STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

MICHAEL F. EASLEY
GOVERNOR

LYNDO TIPPETT
SECRETARY

August 1, 2007

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

ATTENTION: Mr. Richard Spencer
NCDOT Coordinator, Division 8

Dear Sir:

SUBJECT: **Application for Section 404 Nationwide Permit 23.** Replacement of Bridge No. 257 on SR 2824 (Pinehill Rd.) over Vestal Creek, Randolph County, North Carolina. Federal Aid Project No. BRZ-2824(4), State Project No. 8.2573901, WBS Element 33588.1.1, TIP No. B-4245.

Please see the enclosed Programmatic Categorical Exclusion (PCE), Natural Resources Technical Report (NRTR), permit drawings, and design plans for the subject project. The North Carolina Department of Transportation (NCDOT) proposes to replace Bridge No. 257 on SR 2824 (Pinehill Rd.) over Vestal Creek (throughout the documents, the stream has been referred to as Richland Creek). Vestal Creek flows into Richland Creek south of the project area in Randolph County. The existing 53-foot 3-span bridge was constructed in 1952 and received a sufficiency rating of 18.5 out of a possible 100 for a new structure. Based on this rating, the bridge is considered functionally obsolete and structurally deficient. The project proposes to demolish the existing bridge and replace with a three span, pre-stressed concrete girder structure. An off-site traffic detour will be utilized. The new bridge will be approximately 94 feet long with 33 feet of roadway width. The new alignment of the bridge will be east of and parallel to the existing location, and will span Vestal Creek.

IMPACTS TO WATERS OF THE UNITED STATES

General Description: The project is located in sub basin 03-06-09 of the Cape Fear River Basin in Randolph County. This area is part of Hydrologic Cataloging Unit 03030003. The project area is located within the Central Piedmont ecoregion of North Carolina.

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

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

FAX: 919-715-5501

WEBSITE: WWW.NCDOT.ORG

LOCATION:
2728 CAPITAL BLVD. SUITE 240
RALEIGH NC 27604

Vestal Creek is the only stream located within the project study area and has been assigned Stream Index Number 17-44-4 by the North Carolina Division of Water Quality (DWQ). The stream enters the study area as a well-defined perennial stream. Vestal Creek is described as having moderate flow, with a substrate consisting of gravel, cobble, and boulders, and flowing southeastward towards Richland Creek and eventually into the Deep River. Upstream from SR 2824 (Pine Hill Rd.), Vestal Creek is split into two channels, the southernmost ranges between 2 and 6 feet wide, while the northernmost channel is between 8 and 10 feet wide. Cattle have caused severe erosion to the banks in this stretch of the stream. Because of the eroding banks, trees have fallen over the stream. Heavy scouring is present along the outside of the meander bends and large alluvial deposits are present on the inside of the bends. Below Bridge No. 257, Vestal Creek ranges between 8 and 10 feet wide, with sloping banks generally 2.5 - 4.0 feet high. Downstream of the bridge, the channel is not so heavily eroded, however sedimentation is heavy and water clarity is poor. The stretch of stream in the project study area has been assigned a Best Usage Classification of **C**. There are no wetlands associated with this bridge replacement project.

No portion of Vestal Creek, its tributaries, or other surface waters within 1.0 mile of the project are listed on the North Carolina Division of Water Quality's (NCDWQ) 2006 Final 303(d) List of Impaired Waters.

Neither High Quality Waters (HQW), Water Supplies (WS-I or WS-II), nor Outstanding Resource Waters (ORW) occur within 1.0 mile of the project area.

Permanent Impacts: There will be 10 linear feet of permanent impacts to Vestal Creek associated with the construction of a lateral v-ditch during this project. The ditch will be built and tied into the northeastern bank of Vestal Creek, rip-rap will be placed in the channel. The new bridge will span the creek avoiding any additional impacts to the stream.

Temporary Impacts: There are no anticipated temporary impacts to surface waters or wetlands associated with this project.

Bridge Demolition: The existing structure has a reinforced timber deck on timber piles. The existing bridge will be removed without dropping components into Vestal Creek. There are no existing bents in Vestal Creek. All guidelines for Bridge Demolition and Removal will be followed in addition to Best Management Practices for the Protection of Surface Waters.

Utility Impacts: There are no anticipated utility impacts associated with this project.

FEDERALLY PROTECTED SPECIES

Plants and animals with federal classifications of Endangered (E), Threatened (T), Proposed Endangered (PE), and Proposed Threatened (PT) are protected under provisions of Section 7 and Section 9 of the Endangered Species Act of 1973, as amended. The United States Fish and Wildlife Service (USFWS) lists two Federally Protected species, as of May 10, 2007, for Randolph County. Table 1 lists the species and their federal status.

Table 1. Federally Protected Species in Randolph County, NC

Common Name	Scientific Name	Federal Status	Biological Conclusion	Habitat Present
Cape Fear shiner	*Notropis mekistocholas*	E	No Effect	No
Schweinitz's sunflower	*Helianthus schweinitzii*	E	No Effect	Yes

A Cape Fear shiner survey was conducted for this project on July 11, 2002 by NCDOT biologists Neil Medlin, John Alderman, and Heather Montague and NC Wildlife Resources Commission biologist Brian Watson to determine if the Cape Fear shiner was present in this section of the stream. The survey was conducted by pulling a seine through the water above and below the current bridge. Given the results of the survey, distance of the project location from the area of Richland Creek considered to be occupied, instream habitat degradation downstream of the crossing, and no Cape Fear shiners being documented during an investigation approximately two miles downstream, it can be concluded that this project will not effect the Cape Fear shiner.

A Biological Conclusion of "No Effect" was issued for Schweinitz's sunflower. A survey for Schweinitz's sunflower was conducted by NCDOT biologists, Jim Mason and Erica McLamb on September 27, 2006. The survey took a total of 1.5 man-hours to complete and resulted in 100 percent coverage. Potential habitat did exist within the study area; however, no individuals were observed during the survey. A Natural Heritage Program database search in March of 2007 revealed no populations of this species within one mile of the project area. It can be concluded that this project will not effect this species.

AVOIDANCE, MINIMIZATION and MITIGATION

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

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

Avoidance/Minimization: Avoidance examines all appropriate and practicable possibilities of averting impacts to "Waters of the US". The NCDOT is committed to incorporating all reasonable and practicable design features to avoid and minimize jurisdictional impacts and to minimize impacts as part of the project design.

- Temporary construction impacts due to erosion and sedimentation will be minimized through implementation of stringent erosion control methods and use of Best Management Practices (BMPs).

- Best Management Practices for Protection of Surface Waters and Bridge Demolition and Removal will be implemented during the entirety of this project.
- During construction, traffic will utilize an off-site detour.
- No bents will be placed in Vestal Creek.

Compensatory Mitigation: No mitigation is proposed for this bridge replacement project due to the minimal amount of impacts.

SCHEDULE

The project calls for a let date of February 19, 2008 and a review date of January 1, 2008. This project has a date of availability of April 2, 2008. It is expected that the contractor will begin construction shortly after that date.

REGULATORY APPROVALS

Section 404 Permit: It is anticipated that the permanent impacts to surface waters from tying in a lateral v-ditch to Vestal Creek will be authorized under a Section 404 Nationwide Permit 23. We are therefore requesting the issuance of a Nationwide Permit 23 for the anticipated impacts sustained during the construction.

Section 401 Permit: We anticipate Section 401 General Water Quality Certification (WQC) 3632 will be applicable to this project. All general conditions of this WQC will be met. Therefore, written concurrence from the NCDWQ is not required. In accordance with 15A NCAC 2H .0500 and 15A NCAC 2B .0200 we are providing two copies of this application to the North Carolina Department of Environment and Natural Resources, Division of Water Quality, as notification.

A copy of this permit application will be posted on the NCDOT website at: http://www.ncdot.org/doh/preconstruct/pe/neu/permit.html. If you have any questions or need additional information, please contact Ashley Cox at 919-715-5534 or acox@dot.state.nc.us.

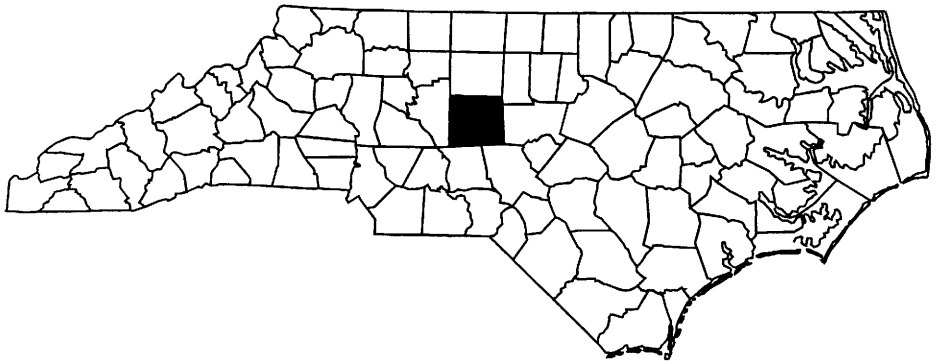
Sincerely,

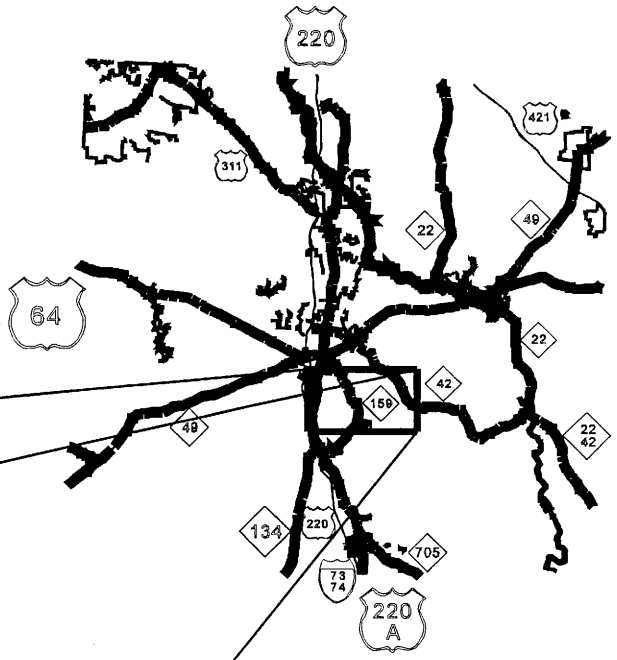
E. L. Lusk

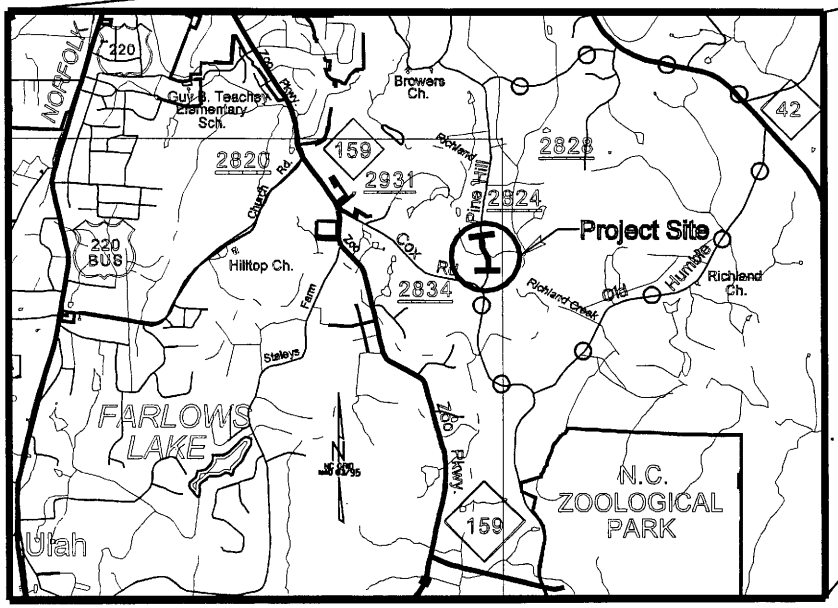
for Gregory J. Thorpe, Ph.D.
Environmental Management Director, PDEA

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

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







WETLAND PERMIT

N. C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RANDOLPH COUNTY
PROJECT 33588.3.1 (B-4245)

BRIDGE NO. 257
OVER RICHLAND CREEK ON SR-2824

MARCH 22, 2007
Permit Drawing
Sheet 1 of 6

WETLAND PERMIT IMPACT SUMMARY

Site No.	Station (From/To)	Structure Size / Type	WETLAND IMPACTS: Permanent Fill In Wetlands (ac)	WETLAND IMPACTS: Temp. Fill In Wetlands (ac)	WETLAND IMPACTS: Excavation in Wetlands (ac)	WETLAND IMPACTS: Mechanized Clearing in Wetlands (ac)	WETLAND IMPACTS: Hand Clearing in Wetlands (ac)	SURFACE WATER IMPACTS: Permanent SW impacts (ac)	SURFACE WATER IMPACTS: Temp. SW impacts (ac)	SURFACE WATER IMPACTS: Existing Channel Impacts Permanent (ft)	SURFACE WATER IMPACTS: Natural Stream Design (ft)
1	-L- 16 + 55 to 17+42	BRIDGE, Single Span L=94' 39" BOX BEAM								10	
TOTALS:										10	

NC DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

RANDOLPH COUNTY
WBS - 33588.3.1 (B-4245)

SHEET 2 of 6 6/19/2007

JMD Revised 2/03/05

Property Owners

Parcel Number	Names	Addresses
1	Edwin Buckner	**3138 Old NC HWY 13 Asheboro, NC 27205**
2	Neil Branson	**1913 Brook Drive Asheboro, NC 27205**
3 & 4	James Sides	**1587 Pine Hill Road Asheboro, NC 27205**

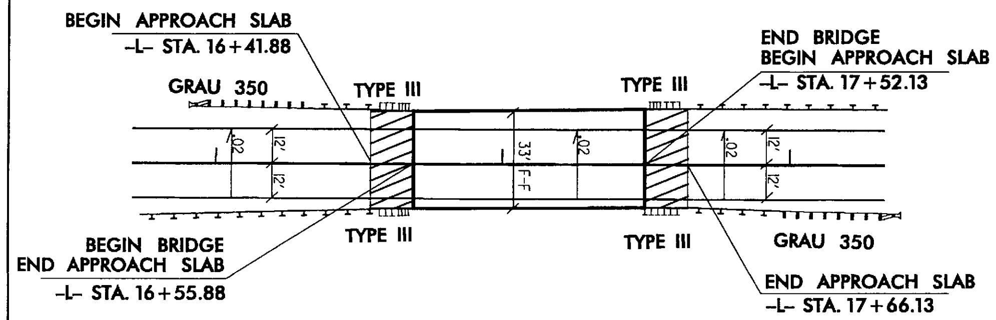
NC DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

RANDOLPH COUNTY
WBS - 33588.3.1 (B-4245)

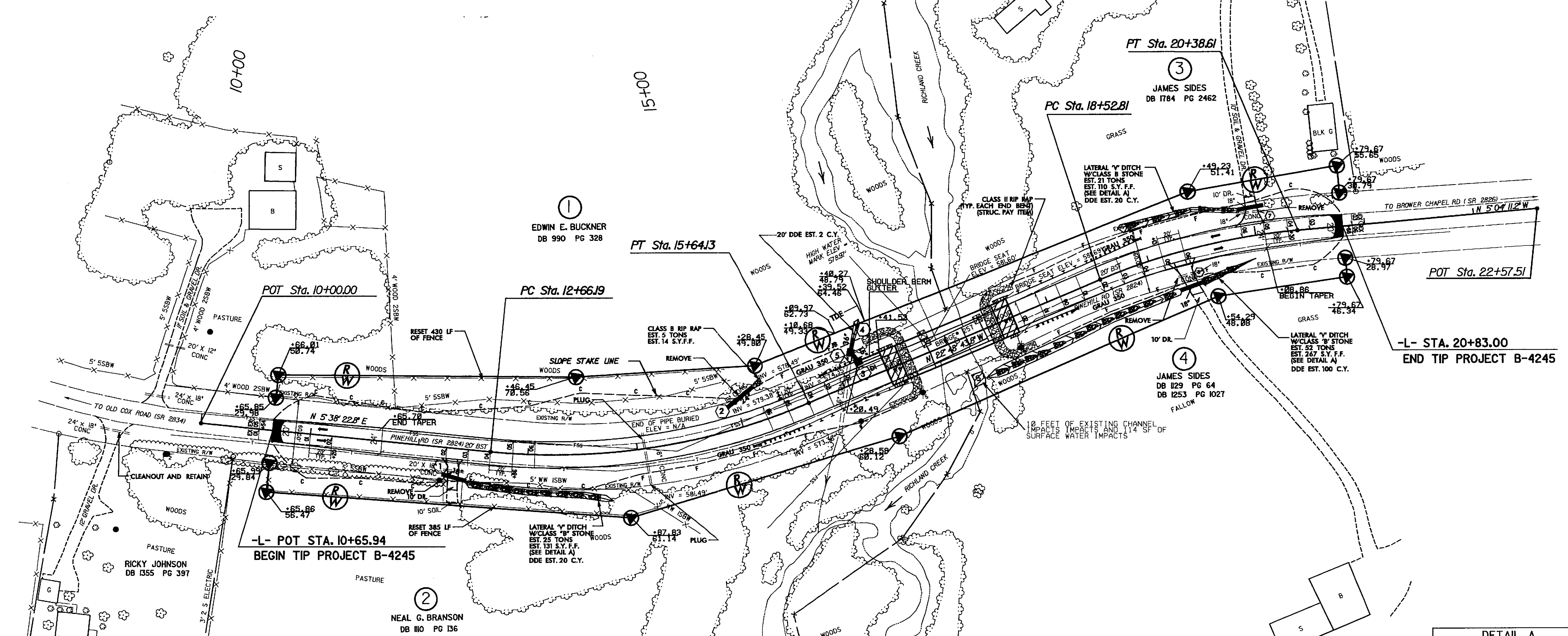
SHEET 3 OF 6 4/20/2007

PROJECT REFERENCE NO.	SHEET NO.
B-4245	4
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 15424 ENGINEER ALLISON C. JOHNSON	NORTH CAROLINA PROFESSIONAL SEAL 21656 ENGINEER ROGER E. WEADON

Permit Drawing Sheet 4 of 6



SKETCH SHOWING BRIDGE/PAVEMENT RELATIONSHIP

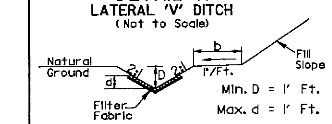


NAD 83
10+00
15+00
20+00
EDWIN E. BUCKNER
DB 990 PG 328
NEAL G. BRANSON
DB 1110 PG 136
RICKY JOHNSON
DB 1355 PG 397
JAMES SIDES
DB 1784 PG 2462
JAMES SIDES
DB 1129 PG 64
DB 1253 PG 1027
POT Sta. 10+00.00
PC Sta. 12+66.19
PT Sta. 15+64.13
PC Sta. 18+52.81
PT Sta. 20+38.61
POT Sta. 22+57.51
-L- POT STA. 10+65.94
BEGIN TIP PROJECT B-4245
-L- STA. 20+83.00
END TIP PROJECT B-4245
RICHLAND CREEK
TO OLD COX ROAD (SR 2834)
TO BROWER CHAPEL RD (SR 2826)
PINEHILL RD (SR 2824)
N 5°38' 22.8" E
N 5°04' 11.2" W
SLOPE STAKE LINE
RESET 430 LF OF FENCE
RESET 385 LF OF FENCE
CLEANOUT AND RETAIN
PASTURE
WOODS
GRASS
FALLOW
10 FEET OF EXISTING CHANNEL IMPACTS AND 114 SF OF SURFACE WATER IMPACTS

NOTE: ALL DRIVEWAYS ARE 16' MINIMUM UNLESS NOTED OTHERWISE ON THE PLANS

- L -	
PI Sta 14+18.30	PI Sta 19+46.46
Δ = 28° 27' 06.2" (LT)	Δ = 17° 44' 32.6" (RT)
D = 9° 32' 57.5"	D = 9° 32' 57.5"
L = 297.95'	L = 185.80'
T = 152.11'	T = 93.65'
R = 600.00'	R = 600.00'
SE = .06	SE = .06
V_{DES} = 40 MPH	V_{DES} = 40 MPH

DETAIL A
LATERAL 'V' DITCH
(Not to Scale)



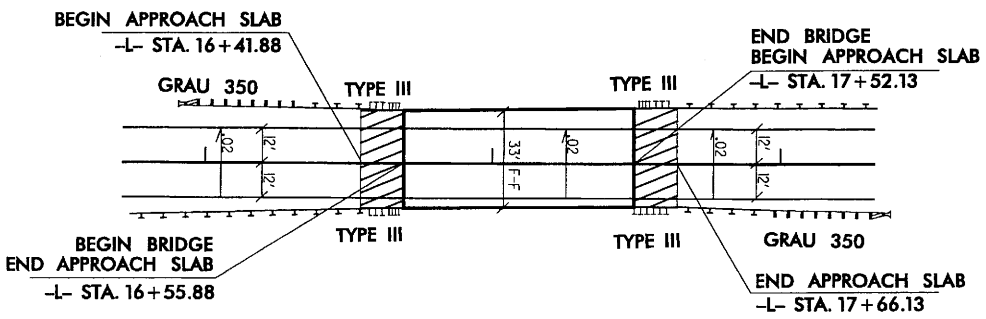
Type of Liner = CLASS 'B' STONE

-L STA 12+50 TO 13+75 RT
-L STA 17+26 TO 20+00 RT
-L STA 18+85 TO 19+90 LT

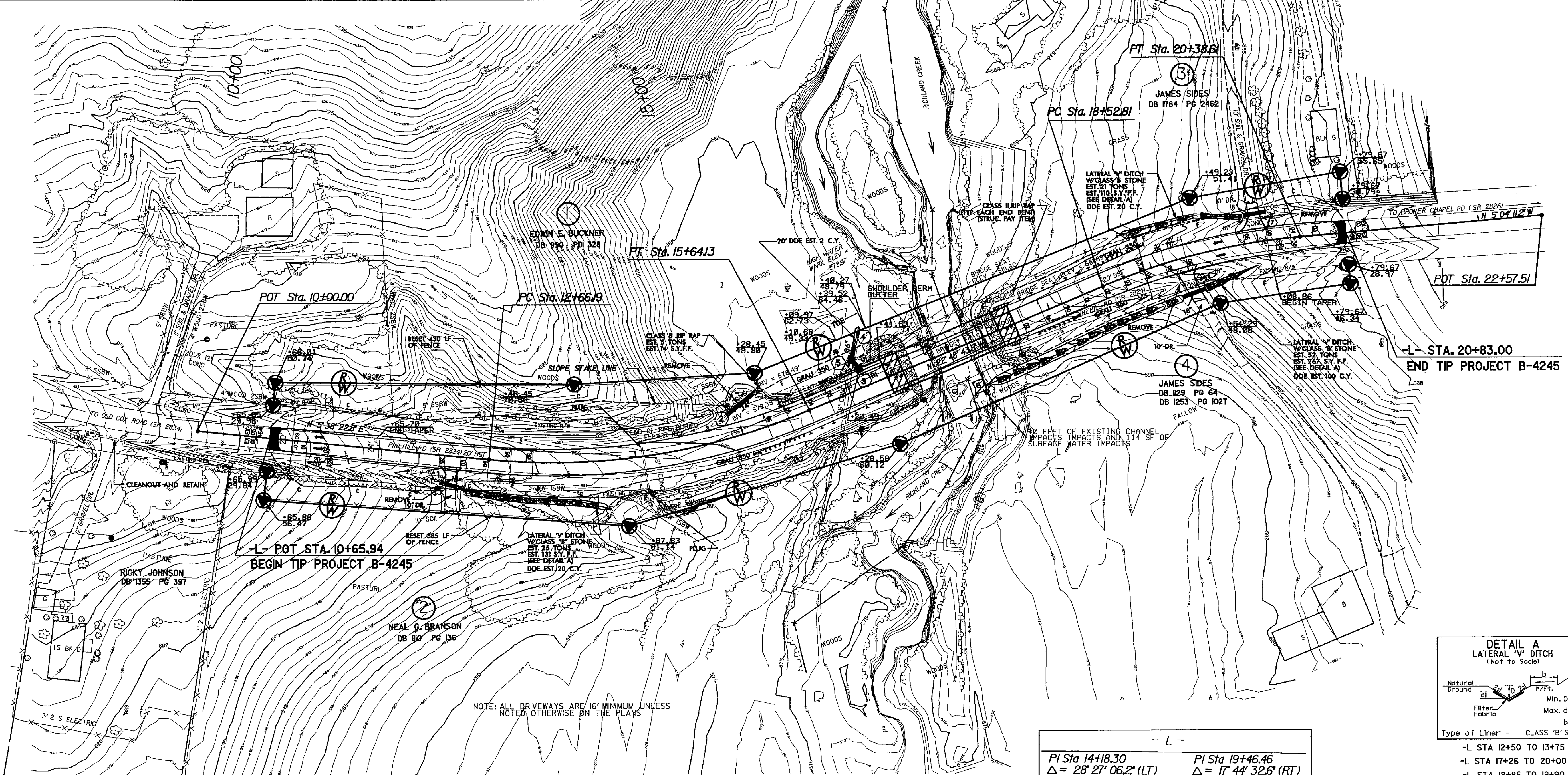
FOR -L- PROFILE SEE SHEET 5
FOR STRUCTURE SEE SHEET S1

PROJECT REFERENCE NO.	SHEET NO.
B-4245	4
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 15424 ENGINEER ALLISON C. JOHNSON	NORTH CAROLINA PROFESSIONAL SEAL 21656 ENGINEER ROGER S. WEADON

Permit Drawing
Sheet 5 of 6



SKETCH SHOWING BRIDGE/PAVEMENT RELATIONSHIP



- L -	
PI Sta 14+18.30	PI Sta 19+46.46
Δ = 28° 27' 06.2" (LT)	Δ = 17° 44' 32.6" (RT)
D = 9° 32' 57.5"	D = 9° 32' 57.5"
L = 297.95'	L = 185.80'
T = 152.11'	T = 93.65'
R = 600.00'	R = 600.00'
SE = .06	SE = .06
VDES = 40 MPH	VDES = 40 MPH

DETAIL A
LATERAL 'V' DITCH
(Not to Scale)

Natural Ground; Fill Slope; Filter Fabric; d; b

Min. D = 1' Ft.
Max. d = 1' Ft.
b = 2' Ft.
Type of Liner = CLASS 'B' STONE

-L STA 12+50 TO 13+75 RT
-L STA 17+26 TO 20+00 RT
-L STA 18+85 TO 19+90 LT

FOR -L- PROFILE SEE SHEET 5
FOR STRUCTURE SEE SHEET S1

REVISIONS

8/17/99

5/14/99

PROJECT REFERENCE NO.	SHEET NO.
B-4245	5

ROADWAY DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 15424 ENGINEER ALLISON C JOHNSON

HYDRAULICS ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 21656 ENGINEER LOGAN E WEAVER

Permit Drawing
Sheet 6 of 6

BRIDGE HYDRAULIC DATA	
DESIGN DISCHARGE	= 1600 CFS
DESIGN FREQUENCY	= 25 YRS
DESIGN HW ELEVATION	= 579.2 FT
BASE DISCHARGE	= 2400 CFS
BASE FREQUENCY	= 100 YRS
BASE HW ELEVATION	= 580.4 FT
OVERTOPPING DISCHARGE	= 7000 CFS
OVERTOPPING FREQUENCY	= 500+ YRS
OVERTOPPING ELEVATION	= 585.2 FT

-L- PINEHILL ROAD (SR 2824)

PI = 11+17.99
EL = 600.20'

BEGIN GRADE
-L- STA. 10+65.94
EL = 603.26

PI = 14+00.00
EL = 582.38
K = 65
VC = 500'
V_{DES} = 40 MPH

LOW POINT
STA. 15+59.00
EL. 585.24

BEGIN BRIDGE
-L- STA 16+55.88

END BRIDGE
-L- STA 17+52.13

PI = 19+03.00
EL = 589.42
K = 49
VC = 270'
V_{DES} = 35 MPH

PI =20+70.28
EL = 600.94'

END GRADE
-L- STA. 20+83.00
EL = 601.77

EXISTING GROUND
PROPOSED GRADE
EXIST. BRIDGE
1.5:1 SLOPE (TYP)
3.5' TYP.

BM #1
-BL- STA. 3+93
3' RIGHT
ELEV. 618.48'

BM #2
-BL- STA. 18+01
44' LEFT
ELEV. 620.68'

FOR -L- PLAN VIEW
SEE SHEET 4

610
600
590
580
570

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

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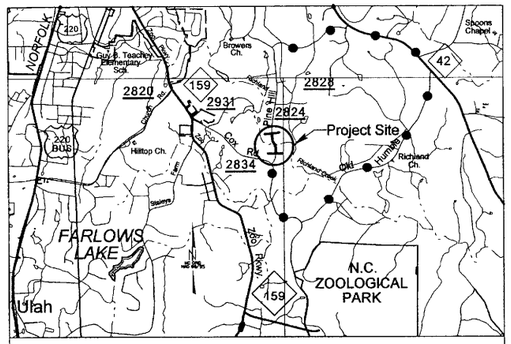
DATE: 08-Nov-05 09:38

09/08/99

TIP PROJECT: B-4245

CONTRACT: C

See Sheet 1-A For Index of Sheets



VICINITY MAP

OFF-SITE DETOUR

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

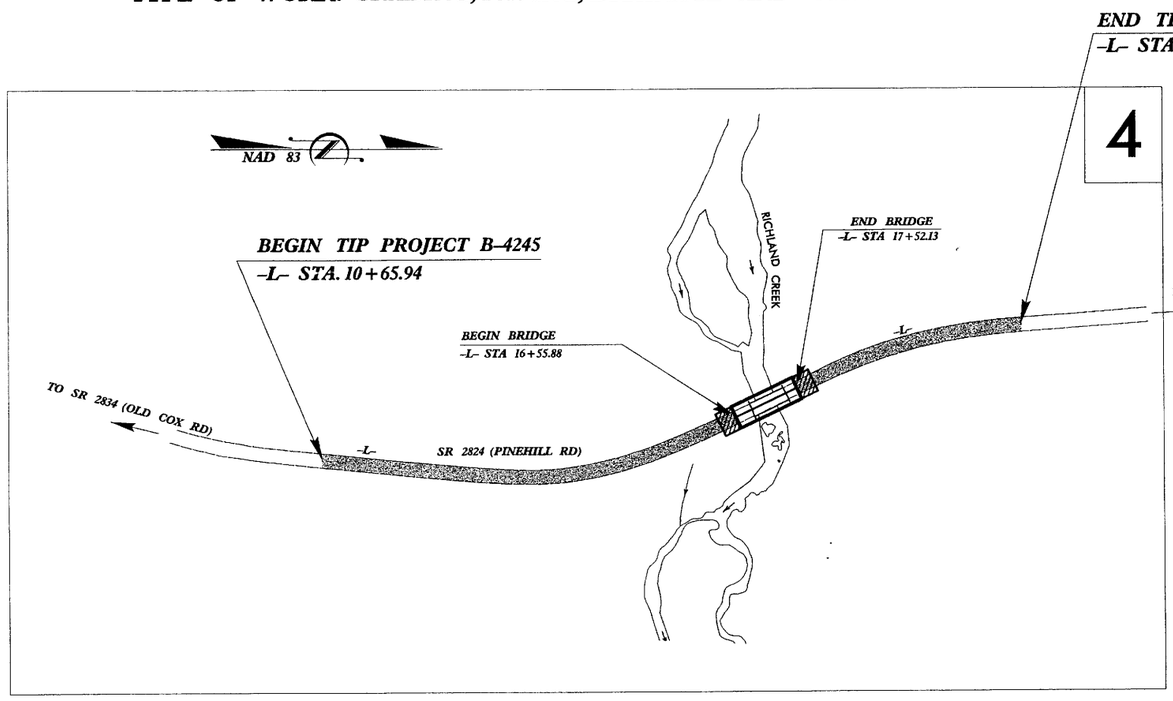
RANDOLPH COUNTY

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-4245	1	

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
33588.1.1	BRZ-2824(4)	P.E.
33588.2.1	BRZ-2824(4)	R/W & UTL.
33588.3.1	BRZ-2824(4)	CONST.

LOCATION: BRIDGE NO. 257 OVER RICHLAND CREEK ON SR 2824 (PINEHILL ROAD)

TYPE OF WORK: GRADING, PAVING, DRAINAGE AND STRUCTURE



NCDOT CONTACT: B.D. TAYLOR, P.E.
ROADWAY DESIGN- ENGINEERING COORDINATION

GRAPHIC SCALES

50 25 0 50 100
PLANS

50 25 0 50 100
PROFILE (HORIZONTAL)

10 5 0 10 20
PROFILE (VERTICAL)

DESIGN DATA

ADT 2007 = 900
ADT 2027 = 1800
DHV = 13 %
D = 2 %
T = 3 % *
V = 40 MPH
* (TTST=1% + DUAL=2%)
FUNC. CLASS= RURAL LOCAL

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT B-4245 = 0.175 MILES

LENGTH STRUCTURE TIP PROJECT B-4245= 0.018 MILES

TOTAL LENGTH OF TIP PROJECT B-4245= 0.193 MILES

PLANS PREPARED FOR NCDOT BY
Gannett Fleming
GANNETT FLEMING, INC.
301 S. McDOWELL STREET, SUITE 914
CHARLOTTE, NORTH CAROLINA 28204
PHONE: 704-375-2438 FAX: 704-332-9361

2006 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE: OCTOBER 26, 2005

LETTING DATE: SEPTEMBER 18, 2007

CHRIS JOHNSON, PE
PROJECT ENGINEER

ANDREA HENDERSON
PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 21656 ENGINEER LOREN E. WELDON
SIGNATURE: *P.E.*

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 15424 ENGINEER ALLISON C. JOHNSON
SIGNATURE: *P.E.*

DIVISION OF HIGHWAYS STATE OF NORTH CAROLINA

P.E.
STATE DESIGN ENGINEER

DEPARTMENT OF TRANSPORTATION FEDERAL HIGHWAY ADMINISTRATION

APPROVED
DIVISION ADMINISTRATOR *DATE*

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DATE: 26-Oct-05 14:12

8/17/99

PROJECT REFERENCE NO.	SHEET NO.
B-4245	1A

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 15424 ENGINEER ALLISON C. JOHNSON

INDEX OF SHEETS

SHEET NUMBER	SHEET
1	TITLE SHEET
1A	INDEX OF SHEETS, GENERAL NOTES, AND LIST OF STANDARD DRAWINGS
1B	CONVENTIONAL SYMBOLS
1C	SURVEY CONTROL
2	PAVEMENT SCHEDULE, TYPICAL SECTIONS, AND WEDGING DETAIL
3	SUMMARY OF QUANTITIES
3A	SUMMARY OF DRAINAGE QUANTITIES
3B	SUMMARY OF GUARDRAIL, EARTHWORK SUMMARY, ASPHALT PAVEMENT REMOVAL SUMARY , AND BREAKING ASPHALT PAVEMENT SUMMARY
4	PLAN SHEET
5	PROFILE SHEET
TCP-1 THRU TCP-	TRAFFIC CONTROL PLANS
PM-1 THRU PM-	PAVEMENT MARKING PLANS
EC-1 THRU EC-	EROSION CONTROL PLANS
U-1 THRU U-	UTILITIES PLANS
X-1 THRU X-7	CROSS-SECTIONS
S-1 THRU S-	STRUCTURE PLANS

GENERAL NOTES:

2006 SPECIFICATIONS
EFFECTIVE: 07-18-06
REVISED:

GRADE LINE:
GRADING AND SURFACING:

THE GRADE LINES SHOWN DENOTE THE FINISHED ELEVATION OF THE PROPOSED SURFACING AT GRADE POINTS SHOWN ON THE TYPICAL SECTIONS. GRADE LINES MAY BE ADJUSTED AT THEIR BEGINNING AND ENDING AND AT STRUCTURES AS DIRECTED BY THE ENGINEER IN ORDER TO SECURE A PROPER TIE-IN.

CLEARING:

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

SUPERELEVATION:

ALL CURVES ON THIS PROJECT SHALL BE SUPERELEVATED IN ACCORDANCE WITH STD. NO. 225.04 USING THE RATE OF SUPERELEVATION AND RUNOFF SHOWN ON THE PLANS. SUPERELEVATION IS TO BE REVOLVED ABOUT THE GRADE POINTS SHOWN ON THE TYPICAL SECTIONS.

SIDE ROADS:

THE CONTRACTOR WILL BE REQUIRED TO DO ALL NECESSARY WORK TO PROVIDE SUITABLE CONNECTIONS WITH ALL ROADS, STREETS, AND DRIVES ENTERING THIS PROJECT. THIS WORK WILL BE PAID FOR AT THE CONTRACT UNIT PRICE FOR THE PARTICULAR ITEMS INVOLVED.

GUARDRAIL:

THE GUARDRAIL LOCATIONS SHOWN ON THE PLANS MAY BE ADJUSTED DURING CONSTRUCTION AS DIRECTED BY THE ENGINEER. THE CONTRACTOR SHOULD CONSULT WITH THE ENGINEER PRIOR TO ORDERING GUARDRAIL MATERIAL.

SUBSURFACE PLANS:

NO SUBSURFACE PLANS ARE AVAILABLE ON THIS PROJECT. THE CONTRACTOR SHOULD MAKE HIS OWN INVESTIGATION AS TO THE SUBSURFACE CONDITIONS.

END BENTS:

THE ENGINEER SHALL CHECK THE STRUCTURE END BENT PLANS, DETAILS, AND CROSS-SECTION PRIOR TO SETTING OF THE SLOPE STAKES FOR THE EMBANKMENT OR EXCAVATION APPROACHING A BRIDGE.

UTILITIES:

UTILITY OWNERS ON THIS PROJECT ARE

RIGHT-OF-WAY MARKERS:

ALL RIGHT-OF-WAY MARKERS ON THIS PROJECT SHALL BE PLACED BY OTHERS.

EFF. 07-18-06

2006 ROADWAY STANDARD DRAWINGS

The following Roadway Standards as appear in "Roadway Standard Drawings" Highway Design Branch - N. C. Department of Transportation - Raleigh, N. C., Dated July 18, 2006 are applicable to this project and by reference hereby are considered a part of these plans:

STD.NO.	TITLE
DIVISION 2 - EARTHWORK	
200.02	Method of Clearing - Method II
225.02	Guide for Grading Subgrade - Secondary and Local
225.04	Method of Obtaining Superelevation - Two Lane Pavement
DIVISION 3 - PIPE CULVERTS	
300.01	Method of Pipe Installation - Method 'A'
310.10	Driveway Pipe Construction
DIVISION 5 - SUBGRADE, BASES AND SHOULDERS	
560.01	Method of Shoulder Construction - High Side of Superelevated Curve - Method I
DIVISION 6 - ASPHALT BASES AND PAVEMENTS	
654.01	Pavement Repairs
DIVISION 8 - INCIDENTALS	
806.01	Concrete Right-of-Way Marker
840.00	Concrete Base Pad for Drainage Structures
840.14	Concrete Drop Inlet - 12" thru 30" Pipe
840.15	Brick Drop Inlet - 12" thru 30" Pipe
840.16	Drop Inlet Frame and Grates - for use with Std. Dwg 840.14 and 840.15
840.25	Anchorage for Frames - Brick or Concrete
840.31	Concrete Junction Box - 12" thru 66" Pipe
840.32	Brick Junction Box - 12" thru 66" Pipe
840.54	Manhole Frame and Cover
840.66	Drainage Structure Steps
840.71	Concrete and Brick Pipe Plug
846.01	Concrete Curb, Gutter and Curb & Gutter
846.04	Drop Inlet Installation in Shoulder Berm Gutter
862.01	Guardrail Placement
862.02	Guardrail Installation
862.03	Structure Anchor Units
866.04	Barbed Wire Fence with Wood Posts (2 - 7 Strands)
876.01	Rip Rap in Channels
876.02	Guide for Rip Rap at Pipe Outlets
876.04	Drainage Ditches with Class 'B' Rip Rap

$$$$SYSTIME$$$$ $$$$JOBNAME$$$$ $$$$FILENAME$$$$

PROJECT REFERENCE NO.	SHEET NO.
B-4245	1B

Note: Not to Scale

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

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

CONVENTIONAL PLAN SHEET SYMBOLS

BOUNDARIES AND PROPERTY:

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

BUILDINGS AND OTHER CULTURE:

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

HYDROLOGY:

- Stream or Body of Water
- Hydro, Pool or Reservoir
- River Basin Buffer — RBB
- Flow Arrow
- Disappearing Stream
- Spring
- Swamp Marsh
- Proposed Lateral, Tail, Head Ditch — FLOW
- False Sump

RAILROADS:

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

RIGHT OF WAY:

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

ROADS AND RELATED FEATURES:

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

VEGETATION:

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

EXISTING STRUCTURES:

MAJOR:

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

MINOR:

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

UTILITIES:

POWER:

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

TELEPHONE:

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

WATER:

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

TV:

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

GAS:

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

SANITARY SEWER:

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

MISCELLANEOUS:

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

6/2/99

PROJECT REFERENCE NO.	SHEET NO.
B-4245	1C
Location and Surveys	

SURVEY CONTROL SHEET B-4245

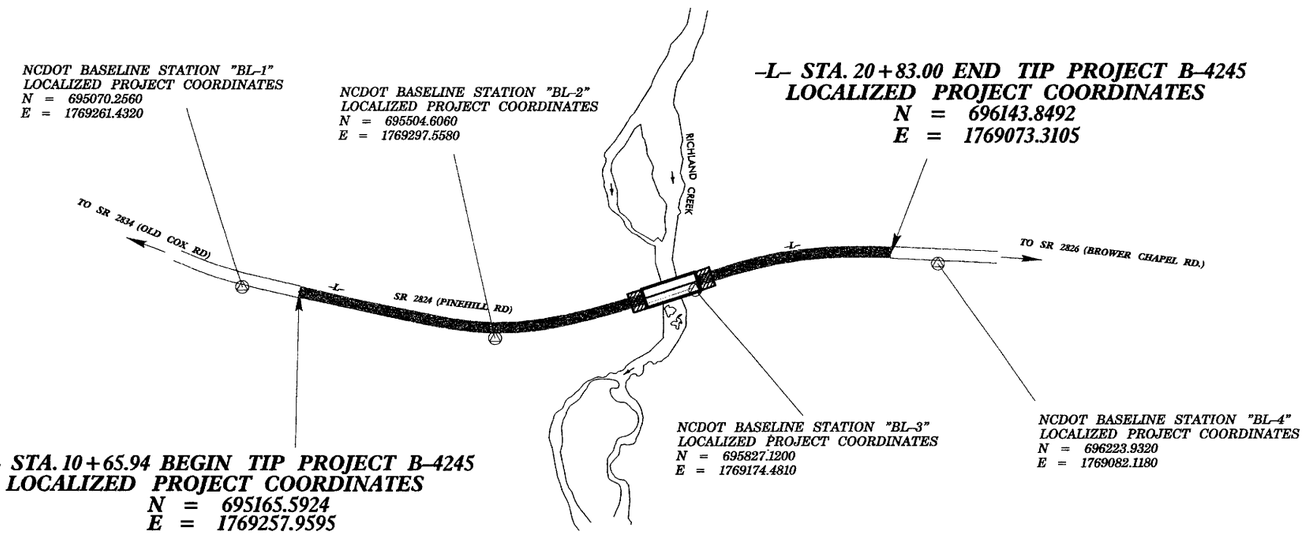
BL

POINT	DESC.	NORTH	EAST	ELEVATION	L STATION	OFFSET
1	BL-1	695878.2560	1769261.4320	689.17	OUTSIDE PROJECT LIMITS	
2	BL-2	695504.6060	1769297.5580	586.71	14+04.14	19.17 RT
3	BL-3	695827.1200	1769174.4810	582.52	17+45.62	12.91 RT
4	BL-4	696223.9320	1769082.1180	685.44	OUTSIDE PROJECT LIMITS	

BM#1 ELEVATION = 618.48
N 694984 E 1769256
L STATION 10+00
S 1° 53' 19.2" E DIST 136.85
RR SPIKE IN BASE OF TELEPHONE POLE
(#A288)

BM#2 ELEVATION = 620.68
N 696324 E 1769014
L STATION 21+03
N 19° 48' 58.3" W DIST 170.13
RR SPIKE IN BASE OF 18" PINE

NAD 83/95



DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCDOT FOR MONUMENT "B4246-1" WITH NAD 83/95 STATE PLANE GRID COORDINATES OF NORTHING: 692905.789(ft) EASTING: 1768903.536(ft)
THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.999873750
THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "B4246-1" TO -L- STATION 10+65.94 IS N 8°54'48.80" E 2287.428'
ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES
VERTICAL DATUM USED IS NAVD 88

NOTES:

1. THE CONTROL DATA FOR THIS PROJECT CAN BE FOUND ELECTRONICALLY BY SELECTING PROJECT CONTROL DATA AT:
   HTTP://WWW.DOH.DOT.STATE.NC.US/PRECONSTRUCT/HIGHWAY/LOCATION/PROJECT/

   THE FILES TO BE FOUND ARE AS FOLLOWS:
   B-4245_LS_CONTROL_051103.TXT

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

© INDICATES GEODETIC CONTROL MONUMENTS USED OR SET FOR HORIZONTAL PROJECT CONTROL BY THE NCDOT LOCATION AND SURVEYS UNIT.
PROJECT CONTROL ESTABLISHED USING GLOBAL POSITIONING SYSTEM.
NETWORK ESTABLISHED FROM EXISTING HARN MONUMENTATION.

NOTE: DRAWING NOT TO SCALE

$$$$SYSTIME$$$$
$$$$DGN$$$$
$$$$FILENAME$$$$

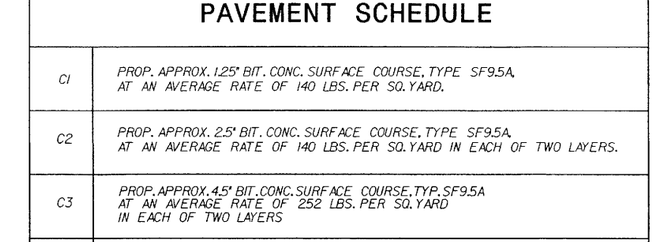
PROJECT REFERENCE NO.	SHEET NO.
B-4245	2
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 15424 ENGINEER ALLISON C. JOHNSON

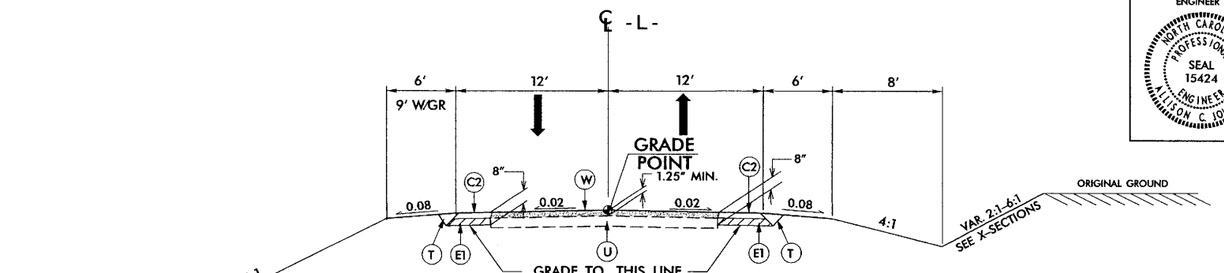
PAVEMENT SCHEDULE

C1	PROP. APPROX. 1.25" BIT. CONC. SURFACE COURSE, TYPE SF9.5A, AT AN AVERAGE RATE OF 140 LBS. PER SQ. YARD.
C2	PROP. APPROX. 2.5" BIT. CONC. SURFACE COURSE, TYPE SF9.5A, AT AN AVERAGE RATE OF 140 LBS. PER SQ. YARD IN EACH OF TWO LAYERS.
C3	PROP. APPROX. 4.5" BIT. CONC. SURFACE COURSE, TYP. SF9.5A AT AN AVERAGE RATE OF 252 LBS. PER SQ. YARD IN EACH OF TWO LAYERS
C4	PROP. VARIABLE DEPTH ASPHALT CONC. SURFACE COURSE, TYPE SF9.5A, AT AN AVERAGE RATE OF 112 LBS. PER SQ. YARD PER 1" DEPTH, TO BE PLACED IN LAYERS NOT TO EXCEED 1.5" IN DEPTH.
E1	PROP. APPROX. 5.5" BIT. CONC. BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 627 LBS. PER SQ. YARD IN ONE LAYER.
E2	PROP. VARIABLE DEPTH ASPHALT CONC. BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YARD PER 1" DEPTH, TO BE PLACED IN LAYERS NOT LESS THAN 3" IN DEPTH OR GREATER THAN 5.5" IN DEPTH.
T	EARTH MATERIAL
U	EXISTING PAVEMENT
W	WEDGING (SEE DETAIL THIS SHEET)

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



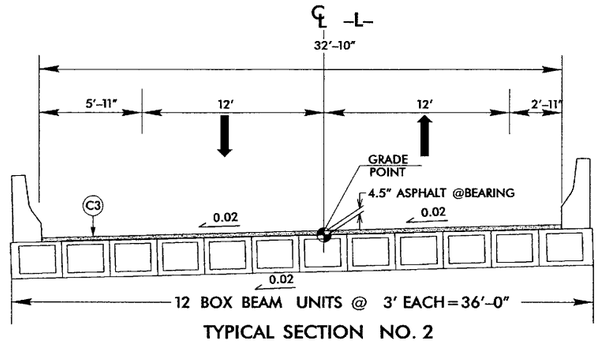
DETAIL SHOWING METHOD OF WEDGING (W)



TYPICAL SECTION NO.1

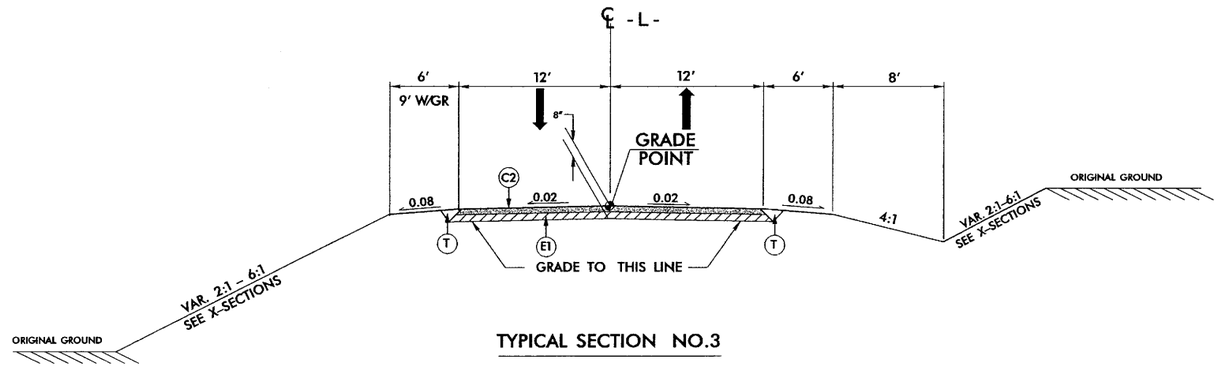
-L- STA. 10+65.94 TO STA. 14+22.95
-L- STA. 19+61.97 TO STA. 20+83.00

NOTE: SEE PLAN FOR SUPER ELEVATION RATES AND TRANSITIONS



TYPICAL SECTION NO. 2

STRUCTURE



TYPICAL SECTION NO.3

-L- STA. 14+22.95 TO STA. 16+41.88
-L- STA. 17+66.13 TO STA. 19+61.97

NOTE: SEE PLAN FOR SUPER ELEVATION RATES AND TRANSITIONS

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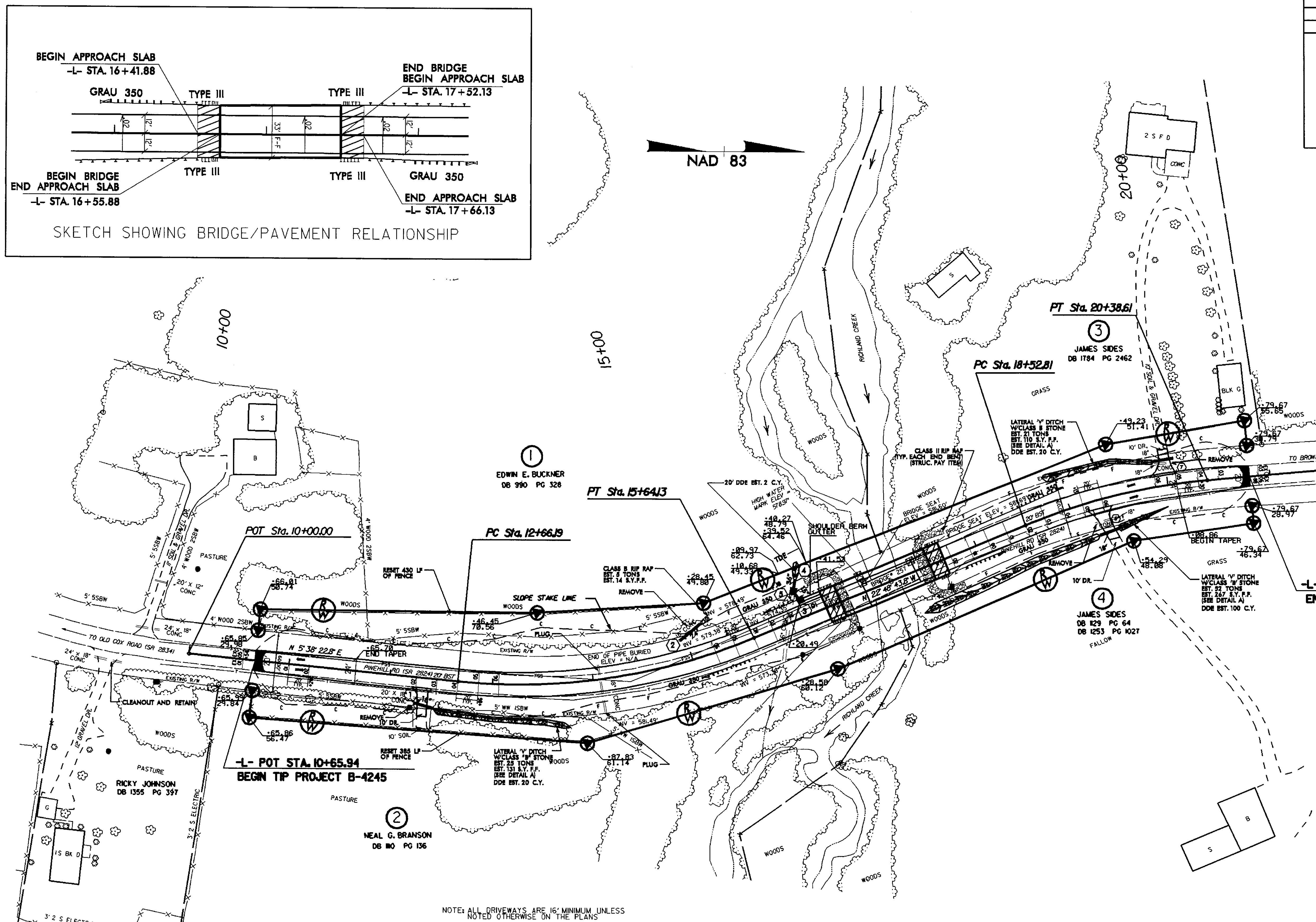
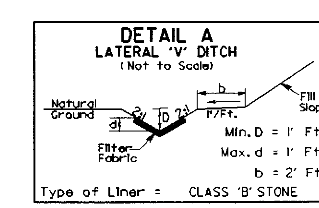
03-02-05 12:11

PROJECT REFERENCE NO.	SHEET NO.
B-4245	4
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 15424 ENGINEER ALLISON C. JOHNSON	NORTH CAROLINA PROFESSIONAL SEAL 21656 ENGINEER ROGER S. WEADON



BEGIN APPROACH SLAB
-L- STA. 16+41.88
END BRIDGE
BEGIN APPROACH SLAB
-L- STA. 17+52.13
GRAU 350
TYPE III
BEGIN BRIDGE
END APPROACH SLAB
-L- STA. 16+55.88
END APPROACH SLAB
-L- STA. 17+66.13
SKETCH SHOWING BRIDGE/PAVEMENT RELATIONSHIP
NAD 83
10+00
15+00
20+00
PT Sta. 20+38.61
PC Sta. 18+52.81
PT Sta. 15+64.13
PC Sta. 12+66.19
POT Sta. 10+00.00
POT Sta. 22+57.51
-L- POT STA. 10+65.94
BEGIN TIP PROJECT B-4245
-L- STA. 20+83.00
END TIP PROJECT B-4245
EDWIN E. BUCKNER
DB 990 PG 328
NEAL G. BRANSON
DB 110 PG 136
JAMES SIDES
DB 1784 PG 2462
JAMES SIDES
DB 129 PG 64
DB 1253 PG 1027
RICKY JOHNSON
DB 1355 PG 397
TO OLD COX ROAD (SR 2834)
TO BROWER CHAPEL RD (SR 2826)
PINEHILL RD (SR 2824)
RICHLAND CREEK
WOODS
PASTURE
GRASS
FALLOW
SLOPE STAKE LINE
END TAPER
BEGIN TAPER
CLEANOUT AND RETAIN
RESET 430 LF OF FENCE
RESET 385 LF OF FENCE
LATERAL 'V' DITCH W/CLASS 'B' STONE
CLASS II RIP RAP
SHOULDER BERM GUTTER
REMOVE
PLUG



-L STA 12+50 TO 13+75 RT
-L STA 17+26 TO 20+00 RT
-L STA 18+85 TO 19+90 LT

NOTE: ALL DRIVEWAYS ARE 16' MINIMUM UNLESS NOTED OTHERWISE ON THE PLANS

- L -	
PI Sta 14+18.30	PI Sta 19+46.46
Δ = 28° 27' 06.2" (LT)	Δ = 17° 44' 32.6" (RT)
D = 9° 32' 57.5"	D = 9° 32' 57.5"
L = 297.95'	L = 185.80'
T = 152.11'	T = 93.65'
R = 600.00'	R = 600.00'
SE = .06	SE = .06
V_{DES} = 40 MPH	V_{DES} = 40 MPH

FOR -L- PROFILE SEE SHEET 5

FOR STRUCTURE SEE SHEET S1

REVISIONS

8/17/99

5/14/99

PROJECT REFERENCE NO.	SHEET NO.
B-4245	5

ROADWAY DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 15424 ENGINEER WILTON C. JOHNSON

HYDRAULICS ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 21656 ENGINEER LOGAN S. WELDON

BRIDGE HYDRAULIC DATA

DESIGN DISCHARGE	= 1600 CFS
DESIGN FREQUENCY	= 25 YRS
DESIGN HW ELEVATION	= 579.2 FT
BASE DISCHARGE	= 2400 CFS
BASE FREQUENCY	= 100 YRS
BASE HW ELEVATION	= 580.4 FT
OVERTOPPING DISCHARGE	= 7000 CFS
OVERTOPPING FREQUENCY	= 500+ YRS
OVERTOPPING ELEVATION	= 585.2 FT

-L- PINEHILL ROAD (SR 2824)

PI = 11+17.99
EL = 600.20'

(-)5.8878%

BEGIN GRADE
-L- STA. 10+65.94
EL = 603.26

(-)6.3193%

(-)6.0000%

(-)4.5000%

PI =13+00.00
EL = 586.72

PI = 14+00.00
EL = 582.38
K = 65
VC = 500'
V_{DES} = 40 MPH

(+)11.4009%

LOW POINT
STA. 15+59.00
EL. 585.24

BEGIN BRIDGE
-L- STA 16+55.88

END BRIDGE
-L- STA 17+52.13

EXISTING GROUND

PROPOSED GRADE

EXIST. BRIDGE

3.5 TYP.

1.5:1 SLOPE (TYP.)

11.4009%

(+)11.4009%

PI = 19+03.00
EL = 589.42
K = 49
VC = 270'
V_{DES} = 35 MPH

(+)11.500%

(+)8.8500%

(+)6.8866%

(+)6.0000%

PI =20+70.28
EL = 600.94'

(+)6.5330%

END GRADE
-L- STA. 20+83.00
EL = 601.77

BEGIN LAT. 'V' DITCH -L- STA.12+56 RT EL = 58972

END LAT. 'V' DITCH -L- STA.13+75 RT EL = 583.35

BEGIN LAT. 'V' DITCH -L- STA.17+26 RT EL = 574.66

PI =19+00.00 EL = 585.00

BEGIN LAT. 'V' DITCH -L- STA.18+85 LT EL = 582.64

END LAT. 'V' DITCH -L- STA.20+00 RT EL = 593.05

END LAT. 'V' DITCH -L- STA.19+90 LT EL = 594.71

BM #1
-BL- STA. 3+93
3' RIGHT
ELEV. 618.48'

BM #2
-BL- STA. 18+01
44' LEFT
ELEV. 620.68'

FOR -L- PLAN VIEW
SEE SHEET 4

610
600
590
580
570

10	11	12	13	14	15	16	17	18	19	20	21
	601.26	598.17	595.21	592.63	590.43	588.62	587.20	586.16	585.51	585.25	585.37
585.88	586.58	587.28	588.08	589.36	591.15	593.45	596.25	599.55			

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PROJ. REFERENCE NO.	SHEET NO.
B-4245	X-1

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

NOTE: EMBANKMENT COLUMN INCLUDES BACKFILL FOR UNDERCUT

CROSS-SECTION SUMMARY

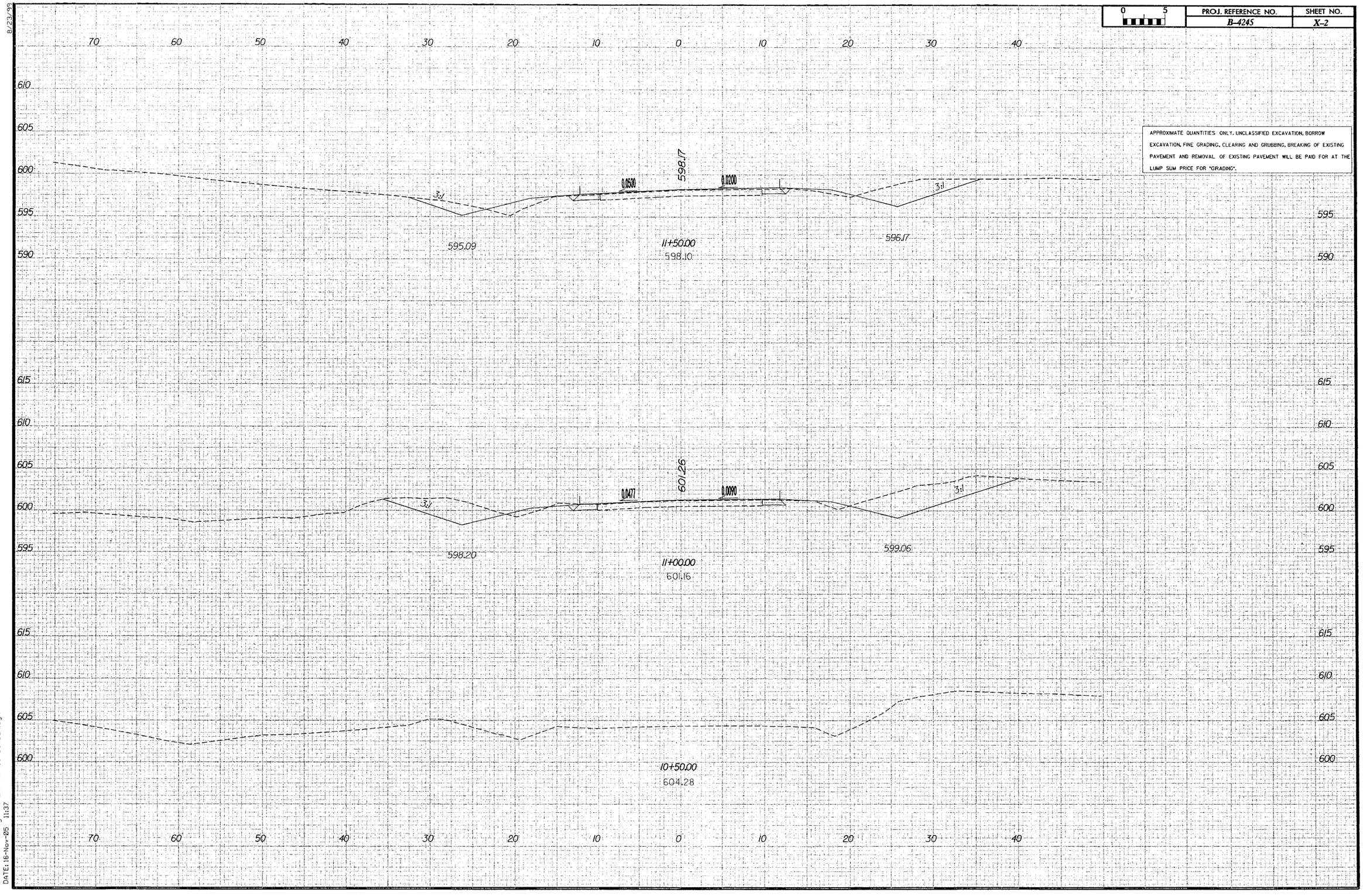
			EXCAVATION				EMBANKMENT		
STATION	DISTANCE (FT.)		AREA (SQ. FT.)	AVG AREA (SQ. FT.)	VOLUME (CU. YD.)		AREA (SQ. FT.)	AVG AREA (SQ. FT.)	VOLUME (CU. YD.)
-L-									
10+66			0				0		
11+00	34.00		65.79	32.90	41.42		3.73	1.87	2.35
11+50	50.00		31.91	48.85	90.46		8.55	6.14	11.37
12+00	50.00		21.35	26.63	49.31		11.13	9.84	18.22
12+50	50.00		20.20	20.78	38.47		19.57	15.35	28.42
13+00	50.00		37.61	28.91	53.53		30.17	24.87	46.05
13+50	50.00		105.76	71.69	132.75		21.54	25.85	47.88
14+00	50.00		111.22	108.49	200.91		10.86	16.20	30.00
14+50	50.00		59.46	85.34	158.04		14.54	12.70	23.52
15+00	50.00		2.39	30.93	57.27		20.33	17.43	32.28
15+50	50.00		0.00	1.20	2.21		109.08	64.70	119.82
16+00	50.00		0.00	0.00	0.00		160.93	135.00	250.00
16+50	50.00		0.00	0.00	0.00		155.31	158.12	292.81
16+56	6.00		0.00	0.00	0.00		155.31	155.31	34.51
BRIDGE									
17+52			0.00				125.87		
18+00	48.00		0.00	0.00	0.00		188.55	157.21	279.48
18+50	50.00		0.00	0.00	0.00		139.64	164.09	303.88
19+00	50.00		0.00	0.00	0.00		94.63	117.13	216.92
19+50	50.00		0.00	0.00	0.00		47.50	71.06	131.60
20+00	50.00		19.55	9.78	18.10		6.84	27.17	50.31
20+50	50.00		54.68	37.12	68.73		3.17	5.00	9.27
20+83	33.00		0.00	27.34	33.42		0.00	1.59	1.94
			-L- TOTAL		945				1931

Approximate quantities only. Unclassified excavation, borrow excavation, fine grading, clearing and grubbing, breaking of existing pavement and removal of existing pavement will be paid for at the lump sum price for "Grading".

8/23/99

0 5	PROJ. REFERENCE NO.	SHEET NO.
	B-4245	X-2

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



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8/23/96

0 5	PROJ. REFERENCE NO.	SHEET NO.
	B-4245	X-3

70 60 50 40 30 20 10 0 10 20 30 40

605 600 595 590 585

2:1 0.0563 590.43 0.0563 4:1 2.0' 2:1

587.28 586.72

13+00.00
590.33

605 600 595 590

3:1 0.0500 592.63 0.0322 4:1 2.0' 2:1

DRIVEWAY @ 12+32.81

589.55 589.72

12+50.00
592.50

605 600 595 590

3:1 0.0500 595.27 0.0200 3:1

592.13 593.21

12+00.00
595.14

70 60 50 40 30 20 10 0 10 20 30 40

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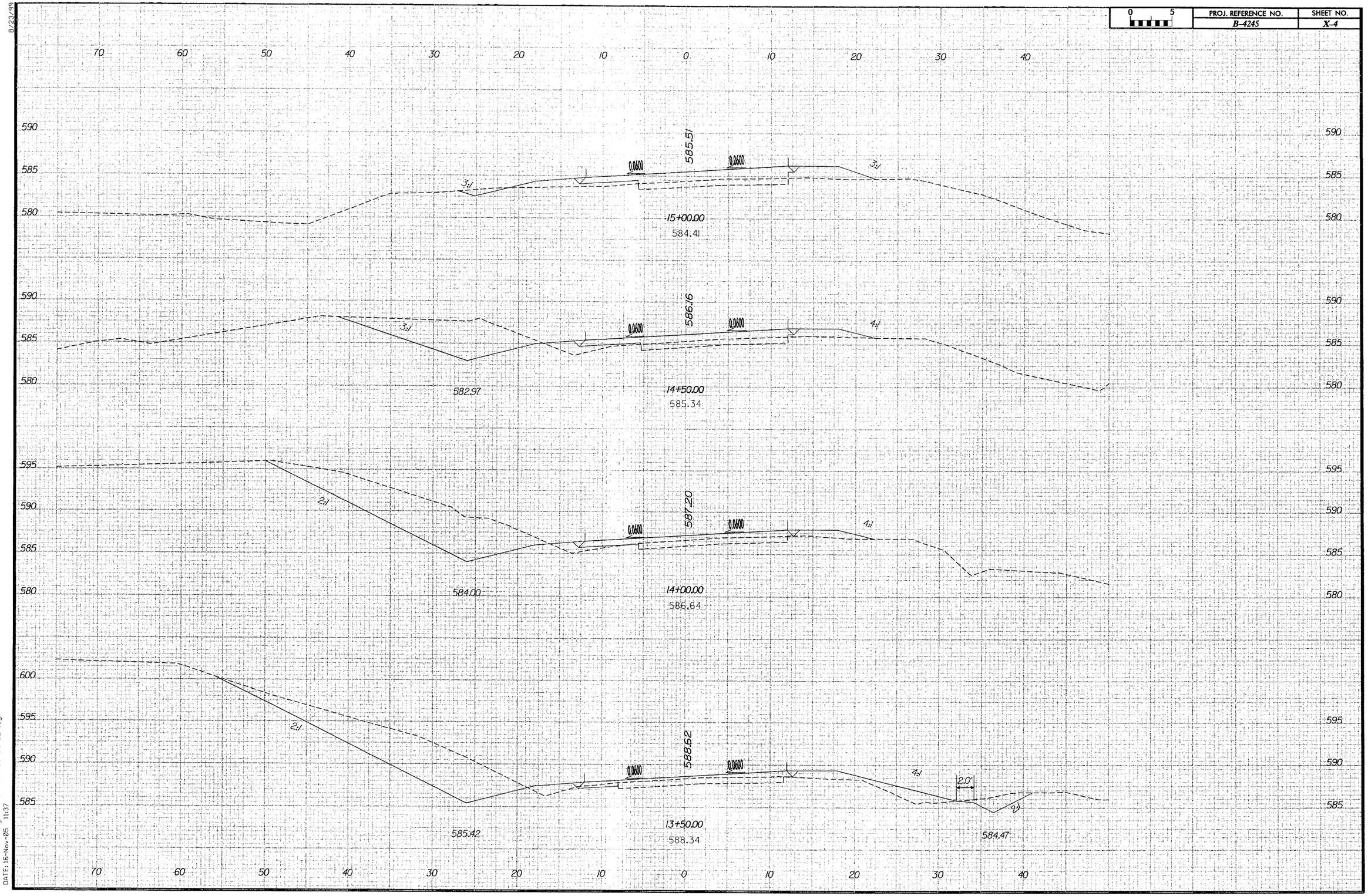
DATE: 16-Nov-05 11:37

8/23/99

0 5	PROJ. REFERENCE NO.	SHEET NO.
	B-4245	X-4



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8/23/99

0 5	PROJ. REFERENCE NO.	SHEET NO.
	B-4245	X-5

70 60 50 40 30 20 10 0 10 20 30 40

585
580
575
570

586.58
0.0200 0.0200

17+00.00
572.66

585.88
0.0200 0.0200
2:1 2:1

16+50.00
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0.0471 0.0471
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15+50.00
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DATE: 16-Nov-05 11:37

8/23/99

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	B-4245	X-6

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2.0'
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586.61
582.00

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2.0'
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8/23/99

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3:1

597.73

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599.53

596.35

600 595 590 585 580

DRIVEWAY @ 20+00.86

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0.0600

3:1

594.87

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598.05

593.05

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595 590 585

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2.0'

4:1

0.0600

593.45

0.0600

2.0'

4:1

2:1

DRIVEWAY @ 19+26.25

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588.00

19+50.00
592.59

580

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DATE: 16-Nov-05 11:37

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

MICHAEL F. EASLEY
GOVERNOR

LYNDO TIPPETT
SECRETARY

December 8, 2003

MEMORANDUM TO: Mr. Calvin W. Leggett, PE, Manager
Program Development Branch

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

SUBJECT: Programmatic Categorical Exclusion Approval for
Randolph County, Replace Bridge No. 257 on SR 2824, over Richland Creek,
Federal Aid Project No. BRZ-2824(4), State Project No. 8.2573901,
T.I.P. No. B-4245

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

Attachment
cc/atta:
State Highway Engineer - Design
State Roadway Design Engineer (2 copies)
State Bridge Design Engineer (2 copies)
Mr. Victor Barbour
State Hydraulics Engineer
State Geotechnical Engineer (2 copies)
Mr. Charles W. Brown (3 copies)
Mr. C. B. Goode, Jr. (3 copies)
Mr. S. D. DeWitt
Mr. Don G. Lee
Mr. Troy A. Peoples (2 copies)
Mr. J. B. Williamson, Jr.
Mr. Mike Bruff
Mr. William H. Williams, Jr.
Mr. Tom Norman
Division Engineer, Mr. Bill Rosser , PE (3 copies)
Mr. C. O. Wiggins, Jr.
Mr. Doug Lane
Mr. W. T. Goodwin, Jr.
N. C. State Publications Clearinghouse (10 copies)

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

CATEGORICAL EXCLUSION ACTION CLASSIFICATION FORM

TIP Project No.	B-4245
State Project No.	8.2573901
Federal Project No.	BRZ-2824(4)

A. Project Description:

NCDOT will replace Bridge No.257 on SR 2824, over Richland Creek, in Randolph County. Replacement will be at approximately the same location with a new bridge 80 feet in length and 30 feet in width. The new bridge will have a 24 foot travelway. The offset of the bridge will be 3 feet on each side.

The approach paved roadway will be 24 feet in width. Turf shoulders will be 6 feet in width. Shoulder width will be increased by at least 3 feet where guardrail is warranted. Traffic will be detoured over existing secondary roads.

B. Purpose and Need: Replace obsolete bridge.

C. Proposed Improvements:

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

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

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

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

    a. Installing ramp metering devices
    b. Installing lights
    c. Adding or upgrading guardrail

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

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

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

4. Transportation corridor fringe parking facilities.

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

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

7. Approvals for changes in access control.

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

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

10. Construction of bus transfer facilities (an open area consisting of passenger shelters, boarding areas, kiosks and related street improvements) when located in a commercial area or other high

activity center in which there is adequate street capacity for projected bus traffic.

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

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

D. Special Project Information

Estimated Costs:

Total Construction Cost	$450,000
Right-of-Way and Utilities	36,000
Total Project Cost	$486,000

Estimated Traffic:

Current - 700 VPD
Year 2025 - 1,600 VPD

Proposed Typical Roadway Section:

The approach paved roadway will be 24 feet in width. Turf shoulders will be 6 feet in width. Shoulder width will be increased by at least 3 feet where guardrail is warranted.

Design Speed:

The design speed will be 40 mph. A design exception is anticipated due to vertical and horizontal alignment.

Functional Classification:

SR 2824 is classified as a Rural Local facility in the Statewide Functional Classification System.

Division Office Comments:

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

E. Threshold Criteria

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

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

PERMITS AND COORDINATION		YES	NO
(10)	If the project is located within a CAMA county, will the project significantly affect the coastal zone and/or any "Area of Environmental Concern" (AEC)?	☐	X

		YES	NO
(11)	Does the project involve Coastal Barrier Resources Act resources?	☐	X
(12)	Will a U. S. Coast Guard permit be required?	☐	X
(13)	Will the project result in the modification of any existing regulatory floodway?	☐	X
(14)	Will the project require any stream relocations or channel changes?	☐	X
SOCIAL, ECONOMIC, AND CULTURAL RESOURCES		YES	NO
(15)	Will the project induce substantial impacts to planned growth or land use for the area?	☐	X
(16)	Will the project require the relocation of any family or business?	☐	X
(17)	Will the project have a disproportionately high and adverse human health and environmental effect on any minority or low-income population?	☐	X
(18)	If the project involves the acquisition of right of way, is the amount of right of way acquisition considered minor?	X	☐
(19)	Will the project involve any changes in access control?	☐	X
(20)	Will the project substantially alter the usefulness and/or land use of adjacent property?	☐	X
(21)	Will the project have an adverse effect on permanent local traffic patterns or community cohesiveness?	☐	X
(22)	Is the project included in an approved thoroughfare plan and/ or Transportation Improvement Program (and is, therefore, in conformance with the Clean Air Act of 1990)?	X	☐
(23)	Is the project anticipated to cause an increase in traffic volumes?	☐	X
(24)	Will traffic be maintained during construction using existing roads, staged construction, or on-site detours?	X	☐

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

F. Additional Documentation Required for Unfavorable Responses in Part E

None.

G. CE Approval

TIP Project No.	B-4245
State Project No.	8.2573901
Federal Project No.	BRZ-2824(4)

Project Description:

NCDOT will replace Bridge No.257 on SR 2824, over Richland Creek, in Randolph County. Replacement will be at approximately the same location with a new bridge 80 feet in length and 30 feet in width. The new bridge will have a 24 foot travelway. The offset of the bridge will be 3 feet on each side. Traffic will be detoured over existing secondary roads.

Categorical Exclusion Action Classification: (Check one)

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

Approved:

11/26/03 Teresa Hart
Date — Assistant Manager
Project Development and Environmental Analysis Branch

11-26-03 William A. Goodwin
Date — Project Planning Unit Head
Project Development and Environmental Analysis Branch

11-18-03 Dennis Pilpher
Date — Project Planning Engineer
Project Development and Environmental Analysis Branch

For Type II(B) projects only:

____ Not Required
Date — Division Administrator
Federal Highway Administration

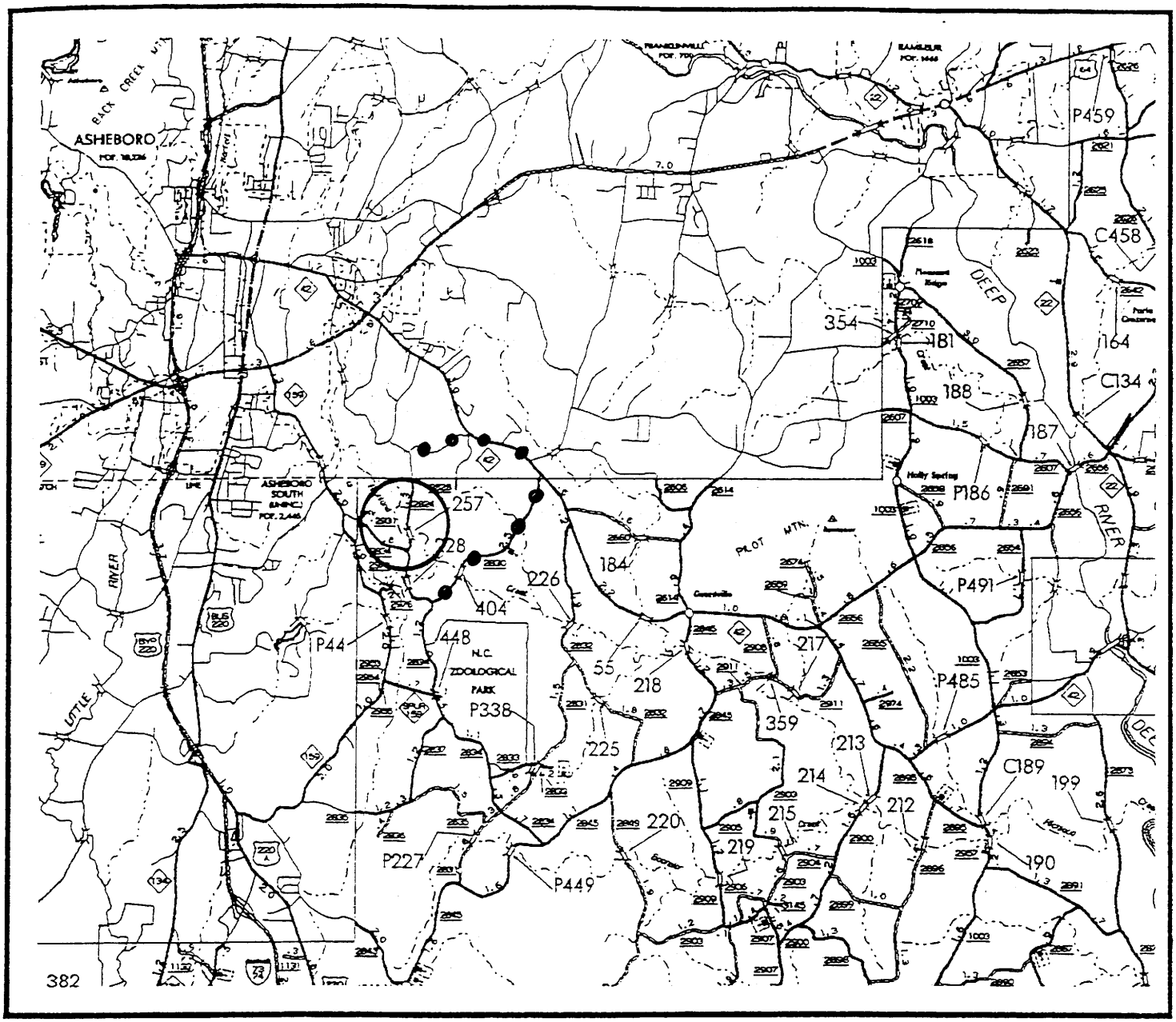
ENVIRONMENTAL COMMITMENTS:

Randolph County
Bridge No. 257 on SR 2824
over Richland Creek
Federal Aid Project No. BRZ-2824(4)
State Project No. 8.2573901
T.I.P. No. B-4245

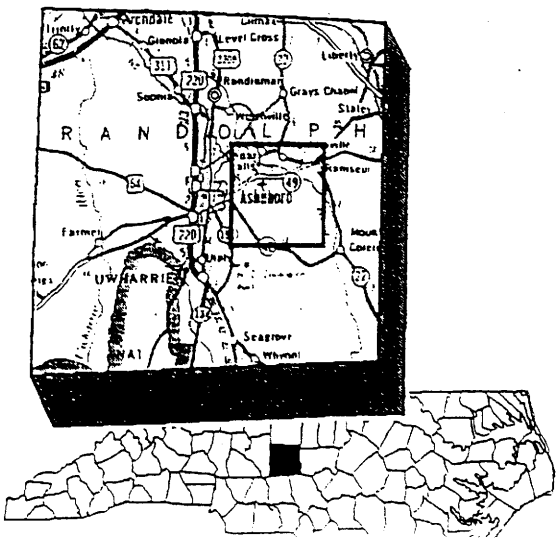
1. Roadway Design Unit, Structure Design Unit, Project Development & Environmental Analysis Branch (Permits), Resident Engineer:

Bridge Demolition:

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



Studied Detour Route



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

RANDOLPH COUNTY
REPLACE BRIDGE NO. 257 ON SR 2824
OVER RICHMOND CREEK
B-4245

Figure 1

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

MICHAEL F. EASLEY
GOVERNOR

LYNDO TIPPETT
SECRETARY

November 1, 2002

Memorandum To: Dennis Pipkin, Project Manager
Bridge Replacement Unit

From: Neil Medlin, Protected Species Group

Subject: Cape Fear Shiner Survey and Freshwater Mussel Survey Report for the Replacement of Bridge No. 257, on SR 2824 Over Vestal Creek, Randolph County, TIP No. B-4245.

The proposed action calls for the replacement of bridge No. 257 over Vestal Creek in Randolph County. The current 53 foot 3-span bridge is to be replaced with a new bridge in the existing location. Traffic will be detoured off-site during project construction.

Vestal Creek immediately above the SR 2824 bridge flows through a wooded area but is bordered by active pasture below the crossing. Cattle have free access to the stream below the bridge. As a result, there is greater siltation and bank erosion for several hundred yards downstream. Vestal Creek is one of the headwater streams for Richland Creek. A fisheries survey to address Cape Fear shiner concerns was conducted in Vestal Creek in the project area as well as a general freshwater mussel survey.

Cape Fear Shiner

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

Cape Fear shiner habitat occurs in streams with gravel, cobble, or boulder substrates. It is most often observed inhabiting slow pools, riffles, and slow runs associated with water willow beds. Juveniles can be found inhabiting slackwater, among large rock outcrops and in flooded side channels and pools. The Cape Fear shiner is

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

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

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

LOCATION:
TRANSPORTATION BUILDING
1 SOUTH WILMINGTON STREET
RALEIGH NC

thought to feed on bottom detritus, diatoms, and other periphytes. Captive specimens feed readily on plant and animal material.

The Cape Fear shiner is limited to three populations in North Carolina. The strongest population of the Cape Fear shiner is in Chatham and Lee Counties in the Deep River from the Locksville dam upstream to the Rocky River and Bear Creek. Another population is located above the Rocky River Hydroelectric Dam in Chatham County, and the third population is found in the Deep River system in Randolph and Moore Counties.

Biological Conclusion: **No Effect**

A fisheries survey was conducted at the project site on July 11, 2002 by NC DOT biologists Neil Medlin, John Alderman and Heather Montague and NC Wildlife Resources Commission biologist Brian Watson to determine if the Cape Fear shiner was present in this section of the stream. The survey was conducted by pulling a seine through water above and below the current bridge. The SR 2824 bridge crossing over Vestal Creek is over 12 river mile upstream of the portion of Richland Creek considered occupied by the Cape Fear shiner. No Cape Fear shiners were documented at the project site. The fish species that were collected during the fisheries survey and those that were observed during the mussel survey on July 30, 2002 are summarized in the table below.

Species Collected	**Relative Abundance**
Highfin shiner, *Notropis altipinnis*	Abundant
Rosyside dace, *Clinostomus funduloides*	Common
Creek chub, *Semotilus atromaculatus*	Rare
Redbreast sunfish, *Lepomis auritus*	Rare
Additional Species Observed on July 30, 2002	
Tessellated darter, *Etheostoma olmstedi*	Common

In order to reduce any further instream habitat degradation to Vestal Creek the following environmental recommendations should be implemented:

- Best Management Practices for bridge removal will be implemented so that no component of Bridge No. 257 will be dropped into waters of the United States during construction.
- High Quality Waters – Soil and Erosion Control Measures will be installed at the project site and maintained throughout project construction
- Project construction should take place during the dry season

Given the results of the fish survey, the distance of the project location from the area of Richland Creek considered to be occupied, the instream habitat degradation downstream of the SR 2824 crossing, and no Cape Fear shiners being documented during a fish survey at another road crossing approximately two miles downstream, it can be concluded that the replacement of Bridge No. 257 will not affect the Cape Fear shiner.

Freshwater Mussels

No Federally listed Threatened or Endangered mussel species are listed for the Cape Fear River Basin in Randolph County. A general mussel survey was conducted at the project site on July 30, 2002 by NCDOT biologists Jeff Burleson, Neil Medlin, Matt Haney, Sharon Snider, Ashley Oliver, and Tom Dickinson. Tactile and visual survey methods were employed for several hundred meters above and below the bridge. In 6 person hours of survey time, 71 Elliptio mussels (*Elliptio complanta* complex) and 11 *Villosa vaughaniana* (Carolina creekshell) were collected. *V. vaughaniana* is listed as a Federal Species of Concern, and was listed as Endangered in North Carolina effect July 1, 2002. In addition to *V. vaughaniana*, three specimens of *Villosa delumbis* (state listed as Significantly Rare by the Natural Heritage Program) were collected. All of the snails observed in the project area belonged to the genus *Campeloma*.

The recommendations intended to prevent further instream habitat degradation in Vestal Creek, will also help to protect the mussel community in the vicinity of the SR 2824 bridge replacement project.

cc: V. Charles Bruton, Ph.D., Assistant Branch Manager
Bill Goodwin, P.E., Bridge Replacement Unit Head
Rachelle Beauregard, Permit Specialist
Central Piedmont Nongame Aquatic Biologist, NC WRC

Memorandum

Date: April 21, 2003

To: Brett Feulner, NC Department of Transportation

From: George Lankford, Earth Tech

Reference: Bridge Group 2005 - Schweinitz's Sunflower Survey
Bridge Number 257 over Vestal Creek in Randolph County (B-4245)

Earth Tech has conducted a survey for the Schweinitz's sunflower (*Helianthus schweinitzii*) for the above referenced bridge project. Potential habitat for this federally listed endangered species was initial identified during a field survey of the project area in July 2001. Habitat is found in open habitats such as clearings and along the edges of upland woods on moderately weathered clayey or rocky soils that derived from mafic rock.

The Schweinitz's sunflower is a rhizomatous perennial herb with a single stem from a cluster of carrot-like tuberous roots and branching only above mid-stem. It grows from 3 to 6 ft (1 to 2 m). The leaves are opposite on the lower stem, changing to alternate above. The pubescence of the underside of the leaves is distinctive and is one of the best characters to distinguish Schweinitz's sunflower from its relatives. Schweinitz's sunflower blooms have comparatively small heads of all yellow flowers. Flowering occurs in late September through frost.

On 8 July 2001 Earth Tech biologists conducted a natural resource survey of Bridge Number 257 (B-4245) over Vestal Creek in Randolph County. Because of the unresolved conclusion for the occurrence of Schweinitz's sunflower at the site, on 26 September 2001 a second site visit at B-4242 was conducted to search for Schweinitz's sunflower. No individual of Schweinitz's sunflower were observed within the project limits and the nearby area. The adjoining terrestrial communities do not include any of the natural community types associated with this species. Soils of the area are of marginal quality to support this species. According to NHP records one occurrence of this species is approximately 1.5 miles (2.4 km) north of the project site. A biological conclusion of **not likely to adversely effect** was determined because no individuals were found at these sites.

The surveys were conducted by investigating the roadside and adjacent powerline right-of-way across the project site. Potential habitat with open characteristics was present but no individuals were found. Vegetation was weedy, and appeared to be periodically maintained in this weedy state. The most common plants observed in the right-of-way were small woodland sunflower (*Helianthus microcephalus*), Jerusalem artichoke (*Helianthus tuberosus*), goldenrod (*Solidago altissima*), wingstem (*Verbesina* sp.), and blackberry (*Rubus* sp.).

B-4245

United States Department of the Interior

OCT 10 2

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

October 8, 2003

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

Dear Dr. Thorpe:

This letter is in response to your letter of September 30, 2003 which provided the U.S. Fish and Wildlife Service (Service) with the biological conclusion of the North Carolina Department of Transportation (NCDOT) that the replacement of Bridge No. 257 on SR 2824 over Richmond Creek in Randolph County (TIP No. B-4245) may affect, but is not likely to adversely affect the federally endangered Schweinitz's sunflower (*Helianthus schweinitzii*). These comments are provided in accordance with section 7 of the Endangered Species Act (ESA) of 1973, as amended (16 U.S.C. 1531-1543).

According to the information you submitted, a plant survey was conducted at the project site on September 26, 2001. The survey covered the roadside and adjacent power line right-of-way. No specimens of Schweinitz's sunflower were observed.

Based on the negative survey results, the Service concurs with your conclusion that the proposed bridge replacement may affect, but is not likely to adversely affect Schweinitz's sunflower. Note however, the Service generally provides concurrence for negative survey results that are no more than two years old. This survey is now slightly older than two years. We recommend that another survey be conducted within two years of project construction to verify that the species has not recently colonized the project area.

We believe that the requirements of section 7 (a)(2) of the ESA have been satisfied for now. We remind you that obligations under section 7 consultation must be reconsidered if: (1) new information reveals impacts of this identified action that may affect listed species or critical habitat in a manner not previously considered in this review; (2) this action is subsequently modified in a manner that was not considered in this review; or (3) a new species is listed or critical habitat determined that may be affected by this identified action.

For future requests for concurrence, the Service recommends that you provide the following additional information in order to better assess potential effects: site location map, plan view

showing area of impact, and biographical information on surveyors.

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

Sincerely,

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

cc: Richard Spencer, USACE, Wilmington, NC
David Franklin, USACE, Wilmington, NC
Beth Barnes, NCDWQ, Raleigh, NC
Travis Wilson, NCWRC, Creedmore, NC
Chris Militscher, USEPA, Raleigh, NC

Natural Resources Technical Report

Proposed Bridge Replacement
SR 2824, Bridge No. 257 over Vestal Creek
Randolph County

TIP No. B-4245
State Project No. 8.2573901
FAP No. BRZ-2824(4)

Prepared for:

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

Issued by:

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

Earth Tech Project No. 46164

November 2001

TABLE OF CONTENTS

TABLES

FIGURES (To be added later)

Note: Highlighted text denotes items not included in this draft that will be added later by NCDOT personnel once alignments are developed.

1.0 INTRODUCTION

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

1.1 Project Description

The proposed project involves the replacement of Bridge No. 257 on SR 2824, which spans Vestal Creek. The project is located in southeastern Randolph County about 2 miles (3.24 kilometers [km]) southeast of Asheboro, North Carolina **(Figure 1)**.

Alternate 1
(Insert description of Alternate here)

Alternate 2
(Insert description of Alternate here)

1.2 Methodology

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

- United States Geological Survey (USGS) quadrangle map (Asheboro, 1994)
- United States Fish and Wildlife Service (USFWS) National Wetlands Inventory (NWI) Map (Asheboro, 1994)
- NCDOT aerial photograph of project area (1:1200)
- Draft maps and descriptions of the soils in the project area (Randolph Soil Survey Office, Natural Resources Conservation Service [NRCS])
- North Carolina Department of Environment and Natural Resources (NCDENR) basin-wide assessment information (NCDENR, 1999)
- USFWS list of protected and candidate species
- North Carolina Natural Heritage Program (NHP) files of rare species and unique habitats

Water resource information was obtained from publications posted on the World Wide Web by NCDENR Division of Water Quality. Information concerning the occurrence of federally protected species in the study area was obtained from the USFWS list of protected and candidate species (page last updated March 2001, last accessed August 21

2001), posted on the World Wide Web by the Ecological Services branch of the USFWS office in North Carolina. Information concerning species under state protection was obtained from the NHP database of rare species and unique habitats. NHP files were reviewed for documented sightings of species on state or federal lists and locations of significant natural areas.

A general field survey was conducted along the proposed project route by Earth Tech biologists on July 10, 2001. Water resources were identified and their physical characteristics were recorded. For the purposes of this study, a brief habitat assessment was performed within the project area of Vestal Creek. Plant communities and their associated wildlife were identified using a variety of observation techniques, including active searching, visual observations, and identifying characteristic signs of wildlife (sounds, tracks, scats, and burrows). Terrestrial community classifications generally follow Schafale and Weakley (1990) where appropriate and plant taxonomy follows Radford *et al.* (1968). Vertebrate taxonomy follows Rohde *et al.* (1994), Conant *et al.* (1998), the American Ornithologists' Union (2001), Thorpe and Covich (1991), and Webster *et al.* (1985). Vegetative communities were mapped using aerial photography of the project site. Predictions regarding wildlife community composition involved general qualitative habitat assessment based on existing vegetative communities.

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

1.3 Terminology and Definitions

For the purposes of this report, the following terms are used for describing the limits of natural resources investigations. "Study corridor" and "project area" denote an area with a width of 75 to 100 feet (22.9 to 30.5 m) along the full length of the project alignment. The "project vicinity" is an area extending 0.5 mile (0.8 km) on all sides of the project area, and "project region" is an area equivalent in size to the area represented by a 7.5-minute USGS quadrangle map (about 61.8 sq miles or 163.3 sq km). When referring to stream banks, "left bank" and "right bank" are relative to an observer facing downstream.

1.4 Qualifications of the Principal Investigators

Investigator:	George Lankford
Education	M.S., Botany, North Carolina State University
Experience	Staff Biologist, Earth Tech < 2 years
Expertise	Licensed soil scientist, wetland delineation
Investigator:	Heather Wallace
Education	B.S., Ecology, Appalachian State University
Experience	Staff Biologist, Earth Tech- < 1 year
Expertise	Natural resources surveys, zoology

2.0 PHYSICAL RESOURCES

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

2.1 Regional Characteristics

The project area lies in the central portion of North Carolina within the Piedmont physiographic province. Elevations in the project area range from 570 to 640 feet (171-192 m) (National Geodetic Vertical Datum, 1929). The topography of the project vicinity is generally flat, but steep slopes rise from the floodplain on the western side of the creek.

The proposed project is in a rural area in Randolph County approximately 2 miles (3.24 km) southeast of Asheboro, NC. Randolph County's major economic resources are forestry and agriculture. The population of Randolph County in 2000 was 130,454 (North Carolina Office of State Budget, Planning and Management 2001).

2.2 Soils

Information about soils in the project area was taken from draft maps and descriptions provided by the Randolph County Soil Survey Office (USDA 2001). The provisional map units in the project area are Chewacla loam with 0-2% slopes, frequently flooded, and various types of Georgeville loam (due to the poor quality of the field maps, it is impossible to determine the exact map unit).

- **Chewacla loams (ChA) with 0-2% slopes** are mapped along the banks of Vestal Creek within the project area. This soil is frequently flooded, has moderate permeability, and is somewhat poorly drained. This soil is typically found in flood plain areas throughout the Piedmont, Coastal Plain, and Sandhills. The seasonal high water table is 0.5 to 1.5 feet (0.15-0.45m) below the surface. When frequently flooded it is classified as a hydric soil by the NRCS.
- **Georgeville loams** are generally found within the Piedmont Slate Belt region. These very deep soils are well drained and have moderate permeability. They are found along the periphery of the Chewacla loams throughout the project area. The water table remains 6 feet (1.8 m) below the surface. These soils are never flooded.

Site index is a measure of soil quality and productivity. The index is the average height, in feet, that dominant and co-dominant trees of a given species attain in a specified number of years (typically 50). The site index applies to fully stocked, even-aged, unmanaged stands. Site index information is not available for Randolph county soils at this time, however site index information for these soils in Stanly County are as follows:

- Chewacla loams have a site index of 100 for tulip poplar (*Liriodendron tulipifera*), 97 for sweet gum (*Liquidambar styraciflua*), and 96 for loblolly pine (*Pinus taeda*).

- Georgeville loams have a site index of 81 for loblolly pine, 70 for scarlet oak (*Quercus coccinea*), 69 for white oak (*Quercus alba*), and 67 for both longleaf pine (*Pinus palustris*) and southern red oak (*Quercus falcata*).

2.3 Water Resources

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

2.3.1 Physical Characteristics of Surface Waters

The project is located in the Cape Fear River basin (CPF09 sub-basin, HUC 03030003). Vestal Creek originates about 2.5 miles (4.0 km) north of the project area. About 1 mile (1.6 km) upstream of the project, Vestal Creek has been dammed to form a pond. Just upstream from the project area, the stream flows through a narrow valley and then passes under SR 2824 (Pine Hill Road). Downstream from the project area, Vestal Creek flows into Richland Creek and eventually the Deep River.

Upstream from Pine Hill Road, Vestal Creek is split into two channels. The southernmost channel is 2-6 feet (0.6-1.8m) wide, while the northernmost channel is 8-10 feet (2.4-3.0 m) wide. The island formed in the middle of the channel is about 60 feet (18.2 m) wide. The channel splits about 250 feet (75.6 m) upstream from the bridge and converges about 70 feet (21.2 m) upstream from the bridge. Cattle have caused severe erosion to the banks in this portion of the stream, and recent flooding has deposited large amounts of debris in the riparian vegetation and on top of the banks. Because of the eroding banks, trees have fallen over across the stream. Heavy scouring is present along the outside of the meander bends and large alluvial deposits are found on the inside of the bends.

Downstream from the bridge, the channel of Vestal Creek is not so heavily eroded. Cattle do not have access to the stream in this area, however some erosion is present. Vegetation is sparse along the banks of the creek throughout the length of the project area. The banks are generally 2.5-4.0 feet (0.8-1.2 m) high, and the channel remains 8-10 (2.4-3.0 m) feet wide.

Sedimentation is heavy in Vestal Creek, and water clarity is poor. The substrate consists of boulders, cobble and gravel. Both the bedform and sinuosity of the stream are poor. On the day of the site visit the water flow was moderate.

2.3.2 Best Usage Classification

Surface waters in North Carolina are assigned a classification by the DWQ that is designed to maintain, protect, and enhance water quality within the state. Vestal Creek [Index # 17-22-4] is classified as a *Class C* water body (NCDENR, 2001). *Class C* water resources are waters protected for aquatic life propagation and survival, fishing, wildlife, secondary recreation, and agriculture. Secondary recreation includes wading, boating, and other uses involving human body contact with water where such activities take place in an infrequent, unorganized, or incidental manner. There are no restrictions on watershed development activities.

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

2.3.3 Water Quality

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

2.3.3.1 General Watershed Characteristics

The project area is in a somewhat forested, moderately agricultural watershed. Pastures, agricultural fields and residential homes are located in the area immediately adjacent to the project area. Poor agricultural practices, cattle, and continued residential development are potential threats to the water quality of this stream.

2.3.3.2 Basin-wide Assessment Report

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

There are no monitoring stations on Vestal Creek. The closest monitoring station is located about 10 miles (16.2 km) downstream from the project site on Richland Creek where it passes under SR 2873. It was sampled in the summer of 1993 and classified as Good. When the same location was sampled again in the summer of 1998 the rating climbed to Excellent.

2.3.3.3 Point Source Discharge Permits

Point source discharges in North Carolina are permitted through the National Pollutant Discharge Elimination System (NPDES) program administered by the DWQ. All dischargers are required to obtain a permit to discharge. There are no permits issued to discharge into Vestal Creek as of July 2001 (NCDENR 2001).

2.3.4 Summary of Anticipated Impacts

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

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

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

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

3.0 BIOTIC RESOURCES

Terrestrial and aquatic communities are included in the description of biotic resources. Living systems described in the following sections include communities of associated plants and animals. These descriptions refer to the dominant flora and fauna in each community and the relationships of these biotic components. Descriptions of the terrestrial systems are presented in the context of plant community classifications. These classifications follow Schafale and Weakley (1990) where possible. They are also cross-referenced to *The Nature Conservancy International Classification of Ecological Communities: Terrestrial Vegetation of the Southeastern United States* (Weakley *et al.*,

1998), which has recently been adopted as the standard land cover classification by the Federal Geographic Data Committee. Representative animal species that are likely to occur in these habitats (based on published range distributions) are also cited. Scientific nomenclature and common names (when applicable) are used for the plant and animal species described. Subsequent references to the same species are by the common name only.

3.1 Terrestrial Communities

Five terrestrial communities were identified within the project area: a disturbed roadside community, a pasture, a hardwood forest, riparian buffer, and a powerline right-of-way **(Figure 2)**. Dominant faunal components associated with these terrestrial areas will be discussed in each community description. Many species are adapted to the entire range of habitats found along the project alignment, but may not be mentioned separately in each community description.

3.1.1 Disturbed Roadside Community

This community covers the area along the road shoulders in the project area. The dominant species of this area include fescue grass (*Festuca* sp.), Bahia grass (*Paspalum notatum*), English plantain (*Plantago lanceolata*), Bermuda grass (*Cynodon dactylon*), and beard grass (*Saccharum* sp.). Other species include red clover (*Trifolium pratense*), ragweed (*Ambrosia artemisiifolia*), goldenrod (*Solidago* sp.), selfheal (*Prunella vulgaris*), and wild carrot (*Daucus carota*).

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

3.1.2 Pasture

Pastures are located on the west side of SR 2824 at opposite ends of the project area. On the day of the site visit no livestock were observed in these pastures but it appears that the pasture at the northern end of the project area is used for horses while the other pasture is used for cattle. Dominant species in this community include fescue grass, Bahia grass, wild carrot and bracted plantain (*Plantago aristata*).

The animal species that frequent this area are similar to those found in the maintained roadside community but may also include eastern bluebird (*Sialia sialia*), eastern kingbird (*Tyrannus tyrannus*), indigo bunting (*Passerina cyanea*), red-tailed hawk (*Buteo*

jamaicencis), red fox (*Vulpes vulpes*), white-tailed deer (*Odocoileus virginianus*) and meadow vole (*Microtus pennsylvanicus*).

3.1.3 Hardwood Forest

This community occurs along the banks of Vestal Creek. Dominant canopy species include sweet gum, mockernut hickory (*Carya alba*), southern red oak, and black walnut (*Juglans nigra*). Other tree species include hickory (*Carya* sp.), American beech (*Fagus grandifolia*), white oak, and American ash (*Fraxinus americana*). The understory is very open, and is dominated by flowering dogwood (*Cornus florida*). No herbaceous layer exists due to recent grazing. This community probably represents a marginal example of a Piedmont/Mountain Bottomland Forest as described by Schafale and Weakley (1990). The TNC classification is most likely I.B.2.N.e.060 *Liquidambar styraciflua* (*Acer rubrum*) Seasonally Flooded Forest Alliance.

On the day of the site visit Earth Tech biologists observed the following bird species in this community: northern cardinal (*Cardinalis cardinalis*), red-eyed vireo (*Vireo olivaceous*), eastern towhee (*Pipilo erythrophthalmus*), Carolina chickadee (*Parus atricapillus*), Carolina wren (*Thryothorus ludovicianus*), downy woodpecker (*Picoides pubescens),* Acadian flycatcher (*Empidonax virescens*), Louisiana waterthrush (*Seiurus motacilla*), summer tanager (*Piranga rubra*), scarlet tanager (*Piranga olivacea*), belted kingfisher (*Megaceryle alcyon*), ruby-throated hummingbird (*Archilochus colubris*), yellow-billed cuckoo (*Coccyzus erythropthalmus*), and northern parula (*Parula americana*).

Raccoon (*Procyon lotor*) tracks were found under the bridge on the day of the site visit, and scat was also found on rocks near the stream. Other mammal species expected in this area include white-tailed deer, Virginia opossum (*Didelphis virginiana*), white-footed mouse (*Peromyscus leucopus*), gray squirrel (*Sciurus carolinensis*), and eastern mole (*Scalopus aquaticus*). Amphibians and reptiles may include northern dusky salamanders (*Desmognathus fuscus fuscus*), eastern box turtle (*Terrapene carolina*), and copperhead (*Agkistrodon contortrix*).

3.1.4 Riparian Buffer Community

This community is located on the east side of SR 2824 and the south side of Vestal Creek. It borders the hardwood forest community on the south side. This community has also been affected by grazing, resulting in little to no herbaceous vegetation. Dominant tree species include American sycamore (*Platanus occidentalis*), sweet gum, green ash (*Fraxinus pennsylvaicum*), white oak, and tulip poplar (*Liriodendrom tulipifera*). Ironwood (*Carpinus caroliniana*) is the dominant shrub and trumpet creeper (*Campsis radicans*) is the dominant vine. This community is similar in part to the Piedmont/Mountain Levee Forest community as described by Schafale and Weakley (1990). The TNC equivalent is I.B.2.N.d.150 *Platanus occidentalis* – (*Liquidambar styraciflua, Liriodendron tulipifera*) Temporarily flooded forest alliance.

The animals that utilize this community are similar to those found in the hardwood forest community.

3.1.5 Powerline Right-of-Way Community

A powerline community occurs on the northwestern edge of the project area. This community is regularly maintained and evidence of herbicide use was seen on the day of the site visit. The dominant species of this community include Virginia pine (*Pinus virginiana*), beard grass, greenbriar (*Smilax rotundifolia*), goldenrod, trailing lespedeza (*Lespedeza procambarus*), and Japanese honeysuckle (*Lonicera japonica*).

The animals that utilize this community are similar to those found in the maintained roadside and pasture communities. Other species may include common yellowthroat (*Geothlypis trichas*), Carolina wren, eastern cottontail (*Sylvilagus floridanus*), and black rat snake (*Elaphe obsoleta obsoleta*).

3.2 Aquatic Communities

Within the project area, Vestal Creek is a mid-gradient, second-order stream. The bed material consists of mostly of small boulders, cobbles, gravel, and a large amount of sediment. On the day of the site visit, the water clarity was poor with much suspended sediment. The riparian community is mostly deciduous trees and is described in Section 3.1.3. No aquatic vegetation was present in the stream.

Aquatic macroinvertebrate larvae found in Vestal Creek include mayfly (Ephemeroptera), caddisfly (Hydropsychidae), and water penny (Coleoptera). Other aquatic or semi-aquatic species include Asian clam (*Corbicula* sp.), crayfish (Cambaridae), water striders (Gerridae), and various fish. Along the banks of Vestal Creek, crayfish burrows and green frogs (*Rana clamitans*) were also observed.

According to Shari Bryant, Fisheries Biologist, and Judy Johnson, Nongame and Endangered Species Biologist, both with the North Carolina Wildlife Resources Commission, there is no fishery data for Vestal Creek. It likely supports a typical Piedmont stream fishery including shiners, minnows, dace, and sunfish. No anadromous fish are known to use this stream for spawning purposes. No protected fish or mussel species are known to inhabit this stream.

3.3 Summary of Anticipated Impacts

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

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

3.3.1 Terrestrial Communities

Terrestrial communities in the project area will be impacted permanently by project construction from clearing and paving. Estimated impacts are based on the length of the alternate and the entire study corridor width. **Table 1** describes the potential impacts to terrestrial communities by habitat type. Because impacts are based on the entire study corridor width, the actual loss of habitat will likely be less than the estimate. **Insert Alternate dimensions here. Table 1 should be completed following project design.**

Table 1. Estimated Area of Impact to Terrestrial Communities

	Area of Impact in Acres (Hectares)			
	Alternate 1		Alternate 2	
Community	**Temporary**	**Permanent**	**Temporary**	**Permanent**
Disturbed Roadside				
Pasture				
Hardwood Forest				
Riparian Buffer				
Powerline Right-of-Way				
Total Impact				

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

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

3.3.2 Aquatic Communities

Impacts to aquatic communities include fluctuations in water temperatures as a result of the loss of riparian vegetation. Shelter and food resources, both in the aquatic and terrestrial portions of these organisms' life cycles, will be affected by losses in the

terrestrial communities. The loss of aquatic plants and animals will affect terrestrial fauna that rely on them as a food source.

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

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

4.0 JURISDICTIONAL TOPICS

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

4.1 Waters of the United States

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

4.1.1 Characteristics of Wetlands and Surface Waters

The Asheboro, NC NWI map shows no wetlands in the project vicinity. No jurisdictional wetlands were observed within the project area during field activities. Vestal Creek meets the definition of surface waters, and therefore is classified as a Water of the United States. The channel of Vestal Creek is about 8-10 feet (2.4-3.0 m) wide within the project area.

4.1.2 Bridge Demolition

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

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

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

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

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

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

Vestal Creek in the vicinity of the proposed project is a *Class C* water, therefore no restrictions are imposed on watershed development activities. Furthermore, Vestal Creek has not been identified as a special resource water, is not associated with fish migration, spawning or larval recruitment, and does not contain any threatened or endangered species. For these reasons, Case 3 applies to the proposed replacement of Bridge No. 257 over Vestal Creek. Should evidence of any protected fish or mussel species become known, demolition and/or construction moratoriums might be imposed.

Add information regarding superstructure and fill here.

The streambed in the project area is nearly all bedrock and cobbles. However this stream has high sediment loads. Therefore, conditions in the stream raise sediment concerns and a turbidity curtain is recommended.

4.1.3 Summary of Anticipated Impacts

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

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

No wetland areas were identified within the project area. Project construction cannot be accomplished without infringing on the surface waters. Anticipated surface water impacts fall under the jurisdiction of the USACE and the DWQ. **Add information regarding stream impacts here.**

4.1.4 Permits

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

Construction is likely to be authorized by Nationwide Permit (NWP) No. 23, as promulgated under 61 FR 65874, 65916; December 13, 1996. This permit authorizes activities undertaken, assisted, authorized, regulated, funded, or financed in whole or in part, by another Federal agency or department where that agency or department has determined that, pursuant to the Council on Environmental Quality Regulations for Implementing the Procedural Provisions of the National Environmental Policy Act:

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

This project will also require a 401 Water Quality Certification or waiver thereof, from the Department of Environment and Natural Resources (DENR) prior to issuance of the NWP 23. Section 401 of the Clean Water Act requires that the state issue or deny water certification for any federally permitted or licensed activity that results in a discharge into Waters of the U.S. Final permit decision rests with the USACE.

4.1.5 Avoidance, Minimization, Mitigation

Because this project will likely be authorized under a Nationwide Permit, mitigation for impacts to surface waters may or may not be required by the USACE. In accordance with the Division of Water Quality Wetland Rules [15A NCAC 211 .0506 (h)] "Fill or alteration of more than one acre of wetlands will require compensatory mitigation; and fill or alteration of more than 150 linear feet of streams may require compensatory mitigation." There are no wetland impacts associated with this project. There are approximately 200 linear feet of Vestal Creek within the study area. If the final length of

stream impact is greater than 150 linear feet (45.6 m), compensatory mitigation may be required.

4.2 Rare and Protected Species

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

4.2.1 Species Under Federal Protection

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

The USFWS lists 2 species under federal protection for Randolph County as of March 2001 (USFWS 2001). These species are listed in **Table 2.**

Table 2. Species Under Federal Protection in Randolph County

Scientific Name	Common Name	Federal Status
Vertebrates		
Cape Fear shiner	*Notropis mekistocholas*	E
Vascular Plants		
Schweinitz's sunflower	*Helianthus schweinitzii*	E

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

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

***Notropis mekistocholas* (Cape Fear shiner)** **Endangered**
Animal Family: Cyprinidae
Date Listed: 9-25-87

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

This fish prefers clean substrates. The species is generally associated with gravel, cobble, and boulder substrates and has been observed to inhabit slow pools, riffles, and slow runs. In these habitats, the species is typically associated with schools of other related species, but it is never the numerically dominant species. Juveniles are often found in slackwater, among large rock outcrops in midstream, and in flooded side channels and pools.

Biological conclusion **Unresolved**

The substrate of Vestal Creek is marginally suitable for the Cape Fear Shiner, but sediment loads are extremely high. A search of the NHP records found no occurrence of this species within the project vicinity. The Cape Fear shiner has been documented in Fork Creek in southeastern Randolph County, several miles to the south of the project area. It is recommended that qualified fisheries biologists verify the absence of this species within the project area with a follow-up investigation. The effect of this project on the Cape Fear Shiner remains unresolved.

***Helianthus schweinitzii* (Schweinitz's sunflower)** **Endangered**

Plant Family: Asteraceae
Date Listed: 5-7-91

Schweinitz's sunflower is a rhizomatous perennial herb that grows from 3 to 6 ft (1 to 2 m) tall from a cluster of carrot-like tuberous roots. Stems are usually solitary, branching only at or above mid-stem. The stem is usually pubescent but can be nearly glabrous; it is often purple. The lanceolate leaves are opposite on the lower stem, changing to alternate above. They are variable in size, being generally larger on the lower stem, and gradually reduced upwards. The pubescence of the underside of the leaves is distinctive and is one of the best characters to distinguish Schweinitz's sunflower from its relatives. The upper surface of the leaves is rough, with the broad-based spinose hairs directed toward the tip of the leaf. From September to frost, Schweinitz's sunflower blooms with comparatively small heads of yellow flowers.

The species occurs in clearings and edges of upland woods on moist to dryish clays, clay-loams, or sandy clay-loams that often have high gravel content and are moderately podzolized. Schweinitz's sunflower usually grows in open habitats not typical of the current general landscape in the Piedmont of the Carolinas. Some of the associated species, many of which are also rare, have affinities to glade and prairie habitats of the Midwest. Other species are associated with fire-maintained sandhills and savannas of the Atlantic Coastal Plain and piedmont. The habitat of this sunflower tends to be dominated by members of the aster, pea, and grass families, an association emphasizing affinities of the habitat to both longleaf pine-dominated sandhills and savannas of the southeastern coastal plain and to glades, barrens, and prairies of the Midwest and Plains (Weakley and Houk, 1992).

Biological Conclusion **Unresolved**

No habitat for Schweinitz's sunflower occurs within the project area, and no individuals of this species were observed. The adjoining terrestrial communities do not include any of the natural community types associated with this species. Soils of the area are of marginal quality to support this species. One occurrence of this species is approximately 1.5 miles (2.4 km) north of the project site. However, Schweinitz's sunflower blooms late August to late October, and it would be appropriate to make an additional visit to the site during this time to verify the absence of this species. The effect of the proposed project on this species is currently unresolved.

4.2.2 Federal Species of Concern and State Status

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

Table 3. Federal Species of Concern in Randolph County

Scientific Name	Common Name	State Status	Habitat present
Vertebrates			
Carolina darter	*Etheostoma collis lepidinion*	SR	NO
Carolina redhorse	*Moxostoma sp.*	SR	YES
Invertebrates			
Atlantic pigtoe	*Fusconaia masoni*	T	YES
Brook floater	*Alasmidonta varicosa*	T	NO
Carolina creekshell	*Villosa vaughaniana*	SC	YES
Pee Dee crayfish ostracod	*Dactyloctythere peedeensis*	none	YES

Sources: Amoroso, ed., 1999; LeGrand and Hall, eds., 1999
Key: T = Threatened, E = Endangered, SC = Special Concern, C = Candidate, SR = Significantly Rare

No FSC species were observed during the site visit, and none are recorded at NHP as occurring within 2 miles (3.2 km) of the project area. Habitat is present for the Carolina redhorse, Atlantic pigtoe, and Carolina creekshell, however Earth Tech biologists did not conduct searches for these species.

According to information given on the NCWRC Nongame and Endangered Wildlife Program's "North Carolina Freshwater Mussels" website (30 July 2001) the Carolina creekshell does not currently exist in Vestal Creek. Furthermore Shari Bryant, fisheries biologist with the NCWRC, stated that no protected fish or mussel species are known to occur in this stream. Ms. Bryant forwarded a copy of Earth Tech's request for information to NCWRC nongame and endangered species biologists, who will reply in the event that any protected species information becomes available. Thorough searches by qualified fisheries biologists are necessary to confirm or deny the presence of these species within the project area.

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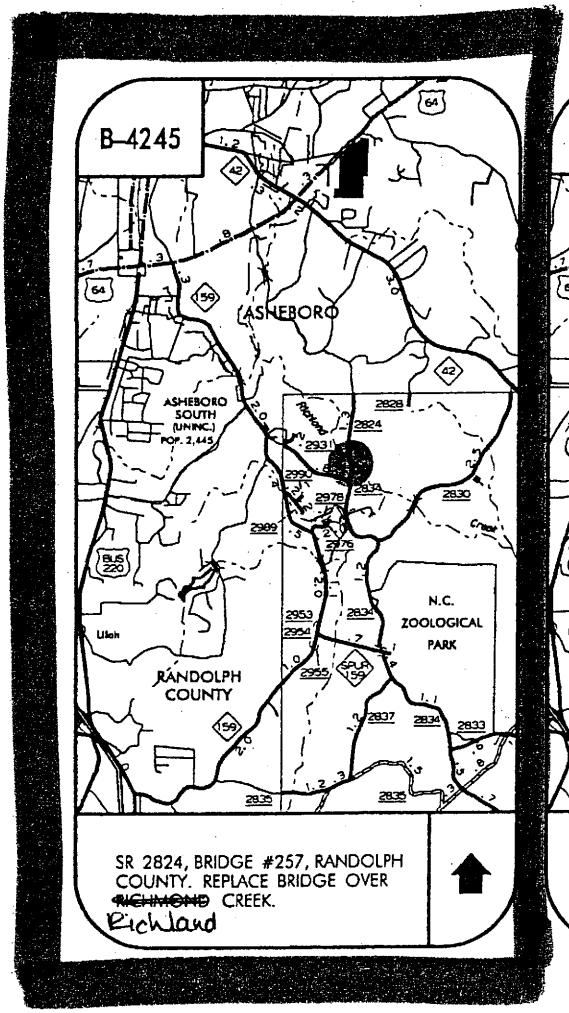
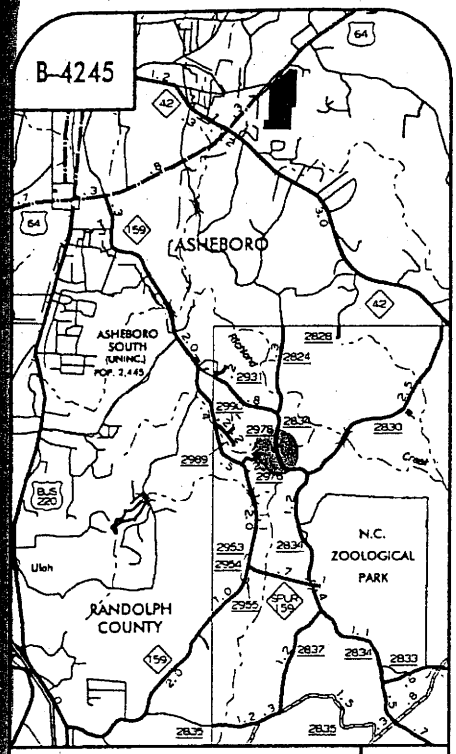
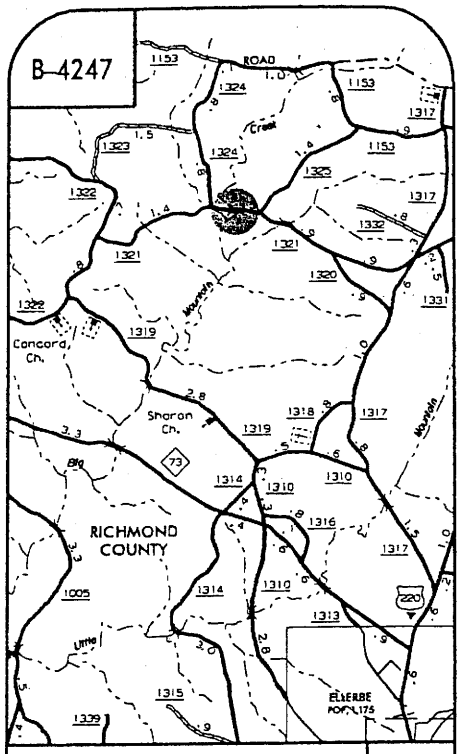


SR 2824, BRIDGE #257, RANDOLPH COUNTY. REPLACE BRIDGE OVER ~~RICHMOND~~ Richland CREEK.



SR 2834, BRIDGE #228, RANDOLPH COUNTY. REPLACE BRIDGE OVER RICHLAND CREEK.



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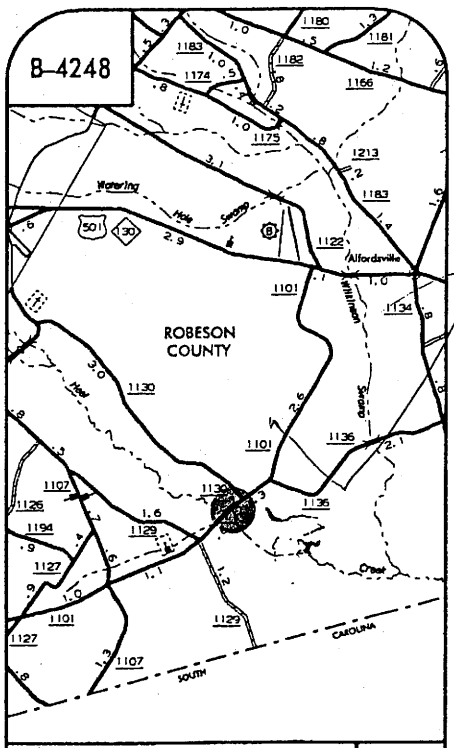
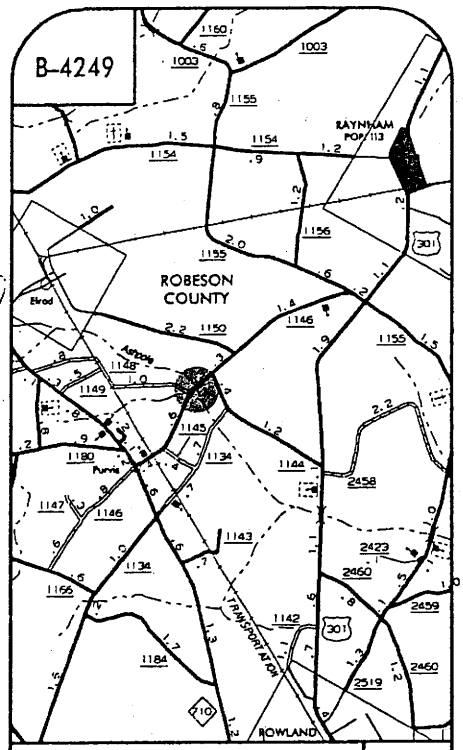
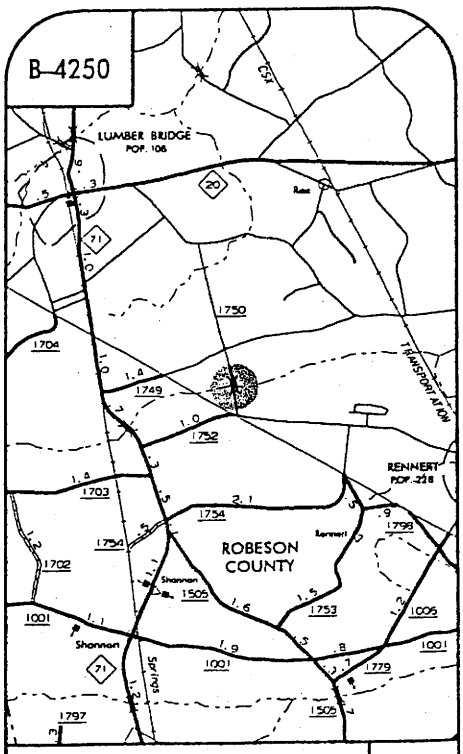


SR 1101, BRIDGE #170, ROBESON COUNTY. REPLACE BRIDGE OVER SHOE HEEL CREEK.



SR 1146, BRIDGE #143, ROBESON COUNTY. REPLACE BRIDGE OVER ASHPOLE SWAMP.



SR 1750, BRIDGE #35, ROBESON COUNTY. REPLACE BRIDGE OVER BIG MARSH SWAMP.


Study limits
Hardwoods
Hardwoods
Shed
House
HW
Dist. Roadside
Dist. Roadside
Driveway
Pasture
Pasture
Gravel Road
Powerline Row
Roadside
Hardwoods
Study limits
Barn
N
B-4245