



STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION

MICHAEL F. EASLEY  
GOVERNOR

LYNDO TIPPETT  
SECRETARY

October 4, 2005

Division of Coastal Management  
Hestron Plaza II  
151-B NC Highway 24  
Morehead City, NC 28557

**ATTENTION:** Mr. Bill Arrington  
District Manager

Dear Mr. Arrington:

**SUBJECT:** **Application for CAMA Major Development Permit** for the proposed replacement of Bridge No. 10 over Doctor's Creek on SR 1305 and 1155 in Duplin and Pender County, Division 3. Federal Aid No. BRZ-1305(2), \$400 Debit Work Order State Project No. 8.2271501, WBS Number 33568.1.1; TIP No. B-4224.

Please find enclosed the Categorical Exclusion (CE) document, the Natural Resource Technical Report (NRTR), permit drawings, and design plan sheets, MP1 and MP5 forms, EEP Confirmation letter and a copy of postal notifications for Adjacent Riparian Property Owners.

#### PROJECT DESCRIPTION

The North Carolina Department of Transportation (NCDOT) proposes to replace Bridge No. 63 over Doctors Creek on SR 1305 on the Duplin/ Pender County line. The existing bridge will be replaced with a 145-foot long bridge along the existing alignment. The proposed bridge replacement will be a spanning structure, thereby eliminating the piles in the stream channel. The normal water level in the project area is 29.5 feet above msl. During construction, traffic will be detoured along existing area roads. Top down construction will be used. There will be no in water construction between February 15 and June 30 to protect anadromous fish spawning. Total bottomland hardwood wetland impacts are 0.32 acres. No primary nursery areas are located in the project area.

#### PROPOSED IMPACTS

Doctors Creek (DWQ Index No. 18-74-29-3) Class C Sw, and associated wetlands will be impacted by the proposed project. Construction of the proposed project will result in 0.32 acre of impacts consisting of 0.28 acres of fill and 0.04 acres of excavation in bottomland hardwood wetlands. The 0.32 acres of fill in wetlands are due to the widening of the fill slopes resulting from widening of the road. Bridge No. 63 will be replaced with a three span structure, using top down construction.

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

TELEPHONE: 919-715-1500  
FAX: 919-715-1501

WEBSITE: [WWW.NCDOT.ORG](http://WWW.NCDOT.ORG)

**LOCATION:**  
TRANSPORTATION BUILDING  
1 SOUTH WILMINGTON STREET  
RALEIGH NC

## **MITIGATION**

**AVOIDANCE AND MINIMIZATION:** 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 and include:

- Best Management Practices for the Protection of Surface Waters and Bridge Demolition and Removal will be followed.
- Top Down Construction will be used
- No Bents will be placed in the water
- No additional impacts will occur as a result of utility relocations
- Fill slopes will be 3:1 in jurisdictional wetlands (2:1 Fill slopes cannot be stabilized in the sandy soils that are in the project area)
- No Mechanized clearing will be used outside of the cut/fill limits (Method II)
- Rip rap has been added at the pipe outlets around Station 16+00 to prevent any scour

The Department has avoided and minimized impacts to jurisdictional resources to the greatest extent possible as described above. The remaining, unavoidable impacts to 0.32 acres of jurisdictional wetlands will be offset by compensatory mitigation provided by the EEP program. See attached confirmation letter from EEP.

## **BRIDGE DEMOLITION**

The super structure of Bridge No. 63 is composed of pre-stressed concrete channels with an asphalt-wearing surface. The substructure is composed of pre-cast concrete caps on timber piles. Bridge components will be removed without dropping any components into Doctor's Creek. In accordance with NCDOT's Best Management Practices for Bridge Demolition and removal for projects that require a CAMA permit, no components of the bridge will be allowed to drop into the water.

All guidelines for bridge demolition and removal will be followed in addition to Best Management Practices for the Protection of Surface Waters and BMP's for Bridge Demolition and Removal.

## **FEDERALLY-PROTECTED SPECIES**

Plants and animals with federal classifications of Endangered, Threatened, Proposed Endangered, and Proposed Threatened are protected under provisions of Section 7 and Section 9 of the Endangered Species Act of 1973, as amended. As of January 29, 2003, the United States Fish and Wildlife Service lists eleven federally protected species for Pender and Duplin County. Of these species, the American alligator (*Alligator mississippiensis*) is listed threatened due to similarity in appearance and is not subject to Section 7 consultation. There is potential habitat for the manatee and the shortnose sturgeon at this project location, but it is unlikely that either will be encountered. However, NCDOT will commit to adhering to the Fish and Wildlife Service Guidelines for Avoiding Impacts to the West Indian Manatee (see attached Guidelines). A biological conclusion of "No Effect" has been rendered for the West Indian manatee. NCDOT also commits to the above mentioned construction moratorium and adherence to best management practices to avoid

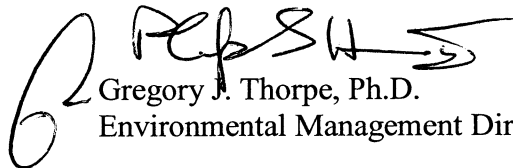
impacts to the shortnose sturgeon. The Biological Conclusion of "May Affect, Not Likely to Adversely Affect" for the shortnose sturgeon remains valid. Biological conclusions of "No Effect" documented in the CE for the remaining species given based on the absence of habitat within the project area remain valid.

### REGULATORY APPROVALS

NCDOT requests that the proposed work be authorized under a Coastal Area Management Act Major Development Permit. We have provided a method of debiting \$475 to be submitted to the DCM for processing the CAMA permit, as noted in the subject line of this application. In a separate application, we are also requesting issuance of a United States Army Corps of Engineers Nationwide Permit 23.

Thank you for your assistance with this project. If you have any questions or need additional information please call Mr. Brett Feulner at (919) 715-1488.

Sincerely,



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

GJT/bmf

Cc: w/ attachment

Ms. Cathy Brittingham, NCDCM  
Mr. David Timpy, USACE, Wilmington  
Mr. John Hennessy, DWQ, Raleigh  
Mr. Travis Wilson, NCWRC  
Mr. Gary Jordan, USFWS  
Mr. Ron Sechler, NMFS  
Mr. Mike Street, NCDMF

Mr. Steve Sollod, NCDCM  
Mr. Mason Herndon, DEO  
Mr. H. Allen Pope, P.E., Div. 3 Engineer  
Mr. David Chang, P.E., Hydraulics  
Mr. Greg Perfetti, P.E., Structure Design  
Mr. Mark Staley, Roadside Environmental

w/o attachment

Mr. Jay Bennett, P.E., Roadway Design  
Mr. Omar Sultan, Programming and TIP  
Mr. Art McMillan, P.E., Highway Design  
Mr. Todd Jones, NCDOT External Audit Branch

Ms. Beth Harmon, EEP  
Mr. Bill Goodwin, PDEA  
Mr. Scott McLendon, USACE, Wilmington



September 20, 2005



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

Dear Dr. Thorpe:

Subject: EEP Mitigation Acceptance Letter:

**B-4224**, Bridge 63 over the Doctor's Creek, Duplin and Pender Counties

The purpose of this letter is to notify you that the Ecosystem Enhancement Program (EEP) will provide the compensatory riverine wetland mitigation for the subject project. Based on the information supplied by you in a letter dated September 9, 2005, the impacts are located in CU 03030007 of the Cape Fear River Basin in the Southern Inner Coastal Plain (SICP) and Southern Outer Coastal Plain (SOCP) Eco-Regions, and are as follows:

Riverine Wetland Impacts: 0.32 acre

The subject project is not listed in Exhibit 2 of the Memorandum of Agreement among the North Carolina Department of Environment and Natural Resources, the North Carolina Department of Transportation, and the U. S. Army Corps of Engineers, Wilmington District dated July 22, 2003. Mitigation for this project will be provided in accordance with the above referenced agreement. EEP will commit to implementing sufficient compensatory riverine wetland mitigation to offset the impacts associated with this project by the end of the MOA year in which this project is permitted, in accordance with Section X of the Tri-Party MOA.

If you have any questions or need additional information, please contact Ms. Beth Harmon at 919-715-1929.

Sincerely,

William D. Gilmore, P.E.  
EEP Director

cc: Mr. David Timpy, USACE-Wilmington  
Mr. John Hennessy, Division of Water Quality, Wetlands/401 Unit  
File: B-4224

*Restoring... Enhancing... Protecting Our State*





**SENDER: COMPLETE THIS SECTION**

- Complete items 1, 2, and 3. Also complete item 4 if Restricted Delivery is desired.
- Print your name and address on the reverse so that we can return the card to you.
- Attach this card to the back of the mailpiece, or on the front if space permits.

1. Article Addressed to:

Armenius Pigford  
4355 Williard Road  
Willard, NC 28478

2. Article Number  
(Transfer from service label)

7003 3110 0000 6901 6540

PS Form 3811, August 2001

Domestic Return Receipt

102595-02-M-1035

**SENDER: COMPLETE THIS SECTION**

- Complete items 1, 2, and 3. Also complete item 4 if Restricted Delivery is desired.
- Print your name and address on the reverse so that we can return the card to you.
- Attach this card to the back of the mailpiece, or on the front if space permits.

Article Addressed to:

Josephine Osborne  
2514 Beachwood Drive  
Tarboro, NC 27886

Article Number  
(Transfer from service label)

7003 3110 0000 6901 6533

PS Form 3811, August 2001

Domestic Return Receipt

102595-02-M-1035

**COMPLETE THIS SECTION ON DELIVERY**

- A. Signature  Agent  Addressee
- B. Received by (Printed Name)  Date of Delivery
- C. Date of Delivery
- D. Is delivery address different from item 1?  Yes  No

If YES, enter delivery address below:

- 3. Service Type
- Certified Mail  Express Mail
- Registered  Return Receipt for Merchandise
- Insured Mail  C.O.D.

4. Restricted Delivery? (Extra Fee)  Yes

**COMPLETE THIS SECTION ON DELIVERY**

- A. Signature  Agent  Addressee
- B. Received by (Printed Name)  Date of Delivery
- C. Date of Delivery
- D. Is delivery address different from item 1?  Yes  No

If YES, enter delivery address below:

- 3. Service Type
- Certified Mail  Express Mail
- Registered  Return Receipt for Merchandise
- Insured Mail  C.O.D.

4. Restricted Delivery? (Extra Fee)  Yes

**SENDER: COMPLETE THIS SECTION**

- Complete items 1, 2, and 3. Also complete item 4 if Restricted Delivery is desired.
- Print your name and address on the reverse so that we can return the card to you.
- Attach this card to the back of the mailpiece, or on the front if space permits.

1. Article Addressed to:

Duplin Street Limited Partnership  
WW Smith  
220 S Duplin Street  
Wallace, NC 24492

2. Article Number  
(Transfer from service label)

7003 3110 0000 6901 6458

PS Form 3811, August 2001

Domestic Return Receipt

102595-02-M-1035

**COMPLETE THIS SECTION ON DELIVERY**

- A. Signature  Agent  Addressee
- B. Received by (Printed Name)  Date of Delivery
- C. Date of Delivery
- D. Is delivery address different from item 1?  Yes  No

If YES, enter delivery address below:

- 3. Service Type
- Certified Mail  Express Mail
- Registered  Return Receipt for Merchandise
- Insured Mail  C.O.D.

4. Restricted Delivery? (Extra Fee)  Yes

# APPLICATION

(To be completed by all applicants)

Wallace

## 1. APPLICANT

a. Landowner:

Name NC Department of Transportation

Address 1598 Mail Service Center

City Raleigh State N.C.

Zip 27699 Day Phone 919-715-1488

Fax 919-715-1501

b. Authorized Agent:

Name Brett Feulner

Address same as above

City \_\_\_\_\_ State N.C.

Zip \_\_\_\_\_ Day Phone \_\_\_\_\_

Fax \_\_\_\_\_

c. Project name (if any) B-4224

*NOTE: Permit will be issued in name of landowner(s), and/or project name.*

## 2. LOCATION OF PROPOSED PROJECT

a. County Pender/Duplin

b. City, town, community or landmark

Revised 03/95

c. Street address or secondary road number  
SR 1305 Doctor's Creek Road

d. Is proposed work within city limits or planning jurisdiction? \_\_\_\_\_ Yes X No

e. Name of body of water nearest project (e.g. river, creek, sound, bay) Doctor's Creek

## 3. DESCRIPTION AND PLANNED USE OF PROPOSED PROJECT

a. List all development activities you propose (e.g. building a home, motel, marina, bulkhead, pier, and excavation and/or filling activities).

Bridge Construction - Replace existing bridge in the same location. Traffic will be maintained by utilizing an offsite detour.

b. Is the proposed activity maintenance of an existing project, new work, or both? New

c. Will the project be for public, private or commercial use? Public

d. Give a brief description of purpose, use, methods of construction and daily operations of proposed project. If more space is needed, please attach additional pages. Bridge # 63 needs to be replaced due to deterioration of the existing structure (36.3/100 sufficiency rating). Traffic will be maintained by utilizing an offsite detour along existing roads. Projected traffic volume is 1400 VPD for the year 2025.

**4. LAND AND WATER CHARACTERISTICS**

- a. Size of entire tract Two lane travel way within 60' of R/W
- b. Size of individual lot(s) N/A
- c. Approximate elevation of tract above MHW or NWL 35 feet above sea level
- d. Soil type(s) and texture(s) of tract Muckalee loam, mixed alluvial land
- e. Vegetation on tract Loblolly pine, yellow poplar, willow oak, red bay, bayberry, inkberry, gall berry, sweetbay, switchcane
- f. Man-made features now on tract Existing Bridge and approaches
- g. What is the CAMA Land Use Plan land classification of the site? (*Consult the local land use plan.*)  

<input type="checkbox"/> Conservation	<input type="checkbox"/> Transitional
<input type="checkbox"/> Developed	<input type="checkbox"/> Community
<input checked="" type="checkbox"/> Rural	<input type="checkbox"/> Other
- h. How is the tract zoned by local government? N/A
- i. Is the proposed project consistent with the applicable zoning?  Yes  No  
*(Attach zoning compliance certificate, if applicable)*
- j. Has a professional archaeological assessment been done for the tract?  Yes  No  
If yes, by whom? NCDOT Staff - see CE
- k. Is the project located in a National Registered Historic District or does it involve a National Register listed or eligible property?  
 Yes  No
- l. Are there wetlands on the site?  Yes  No  
Coastal (marsh)  Other   
If yes, has a delineation been conducted?  Yes  No  
*(Attach documentation, if available)*
- m. Describe existing wastewater treatment facilities.  
N/A

- n. Describe location and type of discharges to waters of the state. (For example, surface runoff, sanitary wastewater, industrial/commercial effluent, "wash down" and residential discharges.) Surface Runoff
- o. Describe existing drinking water supply source.  
N/A  
Doctor's Creek is classified as Class "C" "Sw"

**5. ADDITIONAL INFORMATION**

In addition to the completed application form, the following items must be submitted:

- **A copy of the deed** (with state application only) or other instrument under which the applicant claims title to the affected properties. If the applicant is not claiming to be the owner of said property, then forward a copy of the deed or other instrument under which the owner claims title, plus written permission from the owner to carry out the project.
- **An accurate, dated work plat** (including plan view and cross-sectional drawings) drawn to scale in black ink on an 8 1/2" by 11" white paper. (Refer to Coastal Resources Commission Rule 7J.0203 for a detailed description.)  
  
**Please note** that original drawings are preferred and only high quality copies will be accepted. Blue-line prints or other larger plats are acceptable only if an adequate number of quality copies are provided by applicant. (Contact the U.S. Army Corps of Engineers regarding that agency's use of larger drawings.) A site or location map is a part of plat requirements and it must be sufficiently detailed to guide agency personnel unfamiliar with the area to the site. Include highway or secondary road (SR) numbers, landmarks, and the like.
- **A Stormwater Certification**, if one is necessary.
- **A list of the names and complete addresses of the adjacent waterfront (riparian) landowners and signed return receipts as proof that such owners have received a copy of the application and plats by certified mail.** Such landowners must be advised that they have 30 days in which to submit comments

**Form DCM-MP-1**

on the proposed project to the Division of Coastal Management. Upon signing this form, the applicant further certifies that such notice has been provided.

Name See permit drawings

Address \_\_\_\_\_

Phone \_\_\_\_\_

Name \_\_\_\_\_

Address \_\_\_\_\_

Phone \_\_\_\_\_

Name \_\_\_\_\_

Address \_\_\_\_\_

Phone \_\_\_\_\_

- A list of previous state or federal permits issued for work on the project tract. Include permit numbers, permittee, and issuing dates.

N/A - Existing Bridge constructed in 1966.

- A check for \$250 made payable to the Department of Environment, Health, and Natural Resources (DEHNR) to cover the costs of processing the application.

- A signed AEC hazard notice for projects in oceanfront and inlet areas.

- A statement of compliance with the N.C. Environmental Policy Act (N.C.G.S. 113A - 1 to 10) If the project involves the expenditure of public funds or use of public lands, attach a statement documenting compliance with the North Carolina Environmental Policy Act.

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**6. CERTIFICATION AND PERMISSION TO ENTER ON LAND**

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I understand that any permit issued in response to this application will allow only the development described in the application. The project will be subject to conditions and restrictions contained in the permit.

I certify that to the best of my knowledge, the proposed activity complies with the State of North Carolina's

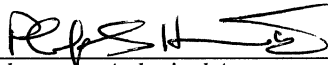
approved Coastal Management Program and will be conducted in a manner consistent with such program.

I certify that I am authorized to grant, and do in fact, grant permission to representatives of state and federal review agencies to enter on the aforementioned lands in connection with evaluating information related to this permit application and follow-up monitoring of the project.

I further certify that the information provided in this application is truthful to the best of my knowledge.

This is the 3rd day of October, 192005.

Print Name Philip S. Harris III

Signature   
*Landowner or Authorized Agent*

Please indicate attachments pertaining to your proposed project.

- DCM MP-2 Excavation and Fill Information
- DCM MP-3 Upland Development
- DCM MP-4 Structures Information
- DCM MP-5 Bridges and Culverts
- DCM MP-6 Marina Development

**NOTE:** Please sign and date each attachment in the space provided at the bottom of each form.

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# BRIDGES AND CULVERTS

Attach this form to Joint Application for CAMA Major Permit, Form DCM-MP-1. Be sure to complete all other sections of the Joint Application that relate to this proposed project.

## 1. BRIDGES

- a. Public  Private
- b. Type of bridge (construction material)  
Cored Slab, Asphalt and concrete
- c. Water body to be crossed by bridge  
Doctor's Creek
- d. Water depth at the proposed crossing at MLW or  
NWL 3.0 feet +/-
- e. Will proposed bridge replace an existing bridge?  
 Yes  No  
If yes,
  - (1) Length of existing bridge 121 feet
  - (2) Width of existing bridge 25.6 feet
  - (3) Navigation clearance underneath existing  
bridge 10 feet
  - (4) Will all, or a part of, the existing bridge be  
removed? (Explain) All of the existing  
bridge will be replaced
- f. Will proposed bridge replace an existing culvert(s)?  
 Yes  No  
If yes,
  - (1) Length of existing culvert \_\_\_\_\_
  - (2) Width of existing culvert \_\_\_\_\_
  - (3) Height of the top of the existing culvert above  
the MHW or NWL \_\_\_\_\_
  - (4) Will all, or a part of, the existing culvert be  
removed? (Explain) \_\_\_\_\_
- g. Length of proposed bridge 145 feet
- h. Width of proposed bridge 33 feet
- i. Height of proposed bridge above wetlands  
5 to 6 feet

- j. Will the proposed bridge affect existing water flow?  
 Yes  No  
If yes, explain \_\_\_\_\_  
\_\_\_\_\_
- k. Navigation clearance underneath proposed bridge  
9.5 feet
- l. Will the proposed bridge affect navigation by  
reducing or increasing the existing navigable  
opening?  Yes  No  
If yes, explain Navigation clearance will be reduced  
from 10 feet to 9.5 feet because the new bridge will  
span the existing channel. In order to span the  
channel the substructure (27 " box girders) will be  
slightly thicker
- m. Will the proposed bridge cross wetlands containing  
no navigable waters?  Yes  No  
If yes, explain Additional Roadway Fill for shoulder  
improvements.
- n. Have you contacted the U.S. Coast Guard  
concerning their approval?  
 Yes  No  
If yes, please provide record of their action.

2. CULVERTS

- a. Water body in which culvert is to be placed \_\_\_\_\_
- b. Number of culverts proposed \_\_\_\_\_
- c. Type of culvert (construction material, style) \_\_\_\_\_
- d. Will proposed culvert replace an existing bridge? \_\_\_\_\_  
 Yes  No  
 If yes,  
 (1) Length of existing bridge \_\_\_\_\_  
 (2) Width of existing bridge \_\_\_\_\_  
 (3) Navigation clearance underneath existing bridge \_\_\_\_\_  
 (4) Will all, or a part of, the existing bridge be removed? (Explain) \_\_\_\_\_
- e. Will proposed culvert replace an existing culvert? \_\_\_\_\_  
 Yes  No  
 If yes,  
 (1) Length of existing culvert \_\_\_\_\_  
 (2) Width of existing culvert \_\_\_\_\_  
 (3) Height of the top of the existing culvert above the MHW or NWL \_\_\_\_\_  
 (4) Will all, or a part of, the existing culvert be removed? (Explain) \_\_\_\_\_
- f. Length of proposed culvert \_\_\_\_\_
- g. Width of proposed culvert \_\_\_\_\_
- h. Height of the top of the proposed culvert above the MHW or NWL \_\_\_\_\_
- i. Will the proposed culvert affect existing water flow? \_\_\_\_\_  
 Yes  No  
 If yes, explain \_\_\_\_\_
- j. Will the proposed culvert affect existing navigation potential? \_\_\_\_\_  
 Yes  No  
 If yes, explain \_\_\_\_\_

- a. Will the placement of the proposed bridge or culvert require any excavation below the MHW or NWL? \_\_\_\_\_  
 Yes  No  
 If yes,  
 (1) Length of area to be excavated \_\_\_\_\_  
 (2) Width of area to be excavated \_\_\_\_\_  
 (3) Depth of area to be excavated \_\_\_\_\_  
 (4) Amount of material to be excavated in cubic yards \_\_\_\_\_
- b. Will the placement of the proposed bridge or culvert require any excavation within:  
 Coastal Wetlands  SAVs  Other Wetlands  
 If yes,  
 (1) Length of area to be excavated 230 feet  
 (2) Width of area to be excavated 7.5 feet  
 (3) Amount of material to be excavated in cubic yards 64 C.Y. (1,728 ft<sup>3</sup>)
- c. Will the placement of the proposed bridge or culvert require any highground excavation? \_\_\_\_\_  
 Yes  No  
 If yes,  
 (1) Length of area to be excavated 105 feet  
 (2) Width of area to be excavated 15 feet  
 (3) Amount of material to be excavated in cubic yards 300 C.Y. (8,100 ft<sup>3</sup>)
- d. If the placement of the bridge or culvert involves any excavation, please complete the following:  
 (1) Location of the spoil disposal area  
An upland area to be determined by the contractor and approved by NCDOT  
 (2) Dimensions of spoil disposal area  
Unknown at this point  
 (3) Do you claim title to the disposal area?  
 Yes  No  
 If no, attach a letter granting permission from the owner.  
 (4) Will the disposal area be available for future maintenance?  Yes  No  
 (5) Does the disposal area include any coastal wetlands (marsh), SAVs, or other wetlands?  
 Yes  No  
 If yes, give dimensions if different from (2) above. \_\_\_\_\_  
 (6) Does the disposal area include any area below the MHW or NWL?  Yes  No  
 If yes, give dimension if different from No. 2 above. \_\_\_\_\_
- e. Will the placement of the proposed bridge or culvert result in any fill (other than excavated material described in Item d. above) to be placed below MHW or NWL? \_\_\_\_\_  
 Yes  No  
 If yes, \_\_\_\_\_

3. EXCAVATION AND FILL

Form DCM-MP-5

- (1) Length of area to be filled \_\_\_\_\_
- (2) Width of area to be filled \_\_\_\_\_
- (3) Purpose of fill \_\_\_\_\_

f. Will the placement of the proposed bridge or culvert result in any fill (other than excavated material described in Item d. above) to be placed within:

\_\_\_\_ Coastal Wetlands \_\_\_\_ SAVs X Other Wetlands

- (1) Length of area to be filled 940 feet
- (2) Width of area to be filled 13 feet
- (3) Purpose of fill Proposed roadway shoulder improvements

g. Will the placement of the proposed bridge or culvert result in any fill (other than excavated material described in Item d. above) to be placed on highground? X Yes \_\_\_\_ No

If yes,

- (1) Length of area to be filled 215 feet
- (2) Width of area to be filled 16 feet
- (3) Purpose of fill Proposed roadway shoulder improvements

f. What type of construction equipment will be used (for example, dragline, backhoe or hydraulic dredge)? Heavy highway construction equipment

g. Will wetlands be crossed in transporting equipment to project site? \_\_\_\_ Yes X No

If yes, explain steps that will be taken to lessen environmental impacts. \_\_\_\_\_

If yes, \_\_\_\_\_

h. Will the placement of the proposed bridge or culvert require any shoreline stabilization?

x Yes \_\_\_\_ No

If yes, explain in detail Riprap at end bents

NCDOT - B - 4224

Applicant or Project Name

[Signature]  
Signature

10/3/05  
Date

**4. GENERAL**

a. Will the proposed project involve any mitigation? X Yes \_\_\_\_ No

If yes, explain in detail Fill and excavation required for proposed roadway shoulder improvements will require offsite mitigation provided by EEP

b. Will the proposed project require the relocation of any existing utility lines? \_\_\_\_ Yes X No

If yes, explain in detail \_\_\_\_\_

c. Will the proposed project require the construction of any temporary detour structures?

\_\_\_\_ Yes X No

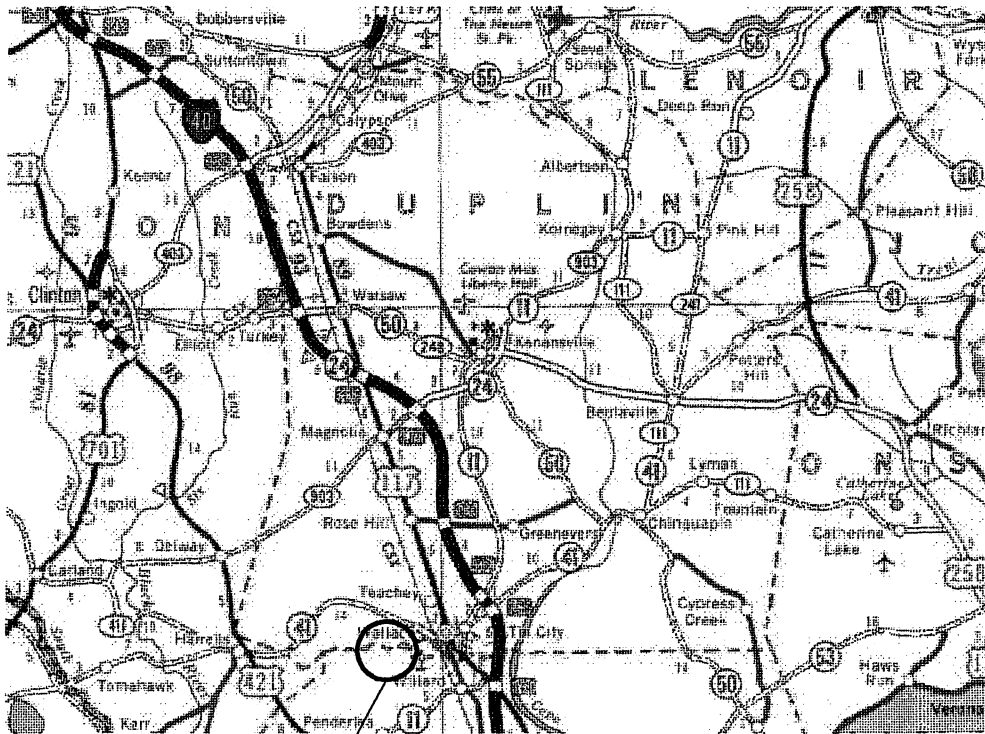
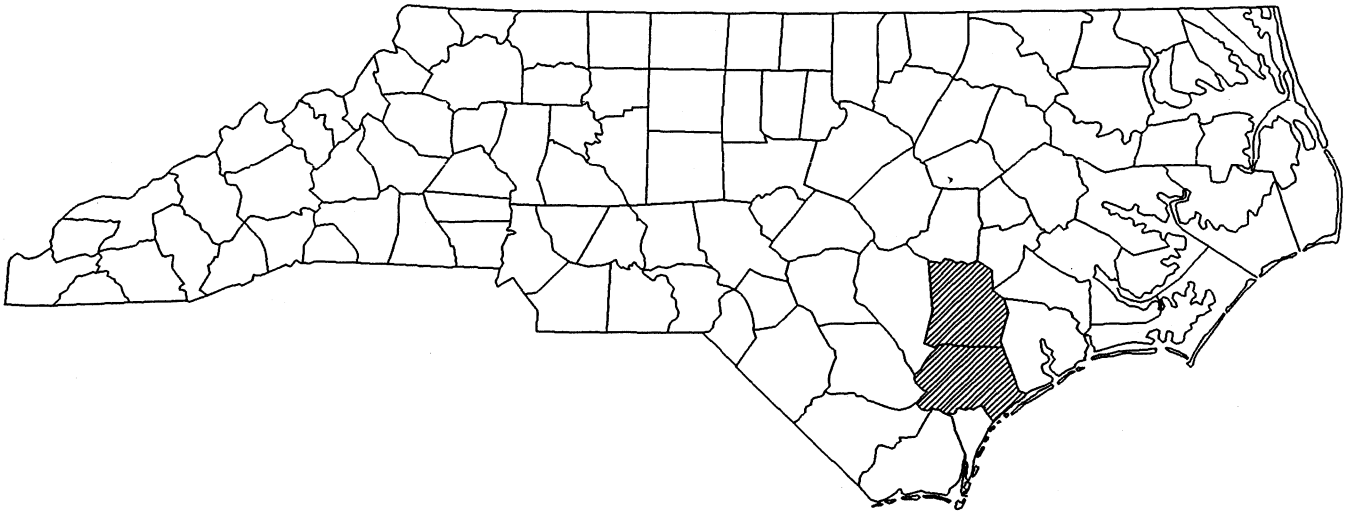
If yes, explain in detail \_\_\_\_\_

d. Will the proposed project require any work channels? \_\_\_\_ Yes X No

If yes, complete Form DCM-MP-2

e. How will excavated or fill material be kept on site and erosion controlled? NCDOT Best Management Practices: silt fence, type B silt basins, etc.

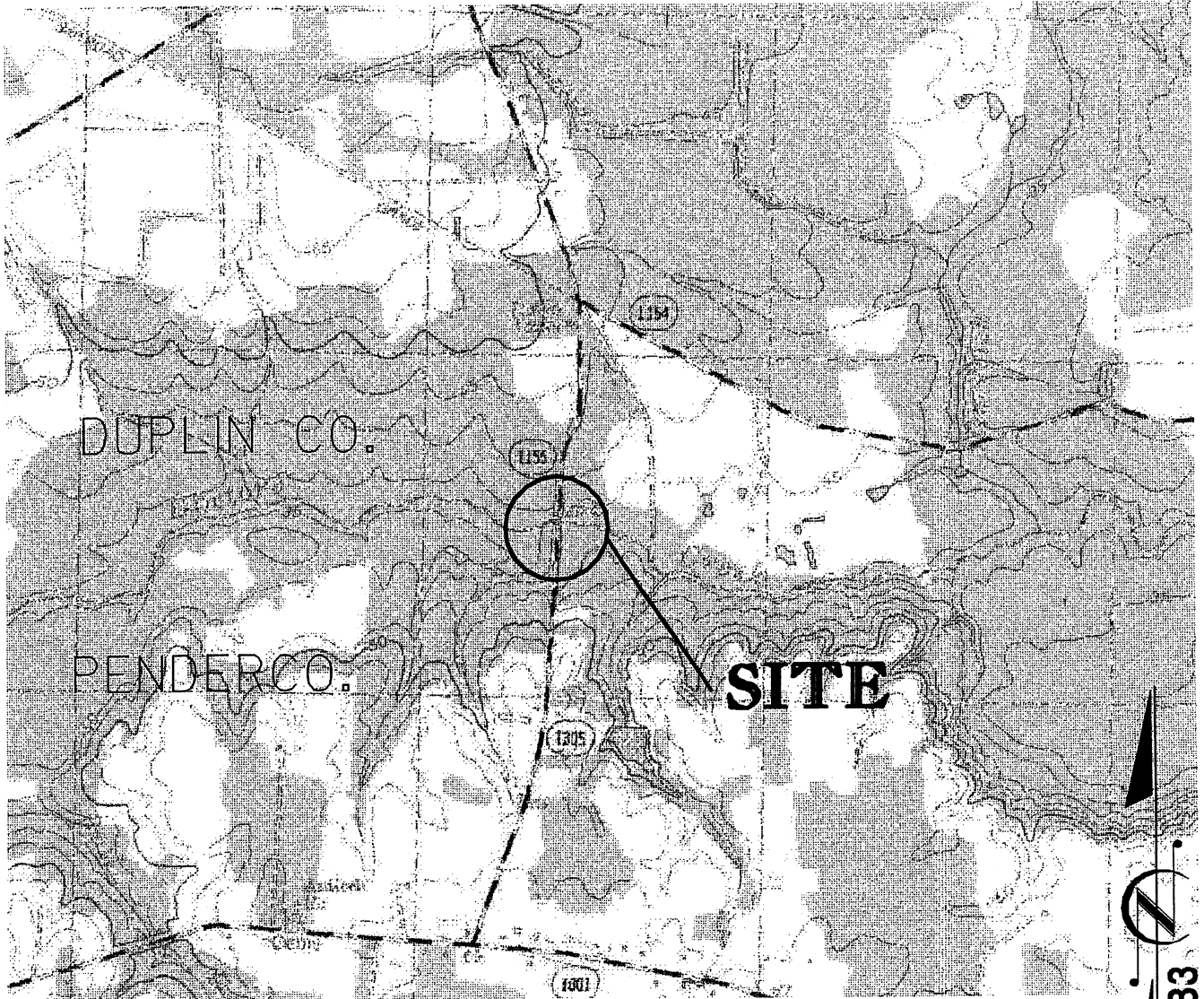
# NORTH CAROLINA



PROJECT  
VICINITY  
MAPS

**NCDOT**  
DIVISION OF HIGHWAYS  
DUPLIN/PENDER COUNTY  
PROJECT: 33568.1.1 (B-4224)  
REPLACE BRIDGE # 63 OVER  
DOCTORS CREEK ALONG  
SR1155 AND SR 1305



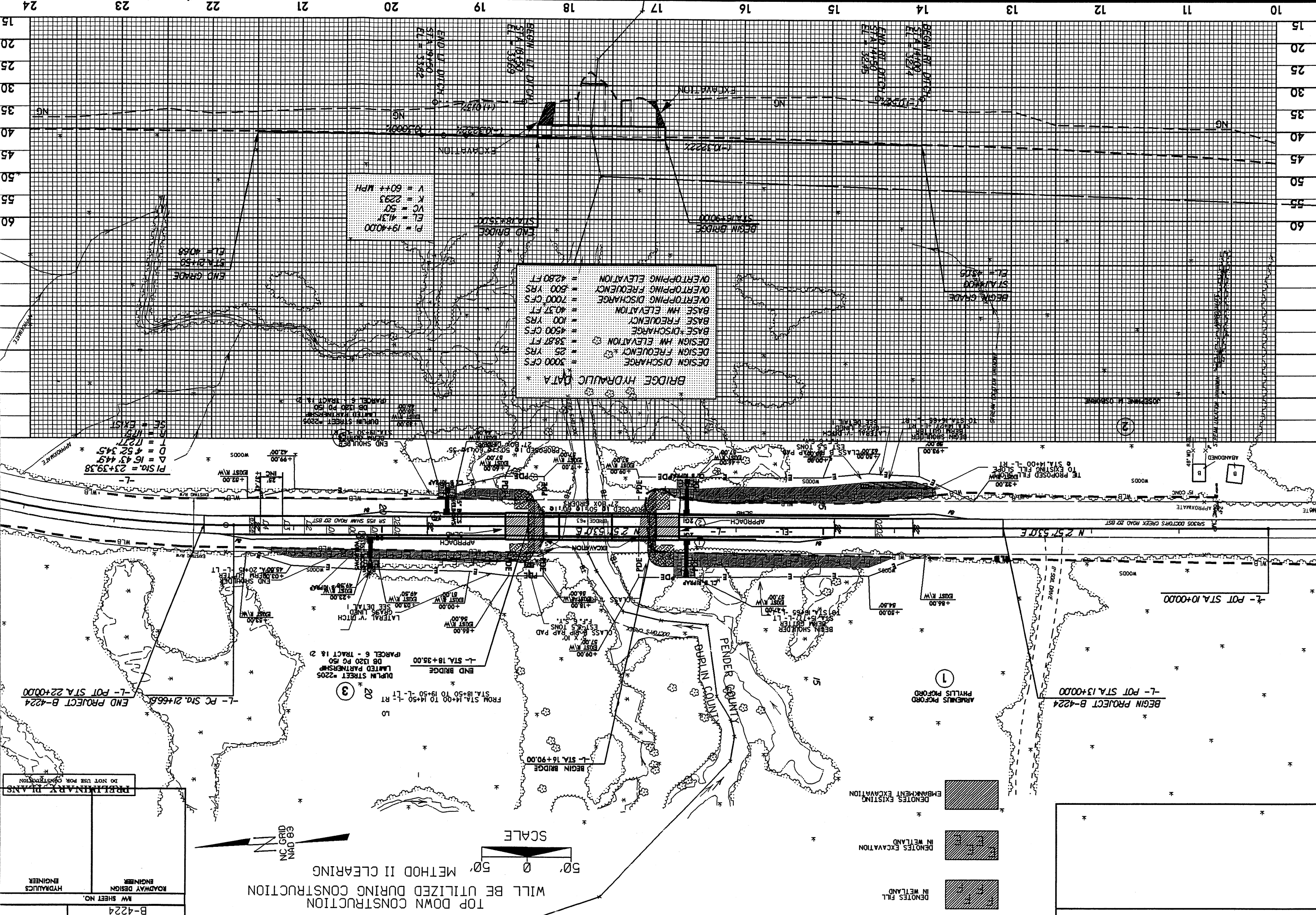


NOT TO SCALE



TOPOGRAPHIC  
MAPS

NCDOT  
DIVISION OF HIGHWAYS  
DUPLIN/PENDER COUNTY  
PROJECT: 33568.1.1 (B-4224)  
REPLACE BRIDGE # 63 OVER  
DOCTORS CREEK ALONG  
SR1155 AND SR 1305



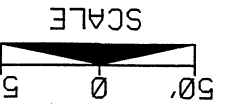
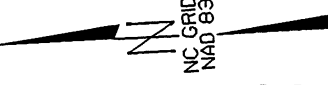
**BRIDGE HYDRAULIC DATA**

DESIGN DISCHARGE	= 3000 CFS
DESIGN FREQUNCY	= 25 YRS
DESIGN HW ELEVATION	= 38.87 FT
BASE DISCHARGE	= 4500 CFS
BASE FREQUNCY	= 100 YRS
BASE HW ELEVATION	= 40.37 FT
OVERTOPPING DISCHARGE	= 7000 CFS
OVERTOPPING FREQUNCY	= 500 YRS
OVERTOPPING ELEVATION	= 42.80 FT

$V = 60 \pm$  MPH  
 $K = 2293$   
 $VC = 50$   
 $EL = 41.31$   
 $P = 19+40.00$

$PI STA. = 23+39.38$   
 $D = 452.345$   
 $R = 1721$   
 $SE = EXIST$

B-4224  
 NW SHEET NO.  
 ROADWAY DESIGN ENGINEER  
 HYDRAULICS ENGINEER  
 PRELIMINARY PLANS  
 DO NOT USE FOR CONSTRUCTION

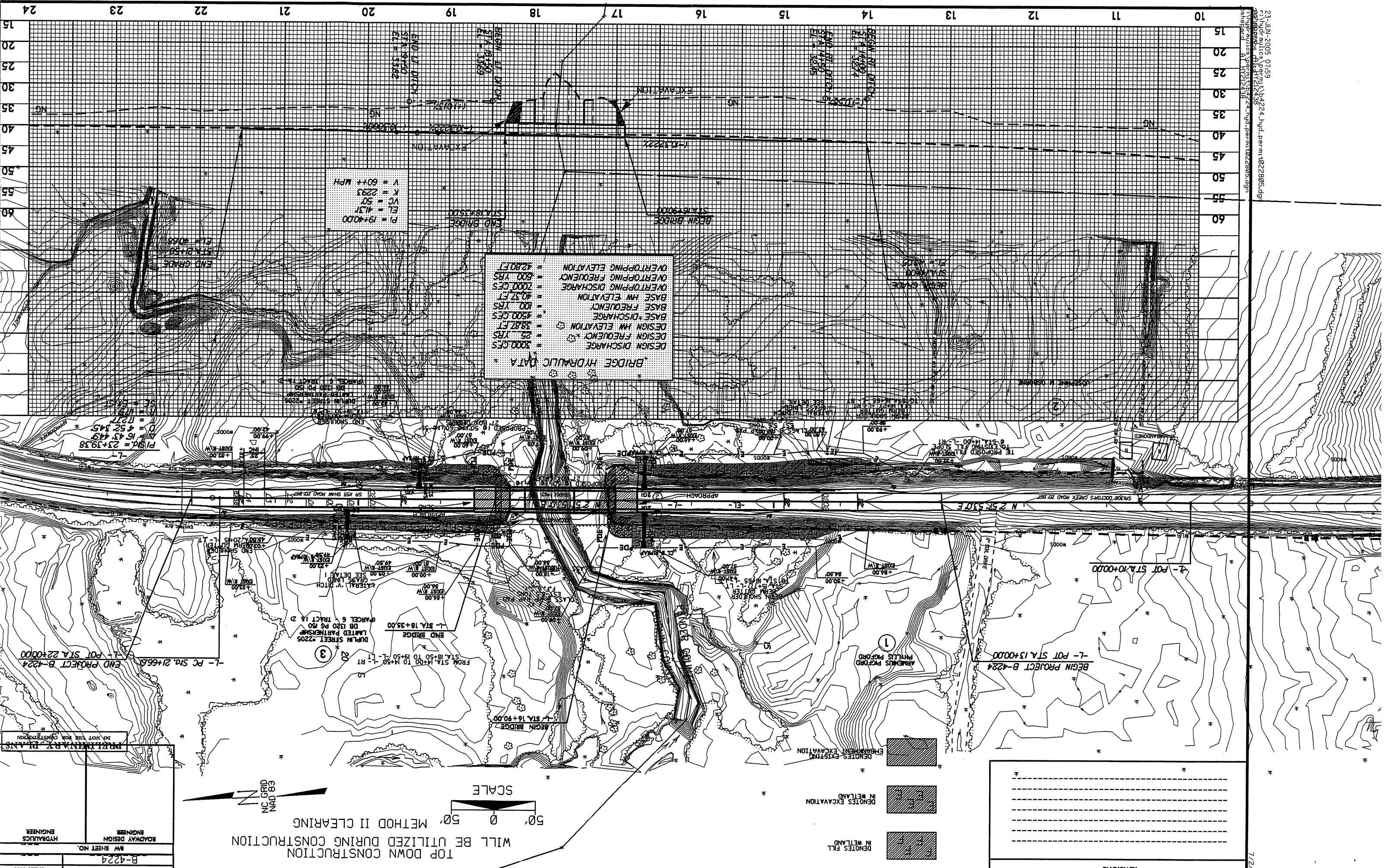


TOP DOWN CONSTRUCTION  
 WILL BE UTILIZED DURING CONSTRUCTION  
 METHOD II CLEARING

- DENOTES FILL IN WETLAND
- DENOTES EXCAVATION IN WETLAND
- DENOTES EXISTING EMBANKMENT



23-JUN-2005 07:59  
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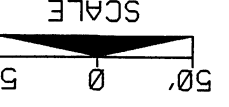
**BRIDGE HYDRAULIC DATA**

DESIGN DISCHARGE	= 3000 CFS
DESIGN FREQUNCY	= 25 YRS
DESIGN HM ELEVATION	= 38.87 FT
BASE DISCHARGE	= 1500 CFS
BASE FREQUNCY	= 100 YRS
BASE HM ELEVATION	= 40.37 FT
OVERTOPPING DISCHARGE	= 7000 CFS
OVERTOPPING FREQUNCY	= 500 YRS
OVERTOPPING ELEVATION	= 42.80 FT

V = 60+ MPH  
 K = 2293  
 VC = 50  
 EL = 41.31  
 PI = 19+40.00  
 STA 18+35.00

PI = 23+39.38  
 D = 16.43 44.9  
 O = 4.52 34.5  
 L = 17.17  
 STA 21+66.61

PROJECT REFERENCE NO. B-4224  
 SHEET NO. 24  
 ROADWAY DESIGN ENGINEER  
 HYDRAULICS ENGINEER

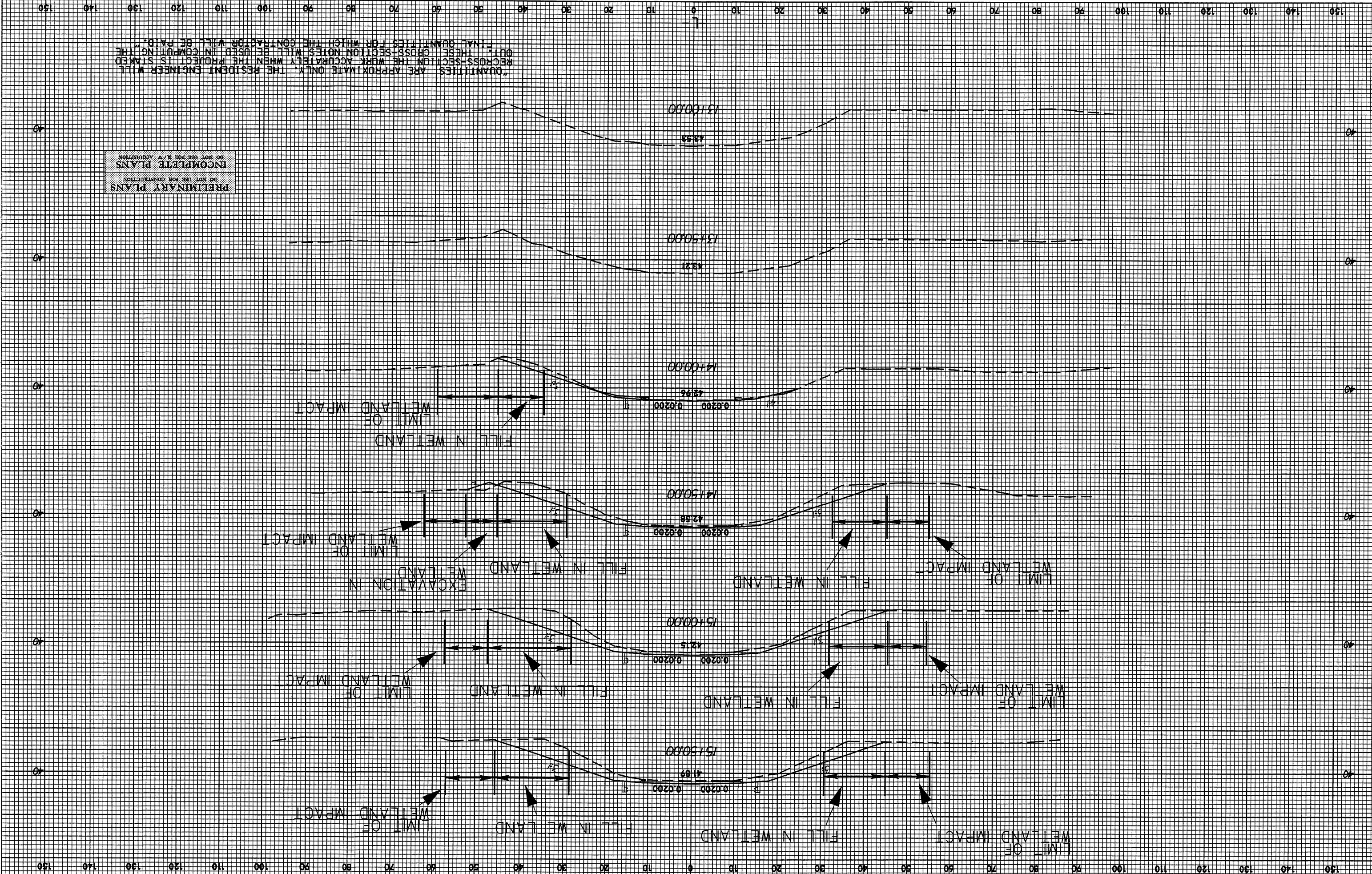


TOP DOWN CONSTRUCTION WILL BE UTILIZED DURING CONSTRUCTION  
 METHOD II CLEARING

- DENOTES EXISTING
- DENOTES EXCAVATION
- DENOTES FILL

**REVISIONS**



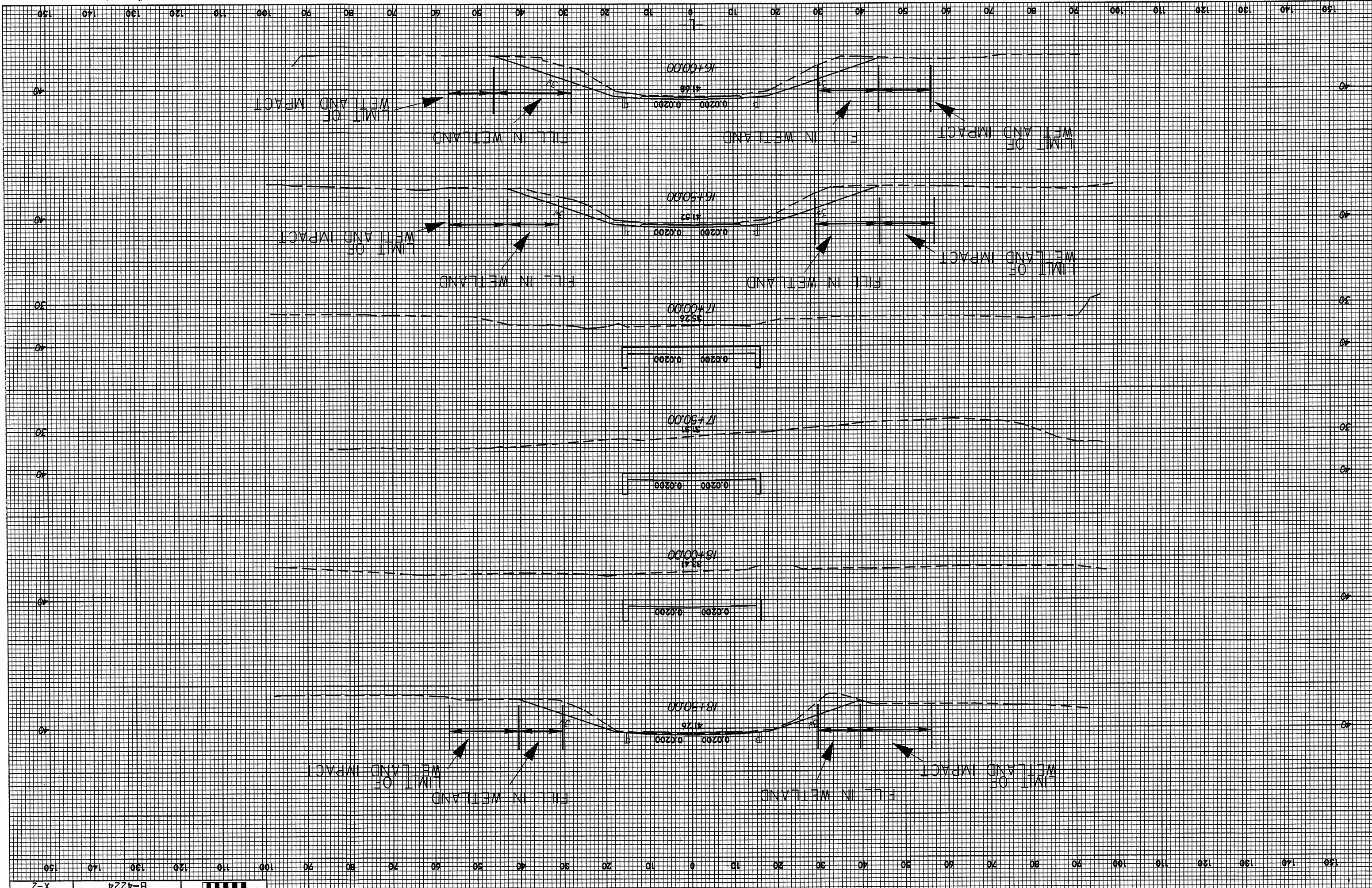



PRELIMINARY PLANS  
DO NOT USE FOR CONSTRUCTION

INCOMPLETE PLANS  
DO NOT USE FOR A QUOTATION

QUANTITIES ARE APPROXIMATE ONLY. THE RESIDENT ENGINEER WILL RECORD SECTION THE WORK ACCURATELY WHEN THE PROJECT IS STAKED OUT. THESE GROSS SECTION NOTES WILL BE USED IN COMPUTING THE FINAL QUANTITIES FOR WHICH THE CONTRACTOR WILL BE PAID.

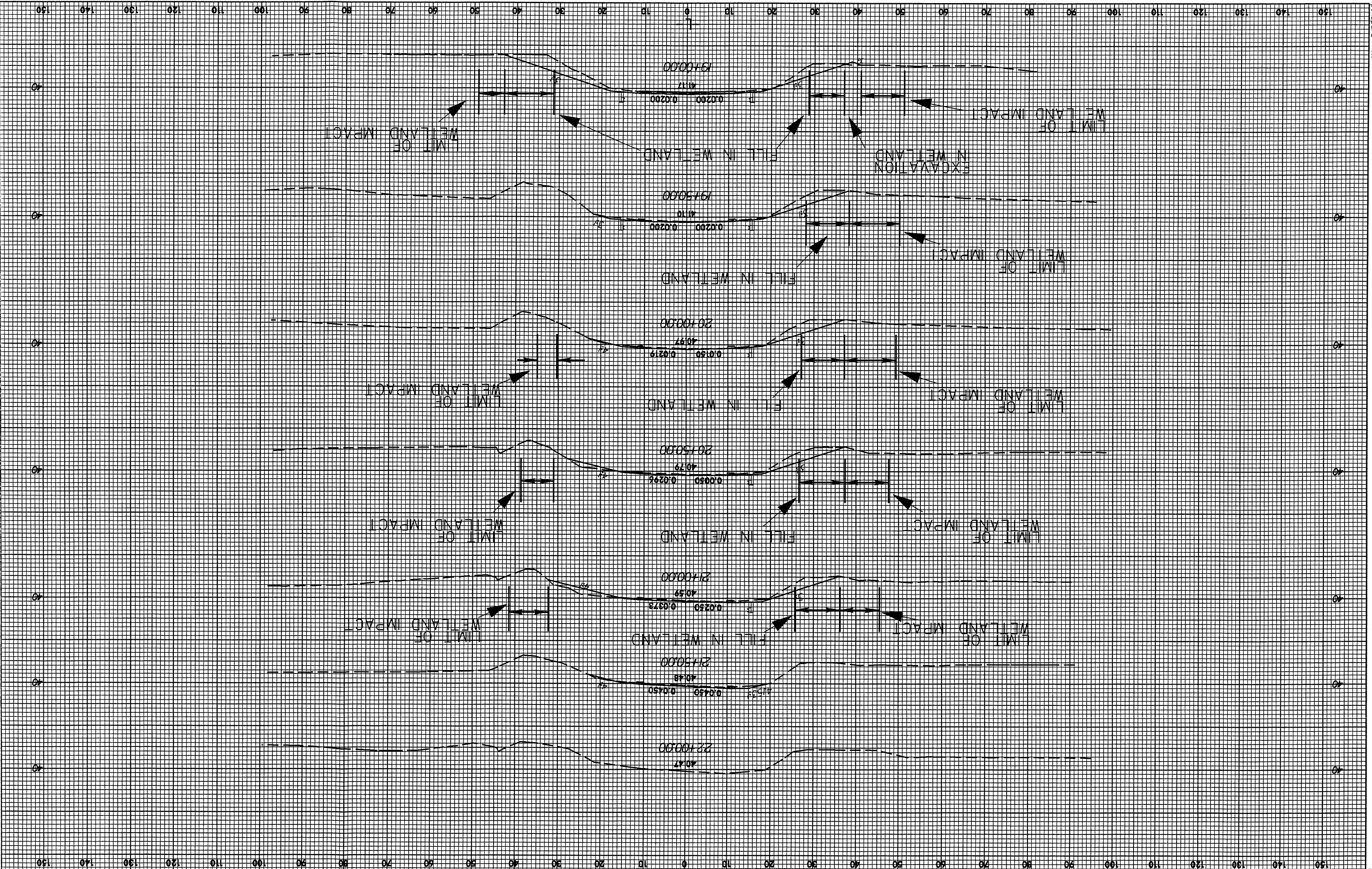




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bjd 2



**WETLAND PERMIT IMPACT SUMMARY**

Site No.	Station (From/To)	Structure Size / Type	WETLAND IMPACTS						SURFACE WATER IMPACTS				
			Permanent Fill In Wetlands (ac)	Temp. Fill In Wetlands (ac)	Excavation in Wetlands (ac)	Mechanized Clearing in Wetlands (ac)	Hand Clearing in Wetlands (ac)	Permanent SW impacts (ac)	Temp. SW impacts (ac)	Existing Channel Impacts Permanent (ft)	Existing Channel Impacts Temp. (ft)	Natural Stream Design (ft)	
1	13+74 to 17+00 -L- RT	Bridge & Ditch	0.109	0.000	0.017	0.000	0.000	0.000	0.000	0.000	0	0	0
	14+21 to 17+00 -L- LT		0.087	0.000	0.007	0.000	0.000	0.000	0.000	0.000	0	0	0
	18+27 to 19+35 -L- RT	Bridge	0.021	0.000	0.006	0.000	0.000	0.000	0.000	0.000	0	0	0
	18+27 to 21+35 -L- LT	Ditch	0.066	0.000	0.010	0.000	0.000	0.000	0.000	0.000	0	0	0
<b>TOTALS:</b>			<b>0.283</b>		<b>0.040</b>								

**METHOD II CLEARING**

NC DEPARTMENT OF TRANSPORTATION  
 DIVISION OF HIGHWAYS  
 DUPLIN-PENDER COUNTY  
 WBS - 33568.1.1 (B-4224)

SHEET **8 of 9** 4/11/2005



# Property Owner Contact Report

TIP # B-4224

Owner Last Name/ Business	Owner First Name	Address	City/Town	State	Zip Code	Contact/ Relationship	Home Phone	Contacted By	Contact Date	How Contacted	Comments
② Osborne	Josephine M	2514 Beachwood Drive	Tarboro	NC	27886			Nick Miguez	04/05/04	Letter	
① Pigford	Armenius	4355 Willard Rd	Willard	NC	28478			Nick Miguez	04/05/04	Letter	
③ Smith	W.W.	220 S Duplin Street	Wallace	NC	24492			Nick Miguez	04/05/04	Letter	

Sheet 9 of 9



**CATEGORICAL EXCLUSION ACTION CLASSIFICATION FORM**

TIP Project No. B-4224  
State Project No. 8.2271501  
Federal Project No. BRZ-1305(2)

**A. Project Description:**

NCDOT will replace Bridge No. 63 on SR 1305 (Doctors Creek Road) over Doctors Creek in Pender County at the Duplin County line. The bridge will be replaced with a new bridge measuring 145 feet in length and 28 feet in width at approximately the same location as the existing bridge. This bridge will provide for a 22 foot travelway and 3 foot offsets on each side. The new approach roadway will be a 22 foot travelway with 4 foot grassed shoulders. The approach work will consist of 485 feet to the south and 470 feet to the north of the existing bridge. The roadway grade of the new structure will be approximately the same as the existing grade at this location. Traffic will be detoured on existing local roads during construction as shown in Figure 1. There will be 9 miles of additional travel.

**B. Purpose and Need:**

Bridge Maintenance records indicate the bridge has a sufficiency rating of 36.3 out of 100. The bridge's four span superstructure is composed of prestressed concrete channels with an asphalt wearing surface. The substructure is composed of precast concrete caps on timber piles. The bridge's low structural evaluation rating qualifies the bridge as structurally deficient according to Federal Highway Administration (FHWA) standards and therefore eligible for FHWA's Highway Bridge Replacement and Rehabilitation Program. The replacement of this inadequate structure will result in safer traffic operations.

**C. Proposed Improvements:**

The following Type II improvements which apply to the project are circled:

1. Modernization of a highway by resurfacing, restoration, rehabilitation, reconstruction, adding shoulders, or adding auxiliary lanes (e.g., parking, weaving, turning, climbing).
  - a. Restoring, Resurfacing, Rehabilitating, and Reconstructing pavement (3R and 4R improvements)
  - b. Widening roadway and shoulders without adding through lanes
  - c. Modernizing gore treatments
  - d. Constructing lane improvements (merge, auxiliary, and turn lanes)

- e. Adding shoulder drains
  - f. Replacing and rehabilitating culverts, inlets, and drainage pipes, including safety treatments
  - g. Providing driveway pipes
  - h. Performing minor bridge widening (less than one through lane)
  - i. Slide Stabilization
  - j. Structural BMP's for water quality improvement
2. Highway safety or traffic operations improvement projects including the installation of ramp metering control devices and lighting.
- a. Installing ramp metering devices
  - b. Installing lights
  - c. Adding or upgrading guardrail
  - d. Installing safety barriers including Jersey type barriers and pier protection
  - e. Installing or replacing impact attenuators
  - f. Upgrading medians including adding or upgrading median barriers
  - g. Improving intersections including relocation and/or realignment
  - h. Making minor roadway realignment
  - i. Channelizing traffic
  - j. Performing clear zone safety improvements including removing hazards and flattening slopes
  - k. Implementing traffic aid systems, signals, and motorist aid
  - l. Installing bridge safety hardware including bridge rail retrofit
- ③ Bridge rehabilitation, reconstruction, or replacement or the construction of grade separation to replace existing at-grade railroad crossings.
- a. Rehabilitating, reconstructing, or replacing bridge approach slabs
  - b. Rehabilitating or replacing bridge decks
  - c. Rehabilitating bridges including painting (no red lead paint), scour repair, fender systems, and minor structural improvements
  - ④ Replacing a bridge (structure and/or fill)
4. Transportation corridor fringe parking facilities.
5. Construction of new truck weigh stations or rest areas.
6. Approvals for disposal of excess right-of-way or for joint or limited use of right-of-way, where the proposed use does not have significant adverse impacts.
7. Approvals for changes in access control.

8. Construction of new bus storage and maintenance facilities in areas used predominantly for industrial or transportation purposes where such construction is not inconsistent with existing zoning and located on or near a street with adequate capacity to handle anticipated bus and support vehicle traffic.
9. Rehabilitation or reconstruction of existing rail and bus buildings and ancillary facilities where only minor amounts of additional land are required and there is not a substantial increase in the number of users.
10. Construction of bus transfer facilities (an open area consisting of passenger shelters, boarding areas, kiosks and related street improvements) when located in a commercial area or other high activity center in which there is adequate street capacity for projected bus traffic.
11. Construction of rail storage and maintenance facilities in areas used predominantly for industrial or transportation purposes where such construction is not inconsistent with existing zoning and where there is no significant noise impact on the surrounding community.
12. Acquisition of land for hardship or protective purposes, advance land acquisition loans under section 3(b) of the UMT Act. Hardship and protective buying will be permitted only for a particular parcel or a limited number of parcels. These types of land acquisition qualify for a CE only where the acquisition will not limit the evaluation of alternatives, including shifts in alignment for planned construction projects, which may be required in the NEPA process. No project development on such land may proceed until the NEPA process has been completed.
13. Acquisition and construction of wetland, stream and endangered species mitigation sites.
14. Remedial activities involving the removal, treatment or monitoring of soil or groundwater contamination pursuant to state or federal remediation guidelines.

**D. Special Project Information:**

**Estimated Cost:**

Construction	\$ 700,000
Right of Way	\$ <u>31,600</u>
<b>Total</b>	<b>\$ 731,600</b>

**Estimated Traffic:**

Current	-	800 VPD
Year 2025	-	1400 VPD
TTST	-	1%
Dual	-	2%

**Proposed Typical Roadway Section:**

The approach roadway will be 22 feet wide with 4-foot shoulders. Shoulder width will be increased by three feet where guardrail is warranted.

**Design Speed:** 60 mph

**Design exceptions:** It is anticipated that no design exceptions will be required.

**Functional Classification:** Rural Local Route

**Division Office Comments:**

The Division 3 Construction Engineer concurs with the recommendation of replacing the bridge in place and detouring traffic on local roads during construction as shown in Figure 1. There will be 9 miles of additional travel.

**Bridge Demolition:**

Bridge No. 63 has 4 spans totaling 121 feet in length. The bridge superstructure is composed of prestressed concrete channels with an asphalt wearing surface. The substructure is composed of precast concrete caps on timber piles. All components of the bridge, except the precast concrete caps, will be removed without dropping any of their components into Waters of the United States. However, there is the potential for components of the precast concrete caps to drop into the Waters of the United States during construction. The resulting temporary fill associated with the precast concrete caps is approximately 3 cubic yards. This project can be classified as a Case 2, where no instream work can occur during the moratorium period from February 15 to June 30 due to anadromous fish migration.

**Alternatives Studied and Rejected:**

The “do-nothing” alternative will eventually necessitate closure of the bridge. This is not acceptable due to the traffic service provided by SR 1305.

One alternative, to replace in place with an on-site detour just east of the existing bridge, was rejected due to the increased cost and increased impacts to wetlands.

**Environmental Commitments:**

Please see attached Green Sheet for Project Commitments.

**E. Threshold Criteria**

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

<u>ECOLOGICAL</u>	<u>YES</u>	<u>NO</u>
(1) Will the project have a substantial impact on any unique or important natural resource?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
(2) Does the project involve any habitat where federally listed endangered or threatened species may occur?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
(3) Will the project affect anadromous fish?	<input checked="" type="checkbox"/>	<input type="checkbox"/>
(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?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
(5) Will the project require use of U. S. Forest Service lands?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
(6) Will the quality of adjacent water resources be adversely impacted by proposed construction activities?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
(7) Does the project involve waters classified as Outstanding Water Resources (OWR) and/or High Quality Waters (HQW)?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
(8) Will the project require fill in waters of the United States in any of the designated mountain trout counties?	<input type="checkbox"/>	<input checked="" type="checkbox"/>

- (9) Does the project involve any known underground storage tanks (UST's) or hazardous materials sites?   X

**PERMITS AND COORDINATION**

**YES**    **NO**

- (10) If the project is located within a CAMA county, will the project significantly affect the coastal zone and/or any "Area of Environmental Concern" (AEC)?   X

- (11) Does the project involve Coastal Barrier Resources Act resources?   X

- (12) Will a U. S. Coast Guard permit be required?   X

- (13) Will the project result in the modification of any existing regulatory floodway?   X

- (14) Will the project require any stream relocations or channel changes?   X

**SOCIAL, ECONOMIC, AND CULTURAL RESOURCES**

**YES**    **NO**

- (15) Will the project induce substantial impacts to planned growth or land use for the area?   X

- (16) Will the project require the relocation of any family or business?   X

- (17) Will the project have a disproportionately high and adverse human health and environmental effect on any minority or low-income population?   X

- (18) If the project involves the acquisition of right of way, is the amount of right of way acquisition considered minor?  X

- (19) Will the project involve any changes in access control?   X

- (20) Will the project substantially alter the usefulness and/or land use of adjacent property?   X

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

- (32) Will the project involve construction in, across, or adjacent to a river designated as a component of or proposed for inclusion in the natural Wild and Scenic Rivers?

X

**F. Additional Documentation Required for Unfavorable Responses in Part E**

(Discussion regarding all unfavorable responses in Part E should be provided below. Additional supporting documentation may be attached, as necessary.)

**Item (3) Anadromous fish**

A moratorium for anadromous fish on in-water construction activities will be observed from February 15 to June 30.

**Item (4) Wetlands**

Impacts to wetlands will be minimized by closing the road and replacing Bridge No. 63 with a new bridge in the same location and at the same elevation as the existing bridge.



**G. CE Approval**

TIP Project No.                     B-4224                      
State Project No.                     8.2271501                      
Federal-Aid Project No.                     BRZ-1305(2)                    

**Project Description:**

NCDOT will replace Bridge No. 63 on SR 1305 (Doctors Creek Road) over Doctors Creek in Pender County at the Duplin County line. The bridge will be replaced with a new bridge measuring 145 feet in length and 28 feet in width at approximately the same location as the existing bridge. This bridge will provide for a 22 foot travelway and 3 foot offsets on each side. The new approach roadway will be a 22 foot travelway with 4 foot grassed shoulders. The approach work will consist of 485 feet to the south and 470 feet to the north of the existing bridge. The roadway grade of the new structure will be approximately the same as the existing grade at this location. Traffic will be detoured on existing local roads during construction. See Figure 1 for the detour route.

**Categorical Exclusion Action Classification:**

           TYPE II(A)  
  X   TYPE II(B)

Approved:

5-28-04 Teresa Hart  
Date Teresa Hart, PE, CPM, Assistant Manager  
Project Development and Environmental Analysis Branch

5-28-04 William T. Goodwin Jr.  
Date William T. Goodwin Jr., P.E., Unit Head  
Bridge Replacement Planning Unit

5-28-04 Joel A. Johnson  
Date Joel A. Johnson, Project Development Engineer  
Bridge Replacement Planning Unit

For Type II(B) projects only:

5-28-04 for John F. Sullivan, III  
Date John F. Sullivan, III, PE, Division Administrator  
Federal Highway Administration

# PROJECT COMMITMENTS

Replacement of Bridge No. 63  
On SR 1305 over Doctors Creek  
Pender County at the Duplin County line  
Federal-Aid No. BRZ-1305(2)  
State Project No. 8.2271501  
T.I.P. No. B-4224

## Commitments Developed Through Project Development and Design

*Hydraulics Unit, Roadside Environmental Unit, Division Three Construction Office,  
Structure Design Unit*

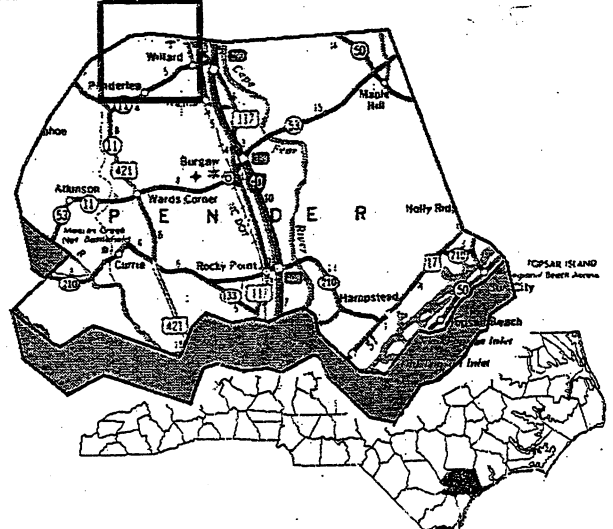
NCDOT will adhere to the Best Management Practices (BMPs) for “Bridge Demolition and Removal” during the removal of Bridge No. 63.


This reach of Doctors Creek has potential as a travel corridor for anadromous fish. Therefore, an in-stream moratorium will be in effect from February 15 to June 30. The Stream Crossing Guidelines for Anadromous Fish Passage will be implemented, as applicable.

The total time of **road closure** for this project should be held to a minimum due to the 9 mile detour. The contractor should be given incentives to minimize the road closure for the project. The **total project construction time** can be longer, as long as work can be done under traffic.



*Detour Route*



	<p>NORTH CAROLINA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS PROJECT DEVELOPMENT &amp; ENVIRONMENTAL ANALYSIS BRANCH</p>
	<p><b>PENDER COUNTY</b> <b>REPLACE BRIDGE NO. 63 ON SR 1305</b> <b>OVER DOCTOR'S CREEK</b> <b>B-4224</b></p>
<p>Figure 1</p>	



North Carolina Department of Cultural Resources  
State Historic Preservation Office

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

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

CITIZENS PARTICIPATION  
RECEIVED

APR 13 2004

April 7, 2004

TO: Clay Swindell  
Office of Human Environment  
Division of Highways  
North Carolina Department of Transportation

FROM: David Brook *for David Brook*

SUBJECT: Archaeological Survey Report: Replacement of Bridge No. 63 over  
Doctor's Creek, Pender and Duplin Counties, ER03-0957

We have received the archaeological survey report for the above project from the Department of Transportation (NCDOT).

During the course of the survey no sites were discovered within the project area. NCDOT has recommended that no further archaeological investigation be conducted in connection with this project. We concur with this recommendation since the project will not involve significant archaeological resources.

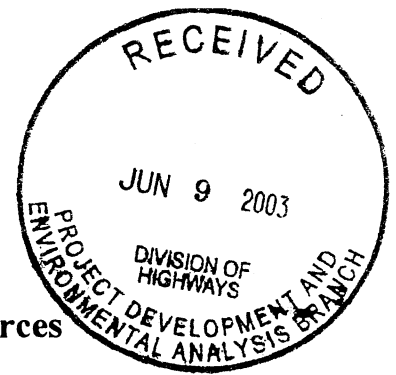
The above comments are made pursuant to Section 106 of the National Historic Preservation Act and the Advisory Council on Historic Preservation's Regulations for Compliance with Section 106 codified at 36 CFR Part 800.

Thank you for your cooperation and consideration. If you have questions concerning the above comment, please contact Renee Gledhill-Earley, environmental review coordinator, at 919/733-4763. In all future communication concerning this project, please cite the above-referenced tracking number.

cc: ✓ Matt Wilkerson

[www.hpo.dcr.state.nc.us](http://www.hpo.dcr.state.nc.us)

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



North Carolina Department of Cultural Resources  
State Historic Preservation Office

David L. S. Brook, Administrator

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

Division of Historical Resources  
David J. Olson, Director

May 29, 2003

MEMORANDUM

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

FROM: David Brook *DSB for David Brook*

SUBJECT: Replacement of Bridge No. 63 on SR 1305 over Doctor's Creek,  
B-4224, Pender County, ER03-0957

We have received notification of the bridge replacement referenced above and would like to comment.

There are no recorded archaeological sites within the proposed project area. If the replacement is to be located along the existing alignment, it is unlikely that significant archaeological resources would be affected and no investigations would be recommended. If, however, the replacement is to be in a new location, please forward a map to this office indicating the location of the new alignment so we may evaluate the potential effects of the replacement upon archaeological resources.

To avoid potential impacts to unknown archaeological resources, we recommend that the "replacement-in-place with traffic detoured off-site" alternative be adopted for this project.

We have conducted a search of our files and are aware of no structures of historical or architectural importance located within the planning area.

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

[www.hpo.dcr.state.nc.us](http://www.hpo.dcr.state.nc.us)

	Location	Mailing Address	Telephone/Fax
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RESTORATION	515 N. Blount St., Raleigh NC	4613 Mail Service Center, Raleigh NC 27699-4613	(919) 733-6547 • 715-4801
SURVEY & PLANNING	515 N. Blount St., Raleigh NC	4618 Mail Service Center, Raleigh NC 27699-4618	(919) 733-6545 • 715-4801

May 29, 2003

Page 2

Thank you for your cooperation and consideration. If you have questions concerning the above comment, contact Renee Gledhill-Earley, environmental review coordinator, at 919/733-4763. In all future communication concerning this project, please cite the above referenced tracking number.

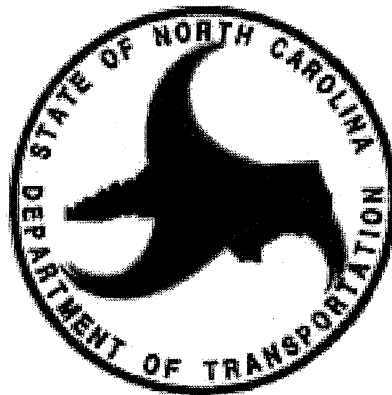
cc: Mary Pope Furr  
Matt Wilkerson

**REPLACE BRIDGE NO. 63 ON SR 1305  
OVER DOCTOR'S CREEK  
DUPLIN AND PENDER COUNTIES, NORTH CAROLINA**

**TIP NUMBER B-4224  
STATE CONTRACT NO. A304259  
STATE PROJECT NO. 8.2271501  
FEDERAL AID PROJECT NO. BRZ-1305(2)**

**NATURAL RESOURCES TECHNICAL REPORT**

**PREPARED FOR:  
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION  
DIVISION OF HIGHWAYS  
PROJECT DEVELOPMENT AND ENVIRONMENTAL ANALYSIS BRANCH**



**MARCH 2003**

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## 1.0 INTRODUCTION

The following Natural Resources Technical Report (NRTR) is submitted to assist in the preparation of a Categorical Exclusion (CE) for the proposed project.

### 1.1 Project Description

The proposed project consists of the replacement of Bridge No. 63 on SR 1305 and SR 1155 (Pigford Road) over Doctor's Creek in Pender and Duplin Counties, North Carolina (Figure 1). The design of the proposed bridge has not been determined.

### 1.2 Purpose

The purpose of this technical report is to inventory, catalog and describe the various natural resources likely to be impacted by the proposed action. This report also attempts to identify and estimate the probable consequences of the anticipated impacts to these resources. Recommendations are made for measures which will minimize resource impacts. These descriptions and estimates are relevant only in the context of existing preliminary design concepts. If design parameters and criteria change, additional field investigations will need to be conducted.

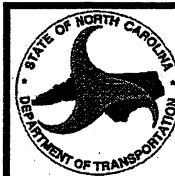
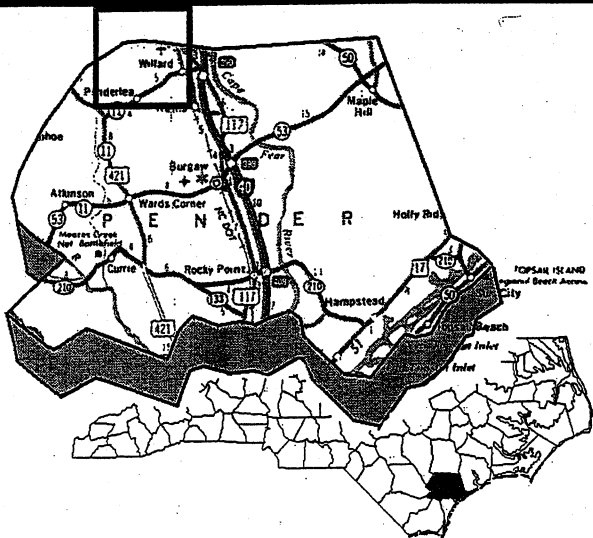
### 1.3 Methodology

Research was conducted prior to field investigations. Data sources utilized in the pre-field investigation of the study area include:

- U.S. Geological Survey (USGS) 7.5-minute topographic quadrangle map (Wallace West, 1984).
- USDA Natural Resource Conservation Service (NRCS) soil survey for Pender County, North Carolina (1990).
- USDA Natural Resource Conservation Service (NRCS) soil survey for Duplin County, North Carolina (1954).
- U.S. Fish and Wildlife Service (USFWS) National Wetlands Inventory (NWI) map for 7.5-minute Wallace West quadrangle (1994).
- N.C. Department of Transportation (NCDOT) aerial photographs of the study area (1:200 scale).

Water resource information was obtained from publications of the North Carolina Department of Environment and Natural Resources, Division of Water Quality (NCDENR-DWQ 2000a and 2002).

Information concerning the occurrence of federal and state protected species in the study area was obtained from the USFWS list of protected species and candidate species (29 January 2003), the North Carolina Natural Heritage Program (NCNHP) database of rare species and unique habitats, and the North Carolina Wildlife Resources Commission (NCWRC) Proposed Critical Habitats for aquatic species.



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

PENDER COUNTY  
REPLACE BRIDGE NO. 63 ON SR 1305  
OVER DOCTOR'S CREEK  
B-4224

Figure 1

General field surveys and wetlands investigations were conducted within the study area by biologists on the staff of Dr. J.H. Carter III & Associates, Inc. (JCA) on 13 January 2003. The corridor investigated extended 300 feet (90 meters (m)) upstream and downstream from the centerline of the existing bridge and 1500 feet north and south from the bridge along SR 1305 and SR 1155. Plant communities and their associated wildlife were identified and recorded. Wildlife identification involved using one or more of the following observation techniques: active searches and capture, visual observations (binoculars), and identification of characteristic signs of wildlife (sounds, scat, tracks, nests and burrows).

All wetlands subject to regulation by the U.S. Army Corps of Engineers (USACE) under Section 404 of the Clean Water Act (CWA) and Section 10 of the Rivers and harbors Act of 1899 were identified and delineated according to methods prescribed in the 1987 Corps of Engineers Wetlands Delineation Manual (USACE 1987) and the USACE's 6 March 1992 Clarification and Interpretation of the 1987 Manual.

#### 1.4 Qualification of Field Investigators

Investigator: Tracy E. Rush  
 Education: B.S. Biology (Botany Option), The Pennsylvania State University  
 M.S. Forest Resources, The Pennsylvania State University  
 Experience: Senior Biologist/Botanist, JCA, July 2000-Present  
 Botanist, Washington State Natural Heritage Program, April 1997-June 2000.  
 Biologist/Botanist, JCA, January 1993-January 1996.  
 Expertise: Protected species surveys for flora and fauna, native plant identification, biotic community identification, wetland delineation, restoration and monitoring, forest management, vegetation monitoring and GPS/GIS.

Investigator: Katie Barch  
 Education: B.S. Environmental Science, Virginia Polytechnic Institute and State University  
 M.S. Soil and Water Science, University of Florida  
 Experience: Wetland Biologist, JCA, October 2002-Present.  
 Environmental Technician, St. Johns River Water Management District, FL.  
 Expertise: Wetland delineation and restoration, hydric soils, wetland hydrology, vegetation and groundwater monitoring, protected species surveys for flora and fauna and use of ArcView software.

#### 1.5 Terminology

The definitions used for area descriptions contained in this report are as follows:

- Study Area (Study Corridor) – denotes the bubble area for the proposed project (area indicated on the aerial photograph by DOT).
- Project Vicinity – denotes an area extending 0.5 mile (mi) (0.8 kilometers (km)) on all sides of the study area.

- Project Region – is equivalent to an area represented by a 7.5 minute USGS quadrangle map with the project occupying the central position.

## 2.0 PHYSICAL RESOURCES

Soil and water resources located within the study area are discussed below.

### 2.1 Regional Characteristics

Pender and Duplin Counties lie in the Coastal Plain physiographic province of North Carolina. The counties range in elevation from approximately sea level (Pender County) to 167 feet (50 m) (Duplin County) above mean sea level (msl). Elevations within the study area range from approximately 35 to 55 feet (10 to 16 m) above msl.

### 2.2 Soils

Nine soil types occur within the study area (USDA 1990 and 1954): Fallington fine sandy loam, Goldsboro fine sandy loam, Kenansville fine sandy loam, Marvyn and Craven soils, Mixed alluvial land, Muckalee loam, Norfolk loamy fine sand, Pactolus fine sand and Woodstown loamy fine sand. All study area soils, their drainage characteristics and hydric classifications are presented in Table 1.

**Table 1. Study Area Soils and Characteristics.**

Map Unit Symbol	Specific Map Unit	Percent Slope	Drainage Class	Hydric Class	Hydric Inclusions
Fa	Fallsington fine sandy loam	0 to 2	poor	hydric	No
GoA	Goldsboro fine sandy loam	0 to 2	moderate	non hydric	Yes
Kb	Kenansville fine sandy loam	0 to 2	well drained	non hydric	No
McC	Marvyn and Craven soils	6 to 12	well/moderate	non hydric	Yes
Mh	Mixed alluvial land	0 to 2	poor	hydric	No
Mk	Muckalee loam	0 to 2	poor	hydric	No
NoB	Norfolk loamy fine sand	2 to 6	well drained	non hydric	Yes
PaA	Pactolus fine sand	0 to 2	moderate/poor	non hydric	Yes
Wc	Woodstown loamy fine sand	0 to 2	moderate	non hydric	Yes

Fallsington fine sandy loam: Fallsington fine sandy loam is a poorly drained soil on slightly depressed baylike areas on broad upland flats. The seasonal high water table occurs at depths 0.5 to 1 feet from the surface and runoff potential is high. The flooding frequency for Fallsington fine sandy loam is never.

Goldsboro fine sandy loam: Goldsboro fine sandy loam is a moderately well drained soil on smooth uplands. The seasonal high water table occurs at depths 2 to 3 feet below the surface and runoff potential is medium. The flooding frequency for Goldsboro fine sandy loam is never.

Kenansville fine sandy loam: Kenansville fine sandy loam is a well drained soil on smooth uplands. The seasonal high water table occurs at depths 6 to 10 feet from the surface and runoff potential is slow to medium. The flooding frequency for Kenansville fine sandy loam is never.

Marvyn and Craven soils: Marvyn and Craven soils are well to moderately well drained soils on side slopes on uplands. The seasonal high water table occurs at depths greater than 6 feet for Marvyn soils and 2 to 3 feet from the surface for Craven soils and runoff potential is medium. The flooding frequency for Marvyn and Craven soils is never.

Mixed alluvial land: Mixed alluvial land is a poorly drained soil on flood plains along major streams. The seasonal high water table occurs at or near the surface and runoff potential is slow to medium. The flooding frequency for Mixed alluvial land is frequent.

Muckalee loam: Muckalee loam is a poorly drained soil on flood plains. The seasonal high water table occurs at depths 0.5 to 1.5 feet from the surface and runoff potential is very slow. The flooding frequency for Muckalee loam is frequent.

Norfolk loamy fine sand: Norfolk loamy fine sand is a well drained soil on convex interstream divides near major drainageways. The seasonal high water table occurs at depths 4 to 6 feet from the surface and runoff potential is medium. The flooding frequency for Norfolk loamy fine sand is never.

Pactolus fine sand: Pactolus fine sand is a moderately well drained or somewhat poorly drained soil on slight depressions on the uplands near the coast and on low ridges on terraces. The seasonal high water table occurs at depths 1.5 to 2.5 feet from the surface and runoff potential is slow. The flooding frequency for Pactolus fine sand is never.

Woodstown loamy fine sand: Woodstown loamy fine sand is a moderately drained soil in broad interstream upland areas. The seasonal high water table occurs at depths 1.5 feet from the surface and runoff potential is slow to medium. The flooding frequency for Woodstown loamy fine sand is never.

## 2.3 Water Resources

This section contains information concerning surface water resources likely to be impacted by the proposed project. Water resource information encompasses physical aspects of the resource, its relationship to major water systems, Division of Water Quality (DWQ) Best Usage Classifications, and the “quality” of the water resources. Probable impacts to these water bodies are also discussed, as are a means to minimize those impacts.

### 2.3.1 Waters Impacted and Characteristics

Doctor's Creek will be the only surface water directly impacted by the proposed project. Waters in the project vicinity are part of the Cape Fear River Basin, Hydrologic Unit 03030007. The Cape Fear River Basin contains 24 subbasins. The study area is found in the Northeast Cape Fear River and Rockfish Creek subbasin 03-06-22. Study area waters drain to the east into Rockfish Creek and eventually south into the Northeast Cape Fear River (NCDENR-DWQ 2000).

### 2.3.2 Best Usage Classification

Doctor's Creek has been assigned a best usage classification of Class "C SW" (index #18-74-29-3, 7/1/73) by the Division of Water Quality (NCDENR-DWQ 2002). A "C" classification designates waters that are for aquatic life propagation/protection and secondary recreation. The Swamp Waters "SW" supplemental classification designates this region as having waters naturally more acidic and with lower levels of dissolved oxygen. **Neither High Quality Waters (HQW), Water Supplies (WS-I: undeveloped watersheds or WS-II: predominantly undeveloped watersheds), nor Outstanding Resource Waters (ORW) occur within 1.0 mi (1.6 km) of the study area.**

*Joint water*

### 2.3.3 Water Quality

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

#### 2.3.3.1 Nonpoint Source Discharge

Nonpoint source runoff from agricultural land are likely to be the primary source of water quality degradation to the water resources located within the project vicinity. The surrounding vicinity appears to be mainly used for agriculture with surrounding forested land. Nutrient loading and increased sedimentation from agricultural runoff and forestry affects water quality. Inputs of nonpoint source pollution from a few private residences within the study area also are likely to contribute to water quality degradation.

Section 303(d) of the Clean Water Act (CWA) requires states to develop a list of waters not meeting water quality standards or which have impaired uses. A review of the 303(d) list for North Carolina indicates that Doctor's Creek in the Cape Fear River Basin is not listed as an impaired waterway (NCDENR-DWQ 2000b).

#### 2.3.3.2 Benthic Macroinvertebrate Ambient Network

The DWQ has initiated a whole basin approach to water quality management for the 17 river basins within the state. To accomplish this goal the DWQ collects biological, chemical and physical data that can be used in basinwide assessment and planning. All basins are reassessed every five years. Prior to the implementation of the basinwide approach to water quality management, the Benthic Macroinvertebrate Ambient Network (managed by the DWQ) assessed

water quality by sampling for benthic macroinvertebrate organisms at fixed monitoring sites throughout the state.

Many benthic macroinvertebrates have stages in their life cycle that can last from six months to a year, therefore, the adverse effects of a toxic spill will not be overcome until the next generation. Different taxa of macroinvertebrates have different tolerances to pollution, thereby, long term changes in water quality conditions can be identified by population shifts from pollution sensitive to pollution tolerant organisms (and vice versa). Overall, the species present, the population diversity and the biomass are reflections of long term water quality conditions. There are no biological stations within 1.0 mi (1.6 km) of the study area (NCDENR-DWQ 2000a).

### **2.3.3.3 Point Source Dischargers**

Point source dischargers located throughout North Carolina are permitted through the National Pollutant Discharge Elimination System (NPDES) Program. Any discharger is required to register a permit. There are no point source dischargers located within 1 mi (1.6 km) of the study area.

### **2.3.4 Summary of Anticipated Impacts to Water Resources**

Construction of the proposed project bridge will impact water resources. The estimated linear impact is the width of the study area since the project is still in the design phase. Project construction may result in the following impacts to surface waters:

- Increased sedimentation and siltation from construction and/or erosion.
- Changes in incident light levels and turbidity due to increased sedimentation rates and vegetation removal.
- Alteration of water levels and flows due to interruptions and/or additions to surface and ground water flow from construction.
- Increases in nutrient loading during construction through runoff from temporarily exposed land surfaces.
- Increased concentration of toxic compounds from highway runoff, construction, toxic spills and increased vehicular use.
- Changes in water temperature due to removal of streamside vegetation.

Precautions should be taken to minimize impacts to water resources in the study area. NCDOT's Best Management Practices for the protection of surface water and water supplies must be strictly enforced during the construction stage of the project. Provisions to preclude contamination by toxic substances during the construction interval must also be strictly enforced.

## **3.0 BIOTIC RESOURCES**

Biotic resources include aquatic and terrestrial communities. This section describes those communities encountered in the study area as well as the relationships between fauna and flora within these communities. Composition and distribution of biotic communities throughout the

project are reflective of topography, hydrologic influences and past and present land uses in the study area. Descriptions of the terrestrial systems are presented in the context of plant community classifications and follow descriptions presented by Schafale and Weakley (1990) where possible. Dominant flora and fauna observed, or likely to occur, in each community are described and discussed.

Scientific nomenclature and the common names (when applicable) are included for each described plant and animal species. Plant taxonomy follows Radford, et al. (1968) and Weakley (2000). Animal Taxonomy follows Martof et al. (1980), Webster et al. (1985), National Geographic (1987) and Rohde et al. (1994). Subsequent references to the same organism will include the common name only. Fauna observed during the site visit are denoted with an asterisk (\*). Spoor evidence or tracks equate to observation of the species. Published range distributions and habitat analysis are used in estimating fauna expected to be present within the study area.

### 3.1 Terrestrial Communities

#### 3.1.1 Coastal Plain Small Stream Swamp (Blackwater Subtype)

The Coastal Plain Small Stream Swamp is located on floodplains of small blackwater streams (Schafale and Weakley 1990). This community type is most common comprising approximately 75% of the study corridor. Canopy vegetation includes bald cypress (*Taxodium distichum*), swamp black gum (*Nyssa biflora*), tulip poplar (*Liriodendron tulipifera*) and red maple (*Acer rubrum*). Understory species include red maple, red bay (*Persea borbonia*), titi (*Cyrilla racemiflora*), sweet bay (*Magnolia virginiana*) and ironwood (*Carpinus caroliniana*). Shrub species include sweet gallberry (*Ilex coriacea*), fetterbush (*Lyonia lucida*), leucothoe (*Leucothoe axillaris*) and inkberry (*Ilex glabra*). The herb layer includes cane (*Arundinaria tecta*) and wool-grass (*Scirpus cyperinus*). Vines are also common including catbrier (*Smilax* spp.), poison ivy (*Toxicodendron radicans*) and yellow jessamine (*Gelsemium sempervirens*).

A portion of the Coastal Plain Small Stream Swamp (northwest quadrant) has been recently clearcut and consists of shrubs and saplings including swamp black gum, red maple, titi and leucothoe. The herbaceous layer includes cane and cat-tails (*Typha latifolia*).

#### 3.1.2 Mesic Pine Flatwoods

Mesic Pine Flatwoods are located on mesic (non-wetland sites) on rolling Coastal Plain sediments (Schafale and Weakley 1990). This community type is located on forested uplands adjacent to the Coastal Plain Small Stream Swamp community type and comprises approximately 10% of the study corridor. Canopy vegetation is dominated loblolly pine (*Pinus taeda*). Understory species include red maple, sweetgum (*Liquidambar styraciflua*), water oak (*Quercus nigra*) and southern red oak (*Quercus falcata*). The shrub layer includes inkberry, dwarf huckleberry (*Gaylussacia dumosa*) and sweet leaf (*Symplocos tinctoria*). The herb layer is dominated by bracken fern (*Pteridium aquilinum*). Vines are also common including Japanese honeysuckle (*Lonicera japonica*), catbrier, poison ivy and yellow jessamine.



### 3.1.3 Maintained/Disturbed Community

The maintained/disturbed communities consist of the road shoulder and residential landscapes. Road shoulders are irregularly maintained, receiving only periodic mowing and herbicide applications. Residential landscapes receive more frequent mowing, general maintenance, and disturbance.

Road shoulders act as buffers between the roadway and surrounding communities by filtering stormwater run-off and reducing runoff velocities. Herbaceous vegetation located in the road shoulder consisted of mowed fescue (*Festuca* spp.), broomsedge (*Andropogon* spp.), Japanese honeysuckle, dog fennel (*Eupatorium capillifolium*) and blackberry (*Rubus* spp.).

Vegetation associated with the residential landscapes included mainly unvegetated areas and grasses such as fescue, Bermuda grass (*Cynodon dactylon*) and crabgrass (*Digitaria* sp.). A few trees and shrubs were also located in the residential landscapes including loblolly pine and various ornamental species.

### 3.1.4 Agricultural Fields

The agricultural field community includes land currently being used for the growth of various crops.

### 3.1.5 Old Field Community

There is one old field community within the study area. This area was dominated by young loblolly pine and early successional species including blackberry, Japanese honeysuckle, dog fennel, goldenrod and sweetgum.

## 3.2 Aquatic Communities

One aquatic community, Doctor's Creek, will be potentially impacted by the proposed project. Physical characteristics of a water body and the condition of the water resource influence faunal composition of aquatic communities. The streambed width (bank to bank) is 40 feet (12 m) at the bridge, the main channel is approximately 8 feet (2.4 m) wide and the channel depth is approximately 1 foot (0.3 m). The channel substrate is composed primarily of sand. The flow of the creek within the study area was moderate.

## 3.3 Wildlife

Many faunal species are highly adaptive and may populate or exploit the entire range of biotic communities located within the study area. Each species present fills its own ecological niche and there are often complex interactions between all species present. Examples of these relationships include symbiotic, competitive and predator/prey relationships.

### 3.3.1 Terrestrial Fauna

Mammals that commonly exploit habitats found within the study area include: raccoon\* (*Procyon lotor*), gray squirrel (*Sciurus carolinensis*) and white-tailed deer\* (*Odocoileus virginianus*). Other mammal species that may exploit the forest edge and open habitats within the project are include Virginia opossum (*Didelphis virginiana*), red fox (*Vulpes vulpes*), eastern cottontail rabbit (*Sylvilagus floridanus*) and eastern mole (*Scalopus aquaticus*) (Webster et al. 1985).

The forest and forest edge habitats located in the study area provide shelter and forage for a variety of avian species. Birds that may be found in these habitats include the American crow\* (*Corvus brachyrhynchos*), Carolina chickadee\* (*Poecile carolinensis*), turkey vulture\* (*Cathartes aura*), mourning dove\* (*Zenaida macroura*), downy woodpecker\* (*Picoides pubescens*), rufous sided towhee\* (*Pipilo erythrophthalmus*), American robin\* (*Turdus migratorius*), northern cardinal (*Cardinalis cardinalis*) and Carolina wren\* (*Thryothorus ludovicianus*) (National Geographic 1987).

The reptiles that can be expected to utilize the terrestrial communities within the study area include Carolina anole (*Anolis carolinensis*), five-lined skink (*Eumeces fasciatus*), eastern hognose snake (*Heterodon platyrhinos*) and the eastern garter snake (*Thamnophis sirtalis*) (Martof et al. 1980).

Terrestrial and ecotonal areas provide habitat for amphibians such as southern dusky salamander (*Desmognathus auriculatus*), slimy salamander (*Plethodon glutinosus*), eastern spadefoot toad (*Scaphiopus holbrooki*), southern road (*Bufo terrestris*), spring peeper (*Hyla crucifer*) and bullfrog (*Rana catesbeiana*) (Martof et al. 1980).

### 3.3.2 Aquatic Fauna

Aquatic fauna present within the study area are dependent upon physical characteristics of the water body and overall condition of the water resource. Terrestrial communities adjacent to a water resource also greatly influence aquatic communities. Fauna associated with the aquatic communities include various vertebrate and invertebrate species.

Representative species of fish that may be found in the study area include American eel (*Anguilla rostrata*), rosyside dace (*Clinostomus funduloides*), brown bullhead (*Ameiurus nebulosus*), redbfin pickerel (*Esox americanus*), pirate perch (*Aphredoderus sayanus*), redbreast sunfish (*Lepomis auritus*) and eastern mosquitofish (*Gambusia holbrooki*) (Rohde et al. 1994).

Doctor's Creek provides habitat for a variety of reptiles. Species which may be present in or near the creek include yellowbelly slider (*Chrysemys scripta*), redbelly water snake (*Nerodia erythrogaster*), rough green snake (*Opheodrys aestivus*), brown water snake (*Nerodia taxipilota*) and cottonmouth (*Agkistrodon piscivorus*) (Martof et al. 1980).

Invertebrates that would be expected within the study area include: crayfish (Camaridae); nymphal and larval stages of dragonflies (Odonata), caddisflies (Trichoptera); and snails (Gastopoda).

### 3.4 Summary of Anticipated Terrestrial Impacts

Construction of the subject project will have various impacts on the biotic resources described. Any construction related activities in or near these resources have the potential to impact biological functions. These impacts cannot be quantified at this time since the specifications of the project are not yet known.

Plant communities found along the proposed study area serve as nesting and sheltering habitat for various wildlife. Project construction may reduce habitat for faunal species, thereby diminishing faunal numbers. Habitat reduction concentrates wildlife into smaller areas of refuge, thus causing some species to become more susceptible to disease, predation and starvation.

Areas modified by construction (but not paved) will become road shoulders and early successional habitat. Increased traffic noise and reduced habitat will displace some wildlife further from the roadway while attracting other wildlife by the creation of more early successional habitat. Animals temporarily displaced by construction activities will repopulate areas suitable for the species. This temporary displacement of animals may result in an increase of competition for the remaining resources.

### 3.5 Summary of Anticipated Aquatic Impacts

Aquatic communities are sensitive to small changes in their environment. Stream channelization, scouring, siltation, sedimentation and erosion from construction-related work would affect water quality and biological constituents. Although direct impacts may be temporary, environmental impacts from these construction processes may result in long term or irreversible effects.

Alterations in the aquatic community will result from the installation of bridges or temporary arched culverts. Impacts often associated with in-stream construction include increased channelization of water and scouring of stream channels. Water movement through these structures becomes concentrated and direct, thereby increasing the flow velocity.

In-stream construction alters the stream substrate and may remove streamside vegetation at the site. Disturbances to the substrate will destroy aquatic vegetation and produce siltation, which clogs the gills and/or feeding mechanisms of benthic organisms (sessile filter-feeders and deposit-feeders), fish and amphibian species. Benthic organisms can also be covered by excessive amounts of sediment. These organisms are slow to recover or repopulate a stream. Turbidity reduces light penetration thus decreasing the growth of aquatic vegetation.

The removal of streamside vegetation and placement of fill material at the construction site alters the terrain. Alterations of the stream bank enhances the likelihood of erosion and sedimentation. Revegetation stabilizes and holds the soil thus mitigating these processes.

Erosion and sedimentation carry soils, toxic compounds and other materials into aquatic communities at the construction site. These processes magnify turbidity and can cause the formation of sandbars at the site and downstream, thereby altering water flow and the growth of vegetation. Streamside alterations also lead to more direct sunlight penetration and to elevations of water temperatures, which may impact many species.

#### 4.0 JURISDICTIONAL TOPICS

This section provides descriptions, inventories and impact analysis pertinent to two important issues--waters of the United States, and rare and protected species.

##### 4.1 Waters of the United States

The U.S. Army Corps of Engineers (USACE) promulgated the definition of "Waters of the United States" under 33 CFR §328.3(a). Waters of the United States include most interstate and intrastate surface waters, tributaries, and wetlands. Areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions are considered "wetlands" under 33 CFR §328.3(b). Wetlands generally include swamps, marshes, bogs, and similar areas. Any action that proposes to place dredged or fill materials into waters of the United States falls under the jurisdiction of the USACE, and must follow the statutory provisions under Section 404 of the Clean Water Act (CWA) (33 U.S.C. 1344).

##### 4.1.1 Characteristics of Wetlands and Surface Waters

Potential wetland communities were investigated pursuant to the 1987 "Corps of Engineers Wetland Delineation Manual". The three parameter approach is used where hydric soils, hydrophytic vegetation and prescribed hydrologic characteristics must **all** be present for an area to be considered a wetland.

One large wetland occurs within the study area, the floodplain swamp of Doctor's Creek. Hydrophytic vegetation in this area includes bald cypress, swamp black gum, sweet bay, bayberry (*Myrica heterophylla*), titi, red bay, leucothoe and cane. The soil is a sandy loam, generally saturated to the surface and has a Munsell color notation of 10YR 2/1 or 3/1 (Appendix I). This wetland has a wetland value score of 65 (NCDENR 1995) (Appendix II).

Jurisdictional surface waters present within the study area include Doctor's Creek. A detailed description of Doctor's Creek is presented in Section 3.2.

##### 4.1.2 Summary of Anticipated Impacts

Estimated impacts to surface waters were derived from aerial photographs of the study area, onto which surface water locations were mapped in the field. The study area width and length were used in the calculations. Usually, project construction does not require the use of the entire study area, therefore, actual impacts may be considerably less.

**Table 2. Anticipated impacts to surface waters based on study area:**

Site	Impacts within Study Area
Doctor's Creek	600 linear ft (182 linear m)

Wetlands were delineated in the field and mapped using a Global Positioning System (GPS). Estimated impacts to wetlands were calculated using GPS and the study area width and length. Usually, project construction does not require the use of the entire study area, therefore, actual impacts may be considerably less.

**Table 3. Anticipated impacts to wetlands based on the study area:**

Site	Impacts within Study Area	DWQ Rating
Wetland A	29.4 ac (11.6 ha)	65

#### 4.1.3 Permits

In accordance with provisions of Section 404 of the Clean Water Act (33 U.S.C. 1344), a Section 404 Nationwide Permit 23 from the USACE is likely to be applicable for all impacts to Waters of the United States resulting from the proposed project. This permit authorizes activities undertaken, assisted, authorized, regulated, funded or financed in whole, or part, by another Federal agency or department where that agency or department has determined that pursuant to the council on environmental quality regulation for implementing the procedural provisions of the National Environmental Policy Act. A Section 404 Nationwide Permit 33 may be required if temporary construction including cofferdams, access and dewatering are required for this project. The USACE will determine the final permit requirements.

A Coastal Area Management Act (CAMA) Permit may be required for this project since Pender County is a coastal county.

A North Carolina Division of Water Quality (DWQ) Section 401 Water Quality General Certification (#3361) is required prior to the issuance of the Section 404 Nationwide 23. Section 401 Certification allows surface waters to be temporarily impacted for the duration of the construction or other land manipulations.

#### 4.1.4 Mitigation

The USACE has adopted, through the Council on Environmental Quality (CEQ), a wetland mitigation policy which embraces the concept of "no net loss of wetlands" and sequencing. The purpose of this policy is to restore and maintain the chemical, biological and physical integrity of Waters of the United States, specifically wetlands. Mitigation of wetland impacts has been defined by the CEQ to include: avoiding impacts (to wetlands), minimizing impacts, rectifying impacts, reducing impacts over time and compensating for impacts (40 CFR 1508.20). Each of these three aspects (avoidance, minimization and compensatory mitigation) must be considered sequentially.

#### 4.1.4.1 Avoidance

Avoidance mitigation examines all appropriate and practicable possibilities of averting impacts to Waters of the United States. According to a 1990 Memorandum of Agreement (MOA) between the Environmental Protection Agency (EPA) and the USACE, in determining "appropriate and practicable" measures to offset unavoidable impacts, such measures should be appropriate to the scope and degree of those impacts and practicable in terms of cost, existing technology and logistics in light of overall project purposes. Impacts to Waters of the United States will likely not be avoided due to their close proximity to the existing bridge.

#### 4.1.4.2 Minimization

Minimization includes the examination of appropriate and practicable steps to reduce the adverse impacts to Waters of the United States. Implementation of these steps will be required through project modifications and permit conditions. Minimization typically focuses on decreasing the footprint of the proposed project through the reduction of median widths, right-of-way (ROW) widths, fill slopes and/or road shoulder widths. Other practical mechanisms to minimize impacts to Waters of the United States crossed by the proposed project include: strict enforcement of sedimentation control BMP's for the protection of surface waters during the entire life of the project; reduction of clearing and grubbing activity; reduction/elimination of direct discharge into streams; reduction of runoff velocity; re-establishment of vegetation on exposed areas, judicious pesticide and herbicide usage; minimization of "in-stream" activity; and litter/debris control. Impacts to Waters of the United States can be minimized by replacing the bridge on the existing location with an off-site detour on SR 1307/1165 to the east or SR 1304/1157 to the west.

#### 4.1.4.3 Compensatory Mitigation

Compensatory mitigation is not normally considered until anticipated impacts to Waters of the United States have been avoided and minimized to the maximum extent possible. It is recognized that "no net loss of wetlands" functions and values may not be achieved in each and every permit action. Appropriate and practicable compensatory mitigation is required for unavoidable adverse impacts which remain after all appropriate and practicable minimization has been required. Compensatory actions often include restoration, creation and enhancement of Waters of the United States. Such actions should be undertaken in areas adjacent to or contiguous to the discharge site. It is anticipated that no compensatory mitigation will be required for this project although final determination rests with the USACE.

### 4.2 Rare and Protected Species

Some populations of fauna and flora have been in, or are in, the process of decline either due to natural forces or their inability to coexist with human activities. Federal law (under the provisions of the Endangered Species Act of 1973, as amended) requires that any action, likely to adversely affect a species classified as federally-protected, be subject to review by the USFWS. Other species may receive additional protection under separate state laws.

#### 4.2.1 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. As of January 29, 2003, the USFWS lists the following federally-protected species for Pender and Duplin Counties (Table 4). A brief description of each species' characteristics and habitat follows.

**Table 4. Federally-Protected Species for Pender and Duplin Counties.**

SCIENTIFIC NAME	COMMON NAME	STATUS	COUNTY
<i>Acipenser brevirostrum</i>	shortnose sturgeon	E	Pender
<i>Alligator mississippiensis</i>	American alligator	T (S/A)	Pender & Duplin
<i>Amaranthus pumilus</i>	seabeach amaranth	T	Pender
<i>Caretta caretta</i>	loggerhead sea turtle	T	Pender
<i>Carex lutea</i>	golden sedge	E	Pender
<i>Charadrius melodus</i>	piping plover	T	Pender
<i>Lysimachia asperulaefolia</i>	rough-leaved loosestrife	E	Pender
<i>Picoides borealis</i>	red-cockaded woodpecker	E	Pender & Duplin
<i>Schwalbea americana</i>	American chaffseed	E	Pender
<i>Thalictrum cooleyi</i>	Cooley's meadowrue	E	Pender
<i>Trichechus manatus</i>	West Indian manatee	E	Pender

"E" denotes Endangered (a species in danger of extinction throughout all or a significant portion of its range).

"T" denotes Threatened (a species that is likely to become an endangered species within the foreseeable future thought all or a significant portion of its range).

"T(S/A)" denotes Threatened due to Similarity of Appearance.

#### ***Acipenser brevirostrum* (shortnose sturgeon) Endangered**

**Family: Acipenseridae**

**Federally listed: March 11, 1967**

The shortnose sturgeon lives in Atlantic Seaboard rivers from southern Canada to northeastern Florida. This fish is usually less than 3 feet (1 m) long. It is dark above and light

below. It has a wide mouth pointed downward beneath a short snout. Along the sides of its body are five rows of sharp, pointed plates which provide protection from predators.

The shortnose sturgeon inhabits the lower sections of larger rivers and coastal waters along the Atlantic coast. It may spend most of the year in brackish or salt water and move into fresh water only to spawn.

## **BIOLOGICAL CONCLUSION**

## **UNRESOLVED**

Habitats in the form of large rivers and coastal waters do not occur within the study area. Additionally, a 14 January 2003 review of the Natural Heritage Program database of threatened and endangered species revealed no known populations of shortnose sturgeon within 1 mile (1.6 km) of the study area. However, the biological conclusion for the shortnose sturgeon will be determined by an NCDOT biologist.

### ***Alligator mississippiensis* (American alligator) Threatened**

**Family: Alligatoridae**

**Federally listed: March 11, 1967**

The American alligator lives throughout the Southeastern United States, including Alabama, Arkansas, North and South Carolina, Florida, Georgia, Louisiana, Mississippi, Oklahoma, and Texas. The American alligator primarily lives in freshwater swamps and marshes, but can also be found in rivers and lakes.

Adult males can reach to 13 to 14.5 feet (4 to 4.5 m) in length with females reaching lengths of 10 feet (3 m). The snout is characteristically broad and when the mouth is closed, the edge of the upper jaw overlaps teeth in the lower jaw. Juveniles are essentially smaller versions of their parents, although they do have bright yellow cross-bands. Older alligators gradually lose the yellow banding and turn olive brown and black.

The study area does contain habitat for the American alligator, however, no nests were found during the field investigations and no surveys are required since the species is threatened due to similarity of appearance. It is likely that American alligators occur in the swamp but will move out of the area during construction activities and repopulate the area once the construction is complete. Biological conclusions are not required for species listed as threatened due to similarity of appearance.

### ***Amaranthus pumilus* (seabeach amaranth) Threatened**

**Family: Amaranthaceae**

**Federally listed: April 7, 1993**

Historically, the seabeach amaranth was found in 31 counties in nine states from Massachusetts to South Carolina. Now there are only 55 populations within three states, New



York and the Carolinas. Of these, 34 were found in Currituck, Dare, Hyde, Carteret, Onslow, Pender, New Hanover and Brunswick Counties, North Carolina.

The seabeach amaranth is an annual plant with fleshy, pink-red or reddish stems and small rounded leaves, 0.5 to 1 inch (1.3 to 2.5 centimeters (cm)) in diameter. This plant initially forms a small unbranched sprig, but soon begins to branch into a clump reaching up to a foot in diameter with 5 to 20 branches. The shiny, spinach-green colored leaves are clustered towards the tip of the stem and have a small notch at the rounded tip. The flowers and fruits are not easily seen and borne on clusters along the stems. Flowering begins as early as June in the Carolinas and extends until late fall or early winter. Seed production begins in July or August and continues until winter. The flowering and fruiting period, however, may vary as a result of weather events.

Seabeach amaranth is endemic to the Atlantic Coast barrier beaches, where its primary habitat is overwashed flats at accreting ends of islands, lower foredunes, and upper strands of noneroding beaches. Occasionally, this plant can be found in other places, including sound-side beaches, blowouts in foredunes, interdunal areas, and on sand and shell material used for beach replenishment or dredge spoil. Seabeach amaranth does not occur on well-vegetated sites because of its intolerance of competition. The species requires areas functioning in a relatively natural and dynamic nature.

## BIOLOGICAL CONCLUSION

## NO EFFECT

Habitat in the form of barrier beaches and dunes do not occur within the study area. Additionally, a 14 January 2003 review of the Natural Heritage Program database of threatened and endangered species revealed no known populations of seabeach amaranth within 1 mile (1.6 km) of the study area. Consequently, the proposed project will have "No Effect" on seabeach amaranth.

### ***Caretta caretta* (loggerhead sea turtle) Threatened**

**Family: Cheloniidae**

**Federally listed: July 28, 1978**

In the United States, loggerhead sea turtles can be found along the southeastern coast with significant nesting sites in Florida, Georgia, South Carolina, and North Carolina. Loggerheads are capable of living in diverse environments, such as in brackish waters or coastal lagoons and river mouths. It has been observed that they favor steeply sloped beaches with gradually sloping offshore approaches. Loggerhead hatchlings and juveniles are often associated with sea fronts (areas where ocean currents converge), downwellings, and eddies, where floating open ocean animals gather. During the winter, the loggerhead sea turtles remain dormant, buried in the mud at the bottom of sounds, bays and estuaries.

Adult loggerhead sea turtles have a reddish-brown carapace measuring about 36 inches (92 cm). The dorsal and lateral head scales and dorsal scales on the extremities are also reddish-brown, but with varying light yellow margins. The neck, shoulders and limb bases, which are

not scaled, are dull brown above and medium yellow laterally and ventrally. The plastron is also medium yellow. Loggerhead sea turtle hatchlings lack the reddish tinge varying from light to dark brown. Both pairs of appendages are dark brown above with distinct white margins. The plastron and other ventral surfaces are dull yellowish tan.

## **BIOLOGICAL CONCLUSION**

## **NO EFFECT**

Habitat in the form of coastal lagoons, brackish water or river mouths do not occur within the study area. Additionally, a 14 January 2003 review of the Natural Heritage Program database of threatened and endangered species revealed no known populations of loggerhead sea turtle within 1 mile (1.6 km) of the study area. Consequently, the proposed project will have "No Effect" on the loggerhead sea turtle.

### ***Carex lutea* (golden sedge) Endangered**

**Family: Cyperaceae**

**Federally listed: January 23, 2002**

Golden sedge has been found in only 2 counties in North Carolina, Onslow and Pender counties. The species has only been found in coastal savannas that are underlain by calcareous, or chalk, deposits.

Golden sedge grows in small to large clumps. The 3 to 7 grass-like leaves range from 2 to 11 inches (5 to 27 cm) long and 0.7 to 1.5 inches (1.7 to 3.8 cm) wide and are found mostly at the base of the plant. Flower spikes develop in early and mid-April and fruits mature by mid-May, with most or all fruits fallen by late June. Leaves and naked flowering stems persist through the summer.

## **BIOLOGICAL CONCLUSION**

## **NO EFFECT**

Habitat in the form of savannas did not occur within the study area. Additionally, a 14 January 2003 review of the Natural Heritage Program database of threatened and endangered species revealed no known populations of golden sedge within 1 mile (1.6 km) of the study area. Consequently, the proposed project will have "No Effect" on the golden sedge.

### ***Charadrius melodus* (piping plover) Threatened**

**Family: Charadriidae**

**Federally listed: January 10, 1986**

Piping plovers breed only in North America in three geographic regions: the Atlantic Coast, the Northern Great Plains, and the Great Lakes. In North Carolina, around 50 pairs of nesting populations were counted (1995). Four pairs of piping plovers were found nesting at Holden Beach in southern North Carolina in 1993. These birds have been observed as early as the end of February in Virginia. There are several North Carolina sites where plovers have been

observed during migration, including Oregon Inlet, Ocracoke Inlet/Portsmouth Flats, and New Drum Inlet. Sightings of the piping plover away from the outer beaches are rare.

Piping plovers are small shorebirds approximately 7 inches (18 cm) long with a 15 inch (38 cm) wingspan. They have a sand-colored plumage on their backs and crown, white underparts, and a black upper tail with a white edge. Breeding birds have a single black breastband (which is often incomplete), a black bar across the forehead, bright orange legs and bill, and a black tip on the bill. During winter, the birds lose the black bands, the legs fade to pale yellow, and the bill becomes mostly black.

Piping plover nests are found above the high tide line on coastal beaches, sandflats at the ends of sand spits and barrier islands, gently sloped foredunes, sparsely vegetated dunes, blowout areas behind primary dunes and washover areas cut into or between dunes. They may also nest where dredge material has been dumped. The nesting sites are shallow scraped depressions residing in fine grained sand to mixtures of sand, pebbles, shells or cobble. Piping plovers will primarily nest in areas with little or no vegetation.

## **BIOLOGICAL CONCLUSION**

## **NO EFFECT**

Habitat in the form of coastal beaches, sandflats and dunes do not occur within the study area. Additionally, a 14 January 2003 review of the Natural Heritage Program database of threatened and endangered species revealed no known populations of piping plovers within 1 mile (1.6 km) of the study area. Consequently, the proposed project will have "No Effect" on piping plovers.

### ***Lysimachia asperulaefolia* (rough-leaved loosestrife) Endangered**

**Family: Primulaceae**

**Federally listed: June 12, 1987**

The rough-leaved loosestrife is endemic to the coastal plain and sandhills of the Carolinas. There are currently 35 populations in North Carolina and one in South Carolina. The populations in North Carolina are in the following counties: Burnswick (8 populations); Pender (1 population); Bladen (1 population); Carteret (8 populations); Scotland (3 populations); Cumberland (5 populations); Onslow (3 populations); Hoke (5 populations); and Pamlico (1 population). Most of the populations are small, both in area covered and in the number of stems.

Rough-leaved loosestrife is a perennial rhizomatous herb with erect stem 11 to 23 inches (30 to 60 cm) tall. The leaves are sessile in whorls of 3 to 4 and are broadest at the base. The leaves encircle the stem at intervals beneath the showy yellow flowers. The upper surface of the leaves is deep yellow-green or blue-green and lustrous. The leaf margins are entire. Flowering occurs from mid-May through June, with fruits present from July through October. This species is easily distinguished from the one other similar southeastern species of *Lysimachia*, *Lysimachia loomisii* Torrey, by its broader, glandular leaves and much larger flowers.

This plant generally occurs in the ecotones or edges between longleaf pine uplands and pond pine pocosins (areas of dense shrub and vine growth usually on wet, peaty, poorly drained soil). This species has also been found on deep peat in the low shrub community of large Carolina bays (shallow, elliptical, poorly drained depressions of unknown origin). Rough-leaved loosestrife is associated with six natural community types: low pocosin, high pocosin, wet pine flatwoods, pine savanna, streamhead pocosin, and sandhill seep. Plants have also been found in disturbed sites such as roadside depressions, power line rights-of-way and firebreaks.

## BIOLOGICAL CONCLUSION

## NO EFFECT

Habitats in the form of ecotones between longleaf pine uplands and pond pine pocosins or Carolina bays with abundant sunlight are not found within the study area. The study area has been severely degraded by agricultural development and fire suppression. Additionally, a 14 January 2003 review of the Natural Heritage Program database of threatened and endangered species revealed no known populations of rough-leaf loosestrife within 1 mile (1.6 km) of the study area. Consequently, the proposed project will have "No Effect" on rough-leaf loosestrife.

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

**Family: Picidae**

**Federally listed: October 13, 1970**

The red-cockaded woodpecker historically occurred from East Texas and Oklahoma, to Florida, and North to New Jersey. The present distribution is similar except the species is not found in Missouri, Maryland and New Jersey. The red-cockaded woodpecker is found in open stands of pine with a minimum age of 80 to 120 years. Longleaf pine (*Pinus palustris*) are the most commonly used, but other species of southern pine are also acceptable. Dense stands that are primarily hardwoods or that have dense hardwood understories are avoided.

The red-cockaded woodpecker is 7 to 8 inches (18 to 20 cm) long with a wing span of 13 to 15 inches (35 to 38 cm). Black and white horizontal stripes are on its back, and its checks and underparts are white. Its flanks are black streaked. The cap and stripe on the side of the neck and throat are black. The male has a small red spot on each side of the black cap. After the first post fledgling molt, fledgling males have a red crown patch. Most often these birds are found in groups ranging from three up to as many as seven other birds.

## BIOLOGICAL CONCLUSION

## NO EFFECT

Habitat in the form of old growth stands of southern pine lacking a thick understory are not present within the study area. No RCW trees were found and no active clusters are located within 0.5 mile (0.8 km) from the study area. Additionally, a 14 January 2003 review of the Natural Heritage Program database of threatened and endangered species revealed no known populations of red-cockaded woodpeckers within 1 mile (1.6 km) of the study area. Consequently, the proposed project will have "No Effect" on the red-cockaded woodpecker.

***Schwalbea americana* (American chaffseed) Endangered****Family: Scrophulariaceae****Federally listed: September 29, 1992**

The American chaffseed is primarily a coastal plain species of the Atlantic and Gulf coasts. Fifty-one populations are known, including one in New Jersey, one in North Carolina (Fort Bragg, Cumberland and Hoke Counties), 43 in South Carolina, four in Georgia, and two in Florida. American chaffseed is found in sandy (sandy peat, sandy loam), acidic, seasonally moist to dry soils. It is found in habitats described as pine flatwoods, fire-maintained savannas, ecotonal areas between peaty wetlands and xeric sandy soils, and other open grass-sedge systems. This plant appears to be shade intolerant and therefore occurs in areas maintained in an open to partially open condition. American chaffseed is dependent on fire, mowing, or fluctuating water tables to maintain the partially open forest conditions it requires.

The American chaffseed is an erect perennial herb with unbranched stems (or stems branched only at the base) growing to a height of 12 to 24 inches (30 to 60 cm). The leaves are alternate, lance-shaped to elliptic and the upper leaves are narrow bracts. They have large, purplish-yellow tubular flowers borne singly on short stalks in the axils of the uppermost, bracts and form a many-flowered, spike-like raceme. The fruit is a narrow capsule enclosed in a sac-like structure. Flowering occurs from April to June. The fruits mature from early summer. This species is distinguished by its unbranched stem alternate leaves, largest at the base; the two-lipped flowers, long and pale yellow with purple near the open end; hairy stems and leaves; and posterior sepal and two bractlets subtending each flower. The dark brown senescing stems are quite distinctive for identification after flowering.

**BIOLOGICAL CONCLUSION****NO EFFECT**

Habitats in the form of fire-maintained pine flatwoods, savannas, ecotonal areas between peaty wetlands and xeric sandy soils do not occur within the study area. The study area has been heavily impacted by fire suppression, agricultural development and timber harvesting. Additionally, a 14 January 2003 review of the Natural Heritage Program database of threatened and endangered species revealed no known populations of American chaffseed within 1 mile (1.6 km) of the study area. Consequently, the proposed project will have "No Effect" on American chaffseed.

***Thalictrum cooleyi* (Cooley's meadowrue) Endangered****Family: Ranunculaceae****Federally listed: February 7, 1989**

Only eleven populations of Cooley's meadowrue remain in Pender, Onslow, Brunswick and Columbus Counties in North Carolina. In Onslow and Pender Counties, the six sites of Cooley's meadowrue are all within a 6.5 km radius. The three sites in Columbus County are within a 2.5 mi (4 km) radius, and the two sites of Cooley's meadowrue in Brunswick County are within a 1 mi (1.6 km) radius.

Cooley's meadowrue is a tall perennial herb, 39 to 78 inches (1 to 2 m), which grows from an underground rhizome. The slender stems stand erect in sunny locations; in the shade, they are lax and may trail along the ground or lean on other plants. The leaflets are 1 inch (2 cm) long, narrow and with entire margins. Both basal and stem leaves are present and usually grouped in threes. All parts of the plant are glabrous (smooth). Male and female flowers are on separate plants. The flowers lack petals, and the sepals are small and drop off early. The sepals on the male plants are pale yellow to white. There are numerous stamens, and the filaments are light lavender. The female plants have green sepals, and their small, spindle-shaped carpels develop into narrowly ellipsoid, one-seeded fruits (achenes). Flowering occurs in mid-to late June with fruits maturing in August or September and remaining on the plant into October.

The Cooley's meadowrue is found in moist wet bogs and savannahs often at the border of intermittent drainages or swamp forests. It grows along fireplow lines, roadside ditches, woodland clearings, and powerline rights-of-way. This species needs some type of disturbance to sustain its open habitat. Tulip poplar growing with cypress and/or Atlantic white cedar has been the best indicator of Cooley's meadowrue sites.

## **BIOLOGICAL CONCLUSION**

## **NO EFFECT**

Habitat in the form of moist wet bogs and savannahs on the border of intermittent drainages and swamp forests does not exist in the study area. The study area has been severely degraded by agricultural development and fire suppression. Additionally, a 14 January 2003 review of the Natural Heritage Program database of threatened and endangered species revealed no known populations of Cooley's meadowrue within one-half mile of the study area. Consequently, the proposed project will have "No Effect" on Cooley's meadowrue.

### ***Trichechus manatus* (West Indian manatee) Endangered**

**Family: Trichechidae**

**Federally listed: March 11, 1967**

The United States' West Indian manatee is confined during the winter to the coastal waters of Florida and to springs and warm water outfalls reaching up to southeast Georgia. They have been known to migrate as far north as coastal Virginia and west to Louisiana during the summer months. Manatees are found in both salt and fresh water with depths ranging from 5 feet (1.5 m) to less than 20 feet (6 m). They have been observed in canals, rivers, estuarine habitats and saltwater bays. When water temperatures fall below 21 to 22 degrees Centigrade, the manatees migrate south to Florida or other cluster together in warm springs or industrial outfalls. In warmer months, manatees are found in areas with an adequate food supply, water depth and near fresh water.

The West Indian manatee is a large, 10 to 15 feet (3 to 4.5 m), long fusiform-shaped mammal that is gray or brown, wrinkled, sparsely haired, and rubber-like. They have modified paddle-like forelimbs, no hindlimbs and a horizontally flattened tail. They have stiff whiskers on their muzzles. Manatees, which are primarily herbivorous, spend about five hours a day feeding on aquatic vegetation.

**BIOLOGICAL CONCLUSION****NO EFFECT**

Habitat in the form of canals, rivers, estuarine habitats and saltwater bays do not exist within the study area. Additionally, a 14 January 2003 review of the Natural Heritage Program database of threatened and endangered species revealed no known populations of West Indian manatees within 1 mile (1.6 km) of the study area. Consequently, the proposed project will have "No Effect" on the West Indian Manatee.

**4.2.2 Federal Species of Concern and State Listed Species**

There are 26 Federal Species of Concern (FSC) listed for Pender and Duplin Counties as of 29 January 2003. Federal Species of Concern are not afforded federal protection under the ESA and are not subject to any of its provisions, including Section 7, until they are formally proposed or listed as Threatened or Endangered. Federal Species of Concern are defined as those species which may or may not be listed in the future. These species were formally candidate species, or species under consideration for listing for which there was insufficient information to support a listing of Endangered, Threatened, Proposed Endangered and Proposed Threatened. Organisms which are listed as Endangered, Threatened, Significantly Rare, or Special Concern by the NCNHP 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.

Table 5 lists Federal Species of Concern, species state status, and the existence of suitable habitat for each species in the study area. This species list is provided for information purposes as the status of these species may be upgraded in the future.

Surveys for these species were not conducted during the site visit, nor were any of these species observed. As of 14 January 2003, review of the NCNHP database of the rare species and unique habitats revealed no records of North Carolina rare and/or protected species in or near the study area.

**Table 5. Federal Species of Concern for Pender and Duplin Counties.**

Scientific Name	Common name	NC Status	Habitat
<i>Acrotis buchholzi</i>	Buchholz's dart moth	SR	No
<i>Aimophila aestivalis</i>	Bachman's sparrow	SC	No
<i>Ammodramus henslowii susurrans</i>	Henslow's sparrow	SR	No
<i>Amorpha georgiana</i> var. <i>georgiana</i>	Georgia indigo-bush	E	No
<i>Aristida simpliciflora</i>	Chapman's three-awn	SR-T	No
<i>Astragalus michauxii</i>	Sandhills milkvetch	T	No
<i>Corynorhinus rafinesquii</i> **	Rafinesque's big-eared bat	T	Yes
<i>Dionaea muscipula</i>	Venus' flytrap	SR-L, SC	No
<i>Fusconaia masoni</i>	Atlantic pigtoe	E	Yes
<i>Hemipachnobia s. subporphyrea</i>	Venus flytrap cutworm moth	SR	No
<i>Heterodon simus</i> *	southern hognose snake	SC	Yes
<i>Lampsilis cariosa</i>	yellow lampmussel	E	Yes
<i>Macbridea caroliniana</i>	Carolina bogmint	T	Yes
<i>Myotis austroriparius</i>	southeastern myotis	SC	Yes
<i>Noturus</i> sp. 1	"broadtail" madtom	SC	Yes
<i>Plantago sparsiflora</i>	pineland plantain	E	No
<i>Procambarus plumimanus</i>	Croatan crayfish	W3	Yes
<i>Rana capito captio</i>	Carolina gopher frog	T	No
<i>Rhynchospora thornei</i>	Thorne's beaksedge	E	No
<i>Sagittaria graminea</i> var. <i>weatherbiana</i>	grassleaf arrowhead	SR-T	Yes
<i>Solidago pulchra</i>	Carolina goldenrod	E	No
<i>Solidago verna</i>	spring-flowering goldenrod	SR-L	No
<i>Solidago villosicarpa</i>	coastal goldenrod	SR-L	No
<i>Spartiniphaga carterae</i>	Carter's spartiniphaga	SR	No
<i>Tofieldia glabra</i>	Carolina asphodel	W1	No
<i>Trillium pusillum</i> var. <i>pusillum</i>	Carolina least trillium	E	No



- “E”--An Endangered species is one whose continued existence as a viable component of the State’s flora is determined to be in jeopardy.
- “T”--A Threatened species is one which is likely to become endangered species within the foreseeable future throughout all or a significant portion of its range.
- “SC”--A Special Concern species is one which requires monitoring but may be taken or collected and sold under regulations adopted under the provisions of Article 25 of Chapter 113 of the General Statutes (animals) and the Plant Protection and Conservation Act (plants). Only propagated material may be sold of Special Concern plants that are also listed as Threatened or Endangered.
- “SR”--A Significantly Rare species is one which is very rare in North Carolina, generally with 1-20 populations in the state, generally substantially reduced in numbers by habitat destruction, direct exploitation or disease. The species is generally more common elsewhere in its range, occurring peripherally in North Carolina.
- “-L”--Range of the species is limited to North Carolina and adjacent states.
- “-T”--Rare throughout their ranges (fewer than 100 populations total).
- “W1”--A watch Category 1 species is a species rare but relatively secure.
- “W3”--A Watch Category 3 species is a species that is poorly known; perhaps needs listing in upcoming years.
- “\*”--Historic record (last observed in the county more than 50 years ago).
- “\*\*”--Obscure record (the date and/or location of observation is uncertain).  
(Amoroso and Finnegan, 2002; LeGrand, Hall and Finnegan, 2001)

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**APPENDIX I:**  
**WETLAND DATA SHEETS**

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

Project/Site: TIP Project No B-4224 Date: 1-13-03  
 Applicant/Owner: NCDOT County: PENDER  
 Investigator: Dr. J.H. Carter III State: NORTH CAROLINA  
 JCA, Inc., Environmental Consultants, P.O. Box 891, Southern Pines, N.C. 28388 (910) 695-1043

Do Normal Circumstances exist on the site?  Yes  No | Community ID: \_\_\_\_\_  
 Is the site significantly disturbed (Atypical Situation) Yes  No  No | Transect ID: \_\_\_\_\_  
 Is the area a potential Problem Area? Yes  No  No | Plot ID: A-6  
 (if needed, explain on reverse) WETLAND A

**VEGETATION**

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. <u>Pinus taeda</u>	<u>1</u>	<u>FAC</u>	9. _____	_____	_____
2. <u>Acer rubrum</u>	<u>2</u>	<u>FAC</u>	10. _____	_____	_____
3. <u>Liquidambar styraciflua</u>	<u>1</u>	<u>FAC</u>	11. _____	_____	_____
4. <u>Carpinus caroliniana</u>	<u>2</u>	<u>FAC</u>	12. _____	_____	_____
5. <u>Liriodendron tulipifera</u>	<u>1</u>	<u>FAC</u>	13. _____	_____	_____
6. <u>Magnolia virginiana</u>	<u>2</u>	<u>FACW</u>	14. _____	_____	_____
7. <u>Sambucus canadensis</u>	<u>3</u>	<u>FACW</u>	15. _____	_____	_____
8. <u>Aralia spinosa</u>	<u>3</u>	<u>FAC</u>	16. _____	_____	_____

1 = tree (overstory) 2 = sapling (midstory) 3 = shrub (understory) 4 = herb layer (ground cover) 5 = vines

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-) 100%

Remarks: HYDROPHYTIC VEGETATION PRESENT

**HYDROLOGY**

<p>Recorded Data (Describe in Remarks):</p> <p>____ Stream, Lake, or Tide Gauge</p> <p>____ Aerial Photographs</p> <p>____ Other</p> <p><input checked="" type="checkbox"/> No Recorded Data Available</p>	<p>Wetland Hydrology Indicators:</p> <p>Primary Indicator:</p> <p>____ Inundated</p> <p><input checked="" type="checkbox"/> Saturated in Upper 12 inches</p> <p>____ Water Marks</p> <p>____ Drift Lines</p> <p>____ Sediment Deposits</p> <p>____ Drainage Patterns in Wetlands</p>
<p>Field Observations:</p> <p>Depth of Surface Water: <u>0</u> (in.)</p> <p>Depth to Free Water in Pit: <u>0</u> (in.)</p> <p>Depth to Saturated Soil: <u>4</u> (in.)</p>	<p>Secondary Indicators (2 or more required):</p> <p><input checked="" type="checkbox"/> Oxidized Root Channels in Upper 12 inches</p> <p>____ Water-Stained Leaves</p> <p>____ Local Soil Survey Data</p> <p>____ FAC-Neutral Test</p> <p>____ Other (Explain in Remarks)</p>

Remarks: WETLAND HYDROLOGY PRESENT

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

Project/Site: TIP Project No. B-4224 Date: 1-13-03  
 Applicant/Owner: NC DOT County: PENDER  
 Investigator: Dr. J.H. Carter III State: NORTH CAROLINA  
 JCA, Inc., Environmental Consultants, P.O. Box 891, Southern Pines, N.C. 28388 (910) 695-1043

Do Normal Circumstances exist on the site?  Yes  No  
 Is the site significantly disturbed (Atypical Situation)  Yes  No  
 Is the area a potential Problem Area?  Yes  No  
 (if needed, explain on reverse)

Community ID: \_\_\_\_\_  
 Transect ID: \_\_\_\_\_  
 Plot ID: A-6  
UPLAND A

↑ edge of a yard / mowed area

**VEGETATION**

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. <u>Pinus taeda</u>	<u>1</u>	<u>FAC</u>	9. _____	_____	_____
2. <u>Quercus nigra</u>	<u>1</u>	<u>FAC</u>	10. _____	_____	_____
3. <u>Liquidambar styraciflua</u>	<u>1</u>	<u>FAC+</u>	11. _____	_____	_____
4. <u>Ligustrum sinense</u>	<u>3</u>	<u>FAC</u>	12. _____	_____	_____
5. <u>Lonicera japonica</u>	<u>5</u>	<u>FAC-</u>	13. _____	_____	_____
6. <u>Andropogon virginicus</u>	<u>4</u>	<u>FAC-</u>	14. _____	_____	_____
7. _____	_____	_____	15. _____	_____	_____
8. _____	_____	_____	16. _____	_____	_____

1 = tree (overstory) 2 = sapling (midstory) 3 = shrub (understory) 4 = herb layer (ground cover) 5 = vines

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-) 66%

Remarks: HYDROPHYTIC VEGETATION PRESENT

**HYDROLOGY**

Recorded Data (Describe in Remarks):  
 Stream, Lake, or Tide Gauge  
 Aerial Photographs  
 Other  
 No Recorded Data Available

Wetland Hydrology Indicators:  
 Primary Indicator:  
 Inundated  
 Saturated in Upper 12 inches  
 Water Marks  
 Drift Lines  
 Sediment Deposits  
 Drainage Patterns in Wetlands

Field Observations:  
 Depth of Surface Water: 0 (in.)  
 Depth to Free Water in Pit: 0 (in.)  
 Depth to Saturated Soil: 0 (in.)

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

Remarks: WETLAND HYDROLOGY ABSENT

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

Project/Site: TIP Project No B-4224 Date: 1-13-03  
 Applicant/Owner: NCDOT County: DUPLIN  
 Investigator: Dr. J.H. Carter III State: NORTH CAROLINA  
 JCA, Inc., Environmental Consultants, P.O. Box 891, Southern Pines, N.C. 28388 (910) 695-1043

Do Normal Circumstances exist on the site?  Yes  No  
 Is the site significantly disturbed (Atypical Situation) Yes  No  No  
 Is the area a potential Problem Area? Yes  No  No  
 (if needed, explain on reverse)

Community ID: \_\_\_\_\_  
 Transect ID: \_\_\_\_\_  
 Plot ID: Northeast  
Quadrant

WETLAND A

**VEGETATION**

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. <u>Pinus taeda</u>	1	FAC	9. <u>Arundinaria tecta</u>	4	FACW
2. <u>Liriodendron tulipifera</u>	1	FAC	10. _____		
3. <u>Quercus nigra</u>	1	FAC	11. _____		
4. <u>Persea borbonia</u>	2	FACW	12. _____		
5. <u>Myrica heterophylla</u>	3	FACW	13. _____		
6. <u>Ilex opaca</u>	3	FAC-	14. _____		
7. <u>Ilex coriacea</u>	3	FACW	15. _____		
8. <u>Magnolia virginiana</u>	2	FACW	16. _____		

1 = tree (overstory) 2 = sapling (midstory) 3 = shrub (understory) 4 = herb layer (ground cover) 5 = vines

Percent of Dominant Species that are OBL, FACW or FAC  
 (excluding FAC-) 88%

Remarks: HYDROPHYTIC VEGETATION PRESENT

**HYDROLOGY**

<p>Recorded Data (Describe in Remarks):</p> <p>____ Stream, Lake, or Tide Gauge</p> <p>____ Aerial Photographs</p> <p>____ Other</p> <p><input checked="" type="checkbox"/> No Recorded Data Available</p>	<p>Wetland Hydrology Indicators:</p> <p>Primary Indicator:</p> <p>____ Inundated</p> <p><input checked="" type="checkbox"/> Saturated in Upper 12 inches</p> <p>____ Water Marks</p> <p>____ Drift Lines</p> <p>____ Sediment Deposits</p> <p>____ Drainage Patterns in Wetlands</p>
<p>Field Observations:</p> <p>Depth of Surface Water: <u>0</u> (in.)</p> <p>Depth to Free Water in Pit: <u>0</u> (in.)</p> <p>Depth to Saturated Soil: <u>1</u> (in.)</p>	<p>Secondary Indicators (2 or more required):</p> <p><input checked="" type="checkbox"/> Oxidized Root Channels in Upper 12 inches</p> <p>____ Water-Stained Leaves</p> <p>____ Local Soil Survey Data</p> <p><input checked="" type="checkbox"/> FAC-Neutral Test</p> <p>____ Other (Explain in Remarks)</p>

Remarks: WETLAND HYDROLOGY PRESENT



**APPENDIX II:**  
**WETLANDS RATING WORKSHEETS**

# WETLANDS RATING WORKSHEET

Fourth Version

WETLAND A

Project name TIP Project No. B-4224 Nearest road SR 1305  
 County PENDER/DUPLIN Wetland area 29.4 acres Wetland width \_\_\_\_\_ feet  
 Name of evaluator TRACY RUSH/KATIE BARCH Date 1-13-03

**Wetland location**

- on pond or lake
- on perennial stream
- on intermittent stream
- within interstream divide
- other \_\_\_\_\_

**Adjacent land use**

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

- forested/natural vegetation 60 %
- agriculture, urban/suburban 35 %
- impervious surface <5 %

**Dominant vegetation**

- (1) Liriodendron tulipifera
- (2) Nyssa biflora
- (3) Cyrille racemiflora

**Soil series** Mervyn & Craven Soils

Fallingston fine sandy loam

- predominantly organic - humus, muck, or peat
- predominantly mineral - non-sandy
- predominantly sandy

**Flooding and wetness**

- Semipermanently to permanently flooded or inundated
- seasonally flooded or inundated
- intermittently flooded or temporary surface water
- no evidence of flooding or surface water

**Hydraulic factors**

- steep topography
- ditched or channelized
- total riparian wetland width  $\geq$  100 feet

**Wetland type (select one)\***

- Bottomland hardwood forest
- Headwater forest
- Swamp forest creek edge
- Wet flat
- Pocosin

- Pine savanna
- Freshwater marsh
- Estuarine fringe forest
- Ephemeral wetland
- Carolina Bay

- Bog forest
- Bog/fen
- Seep
- Other \_\_\_\_\_

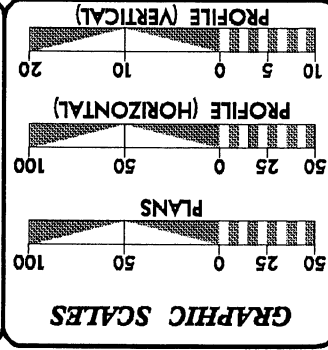
\*The rating system cannot be applied to salt or brackish marshes or stream channels.

		<i>weight</i>			
R	Water storage <u>3</u>	x 4.00 =	<u>12</u>		
A	Bank/Shoreline stabilization <u>2</u>	x 4.00 =	<u>8</u>		
T	Pollutant removals <u>4</u>	x 5.00 =	<u>20</u>		
I	Wildlife habitat <u>5</u>	x 2.00 =	<u>7</u>		
N	Aquatic life value <u>4</u>	x 4.00 =	<u>16</u>		
G	Recreation/Education <u>2</u>	x 1.00 =	<u>2</u>		
					<b>Wetland Score</b>
					<u>65</u>

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

**CONTRACT: C201484**

**TIP PROJECT: B-4224**



**DESIGN DATA**

ADT 2003 = 800  
 ADT 2025 = 1400  
 DHV = 10 %  
 D = 60 %  
 T = 3 %  
 V = 60 MPH  
 • TTST 1 %  
 DUAL 2 %  
 FUNC CLASS = LOCAL

**PROJECT LENGTH**

LENGTH ROADWAY TIP PROJECT B-4224 = 0.143 MILES  
 LENGTH STRUCTURE TIP PROJECT B-4224 = 0.027 MILES  
 TOTAL LENGTH OF TIP PROJECT B-4224 = 0.170 MILES

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

PROJECT ENGINEER: JASON MOORE, PE  
 PROJECT DESIGN ENGINEER: BRYAN KEY, PE

RIGHT OF WAY DATE: APRIL 21, 2005  
 LETTING DATE: APRIL 18, 2006

HYDRAULICS ENGINEER: [Signature]  
 ROADWAY DESIGN ENGINEER: [Signature]

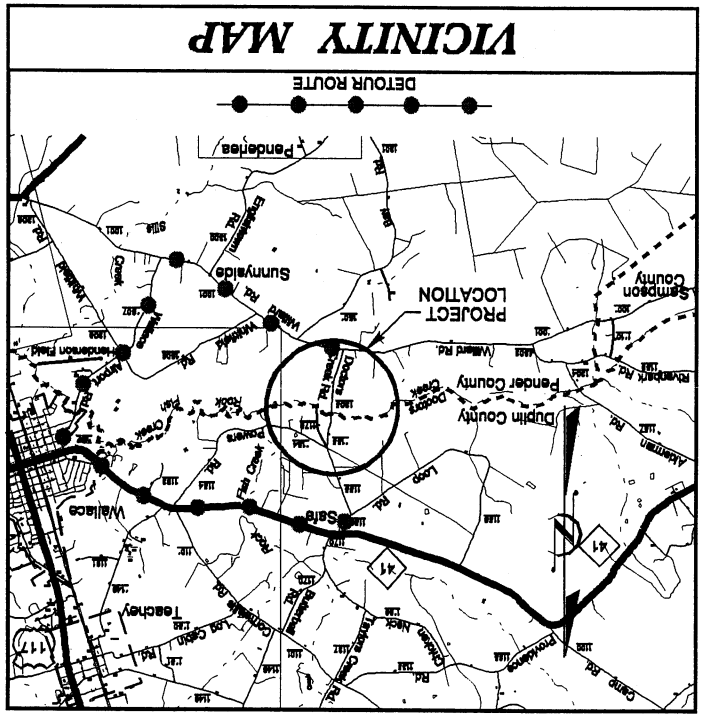
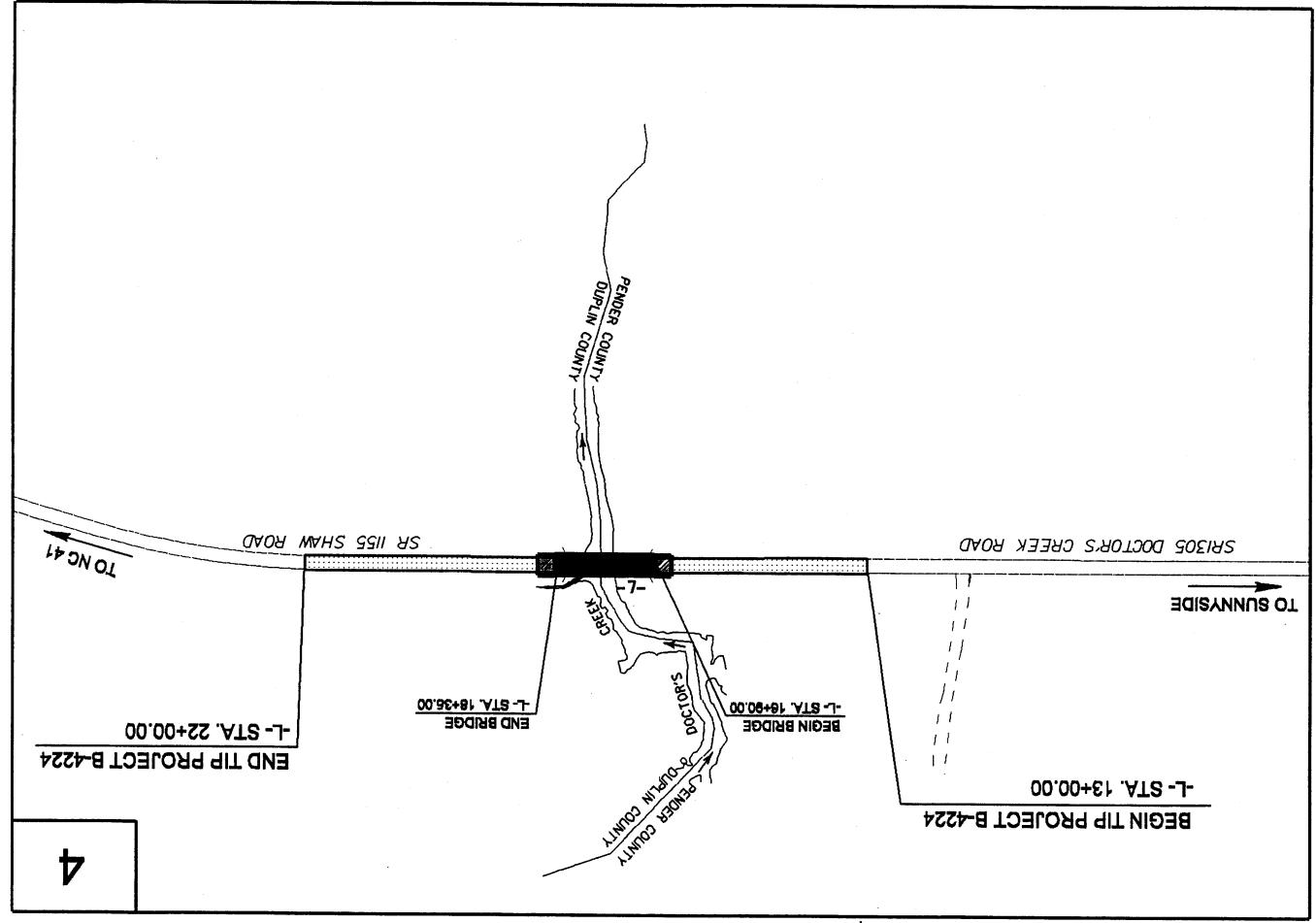
DIVISION OF HIGHWAYS  
 STATE OF NORTH CAROLINA

STATE DESIGN ENGINEER: [Signature]  
 FEDERAL HIGHWAY ADMINISTRATION

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

THIS PROJECT IS NOT WITHIN ANY MUNICIPAL BOUNDARIES.

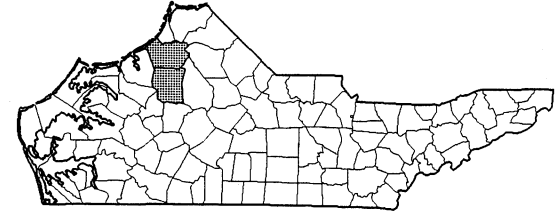
PRELIMINARY PLANS  
 DO NOT USE FOR CONSTRUCTION



**LOCATION: BRIDGE 63 OVER DOCTOR'S CREEK ON SR 1305 & SR 1155**

**TYPE OF WORK: GRADING, DRAINAGE, STRUCTURE, PAVING, GUARDRAIL, AND PAVEMENT MARKINGS**

**PENDER/DUPLIN COUNTIES**  
 DIVISION OF HIGHWAYS  
 STATE OF NORTH CAROLINA

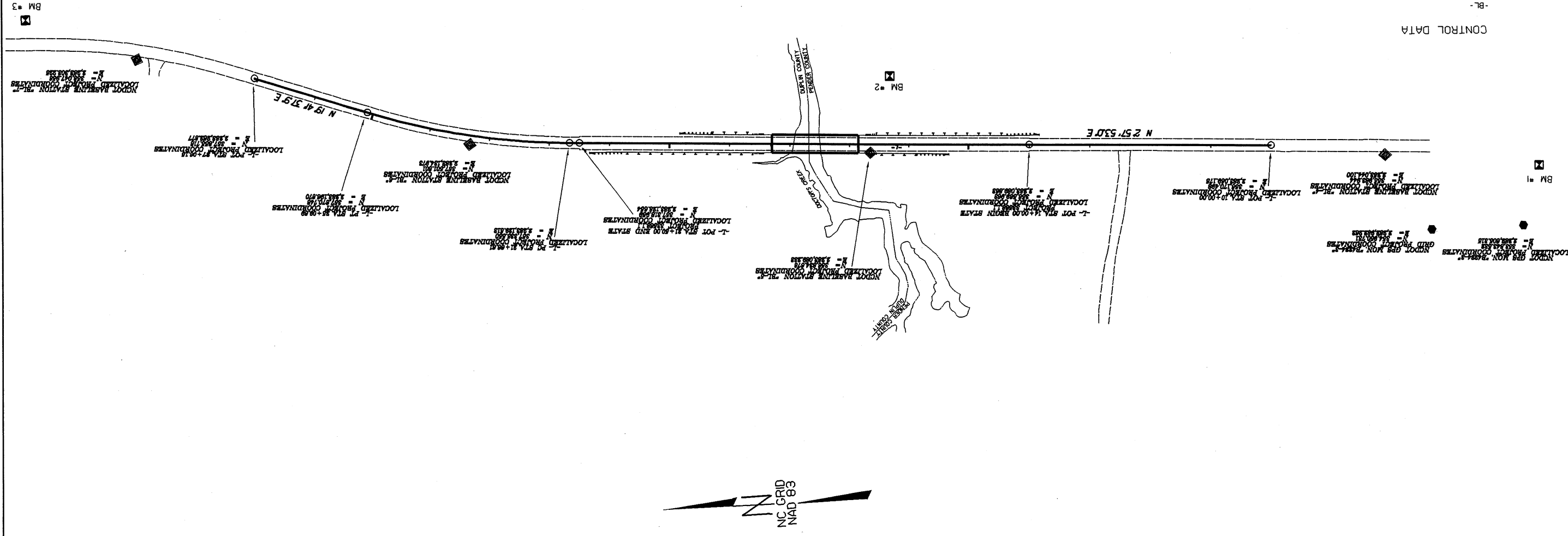


STATE PROJECT REFERENCE NO.	B-4224	SHEET NO.	1	TOTAL SHEETS	1
STATE PROJ. NO.	N.C.	DESCRIPTION			
P.E.	33568.11	BRZ-1305(2)			
R/W UTILITIES	33568.21	BRZ-1305(2)			

See Sheet 1-A For Index of Sheets

## SURVEY CONTROL SHEET

PROJECT REFERENCE NO.	B-224
SHEET NO.	1-C



POINT	DESC.	NORTH	EAST	ELEVATION	L STATION	OFFSET
3	NCDOT GPS MON. B-4224-3	3549583.7310	2282982.2620	62.14	OUTSIDE PROJECT LIMITS	
4	BL-4	355883.9440	2283044.1000	49.09	OUTSIDE PROJECT LIMITS	
5	BL-5	356834.6780	2283069.2330	40.62	16+64.33	
6	BL-6	357801.6810	2283134.9730	40.54	23+31.20	14.79 LT
7	BL-7	358847.9560	2283303.2250	40.67	OUTSIDE PROJECT LIMITS	

**CONTROL DATA**

**BENCHMARK DATA**

BM1	ELEVATION	59.16	N 35652	E 2282993	L STATION 10+00	S 8° 23' 47.8" W DIST 523.71	RR SPIKE SET IN POWER POLE
BM2	ELEVATION	34.00	N 356795	E 2283216	L STATION 16+32 114 RIGHT		RR SPIKE SET IN 17' MAPLE
BM3	ELEVATION	44.18	N 358291	E 2283381	L STATION 27+06	N 15° 08' 16.9" E DIST 450.41	RR SPIKE SET IN 20' PINE

**DATUM DESCRIPTION**

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCDOT FOR MONUMENT B-4224-3.  
 WITH NAD 83 STATE PLANE GRID COORDINATES OF NORTHING: 35495073 (N) EASTING: 2282982262 (E)  
 NORTHING: 35495073 (N) EASTING: 2282982262 (E)  
 THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (ROUND TO GRID) IS: 0.999917  
 THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM B-4224-3 TO L-STATION 14+00.00 IS N 03° 48' 07" E 1622.80'  
 ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES. VERTICAL DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES.

**NOTES:**

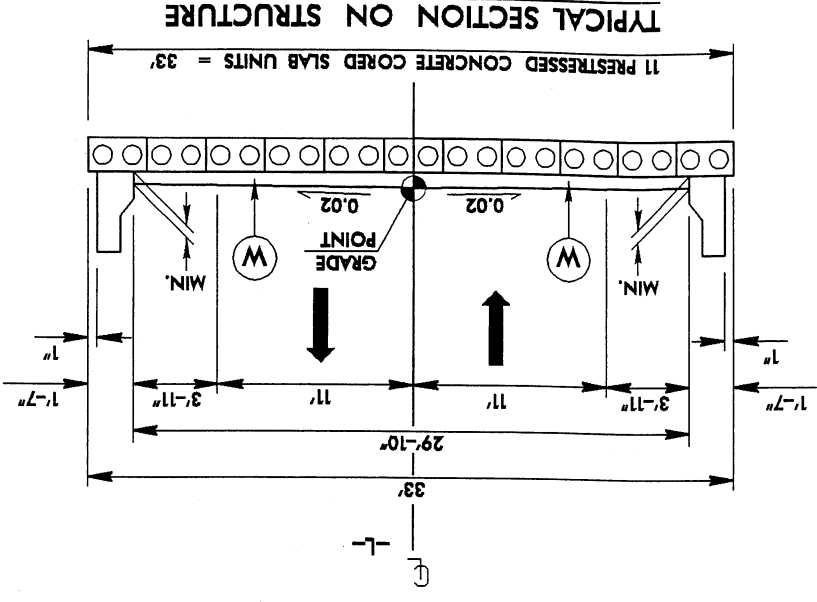
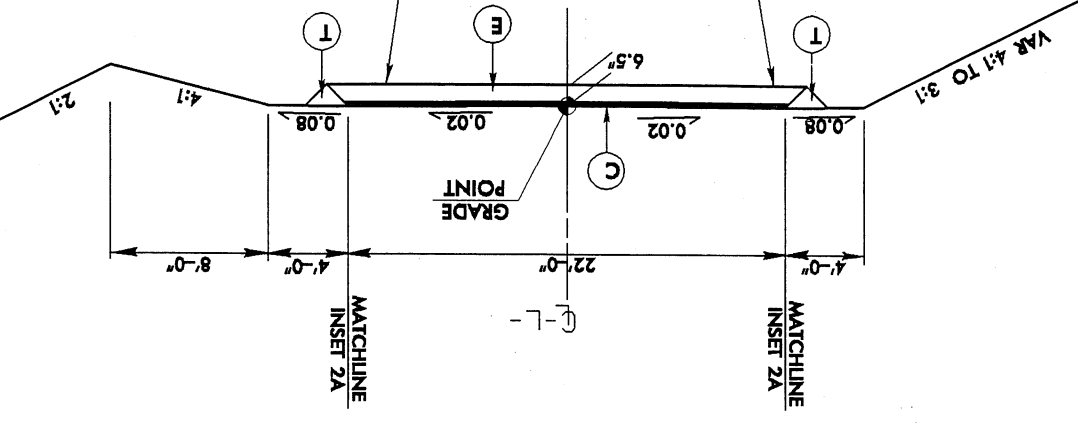
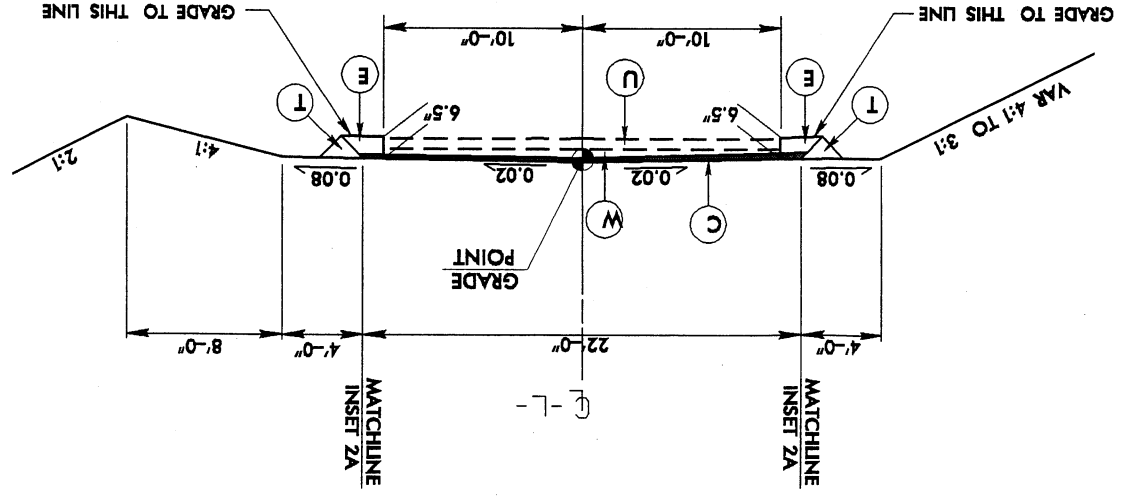
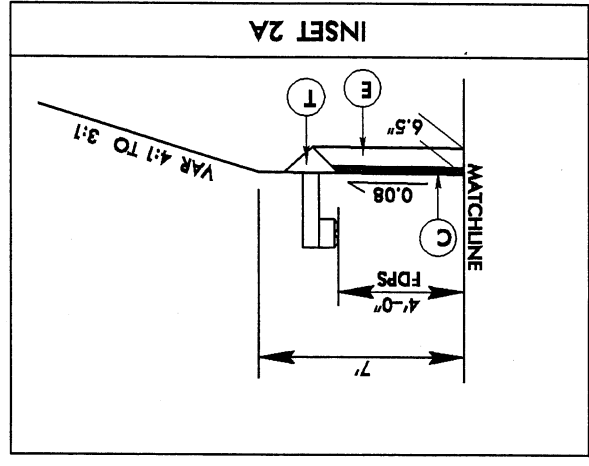
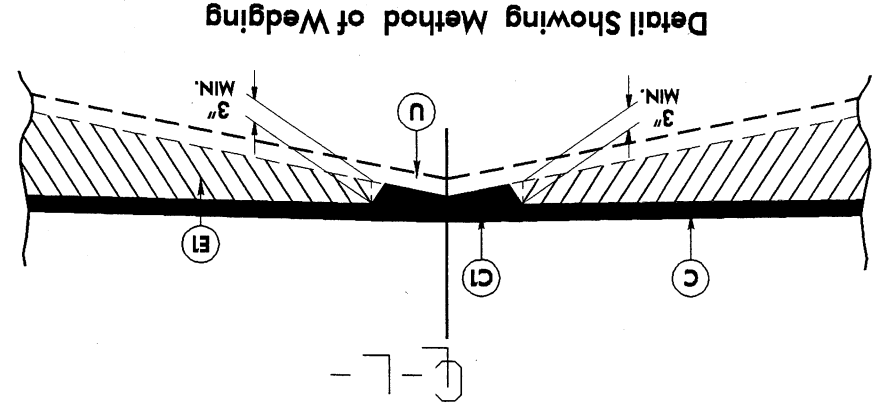
THE CONTROL DATA FOR THIS PROJECT CAN BE FOUND ELECTRONICALLY BY SELECTING PROJECT CONTROL DATA AT:

HTTP://WWW.DOH.DOT.STATE.NC.US/PROJECTS/STRUCTURE/HIGHWAY/LOCATION/PROJECT FILE NAME: b4224\_1a\_control\_061010.dwg

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 MONUMENTS NAD 8395

NOTE: DRAWING NOT TO SCALE

PAVEMENT SCHEDULE	
C	PROP. APPROX. 2 1/2" ASPHALT CONCRETE SURFACE COURSE TYPE SF9.5A, AT AN AVERAGE RATE OF 137.5 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.
C1	PROP. VAR. DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE SF9.5A, AT AN AVERAGE RATE OF 110 LBS. PER SQ. YD. PER 1" DEPTH TO BE PLACED IN LAYERS NOT LESS THAN 1" IN DEPTH OR GREATER THAN 1 1/2" IN DEPTH.
E	PROP. APPROX. 4" ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.
E1	PROP. VAR. DEPTH ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NOT LESS THAN 3" IN DEPTH OR GREATER THAN 6 1/2" IN DEPTH.
T	EARTH MATERIAL.
U	EXISTING PAVEMENT.
W	VARIABLE DEPTH ASPHALT PAVEMENT (SEE STANDARD WEDGING DETAIL BELOW)

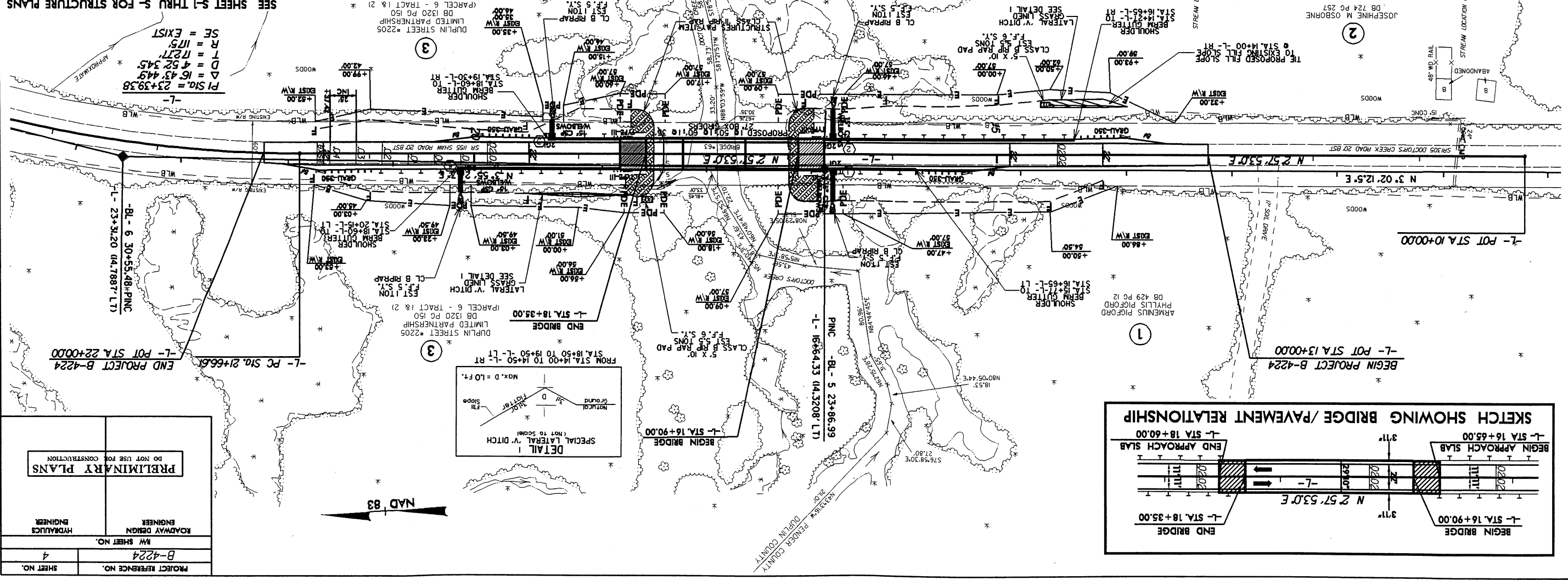
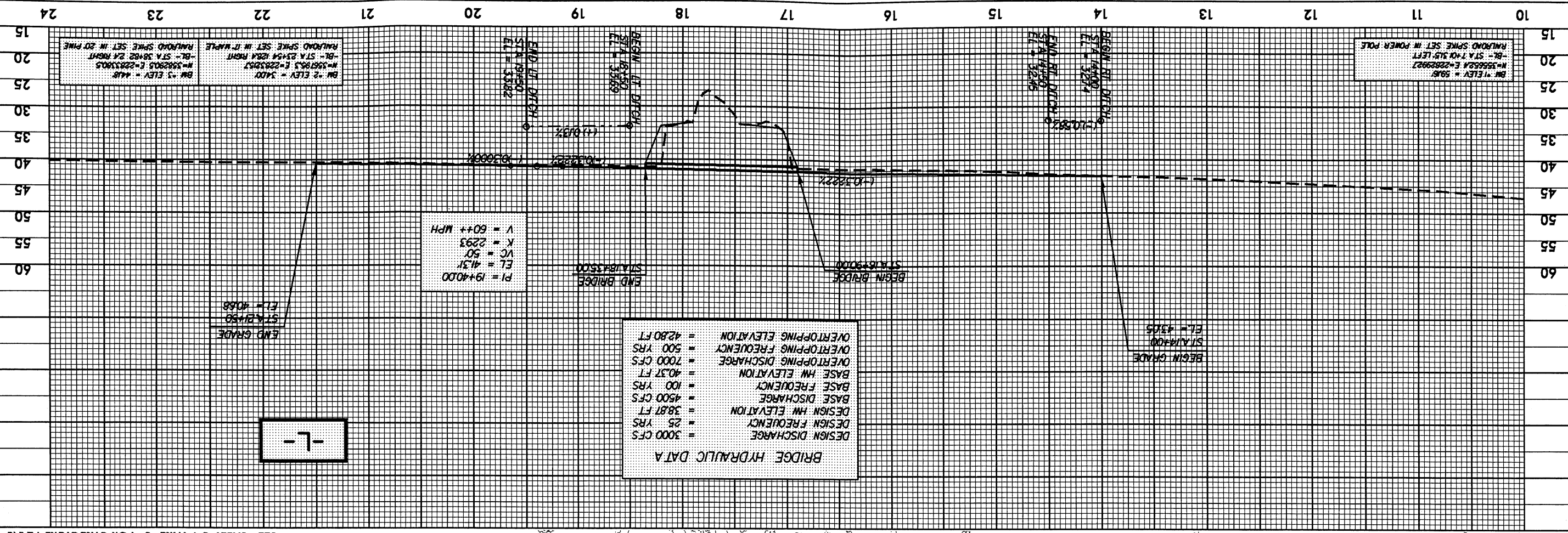


USE TYPICAL SECTION NO.3  
 STA 16+90.00 TO 18+35.00

USE TYPICAL SECTION NO.2  
 -L- STA. 15+90.00 TO STA. 16+90.00  
 -L- STA. 18+35.00 TO STA. 19+35.00  
 USE INSET 2A IN GUARDRAIL LOCATIONS

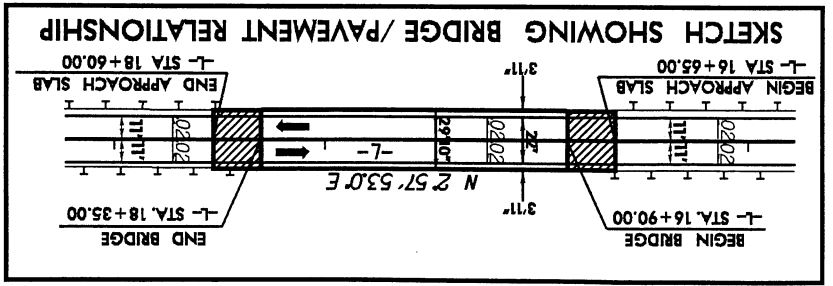
USE TYPICAL SECTION NO.1  
 -L- STA. 14+00.00 TO STA. 15+90.00  
 -L- STA. 19+35.00 TO STA. 21+50.00  
 -L- STA. 21+50.00 TO STA. 22+00.00  
 TRANSITION TO EXISTING  
 -L- STA. 13+00.00 TO -L- STA. 14+00.00  
 -L- STA. 21+50.00 TO -L- STA. 22+00.00  
 USE INSET 2A IN GUARDRAIL LOCATIONS

PROJECT REFERENCE NO.	B-4224
SHEET NO.	2
ROADWAY DESIGN ENGINEER	
PAVEMENT DESIGN ENGINEER	
PRIMARY PLANS	DO NOT USE FOR CONSTRUCTION

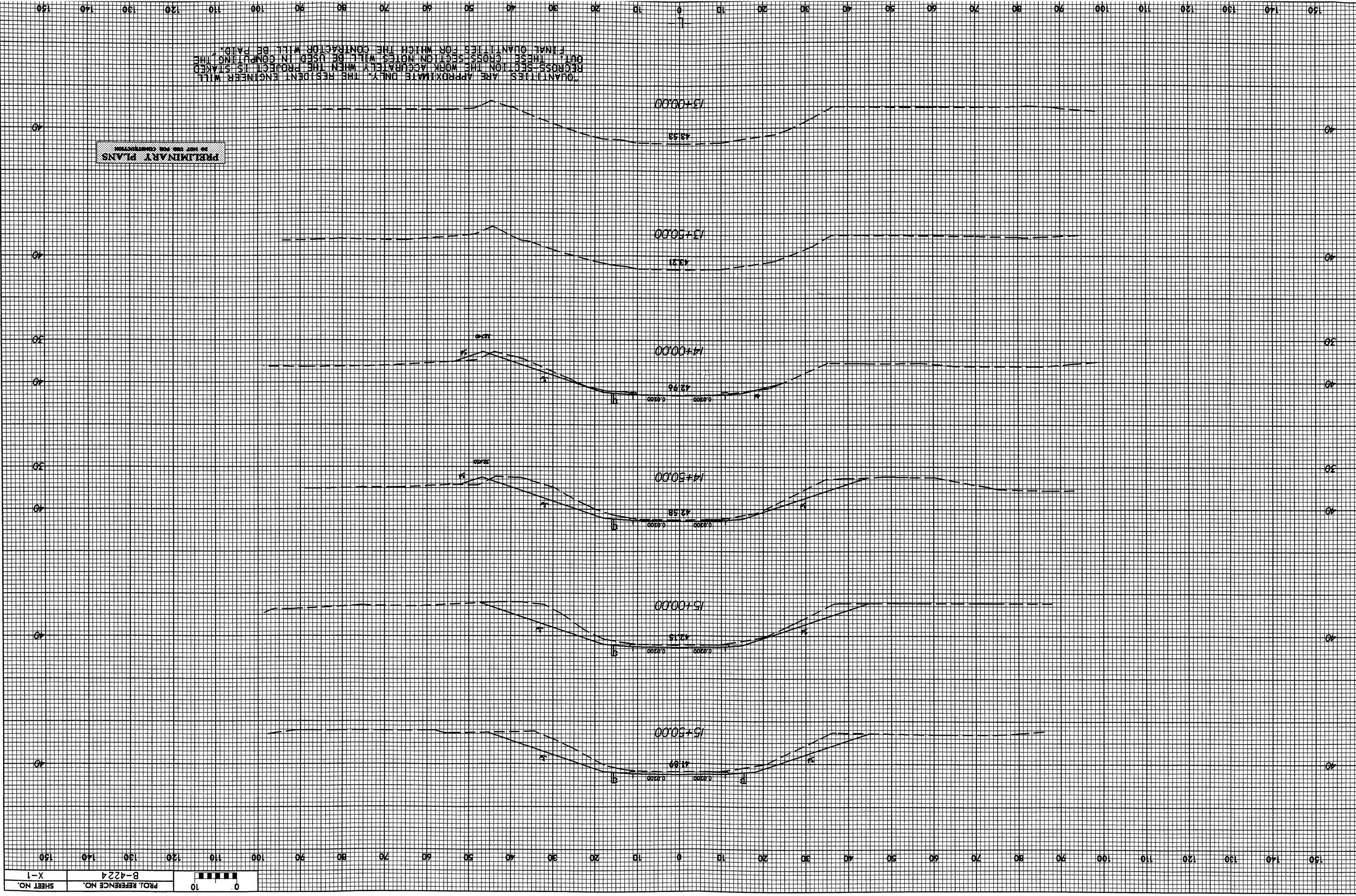


REVISIONS

PROJECT REFERENCE NO.	B-4224
SHEET NO.	4
HW SHEET NO.	
ROADWAY DESIGN ENGINEER	
HYDRAULICS ENGINEER	
DO NOT USE FOR CONSTRUCTION	PRELIMINARY PLANS

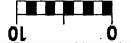




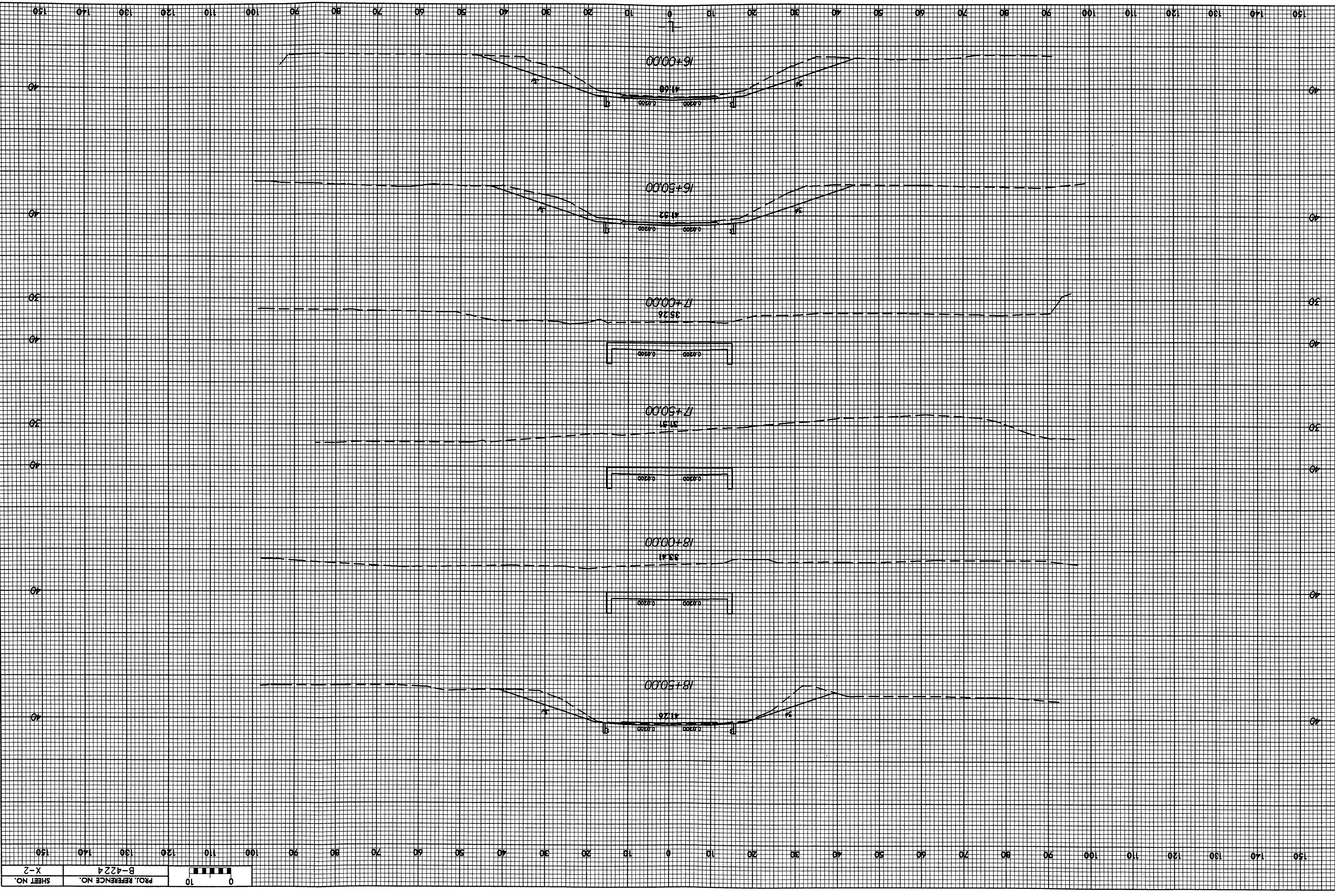


QUANTITIES ARE APPROXIMATE ONLY. THE RESIDENT ENGINEER WILL RECORD SECTION THE WORK ACCURATELY WHEN THE PROJECT IS STAKED OUT. THESE CROSS SECTION NOTES WILL BE USED IN COMPUTING THE FINAL QUANTITIES FOR WHICH THE CONTRACTOR WILL BE PAID.

PRELIMINARY PLANS  
DO NOT USE FOR CONSTRUCTION







PROJ. REFERENCE NO. B-4224  
SHEET NO. X-2

