (8.0 km) of the project study area (DWQ 2000).

C.3. Permitted Dischargers

Discharges that enter surface waters through a pipe, ditch or other well-defined point of discharge are broadly referred to as "point sources." Wastewater point source discharges include municipal (city and county) and industrial wastewater treatment plants and small domestic wastewater treatment systems serving schools, commercial offices, residential subdivisions, and individual homes (DWQ 1999). Stormwater point source discharges include stormwater collection systems for municipalities and stormwater discharges associated with certain industrial activities. Point source dischargers in North Carolina must apply for and obtain a National Pollutant Discharge Elimination System (NPDES) permit. Discharge permits are issued under the NPDES program, delegated to DWQ by the Environmental Protection Agency (EPA). There are four permitted point source dischargers located within 5.0 miles (8.0 km) upstream of the project study area (DENR 2002b). The closest major discharger downstream of the project study area is located over 12 miles (19.3 km) south of Goshen Swamp.

C.4. Anticipated Impacts to Water Resources

Short-term impacts to water quality, such as sedimentation and turbidity, may result from construction-related activities. Temporary construction impacts due to erosion and sedimentation will be minimized through implementation of a stringent erosion control schedule and the use of BMP's. The contractor will follow contract specifications pertaining to erosion control measures as outlined in 23 CFR 650 Subpart B and Article 107-13 entitled Control of Erosion, Siltation, and Pollution pursuant to NCDOT's *Standard Specifications for Roads and Structures*. These measures include: the use of dikes, berms, silt basins, and other containment measures to control runoff and elimination of construction staging areas in floodplains and adjacent waterways. Disturbed sites will be revegetated with herbaceous cover after any temporary construction impacts

Other impacts to water quality, such as changes in water temperature as a result of increased exposure to sunlight due to the removal of stream-side vegetation or increased shade due to the construction of the bridges, and changes in stormwater flows due to changes in the amount of impervious surface adjacent to the stream channels, can be anticipated as a result of this project. However, due to the limited amount of overall change in the surrounding areas, impacts are expected to be temporary in nature.

No adverse long-term impacts to water resources are expected to result from the alternatives being considered. The proposed bridge replacement project will allow for continuation of present stream flow within the existing channel, thereby protecting stream integrity.

C.5. Impacts Related to Bridge Demolition and Removal

Section 402-2 of NCDOT's Standard Specifications for Roads and Structures is labeled **Removal of Existing Structure**. This section outlines restrictions and Best Management Practices for Bridge Demolition and Removal (BMP-BDRs), as well as guidelines for calculating maximum potential fill in the creek resulting from demolition. These standards will be followed during the replacement of Bridge No. 24.

The superstructure of Bridge No. 24 consists of a reinforced concrete deck on timber joists. The substructure of the bridge consists of end bents and three interior bents all consisting of timber caps on timber piles. Four of the piles on all the bents have concrete jackets. The bridge has four spans and totals 70 feet (21 m) in length.

There is the potential for the concrete deck and the concrete jackets to be dropped into Waters of the United States during demolition and removal. The maximum (worst case) resulting temporary fill associated with the removal of Bridge No. 24 is approximately 40.4 cubic yards (30.9 cubic m).

According to comments received from the North Carolina Wildlife Resources Commission (NCWRC), bridge demolition and removal activities are prohibited during the fish spawning season of February 15 to June 15. Because a moratorium applies, this project falls under Case 2 (allowing no in-water work during moratorium periods) of the Best Management Practices for Bridge Demolition and Removal.

D. Biotic Resources

D.1. Plant Communities

Distribution and composition of plant communities throughout the project study area reflect landscape-level variations in topography, soils, hydrology, and past and present land use practices. When appropriate, the plant community names have been adopted and modified from the NHP classification system (Schafale and Weakley 1990) and the descriptions written to reflect local variations within the project study area. Four plant communities were identified within the project study area: Coastal Plain bottomland hardwood forest, mixed hardwood forest, agricultural land, and maintained/disturbed areas. These communities total approximately 32.0 acres (13.0 ha), which does not include the existing impervious surface (1.1 acres [0.4 ha]) associated with the roadway. Open water area is not separated from the Coastal Plain bottomland hardwood forest acreage due to the lack of a well-defined main channel.

Coastal Plain Bottomland Hardwood Forest – Coastal Plain bottomland hardwood forest covers approximately 14.2 acres (5.7 ha) (44%) of the project study area. This community type comprises the floodplain of the Northeast Cape Fear River. Coastal Plain bottomland hardwood forests are located on abandoned or relict natural levee deposits, point bar ridges, and other relatively high parts of the floodplain, away from the channel. Dominant canopy species include red maple (*Acer rubrum*), sweetgum (*Liquidambar styraciflua*), and river birch (*Betula nigra*). The herbaceous layer is thick and diverse and consisted of such species as soft rush (*Juncus effusus*), sedges (*Carex* spp.), spike rush (*Eleocharis* spp.), and lizards tail (*Saururus cernuus*).

Mixed Hardwood Forest – Mixed hardwood forest covers approximately 6.6 acres (2.7 ha) (21%) of the project study area. This community type is found on mid slopes, low ridges, upland flats, and other dry-mesic upland areas. Dominant tree species include water oak (*Quercus nigra*), tulip poplar (*Liriodendron tulipifera*), red maple, sweetgum, and black cherry (*Prunus serotina*). Groundcover is relatively sparse with dominant species comprised of ebony spleenwort (*Asplenium platyneuron*), and Japanese honeysuckle (*Lonicera japonica*).

Agricultural Land – Agricultural land covers approximately 9.1 acres (3.7 ha) (28%) of the project study area. Agricultural land includes areas that are currently or have been recently in production of crops. These are not

natural plant communities and are selectively planted or maintained for specific domesticated plants. Soybeans, corn, tobacco, and cotton are the primary crops observed in the project vicinity.

Maintained/Disturbed Areas –Maintained/disturbed areas cover approximately 2.1 acres (0.9 ha) (7%) of the project study area. Maintained/disturbed areas located within the project study area include maintained rights-of-way, residential areas, and driveways. The impervious road surface is not included in this community type. Vegetation associated with the maintained/disturbed land includes grasses such as fescue (*Festuca* sp.), and unidentified species of *Panicum* sp. and *Paspalum* sp.

D.2. Wildlife

The project study area was visually surveyed for signs of terrestrial and aquatic wildlife; however, little evidence of wildlife was observed during the field effort. Floodplain forests and upland forests along the Northeast Cape Fear River may provide cover and food and allow animals to travel between different habitats. Only one terrestrial reptile was observed within the project study area. A copperhead (*Agkistrodon contortix*) was seen in an area of mixed hardwood forest. Other species expected to occur within the project study area include eastern box turtle (*Terrapene carolina*), eastern garter snake (*Thamnophis sirtalis*), worm snake (*Carphophis amoenus*), black racer (*Coluber constrictor*), green anole (*Anolis carolinensis*), and ground skink (*Scincella lateralis*).

No terrestrial amphibians were observed within the project study area. Species expected to occur within the project study area include Fowler's toad (*Bufo woodhousei*), green treefrog (*Hyla cinerea*), and Brimley's chorus frog (*Pseudacris brimleyi*).

Bird species observed within or adjacent to the project study area include such species as mourning dove (*Zenaida macroura*), pileated woodpecker (*Dryocopus pileatus*), barn swallow (*Hirundo rustica*), tufted titmouse (*Baeolophus bicolor*), Carolina chickadee (*Poecile carolinensis*), Carolina wren (*Thryothorus ludovicianus*), blue-gray gnatcatcher (*Polioptila caerulea*), common yellowthroat (*Geothlypis trichas*), eastern towhee (*Pipilo erythrophthalmus*), northern cardinal (*Cardinalis cardinalis*), and red-winged blackbird (*Agelaius phoeniceus*).

No mammals were observed or evidenced within the project study area. Species expected to be found in and around the project study area include raccoon (*Procyon lotor*), Virginia opossum (*Didelphis virginiana*), red fox (*Vulpes vulpes*), gray squirrel (*Sciurus carolinensis*), and eastern cottontail (*Sylvilagus floridanus*). Other species that may use the Northeast Cape Fear River floodplain as a travel corridor are white-tailed deer (*Odocoileus virginianus*) and bobcat (*Felis rufus*).

D.3. Aquatic Communities

Limited kick-netting, seining, dip-netting, and visual observation of stream banks and channel within the project study area were conducted in the Northeast Cape Fear River. The water depth greatly limited the amount of benthic samples collected. Samples were collected from the edge of the deep channel along mud banks and sandbars. Benthic macroinvertebrate samples were collected pursuant to current DWQ Aquatic Insect Collection Protocols.

Only one fish species was documented within this reach of the Northeast Cape Fear River; eastern mudminnow (*Umbra pygmaea*). Other species expected to occur in the project study area include redfin

pickerel (*Esox americanus*), largemouth bass (*Micropterus salmoides*), bluegill (*Lepomis macrochirus*), and American eel (*Anquilla rostrata*).

Coastal Plain streams are often utilized by anadromous fish species. Anadromous fish, such as striped bass (*Morone saxatilis*), shad (*Alosa* spp.), and sturgeon (*Acipenser* spp.) spend their adult lives in the ocean but return to freshwater habitats to reproduce. Spawning habitats of anadromous species are typically located upstream of tidal influence and saltwater intrusion. Spawning conditions are specific for each species and variables include water velocity, water depth, substrate composition, temperature, pH, turbidity, and water hardness. The Northeast Cape Fear River is known to have seasonal populations of these species; however, Menhinick (1991) does not document either American shad or striped bass as occurring in the project study area. In addition, neither Atlantic sturgeon (*Acipenser oxyrhychus*) nor shortnose sturgeon (*A. brevirostrum*) have been documented from the project study area (Menhinick 1991).

Aquatic invertebrate surveys included dip-net surveys. Other accepted methods were not feasible due to the depth and flooded condition of the river at the time of the field effort. One mussel species was found in the Northeast Cape Fear River, eastern floater (*Pyganodon cataracta*). Various aquatic macroinvertebrates were also found during the dip-netting. Numerous taxa of macroinvertebrates were captured while sampling the Northeast Cape Fear River and were identified based on McCafferty (1998). Benthic macroinvertebrates collected include midges (Family Chironomidae), leeches (Class Hirundea), beetles (Families Noteridae, Naucoridae, and Halipidae), mayflies (Families Caenidae, and Siphlonuridae), damsel flies and dragonflies (Families Lestidae and Macromiidae), and snails (Class Gastropoda).

No aquatic reptiles were observed in the project study area. Species expected to occur within the project study area include the brown water snake (*Nerodia taxispilota*), slider (*Pseudemys scripta*), eastern cottonmouth (*Agkistrodon piscivorus*), mud turtle (*Kinosternon subrubrum*), painted turtle (*Chrysemys picta*), and snapping turtle (*Chelydra serpentina*).

No aquatic amphibians were observed within the project study area. Species expected to occur within the project study area include such species as bullfrog (*Rana catesbeiana*), green tree frog (*Hyla cinera*), Southern leopard frog (*Rana utricularia*), and pickerel frog (*Rana palustris*).

D.4. Anticipated Impacts to Biotic Communities

D.4.a. Terrestrial Communities

Potential impacts to plant communities are estimated based on the approximate area of each plant community present within both the proposed right-of-way and the temporary construction limits of any on-site detour or easement that falls outside the estimated permanent right-of-way limit. A summary of potential plant community impacts is presented in Table 2. All plant community impacts are based on aerial photograph base mapping. A portion of the permanent plant community impact amount will consist of proposed right-of-way for the road after the bridge replacement is complete. Impervious surface and open water areas are not included in this analysis.

Table 2
Potential Impacts to Plant Communities

PLANT COMMUNITY	POTENTIAL IMPACTS acres (hectares)			
	ALT A (Preferred)	ALT B		ALT C
	Impacts	Impacts	Temp. Impacts*	Impacts
Coastal Plain Bottomland Hardwood	0.29 (0.12)	0.29 (0.12)	0.21 (0.09)	1.74 (0.70)
Mixed Hardwood Forest	0.04 (0.02)	0.04 (0.02)	0.27 (0.11)	0.57 (0.23)
Agricultural Land	0.0	0.0	0.0	0.25 (0.10)
Maintained/Disturbed Areas	0.0	0.0	0.0	0.21 (0.09)
Total (acre[ha])	0.33 (0.14)	0.33 (0.14)	0.48 (0.20)	2.77 (1.12)
TOTAL FOR ALT (acre[ha])	**0.33 (0.14)**	**0.81 (0.34)**		**2.77 (1.12)**

* Note: Temporary construction impacts are based on the portion of the impacts that fall outside the estimated right-of-way limit or impacts of temporary on-site detour.

Permanent community impacts for Alternative A represent the least amount of the three alternatives when the potential temporary impacts are included. The highest amount of permanent plant community impacts result from Alternative C, which calls for bridge replacement on new location. The plant communities with the largest amount of potential permanent and temporary impacts for all proposed alternatives is the Coastal Plain bottomland hardwood forest and mixed hardwood forest communities.

D.4.b. Aquatic Communities

The proposed bridge replacement will not result in substantial loss or displacement of known terrestrial wildlife populations. Potential down-stream impacts to aquatic habitat will be avoided by bridging the Northeast Cape Fear River to maintain regular flow and stream integrity. In addition, temporary impacts to downstream habitat from increased sediment during construction will be reduced by limiting in-stream work to an absolute minimum, except for the removal of the portion of the sub-structure below the water. BMP's and BMP-BDRs will be followed to minimize impacts.

E. Special Topics

E.1. Waters of the United States

Wetlands and surface waters fall under the broad category of "Waters of the United States" as defined in 33 CFR 328.3 and in accordance with provisions of Section 404 of the Clean Water Act (33 U.S.C. 1344). Waters of the United States are regulated by the United States Army Corps of Engineers (USACE). The waters in the Northeast Cape Fear River within the project study area exhibit characteristics of riverine lower perennial, unconsolidated bottom, permanently flooded (R2UB3) waters (Cowardin *et al.* 1979). The main channel of the Northeast Cape Fear River located within the project study area was surrounded by flooded wetlands at the time of the field investigation. Therefore, the channel was not delineated and was approximated on the wetlands maps.

Wetlands subject to review under Section 404 of the Clean Water Act (33 U.S.C. 1344) are defined by the presence of three primary criteria: hydric soils, hydrophytic vegetation, and evidence of hydrology within 12 inches (30.5 centimeters[cm]) of the soil surface for a portion (12.5 percent) of the growing season (DOA 1987). Based on this three-parameter approach, jurisdictional wetlands occur within the project study area in the form of Coastal Plain bottomland hardwood forest. The Coastal Plain bottomland hardwood forest exhibits characteristics of a palustrine, forested, broad-leaved deciduous, seasonally flooded (PFO1C) wetland (Cowardin *et al.* 1979).

E.2. Potential Impacts to Waters of the United States

Temporary and permanent impacts to surface waters and wetlands are estimated based on the amount of each jurisdictional area within the project limits. Temporary impacts include those impacts that will result from temporary construction activities outside of permanent right-of-way and/or those associated with temporary on-site detours. Temporary impacts will be restored to their original condition after the project has been completed. Permanent impacts are those areas that will be in the construction limits and/or the proposed right-of-way of the new structure and approaches. Potential wetland and surface water impacts are included in Table 3.

Table 3
Potential Impacts to Jurisdictional Wetlands and Surface Waters

JURISDICTIONAL AREAS	POTENTIAL IMPACTS			
	ALT A (Preferred)	ALT B		ALT C
	Impacts	Impacts	Temp. Impacts*	Impacts
R2UB3	0.12 (0.05)	0.12 (0.05)	0.03 (0.01)	0.15 (0.06)
PFO1C	0.29 (0.12)	0.29 (0.12)	0.69 (0.28)	1.74 (0.70)
Total Areas (acres[ha])	0.41 (0.17)	0.41 (0.17)	0.72 (0.29)	1.89 (0.76)
TOTAL FOR ALT (acres[ha]):	**0.41 (0.17)**	**1.13 (0.46)**		**1.89 (0.76)**
Perennial Stream Channel Impacts feet (m)	115 (35)	115 (35)	50 (15)	165 (50)
TOTAL FOR ALT feet (m)	**115 (35)**	**165 (50)**		**165 (50)**

R2UB3 – riverine, lower perennial, unconsolidated bottom, permanently flooded
PFO1C – palustrine, forested, broad-leaved deciduous, seasonally flooded
*Note: Temporary construction impacts are based on the portion of the impacts not included in the construction limits for the permanent structure.

Alternative A (Preferred) will potentially impact the least amount of jurisdictional wetlands and surface waters. Alternative B will have permanent impacts consistent with those of Alternative A; however, Alternative B will also have temporary jurisdictional impacts, which adds to the overall impact amount. Alternative C is not anticipated to have any temporary impacts, although permanent jurisdictional impacts may be greater than the impacts for the other two alternatives.

E.3. Permits

Section 404 of the Clean Water Act – In accordance with Section 404 of the Clean Water Act (33 U.S.C. 1344), a permit is required from the USACE for projects of this type for the discharge of dredged or fill material into "Waters of the United States". The USACE issues two types of permits for these activities. A general permit may be issued on a nationwide or regional basis for a category or categories of activities when: those activities are substantially similar in nature and cause only a minimal individual or cumulative environmental impacts, or when the general permit would result in avoiding unnecessary duplication or regulatory control exercised by another Federal, state, or local agency provided that the environmental consequences of the action are individually and cumulatively minimal. If a general permit is not appropriate for a particular activity, then an individual permit must be utilized. Individual permits are authorized on a case-by-case evaluation of a specific project involving the proposed discharges.

It is anticipated that this project will fall under Nationwide Permit 23, which is a type of general permit. Nationwide Permit 23 is relevant to approved Categorical Exclusions. This permit authorizes any activities, work and discharges undertaken, assisted, authorized, regulated, funded or financed, in whole or in part, by another federal agency and that the activity is "categorically excluded" from environmental documentation because it is included within a category of actions which neither individually nor cumulatively have a significant effect on the environment. Activities authorized under nationwide permits must satisfy all terms and conditions of the particular permit. However, final permit decisions are left to the discretionary authority of the USACE.

Section 401 Water Quality Certification – A 401 Water Quality Certification, administered through the DWQ, will also be required. This certification is issued for any activity which may result in a discharge into waters for which a federal permit is required. According to the DWQ, one condition of the permit is that the appropriate sediment and erosion control practices must be utilized to prevent exceedances of the appropriate turbidity water quality standard.

E.4. Mitigation Evaluation

Avoidance – Each project alternative contains jurisdictional wetlands and surface waters, which may be subject to impact. Complete avoidance of jurisdictional impacts is not possible due to the scope of the project and on-site constraints.

Minimization – Of the three alternatives studied, Alternative A will impact the least amount of jurisdictional area. Efforts to minimize impacts to jurisdictional areas have been made by reducing the side slope of NC 403 from a desired 6:1 slope to a maximum of 2:1. Further measures to minimize impacts to these areas would require a reduction in the design standards of NC 403, which is not recommended considering the volume of traffic, existing alignment of the roadway and the speed of vehicles traveling through the project area. Best Management Practices will be used in an effort to minimize impacts, including avoiding placing staging areas within wetlands.

Mitigation - Compensatory mitigation is not proposed for this project due to the limited nature of project impacts. Temporary impacts associated with the construction activities could be mitigated by replanting disturbed wetland areas with native species and removal of any temporary fill material within the floodplain upon project completion. Final compensatory wetland and stream mitigation requirements will be determined

by the USACE under the statutory provisions of CWA S404 and the January 15, 2002 Final Notice of Issuance of Nationwide Permits.

F. Protected Species

F.1. Federally Protected Species

Species with the federal classification of Endangered (E) or Threatened (T), or officially proposed (P) for such listing, are protected under the Endangered Species Act (ESA) of 1973, as amended (16 U.S.C. 1531 *et seq.*). The following federal protected species are listed for Duplin and Wayne County (USFWS list dated May 31, 2002):

Table 4
Federally Protected Species Listed for Wayne and Duplin Counties

Common Name	Scientific Name	Status	County	Biological Conclusion
Red-cockaded woodpecker	*Picoides borealis*	E	Wayne and Duplin	No effect
American alligator	*Alligator mississippiensis*	T(S/A)	Duplin	N/A

Endangered – any native or once-native species in danger of extinction throughout all or a significant portion of its range.
Threatened (S/A) – a species carrying the threatened status due to having a similar appearance to another listed species.

Red-cockaded woodpecker (RCW) - This small woodpecker measuring 7 to 8.5 inches (17.8 to 21.6 cm) long has a black head, prominent white cheek patch, and black-and-white barred back. Males often have red markings (cockades) behind the eye, but the cockades may be absent or difficult to see (Potter *et al.* 1980). Primary nest sites for RCWs include open pine stands greater than 60 years of age with little or no mid-story development. Foraging habitat is comprised of open pine or pine/mixed hardwood stands 30 years of age or older (Henry 1989). Primary habitat consists of mature to over-mature southern pine forests dominated by loblolly (*Pinus taeda*), long-leaf (*P. palustris*), slash (*P. elliotii*), and pond (*P. serotina*) pines. Nest cavities are constructed in the heartwood of living pines, generally older than 60 years, that have been infected with red-heart disease. Nest cavity trees tend to occur in clusters, which are referred to as colonies. The woodpecker drills holes into the bark around the cavity entrance, resulting in a shiny, resinous buildup around the entrance that allows for easy detection of active nest trees. Pine flatwoods or pine-dominated savannas, which have been maintained by frequent natural fires, serve as ideal nesting and foraging sites for this woodpecker. Development of a thick understory may result in abandonment of cavity trees.

BIOLOGICAL CONCLUSION: NO EFFECT

No suitable nesting or foraging habitat for the red-cockaded woodpecker exists within the project study area. An updated NHP records search was performed on December 10, 2002. NHP records document one RCW occurrence within 3.0 miles (4.8 km) of the project study area. This RCW occurrence is located approximately 4.0 miles (6.4 km) southeast of Mt. Olive and is approximately 3.0 miles (4.8 km) from the project study area. The last recorded observation is from 1979. Project construction should not impact this species due to the fact that no suitable habitat occurs within the project study area.

American alligator - American alligator is listed as Threatened based on the similarity in appearance to other protected crocodilians; however, there are no other crocodilians within North Carolina. American alligators can be found in a variety of freshwater to estuarine aquatic habitats including swamp forests, marshes, large streams and canals, and ponds and lakes (Martof *et al.* 1980).

Potential habitat for American alligator does exist within the project study area; however, no individuals were observed. Construction activities may temporarily displace American alligators in the project vicinity; however, no long-term impact to the American alligator is anticipated as a result of this project.

BIOLOGICAL CONCLUSION: NOT APPLICABLE

The American alligator is listed as Threatened due to Similarity of Appearance [T(S/A)]. T(S/A) species are not subject to Section 7 consultation and a biological conclusion is not required. Potential habitat does exist for the American alligator within the project study area. Any impacts to this species should be only temporary in nature.

F.2. Federal species of concern

The May 31, 2002 FWS list also includes a category of species designated as "Federal species of concern" (FSC). The FSC designation provides no federal protection under the ESA for the species listed. The presence of potential suitable habitat (Amoroso 1999, LeGrand *et al.* 2001) within the project study area has been evaluated for the following FSC species listed for Duplin and Wayne Counties.

Table 5
Federal Species of Concern Listed for Duplin and Wayne Counties

Common Name	Scientific Name	County	State Status	Potential Habitat
Southern hognose snake	*Heterodon simus*	Duplin, Wayne	SR	N
Croatan crayfish	*Procambarus plumimanus*	Duplin	W	Y
Venus flytrap	*Dionea muscipula*	Duplin	C-SC	N
Savanna cowbane	*Oxypolis ternate*	Duplin	W	N
Rafinesque's big-eared bat	*Corynorhinus rafinesquii*	Wayne	SC	Y
Pinewoods shiner	*Lythrurus matutinus*	Wayne	SR	Y
Atlantic pigtoe	*Fusconaia masoni*	Wayne	T	Y
Pondspice	*Litsea aestivalis*	Wayne	C	N

Special Concern (SC) – any species which requires monitoring but which may be collected and sold under specific regulations.
Candidate(C) – a species for which USFWS has enough information on file to support proposals for listing as endangered or threatened.
Watch List (W) – any species believed to be rare and of conservation concern but not warranting active monitoring.
Significantly Rare (SR) – species which are very rare, generally with 1-20 populations in the state, and generally reduced in numbers by habitat destruction.
Threatened (T) – likely to become endangered within the foreseeable future throughout all or a portion of its range.

An updated search of the NHP records on December 10, 2002 documented no FSC occurrences within 3.0 miles (4.8 km) of the project study area.

F.3. State Protected Species

Plant and animal species which are on the North Carolina state list as Endangered (E), Threatened (T), or Special Concern (SC) receive limited protection under the North Carolina Endangered Species Act (G.S. 113-331 *et seq.*) and the North Carolina Plant Protection Act of 1979 (G.S. 106-202 *et seq.*). An updated search of the NHP records on December 10, 2002 documented no state protected species occurrences within 3.0 miles (4.8 km) of the project study area.

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, 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 included in or eligible for inclusion in the National Register of Historic Places and to afford the Advisory Council on Historic Preservation a reasonable opportunity to comment on such undertakings. This project has been coordinated with the North Carolina State Historic Preservation Officer (SHPO) in accordance with the Advisory Council's regulations and FHWA procedures.

B. Historic Architecture

In their August 6, 2001, letter, the SHPO stated "We have conducted a review of the project area and are aware of no properties of architectural, historic, or archaeological significance, which would be affected by the project. Therefore, we have no comment on the project as currently proposed." Based on the SHPO's comments, a survey was not conducted. A copy of the SHPO memorandum is included in the Appendix.

C. Archaeology

In their August 6, 2001, letter, the SHPO stated "We have conducted a review of the project area and are aware of no properties of architectural, historic, or archaeological significance, which would be affected by the project. Therefore, we have no comment on the project as currently proposed." Based on the SHPO's comments, a survey was not conducted. A copy of the SHPO memorandum is included in the Appendix.

VII. ENVIRONMENTAL EFFECTS

The project is expected to have an overall positive impact. Replacement of inadequate bridges will result in safer traffic operations.

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

Replacement of Bridge No. 24 will not have an adverse effect on the quality of the human or natural environment.

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

No adverse impact on families or communities is anticipated. Right-of-way acquisition will be limited. No relocatees 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 and 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 expected. The project is not expected to adversely affect social, economic, or religious opportunities in the area.

The studied route does not contain any bicycle accommodations, nor is it a designated bicycle route; therefore, no bicycle accommodations have been included as part of this project.

This project has been coordinated with the United States Department of Agriculture, Natural Resources Conservation Service. The Farmland Protection Policy Act requires all federal agencies or their representatives to consider the potential impact to prime farmland for all land acquisition and construction projects. Alternatives A and B will not impact prime farmland. Alternative C will involve 0.13 acres of prime and unique farmland and 1.25 acres of farmland having state or local importance in the vicinity of the project.

No publicly owned parks or recreational facilities, wildlife and waterfowl refuges, or historic sites of national, state or local significance in the immediate vicinity of the project will be impacted. The proposed project will not require right-of-way acquisition or easement from any land protected under Section 4(f) of the Department of Transportation Act of 1966.

No adverse effects to air quality are anticipated from this project. This project is an air quality "neutral" project, so it is not required to be included in the regional emissions analysis, and a project level CO analysis is not required. Since the project is located in an attainment area, 40 CFR Part 51 is not applicable. If vegetation or wood debris is disposed of by open burning, it 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 and 1990 Clean Air Act Amendments and the National Environmental Policy Act. This evaluation completes the assessment requirements for air quality, and no additional reports are required.

Ambient noise levels may increase during the construction of this project; however this increase will be only temporary and usually confined to daylight hours. There should be no notable change in traffic volumes after this project is complete. Therefore, this project will have no adverse effect on existing noise levels. Noise receptors in the project area will not be impacted by this project. This evaluation completes the assessment requirements for highway noise set forth in 23 CFR Part 772. No additional reports are required.

The NCDOT Geotechnical Unit observed no evidence of underground storage tanks or other areas of contamination at or near the proposed project.

It is unlikely that any archaeological resources listed in or eligible for listing in the National Register of Historic Places will be affected by this project.

No adverse effect on the overall public is expected. There will be some inconvenience to local travel due to the closure of SR 1235. Wayne / Duplin County Emergency Services Departments indicated that this project will not significantly impact their response time if Alternative A is chosen as the preferred alternative.

Wayne and Duplin Counties are participants in the National Flood Insurance Regular Program. The project is not located in a Detailed Study Area, but is located within a Zone A floodplain. The approximate 100-year floodplain in the project area is shown in Figure 9. There are no practical alternatives to crossing the floodplain area. Any shift in alignment will result in an impact of about the same magnitude. The proposed project is not anticipated to increase the level or extent of upstream flood potential. All reasonable measures will be taken to minimize any possible harm.

Geotechnical borings for the bridge foundation will be necessary.

Based on the above discussion, it is concluded that no substantial adverse environmental impacts will result from the replacement of Bridge No. 24.

VIII. PUBLIC INVOLVEMENT

Due to the isolated nature of this bridge replacement project, no formal public involvement program was initiated. Efforts were undertaken early in the planning process to contact local officials to involve them in the project development with a scoping letter.

IX. AGENCY COORDINATION

Agency comments are summarized below. Letters from the commenting agencies are included in the appendix.

North Carolina Wildlife Resources Commission (NCWRC): Due to the potential for anadromous fish at this location, NCDOT should closely follow the "Stream Crossing Guidelines for Anadromous Fish Passage". This includes an in-water moratorium from February 15 to June 15.

> **Response:** The NCDOT will observe a moratorium on in-water work between February 15 to June 15 to protect fish spawning and will follow the "Stream Crossing Guidelines for Anadromous Fish Passage".

X. REFERENCES

Amoroso, J.L. 1999. Natural Heritage Program List of the Rare Plant Species of North Carolina. North Carolina Natural Heritage Program, Division of Parks and Recreation, N.C. Department of Environment, Health and Natural Resources, Raleigh. 85 pp.

Cowardin, L.M., V. Carter, F.C. Golet, and E.T. LaRoe. 1979. Classification of Wetlands and Deepwater Habitats of the United States. FWS/OBS-79/31. Fish and Wildlife Service, U.S. Department of the Interior, Washington, DC. 103 pp.

Department of the Army (DOA). 1987. Corps of Engineers Wetlands Delineation Manual. Tech. Rpt. Y-87-1. US Army Engineer Waterways Experiment Station, Vicksburg, MS. 100 pp.

Department of Environment and Natural Resources (DENR). 2002a. North Carolina Waterbodies Listed by Subbasin. http://h2o.enr.state.nc.us/bims/reports/basinsand waterbodies.

DENR. 2002b. Active NPDES Permit. Web Address: http://h2o.enr.state.nc.us/NPDES/documents/permits.xls

Division of Environmental Management (DEM). 1993. Classifications and Water Quality Standards Assigned to the Waters of the Cape Fear River Basin. North Carolina Department of Environment, Health, and Natural Resources, Raleigh.

Division of Water Quality (DWQ). 1999. Basinwide Assessment Report-Cape Fear River Basin. NC Department of Environment and Natural Resources. Raleigh, NC. 420 pp.

DWQ. 2000. Cape Fear River Basinwide Water Quality Plan. NC Department of Environment and Natural Resources. Raleigh, NC. 274 pp.

Hamel, P.B. 1992. Land Manager's Guide to the Birds of the South. The Nature Conservancy, Southeastern Region, Chapel Hill, NC. 437 pp.

Henry, V.G. 1989. Guidelines for Preparation of Biological Assessments and Evaluations for the Red-cockaded Woodpecker. U.S. Department of the Interior, Fish and Wildlife Service, Southeast Region, Atlanta, GA. 13 pp.

LeGrand, H.E., Jr., S.P. Hall, and J.T. Finnegan. 2001. Natural Heritage Program List of the Rare Animal Species of North Carolina. North Carolina Natural Heritage Program, Division of Parks and Recreation, N.C. Department of Environment, Health and Natural Resources, Raleigh. 91 pp.

Martof, B.S., W.M. Palmer, J.R. Bailey, and J.R. Harrison III. 1980. Amphibians and Reptiles of the Carolinas and Virginia. The University of North Carolina Press, Chapel Hill, NC. 264 pp.

McCafferty, W. P. 1998. Aquatic Entomology. Jones and Bartlett Publishers, Sudbury, MA. 448 pp.

Menhinick, E.F. 1991. The Freshwater Fishes of North Carolina. North Carolina Wildlife Resources Commission, Raleigh. 227 pp.

Palmer, W.M. and A.L. Braswell. 1995. Reptiles of North Carolina. The University of North Carolina Press, Chapel Hill, NC. 412 pp.

Potter, E.F., J.F. Parnell, and R.P. Teulings. 1980. Birds of the Carolinas. The University of North Carolina Press, Chapel Hill, NC. 408 pp.

Radford, A. E., H.E. Ahles, and C.R. Bell. 1968. Manual of the Vascular Flora of The Carolinas. The University of North Carolina Press, Chapel Hill, NC. 1183 pp.

Rohde, F.C., R.G Arndt, D.G. Lindquist, and J.F. Parnell. 1994. Freshwater Fishes of the Carolinas, Virginia, Maryland, and Delaware. The University of North Carolina Press, Chapel Hill, NC. 222 pp.

Rosgen, D. 1996. Applied River Geomorphology. Wildland Hydrology, Inc. Pagosa Springs, CO. 365 pp.

Schafale, M.P. and A.S. Weakley. 1990. Classification of the Natural Communities of North Carolina: Third Approximation. Natural Heritage Program, Division of Parks and Recreation, N.C. Department of Environment, Health, and Natural Resources. Raleigh. 325 pp.

U.S. Department of Agriculture (USDA). 1959. Soil Survey of Duplin County, North Carolina. 74 pp.

USDA. 1974. Soil Survey of Wayne County, North Carolina. 72 pp.

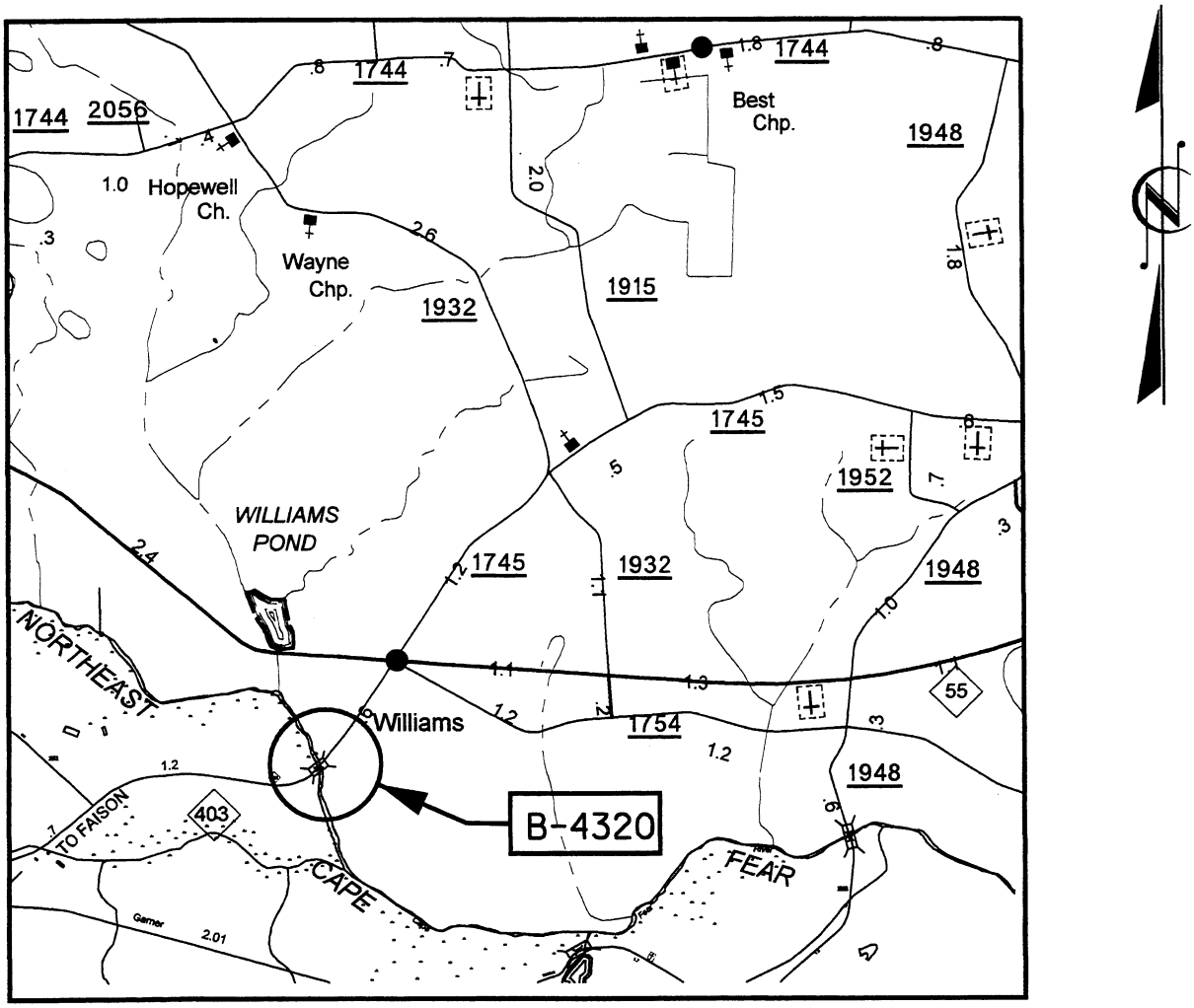
U.S. Fish and Wildlife Service (USFWS). 12 April 2001. Endangered, threatened, and candidate species and federal species of concern, by county, in North Carolina. 51 pp.

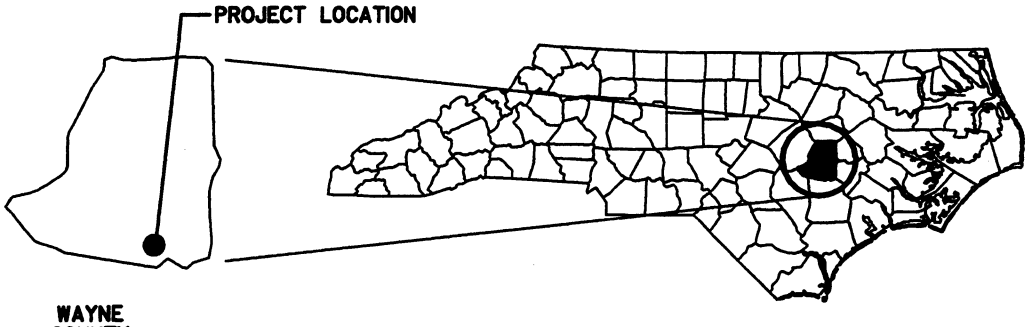
U.S. Geological Survey (USGS). 1974. Hydrologic Units Map, State of North Carolina.

USGS. 1980. Williams, NC 7.5-minute series topographic quadrangle map.

Webster, W.D., J.F. Parnell, and W.C. Biggs, Jr. 1985. Mammals of the Carolinas, Virginia, and Maryland. The University of North Carolina Press, Chapel Hill, NC. 255 pp.

FIGURES





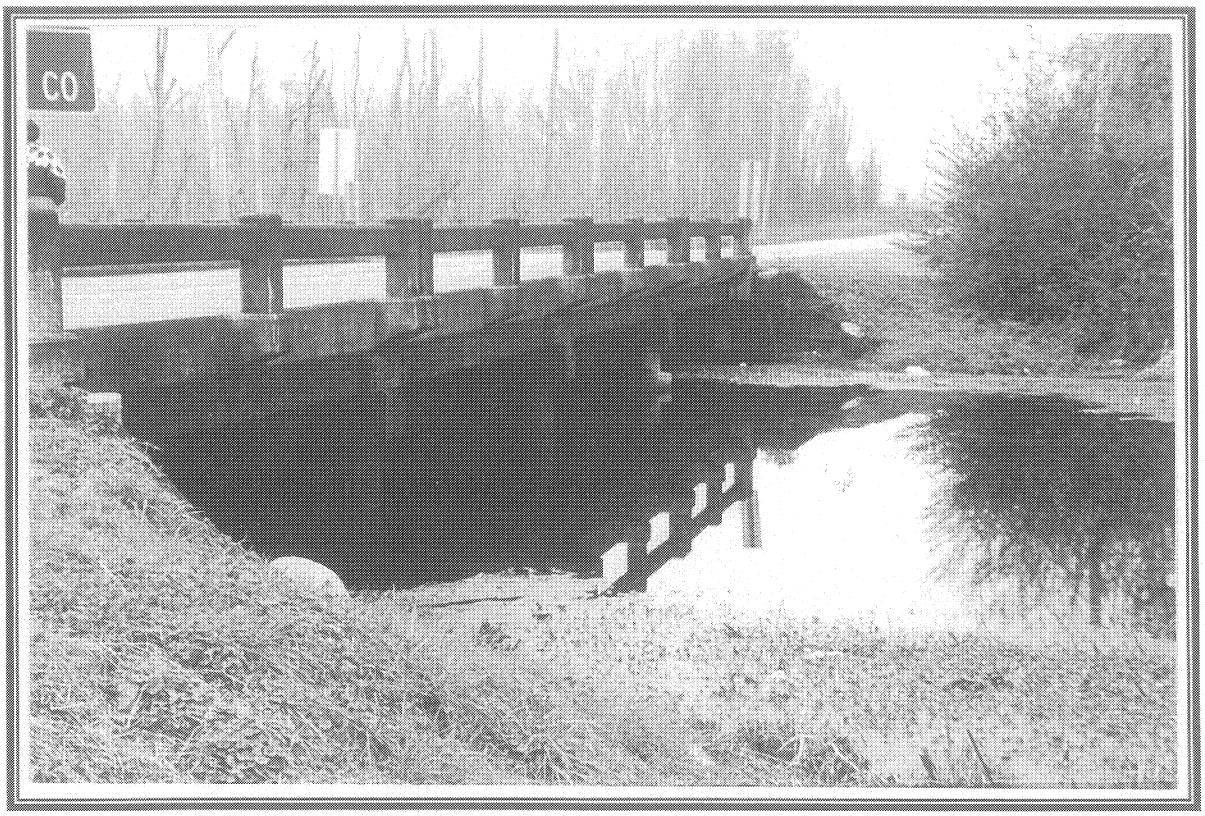
SCALE IN MILES

1 0 1

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

FIGURE 1
AREA LOCATION MAP
BRIDGE NO. 24
ON NC 403
OVER NORTHEAST CAPE FEAR RIVER
WAYNE COUNTY, NORTH CAROLINA
TIP PROJECT B-4320

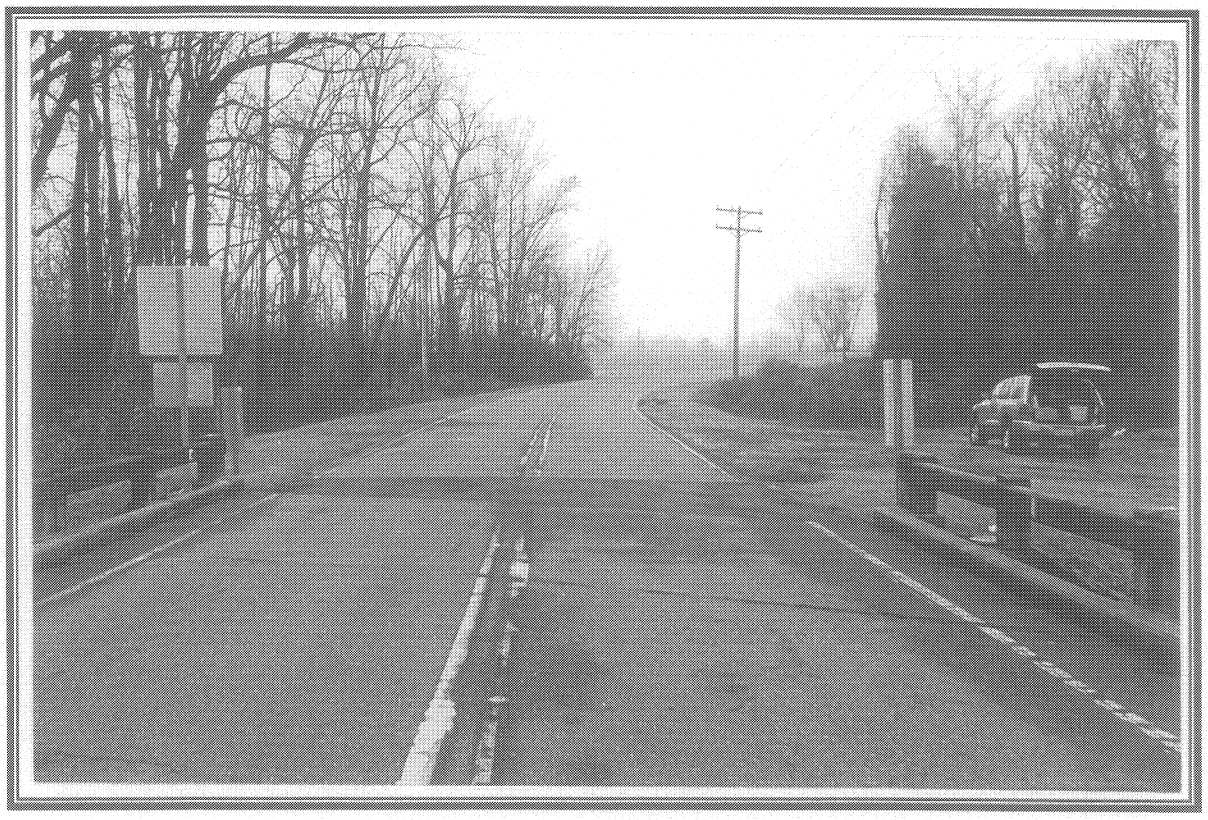
LOOKING AT WEST SIDE OF BRIDGE NO. 24



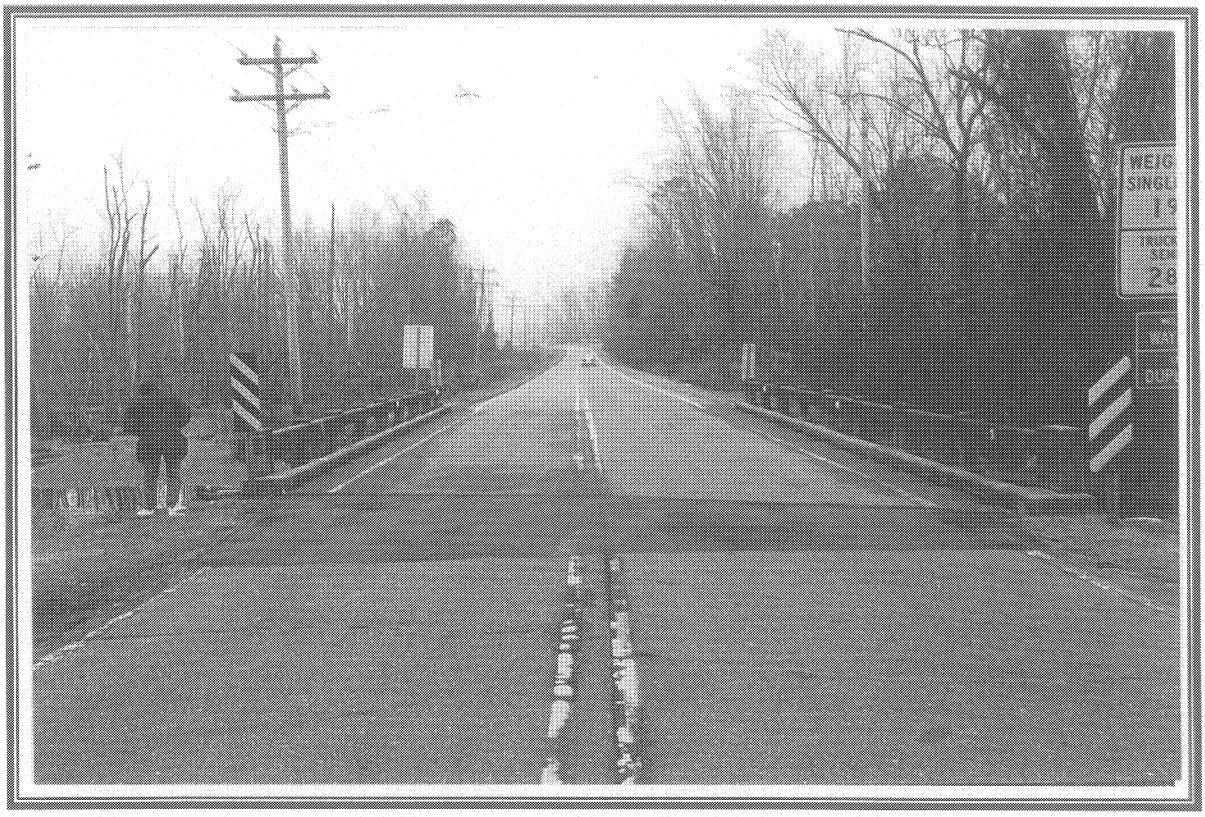
LOOKING AT EAST SIDE OF BRIDGE NO. 24

B-4320 WAYNE / DUPLIN COUNTIES
REPLACE BRIDGE NO. 24 ON NC 403 OVER NORTHEAST CAPE FEAR RIVER

FIGURE 2
PROJECT PHOTOGRAPHS



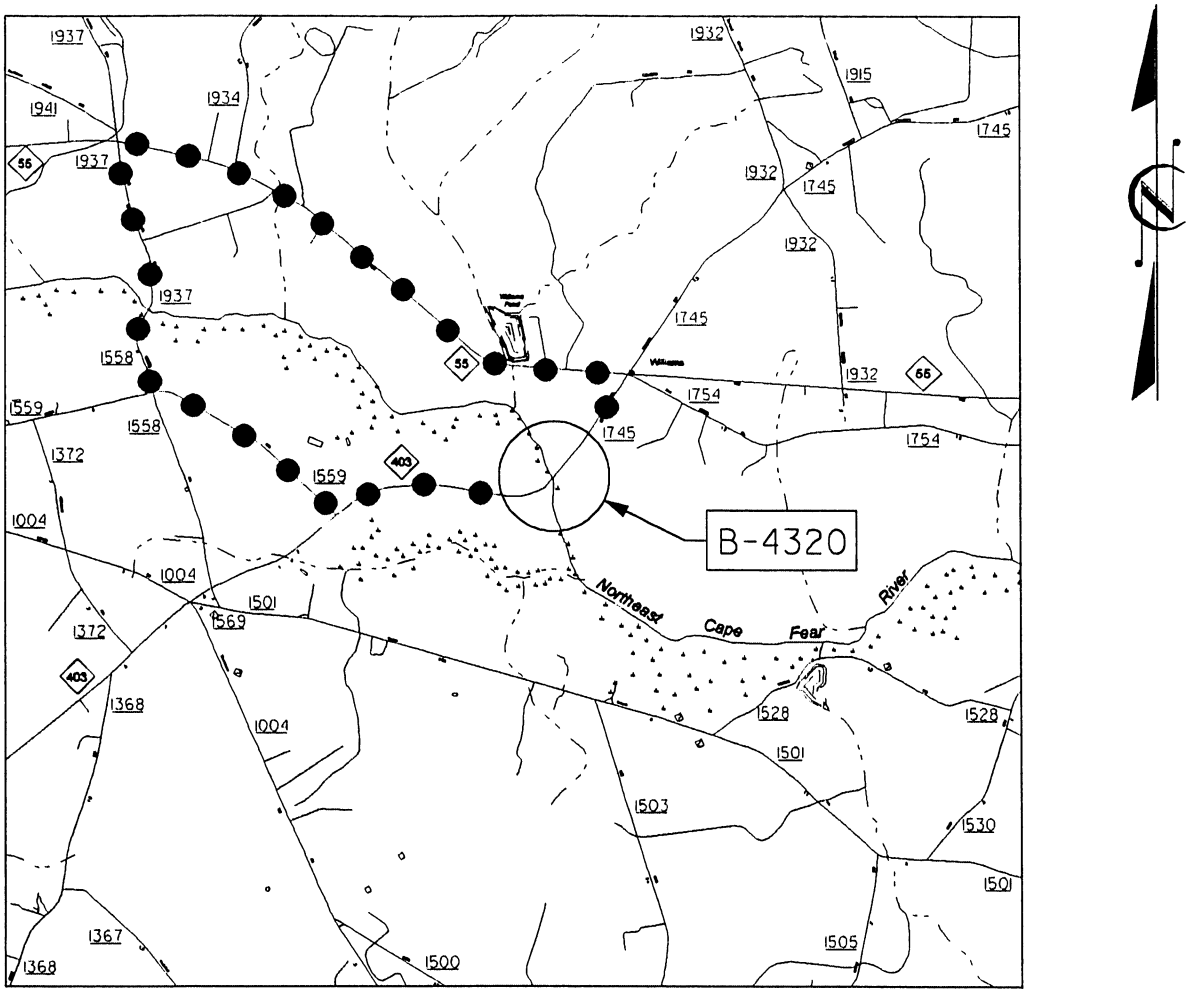
LOOKING SOUTH ACROSS BRIDGE NO. 24

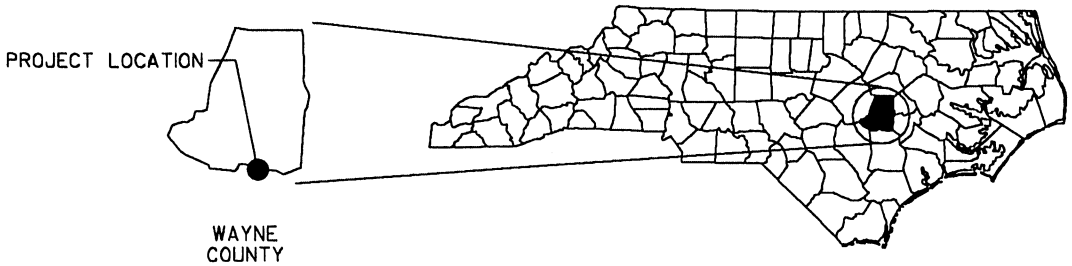


LOOKING NORTH ACROSS BRIDGE NO. 24

B-4320 WAYNE / DUPLIN COUNTIES
REPLACE BRIDGE NO. 24 ON NC 403 OVER NORTHEAST CAPE FEAR RIVER

FIGURE 3
PROJECT PHOTOGRAPHS





SCALE IN MILES

1 0 1

STUDIED DETOUR

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

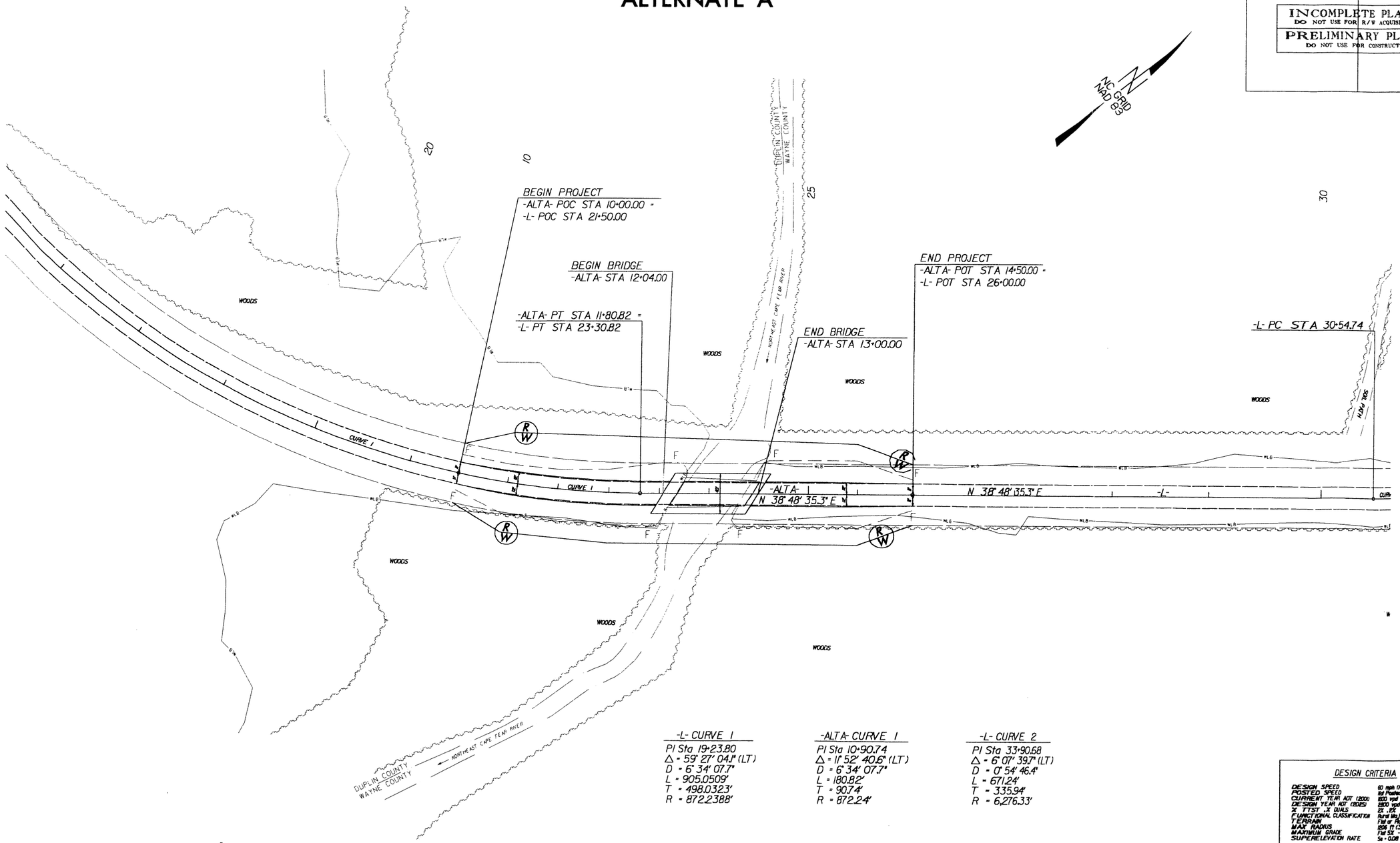
FIGURE 4
STUDIED OFF-SITE DETOUR
BRIDGE NO. 24
ON NC 403
OVER NE CAPE FEAR RIVER
WAYNE COUNTY, NORTH CAROLINA
TIP PROJECT B-4320

PROJECT REFERENCE NO.	SHEET NO.
B-4320	
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

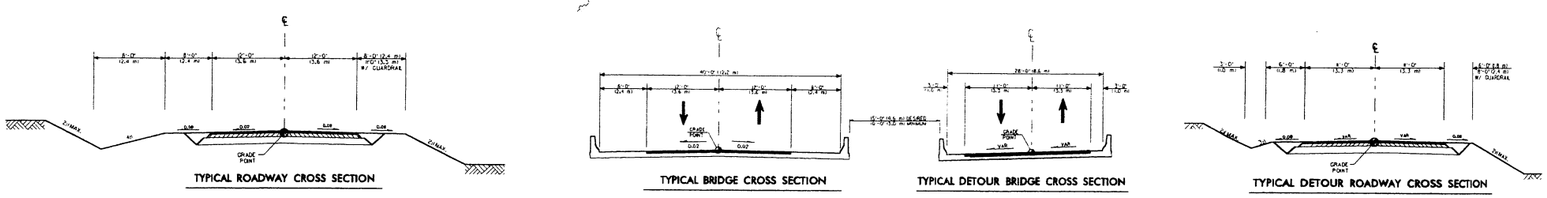
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

(REPLACE IN-PLACE WITH OFF-SITE DETOUR)
ALTERNATE A



-L- CURVE 1	-ALTA- CURVE 1	-L- CURVE 2
PI Sta 19+23.80	PI Sta 10+90.74	PI Sta 33+90.68
Δ = 59° 27' 04.1" (LT)	Δ = 11° 52' 40.6" (LT)	Δ = 6° 07' 39.7" (LT)
D = 6° 34' 07.7"	D = 6° 34' 07.7"	D = 0° 54' 46.4"
L = 905.0509'	L = 180.82'	L = 671.24'
T = 498.0323'	T = 90.74'	T = 335.94'
R = 872.2388'	R = 872.24'	R = 6,276.33'



DESIGN CRITERIA	
DESIGN SPEED	60 mph (100 km/h)
POSTED SPEED	Not Posted - 55 mph
CURRENT YEAR ADT (2020)	1800 vpd
DESIGN YEAR ADT (2045)	1800 vpd
% TTST	2% DUAL 2%
FUNCTIONAL CLASSIFICATION	Rural Major Collector
TERRAIN	Flat or Rolling
MAX RADIUS	956 ft (368 m)
MAXIMUM GRADE	Flat 5% - Rolling 6%
SUPERELEVATION RATE	Se = 0.08

DETOUR DESIGN CRITERIA	
DESIGN SPEED	50 mph (80 km/h)
MAX RADIUS	949 ft (259 m)
MAX GRADE	8%
SUPERELEVATION RATE	Se = 0.06

SCALE
50 0 50 100

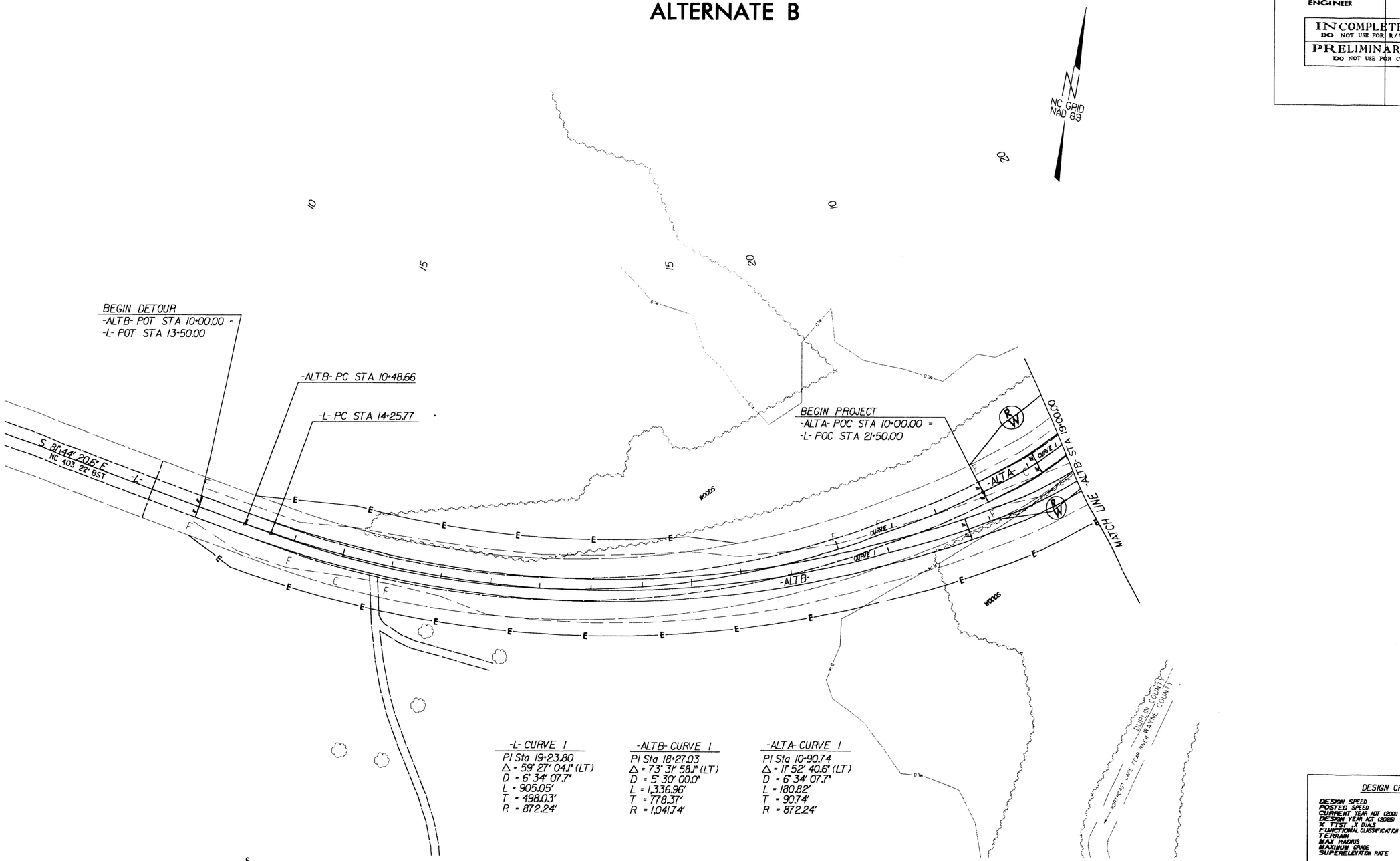
FIGURE 5

PROJECT REFERENCE NO.	SHEET NO.
B-4320	
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

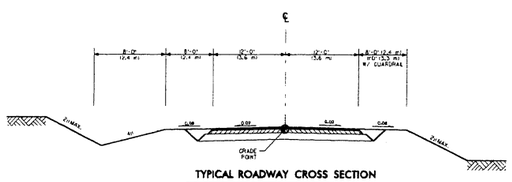
(REPLACE IN-PLACE WITH ON-SITE DETOUR)
ALTERNATE B



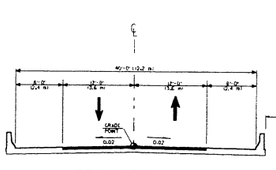
-L- CURVE 1
PI Sta 19+23.80
Δ = 59° 27' 04.1" (LT)
D = 6° 34' 07.7"
L = 905.05'
T = 498.03'
R = 872.24'

-ALTB- CURVE 1
PI Sta 18+27.03
Δ = 73° 31' 58.1" (LT)
D = 5° 30' 00.0"
L = 1,336.96'
T = 778.37'
R = 1,041.74'

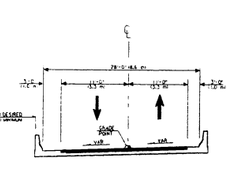
-ALTA- CURVE 1
PI Sta 10+90.74
Δ = 11° 52' 40.6" (LT)
D = 6° 34' 07.7"
L = 180.82'
T = 90.74'
R = 872.24'



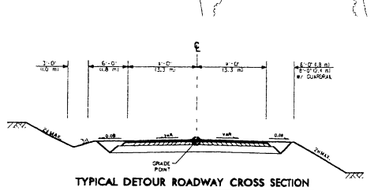
TYPICAL ROADWAY CROSS SECTION



TYPICAL BRIDGE CROSS SECTION



TYPICAL DETOUR BRIDGE CROSS SECTION



TYPICAL DETOUR ROADWAY CROSS SECTION

DESIGN CRITERIA

DESIGN SPEED	60 mph (100 km/h)
POSTED SPEED	Not Posted - 55 mph
CURRENT YEAR ADT (2000)	1600 vpd
DESIGN YEAR ADT (2025)	2800 vpd
% TTST, % DHV	6%, 12%
FUNCTIONAL CLASSIFICATION	Rural Major Collector
TERRAIN	Flat or Rolling
MAX RADIUS	1206 ft (368 m)
MAXIMUM GRADE	Flat 6% - Rolling 6%
SUPERELEVATION RATE	Se = 0.06

DETOUR DESIGN CRITERIA

DESIGN SPEED	50 mph (80 km/h)
MAX RADIUS	849 ft (259 m)
MAX GRADE	6%
SUPERELEVATION RATE	Se = 0.06

SCALE
50 0 50 100

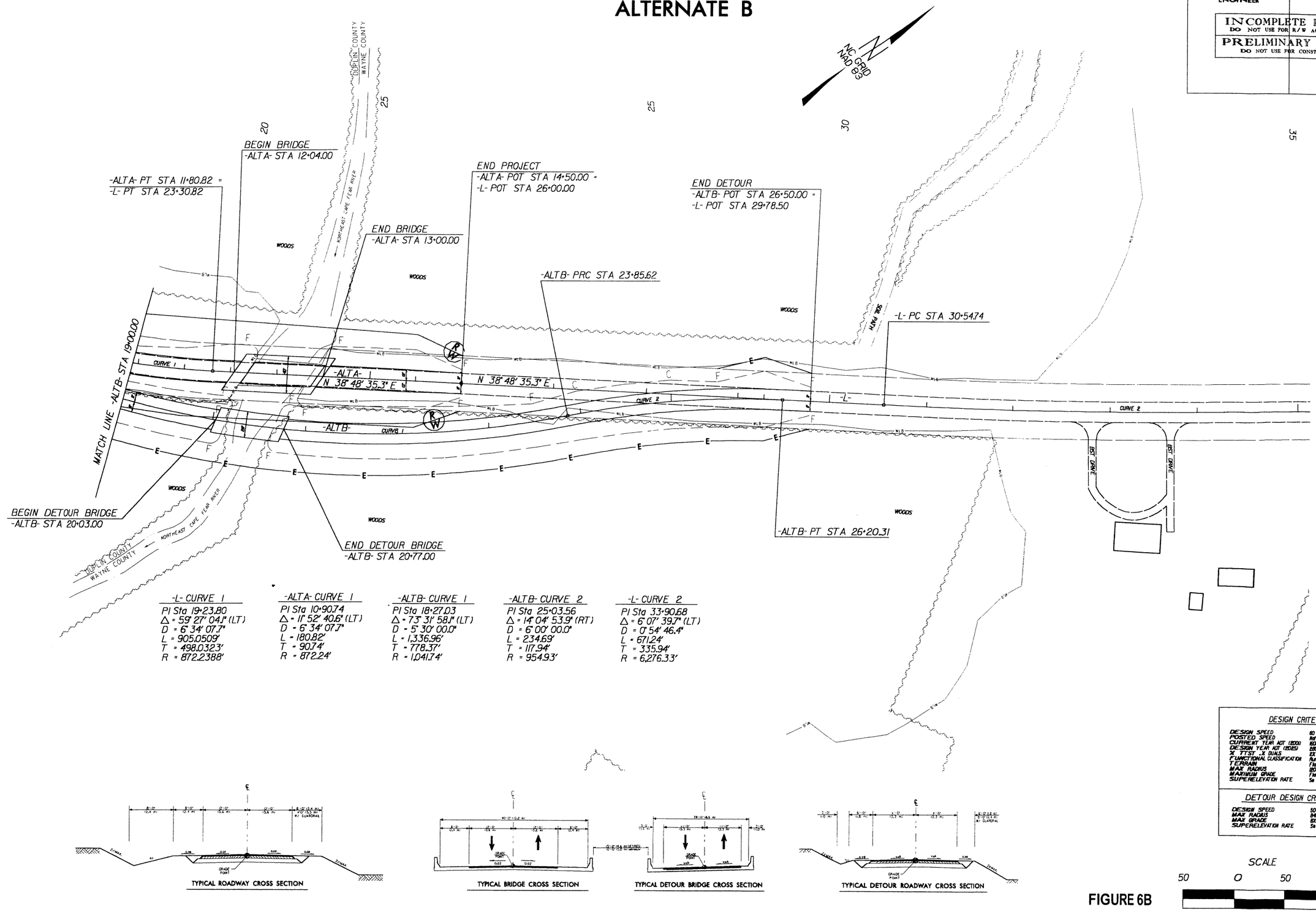
FIGURE 6A

(REPLACE IN-PLACE WITH ON-SITE DETOUR)
ALTERNATE B

PROJECT REFERENCE NO.	SHEET NO.
B-4320	
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



-L- CURVE 1	-ALTA- CURVE 1	-ALTB- CURVE 1	-ALTB- CURVE 2	-L- CURVE 2
PI Sta 19+23.80	PI Sta 10+90.74	PI Sta 18+27.03	PI Sta 25+03.56	PI Sta 33+90.68
Δ = 59° 27' 04.1" (LT)	Δ = 11° 52' 40.6" (LT)	Δ = 73° 31' 58.1" (LT)	Δ = 14° 04' 53.9" (RT)	Δ = 6° 07' 39.7" (LT)
D = 6° 34' 07.7"	D = 6° 34' 07.7"	D = 5° 30' 00.0"	D = 6° 00' 00.0"	D = 0° 54' 46.4"
L = 905.0509'	L = 180.82'	L = 1,336.96'	L = 234.69'	L = 671.24'
T = 498.0323'	T = 90.74'	T = 778.37'	T = 117.94'	T = 335.94'
R = 872.2388'	R = 872.24'	R = 1,041.74'	R = 954.93'	R = 6,276.33'

TYPICAL ROADWAY CROSS SECTION

TYPICAL BRIDGE CROSS SECTION

TYPICAL DETOUR BRIDGE CROSS SECTION

TYPICAL DETOUR ROADWAY CROSS SECTION

DESIGN CRITERIA	
DESIGN SPEED	60 mph (100 km/h)
POSTED SPEED	Not Posted - 55 mph
CURRENT YEAR ADT (2000)	1600 vpd
DESIGN YEAR ADT (2025)	2600 vpd
% TTST, DUALS	6% , 2%
FUNCTIONAL CLASSIFICATION	Rural Major Collector
TERRAIN	Flat or Rolling
MAX RADIUS	1606 ft (489 m)
MAXIMUM GRADE	Flat 5% - Rolling 6%
SUPERELEVATION RATE	Se - 0.08

DETOUR DESIGN CRITERIA	
DESIGN SPEED	50 mph (80 km/h)
MAX RADIUS	849 ft (259 m)
MAX GRADE	8%
SUPERELEVATION RATE	Se - 0.06

SCALE
50 0 50 100

FIGURE 6B

(NEW LOCATION EAST OF EXISTING BRIDGE)
ALTERNATE C

PROJECT REFERENCE NO.	SHEET NO.
B-4320	
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

NC GRID NAD 83

BEGIN PROJECT
-ALTC- POT STA 10+00.00 -
-L- POT STA 13+00.00

-ALTC- PC STA 10+29.40

-L- PC STA 14+25.77

S 81-44-20.6" E
NC 403 22' BST.

-L-

-ALTC-

-L- PT STA 23+30.82

MATCH LINE -ALTC- STA 22+00.00

N 38° 48' 25.3" E

END BRIDGE
-ALTC- STA 21+18.00

BEGIN BRIDGE
-ALTC- STA 20+42.00

CURVE 1

WOODS

DUPLIN COUNTY
WAYNE COUNTY

NORTHEAST CAPE FEAR WATER

-L- CURVE 1	-ALTC- CURVE 1
PI Sta 19+23.80	PI Sta 18+06.44
Δ = 59° 27' 04.1" (LT)	Δ = 65° 34' 43.8" (LT)
D = 6° 34' 07.7"	D = 4° 45' 00.0"
L = 905.05'	L = 1,380.61'
T = 498.03'	T = 777.04'
R = 872.24'	R = 1,206.23'

TYPICAL ROADWAY CROSS SECTION

TYPICAL BRIDGE CROSS SECTION

TYPICAL DETOUR BRIDGE CROSS SECTION

TYPICAL DETOUR ROADWAY CROSS SECTION

DESIGN CRITERIA

DESIGN SPEED	60 mph (100 km/h)
POSTED SPEED	55 Posted - 55 mph
CURRENT YEAR ADT (2000)	1600 vpd
DESIGN YEAR ADT (2025)	2800 vpd
% TTST ,% DUALS	2% , 2%
FUNCTIONAL CLASSIFICATION	Rural Major Collector
TERRAIN	Flat or Rolling
MAX RADIUS	1206 ft (368 m)
MAXIMUM GRADE	Flat 5% - Rolling 6%
SUPERELEVATION RATE	Se - 0.06

DETOUR DESIGN CRITERIA

DESIGN SPEED	50 mph (80 km/h)
MAX RADIUS	849 ft (259 m)
MAX GRADE	8%
SUPERELEVATION RATE	Se - 0.06

SCALE
50 0 50 100

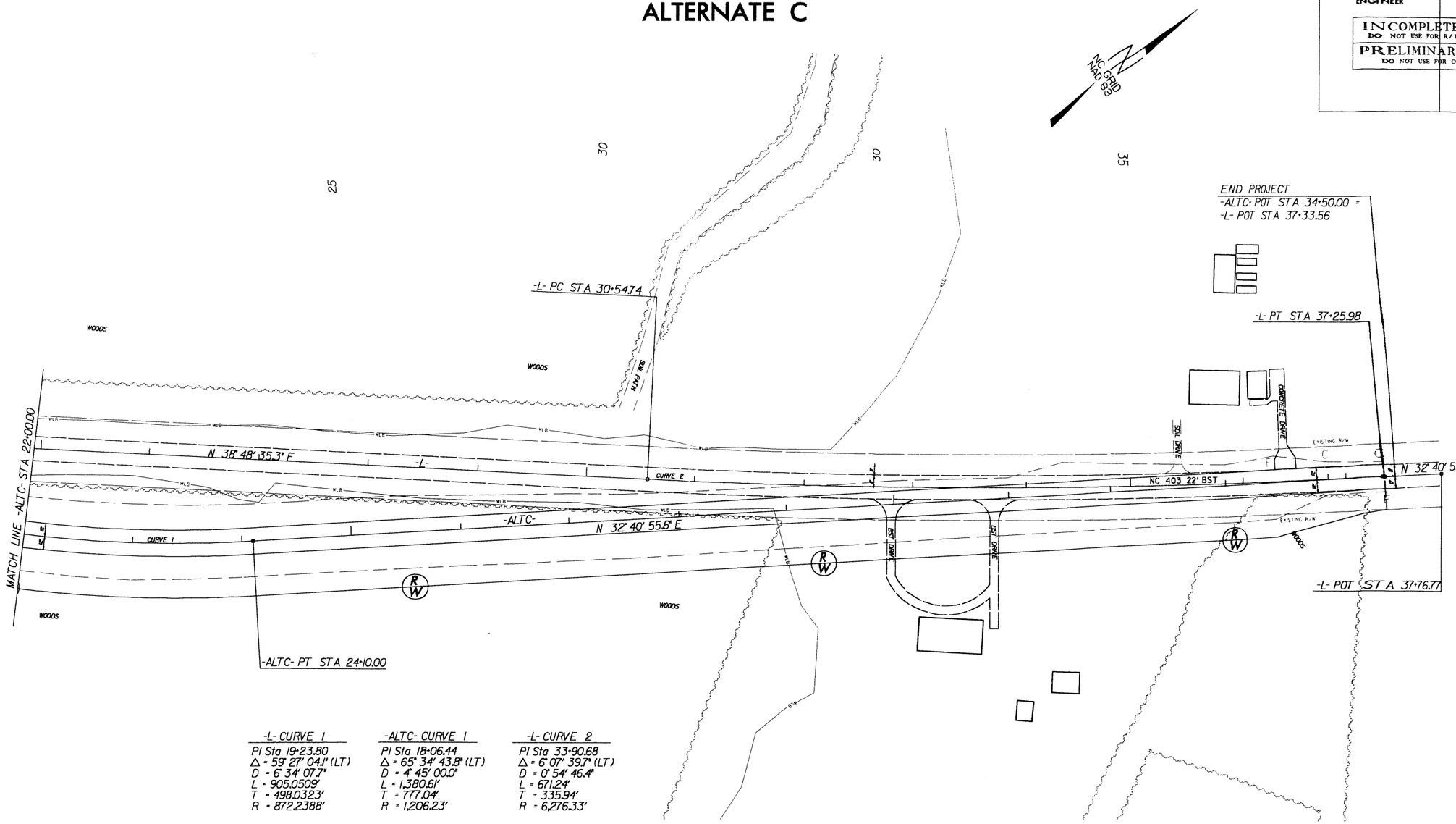
FIGURE 7A

PROJECT REFERENCE NO.	SHEET NO.
B-4320	
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

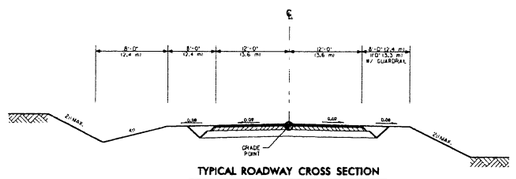
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

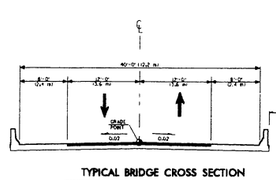
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

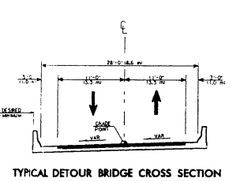
(NEW LOCATION EAST OF EXISTING BRIDGE)
ALTERNATE C

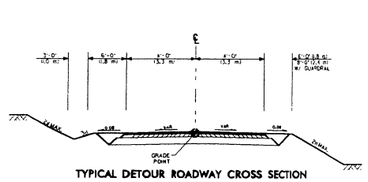


-L- CURVE 1	-ALTC- CURVE 1	-L- CURVE 2
PI Sta 19+23.80	PI Sta 18+06.44	PI Sta 33+90.68
Δ = 59° 27' 04.1" (LT)	Δ = 65° 34' 43.8" (LT)	Δ = 6° 07' 39.7" (LT)
D = 6° 34' 07.7"	D = 4° 45' 00.0"	D = 0° 54' 46.4"
L = 905.0509'	L = 1,380.61'	L = 671.24'
T = 498.0323'	T = 777.04'	T = 335.94'
R = 872.2388'	R = 1,206.23'	R = 6,276.33'









DESIGN CRITERIA

DESIGN SPEED	60 mph (100 km/h)
POSTED SPEED	Not Posted - 55 mph
CURRENT YEAR ADT (2020)	1100 vpd
DESIGN YEAR ADT (2045)	2800 vpd
% TTST, % DUALS	2%, 0%
FUNCTIONAL CLASSIFICATION	Rural Major Collector
TERRAIN	Flat or Rolling
MAX. RADIUS	2016 FT (1368 m)
MAXIMUM GRADE	Flat 5% - Rolling 6%
SUPERELEVATION RATE	Se = 0.08

DETOUR DESIGN CRITERIA

DESIGN SPEED	50 mph (80 km/h)
MAX. RADIUS	849 FT (259 m)
MAX. GRADE	8%
SUPERELEVATION RATE	Se = 0.06

SCALE
50 0 50 100

FIGURE 7B

Bridge Sign

NC 403

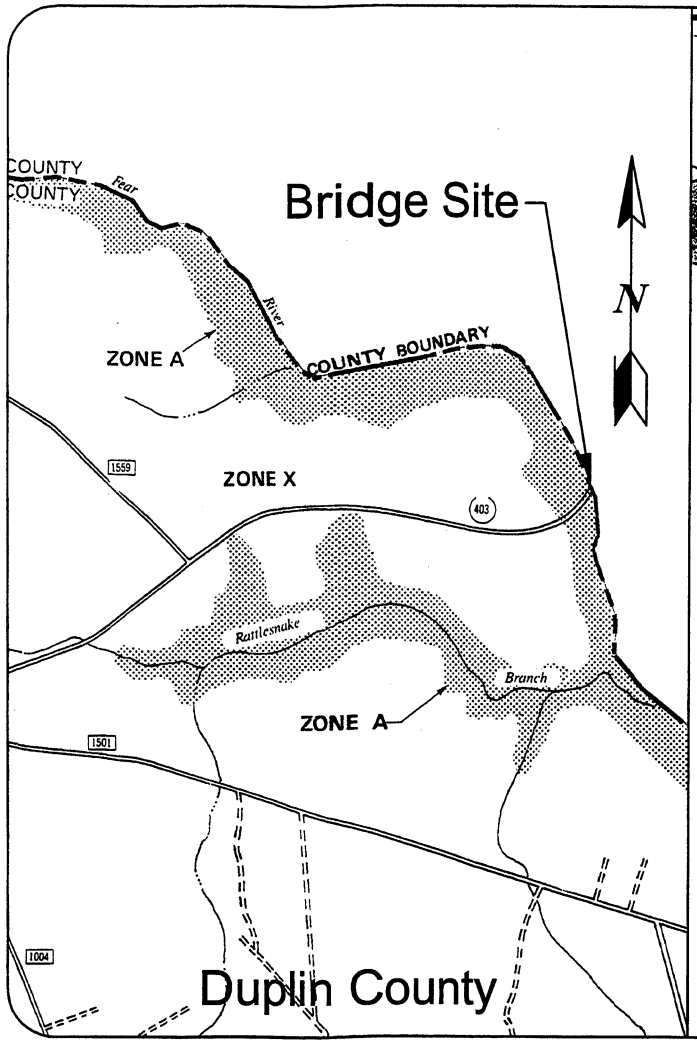
NC 403

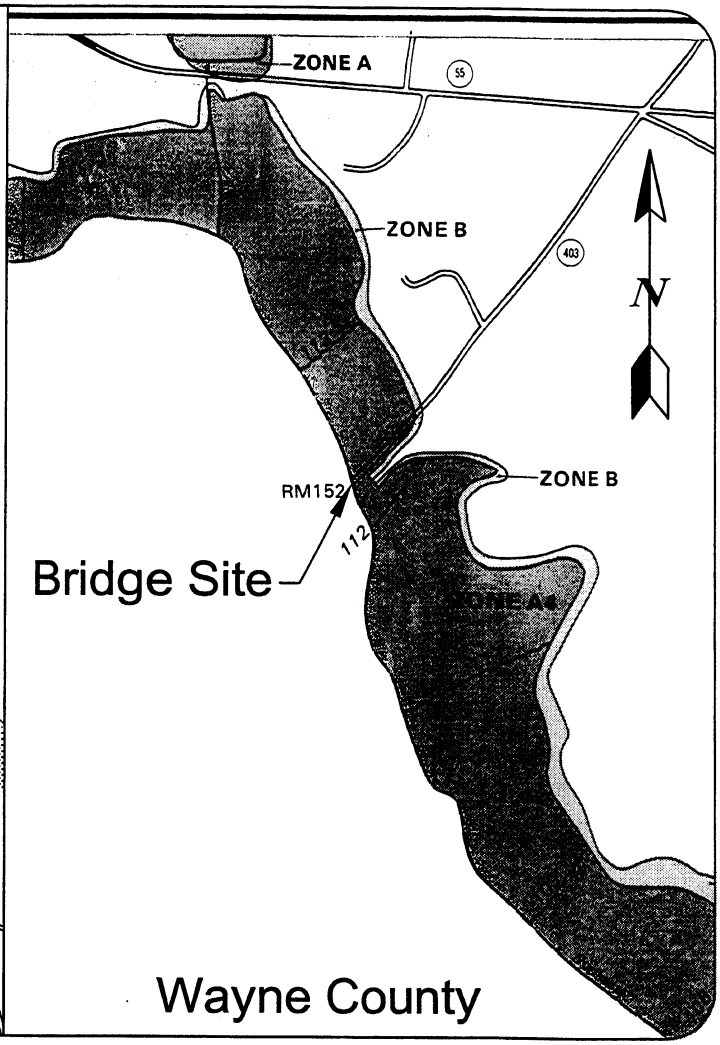
NC 403
Replace Bridge No. 24 over
Northeast Cape Fear River
Wayne County/Duplin County
North Carolina

Figure 8

Project Vicinity

TIP NO. B-4320



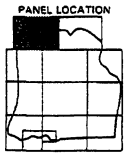


FIRM
FLOOD INSURANCE RATE MAP

DUPLIN COUNTY,
NORTH CAROLINA
(UNINCORPORATED AREAS)

PANEL 25 OF 275

PANEL LOCATION



COMMUNITY-PANEL NUMBER
370083 0025 B

EFFECTIVE DATE:
JULY 4, 1989

Federal Emergency Management Agency

FIRM
FLOOD INSURANCE RATE MAP

WAYNE COUNTY,
NORTH CAROLINA
(UNINCORPORATED AREAS)

PANEL 140 OF 145
(SEE MAP INDEX FOR PANELS NOT PRINTED)

COMMUNITY-PANEL NUMBER
370254 0140 C

EFFECTIVE DATE:
SEPTEMBER 30, 1983

Federal Emergency Management Agency

NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

NC 403
Replace Bridge No. 24 over
Northeast Cape Fear River
Wayne County/Duplin County,
North Carolina

TIP NO. B-4320
FEMA 100-YEAR FLOOD PLAIN MAP

Not to Scale

FIGURE 9

APPENDIX

U.S. Department of Agriculture

FARMLAND CONVERSION IMPACT RATING

RT I *(To be completed by Federal Agency)*	Date Of Land Evaluation Request 12/21/01
Name Of Project NC DOT B-4320 on NC 403	Federal Agency Involved USDA - NRCS
Proposed Land Use Replace Existing Bridge No. 24	County And State Wayne Co., NC
ART II *(To be completed by SCS)*	Date Request Received By SCS 12/23/01

Does the site contain prime, unique, statewide or local important farmland? *(If no, the FPPA does not apply — do not complete additional parts of this form).*	Yes ☑	No ☐	Acres Irrigated None	Average Farm Size 173

Major Crop(s)	Farmable Land In Govt. Jurisdiction	Amount Of Farmland As Defined in FPPA
Corn	Acres: 305472 % 86	Acres: 275,280 % 77.5

Name Of Land Evaluation System Used	Name Of Local Site Assessment System	Date Land Evaluation Returned By SCS
Wayne LE	None	01/29/02

PART III *(To be completed by Federal Agency)*	Alternative Site Rating			
	Site A	Site B	Site C	Site D
A. Total Acres To Be Converted Directly	0.16	0.16	1.21	
B. Total Acres To Be Converted Indirectly				
C. Total Acres In Site	0.16	0.16	1.21	
PART IV *(To be completed by SCS)* Land Evaluation Information				
A. Total Acres Prime And Unique Farmland			0.00	
B. Total Acres Statewide And Local Important Farmland			0.70	
C. Percentage Of Farmland In County Or Local Govt. Unit To Be Converted			40.01	
D. Percentage Of Farmland In Govt. Jurisdiction With Same Or Higher Relative Value			77.50	
PART V *(To be completed by SCS)* Land Evaluation Criterion Relative Value Of Farmland To Be Converted *(Scale of 0 to 100 Points)*			35.8	

PART VI *(To be completed by Federal Agency)* Assessment Criteria *(These criteria are explained in 7 CFR 658.5(b)*	Maximum Points				
1. Area In Nonurban Use	15	15	15	15	
2. Perimeter In Nonurban Use	10	10	10	10	
3. Percent Of Site Being Farmed	20	5	5	5	
4. Protection Provided By State And Local Government	20	0	0	0	
5. Distance From Urban Builtup Area	15	10	10	10	
6. Distance To Urban Support Services	15	10	10	10	
7. Size Of Present Farm Unit Compared To Average	10	9	9	9	
8. Creation Of Nonfarmable Farmland	10	0	0	0	
9. Availability Of Farm Support Services	5	5	5	5	
10. On-Farm Investments	20	10	10	10	
11. Effects Of Conversion On Farm Support Services	10	0	0	0	
12. Compatibility With Existing Agricultural Use	10	0	0	0	
TOTAL SITE ASSESSMENT POINTS	160				
PART VII *(To be completed by Federal Agency)*					
Relative Value Of Farmland *(From Part V)*	100				
Total Site Assessment *(From Part VI above or a local site assessment)*	160				
TOTAL POINTS *(Total of above 2 lines)*	260				

ite Selected:	Date Of Selection	Was A Local Site Assessment Used? Yes ☐ No ☐

eason For Selection:

U.S. Department of Agriculture

FARMLAND CONVERSION IMPACT RATING

RT I *(To be completed by Federal Agency)*	Date Of Land Evaluation Request 12/21/01
Name Of Project NCDOT B-4320 on NC 403	Federal Agency Involved USDA - NRCS
Proposed Land Use Replace Existing Bridge No. 24	County And State Duplin Co., NC
ART II *(To be completed by SCS)*	Date Request Received By SCS 12/23/01

Does the site contain prime, unique, statewide or local important farmland? Yes ☑ No ☐ *(If no, the FPPA does not apply — do not complete additional parts of this form).*

Acres Irrigated: None | Average Farm Size: 153

Major Crop(s)	Farmable Land In Govt. Jurisdiction	Amount Of Farmland As Defined in FPPA
Corn	Acres: 440753 %84.3	Acres: 305860 %58.5
Name Of Land Evaluation System Used: Duplin LE	Name Of Local Site Assessment System: None	Date Land Evaluation Returned By SCS: 01/29/02

ART III *(To be completed by Federal Agency)*	Alternative Site Rating			
	Site A	Site B	Site C	Site D
A. Total Acres To Be Converted Directly	0.231	0.231	1.715	
B. Total Acres To Be Converted Indirectly				
C. Total Acres In Site	0.231	0.231	1.715	
ART IV *(To be completed by SCS)* Land Evaluation Information				
A. Total Acres Prime And Unique Farmland			0.13	
B. Total Acres Statewide And Local Important Farmland			0.55	
C. Percentage Of Farmland In County Or Local Govt. Unit To Be Converted			<0.01	
D. Percentage Of Farmland In Govt. Jurisdiction With Same Or Higher Relative Value			94.00	
ART V *(To be completed by SCS)* Land Evaluation Criterion Relative Value Of Farmland To Be Converted *(Scale of 0 to 100 Points)*			30.3	

ART VI *(To be completed by Federal Agency)* Assessment Criteria *(These criteria are explained in 7 CFR 658.5(b)*	Maximum Points				
1. Area In Nonurban Use	15	15	15	15	
2. Perimeter In Nonurban Use	10	10	10	10	
3. Percent Of Site Being Farmed	20	5	5	5	
4. Protection Provided By State And Local Government	20	0	0	0	
5. Distance From Urban Builtup Area	15	10	10	10	
6. Distance To Urban Support Services	15	10	10	10	
7. Size Of Present Farm Unit Compared To Average	10	9	9	9	
8. Creation Of Nonfarmable Farmland	10	0	0	0	
9. Availability Of Farm Support Services	5	5	5	5	
10. On-Farm Investments	20	10	10	10	
11. Effects Of Conversion On Farm Support Services	10	0	0	0	
12. Compatibility With Existing Agricultural Use	10	0	0	0	
TOTAL SITE ASSESSMENT POINTS	160	74	74	74	
ART VII *(To be completed by Federal Agency)*					
Relative Value Of Farmland *(From Part V)*	100				
Total Site Assessment *(From Part VI above or a local site assessment)*	160				
TOTAL POINTS *(Total of above 2 lines)*	260				

te Selected: | Date Of Selection | Was A Local Site Assessment Used? Yes ☐ No ☐

eason For Selection:

U.S. ARMY CORPS OF ENGINEERS
Wilmington District

Action ID: 200101325 **County:** Duplin

Notification of Jurisdictional Determination

Property Owner:
Mr. William D. Gilmore, P.E., Manager
Project Development & Environmental Analysis
1548 Mail Service Center
Raleigh, N.C. 27699-1548

Authorized Agent:
Jeff Harbour, PWS
Environmental Services, INC
524 New Hope Road
Raleigh, North Carolina 27610

Size and Location of Property (waterbody, Highway name/number, town, etc.): TIP Project No. B-4320, Bridge NO. 24 on NC 403 over the NE Cape Fear River, Duplin County, North Carolina.

Basis for Determination: Onsite field inspection of selected wetland sites.

Indicate Which of the Following apply:

- ☐ There are wetlands on the above described property which we strongly suggest should be delineated and surveyed. The surveyed wetland lines must be verified by our staff before the Corps will make a final jurisdictional determination on your property.
- ☐ On **October 9, 2001**, the undersigned inspected the Section 404 jurisdictional line as determined by the NCDOT and/or its representatives for the subject NCDOT project. A select number of wetland sites were inspected for the proposed project and all were found to accurately reflect the limits of Corps jurisdiction. The Corps believes that this jurisdictional delineation can be relied on for planning purposes and impact assessment.
- ☐ The wetlands on your lot have been delineated and the limits of the Corps jurisdiction have been explained to you. Unless there is a change in the law or our published regulations, this determination may be relied upon for a period not to exceed five years from the date of this notification.
- ☐ There are no wetlands present on the above described property which are subject to the permit requirements of section 404 of the Clean Water Act (33 USC 1344). Unless there is a change in the law or our published regulations, this determination may be relied upon for a period not to exceed five years from the date of this notification.
- ☐ The project is located in one of the 20 Coastal Counties. You should contact the nearest State Office of Coastal Management to determine their requirements.

Placement of dredged or fill material in wetlands on this property without a Department of the Army permit is in most cases a violation of Section 301 of the Clean Water Act (33 USC 1311). A permit is not required for work on the property restricted entirely to existing high ground. If you have any questions regarding the Corps of Engineers regulatory program, please contact Mr. Dave Timpy at 910-251-4634.

Project Manager Signature _____

Date January 2, 2002 **Expiration Date** January 2, 2007

SURVEY PLAT OR FIELD SKETCH OF DESCRIBED PROPERTY AND THE WETLAND DELINEATION FORM MUST BE ATTACHED TO THIS FORM.

J. Ellerby

DEPARTMENT OF THE ARMY
WILMINGTON DISTRICT, CORPS OF ENGINEERS
P.O. BOX 1890
WILMINGTON, NORTH CAROLINA 28402-1890

October 22, 2001

IN REPLY REFER TO

Regulatory Division

Action ID. 200121178; NC 403, Replace Bridge No. 24 over the Northeast Cape Fear River, Wayne County, North Carolina, TIP No. B-4320

William D. Gilmore, P.E., Manager
Planning and Environmental Branch
North Carolina Department of Transportation
Division of Highways
1548 Mail Service Center
Raleigh, North Carolina 27699-1548

Dear Mr. Gilmore:

This is in response to your letter dated June 21, 2001, requesting input on the replacement of Bridge No. 24 on NC 403 over the Northeast Cape Fear, northeast of Mount Olive, Wayne County, North Carolina (TIP No. B-4320).

Prior Department of the Army permit authorization, pursuant to Section 404 of the Clean Water Act of 1977, as amended, will be required for the discharge of excavated or fill material into waters and/or wetlands in conjunction with this project, including temporary impacts for construction access or bridge demolition, and the disposal of construction debris.

Review of the project indicates that the proposed work may involve the discharge of excavated or fill material into waters and wetlands. When final plans are completed, including the extent and location of any work within waters of the United States and wetlands, our Regulatory Division would appreciate the opportunity to review these plans for a project-specific determination of Department of the Army permit requirements. These plans should include temporary impacts from any necessary construction access or bridge demolition. Bridge demolition work should be planned in strict accordance with the latest NCDOT Policy: Bridge Demolition and Removal in Waters of the United States (BDR Policy), including the Best Management Practices for Bridge Demolition and Removal. If there are only minor impacts to waters, including wetlands, the work might be authorized under one or more nationwide or regional general permits provided avoidance and minimization are adequately addressed.

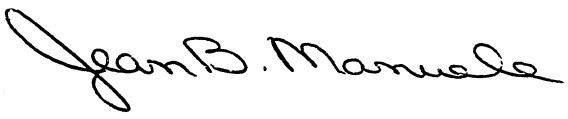
The Corps of Engineers must assess the impacts of such activities on the aquatic environment prior to issuing Department of the Army permits. Authorization of aquatic fill activities requires that the project be water dependent and/or that no practicable alternatives are available. Our initial review emphasis for North Carolina Department of Transportation (NCDOT) projects will focus on the impacts to waters and/or wetlands. However, if degradation to other aspects of the natural environment (e.g., habitat of endangered species) is considered to be of greater concern, an alternative resulting in greater aquatic losses may be chosen as preferred.

In all cases, and in accordance with the Memorandum of Agreement between the U.S. Environmental Protection Agency and the Corps, the sequencing process of avoidance, minimization, and compensatory mitigation of unavoidable wetland impacts will be satisfied prior to the final permit decision. A Department of the Army permit will not be issued until a final plan for compensatory mitigation is approved. Mitigation for stream impacts may also be required.

Regarding the alternatives to be studied, the Corps recommends that NCDOT study an alternative to replace the structure on existing location, and detour traffic on existing roads. This alternative would likely reduce temporary and permanent impacts to the stream and its stable bank.

Questions or comments pertaining to permits may be directed to me, at telephone (919) 876-8441, extension 24.

Sincerely,



Jean B. Manuele
Project Manager,
Raleigh Regulatory Field Office

Copy Furnished:

Ms. Emily Lawton
Federal Highway Administration
310 New Bern Ave., Rm 410
Raleigh, North Carolina 27601-1442

Theresa Chilcoat

United States Department of the Interior

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

August 9, 2001

Mr. William D. Gilmore, P.E., Manager
NCDOT
Project Development and Environmental Analysis Branch
1548 Mail Service Center
Raleigh, North Carolina 27699-1548

Dear Mr. Gilmore:

Thank you for your June 21, 2001, request for information from the U.S. Fish and Wildlife Service (Service) on the potential environmental impacts of proposed bridge replacements in Nash and Wayne Counties, North Carolina (TIP Nos. B-3681 & B-4320). This report provides scoping information and is provided in accordance with provisions of the Fish and Wildlife Coordination Act (FWCA) (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). This report also serves as initial scoping comments to federal and state resource agencies for use in their permitting and/or certification processes for this project

The North Carolina Department of Transportation (NCDOT) is planning to replace the following bridges:

1. B-3681, Bridge No. 277 on SR 1555 over the CSX Railroad, Nash County; and,

2. B-4320, Bridge No. 24 on NC 403 over NE Cape Fear River, Wayne County.

The following recommendations are provided to assist you in your planning process and to facilitate a thorough and timely review of the project.

Generally, the Service recommends that wetland impacts be avoided and minimized to the maximum extent practical as outlined in Section 404 (b)(1) of the Clean Water Act Amendments of 1977. In regard to avoidance and minimization of impacts, we recommend that proposed highway projects be aligned along or adjacent to existing roadways, utility corridors, or previously developed areas in order to minimize habitat fragmentation and encroachment. Areas exhibiting high biodiversity or ecological value important to the watershed and region should be avoided. Crossings of streams and associated wetland systems should use existing crossings and/or occur on a structure wherever feasible. Where bridging is not feasible, culvert structures that maintain natural water flows and hydraulic regimes without scouring, or impeding fish and

wildlife passage, should be employed. Highway shoulder and median widths should be reduced through wetland areas. Roadway embankments and fill areas should be stabilized by using appropriate erosion control devices and techniques. Wherever appropriate, construction in sensitive areas should occur outside fish spawning and migratory bird nesting seasons.

The National Wetlands Inventory (NWI) map of the Rocky Mount 7.5 Minute Quadrangle does not show wetland resources in the CSX work area. The NWI map of the Williams 7.5 Minute Quadrangle does show wetland resources in the project area. However, while the NWI maps are useful for providing an overview of a given area, they should not be relied upon in lieu of a detailed wetland delineation by trained personnel using an acceptable wetland classification methodology. Therefore, in addition to the above guidance, we recommend that the environmental documentation for this project include the following in sufficient detail to facilitate a thorough review of the action.

1. 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. 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 (Corps).

2. If unavoidable wetland impacts are proposed, we recommend that every effort 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, preferably via conservation easement, should be explored at the outset.

The document presents a number of scenarios for replacing each bridge, ranging from in-place to relocation, with on-site and off-site detours. The Service recommends that each bridge be replaced on the existing alignment with an off-site detour.

The enclosed list identifies the federally-listed endangered and threatened species, and Federal Species of Concern (FSC) that are known to occur in Nash and Wayne Counties. The Service recommends that habitat requirements for the listed species be compared with the available habitats at the respective project sites. If suitable habitat is present within the action area of the project, biological surveys for the listed species should be performed. Environmental documentation that includes survey methodologies, results, and NCDOT's recommendations based on those results, should be provided to this office for review and comment.

FSC's are those plant and animal species for which the Service remains concerned, but further biological research and field study are needed to resolve the conservation status of these taxa. Although FSC's receive no statutory protection under the ESA, we would encourage the NCDOT to be alert to their potential presence, and to make every reasonable effort to conserve them if

found. The North Carolina Natural Heritage Program should be contacted for information on species under state protection.

The Service appreciates the opportunity to comment on this project. Please continue to advise us during the progression of the planning process, including your official determination of the impacts of this project. If you have any questions regarding these comments, please contact Tom McCartney at 919-856-4520, Ext. 32.

Sincerely,

Garland B. Pardue

Dr. Garland B. Pardue
Ecological Services Supervisor

Enclosures

cc: COE, Raleigh, NC (Eric Alsmeyer)
COE, Washington, NC (Michael F. Bell)
NCDWQ, Raleigh, NC (John Hennessy)
NCDNR, Creedmoor, NC (David Cox)

FWS/R4:TMcCartney:TM:08/08/01:919/856-4520 extension 32:\2bdgnash.wak

COMMON NAME	SCIENTIFIC NAME	STATUS
WATAUGA COUNTY		
Vertebrates		
Bog turtle	*Clemmys muhlenbergii*	T(S/A)[1]
Hellbender	*Cryptobranchus alleganiensis*	FSC
Cerulean warbler	*Dendroica cerulea*	FSC
Carolina northern flying squirrel	*Glaucomys sabrinus coloratus*	Endangered
Alleghany woodrat	*Neotoma magister*	FSC*
Kanawha minnow	*Phenacobius teretulus*	FSC
Southern water shrew	*Sorex palustris punctulatus*	FSC*
Appalachian cottontail	*Sylvilagus obscurus*	FSC*
Invertebrates		
Green floater	*Lasmigona subviridus*	FSC
Diana fritillary butterfly	*Speyeria diana*	FSC
Vascular Plants		
Fraser fir	*Abies fraseri*	FSC
Mountain bittercress	*Cardamine clematitis*	FSC
Tall larkspur	*Delphinium exaltatum*	FSC
Glade spurge	*Euphorbia purpurea*	FSC**
Bent avens	*Geum geniculatum*	FSC
Spreading avens	*Geum radiatum*	Endangered
Roan Mountain bluet	*Houstonia montana (=Hedyotis purpurea* var. *montana*)	Endangered
Butternut	*Juglans cinerea*	FSC
Heller's blazing star	*Liatris helleri*	Threatened
Gray's lily	*Lilium grayi*	FSC
Bog bluegrass	*Poa paludigena*	FSC*
WAYNE COUNTY		
Vertebrates		
Rafinesque's big-eared bat	*Corynorhinus (=Plecotus) rafinesquii*	FSC*
Southern hognose snake	*Heterodon simus*	FSC*
Red-cockaded woodpecker	*Picoides borealis*	Endangered
Invertebrates		
Atlantic pigtoe	*Fusconaia masoni*	FSC
Vascular Plants		
Pondspice	*Litsea aestivalis*	FSC
WILKES COUNTY		
Vertebrates		
Bog turtle	*Clemmys muhlenbergii*	T(S/A)[1]
Cerulean warbler	*Dendroica cerulea*	FSC

North Carolina Wildlife Resources Commission

Charles R. Fullwood, Executive Director

TO: Derrick Weaver
Project Development Engineer, NCDOT

FROM: David Cox, Highway Project Coordinator
Habitat Conservation Program

DATE: March 18, 2002

SUBJECT: NCDOT Bridge Replacements in Hyde, Nash, Pasquotank, and Wayne counties of North Carolina. TIP Nos. B-3858, B-3681, B-4222, and B-4320.

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).

On bridge replacement projects of this scope our standard recommendations are as follows:

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

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

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

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

5. If temporary access roads or detours are constructed, they should be removed back to original ground elevations immediately upon the completion of the project. Disturbed areas should be seeded or mulched to stabilize the soil and native tree species should be planted with a spacing of not more than 10'x10'. If possible, when using temporary structures the area should be cleared but not grubbed. Clearing the area with chain

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

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. Tim Savidge 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 fish passage. Generally, this means that the culvert or pipe invert is buried at least 1 foot below the natural stream bed. If multiple cells are required the second and/or third cells should be placed so that their bottoms are at stream bankful stage (similar to Lyonsfield design). This could be

accomplished by constructing a low sill on the upstream end of the other cells that will divert low flows to another cell. This will allow sufficient water depth in the culvert or pipe during normal flows to accommodate fish movements. If culverts are long, notched baffles should be placed in reinforced concrete box culverts at 15 foot intervals to allow for the collection of sediments in the culvert, to reduce flow velocities, and to provide resting places for fish and other aquatic organisms moving through the structure.

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 so that no channel realignment or widening is required. Widening of the stream channel at the inlet or outlet of structures usually causes a decrease in water velocity causing sediment deposition that will require future maintenance.

4. Riprap should not be placed on the stream bed.

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 that is reclaimed was previously wetlands, NCDOT should restore the area to wetlands. If successful, the site may be used as wetland mitigation for the subject project or other projects in the watershed.

Project specific comments:

1. B-3858 – Hyde County – Bridge No. 6 on SR 1110 over Lake Landing Canal (Grays Ditch). Due to the potential for anadromous fish at this location, NCDOT should closely follow the "Stream Crossing Guidelines for Anadromous Fish Passage". This includes an in-water work moratorium from February 15 to June 15. We are not aware of any threatened of endangered species in the project vicinity. Standard comments apply.

2. B-3681 – Nash County – Bridge No. 277 on SR 1555 over CSX Railroad. No Comment.

3. B-4222 – Pasquotank County – Bridge No. 24 on SR 1140 over Halls Creek. Due to the potential for anadromous fish at this location, NCDOT should closely follow the "Stream Crossing Guidelines for Anadromous Fish Passage". This includes an in-water work moratorium from February 15 to June 15. We are not aware of any threatened of endangered species in the project vicinity. Standard comments apply.

4. B-4320 – Wayne County – Bridge No. 24 on NC 403 over the Northeast Cape Fear River. Due to the potential for anadromous fish at this location, NCDOT should closely follow the "Stream Crossing Guidelines for Anadromous Fish Passage". This includes an in-water work moratorium from February 15 to June 15. We are not aware of any threatened of endangered species in the project vicinity. Standard comments apply.

We request that NCDOT routinely minimize adverse impacts to fish and wildlife resources in the vicinity of bridge replacements. The 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, reducing habitat fragmentation and vehicle related mortality at highway crossings.

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.

State of North Carolina
Department of Environment
and Natural Resources
Division of Water Quality

Michael F. Easley, Governor
William G. Ross, Jr., Secretary
Kerr T. Stevens, Director

July 13, 2001

MEMORANDUM

To: William D. Gilmore, P.E., Manager, NCDOT, Project Development & Environmental Analysis

From: John E. Hennessy, NC Division of Water Quality

Subject: Scoping comments on the proposed replacement of Bridge No. 24 on NC 403 over the Northeast Cape Fear River in Wayne County, TIP B-~~4014~~ 4370, State Project No. 8.211702.

Reference your correspondence dated June 21, 2001, in which you requested scoping comments for the referenced project. Preliminary analysis of the project reveals that the proposed bridge will span the Northeast Cape Fear River in the Cape Fear River Basin. The DWQ index number for the stream is 18-74-(1) and the stream is classified as Class C SW waters. The Division of Water Quality requests that NCDOT consider the following environmental issues for the proposed project:

A. The document should provide a detailed and itemized presentation of the proposed impacts to wetlands and streams with corresponding mapping.

B. For any proposed stream relocation (and any other stream relocation) will have to be approved by the NCDWQ as part of the 401 Water Quality Certification review. In addition, the relocated stream will need to be designed and constructed using natural channel design techniques.

C. There should be a discussion on mitigation plans for unavoidable impacts. If mitigation is required, it is preferable to present a conceptual (if not finalized) mitigation plan with the environmental documentation. While the NCDWQ realizes that this may not always be practical, it should be noted that for projects requiring mitigation, appropriate mitigation plans will be required prior to issuance of a 401 Water Quality Certification.

D. Review of the project reveals that no Outstanding Resource Waters, Water Supply Water, High Quality Waters, or Trout Waters will be impacted during the project implementation. However, should further analysis reveal the presence of any of the aforementioned waters, the DWQ requests that DOT strictly adhere to North Carolina regulations entitled "Design Standards in Sensitive Watersheds" (15A NCAC 04B .0024) throughout design and construction of the project. This would apply for any area that drains to streams having WS (Water Supply), ORW (Outstanding Resource Water), HQW (High Quality Water), SA (Shellfish Water) or Tr (Trout Water) classifications.

E When practical, the DWQ requests that bridges be replaced on the existing location with road closure. If a detour proves necessary, remediation measures in accordance with the NCDWQ requirements for General 401 Certification 2726/Nationwide Permit No. 33 (Temporary Construction, Access and Dewatering) must be followed.

F. Review of the project reveals that no High Quality Waters or Water Supply Waters will be impacted by the project. However, should further analysis reveal the presence of any of the aforementioned water resources, the DWQ requests that hazardous spill catch basins be installed at any bridge crossing a stream classified as HQW or WS (Water Supply). The number of catch basins installed should be determined by the design of the bridge, so that runoff would enter said basin(s) rather than flowing directly into the stream.

G. If applicable, DOT should not install the bridge bents in the creek, to the maximum extent practicable.

H. Wetland and stream impacts should be avoided (including sediment and erosion control structures/measures) to the maximum extent practical. If this is not possible, alternatives that minimize wetland impacts should be chosen. Mitigation for unavoidable impacts will be required by DWQ for impacts to wetlands in excess of one acre and/or to streams in excess of 150 linear feet.

I. Borrow/waste areas should not be located in wetlands. It is likely that compensatory mitigation will be required if wetlands are impacted by waste or borrow.

J. DWQ prefers replacement of bridges with bridges. However, if the new structure is to be a culvert, it should be countersunk to allow unimpeded fish and other aquatic organisms passage through the crossing.

K. If foundation test borings are necessary; it should be noted in the document. Geotechnical work is approved under General 401 Certification Number 3027/Nationwide Permit No. 6 for Survey Activities.

L. In accordance with the NCDWQ Wetlands Rules {15A NCAC 2H.0506(b)(6)}, mitigation will be required for impacts of greater than 150 linear feet to any single perennial stream. In the event that mitigation becomes required, the mitigation plan should be designed to replace appropriate lost functions and values. In accordance with the NCDWQ Wetlands Rules {15A NCAC 2H.0506 (h)(3)}, the Wetland Restoration Program may be available for use as stream mitigation.

M. Sediment and erosion control measures should not be placed in wetlands.

N. The 401 Water Quality Certification application will need to specifically address the proposed methods for stormwater management. More specifically, stormwater should not be permitted to discharge directly into the creek. Instead, stormwater should be designed to drain to a properly designed stormwater detention facility/apparatus.

O. While the use of National Wetland Inventory (NWI) maps and soil surveys is a useful office tool, their inherent inaccuracies require that qualified personnel perform onsite wetland delineations prior to permit approval.

Thank you for requesting our input at this time. The DOT is reminded that issuance of a 401 Water Quality Certification requires that appropriate measures be instituted to ensure that water quality standards are met and designated uses are not degraded or lost. If you have any questions or require additional information, please contact John Hennessy at (919) 733-5694.

cc: Mike Bell, Corps of Engineers Washington Field Office
Tom McCartney, USFWS
David Cox, NCWRC
Personal Files
File Copy

C:\ncdot\TIP B-4823\comments\B-4823 scoping comments.doc

4320 4320

Theresa Ellerby

North Carolina Department of Cultural Resources
State Historic Preservation Office
David L. S. Brook, Administrator

Michael F. Easley, Governor
Lisbeth C. Evans, Secretary

Division of Archives and History
Jeffrey J. Crow, Director

August 6, 2001

MEMORANDUM

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

From: David Brook RWG for David Brook
Deputy State Historic Preservation Officer

Re: Replace Bridge No. 24 on NC 403 over northeast Cape Fear River, BRSTP-403(3), 8.1331881, B-4320, Wayne County, ER 01-10084

Thank you for your memorandum of June 21, 2001, concerning the above project.

We have conducted a review of the project and are aware of no properties of architectural, historic, or archaeological significance, which would be affected by the project. Therefore, we have no comment on the project as currently proposed.

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.

DB:kgc

cc: Mary Pope Furr, NCDOT
T. Padgett, NCDOT

Federal Aid # BRSTP-403(3) *TIP* # B-4320 *County*: Wayne

CONCURRENCE FORM FOR PROPERTIES NOT ELIGIBLE FOR THE NATIONAL REGISTER OF HISTORIC PLACES

Project Description: Replace Bridge No. 24 on NC 403 over Northeast Cape Fear River

On ~~8/29/2001,~~ 8/30/2001 representatives of the

- [x] North Carolina Department of Transportation (NCDOT)
- [ ] Federal Highway Administration (FHWA)
- [x] North Carolina State Historic Preservation Office (HPO)
- [ ] Other

Reviewed the subject project at

- [ ] Scoping meeting
- [x] Historic architectural resources photograph review session/consultation
- [ ] Other

All parties present agreed

- [ ] There are no properties over fifty years old within the project's area of potential effects.
- [x] There are no properties less than fifty years old which are considered to meet Criteria Consideration G within the project's area of potential effects.
- [x] There are properties over fifty years old within the project's Area of Potential Effects (APE), but based on the historical information available and the photographs of each property, the properties identified as Bridge #24 are considered not eligible for the National Register and no further evaluation of them is necessary.
- [x] There are no National Register-listed or Study Listed properties within the project's area of potential effects.
- [x] All properties greater than 50 years of age located in the APE have been considered at this consultation, and based upon the above concurrence, all compliance for historic architecture with Section 106 of the National Historic Preservation Act and GS 121-12(a) has been completed for this project.
- [ ] There are no historic properties affected by this project. (*Attach any notes or documents as needed*)

Signed:

Representative, NCDOT — Date 8/30/01

FHWA, for the Division Administrator, or other Federal Agency — Date 9/7/01

Representative, HPO — Date 8/30/01

State Historic Preservation Officer — Date 8/30/01

If a survey report is prepared, a final copy of this form and the attached list will be included.