



STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION

MICHAEL F. EASLEY  
GOVERNOR

LYNDO TIPPETT  
SECRETARY

March 16, 2007

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

ATTENTION: Ms. Jennifer Frye  
NCDOT Coordinator

Dear Madam:

SUBJECT: **Nationwide Permit 23 Application** for the proposed replacement of Bridge No. 98 on SR 1246 (Butler Island Road) over Big Swamp, in Sampson County (Division 3). Federal Aid Project No. BRZ-1246(2), State Project No. 8.2281701, TIP No. B-4271, WBS Element 33612.1.1.

Please find enclosed copies of the Categorical Exclusion (CE) Document, Natural Resources Technical Report (NRTR), permit drawings, and roadway plans for the above referenced project proposed by the North Carolina Department of Transportation (NCDOT). The department plans to replace Bridge No. 98 on SR 1246 (Butler Island Road) in place, with a 105-foot long 30-foot wide bridge. An off-site detour will be utilized during construction. This project is scheduled to let August 21, 2007, with a July 3, 2007 review date. Proposed permanent impacts to jurisdictional wetlands are 0.04 acre.

### Impacts to Waters of the United States

General Description: Big Swamp is located in the Cape Fear River Basin, USGS 8-digit Hydrologic Unit Code (HUC) 03030006. The study area is found in the DWQ subbasin 03-06-18. Study area waters drain to the southeast and south eventually flowing into the South River. Big Swamp has been assigned a best usage classification of "C SW" (index #18-68-12-8, 7/1/73) by the N.C. Division of Water Quality. 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. Big Swamp is not classified as a 303d stream.

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

TELEPHONE: 919-715-1334 or  
919-715-1335  
FAX: 919-715-5501

**LOCATION:**  
PARKER LINCOLN BUILDING  
2728 CAPITAL BLVD. SUITE 240  
RALEIGH NC 27604

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

Permanent Impacts: Adjacent riverine wetlands of Big Swamp will be impacted by the proposed project. Construction of the proposed bridge will result in permanent impacts of 0.04 acre. These impacts are a result of permanent fill associated with widening of the roadway and class II riprap utilized for stormwater management devices.

Temporary Impacts: There are no temporary impacts associated with this project.

Utility Impacts: There are impacts to jurisdictional resources due to project construction.

### **Bridge Demolition**

The existing bridge was constructed in 1949, and consists of five spans (1 @ 17' -5", 1 @ 17' -3", 1 @ 17' -2", 1 @ 17' -3", 1 @ 17' -5") with a total length of 86' -6". The superstructure consists of a reinforced concrete deck supported by steel I-beams and reinforced concrete caps, timber piles, and vertical timber abutments. The bridge deck is situated 11' above the creek bed. The bridge will be removed using BMP's for bridge demolition, and without dropping any of its components into "Waters of the United States".

### **Avoidance and Minimization**

NCDOT has avoided and minimized impacts to the fullest extent possible:

- Traffic will be maintained using an off-site detour during construction.
- The bridge will be built in-place using top-down construction and can therefore be built without the need of a causeway or work pad.
- There will be no deck drains over the creek.
- In compliance with 15A NCAC 02B.0104(m) we have incorporated the use of BMP's in the design of the project.
- Erosion and Sediment Control Guidelines will be utilized during construction.
- 3:1 slopes will be utilized in areas adjacent to wetlands.

### **Mitigation**

As a result of project construction, 0.06 acre of riverine wetland will be restored through the removal of the existing causeway. A Wetland Restoration Plan is included and outlines the specifics of this proposal.

### **Federally Protected Species**

As of January 29, 2007, the United States Fish and Wildlife Service (USFWS) lists four federally protected species for Sampson County (Table 1). Survey of the field site revealed no suitable habitat for *Lindera melissifolia* or *Picoides borealis*. Further, a review of the Natural Heritage Program (NHP) files on January 8, 2007, indicated no occurrence of federally listed species within 2 miles of the project site. *Schwalbea americana* was not listed as a Threatened or Endangered species at the time the Categorical Exclusion was signed. A brief description of *Schwalbea americana*, results of a recent habitat survey, and its biological conclusion are included below.

***Schwalbea americana* (American chaffseed)**

**Endangered**

Plant Family: Scrophulariaceae

Date Listed: September 29, 1992

American chaffseed is an erect perennial herb with unbranched stems (or stems branched only at the base) with large, purplish-yellow, tubular flowers that are borne singly on short stalks in the axils of the uppermost, reduced leaves (bracts). The leaves are alternate, lance-shaped to elliptic, stalkless, 2 to 5 centimeters (1 to 2 inches) long, and entire. The entire plant is densely, but minutely hairy throughout, including the flowers. Flowering occurs from April to June in the South, and from June to mid-July in the North. Chaffseed fruits are long, narrow capsules enclosed in a sac-like structure that provides the basis for the common name. Fruits mature from early summer in the South to October in the North. *Schwalbea* is a hemiparasite (partially dependent upon another plant as host). Like most of the hemiparasitic Scrophulariaceae, it is not host-specific, so its rarity is not due to its preference for a specialized host. Although another species (*S. australis*) was once recognized, the genus *Schwalbea* is now considered to be monotypic.

American chaffseed occurs in sandy (sandy peat, sandy loam), acidic, seasonally moist to dry soils. It is generally found in habitats described as open, moist pine flatwoods, fire-maintained savannas, ecotonal areas between peaty wetlands and xeric sandy soils, and other open grass-sedge systems. Chaffseed is dependent on factors such as fire, mowing, or fluctuating water tables to maintain the crucial open to partly-open conditions that it requires. Historically, the species existed on savannas and pinelands throughout the coastal plain and on sandstone knobs and plains inland where frequent, naturally occurring fires maintained these sub-climax communities. Under these conditions, herbaceous plants such as *Schwalbea* were favored over trees and shrubs.

**Biological Conclusion**

**NO EFFECT**

Habitat in the form of open, moist pine flatwoods, maintained by mowing or fire was not present within the study site when surveyed on December 12, 2006. Most of the study area is classified as coastal plain small stream swamp. A small amount of mesic pine flatwood habitat exists within the northeast and northwest corners of the project area. These areas were dominated by loblolly pine (*Pinus taeda*) in the canopy and sweetgum (*Liquidambar styraciflua*), southern red oak (*Quercus falcata*), and water oak (*Quercus nigra*) in the understory. The shrub layer includes inkberry (*Ilex glabra*), dwarf huckleberry (*Gaylussacia dumosa*), and sweet leaf (*Symplocos tinctoria*). The herbaceous layer is dominated by bracken fern (*Pteridium aquilinum*), and vines include honeysuckle (*Lonicera japonica*), catbriar (*Smilax glauca*), poison ivy (*Toxicodendron radicans*), and yellow jessamine (*Gelsemium sempervirens*). Although these areas may classify as habitat marginally suitable for *Schwalbea*, the proposed project will not impact any such areas. Consequently, the proposed project will have “No Effect” on *Schwalbea americana*.

**Table 1. Federally Protected Species for Sampson County**

<b>Common Name</b>	<b>Scientific Name</b>	<b>Habitat</b>	<b>Status</b>	<b>Biological Conclusion</b>
American alligator	<i>Alligator mississippiensis</i>	N/A	T (S/A)	N/A
American chaffseed	<i>Schwalbea americana</i>	NO	E	NO EFFECT
Pondberry	<i>Lindera melissifolia</i>	NO	E	NO EFFECT
Red-cockaded woodpecker	<i>Picoides borealis</i>	NO	E	NO EFFECT

T(S/A)-denotes threatened due to similarity of appearance; E-denotes Endangered

### **Regulatory Approvals**

Section 404 Permit: All other aspects of this project are being processed by the Federal Highway Administration as a “Categorical Exclusion” in accordance with 23 CFR § 771.115(b). The NCDOT requests that these activities be authorized by Nationwide Permit 23 (FR number 10, pages 2020 – 2095, June 15, 2002).


Section 401 Permit: We anticipate 401 General Certification number 3403 will apply to this project. The NCDOT will adhere to all general conditions. Therefore, we are not requesting written concurrence. In accordance with 15A NCAC 2H .0500(a) we are providing two copies of this application to the North Carolina Department of Environmental and Natural Resources, Division of Water Quality, for their records.

Thank you for your assistance with this project. If you have any questions or need additional information, please contact Worth Calfee at [wcalfee@dot.state.nc.us](mailto:wcalfee@dot.state.nc.us) or (919) 715-7225.

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

Sincerely,



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

cc:

w/ attachment

Mr. John Hennessy, NCDWQ (2 Copies)  
Mr. Travis Wilson, NCWRC  
Mr. Gary Jordan, USFWS  
Mr. Ron Sechler, NMFS  
Mr. Michael Street, NCDMF  
Dr. David Chang, P.E., Hydraulics  
Mr. Mark Staley, Roadside Environmental  
Mr. Greg Perfetti, P.E., Structure Design  
Mr. Victor Barbour, Project Services Unit  
Mr. H. Allen Pope, P.E., Division 3 Engineer  
Mr. Mason Herndon, Division 3 Environmental Officer

w/out attachment

Mr. Jay Bennett, P.E., Roadway Design  
Mr. Majed Alghandour, P. E., Programming and TIP  
Mr. Art McMillan, P.E., Highway Design  
Mr. Scott McLendon, USACE, Wilmington  
Mr. Gregory M. Blakeney, PDEA Project Planning Engineer

**Wetland Restoration Plan  
At Bridge No. 98 over Big Swamp  
on SR 1246  
Sampson County**

**TIP B-4271  
Federal Aid Project No. BRZ-1246 (2)  
WBS No. 33612.1.1**

**March, 2007**

The North Carolina Department of Transportation (NCDOT) will perform on-site mitigation for wetland impacts at the SR 1246 overpass of Big Swamp. This mitigation site occurs within Transportation Improvement Program (TIP) B-4271. The project begins approximately 390 feet west of Bridge No. 98 and continues for approximately 490 feet to the west of the bridge. NCDOT will restore approximately 0.06 acres of coastal plain small stream swamp wetland as onsite mitigation for B-4271. The roadway project will impact 0.04 acres of unavoidable wetlands, leaving approximately 0.02 acres of riverine wetland restoration assets on-site.

### **EXISTING CONDITIONS**

The project is located in Sampson County, southwest of Roseboro, approximately 3 miles from the intersection of NC 242 and SR 1246 (Butler Island Rd.) close to the Sampson and Cumberland County line. The project study area land use is primarily comprised of agricultural and forested land.

The Natural Resources Technical Report for TIP B-4271, dated March 2003, provides further details concerning existing roadway and project study area conditions.

The existing embankments of the approaches to Bridge No. 98 are located within the floodplain of Big Swamp within a wetland community known as a Coastal Plain Small Stream Swamp. The wetland is dominated by tulip poplar (*Liriodendron tulipifera*), sweet bay (*Magnolia virginiana*), fetterbush (*Lyonia lucida*) and a herbaceous layer of cane (*Arundinaria gigantea*). The transition zone where the wetland grades into the existing causeway slope is dominated by cane (*Arundinaria gigantea*).

### **PROPOSED CONDITIONS DESIGN**

The proposed wetland mitigation will consist of restoring 0.06 acres of riverine wetland. Restoration will involve removing causeway fill and transition area along both

approaches to Bridge No. 98 to match the adjacent wetland elevation. Representative spot elevations will be taken in all four quadrants of the bridge project within the adjacent reference wetland to determine target elevations. Excavated areas will be ripped and disked prior to planting of the site if necessary.

The Natural Environment Unit shall be contacted to provide construction oversight to ensure that the wetland mitigation area is constructed appropriately.

### **VEGETATION PLANTING**

The restoration areas adjacent to the new bridge structure will be planted following the successful completion of the site grading. The site will be planted with bottomland hardwood species including at least three of the following: water oak (*Quercus nigra*), tulip poplar (*Liriodendron tulipifera*), green ash (*Fraxinus pennsylvanica*), willow oak (*Quercus phellos*), sycamore (*Platanis occidentalis*), water tupelo (*Nyssa aquatica*), swamp chestnut oak (*Quercus michauxii*).

### **MONITORING**

Upon successful completion of construction, the following monitoring strategy is proposed for the mitigation site. NCDOT will document monitoring activities on the site in an annual report distributed to the regulatory agencies.

### **HYDROLOGIC MONITORING**

No specific hydrological monitoring is proposed for this restoration site. The target elevation will be based on the reference wetland and verified during construction. Constructing the site at the adjacent wetland elevation will ensure the hydrology in the restored area is similar to the hydrology in the reference area.

### **VEGETATION SUCCESS CRITERIA**

NCDOT shall monitor the restoration site by visual observation and photo points for survival and aerial cover of vegetation. NCDOT shall monitor the site for a minimum of three years or until the site is deemed successful. Monitoring will be initiated upon completion of the site planting.

**CATEGORICAL EXCLUSION ACTION CLASSIFICATION FORM**

TIP Project No.	<u>B-4271</u>
State Project No.	<u>8.2281701</u>
Federal Project No.	<u>BRZ-1246(2)</u>

**A. Project Description:**

NCDOT will replace Bridge No. 98 on SR 1246 (Butler Island Road) over Big Swamp in Sampson County. The bridge will be replaced with a new bridge measuring 105 feet in length and 30 feet in width at approximately the same location and elevation as the existing bridge. This will provide a 24 foot travelway and 3 foot offsets on each side. The new approach roadway will be a 24 foot travelway with 8 foot grassed shoulders. The approach work will consist of 350 feet to the southwest and 375 feet to the northeast of the existing bridge. Traffic will be detoured on existing secondary roads as shown in Figure 1 during construction. There will be 11.3 miles of additional travel.

**B. Purpose and Need:**

Bridge Maintenance records indicate the bridge has a sufficiency rating of 23.8 out of 100. The bridge's five span superstructure is composed of reinforced concrete deck on steel I-beams. The substructure is composed of reinforced concrete caps on timber piles. The bridge's low superstructure condition 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	\$ 575,000
Right of Way	\$ <u>32,600</u>
<b>Total</b>	<b>\$ 607,600</b>

**Estimated Traffic:**

Current	-	1500 VPD
Year 2025	-	2600 VPD
TTST	-	4%
Dual	-	2%

**Proposed Typical Roadway Section:**

The approach roadway will be 24 feet wide with 8-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 Minor Collector

**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 11.3 miles of additional travel.

**Bridge Demolition:**

Bridge No. 98 has 5 spans totaling 87 feet in length. The bridge superstructure is composed of a reinforced concrete deck on steel I-beams. The substructure is composed of reinforced concrete caps on timber piles. All components of the bridge will be removed without dropping any of their components into Waters of the United States.

**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 1246.

Due to the relatively short detour (11.3 miles) and the relatively low traffic (1500 vehicles per day), and the presence of high quality wetlands in the project area, no other alternatives were studied.

**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"/>	<u>X</u>
(2) Does the project involve any habitat where federally listed endangered or threatened species may occur?	<input type="checkbox"/>	<u>X</u>
(3) Will the project affect anadromous fish?	<input type="checkbox"/>	<u>X</u>
(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?	<u>X</u>	<input type="checkbox"/>
(5) Will the project require use of U. S. Forest Service lands?	<input type="checkbox"/>	<u>X</u>
(6) Will the quality of adjacent water resources be adversely impacted by proposed construction activities?	<input type="checkbox"/>	<u>X</u>
(7) Does the project involve waters classified as Outstanding Water Resources (OWR) and/or High Quality Waters (HQW)?	<input type="checkbox"/>	<u>X</u>
(8) Will the project require fill in waters of the United States in any of the designated mountain trout counties?	<input type="checkbox"/>	<u>X</u>

- (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.)

**G. CE Approval**

TIP Project No.                   B-4271                    
State Project No.                   8.2281701                    
Federal-Aid Project No.                   BRZ-1246(2)                  

**Project Description:**

NCDOT will replace Bridge No. 98 on SR 1246 (Butler Island Road) over Big Swamp in Sampson County. The bridge will be replaced with a new bridge measuring 105 feet in length and 30 feet in width at approximately the same location and elevation as the existing bridge. This will provide a 24 foot travelway and 3 foot offsets on each side. The new approach roadway will be a 24 foot travelway with 8 foot grassed shoulders. The approach work will consist of 350 feet to the southwest and 375 feet to the northeast of the existing bridge. Traffic will be detoured on existing secondary roads as shown in Figure 1 during construction. There will be 11.3 miles of additional travel.

**Categorical Exclusion Action Classification:**

  X   TYPE II(A)  
       TYPE II(B)

Approved:

6-30-04 Teresa Hart  
Date Teresa Hart, PE, CPM, Assistant Manager  
Project Development and Environmental Analysis Branch

6-30-04 William T. Goodwin Jr.  
Date William T. Goodwin Jr., P.E., Unit Head  
Bridge Replacement Planning Unit

6-30-04 Joel A. Johnson  
Date Joel A. Johnson, Project Development Engineer  
Bridge Replacement Planning Unit



# PROJECT COMMITMENTS

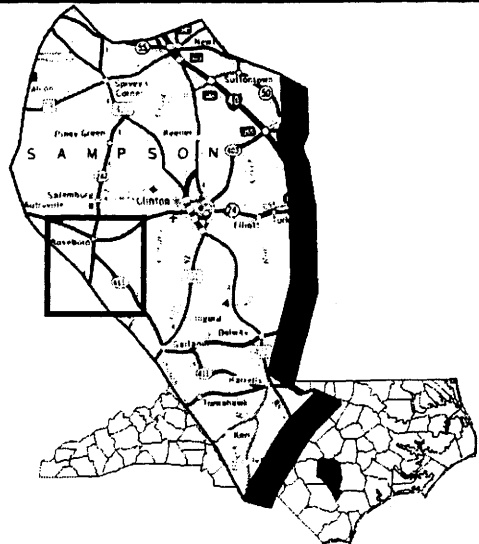
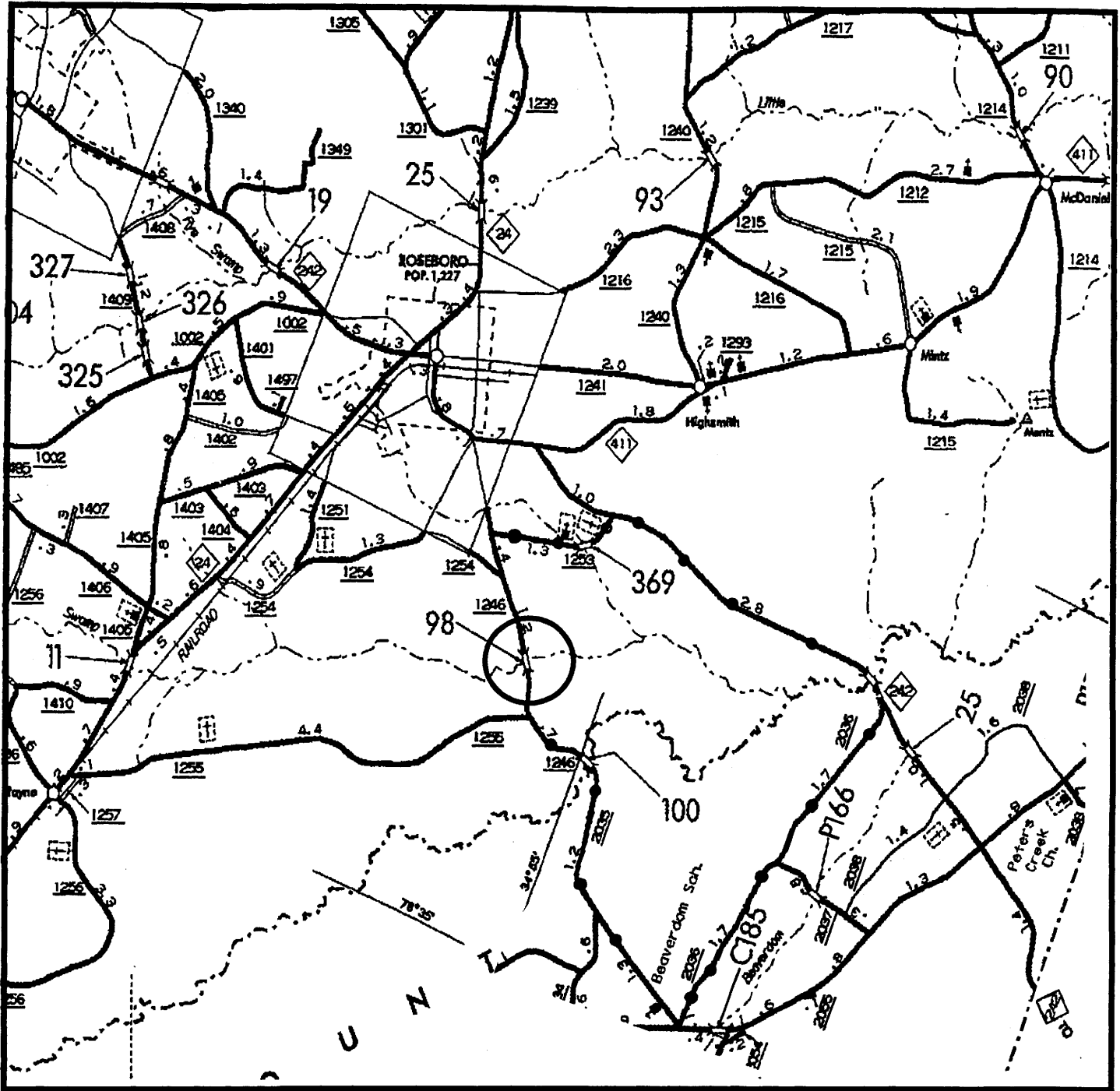
Replacement of Bridge No. 98  
On SR 1246 over Big Swamp  
Sampson County  
Federal-Aid No. BRZ-1246(2)  
State Project No. 8.2281701  
T.I.P. No. B-4271

## Commitments Developed Through Project Development and Design

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

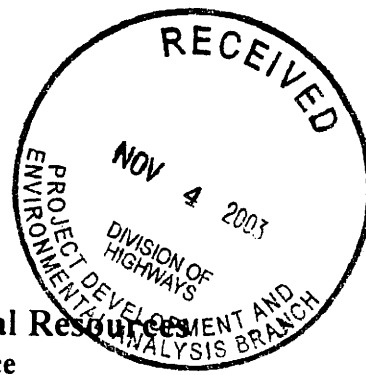
NCDOT will adhere to the Best Management Practices (BMPs) for “Bridge Demolition and Removal” during the removal of Bridge No. 98.

The total time of **road closure** for this project should be held to a minimum due to the 11.3 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>SAMPSON COUNTY          REPLACE BRIDGE NO. 98 ON SR 1246          OVER BIG SWAMP          B-4271</b></p>	
<p style="text-align: right;">Figure 1</p>	



**North Carolina Department of Cultural Resources**  
**State Historic Preservation Office**

David L. S. Brook, Administrator

Division of Historical Resources

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

October 29, 2003

MEMORANDUM

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

FROM: David Brook *David Brook*

SUBJECT: Replacement of Bridge No. 98 on SR 1246 over Big Swamp, B-4271,  
Sampson County, ER03-0971

On September 4, 2003, Sarah McBride, our preservation specialist for transportation projects, met with the North Carolina Department of Transportation (NCDOT) staff for a meeting of the minds concerning the above project. We reported on our available information on historic architectural and archaeological surveys and resources along with our recommendations. DOT provided project area photographs and aerial photographs at the meeting.

Based on our review of the photographs and the information discussed at the meeting, we offer our preliminary comments regarding this project.

In terms of historic architectural resources, we are aware of no historic structures located within the areas of potential effect. We recommend that no historic architectural survey be conducted for this project.

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

Having provided this information, we look forward to receipt of either a Categorical Exclusion or Environmental Assessment which indicates how NCDOT addressed our comments.

[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
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October 29, 2003

Page 2

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

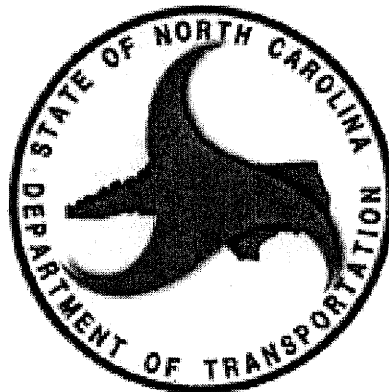
Thank you for your cooperation and consideration. If you have questions concerning the above comment, contact Renee Gledhill-Earley, environmental review coordinator, at 919/733-4763. In all future communication concerning this project, please cite the above referenced tracking number.

**REPLACE BRIDGE NO. 98 ON SR 1246  
OVER BIG SWAMP  
SAMPSON COUNTY, NORTH CAROLINA**

**TIP NUMBER B-4271  
STATE CONTRACT NO. A304259  
STATE PROJECT NO. 8.2281701  
FEDERAL AID PROJECT NO. BRZ-1246(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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**APPENDICES**

Appendix I. Wetland Data Sheets  
Appendix II. Wetlands Rating Worksheet

## **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. 98 on SR 1246 (Butler Island Road) over Big Swamp in Sampson County, 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 (Roseboro, 1987).
- USDA Natural Resource Conservation Service (NRCS) soil survey for Sampson County, North Carolina (1985).
- U.S. Fish and Wildlife Service (USFWS) National Wetlands Inventory (NWI) map for 7.5-minute Roseboro quadrangle (1994).
- NC 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.

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 9 and 10 January



Figure 1

2003. The corridor investigated extended 200 feet (60 meters (m)) upstream and downstream from the centerline of the existing bridge and 1200 feet (365 m) east and west from the bridge along SR 1246. 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

Sampson County lies in the Coastal Plain physiographic province of North Carolina. The county ranges in elevation from approximately 20 to 210 feet (6 to 64 m) above mean sea level (msl). Elevations within the study area range from approximately 80 to 100 feet (24 to 30 m) above msl.

### 2.2 Soils

Five major soil types occur within the study area (USDA 1985): Autryville loamy sand, Johns fine sandy loam, Johnston loam, Kalmia loamy sand and Lumbee sandy loam. 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
Au	Autryville loamy sand	0 to 6	well	non hydric	No
Jo	Johns fine sandy loam	0 to 2	poor/moderate	non hydric	Yes
JT	Johnston loam	0 to 2	very poor	hydric	No
KaA	Kalmia loamy sand	0 to 3	well	non hydric	Yes
Lm	Lumbee sandy loam	0 to 2	poor	hydric	No

Autryville loamy sand: Autryville loamy sand is a well drained soil on broad, smooth uplands. The seasonal high water table occurs 4.0 to 6.0 feet below the surface and runoff potential is low. The flooding frequency for Autryville loamy sand is never.

Johns fine sandy loam: Johns fine sandy loam is a poorly drained to moderately well drained soil on stream terraces. The seasonal high water table occurs at depths 1.5 to 3.0 feet below the surface and runoff potential is high. The flooding frequency for Johns fine sandy loam is rare.

Johnston loam: Johnston loam is a very poorly drained soil on narrow to moderately broad floodplains. The seasonal high water table occurs at or near the surface and runoff potential is very high. The flooding frequency for Johnston loam is frequent.

Kalmia loamy sand: Kalmia loamy sand is a well drained soil on terraces. The seasonal high water table occurs at depths greater than 6 feet below the surface and runoff potential is medium. The flooding frequency for Kalmia loamy sand is rare.

Lumbee sandy loam: Lumbee sandy loam is a poorly drained soil on uplands smooth flats and shallow depressions on stream terraces. The seasonal high water table occurs at depths 0 to 1.5 feet below the surface and runoff potential is medium to very high. The flooding frequency for Lumbee sandy loam is rare.

## 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 means to minimize those impacts.

### 2.3.1 Waters Impacted and Characteristics

Big Swamp 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, USGS 8-digit Hydrologic Unit Code (HUC) 03030006. The Cape Fear River Basin contains 24 subbasins. The study area is found in the South River and Big Creek DWQ subbasin 03-06-18. Study area waters drain to the southeast and south eventually flowing into the South River (NCDENR-DWQ 2000a).

### 2.3.2 Best Usage Classification

Big Swamp has been assigned a best usage classification of Class “C SW” (index #18-68-12-8, 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.**

### 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 and timbering operations 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 and timber production. 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 Big Swamp in the Cape Fear River basin is not listed as an impaired waterway (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 dischargers located within 1 mile (1.6 km) of the study area (EPA 2003).

### **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 the 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*).

##### 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 by loblolly pine

(*Pinus taeda*). Understory species include 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, transmission line right-of-way, borrow pit and residential landscapes. Road shoulders and transmission line right-of-ways 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.).

The transmission line right-of-way consists of sweet gum, red maple and loblolly pine saplings. Shrub species include Chinese privet (*Ligustrum sinense*) and blackberry. Herbaceous vegetation includes bracken fern, Japanese honeysuckle, dog fennel, giant plume grass (*Erianthus giganteus*) and soft rush (*Juncus effusus*).

The borrow pit area consists of open sand with a few sweet gum and loblolly pine trees and other early successional species.

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.

## 3.2 Aquatic Communities

One aquatic community, Big Swamp, 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 50 to 80 feet (15 to 24 m). The main channel width is 10 feet (3 m) and the channel depth is approximately 1 to 2 feet (0.3 to 0.6 m). The channel substrate is composed primarily of muck and organic debris. The flow of the creek within the study area was low.

### 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*), blue jay\* (*Cyanocitta cristata*), 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 holbrookii*), southern toad (*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*), redfin pickerel (*Esox americanus*), pirate perch (*Aphredoderus sayanus*), redbreast sunfish (*Lepomis auritus*) and eastern mosquitofish (*Gambusia holbrookii*) (Rohde et al. 1994).



Big Swamp within the study corridor 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 taxispilota*) 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 of Big Swamp. Hydrophytic vegetation in this area includes bald cypress, swamp black gum, sweet bay, sweet gallberry, fetterbush, leucothoe and cane. The soil is a sandy loam, generally saturated to the surface and has a Munsell color notation of 10YR 2/1 (Appendix I). This wetland has a wetland value score of 70 (NCDENR 1995) (Appendix II).

Jurisdictional surface waters present within the study area include Big Swamp. A detailed description of Big Swamp 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
Big Swamp	400 linear ft (121 linear m)
Borrow Pit	0.07 ac (0.03 ha)

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	18.2 ac (7.4 ha)	70

### 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 a temporary construction including cofferdams, access and dewatering are required for this project. The USACE will determine the final permit requirements.

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 N.C. Highway 242.

#### **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 Sampson County (Table 4). A brief description of each species' characteristics and habitat follows.

**Table 4. Federally-Protected Species for Sampson County.**

SCIENTIFIC NAME	COMMON NAME	STATUS
<i>Alligator mississippiensis</i>	American alligator	T (S/A)
<i>Lindera melissifolia</i>	pondberry	E
<i>Picoides borealis</i>	red-cockaded woodpecker	E

“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 throughout all or a significant portion of its range).

“T(S/A)” denotes Threatened due to Similarity of Appearance. These species are not biologically endangered or threatened and are not subject to Section 7 consultation.

#### ***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.

***Lindera melissifolia* (pondberry) Endangered**

**Family: Lauraceae**

**Federally listed: July 31, 1986**

Pondberry is known to be scattered across the Southeastern United States with one population existing in Bladen County, North Carolina. It is associated mostly with wetland habitats such as bottomland hardwoods and the margins of sinks, ponds and other depressions.

This deciduous shrub grows approximately 6 feet (2 m) high and spreads vegetatively by stolons. Pondberry is distinguished from the two other North American members of the genus (*Lindera benzoin* and *Lindera subcoriacea*) by its drooping, thin membranaceous, and ovately to elliptically shaped leaves that have a strong sassafras-like odor when crushed. The plants bloom pale yellow flowers around March, and mature fruits, which are bright red and oval-shaped, can be found in October. The plants grow in clones of numerous stems. Young stems replace dead stems at the base. Thus, a mature colony usually consists of numerous dead stems along with younger leafy ones.

**BIOLOGICAL CONCLUSION**

**NO EFFECT**

Habitat in the form of bottomland hardwoods, sinks, ponds and other depressions is not present within the study area. Habitat within the study area has been severely degraded by timber harvesting, agriculture and filling. Additionally, a 14 January 2003 review of the Natural Heritage Program database of threatened and endangered species revealed no known populations of pondberry within 1 mile (1.6 km) of the study area. Consequently, the proposed project will have "No Effect" on pondberry.

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

**Family: Picidae**

**Federally listed: October 13, 1970**

The red-cockaded woodpecker (RCW) 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.

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

There are 14 Federal Species of Concern (FSC) listed for Sampson County 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 Sampson County.**

Scientific Name	Common name	NC Status	Habitat
<i>Aimophila aestivalis</i>	Bachman's sparrow	SC	No
<i>Corynorhinus rafinesquii</i> **	Rafinesque's big-eared bat	SC (PT)	Yes
<i>Cylindrocolea andersonii</i> *	a liverwort	W2	No
<i>Dionaea muscipula</i>	Venus' flytrap	SR-L, SC	No
<i>Dolania americana</i>	American sand burrowing mayfly	SR	No
<i>Heterodon simus</i> *	southern hognose snake	SC	Yes
<i>Juglans cinerea</i>	butternut	W5	No
<i>Litsea aestivalis</i>	pondspice	SR-T	No
<i>Ludwigia brevipes</i> *	long beach seedbox	SR-T	Yes
<i>Macbridea caroliniana</i>	Carolina bogmint	T	Yes
<i>Noturus</i> sp. 1	"broadtail" madtom	SC	Yes
<i>Ophisaurus mimicus</i> *	mimic glass lizard	SC	No
<i>Rana capito capito</i>	Carolina gopher frog	T	No
<i>Solidago verna</i>	spring-flowering goldenrod	SR-L	No

"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"--These species are rare throughout their ranges.

"P\_"--Proposed (used as a qualifier of the ranks above).

"W2"--A Watch Category 2 species is a species rare to uncommon, but probably not in trouble.

"W5"--A Watch Category 5 species is a species with increasing amounts of threats to its habitat; populations may or may not be known to be declining.

"\*"--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).



## 6.0 REFERENCES

Amoroso, Jame L., and J.T. Finnegan. 2002. "Natural Heritage Program List of the Rare Plant Species of North Carolina". Raleigh: North Carolina Natural Heritage Program.

Environmental Protection Agency. 2003. EnviroMapper website (<http://maps.epa.gov/enviromapper>).

LeGrand, Jr., H.E., S. P. Hall and J.T. Finnegan. 2001. "Natural Heritage Program List of the Rare Animal Species of North Carolina". North Carolina Natural Heritage Program.

Martof, B. S., et al. 1980. *Amphibians and Reptiles of the Carolinas and Virginia*. University of North Carolina Press, Chapel Hill.

National Geographic. 1987. *Field Guide to the Birds of North America*. Third Edition. National Geographic Society, Washington, D.C.

NCDENR-DWQ. 2002. Basinwide Information Management System (BIMS) website (<http://h2o.enr.state.nc.us/bims/Reports/reportsWB.html>)

NCDENR-DWQ. 2000a. Cape Fear River Basinwide Water Quality Plan.

NCDENR-DWQ. 2000b. North Carolina's Draft 2000 303(d) list. (<http://h2o.enr.state.nc.us/mtu/files/303d/NC2kLIST.pdf>)

NCDENR. 1995. "Guidance for rating the values of wetlands in North Carolina". Fourth Version. North Carolina Department of Environment and natural Resources, Raleigh, North Carolina.

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

Rohde, F.C., et al. 1994. *Freshwater Fishes of the Carolinas, Virginia, Maryland, & Delaware*. University of North Carolina Press, Chapel Hill.

Schafale, M.P. and A.S. Weakley. 1990. *Classification of The Natural Communities of North Carolina*. Third Approximation. North Carolina Natural Heritage Program, Division of Parks and Recreation, NCDEHNR.

State of North Carolina. 1987. Roseboro Quadrangle [7.5 minute Topographic map]. Reston: US Geological Service. 1 sheet.

U.S. Army Corps of Engineers. 1987. "Corps of Engineers Wetlands Delineation Manual," Technical report Y-87-1, U.S. Army Engineer Waterways Experiment Station, Vicksburg, Miss.

U.S. Department of Agriculture Natural Resources Conservation Service. 1985. Soil Survey for Sampson County, North Carolina.

U.S. Fish and Wildlife Service. 1993. "Recovery Plan for Pondberry (*Lindera melissifolia*)". U.S. Fish and Wildlife Service. Atlanta, GA. 56 pp.

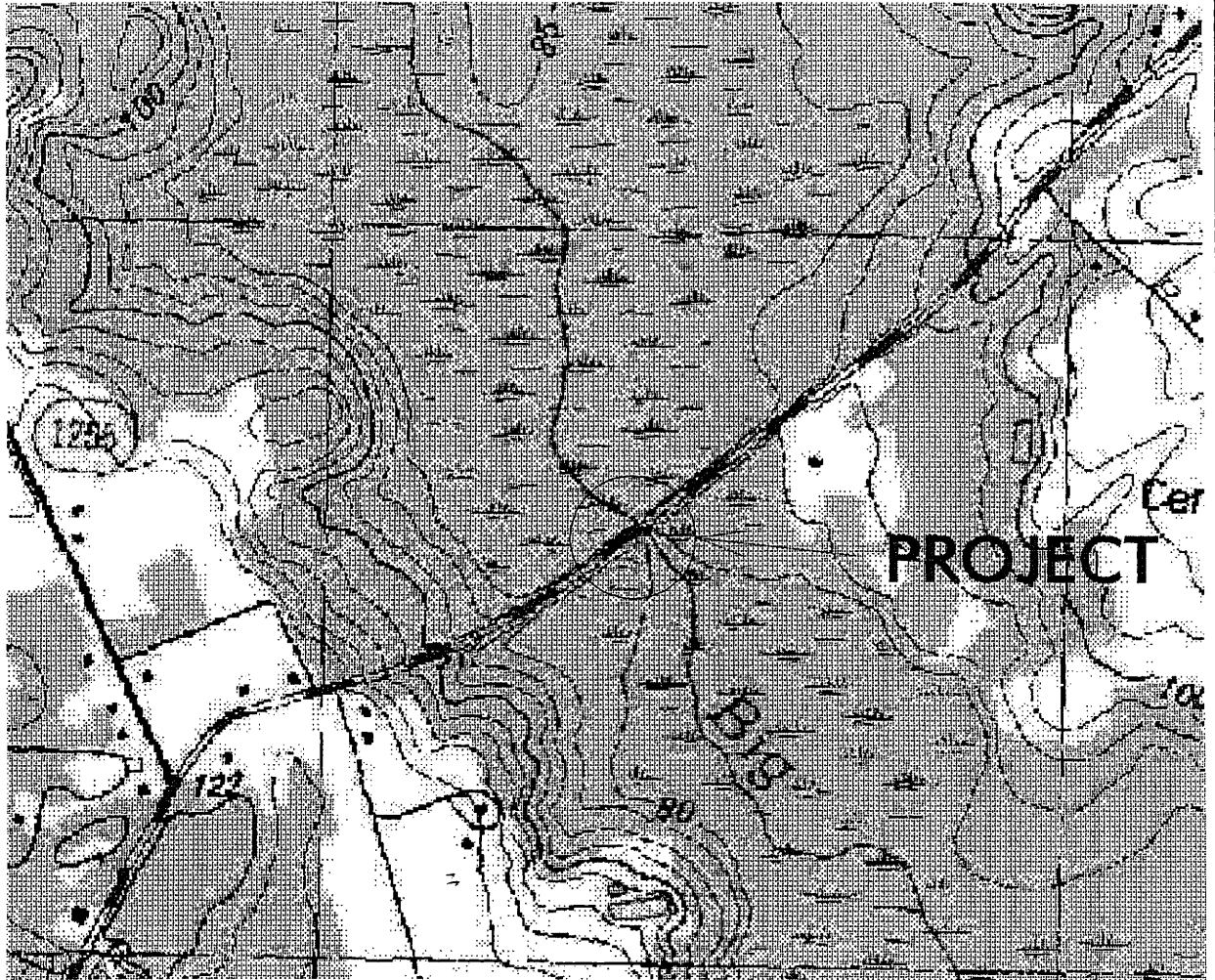
U.S. Fish and Wildlife Service. 2000. "Technical/agency draft revised recovery plan for the red-cockaded woodpecker (*Picoides borealis*)". U.S. Fish and Wildlife Service, Atlanta, GA.

U.S. Fish and Wildlife Service. 2002. North Carolina Ecological Services website (<http://nc-es.fws.gov>).

Weakley, A.S. 2000. "Flora of the Carolinas and Virginia". Working Draft May 15, 2000. Association for Biodiversity Information/The Nature Conservancy, Chapel Hill.

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





SITE  
MAP

NCDOT  
DIVISION OF HIGHWAYS  
SAMPSON COUNTY  
PROJECT: 8.2281701 (B-4271)  
WBS 35612.1.1  
SR 1246 OVER BIG SWAMP

**WETLAND PERMIT IMPACT SUMMARY**

Site No.	Station (From/To)	Structure Size / Type	WETLAND IMPACTS				SURFACE WATER IMPACTS				Natural Stream Design (ft)									
			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)								
1	12+69.16 -L- TO	Bridge	0.040																	
1	21+50.00 -L-																			
TOTALS:			0.040																	

Restored Wetlands = 0.06 ac.  
 (Existing Embankment Removed)  
 Structure comments: Existing bridge can be removed without debris falling into water.  
 Area of interior bents in stream is 12 sq. ft/bent for a total of 24 sq. ft.

NC DEPARTMENT OF TRANSPORTATION  
 DIVISION OF HIGHWAYS  
 SAMPSON COUNTY  
 PROJECT: 8.2281701 (B-4271)  
 WBS 33612.1.1

SHEET **3 of 6**

5/12/2006

# PROPERTY OWNERS

## NAMES AND ADDRESSES

PARCEL NO.	NAMES	ADDRESSES
1	JAMES M. HOBBS	148 PINE CREST LANE SOLEMBURG, NC 28385
2	JOHNNY DUDLEY	3603 HAYNE STRETCH ROAD ROSEBORO, NC 28382
3	MILDRED H. JACKSON	2119 BUTLER ISLAND ROAD ROSEBORO, NC 28382
4	DONALD LUCAS	1671 BUTLER ISLAND ROAD ROSEBORO, NC 28382
5	KEVIN LUCAS	BUTLER ISLAND ROAD ROSEBORO, NC 28382

NCDOT

DIVISION OF HIGHWAYS

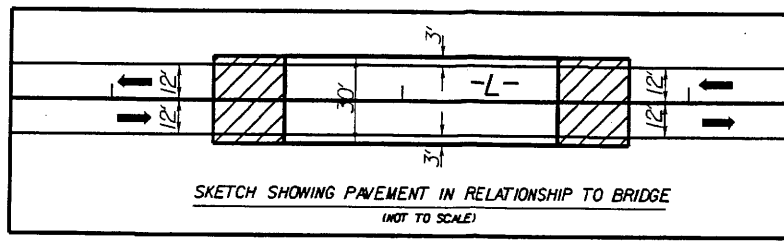
SAMPSON COUNTY

PROJECT: 8.2281701 (B-4271)

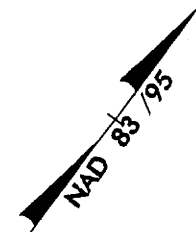
WBS 53612.1.1

SR 1246 OVER BIG SWAMP

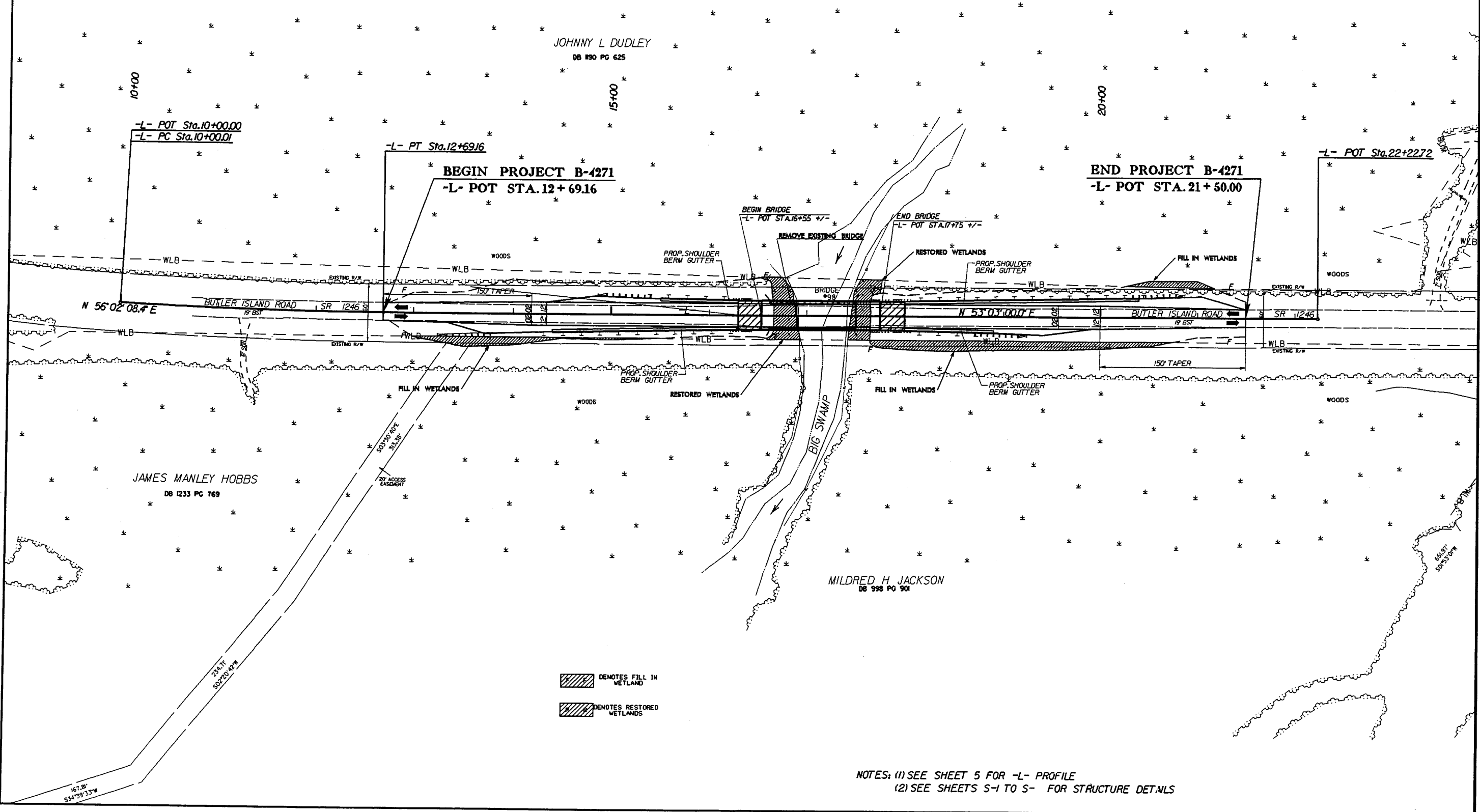
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 PI Sta 11+34.61  
 $\Delta = 2^{\circ} 59' 08.4" (LT)$   
 $D = 1^{\circ} 06' 33.5"$   
 $L = 269.15'$   
 $T = 134.60'$   
 $R = 5165.00'$



PROJECT REFERENCE NO. B-4271	SHEET NO. 4
R/W SHEET NO. 4	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	

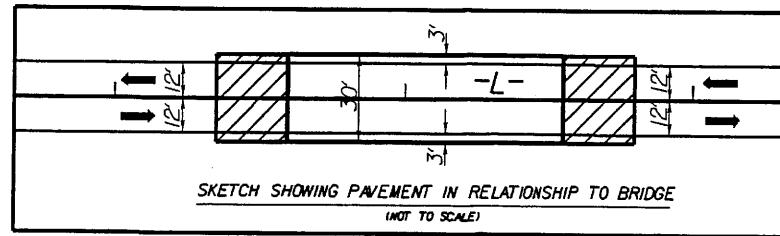


Sheet 5 of 6

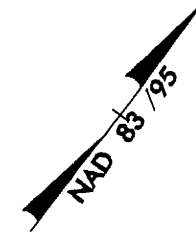


NOTES: (1) SEE SHEET 5 FOR -L- PROFILE  
 (2) SEE SHEETS S-1 TO S- FOR STRUCTURE DETAILS

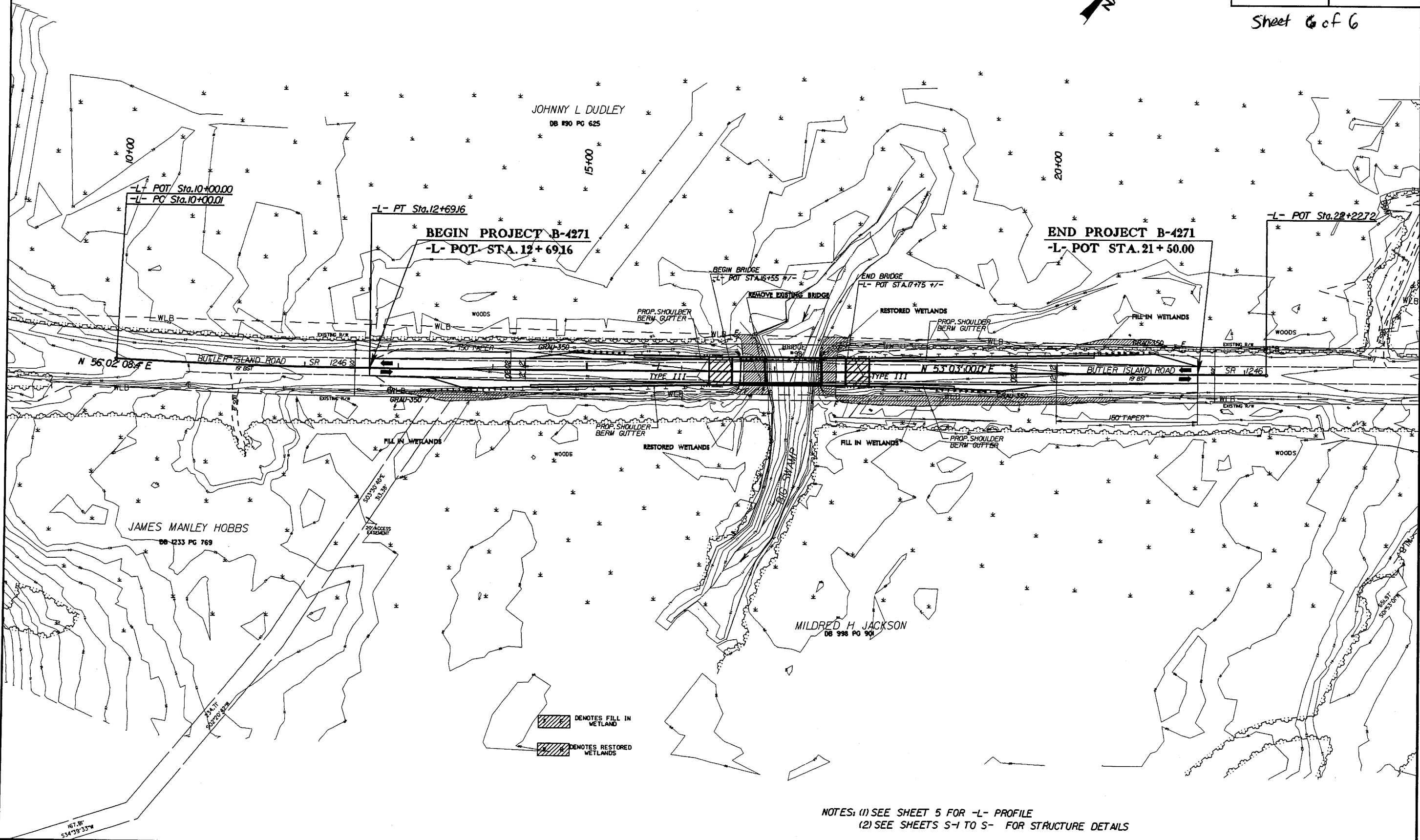
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 PI Sta. 11+34.61  
 $\Delta = 2^{\circ} 59' 08.4" (LT)$   
 $D = 1^{\circ} 06' 33.5"$   
 $L = 269.15'$   
 $T = 134.60'$   
 $R = 5165.00'$



PROJECT REFERENCE NO. B-4271	SHEET NO. 4
R/W SHEET NO. 4	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	



Sheet 6 of 6



DENOTES FILL IN WETLAND  
 DENOTES RESTORED WETLANDS

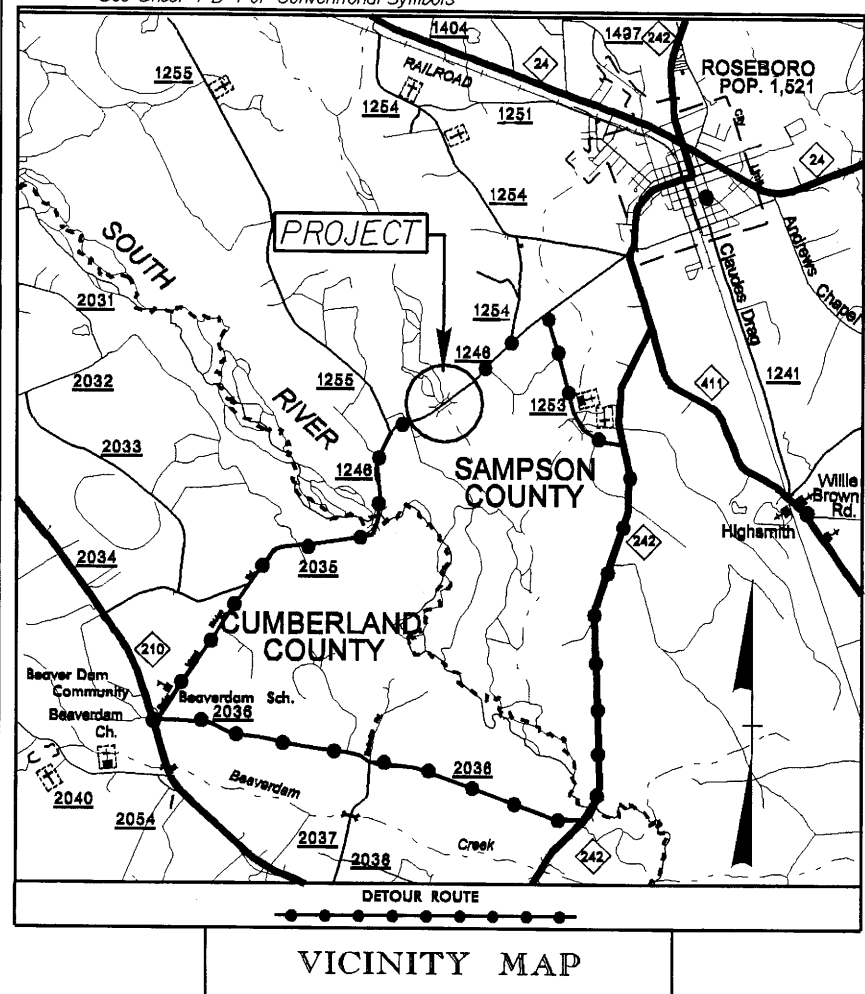
NOTES: (1) SEE SHEET 5 FOR -L- PROFILE  
 (2) SEE SHEETS S-1 TO S- FOR STRUCTURE DETAILS



TIP PROJECT: B-4271

CONTRACT: C201499

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



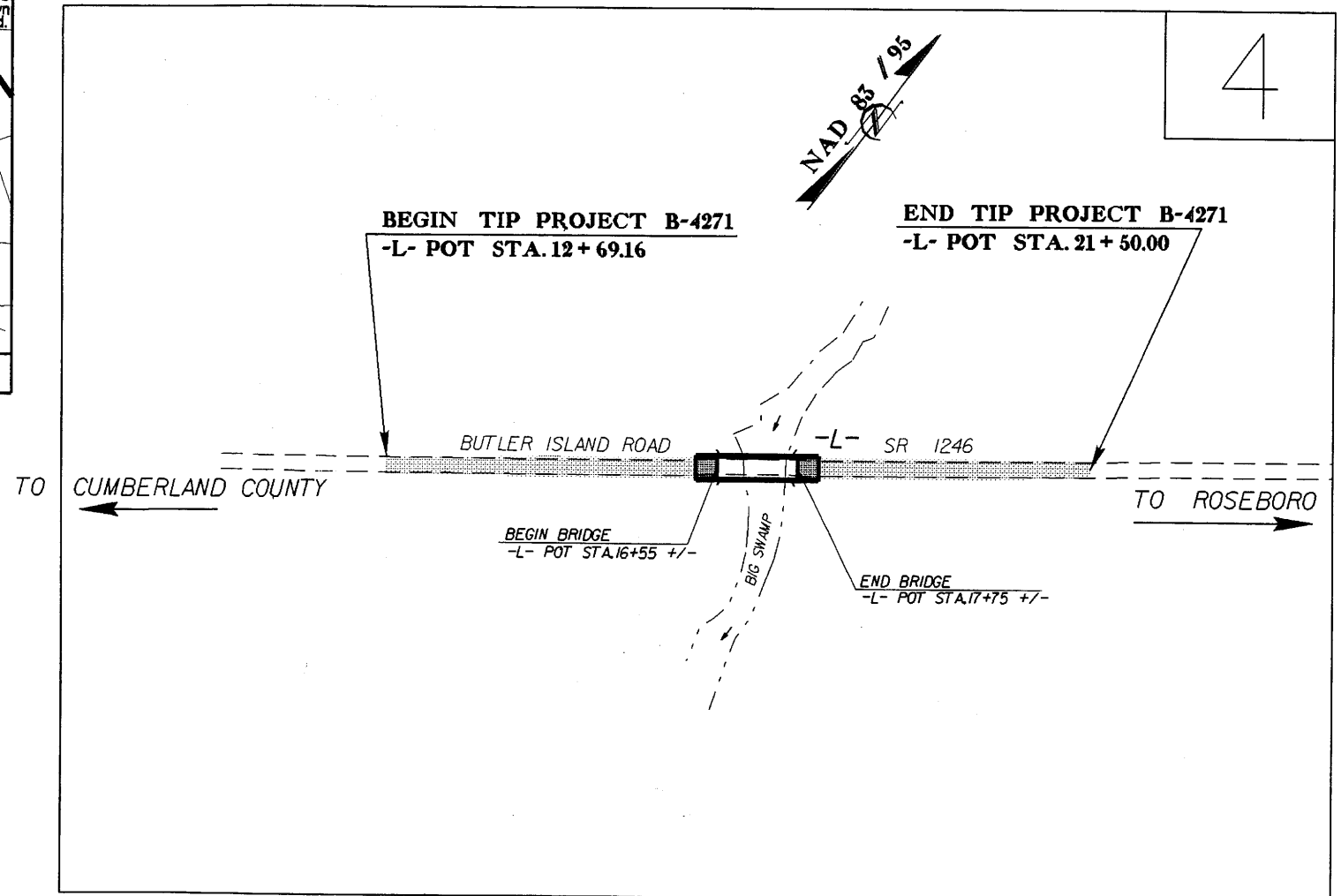
STATE OF NORTH CAROLINA  
DIVISION OF HIGHWAYS

**SAMPSON COUNTY**

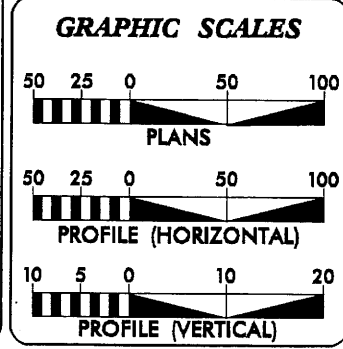
LOCATION: BRIDGE NO. 98 OVER BIG SWAMP ON SR 1246

TYPE OF WORK: GRADING, PAVING, DRAINAGE, & STRUCTURE

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-4271	1	
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
33612.1.1	BRZ-1246(2)	P.E.	
33612.2.1	BRZ-1246(2)	R / W & UTIL.	



NOTES: (1) CLEARING ON THIS PROJECT SHALL BE PERFORMED TO THE LIMITS ESTABLISHED BY METHOD II  
(2) THIS PROJECT IS NOT WITHIN ANY MUNICIPAL BOUNDARIES.



**DESIGN DATA**

ADT 2005 = 1650
ADT 2025 = 2600
DHV = 12 %
D = 60 %
T = 6 % *
V = 60 MPH
FUNC. CLASS: COLLECTOR
* TTST 4 % DUAL 2 %

**PROJECT LENGTH**

LENGTH ROADWAY TIP PROJECT B-4271 = 0.144 MI.
LENGTH STRUCTURE TIP PROJECT B-4271 = 0.023 MI.
TOTAL LENGTH OF TIP PROJECT B-4271 = 0.167 MI.

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

2002 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE: JUNE 14, 2005

LETTING DATE: JUNE 20, 2006

ROGER D. THOMAS, P.E.  
PROJECT ENGINEER

MICHAEL W. LITTLE, P.E.  
PROJECT DESIGN ENGINEER

**HYDRAULICS ENGINEER**

SIGNATURE: \_\_\_\_\_ P.E.

ROADWAY DESIGN ENGINEER

PRELIMINARY PLANS

SIGNATURE: \_\_\_\_\_ P.E.

**DIVISION OF HIGHWAYS**  
STATE OF NORTH CAROLINA

STATE DESIGN ENGINEER

DEPARTMENT OF TRANSPORTATION  
FEDERAL HIGHWAY ADMINISTRATION

APPROVED

DIVISION ADMINISTRATOR

Note: Not to Scale

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

STATE OF NORTH CAROLINA  
DIVISION OF HIGHWAYS

# CONVENTIONAL PLAN SHEET SYMBOLS

### BOUNDARIES AND PROPERTY:

State Line	-----
County Line	-----
Township Line	-----
City Line	-----
Reservation Line	-----
Property Line	-----
Existing Iron Pin	○ IP
Property Corner	-----
Property Monument	□ EOM
Parcel/Sequence Number	②③
Existing Fence Line	-----
Proposed Woven Wire Fence	-----
Proposed Chain Link Fence	-----
Proposed Barbed Wire Fence	-----
Existing Wetland Boundary	-----
Proposed Wetland Boundary	-----
Existing High Quality Wetland Boundary	-----
Existing Endangered Animal Boundary	-----
Existing Endangered Plant Boundary	-----

### BUILDINGS AND OTHER CULTURE:

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

### HYDROLOGY:

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

### RAILROADS:

Standard Gauge	-----
RR Signal Milepost	-----
Switch	-----
RR Abandoned	-----
RR Dismantled	-----

### RIGHT OF WAY:

Baseline Control Point	◆
Existing Right of Way Marker	△
Existing Right of Way Line	-----
Proposed Right of Way Line	-----
Proposed Right of Way Line with Iron Pin and Cap Marker	-----
Proposed Right of Way Line with Concrete or Granite Marker	-----
Existing Control of Access	-----
Proposed Control of Access	-----
Existing Easement Line	-----
Proposed Temporary Construction Easement	-----
Proposed Temporary Drainage Easement	-----
Proposed Permanent Drainage Easement	-----
Proposed Permanent Utility Easement	-----

### ROADS AND RELATED FEATURES:

Existing Edge of Pavement	-----
Existing Curb	-----
Proposed Slope Stakes Cut	-----
Proposed Slope Stakes Fill	-----
Proposed Wheel Chair Ramp	-----
Curb Cut for Future Wheel Chair Ramp	-----
Existing Metal Guardrail	-----
Proposed Guardrail	-----
Existing Cable Guiderail	-----
Proposed Cable Guiderail	-----
Equaility Symbol	-----
Pavement Removal	-----

### VEGETATION:

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

### EXISTING STRUCTURES:

MAJOR:	
Bridge, Tunnel or Box Culvert	-----
Bridge Wing Wall, Head Wall and End Wall	-----
MINOR:	
Head and End Wall	-----
Pipe Culvert	-----
Footbridge	-----
Drainage Box: Catch Basin, DI or JB	-----
Paved Ditch Gutter	-----
Storm Sewer Manhole	-----
Storm Sewer	-----

### UTILITIES:

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

### TELEPHONE:

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

### WATER:

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

### TV:

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

### GAS:

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

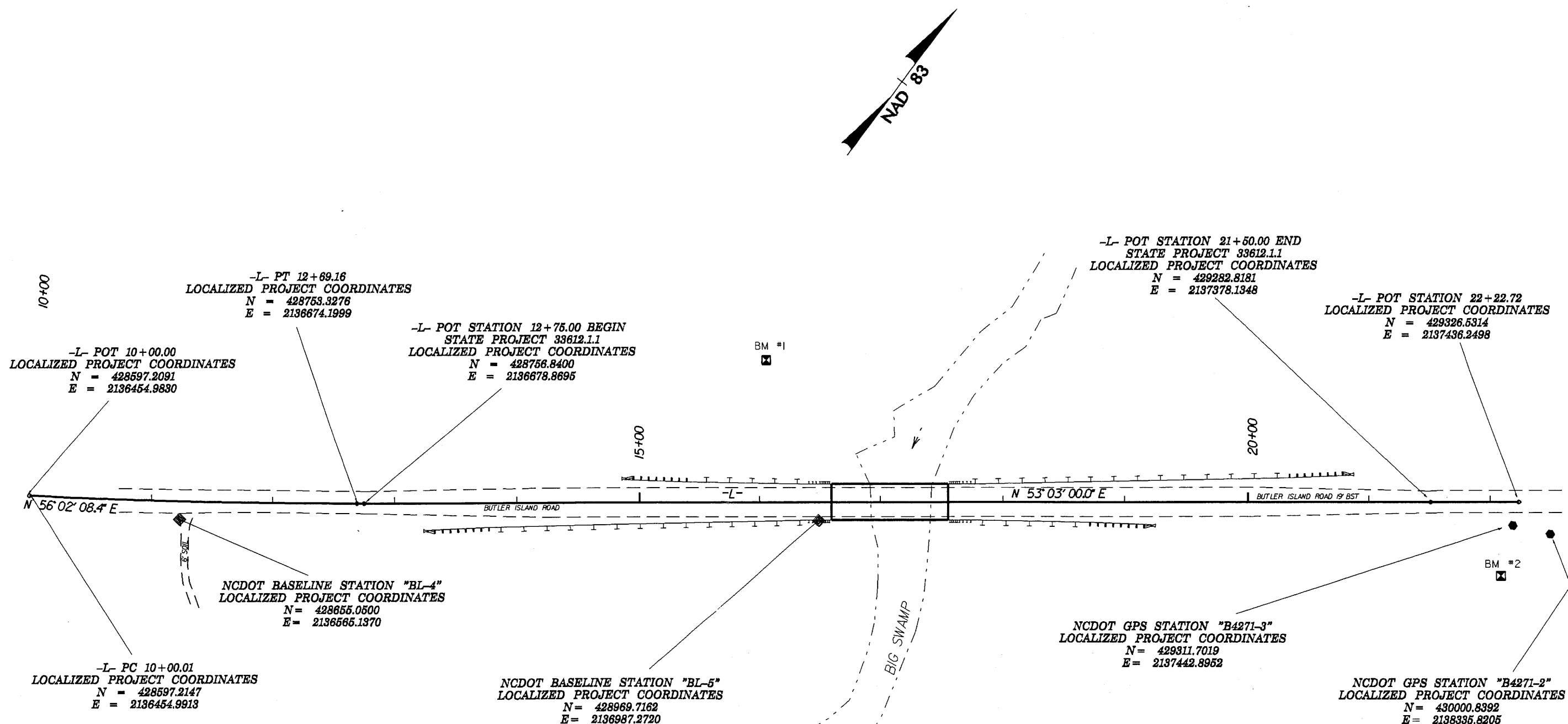
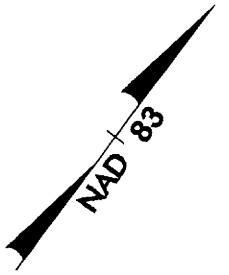
### SANITARY SEWER:

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

### MISCELLANEOUS:

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

# SURVEY CONTROL SHEET



10+00

-L- PT 12+69.16  
LOCALIZED PROJECT COORDINATES  
N = 428753.3276  
E = 2136674.1999

-L- POT 10+00.00  
LOCALIZED PROJECT COORDINATES  
N = 428597.2091  
E = 2136454.9830

-L- POT STATION 12+75.00 BEGIN  
STATE PROJECT 33612.1.1  
LOCALIZED PROJECT COORDINATES  
N = 428756.8400  
E = 2136678.8695

-L- POT STATION 21+50.00 END  
STATE PROJECT 33612.1.1  
LOCALIZED PROJECT COORDINATES  
N = 429282.8181  
E = 2137378.1348

-L- POT STATION 22+22.72  
LOCALIZED PROJECT COORDINATES  
N = 429326.5314  
E = 2137436.2498

NCDOT BASELINE STATION "BL-4"  
LOCALIZED PROJECT COORDINATES  
N = 428655.0500  
E = 2136565.1370

-L- PC 10+00.01  
LOCALIZED PROJECT COORDINATES  
N = 428597.2147  
E = 2136454.9913

NCDOT BASELINE STATION "BL-5"  
LOCALIZED PROJECT COORDINATES  
N = 428969.7162  
E = 2136987.2720

NCDOT GPS STATION "B4271-3"  
LOCALIZED PROJECT COORDINATES  
N = 429311.7019  
E = 2137442.8952

NCDOT GPS STATION "B4271-2"  
LOCALIZED PROJECT COORDINATES  
N = 430000.8392  
E = 2138335.8205

**CONTROL DATA**

BL	POINT	DESC.	NORTH	EAST	ELEVATION	L STATION	OFFSET
4	BL-4		428655.0500	2136565.1370	85.18	11+23.33	15.04 RT
5	BL-5		428969.7170	2136987.2730	84.98	16+49.43	15.26 RT
3	B-4271-3		429311.7040	2137442.8980	83.83	22+19.12	15.85 RT
2	B-4271-2		430000.8380	2138335.8190	94.68	OUTSIDE PROJECT LIMITS	

.....  
 BM1 ELEVATION = 80.35  
 N 429051 E 2136873  
 L STATION 16+07 118 LEFT  
 RAILROAD SPIKE SET IN 22" OAK  
 .....

.....  
 BM2 ELEVATION = 86.16  
 N 429400 E 2137632  
 L STATION 22+23  
 N 69° 30' 41.3" E DIST 208.76  
 RAILROAD 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 "B4271-3"

WITH NAD 1983/95 STATE PLANE GRID COORDINATES OF NORTHING: 429311704(11) EASTING: 2,137,442,898(11)

THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.999889253

THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "B4271-3" TO L-L STATION 10+00.00 IS  
 S 54°07'27.2" W 12192125

ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES  
 VERTICAL DATUM USED IS NAD 88

**NOTES:**

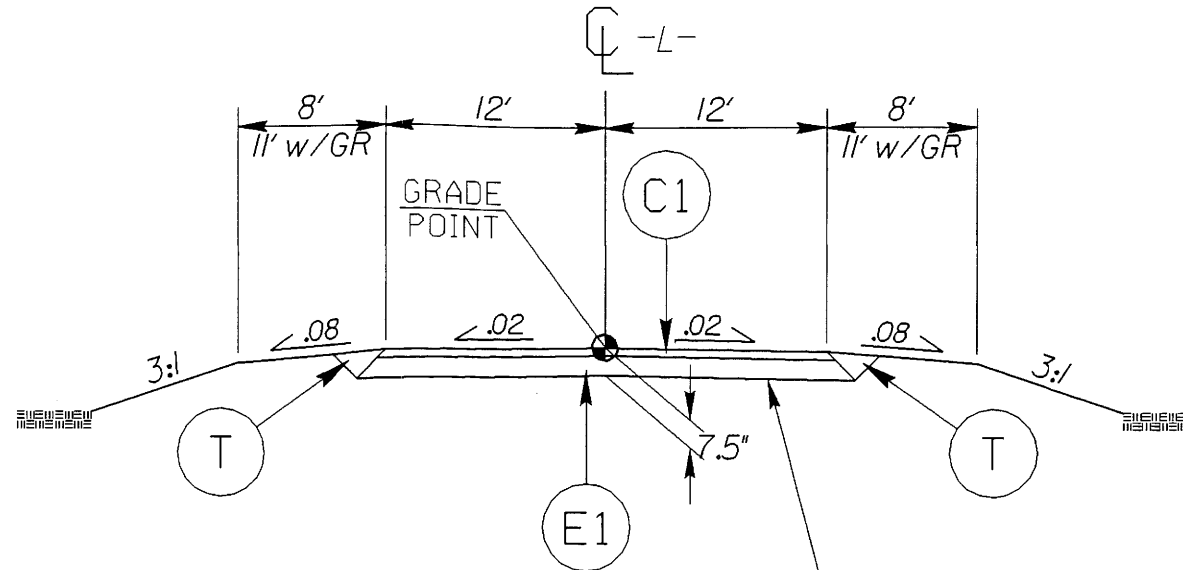
- THE CONTROL DATA FOR THIS PROJECT CAN BE FOUND ELECTRONICALLY BY SELECTING PROJECT CONTROL DATA AT:  
[HTTP://WWW.DOH.DOT.STATE.NC.US/PRECONSTRUCT/HIGHWAY/LOCATION/PROJECT](http://www.doh.dot.state.nc.us/preconstruct/highway/location/project)  
 FILE NAME: B4271\_LS\_CONTROL\_050210.TXT
- SITE CALIBRATION INFORMATION HAS NOT BEEN PROVIDED FOR THIS PROJECT. IF FURTHER INFORMATION IS NEEDED, PLEASE CONTACT THE LOCATION AND SURVEYS UNIT.
- INDICATES GEODETIC CONTROL MONUMENTS USED OR SET FOR HORIZONTAL PROJECT CONTROL BY THE NCDOT LOCATION AND SURVEYS UNIT.
- PROJECT CONTROL ESTABLISHED USING GLOBAL POSITIONING SYSTEM.
- NETWORK ESTABLISHED FROM NGS ONLINE POSITIONING USER SERVICE (OPUS)

**NOTE: DRAWING NOT TO SCALE**

PAVEMENT SCHEDULE	
C1	PROP. APPROX. 2½" ASPHALT CONCRETE SURFACE COURSE, TYPE SF9.5A, AT AN AVERAGE RATE OF 275 LBS. PER SQ. YD.
E1	PROP. APPROX. 5" ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 570 LBS. PER SQ. YD.
T	EARTH MATERIAL

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

PROJECT REFERENCE NO.	SHEET NO.
B-4271	2
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER
<b>PRELIMINARY PLANS</b> DO NOT USE FOR CONSTRUCTION	



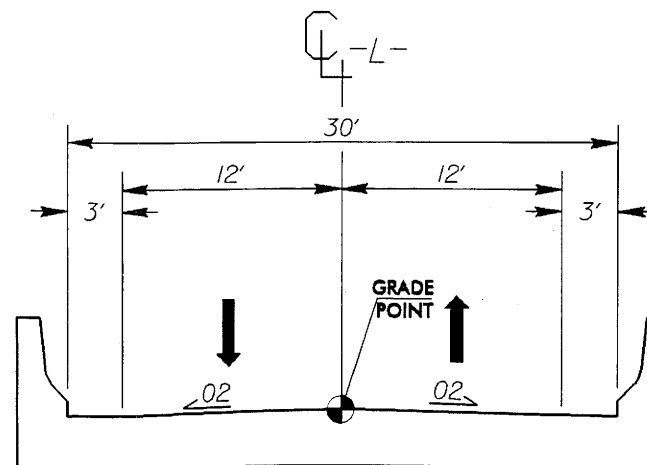
GRADE TO THIS LINE  
TYPICAL SECTION NO. 1

USE TYPICAL SECTION NO. 1 FOR:

- L- STA. 14+19.16 TO -L- STA. 16+55 +/- (BEGIN BRIDGE)
- L- STA. 17+75 +/- (END BRIDGE) TO -L- STA. 20+00.00

NOTE: TRANSITION FROM EXISTING TO T.S. NO. 1

- L- STA. 12+69.16 TO -L- STA. 14+19.16
- TRANSITION FROM T.S. NO. 1 TO EXISTING
- L- STA. 20+00.00 TO -L- STA. 21+50.00



TYPICAL SECTION ON STRUCTURE

-L- STA. 16+55 +/- to 17+75 +/-



BM #1  
ELEV. = 80.35'  
N 429050.9 E 2136873.2  
-BL- STA. 9+84 133.3' LT.  
-L- STA. 16+07.50 118.22' LT.  
RAILROAD SPIKE SET IN 22' OAK

BM #2  
ELEV. = 86.16'  
N 429399.6 E 2137631.8  
-BL- STA. 17+99 45.9' RT.  
RAILROAD SPIKE SET IN 20' PINE

BEGIN GRADE STA. 12+50.00  
ELEV. 84.05' (INCLUDES 2% PRE-SURFACEING)

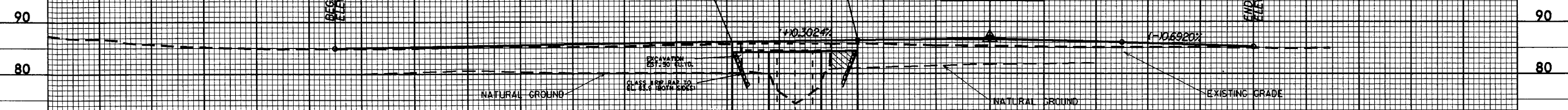
END GRADE STA. 21+50.00  
ELEV. 85.11' (INCLUDES 2% PRE-SURFACEING)

-L-

BEGIN BRIDGE  
STA. 16+85 +/-

END BRIDGE  
STA. 17+75 +/-

PI = 19+00.00  
EL = 86.84'  
VC = 250'  
K = 251  
SSD = 793'

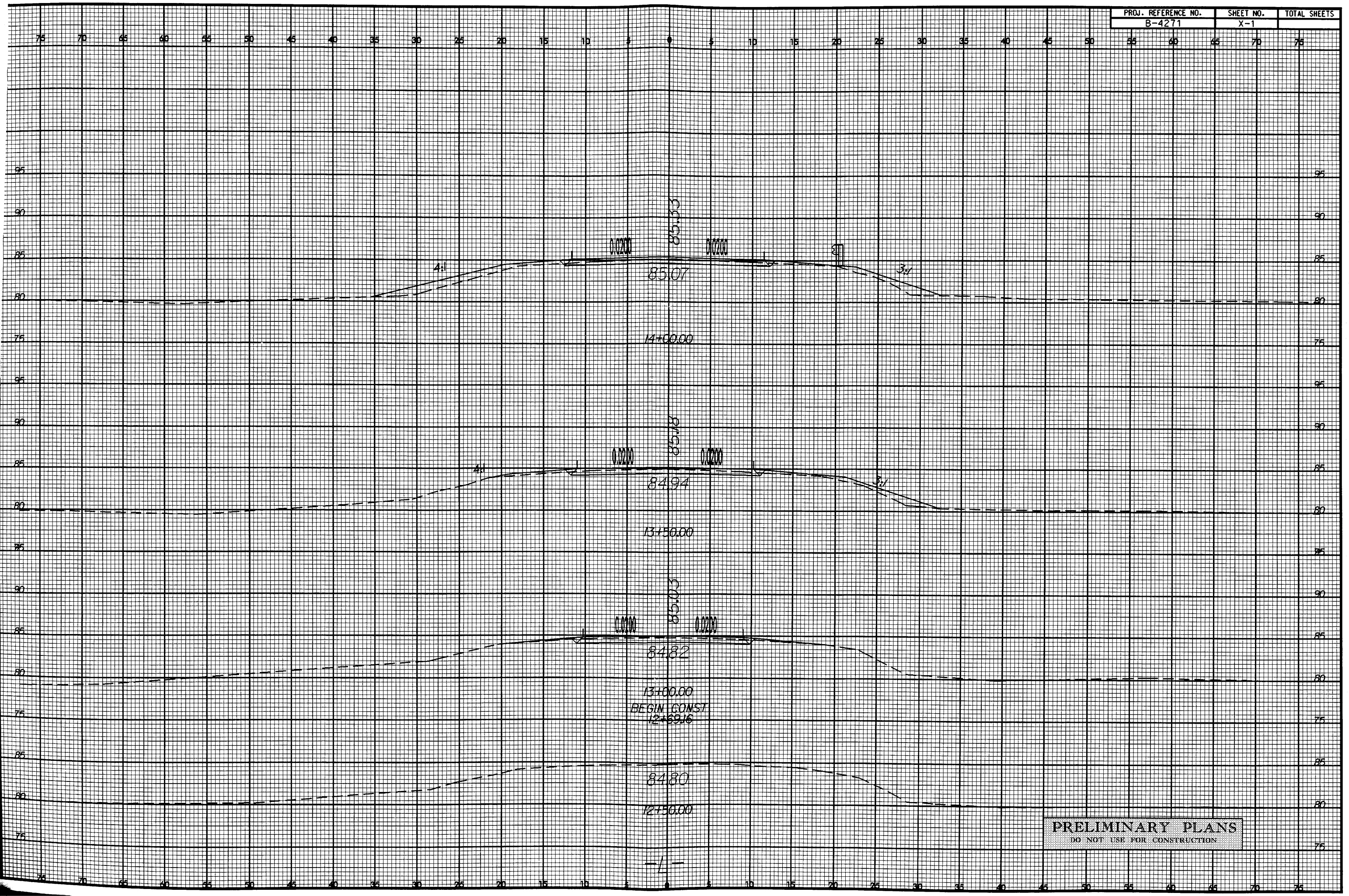


**BRIDGE HYDRAULIC DATA**

DESIGN DISCHARGE	= 2650 CFS
DESIGN FREQUENCY	= 25 YRS
DESIGN HW ELEVATION	= 83.65 FT
BASE DISCHARGE	= 4200 CFS
BASE FREQUENCY	= 100 YRS
BASE HW ELEVATION	= 84.84 FT
OVERTOPPING DISCHARGE	= 4200 CFS
OVERTOPPING FREQUENCY	= 100+ YRS
OVERTOPPING ELEVATION	= 84.95 FT
DATE OF SURVEY	= 12/21/04
W.S. ELEVATION AT DATE OF SURVEY	= 79.5'

FOR -L- PLAN VIEW  
SEE SHEET 4





**PRELIMINARY PLANS**  
DO NOT USE FOR CONSTRUCTION

11/15/2011 10:50 AM  
 11/15/2011 10:50 AM  
 11/15/2011 10:50 AM

