STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

MICHAEL F. EASLEY
GOVERNOR

LYNDO TIPPETT
SECRETARY

April 25, 2008

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

ATTN: Mr. William Wescott
NCDOT Coordinator

Dear Sir:

Subject: **Application for Section 404 Nationwide Permit 33, Section 401 Water Quality Certification, and Neuse Riparian Buffer Authorization** for the Replacement of Bridge No. 89 over Sassarixa Swamp on SR 1162, Johnston County; State Project No. 8.2313301; TIP No. B-4165. Debit $240 from WBS 33513.1.1.

Please find enclosed permit drawings, roadway plans, and a Pre-construction Notice (PCN) for the above referenced project proposed by the North Carolina Department of Transportation (NCDOT). A Categorical Exclusion (CE) was completed for this project on April 11, 2006, and distributed shortly thereafter. Additional copies are available upon request.

The NCDOT proposes to replace existing Bridge No. 89 over Sassarixa Swamp on SR 1162 in Johnston County. The project involves replacing the existing 70-foot bridge on the existing location, with a three-span bridge approximately 136 feet long. Traffic will be maintained with an off-site detour during construction. Proposed permanent impacts to surface waters will be less than 0.01 acre. Proposed temporary impacts to surface waters will be 0.02 acre.

Impacts to Waters of the United States

General Description: Sassarixa Swamp and the surrounding wetlands are the only water resources within the project area and are located in the Neuse River Drainage Basin, Subbasin 03-04-04. Sassarixa Swamp [Stream Index No. 27-45-13] has been assigned a Best Usage Classification of C; NSW by the North Carolina Department of Environmental and Natural Resources (NCDENR) and is in Hydrologic Unit 03020201. Sassarixa Swamp is not designated as a North Carolina Natural or Scenic River, or as a National Wild and Scenic River. No designated High Quality Waters (HQW), Water Supply I (WS-I), or Water Supply II (WS-II) waters occur within 1.0 mile of the project study area. Finally, Sassarixa Swamp is not listed on the Final 2006 303(d) list of impaired waters, nor does it drain into any Section 303(d) waters within 1.0 mile of the project study area.

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

TELEPHONE: 919-733-3141
FAX: 919-715-1501

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

LOCATION:
TRANSPORTATION BUILDING
1 SOUTH WILMINGTON STREET
RALEIGH NC

Permanent Impacts: NCDOT anticipates permanent impacts to surface waters for this project. Permanent impacts to surface waters due to two interior bents will be less than 0.01 acre. No impacts are proposed to jurisdictional wetlands.

Temporary Impacts: NCDOT anticipates temporary impacts to surface waters. Proposed temporary impacts to surface waters will be 0.02 acre due to a temporary work pad. No impacts are proposed to jurisdictional wetlands.

Hand Clearing: There will be 0.01 acre of hand clearing in jurisdictional areas for this project.

Utility Impacts: There will be no stream or wetland impacts due to utilities for this project.

Bridge Demolition: The existing structure is approximately 70 feet long and 25 feet wide. The superstructure consists of two 17.8-foot spans and two 17.0 foot spans of reinforced concrete deck on timber joists. The existing substructure consists of timber caps on timber piles. It is likely that all components can be removed without any appreciable debris falling into the water.

Neuse River Basin Buffer Rules

This project is located in the Neuse River Basin; therefore, the regulations pertaining to the buffer rules apply. There will be a total of 5,809 ft^2 of impacts to riparian buffers. This includes 3,573 ft^2 (3,168 ft^2 in Zone 1 and 405 ft^2 in Zone 2) due to the bridge crossing. According to the buffer rules, bridges are allowable. There will be 2,236 ft^2 (880 ft^2 in Zone 1 and 1,365 ft^2 in Zone 2) of impacts from approach fill due to road crossings. This Road Crossing activity is allowable because impacts are less than the 150-foot/0.3 acre threshold, for which mitigation is required. Uses designated as allowable may proceed within the riparian buffer provided that there are no practical alternatives to the requested use pursuant to Item (8) of this rule. In addition, there will be 332 ft^2 of impacts to Zone 1 due to water line installation. These Utility impacts are considered exempt according to the buffer rules because the impacts are less than 10 feet wide.

Federally Protected Species

As of January 31, 2008, the U.S. Fish and Wildlife Service (USFWS) lists four protected species for Johnston County (Table 1). The biological conclusions for all species remain valid. Concurrence was received from the USFWS on April 16, 2007. Due to the poor quality of mussel habitat in the area, USFWS has not required any further surveys. A copy of this concurrence letter is included with this application.

Table 1. Federally protected species of Johnston County.

Scientific Name	Common Name	Federal Status	Biological Conclusion
Picoides borealis	Red-cockaded woodpecker	Endangered	No Effect
Alasmidonta heterodon	Dwarf wedgemussel	Endangered	MANLAA
Elliptio steinstansana	Tar River spinymussel	Endangered	MANLAA
Rhus michauxii	Michaux's sumac	Endangered	No Effect

Bald Eagle

The bald eagle was removed from the Endangered Species List as of August 8, 2007. It is still protected under the Bald and Golden Eagle Protection Act. A survey conducted on June 11, 2004 found no bald eagle nests or foraging habitat within 660 feet of the project area.

Avoidance and Minimization

Avoidance examines all appropriate and practicable possibilities of averting impacts to "Waters of the United States". Due to the presence of surface waters and wetlands within the project study area, avoidance of all impacts is not possible. The NCDOT is committed to incorporating all reasonable and practicable design features to avoid and minimize jurisdictional impacts. Minimization measures incorporated as part of the project design included:

- Reducing the number of bents in the water from three for the existing bridge to two for the new bridge,
- Using hand-clearing methods in wetlands outside of the slope limits instead of clearing and grubbing,
- In compliance with 15A NCAC 02B.0104(m) the NCDOT has incorporated the use of BMP's for the Protection of Surface Water in the design of the project,
- Use of an off-site detour during construction,
- Construction of a 65-foot longer bridge,
- Minimizing impacts to the buffer zone by using the existing alignment,
- Design Standards in Sensitive Watersheds will be utilized during demolition of the existing bridge and construction of the new bridge.

Mitigation

No compensatory mitigation is proposed for this project due to the limited permanent impacts to Sassarixa Swamp.

Project Schedule

The project schedule calls for a November 18, 2008 let with a review date of September 30, 2008.

Regulatory Approvals

Section 404 Permit: All 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 a Nationwide Permit 33 for the temporary work pad. (72 CFR; 11092-11198, March 12, 2007).

Section 401 Water Quality Certification: We anticipate 401 General Certification number 3688 will apply to this project. All general conditions of the Water Quality Certifications will be met. Therefore, in accordance with 15A NCAC 2H, Section .0500(a), we are providing five copies of this application to the NCDWQ for their review and approval. Authorization to debit the $240 Permit Application Fee from WBS Element 33513.1.1 is hereby given.

Thank you for your time and assistance with this project. Please contact Ms. Veronica Barnes at vabarnes@dot.state.nc.us or (919) 715-7232 if you have any questions or need additional information.

Sincerely,

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

Cc:
W/attachment

Mr. Brian Wrenn, NCDWQ (5 Copies)
Mr. Travis Wilson, NCWRC
Mr. Gary Jordan, USFWS
Mr. Ron Sechler, NMFS
Ms. Jeanne Hardy, NCDMF

W/o attachment (see website for attachments)

Dr. David Chang, P.E., Hydraulics
Mr. Greg Perfetti, P.E., Structure Design
Mr. Victor Barbour, P.E., Project Services Unit
Mr. Mark Staley, Roadside Environmental
Mr. Richard E. Greene , P.E. Div. 4 Engineer
Mr. Chad Coggins, Div. 4 Environmental Officer
Mr. Scott McLendon, USACE, Wilmington
Mr. Jay Bennett, P.E., Roadway Design
Mr. Majed Alghandour, P. E., Programming and TIP
Mr. Art McMillan, P.E., Highway Design
Mr. Vince Rhea, P.E., PDEA Engineer

Office Use Only: Form Version March 05

USACE Action ID No. _____ **DWQ No.** _____

(If any particular item is not applicable to this project, please enter "Not Applicable" or "N/A".)

I. Processing

1. Check all of the approval(s) requested for this project:
   - ☒ Section 404 Permit
   - ☐ Section 10 Permit
   - ☒ 401 Water Quality Certification
   - ☒ Riparian or Watershed Buffer Rules
   - ☐ Isolated Wetland Permit from DWQ
   - ☐ Express 401 Water Quality Certification

2. Nationwide, Regional or General Permit Number(s) Requested: 33

3. If this notification is solely a courtesy copy because written approval for the 401 Certification is not required, check here: ☐

4. If payment into the North Carolina Ecosystem Enhancement Program (NCEEP) is proposed for mitigation of impacts, attach the acceptance letter from NCEEP, complete section VIII, and check here: ☐

5. If your project is located in any of North Carolina's twenty coastal counties (listed on page 4), and the project is within a North Carolina Division of Coastal Management Area of Environmental Concern (see the top of page 2 for further details), check here: ☐

II. Applicant Information

1. Owner/Applicant Information
   Name: Gregory J. Thorpe, Ph.D., Environmental Management Director
   Mailing Address: 1598 Mail Service Center
   Telephone Number: (919) 733-3141 Fax Number: (919) 733-9794
   E-mail Address: vabarnes@dot.state.nc.us

2. Agent/Consultant Information (A signed and dated copy of the Agent Authorization letter must be attached if the Agent has signatory authority for the owner/applicant.)
   Name: _____
   Company Affiliation: _____
   Mailing Address: _____
   Telephone Number: _____ Fax Number: _____
   E-mail Address: _____

III. Project Information

Attach a **vicinity map** clearly showing the location of the property with respect to local landmarks such as towns, rivers, and roads. Also provide a detailed **site plan** showing property boundaries and development plans in relation to surrounding properties. Both the vicinity map and site plan must include a scale and north arrow. The specific footprints of all buildings, impervious surfaces, or other facilities must be included. If possible, the maps and plans should include the appropriate USGS Topographic Quad Map and NRCS Soil Survey with the property boundaries outlined. Plan drawings, or other maps may be included at the applicant's discretion, so long as the property is clearly defined. For administrative and distribution purposes, the USACE requires information to be submitted on sheets no larger than 11 by 17-inch format; however, DWQ may accept paperwork of any size. DWQ prefers full-size construction drawings rather than a sequential sheet version of the full-size plans. If full-size plans are reduced to a small scale such that the final version is illegible, the applicant will be informed that the project has been placed on hold until decipherable maps are provided.

1. Name of project: Replacement of Bridge No. 89 over Sassarixa Swamp on SR 1162, Johnston County

2. T.I.P. Project Number or State Project Number (NCDOT Only): B-4165

3. Property Identification Number (Tax PIN): N/A

4. Location
   County: Johnston Nearest Town: Four Oaks
   Subdivision name (include phase/lot number): N/A
   Directions to site (include road numbers/names, landmarks, etc.): Take I-40 to exit 319, NC 210. Take NC 210 headed east for approximately 2 miles. Turn right onto Lassiter Rd. Take Lassiter Rd until it dead ends into Black Creek Rd. Turn left onto Black Creek Rd. Bridge 89 is located on Black Creek Rd just past the intersection with Sedgewood Rd.

5. Site coordinates (For linear projects, such as a road or utility line, attach a sheet that separately lists the coordinates for each crossing of a distinct waterbody.)
   Decimal Degrees (6 digits minimum): 35.478517 °N 78.446664 °W

6. Property size (acres): N/A

7. Name of nearest receiving body of water: Black Creek

8. River Basin: Neuse
   (Note – this must be one of North Carolina's seventeen designated major river basins. The River Basin map is available at http://h2o.enr.state.nc.us/admin/maps/.)

9. Describe the existing conditions on the site and general land use in the vicinity of the project at the time of this application: Land use in the area is mostly low density housing and forested land.

10. Describe the overall project in detail, including the type of equipment to be used: The existing superstructure consists of a 4-span bridge with a concrete surface on timber joists. The existing substructure consists of timber piles with timber caps. The project involves replacing the old bridge on the existing location with a new three span bridge approximately 136 feet long. Traffic will be detoured off-site during construction. Standard NCDOT construction equipment will be used.

11. Explain the purpose of the proposed work: The current bridge has a sufficiency rating of 7 out of 100 and a structure apprasial of 2 out of 9. It is therefore considered structurally deficient by the Federal Highway Administration standards and rehabilitation is not feasible due to the bridge's age and condition.

IV. Prior Project History

If jurisdictional determinations and/or permits have been requested and/or obtained for this project (including all prior phases of the same subdivision) in the past, please explain. Include the USACE Action ID Number, DWQ Project Number, application date, and date permits and certifications were issued or withdrawn. Provide photocopies of previously issued permits, certifications or other useful information. Describe previously approved wetland, stream and buffer impacts, along with associated mitigation (where applicable). If this is a NCDOT project, list and describe permits issued for prior segments of the same T.I.P. project, along with construction schedules. A jurisdictional determination packet was received and reviewed in June 2006 under the Action ID SAW 200632962. The Categorical Exclusion was received in October 2006 under Action ID SAW 2004 11047.

V. Future Project Plans

Are any future permit requests anticipated for this project? If so, describe the anticipated work, and provide justification for the exclusion of this work from the current application.
No future permit requests are anticipated for this project.

VI. Proposed Impacts to Waters of the United States/Waters of the State

It is the applicant's (or agent's) responsibility to determine, delineate and map all impacts to wetlands, open water, and stream channels associated with the project. Each impact must be listed separately in the tables below (e.g., culvert installation should be listed separately from riprap dissipater pads). Be sure to indicate if an impact is temporary. All proposed impacts, permanent and temporary, must be listed, and must be labeled and clearly identifiable on an accompanying site plan. All wetlands and waters, and all streams (intermittent and perennial) should be shown on a delineation map, whether or not impacts are proposed to these systems. Wetland and stream evaluation and delineation forms should be included as appropriate. Photographs may be included at the applicant's discretion. If this proposed impact is strictly for

wetland or stream mitigation, list and describe the impact in Section VIII below. If additional space is needed for listing or description, please attach a separate sheet.

1. Provide a written description of the proposed impacts: There are no proposed permanent or temporary impacts to wetlands. There are <0.01 acre of proposed permanent impacts and 0.02 acre of temporary impacts to streams. Impacts to riparian buffer total 5,809 square feet

2. Individually list wetland impacts. Types of impacts include, but are not limited to mechanized clearing, grading, fill, excavation, flooding, ditching/drainage, etc. For dams, separately list impacts due to both structure and flooding.

Wetland Impact Site Number (indicate on map)	Type of Impact	Type of Wetland (e.g., forested, marsh, herbaceous, bog, etc.)	Located within 100-year Floodplain (yes/no)	Distance to Nearest Stream (linear feet)	Area of Impact (acres)
N/A					
Total Wetland Impact (acres)					0

3. List the total acreage (estimated) of all existing wetlands on the property: 1.55

4. Individually list all intermittent and perennial stream impacts. Be sure to identify temporary impacts. Stream impacts include, but are not limited to placement of fill or culverts, dam construction, flooding, relocation, stabilization activities (e.g., cement walls, rip-rap, crib walls, gabions, etc.), excavation, ditching/straightening, etc. If stream relocation is proposed, plans and profiles showing the linear footprint for both the original and relocated streams must be included. To calculate acreage, multiply length X width, then divide by 43,560.

Stream Impact Number (indicate on map)	Stream Name	Type of Impact	Perennial or Intermittent?	Average Stream Width Before Impact	Impact Length (linear feet)	Area of Impact (acres)
1	Sassarixa Swamp	Permanent fill	Perennial	45 ft	N/A	<0.01
2	Sassarixa Swamp	Temporary fill	Perennial	45 ft.	N/A	0.02
Total Stream Impact (by length and acreage)					N/A	0.02

5. Individually list all open water impacts (including lakes, ponds, estuaries, sounds, Atlantic Ocean and any other water of the U.S.). Open water impacts include, but are not limited to fill, excavation, dredging, flooding, drainage, bulkheads, etc.

Open Water Impact Site Number (indicate on map)	Name of Waterbody (if applicable)	Type of Impact	Type of Waterbody (lake, pond, estuary, sound, bay, ocean, etc.)	Area of Impact (acres)
N/A				
Total Open Water Impact (acres)				0

6. List the cumulative impact to all Waters of the U.S. resulting from the project:

Stream Impact (acres):	0.02
Wetland Impact (acres):	0
Open Water Impact (acres):	0
Total Impact to Waters of the U.S. (acres)	0.02
Total Stream Impact (linear feet):	N/A

7. Isolated Waters
   Do any isolated waters exist on the property? ☐ Yes ☒ No
   Describe all impacts to isolated waters, and include the type of water (wetland or stream) and the size of the proposed impact (acres or linear feet). Please note that this section only applies to waters that have specifically been determined to be isolated by the USACE.

8. Pond Creation
   If construction of a pond is proposed, associated wetland and stream impacts should be included above in the wetland and stream impact sections. Also, the proposed pond should be described here and illustrated on any maps included with this application.
   Pond to be created in (check all that apply): ☐ uplands ☐ stream ☐ wetlands
   Describe the method of construction (e.g., dam/embankment, excavation, installation of draw-down valve or spillway, etc.): N/A
   Proposed use or purpose of pond (e.g., livestock watering, irrigation, aesthetic, trout pond, local stormwater requirement, etc.): N/A
   Current land use in the vicinity of the pond: N/A
   Size of watershed draining to pond: N/A Expected pond surface area: N/A

VII. Impact Justification (Avoidance and Minimization)

Specifically describe measures taken to avoid the proposed impacts. It may be useful to provide information related to site constraints such as topography, building ordinances, accessibility, and financial viability of the project. The applicant may attach drawings of alternative, lower-impact site layouts, and explain why these design options were not feasible. Also discuss how impacts were minimized once the desired site plan was developed. If applicable, discuss construction techniques to be followed during construction to reduce impacts.

NCDOT has minimized impacts to the fullest extent possible. Minimization measures incorporated as part of the project design included reducing the number of bents in the water from three for the existing bridge to two for the new bridge, using hand-clearing methods in wetlands outside of the slope limits instead of clearing and grubbing, incorporating the use of BMP's for the Protection of Surface Water in the design of the project in compliance with 15A NCAC 02B.0104(m) the NCDOT, use of an off-site detour during construction, construction of a 65-foot longer bridge, minimizing impacts to the buffer zone by using the existing alignment, utilizing Design Standards in Sensitive Watersheds during demolition of the existing bridge and construction of the new bridge.

VIII. Mitigation

DWQ - In accordance with 15A NCAC 2H .0500, mitigation may be required by the NC Division of Water Quality for projects involving greater than or equal to one acre of impacts to freshwater wetlands or greater than or equal to 150 linear feet of total impacts to perennial streams.

USACE – In accordance with the Final Notice of Issuance and Modification of Nationwide Permits, published in the Federal Register on January 15, 2002, mitigation will be required when necessary to ensure that adverse effects to the aquatic environment are minimal. Factors including size and type of proposed impact and function and relative value of the impacted aquatic resource will be considered in determining acceptability of appropriate and practicable mitigation as proposed. Examples of mitigation that may be appropriate and practicable include, but are not limited to: reducing the size of the project; establishing and maintaining wetland and/or upland vegetated buffers to protect open waters such as streams; and replacing losses of aquatic resource functions and values by creating, restoring, enhancing, or preserving similar functions and values, preferable in the same watershed.

If mitigation is required for this project, a copy of the mitigation plan must be attached in order for USACE or DWQ to consider the application complete for processing. Any application lacking a required mitigation plan or NCEEP concurrence shall be placed on hold as incomplete. An applicant may also choose to review the current guidelines for stream restoration in DWQ's Draft Technical Guide for Stream Work in North Carolina, available at http://h2o.enr.state.nc.us/ncwetlands/strmgide.html.

1. Provide a brief description of the proposed mitigation plan. The description should provide as much information as possible, including, but not limited to: site location (attach directions and/or map, if offsite), affected stream and river basin, type and amount (acreage/linear feet) of mitigation proposed (restoration, enhancement, creation, or preservation), a plan view, preservation mechanism (e.g., deed restrictions, conservation easement, etc.), and a description of the current site conditions and proposed method of construction. Please attach a separate sheet if more space is needed.
   N/A

2. Mitigation may also be made by payment into the North Carolina Ecosystem Enhancement Program (NCEEP). Please note it is the applicant's responsibility to contact the NCEEP at (919) 715-0476 to determine availability, and written approval from the NCEEP indicating that they are will to accept payment for the mitigation must be attached to this form. For additional information regarding the application process for the NCEEP, check the NCEEP website at http://h2o.enr.state.nc.us/wrp/index.htm. If use of the NCEEP is proposed, please check the appropriate box on page five and provide the following information:
   Amount of stream mitigation requested (linear feet): 0
   Amount of buffer mitigation requested (square feet): 0
   Amount of Riparian wetland mitigation requested (acres): 0
   Amount of Non-riparian wetland mitigation requested (acres): 0
   Amount of Coastal wetland mitigation requested (acres): 0

IX. Environmental Documentation (required by DWQ)

1. Does the project involve an expenditure of public (federal/state/local) funds or the use of public (federal/state) land? Yes ☒ No ☐

2. If yes, does the project require preparation of an environmental document pursuant to the requirements of the National or North Carolina Environmental Policy Act (NEPA/SEPA)? Note: If you are not sure whether a NEPA/SEPA document is required, call the SEPA coordinator at (919) 733-5083 to review current thresholds for environmental documentation. Yes ☒ No ☐

3. If yes, has the document review been finalized by the State Clearinghouse? If so, please attach a copy of the NEPA or SEPA final approval letter. Yes ☒ No ☐

X. Proposed Impacts on Riparian and Watershed Buffers (required by DWQ)

It is the applicant's (or agent's) responsibility to determine, delineate and map all impacts to required state and local buffers associated with the project. The applicant must also provide justification for these impacts in Section VII above. All proposed impacts must be listed herein, and must be clearly identifiable on the accompanying site plan. All buffers must be shown on a map, whether or not impacts are proposed to the buffers. Correspondence from the DWQ Regional Office may be included as appropriate. Photographs may also be included at the applicant's discretion.

1. Will the project impact protected riparian buffers identified within 15A NCAC 2B .0233 (Neuse), 15A NCAC 2B .0259 (Tar-Pamlico), 15A NCAC 02B .0243 (Catawba) 15A NCAC 2B .0250 (Randleman Rules and Water Supply Buffer Requirements), or other (please identify_____)? Yes ☒ No ☐

2. If "yes", identify the square feet and acreage of impact to each zone of the riparian buffers. If buffer mitigation is required calculate the required amount of mitigation by applying the buffer multipliers.

Zone*	Impact (square feet)	Multiplier	Required Mitigation
1	3,573	3 (2 for Catawba)	0
2	2,236	1.5	0
Total	5,809		0

* Zone 1 extends out 30 feet perpendicular from the top of the near bank of channel; Zone 2 extends an additional 20 feet from the edge of Zone 1.

3. If buffer mitigation is required, please discuss what type of mitigation is proposed (i.e., Donation of Property, Riparian Buffer Restoration / Enhancement, or Payment into the Riparian Buffer Restoration Fund). Please attach all appropriate information as identified within 15A NCAC 2B .0242 or .0244, or .0260. N/A

XI. Stormwater (required by DWQ)

Describe impervious acreage (existing and proposed) versus total acreage on the site. Discuss stormwater controls proposed in order to protect surface waters and wetlands downstream from the property. If percent impervious surface exceeds 20%, please provide calculations demonstrating total proposed impervious level. N/A

XII. Sewage Disposal (required by DWQ)

Clearly detail the ultimate treatment methods and disposition (non-discharge or discharge) of wastewater generated from the proposed project, or available capacity of the subject facility.
N/A

XIII. Violations (required by DWQ)

Is this site in violation of DWQ Wetland Rules (15A NCAC 2H .0500) or any Buffer Rules?
Yes ☐ No ☒

Is this an after-the-fact permit application? Yes ☐ No ☒

XIV. Cumulative Impacts (required by DWQ)

Will this project (based on past and reasonably anticipated future impacts) result in additional development, which could impact nearby downstream water quality? Yes ☐ No ☒
If yes, please submit a qualitative or quantitative cumulative impact analysis in accordance with the most recent North Carolina Division of Water Quality policy posted on our website at http://h2o.enr.state.nc.us/ncwetlands. If no, please provide a short narrative description:
The project is a relatively small bridge in a residential area. There will be no new road created and no additional lanes added, therefore it is unlikely to attract development.

XV. Other Circumstances (Optional):

It is the applicant's responsibility to submit the application sufficiently in advance of desired construction dates to allow processing time for these permits. However, an applicant may choose to list constraints associated with construction or sequencing that may impose limits on work schedules (e.g., draw-down schedules for lakes, dates associated with Endangered and Threatened Species, accessibility problems, or other issues outside of the applicant's control).
N/A

E. L. Lupe 4.23.08

Applicant/Agent's Signature **Date**
(Agent's signature is valid only if an authorization letter from the applicant is provided.)

United States Department of the Interior

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

April 16, 2007

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

Dear Dr. Thorpe:

This letter is in response to your letter of April 11, 2007 which provided the U.S. Fish and Wildlife Service (Service) with the biological determination of the North Carolina Department of Transportation (NCDOT) that the replacement of Bridge No. 89 on SR 1162 over Sassarixa Swamp in Johnston County (TIP No. B-4165) may affect, but is not likely to adversely affect the federally endangered dwarf wedgemussel (*Alasmidonta heterodon*) and Tar spinymussel (*Elliptio steinstansana*). In addition, NCDOT has determined that the proposed project will have no effect on the federally protected bald eagle (*Haliaeetus leucocephalus*), red-cockaded woodpecker (*Picoides borealis*) and Michaux's sumac (*Rhus michauxii*). These comments are provided in accordance with section 7 of the Endangered Species Act (ESA) of 1973, as amended (16 U.S.C. 1531-1543).

According to information provided, a mussel survey was conducted at the project site on March 22, 2007. The survey extended 50 meters upstream and 400 meters downstream of SR 1162. Neither of the federally listed mussels was observed, and habitat quality for the two species was not suitable upstream of the bridge. Only one mussel, an eastern elliptio (*Elliptio complanata*) was observed during the survey.

According to the previously provided Federal Categorical Exclusion, a plant survey was conducted within suitable habitat for Michaux's sumac on June 11, 2004. No specimens of Michaux's sumac were observed.

Based on the mussel survey results and other available information, the Service concurs with your determination that the proposed project may affect, but is not likely to adversely affect the dwarf wedgemussel and Tar spinymussel. Based on the plant survey and other available information, the Service concurs with your determination that the proposed project will have no effect on Michaux's sumac. Also, due to the lack of habitat, the Service concurs with your determination that the project will have no effect on the bald eagle and red-cockaded woodpecker. We believe that the requirements of section 7(a)(2) of the ESA have been satisfied. We remind you that obligations under section 7 consultation must be reconsidered if: (1) new

information reveals impacts of this identified action that may affect listed species or critical habitat in a manner not previously considered in this review; (2) this action is subsequently modified in a manner that was not considered in this review; or (3) a new species is listed or critical habitat determined that may be affected by this identified action.

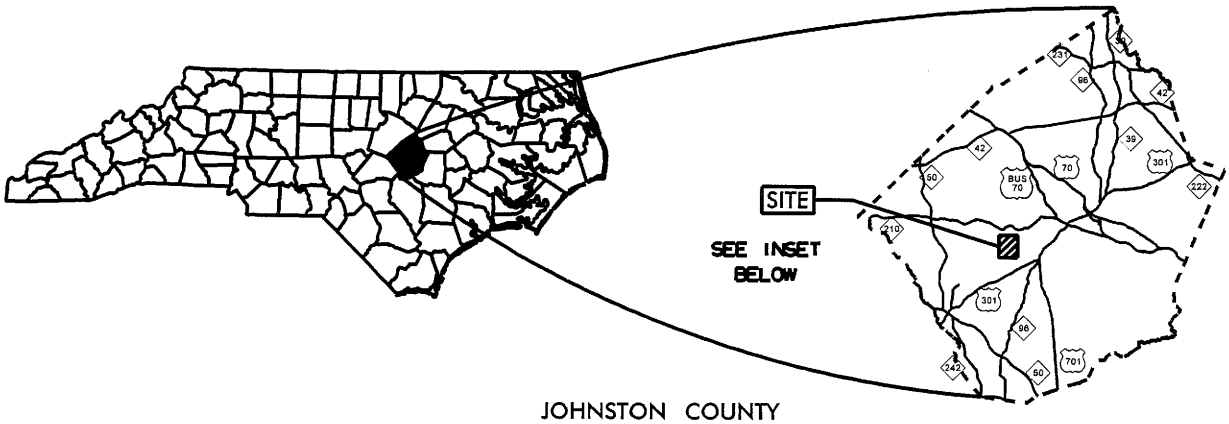
The Service appreciates the opportunity to review this project. If you have any questions regarding our response, please contact Mr. Gary Jordan at (919) 856-4520 (Ext. 32).

Sincerely,

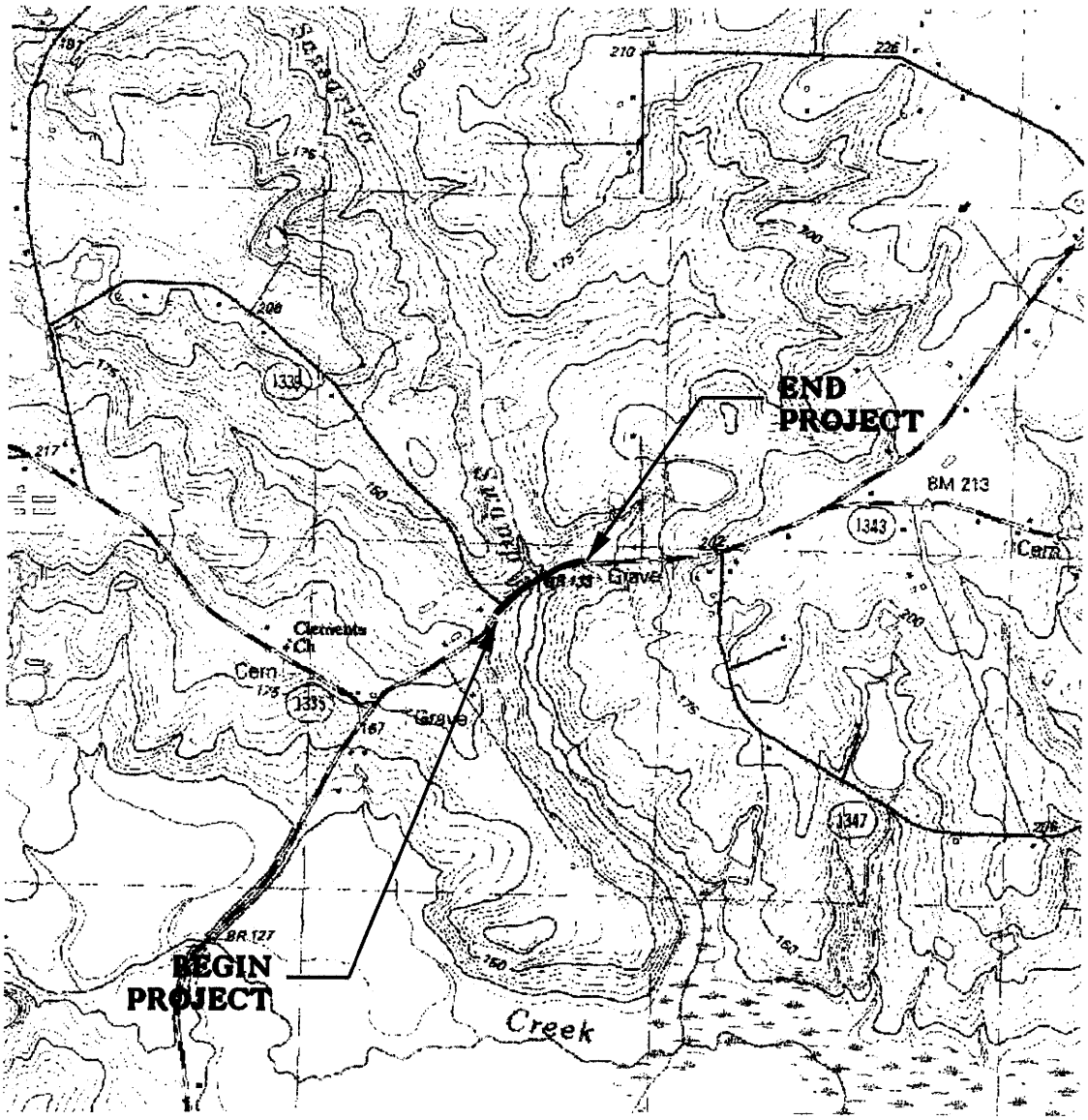
Gary Jordan

for Pete Benjamin
Field Supervisor

cc: William Wescott, USACE, Washington, NC
Rob Ridings, NCDWQ, Raleigh, NC
Travis Wilson, NCWRC, Creedmoor, NC
Chris Militscher, USEPA, Raleigh, NC
John Sullivan, FHWA, Raleigh, NC
David Harris, NCDOT, Raleigh, NC



JOHNSTON COUNTY



WETLAND IMPACTS
VICINITY MAP

N.C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS

JOHNSTON COUNTY

PROJECT:33513.1.1 (B-4165)
BRIDGE NO.89 OVER
SASSARIXA SWAMP ON
SR 1162 (BLACK CREEK RD)

SHEET 1 **OF** 9 **12/28/07**

WETLAND PERMIT IMPACT SUMMARY

			WETLAND IMPACTS					SURFACE WATER IMPACTS				
Site No.	Station (From/To)	Structure Size / Type	Permanent Fill In Wetlands (ac)	Temp. Fill In Wetlands (ac)	Excavation in Wetlands (ac)	Mechanized Clearing in Wetlands (ac)	Hand Clearing in Wetlands (ac)	Permanent SW impacts (ac)	Temp. SW impacts (ac)	Existing Channel Impacts Permanent (ft)	Existing Channel Impacts Temp. (ft)	Natural Stream Design (ft)
1	16+30 -L-	BRIDGE					0.01		0.02			
TOTALS:			0.00	0.00	0.00	0.00	0.01	0.00	0.02	0	0	0

20 sq. ft. of impacts for one in-water pier.

NC DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

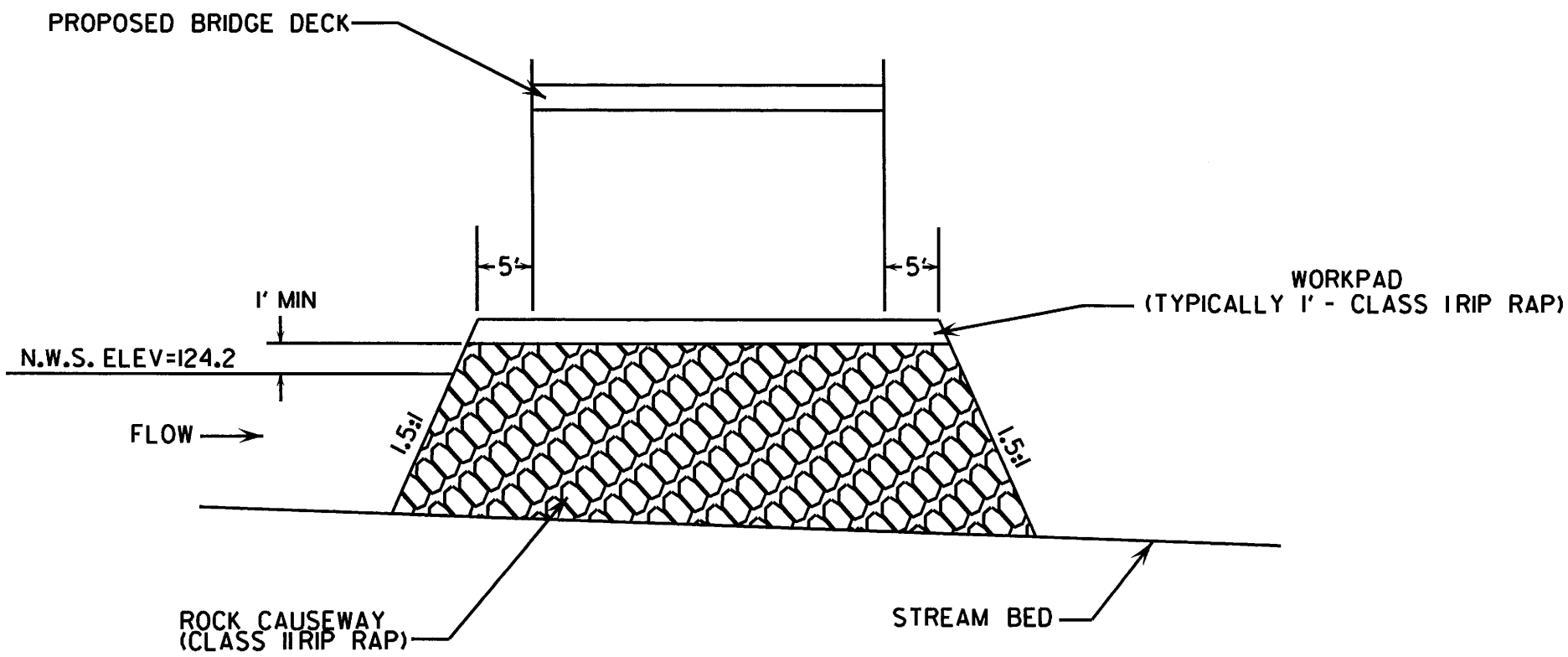
JOHNSTON COUNTY
PROJECT: 33513.1.1 (B-4165)

SHEET 12/28/2007

Permit Drawing
Sheet 2 of 9

ATN Revised 3/31/05

WORKPAD DETAIL
(NOT TO SCALE)



QUANTITIES OF ESTIMATES

VOLUME OF CLASS II RIP RAP= 350 yds^3

AREA OF CLASS II RIP RAP= 0.03 ac

Estimate 520 Tons Class II Rip Rap

N.C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS

JOHNSTON COUNTY
PROJECT: 33513.1.1 (B-4165)
BRIDGE NO. 89 ON SR 1162
(BLACK CREEK RD) OVER
SASSARIXA SWAMP

SHEET ___ OF ___ **12/28/07**

Permit Drawing

PROPERTY OWNERS

NAMES AND ADDRESSES

PARCEL NO.	NAMES	ADDRESSES
1	TERRY ANDREW SPENCE	310 WATKINS RD CLAYTON, NC 27520
2	WILSON F. WILLIAMS	P.O. BOX 152 FOUR OAKS, NC 27524

NCDOT

DIVISION OF HIGHWAYS

JOHNSTON COUNTY

PROJECT: 33513.1.1 (B-4165)
BRIDGE NO. 89 ON SR 1162
(BLACK CREEK RD) OVER
SASSARIXA SWAMP

SHEET OF 12/28/07

Permit Drawing
Sheet 4 of 9

09/08/99

TIP PROJECT: B-4165

CONTRACT:

$$$$$$SYSTIME$$$$$
$$$$$$$$$$$$$DGN$$$$$$$$$$$$$$$$$$$
$$$$USERNAME$$$$$

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

VICINITY MAP

(THIS PROJECT IS NOT INCLUDED WITHIN ANY MUNICIPAL BOUNDARIES)

●—●—● OFFSITE DETOUR

** DESIGN EXCEPTION FOR HORIZONTAL ALIGNMENT, VERTICAL ALIGNMENT, AND VERTICAL STOPPING SIGHT DISTANCE.

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

JOHNSTON COUNTY

LOCATION: BRIDGE NO. 89 ON SR 1162 (BLACK CREEK RD) OVER SASSARIXA SWAMP

TYPE OF WORK: GRADING, DRAINAGE, PAVING AND STRUCTURE

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-4165	1	

STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION
33513.1.1	BRZ-1162 (5)	PE
33513.2.1	BRZ-1162 (5)	R/W & UTIL.

R/W PLANS

WETLAND/STREAM IMPACTS

BEGIN TIP PROJECT B-4165
-L- STA. 11+75.00

END TIP PROJECT B-4165
-L- STA. 20+85.00

NCDOT CONTACT : CATHY HOUSER, P.E.
ROADWAY DESIGN-ENGINEERING COORDINATION

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

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

GRAPHIC SCALES

50 25 0 50 100
PLANS

50 25 0 50 100
PROFILE (HORIZONTAL)

10 5 0 10 20
PROFILE (VERTICAL)

DESIGN DATA

ADT 2008 = 3,191
ADT 2028 = 6,496
DHV = 10 %
D = 60 %
T = 3 % *
**V = 60 MPH
FUNC. CLASS. = RURAL MINOR COLLECTOR
* TTST 1% DUAL 2%

PROJECT LENGTH

Length Structure TIP Project B-4165 = 0.026 Miles
Length Roadway TIP Project B-4165 = 0.146 Miles
Total Length TIP Project B-4165 = 0.172 Miles

Prepared In the Office of:

THE LPA GROUP TRANSPORTATION CONSULTANTS
THE LPA GROUP of North Carolina, p.a.
5000 Falls of Neuse Rd., Suite 304
Raleigh, North Carolina 27609

2006 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
NOVEMBER 16, 2007

LETTING DATE:
NOVEMBER 18, 2008

JEANNE K. RICHTER P.E.
PROJECT ENGINEER

JODY L. COLE
PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER

SIGNATURE: P.E.

ROADWAY DESIGN ENGINEER

SIGNATURE: P.E.

DIVISION OF HIGHWAYS STATE OF NORTH CAROLINA

STATE HIGHWAY DESIGN ENGINEER P.E.

Permit Drawing
Sheet 5 of 9

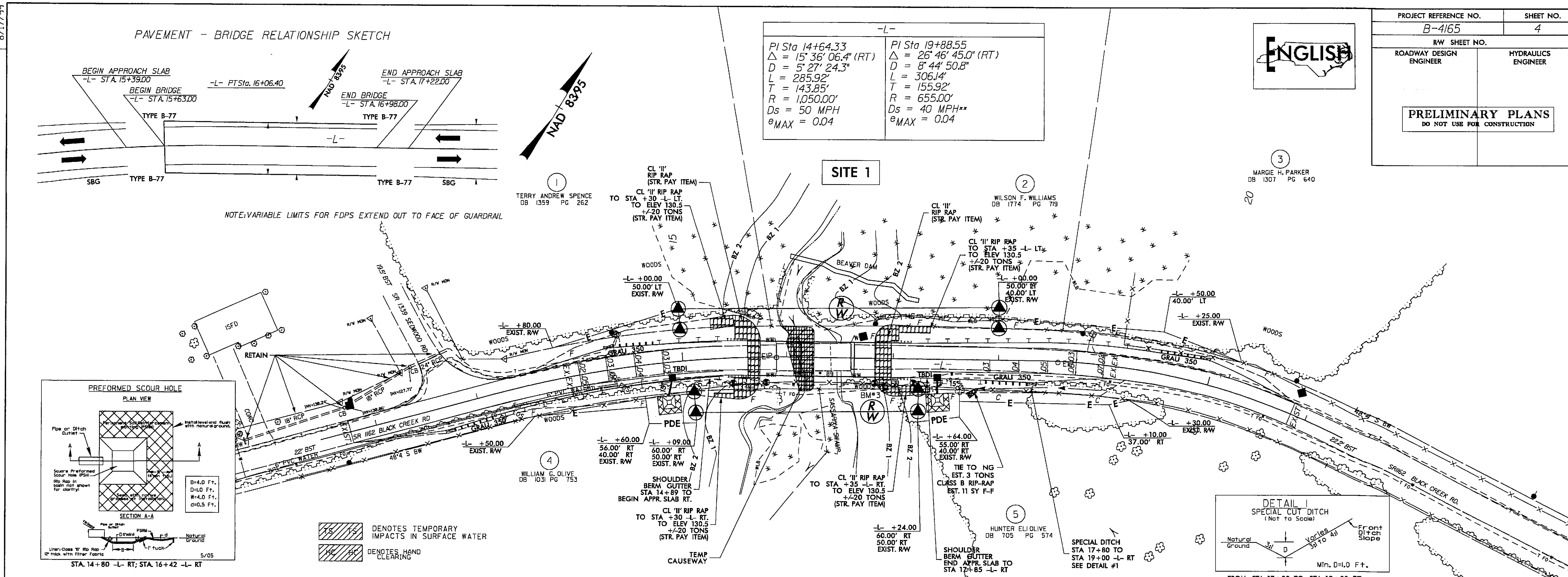
PROJECT REFERENCE NO.	SHEET NO.
B-4165	4

R/W SHEET NO.

ROADWAY DESIGN ENGINEER — HYDRAULICS ENGINEER

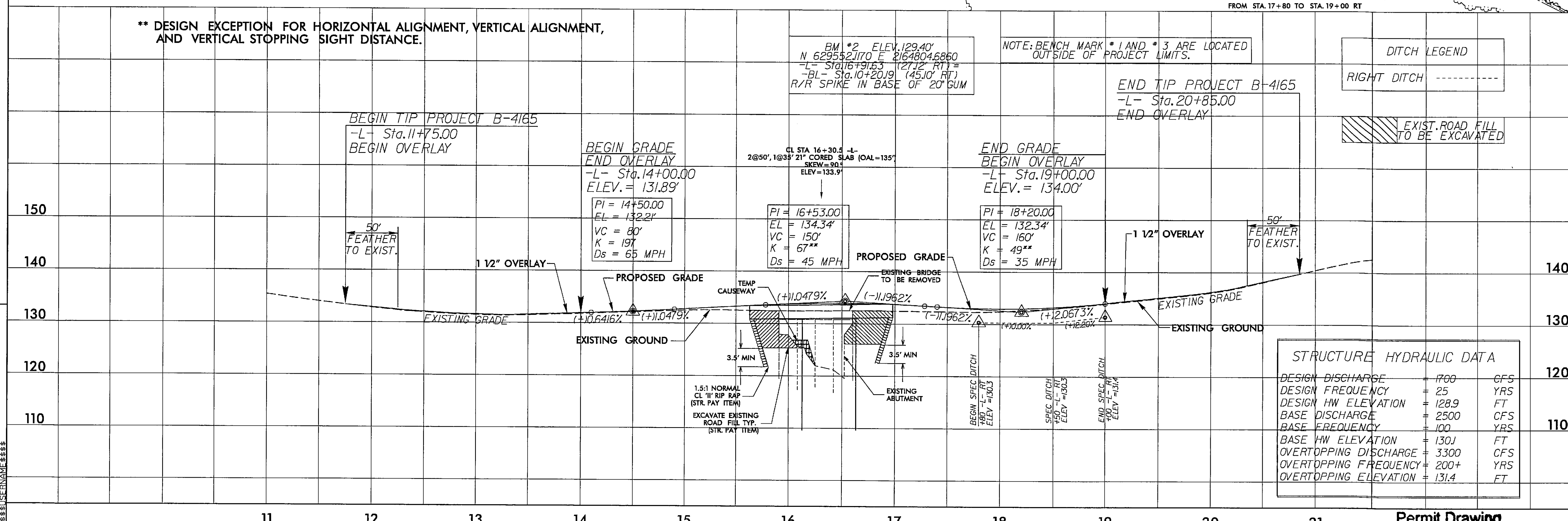
ENGLISH

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



-L-	
PI Sta 14+64.33	PI Sta 19+88.55
Δ = 15° 36' 06.4" (RT)	Δ = 26° 46' 45.0" (RT)
D = 5° 27' 24.3"	D = 8° 44' 50.8"
L = 285.92'	L = 306.14'
T = 143.85'	T = 155.92'
R = 1,050.00'	R = 655.00'
Ds = 50 MPH	Ds = 40 MPH**
e_{MAX} = 0.04	e_{MAX} = 0.04

** DESIGN EXCEPTION FOR HORIZONTAL ALIGNMENT, VERTICAL ALIGNMENT, AND VERTICAL STOPPING SIGHT DISTANCE.



STRUCTURE HYDRAULIC DATA

DESIGN DISCHARGE	= 1700	CFS
DESIGN FREQUENCY	= 25	YRS
DESIGN HW ELEVATION	= 128.9	FT
BASE DISCHARGE	= 2500	CFS
BASE FREQUENCY	= 100	YRS
BASE HW ELEVATION	= 130.1	FT
OVERTOPPING DISCHARGE	= 3300	CFS
OVERTOPPING FREQUENCY	= 200+	YRS
OVERTOPPING ELEVATION	= 131.4	FT

REVISIONS

8/17/99

Permit Drawing Sheet 4 of 9

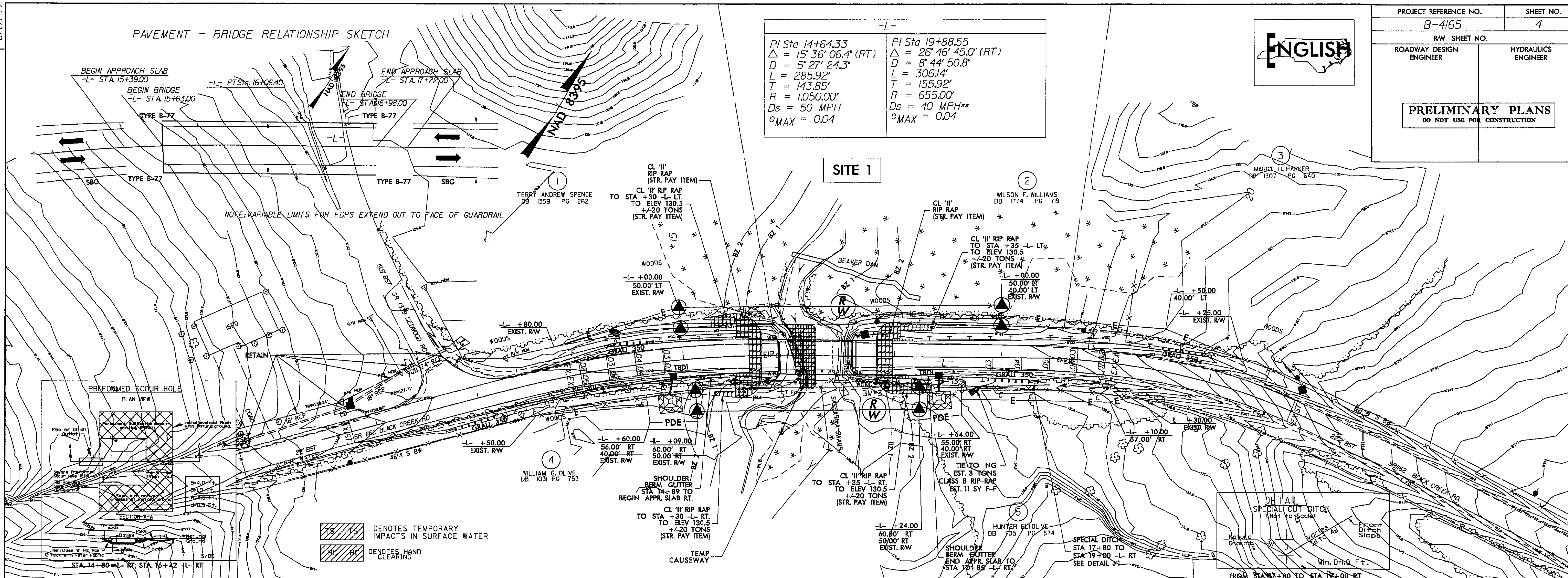
8/17/99

PROJECT REFERENCE NO.	SHEET NO.
B-4165	4
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

ENGLISH

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

-L-	
PI Sta 14+64.33	PI Sta 19+88.55
△ = 15° 36' 06.4" (RT)	△ = 26° 46' 45.0" (RT)
D = 5° 27' 24.3"	D = 8° 44' 50.8"
L = 285.92'	L = 306.14'
T = 143.85'	T = 155.92'
R = 1,050.00'	R = 655.00'
Ds = 50 MPH	Ds = 40 MPH**
e_{MAX} = 0.04	e_{MAX} = 0.04

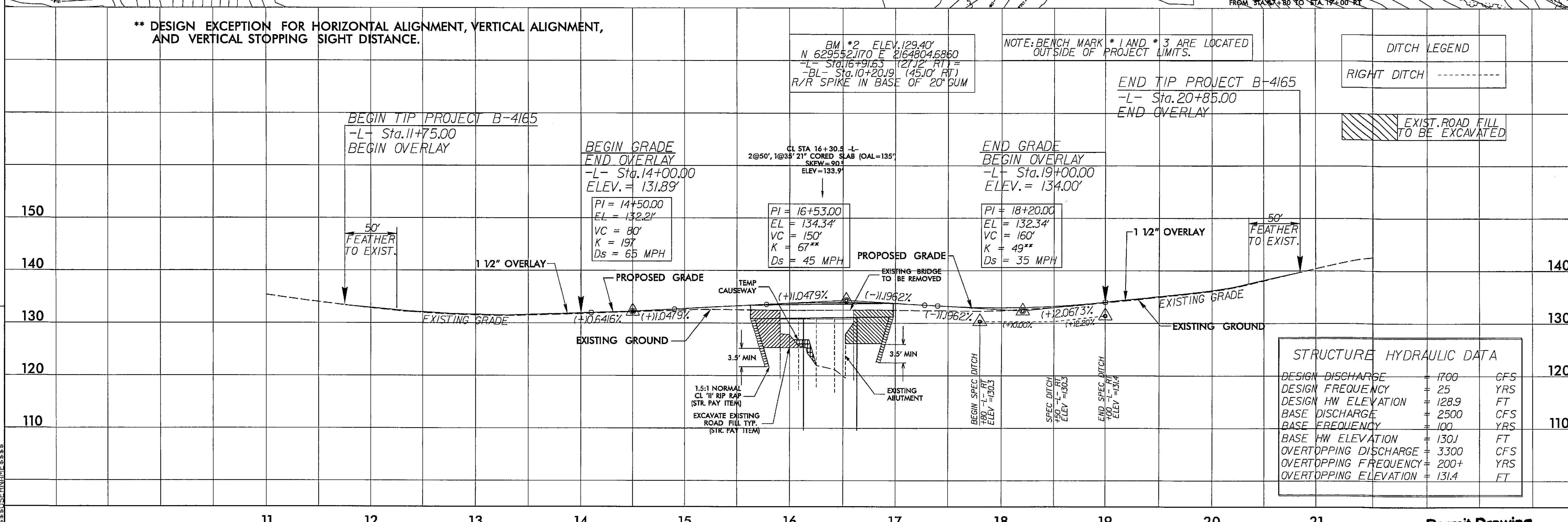


** DESIGN EXCEPTION FOR HORIZONTAL ALIGNMENT, VERTICAL ALIGNMENT, AND VERTICAL STOPPING SIGHT DISTANCE.

BM #2 ELEV. 129.40'
N 629552.1170 E 2164804.6860
-L- Sta. 16+91.63 (27.12' RT) =
-BL- Sta. 10+20.19 (45.10' RT)
R/R SPIKE IN BASE OF 20" GUM

NOTE: BENCH MARK #1 AND #3 ARE LOCATED OUTSIDE OF PROJECT LIMITS.

DITCH LEGEND	
RIGHT DITCH	----------

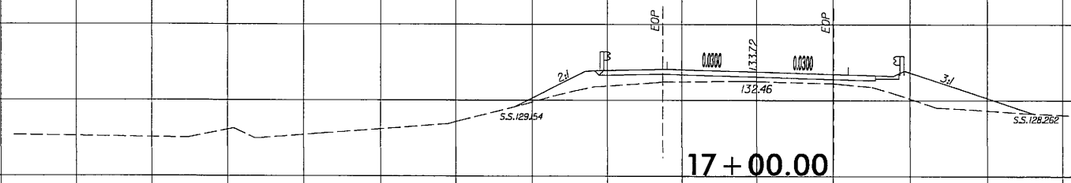


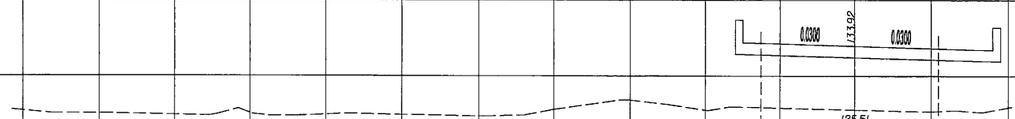
STRUCTURE HYDRAULIC DATA		
DESIGN DISCHARGE	= 1700	CFS
DESIGN FREQUENCY	= 25	YRS
DESIGN HW ELEVATION	= 128.9	FT
BASE DISCHARGE	= 2500	CFS
BASE FREQUENCY	= 100	YRS
BASE HW ELEVATION	= 130.1	FT
OVERTOPPING DISCHARGE	= 3300	CFS
OVERTOPPING FREQUENCY	= 200+	YRS
OVERTOPPING ELEVATION	= 131.4	FT

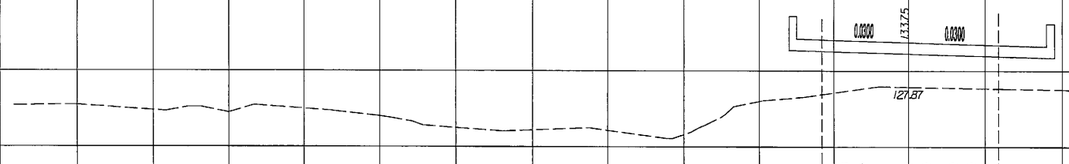
REVISIONS

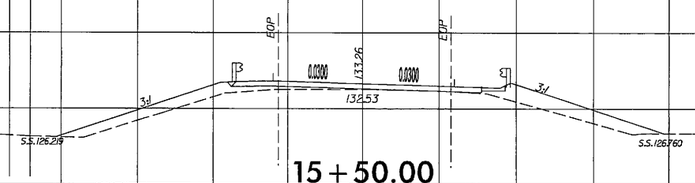
$$$$SYSTIME$$$$ $$$$DGN$$$$ $$$$USERNAME$$$$

Permit Drawing
Sheet 7 of 9









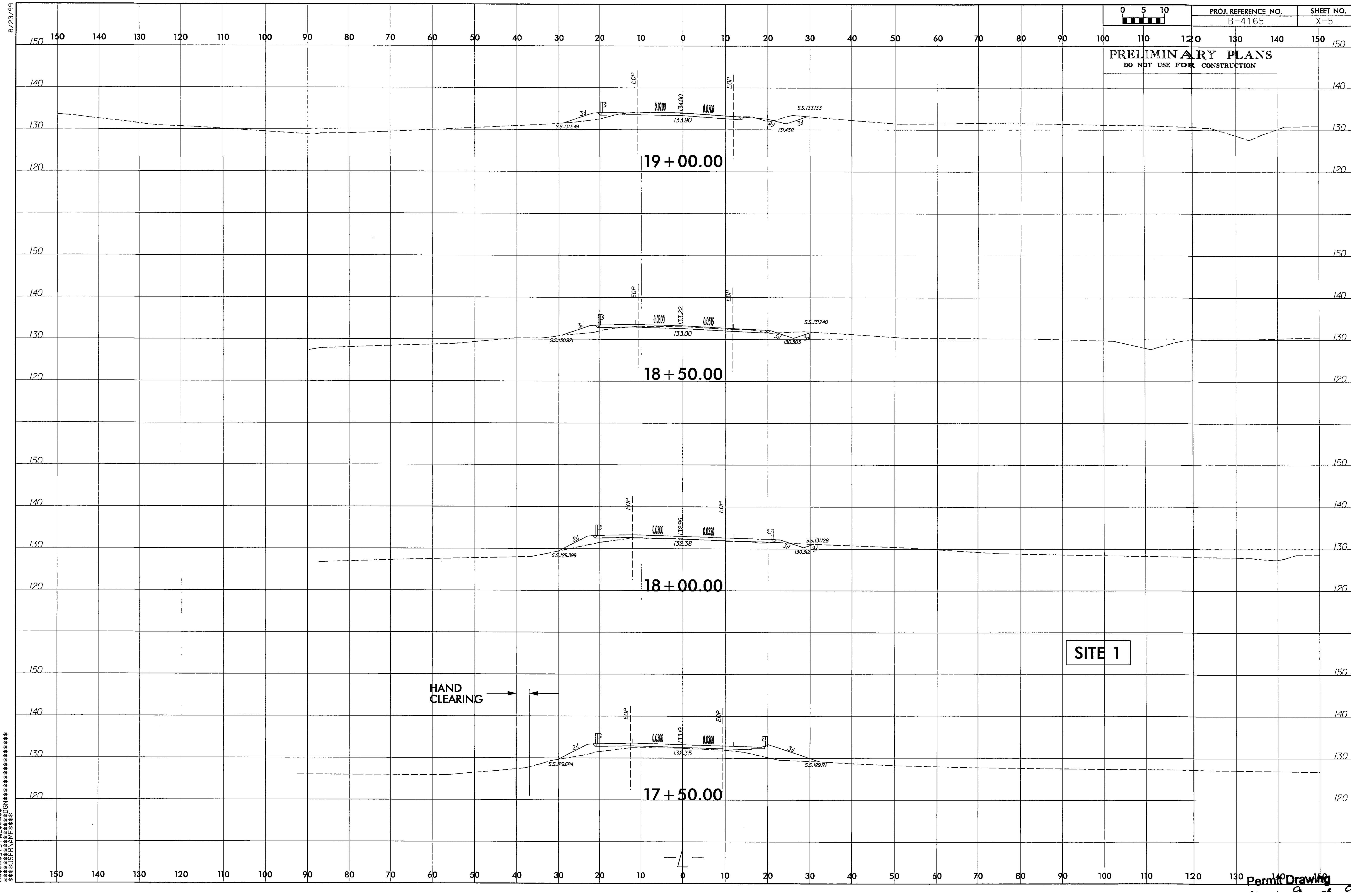
PROJ. REFERENCE NO.	SHEET NO.
B-4165	X-4

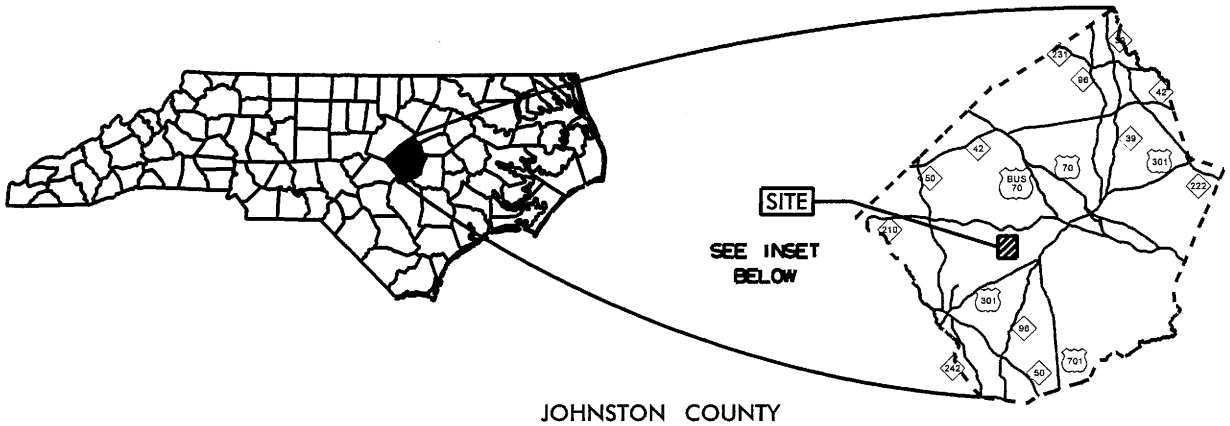
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

8/23/99

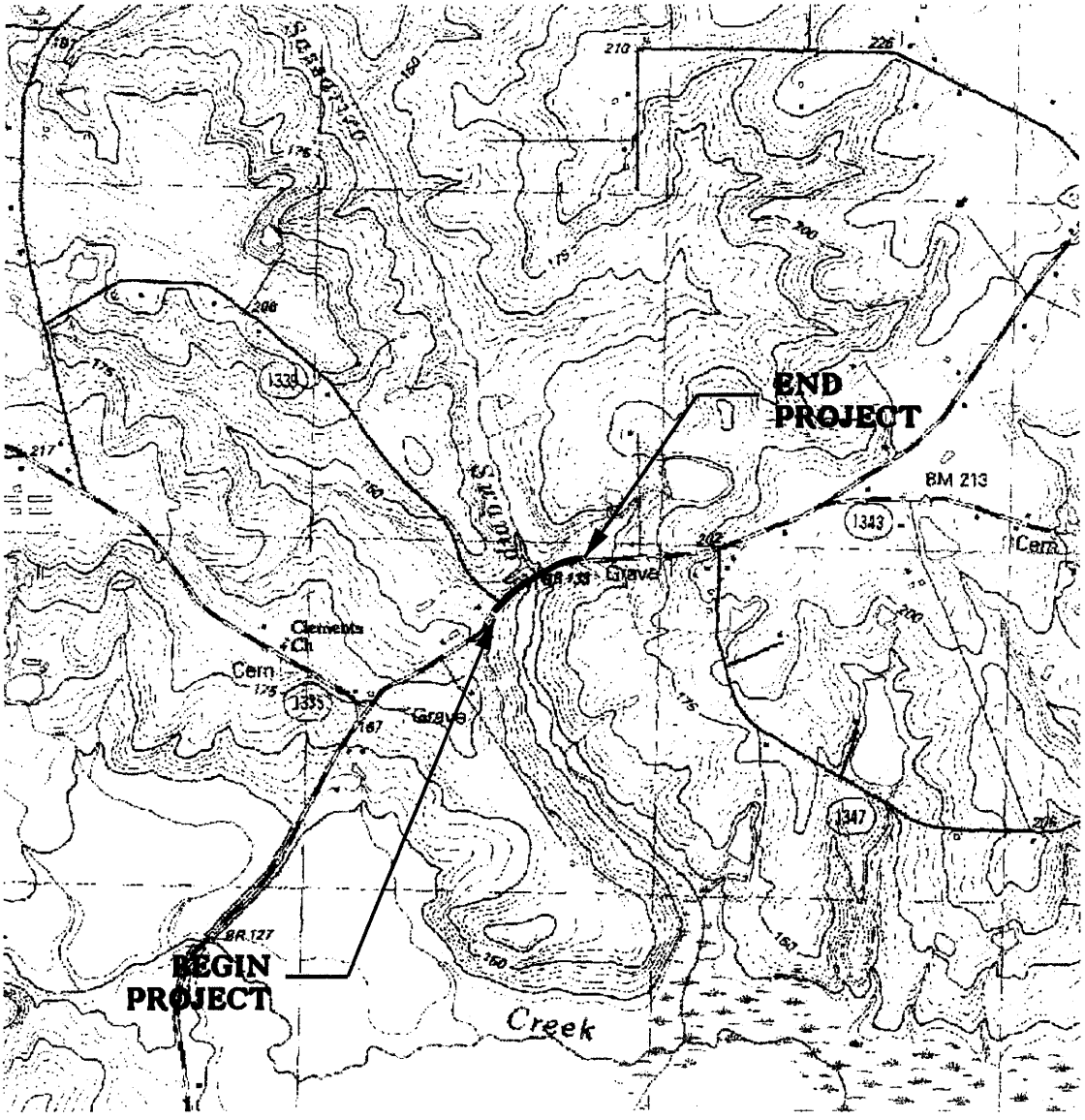
$$$$$SYSTIME$$$$
$$$$$$$$$$$$$$$$DGN$$$$$$$$$$$$$$$$$$
$$$USERNAME$$$$

Permit Drawing


PROJ. REFERENCE NO.
B-4165
SHEET NO.
X-5
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
8/23/99
19+00.00
18+50.00
18+00.00
17+50.00
EOP
HAND CLEARING
SITE 1
Permit Drawing



JOHNSTON COUNTY



BUFFER IMPACTS
VICINITY MAP

N.C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS

JOHNSTON COUNTY

PROJECT:33513.1.1 (B-4165)
BRIDGE NO.89 OVER
SASSARIXA SWAMP ON
SR 1162 (BLACK CREEK RD)

SHEET 1 OF 7 **12/28/07**

BUFFER IMPACTS SUMMARY

			IMPACT									BUFFER REPLACEMENT	
			TYPE			ALLOWABLE			MITIGABLE				
SITE NO.	STRUCTURE SIZE / TYPE	STATION (FROM/TO)	ROAD CROSSING	BRIDGE	PARALLEL IMPACT	ZONE 1 (ft^2)	ZONE 2 (ft^2)	TOTAL (ft^2)	ZONE 1 (ft^2)	ZONE 2 (ft^2)	TOTAL (ft^2)	ZONE 1 (ft^2)	ZONE 2 (ft^2)
1	BRIDGE	15+63-16+98 -L-		X		3168	405	3573					
			X			880	1356	2236					
TOTAL:						4048	1761	5809	0.0	0.0	0.0		

REVISED 1-14-08: SEPARATION OF ROADWAY IMPACTS AND BRIDGE IMPACTS

N.C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS

JOHNSTON COUNTY
PROJECT: 33513.1.1 (B-4165)

12/28/07
SHEET OF

Rev. May 2006

Buffer Drawing
Sheet 2 of 2

BUFFER IMPACTS SUMMARY

		WETLANDS IN BUFFER	
Site	Station	ZONE 1 (ft^2)	ZONE 2 (ft^2)
1	15+63-16+98 -L-	1194	342
	TOTAL	1194	342

NC DEPARTMENT OF TRANSPORTATION

DIVISION OF HIGHWAYS

JOHNSTON COUNTY

PROJECT:33513.1.1 (B-4165)

12/28/2007

Buffer Drawing

PROPERTY OWNERS

NAMES AND ADDRESSES

PARCEL NO.	NAMES	ADDRESSES
1	TERRY ANDREW SPENCE	310 WATKINS RD CLAYTON, NC 27520
2	WILSON F. WILLIAMS	P.O. BOX 152 FOUR OAKS, NC 27524
4	WILLIAM G. OLIVE	3968 BLACK CREEK RD SMITHFIELD, NC 27577
5	HUNTER ELI OLIVE	3956 BLACK OLIVE RD SMITHFIELD, NC 27577

NCDOT

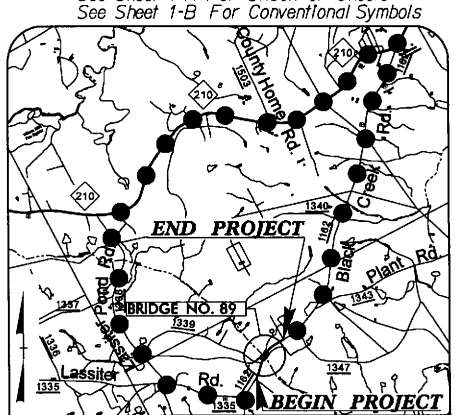
DIVISION OF HIGHWAYS

JOHNSTON COUNTY

PROJECT: 33513.1.1 (B-4165)
BRIDGE NO. 89 ON SR 1162
(BLACK CREEK RD) OVER
SASSARIXA SWAMP

SHEET OF 12/28/07

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



VICINITY MAP

(THIS PROJECT IS NOT INCLUDED WITHIN ANY MUNICIPAL BOUNDARIES)

●—●—● OFFSITE DETOUR

** DESIGN EXCEPTION FOR HORIZONTAL ALIGNMENT, VERTICAL ALIGNMENT, AND VERTICAL STOPPING SIGHT DISTANCE.

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

JOHNSTON COUNTY

LOCATION: BRIDGE NO. 89 ON SR 1162 (BLACK CREEK RD) OVER SASSARIXA SWAMP

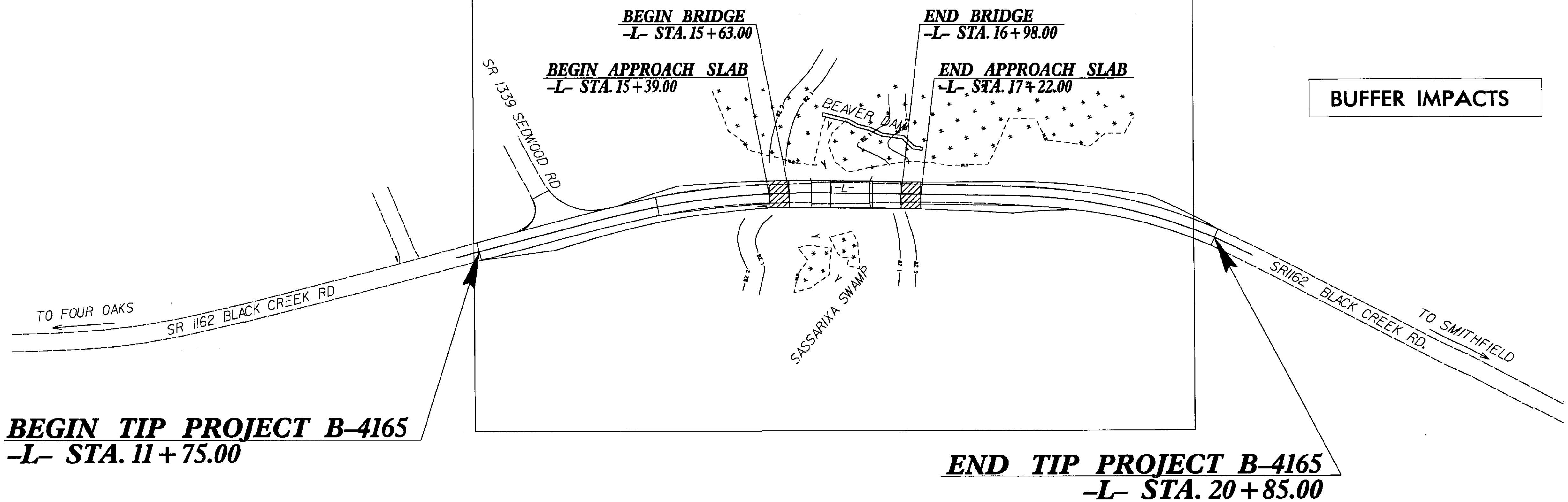
TYPE OF WORK: GRADING, DRAINAGE, PAVING AND STRUCTURE

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-4165	1	

STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION
33513.1.1	BRZ-1162 (5)	PE
33513.2.1	BRZ-1162 (5)	R/W & UTIL.

R/W PLANS

BUFFER IMPACTS



BEGIN TIP PROJECT B-4165
-L- STA. 11+75.00

END TIP PROJECT B-4165
-L- STA. 20+85.00

NCDOT CONTACT : CATHY HOUSER, P.E.
ROADWAY DESIGN-ENGINEERING COORDINATION

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

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

TIP PROJECT: B-4165

CONTRACT:

GRAPHIC SCALES

50 25 0 50 100
PLANS

50 25 0 50 100
PROFILE (HORIZONTAL)

10 5 0 10 20
PROFILE (VERTICAL)

DESIGN DATA

ADT 2008 = 3,191
ADT 2028 = 6,496
DHV = 10 %
D = 60 %
T = 3 % *
**V = 60 MPH
FUNC. CLASS. = RURAL MINOR COLLECTOR
* TTST 1% DUAL 2%

PROJECT LENGTH

Length Structure TIP Project B-4165 = 0.026 Miles
Length Roadway TIP Project B-4165 = 0.146 Miles
Total Length TIP Project B-4165 = 0.172 Miles

Prepared In the Office of:
THE LPA GROUP TRANSPORTATION CONSULTANTS
THE LPA GROUP of North Carolina, p.a.
5000 Falls of Neuse Rd., Suite 304
Raleigh, North Carolina 27609

2006 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
NOVEMBER 16, 2007

LETTING DATE:
NOVEMBER 18, 2008

JEANNE K. RICHTER P.E.
PROJECT ENGINEER

JODY L. COLE
PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER

SIGNATURE: P.E.

ROADWAY DESIGN ENGINEER

SIGNATURE: P.E.

DIVISION OF HIGHWAYS STATE OF NORTH CAROLINA

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

P.E.
STATE HIGHWAY DESIGN ENGINEER

09/08/99

$$$$$$SYSTIME$$$$$
$$$$$$$$$$$$DGN$$$$$$$$$$$$$$$$$$$$
$$$$USERNAME$$$$

Buffer Drawing
Sheet 5 of 7

8/17/99

PROJECT REFERENCE NO.	SHEET NO.
B-4165	4
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

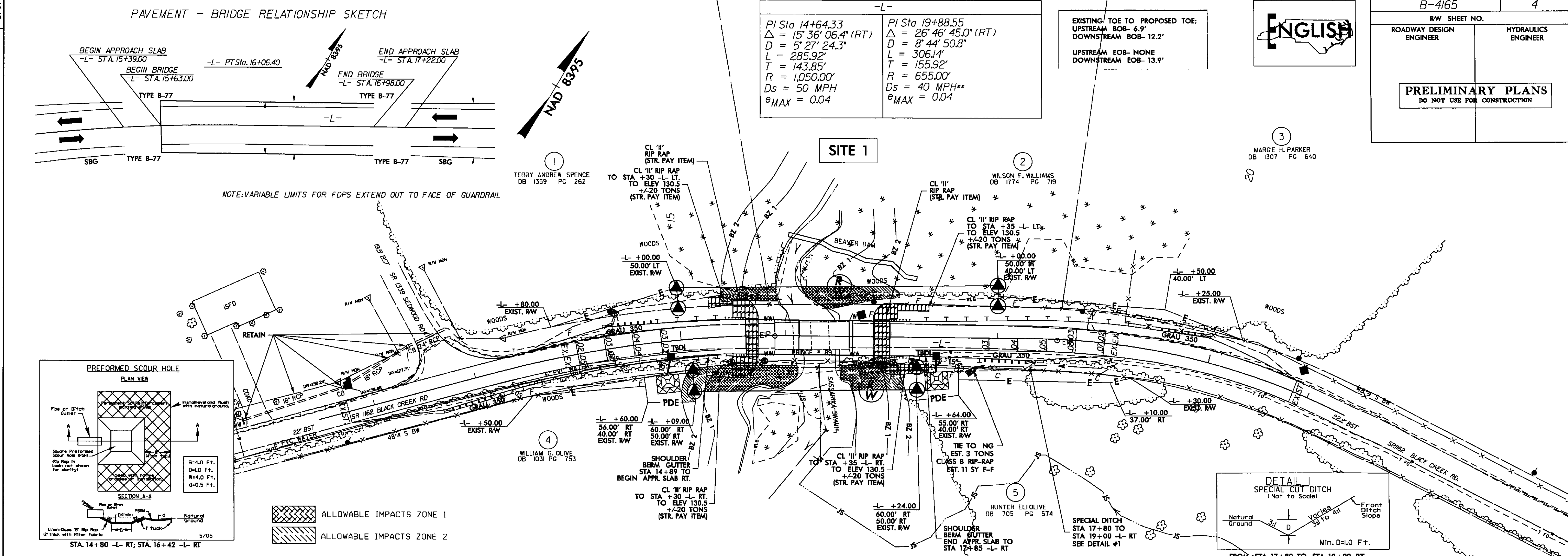
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

ENGLISH

PAVEMENT - BRIDGE RELATIONSHIP SKETCH

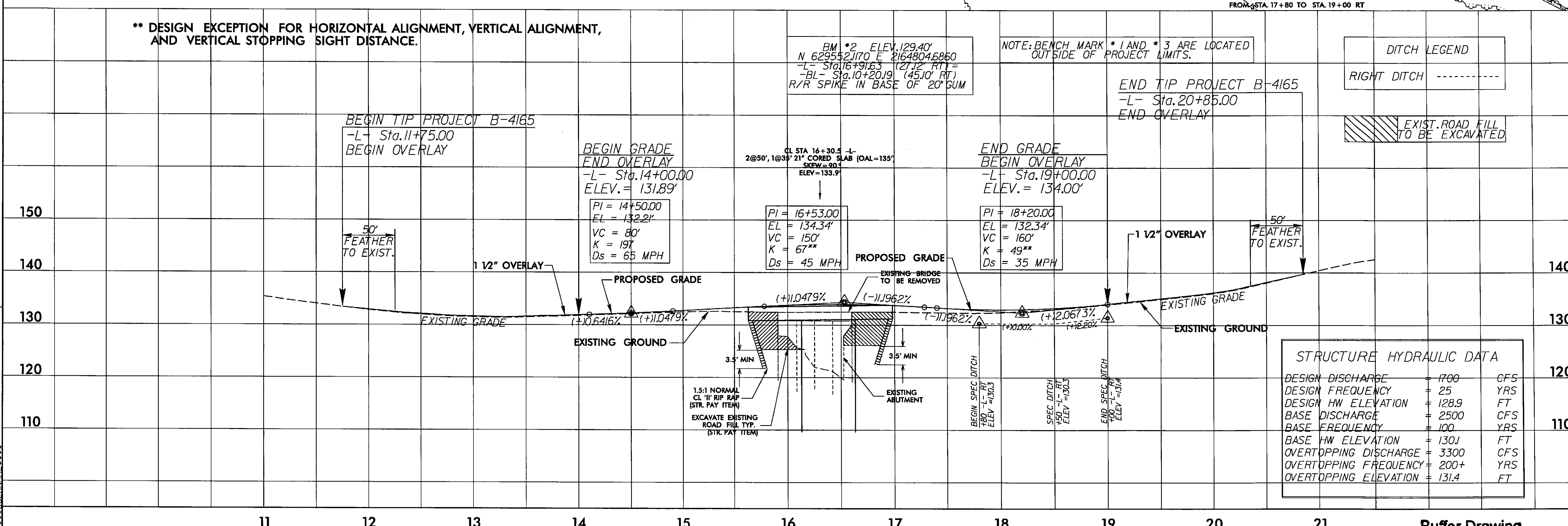
-L-	
PI Sta 14+64.33	PI Sta 19+88.55
Δ = 15° 36' 06.4" (RT)	Δ = 26° 46' 45.0" (RT)
D = 5° 27' 24.3"	D = 8° 44' 50.8"
L = 285.92'	L = 306.14'
T = 143.85'	T = 155.92'
R = 1,050.00'	R = 655.00'
Ds = 50 MPH	Ds = 40 MPH**
e_{MAX} = 0.04	e_{MAX} = 0.04

EXISTING TOE TO PROPOSED TOE:
UPSTREAM BOB- 6.9'
DOWNSTREAM BOB- 12.2'
UPSTREAM EOB- NONE
DOWNSTREAM EOB- 13.9'



BEGIN APPROACH SLAB -L- STA 15+39.00
BEGIN BRIDGE -L- STA 15+63.00
-L- PT Sta. 16+06.40
END APPROACH SLAB -L- STA 17+22.00
END BRIDGE -L- STA 16+98.00
TYPE B-77
SBG
NAD 83/95
NOTE: VARIABLE LIMITS FOR FDPS EXTEND OUT TO FACE OF GUARDRAIL
SITE 1
TERRY ANDREW SPENCE DB 1359 PG 262
WILSON F. WILLIAMS DB 1774 PG 719
MARGIE H. PARKER DB 1307 PG 640
WILLIAM G. OLIVE DB 1031 PG 753
HUNTER ELI OLIVE DB 705 PG 574
SR 1162 BLACK CREEK RD
BEAVER DAM
WOODS
PDE
PREFORMED SCOUR HOLE
PLAN VIEW
SECTION A-A
STA. 14+80 -L- RT; STA. 16+42 -L- RT
ALLOWABLE IMPACTS ZONE 1
ALLOWABLE IMPACTS ZONE 2
DETAIL 1
SPECIAL CUT DITCH (Not to Scale)
FROM STA. 17+80 TO STA. 19+00 RT
SPECIAL DITCH STA 17+80 TO STA 19+00 -L- RT SEE DETAIL #1

REVISIONS



** DESIGN EXCEPTION FOR HORIZONTAL ALIGNMENT, VERTICAL ALIGNMENT, AND VERTICAL STOPPING SIGHT DISTANCE.
BM #2 ELEV.129.40' N 629552.1170 E 2164804.6860 -L- Sta.16+91.63 (27.12' RT) = -BL- Sta.10+20.19 (45.10' RT) R/R SPIKE IN BASE OF 20" GUM
NOTE: BENCH MARK # 1 AND # 3 ARE LOCATED OUTSIDE OF PROJECT LIMITS.
DITCH LEGEND
RIGHT DITCH
EXIST. ROAD FILL TO BE EXCAVATED
BEGIN TIP PROJECT B-4165 -L- Sta.11+75.00 BEGIN OVERLAY
BEGIN GRADE END OVERLAY -L- Sta.14+00.00 ELEV.= 131.89'
PI = 14+50.00 EL = 132.21' VC = 80' K = 197 Ds = 65 MPH
CL STA 16+30.5 -L- 2@50', 1@35' 21" CORED SLAB (OAL=135') SKEW=90° ELEV=133.9'
PI = 16+53.00 EL = 134.34' VC = 150' K = 67** Ds = 45 MPH
END GRADE BEGIN OVERLAY -L- Sta.19+00.00 ELEV.= 134.00'
PI = 18+20.00 EL = 132.34' VC = 160' K = 49** Ds = 35 MPH
END TIP PROJECT B-4165 -L- Sta.20+85.00 END OVERLAY
50' FEATHER TO EXIST.
1 1/2" OVERLAY
PROPOSED GRADE
EXISTING GRADE
EXISTING GROUND
EXISTING BRIDGE TO BE REMOVED
(+)0.6416%
(+)1.0479%
(-)1.1962%
(+)2.0673%
3.5' MIN
1.5:1 NORMAL CL 'II' RIP RAP (STR. PAY ITEM)
EXCAVATE EXISTING ROAD FILL TYP. (STR. PAY ITEM)
EXISTING ABUTMENT
150
140
130
120
110
11
12
13
14
15
16
17
18
19
20
21

STRUCTURE HYDRAULIC DATA

DESIGN DISCHARGE	=	1700	CFS
DESIGN FREQUENCY	=	25	YRS
DESIGN HW ELEVATION	=	128.9	FT
BASE DISCHARGE	=	2500	CFS
BASE FREQUENCY	=	100	YRS
BASE HW ELEVATION	=	130.1	FT
OVERTOPPING DISCHARGE	=	3300	CFS
OVERTOPPING FREQUENCY	=	200+	YRS
OVERTOPPING ELEVATION	=	131.4	FT

$$$$SYSTIME$$$$
$$$$USERNAME$$$$

Buffer Drawing
Sheet 4 of 7

8/17/99

PROJECT REFERENCE NO.	SHEET NO.
B-4165	4
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

ENGLISH

-L-	
PI Sta 14+64.33	PI Sta 19+88.55
Δ = 15° 36′ 06.4″ (RT)	Δ = 26° 46′ 45.0″ (RT)
D = 5° 27′ 24.3″	D = 8° 44′ 50.8″
L = 285.92′	L = 306.14′
T = 143.85′	T = 155.92′
R = 1,050.00′	R = 655.00′
Ds = 50 MPH	Ds = 40 MPH**
e_{MAX} = 0.04	e_{MAX} = 0.04

EXISTING TOE TO PROPOSED TOE:
UPSTREAM BOB- 6.9′
DOWNSTREAM BOB- 12.2′

UPSTREAM EOB- NONE
DOWNSTREAM EOB- 13.9′

REVISIONS

** DESIGN EXCEPTION FOR HORIZONTAL ALIGNMENT, VERTICAL ALIGNMENT, AND VERTICAL STOPPING SIGHT DISTANCE.

BM *2 ELEV. 129.40′
N 629552.1170 E 2164804.6860
-L- Sta. 16+91.63 (27.12′ RT) =
-BL- Sta. 10+20.19 (45.10′ RT)
R/R SPIKE IN BASE OF 20″ GUM

NOTE: BENCH MARK * 1 AND * 3 ARE LOCATED OUTSIDE OF PROJECT LIMITS.

DITCH LEGEND	
RIGHT DITCH	- - - - - - - - -

▨ EXIST. ROAD FILL TO BE EXCAVATED

STRUCTURE HYDRAULIC DATA			
DESIGN DISCHARGE	=	1700	CFS
DESIGN FREQUENCY	=	25	YRS
DESIGN HW ELEVATION	=	128.9	FT
BASE DISCHARGE	=	2500	CFS
BASE FREQUENCY	=	100	YRS
BASE HW ELEVATION	=	130.1	FT
OVERTOPPING DISCHARGE	=	3300	CFS
OVERTOPPING FREQUENCY	=	200+	YRS
OVERTOPPING ELEVATION	=	131.4	FT

$$$$SYSTIME$$$$
$$$$DGN$$$$
$$$$USERNAME$$$$

Buffer Drawing

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-4165	1	

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
33513.1.1	BRZ-1162 (5)	PE
33513.2.1	BRZ-1162 (5)	R/W & UTIL.
33513.3.1	BRZ-1162 (5)	CONST.

R/W PLANS

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

JOHNSTON COUNTY

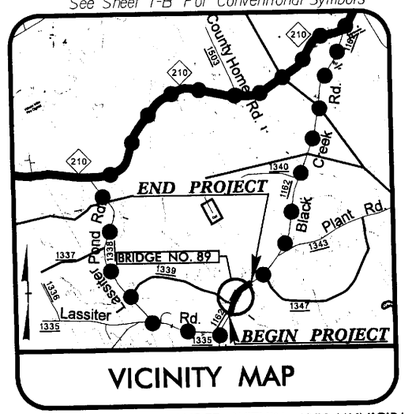
LOCATION: BRIDGE NO. 89 OVER SASSARIXA SWAMP ON SR 1162 (BLACK CREEK RD.)

TYPE OF WORK: GRADING, DRAINAGE, PAVING AND STRUCTURE

TIP PROJECT: B-4165

CONTRACT:

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

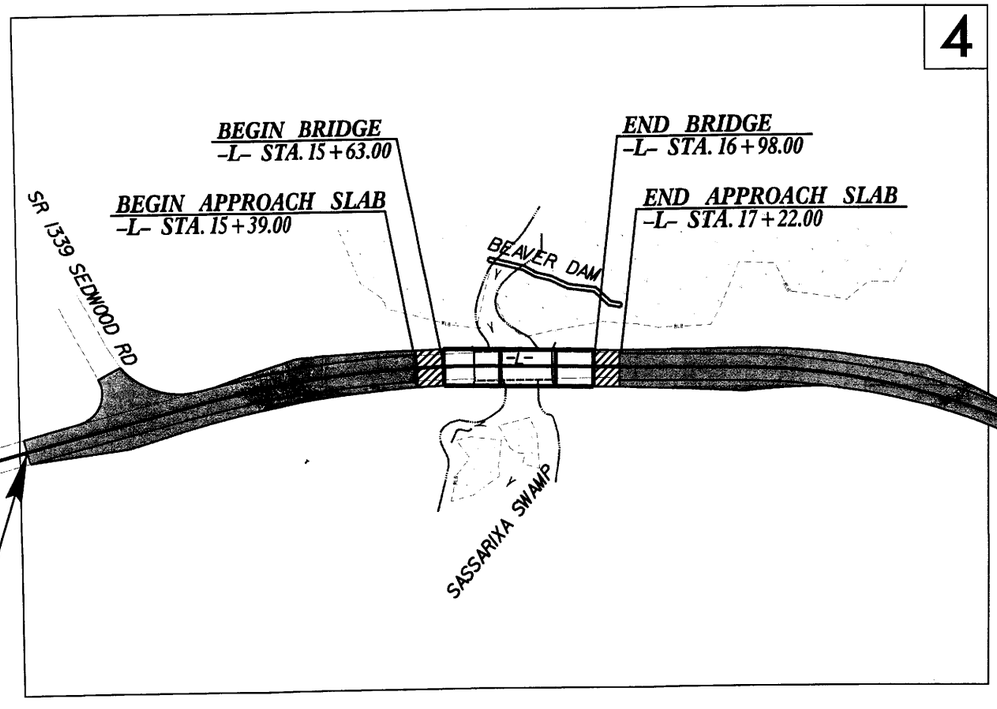


VICINITY MAP

(THIS PROJECT IS NOT INCLUDED WITHIN ANY MUNICIPAL BOUNDARIES)

OFFSITE DETOUR

** DESIGN EXCEPTION FOR HORIZONTAL ALIGNMENT, VERTICAL ALIGNMENT, AND VERTICAL STOPPING SIGHT DISTANCE.



BEGIN TIP PROJECT B-4165
-L- STA. 11+75.00

END TIP PROJECT B-4165
-L- STA. 20+85.00

NCDOT CONTACT : CATHY HOUSER, P.E.
ROADWAY DESIGN-ENGINEERING COORDINATION

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

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

GRAPHIC SCALES

50 25 0 50 100
PLANS

50 25 0 50 100
PROFILE (HORIZONTAL)

10 5 0 10 20
PROFILE (VERTICAL)

DESIGN DATA

ADT 2008 = 3,191
ADT 2028 = 6,496
DHV = 10 %
D = 60 %
T = 3 % *
**V = 60 MPH
FUNC. CLASS. = RURAL MINOR COLLECTOR
* TTST 1% DUAL 2%

PROJECT LENGTH

Length Structure TIP Project B-4165 = 0.026 Miles
Length Roadway TIP Project B-4165 = 0.146 Miles
Total Length TIP Project B-4165 = 0.172 Miles

Prepared In the Office of:
THE LPA GROUP TRANSPORTATION CONSULTANTS
THE LPA GROUP of North Carolina, p.a.
5000 Falls of Neuse Rd., Suite 304
Raleigh, North Carolina 27609

2006 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
NOVEMBER 16, 2007

LETTING DATE:
NOVEMBER 18, 2008

JEANNE K. RICHTER P.E.
PROJECT ENGINEER

JODY L. COLE
PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER

SIGNATURE: *P.E.*

ROADWAY DESIGN ENGINEER

SIGNATURE: *P.E.*

DIVISION OF HIGHWAYS STATE OF NORTH CAROLINA

STATE HIGHWAY DESIGN ENGINEER *P.E.*

PROJECT REFERENCE NO.	SHEET NO.
B-4165	1-B

Note: Not to Scale

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

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

CONVENTIONAL PLAN SHEET SYMBOLS

BOUNDARIES AND PROPERTY:

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

BUILDINGS AND OTHER CULTURE:

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

HYDROLOGY:

- Stream or Body of Water
- Hydro, Pool or Reservoir
- Jurisdictional Stream — JS
- Buffer Zone 1 — BZ 1
- Buffer Zone 2 — BZ 2
- Flow Arrow
- Disappearing Stream
- Spring
- Wetland
- Proposed Lateral, Tail, Head Ditch — FLOW
- False Sump

RAILROADS:

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

RIGHT OF WAY:

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

ROADS AND RELATED FEATURES:

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

VEGETATION:

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

EXISTING STRUCTURES:

MAJOR:

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

MINOR:

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

UTILITIES:

POWER:

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

TELEPHONE:

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

WATER:

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

TV:

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

GAS:

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

SANITARY SEWER:

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

MISCELLANEOUS:

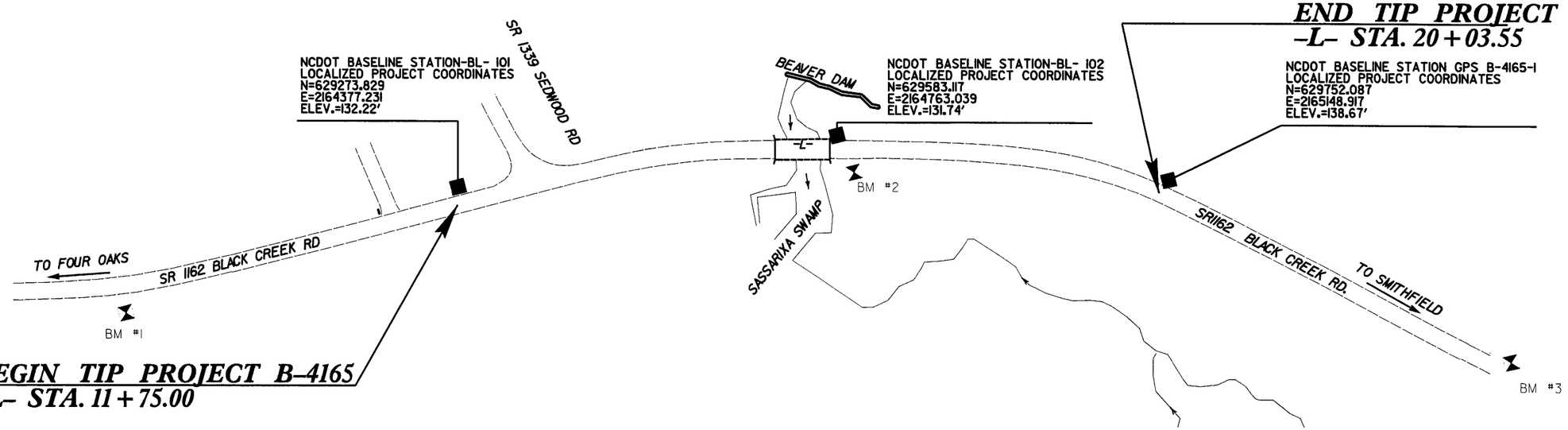
- Utility Pole
- Utility Pole with Base
- Utility Located Object
- Utility Traffic Signal Box — S
- Utility Unknown U/G Line — ?UTL
- U/G Tank; Water, Gas, Oil
- A/G Tank; Water, Gas, Oil
- U/G Test Hole (S.U.E.*)
- Abandoned According to Utility Records — AATUR
- End of Information — E.O.I.

WBS REFERENCE NO.	SHEET NO.
B-4165	1C
Location and Surveys	

SURVEY CONTROL SHEET B-4165

CONTROL DATA

BENCHMARK DATA



BEGIN TIP PROJECT B-4165
-L- STA. 11+75.00

END TIP PROJECT B-4165
-L- STA. 20+03.55

DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCGS FOR MONUMENT "B4165-1"
WITH NAD 1983/95 STATE PLANE GRID COORDINATES OF
NORTHING: 629752.0870(ft) EASTING: 2165148.9170(ft)
THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: .99987761
THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "B4165-1" TO -L- STATION POT STA 11+75.00 IS
S 56° 36' 31.6" W 907.22'
ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES
VERTICAL DATUM USED IS NAVD 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
FILE : B4165_LS_CONTROL_060920.TXT

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

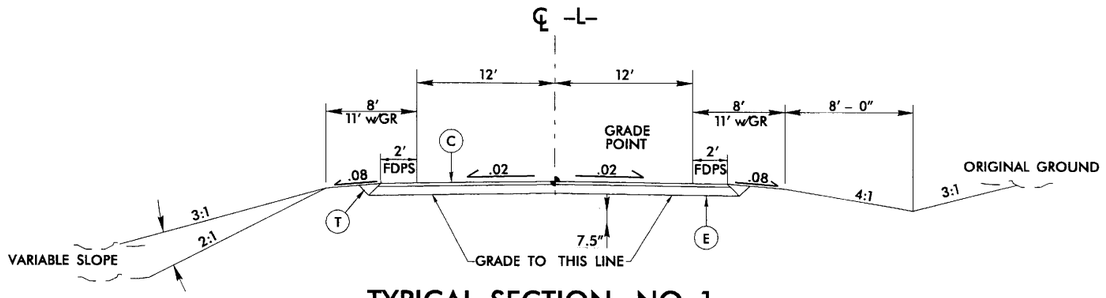
■ *INDICATES GEODETIC CONTROL MONUMENTS USED OR SET FOR HORIZONTAL PROJECT CONTROL BY THE NCDOT LOCATION AND SURVEYS UNIT.*

PROJECT CONTROL ESTABLISHED USING GLOBAL POSITIONING SYSTEM.
CONTROL NETWORK FOR B4165 ESTABLISHED FROM NGS ONLINE POSITIONING USER SERVICE (OPUS)

NOTE: DRAWING NOT TO SCALE

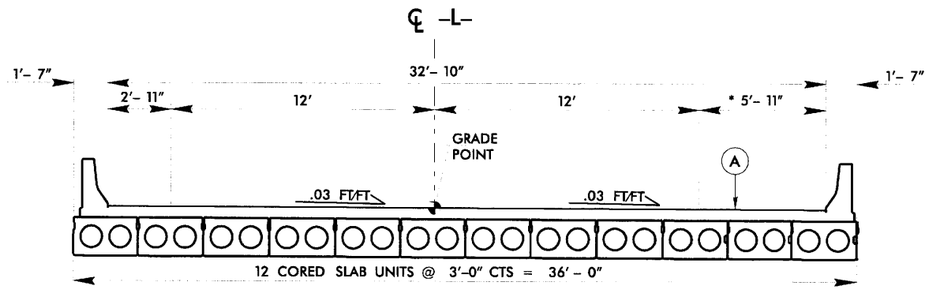
PROJECT REFERENCE NO.	SHEET NO.
B-4165	2
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



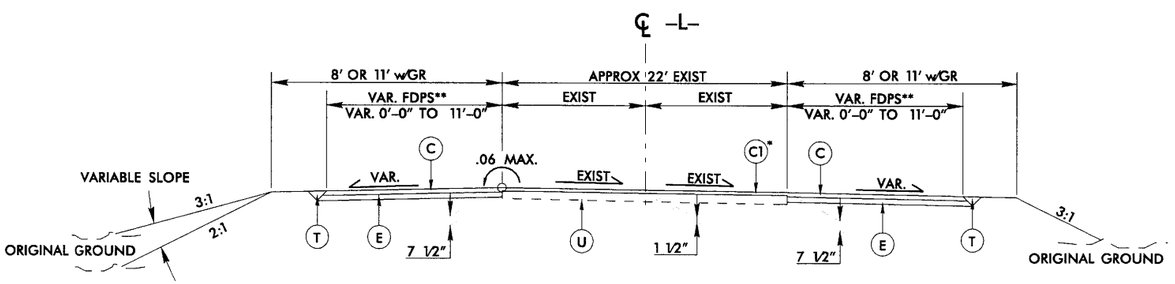
TYPICAL SECTION NO. 1

-L- STA. 14+00.00 TO STA. 15+63.00 (BEGIN BRIDGE)
-L- STA. 16+98.00 (END BRIDGE) TO STA. 19+00.00



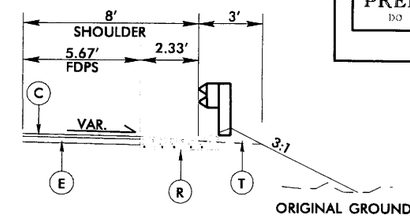
TYPICAL BRIDGE SECTION NO. 2

-L- STA. 15+63.00 (BEGIN BRIDGE) TO STA. 16+98.00 (END BRIDGE)
* WIDENED SHOULDER DUE TO HYDRAULIC SPREAD



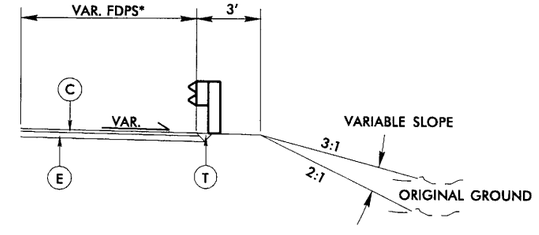
TYPICAL SECTION NO. 3

-L- STA. 11+75.00 TO STA. 14+00.00
-L- STA. 19+00.00 TO STA. 20+85.00
* OVERLAY EXISTING PAVEMENT WITH (C1) ONLY
**SEE PLAN FOR LIMITS OF VARIABLE FDPS



USE IN CONJUCTION WITH TYPICAL SECTION NO. 1

(SEE PLAN FOR LOCATIONS)



USE IN CONJUCTION WITH TYPICAL SECTION NO. 1+3

(SEE PLAN FOR LOCATIONS)
*SEE PLAN FOR LIMITS OF FDPS

PAVEMENT SCHEDULE	
A	5" PORTLAND CEMENT CONCRETE PAVEMENT.
C	PROP. APPROX. 3" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.
C1	PROP. APPROX. 1½" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD.
E	PROP. APPROX. 4½" ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 513 LBS. PER SQ. YD.
R	SHOULDER BERM GUTTER
T	EARTH MATERIAL.
U	EXISTING PAVEMENT

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

COMPUTED BY: PEA DATE: 11/07/07
CHECKED BY: JLC DATE: 11/07/07

PROJECT REFERENCE NO.	SHEET NO.
B-4165	3-A

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

SUMMARY OF EARTHWORK

IN CUBIC YARDS

LOCATION	UNCLASSIFIED EXCAVATION	UNDERCUT	EMBT+25%	BORROW	WASTE
–L– 11+75.00 TO					
15+63.00 (BEGIN BRIDGE)	100		284	184	
–L– 16+98.00 (END BRIDGE) TO					
20+85.00	97		948	851	
TOTALS	197		1,232	1,035	
PROJECT TOTALS	197		1,232	1,035	
EST. 5% FOR REPLACING					
TOPSOIL ON ON BORROW PIT				52	
GRAND TOTALS	197			1,087	
SAY	225			1,100	

EST. SELECT GRANULAR MATERIAL = 200 C.Y.
EST. UNDERCUT EXCAVATION = 200 C.Y.

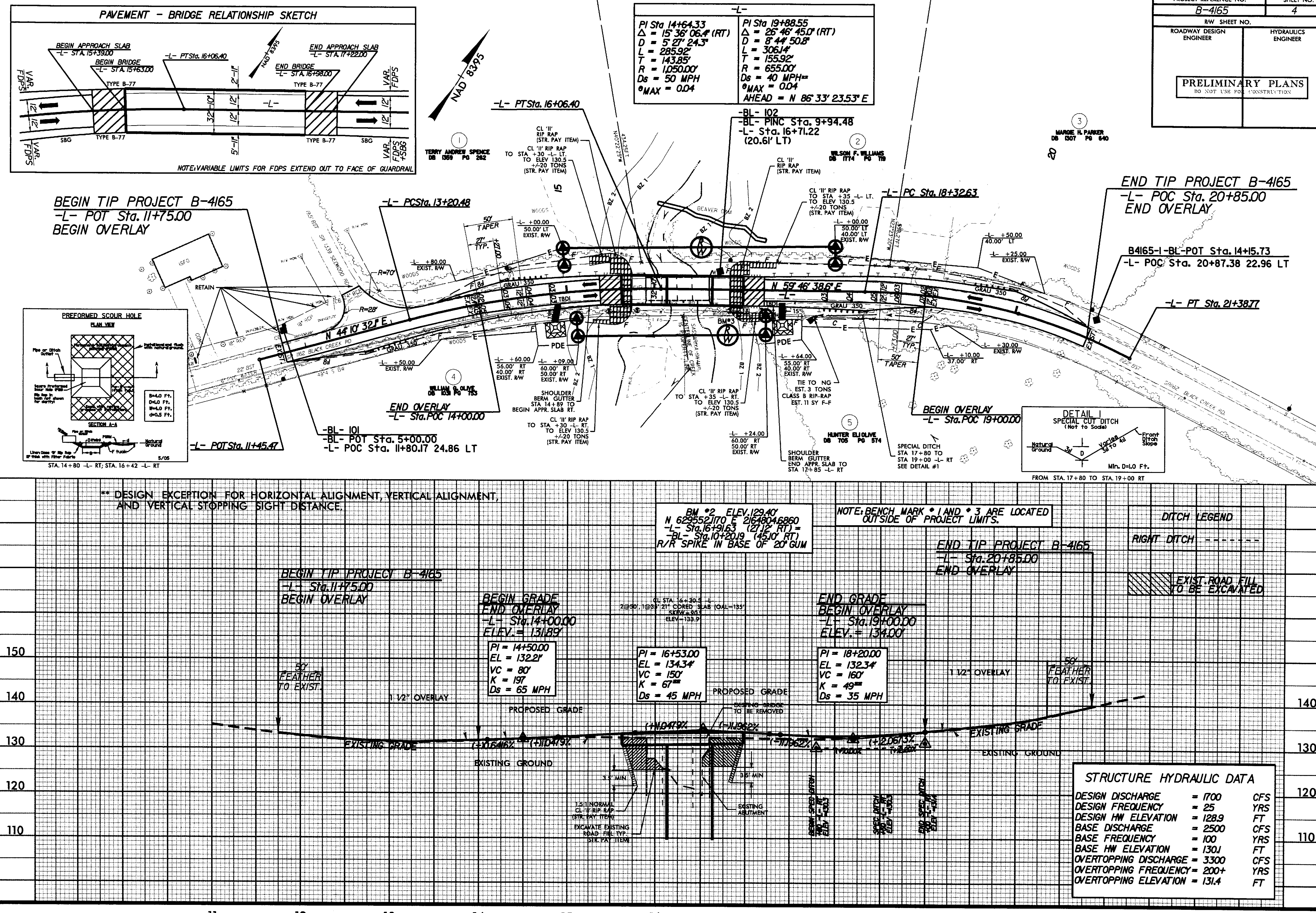
NOTE: Approximate quantities only. Unclassified Excavation, Borrow Excavation, Fine Grading, Clearing and Grubbing and Removal of Existing Pavement will be paid for at the contract lump sum price for "Grading."

PROJECT REFERENCE NO.	SHEET NO.
B-4165	4

R/W SHEET NO.

ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



PAVEMENT - BRIDGE RELATIONSHIP SKETCH
BEGIN APPROACH SLAB -L- STA. 15+39.00
BEGIN BRIDGE -L- STA. 15+63.00
-L- PT Sta. 16+06.40
END APPROACH SLAB -L- STA. 17+22.00
END BRIDGE -L- STA. 16+98.00
TYPE B-77
NOTE: VARIABLE LIMITS FOR FDPS EXTEND OUT TO FACE OF GUARDRAIL
NAD 83/95
-L- PT Sta. 16+06.40
BEGIN TIP PROJECT B-4165
-L- POT Sta. 11+75.00
BEGIN OVERLAY
-L- PC Sta. 13+20.48
-BL- 102
-BL- PINC Sta. 9+94.48
-L- Sta. 16+71.22
(20.61' LT)
-L- PC Sta. 18+32.63
END TIP PROJECT B-4165
-L- POC Sta. 20+85.00
END OVERLAY
B4165-1-BL-POT Sta. 14+15.73
-L- POC Sta. 20+87.38 22.96 LT
-L- PT Sta. 21+38.77
N 59° 46' 38.6" E
N 44° 10' 32" E
TERRY ANDREW SPENCE DB 1359 PG 262
WILSON F. WILLIAMS DB 1174 PG 119
MARGIE H. PARKER DB 1307 PG 640
WILLIAM G. OLIVE DB 1035 PG 153
HUNTER ELI OLIVE DB 705 PG 574
PREFORMED SCOUR HOLE
SECTION A-A
STA. 14+80 -L- RT; STA. 16+42 -L- RT
END OVERLAY -L- Sta. POC 14+00.00
-BL- 101
-BL- POT Sta. 5+00.00
-L- POC Sta. 11+80.17 24.86 LT
-L- POT Sta. 11+45.47
BEGIN OVERLAY -L- Sta. POC 19+00.00
DETAIL 1
SPECIAL CUT DITCH (Not to Scale)
Min. D=1.0 Ft.
FROM STA. 17+80 TO STA. 19+00 RT
SPECIAL DITCH STA 17+80 TO STA 19+00 -L- RT SEE DETAIL #1
** DESIGN EXCEPTION FOR HORIZONTAL ALIGNMENT, VERTICAL ALIGNMENT, AND VERTICAL STOPPING SIGHT DISTANCE.
BM #2 ELEV. 129.40' N 629552.1170 E 2164804.6860 -L- Sta. 16+91.63 (27.12' RT) = -BL- Sta. 10+20.19 (45.10' RT) R/R SPIKE IN BASE OF 20" GUM
NOTE: BENCH MARK # 1 AND # 3 ARE LOCATED OUTSIDE OF PROJECT LIMITS.
DITCH LEGEND
RIGHT DITCH
EXIST. ROAD FILL TO BE EXCAVATED
BEGIN TIP PROJECT B-4165 -L- Sta. 11+75.00 BEGIN OVERLAY
BEGIN GRADE END OVERLAY -L- Sta. 14+00.00 ELEV. = 131.89'
END GRADE BEGIN OVERLAY -L- Sta. 19+00.00 ELEV. = 134.00'
END TIP PROJECT B-4165 -L- Sta. 20+85.00 END OVERLAY
PI = 14+50.00 EL = 132.21' VC = 80' K = 197 Ds = 65 MPH
PI = 16+53.00 EL = 134.34' VC = 150' K = 67** Ds = 45 MPH
PI = 18+20.00 EL = 132.34' VC = 160' K = 49** Ds = 35 MPH
50' FEATHER TO EXIST.
1 1/2" OVERLAY
PROPOSED GRADE
EXISTING GRADE
EXISTING GROUND
EXISTING BRIDGE TO BE REMOVED
EXISTING ABUTMENT
150
140
130
120
110
11 12 13 14 15 16 17 18 19 20 21

-L-

PI Sta 14+64.33	PI Sta 19+88.55
Δ = 15° 36' 06.4" (RT)	Δ = 26° 46' 45.0" (RT)
D = 5° 27' 24.3"	D = 8° 44' 50.8"
L = 285.92'	L = 306.14'
T = 143.85'	T = 155.92'
R = 1,050.00'	R = 655.00'
Ds = 50 MPH	Ds = 40 MPH**
e MAX = 0.04	e MAX = 0.04
	AHEAD = N 86° 33' 23.53" E

STRUCTURE HYDRAULIC DATA

DESIGN DISCHARGE	= 1700	CFS
DESIGN FREQUENCY	= 25	YRS
DESIGN HW ELEVATION	= 128.9	FT
BASE DISCHARGE	= 2500	CFS
BASE FREQUENCY	= 100	YRS
BASE HW ELEVATION	= 130.1	FT
OVERTOPPING DISCHARGE	= 3300	CFS
OVERTOPPING FREQUENCY	= 200+	YRS
OVERTOPPING ELEVATION	= 131.4	FT

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

NOTE: EMBANKMENT COLUMN DOES NOT INCLUDE BACKFILL FOR UNDERCUT

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS
CROSS-SECTION SUMMARY

PROJ. REFERENCE NO.	SHEET NO.
B-4165	X-1

Stations L	Uncl. Exc. (cu.yd.)	Embt (cu.yd)
11+75.00	0	0
12+00.00	0	0
12+50.00	7	0
13+00.00	12	0
13+50.00	12	0
14+00.00	19	22
14+50.00	26	59
15+00.00	17	78
15+50.00	7	125
15+63.00	0	0

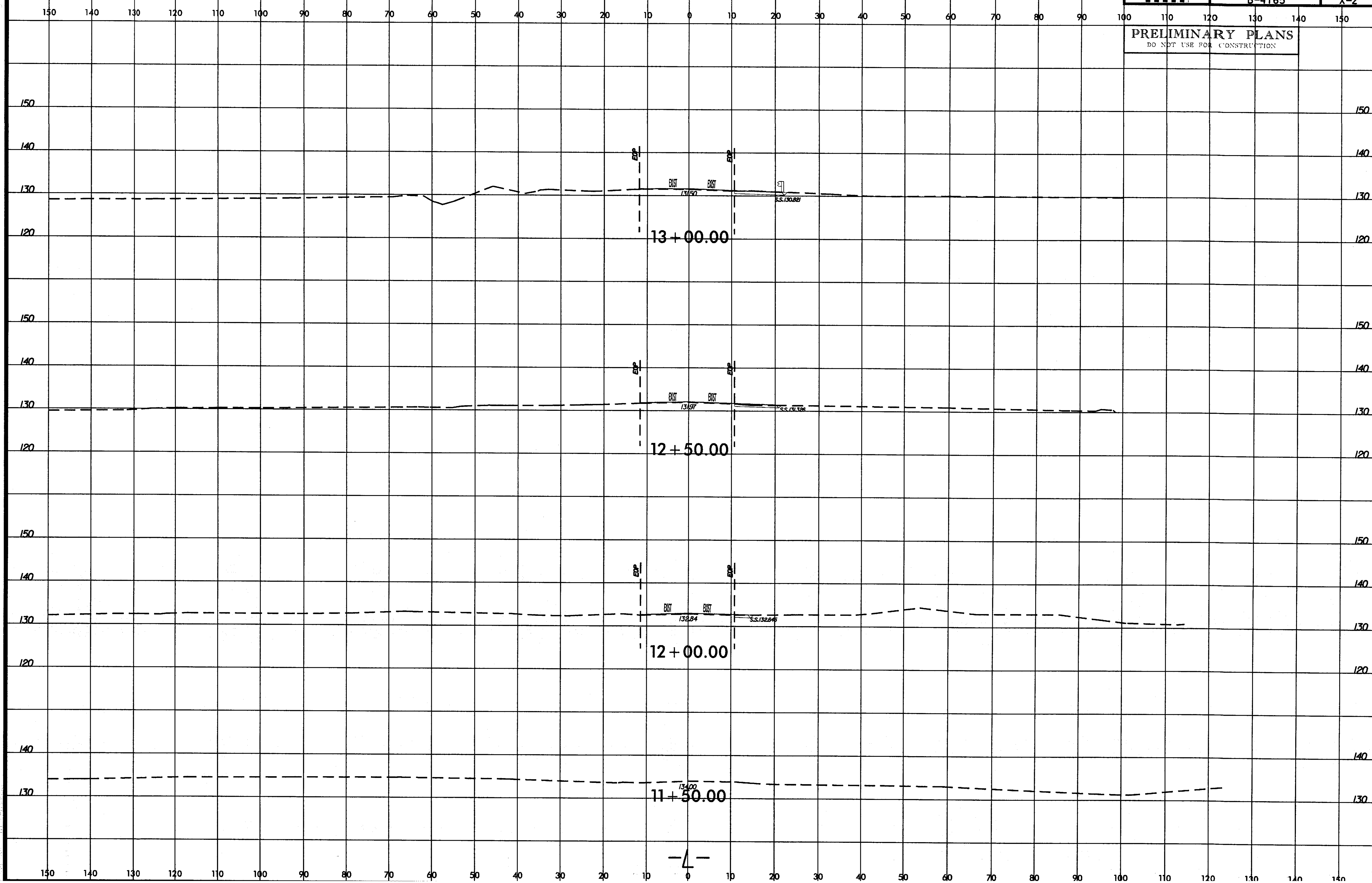
Stations L	Uncl. Exc. (cu.yd.)	Embt (cu.yd)
16+98.00	0	0
17+00.00	0	559
17+50.00	0	171
18+00.00	3	92
18+50.00	21	38
19+00.00	41	27
19+50.00	25	25
20+00.00	3	21
20+50.00	4	15
20+85.00	0	0

PROJ. REFERENCE NO. B-4165

SHEET NO. X-2

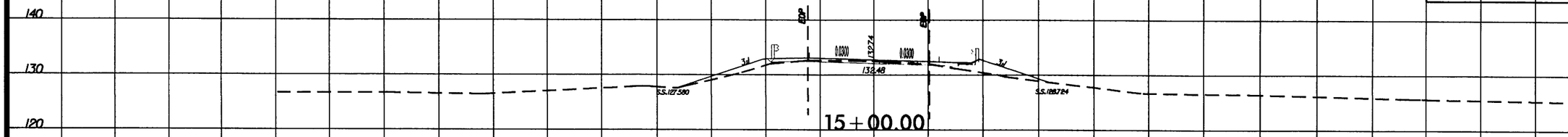
PRELIMINARY PLANS

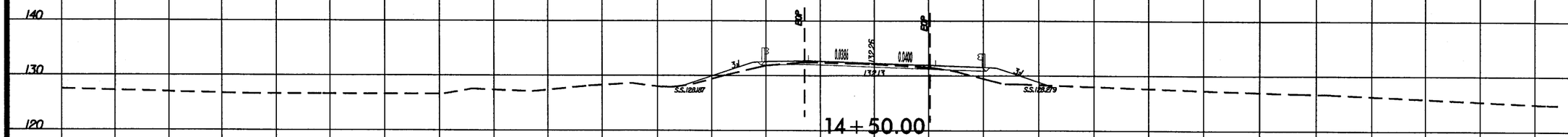
DO NOT USE FOR CONSTRUCTION

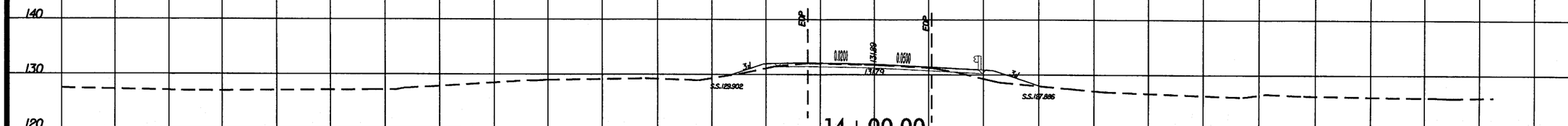


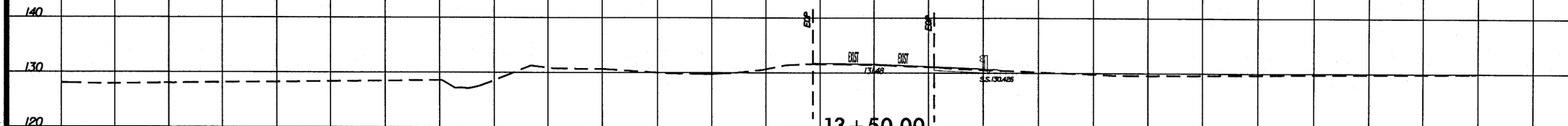
0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	B-4165	X-3

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION









PROJ. REFERENCE NO.	SHEET NO.
B-4165	X-4

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

17+00.00

16+50.00

16+00.00

15+50.00

PROJ. REFERENCE NO.	SHEET NO.
B-4165	X-5

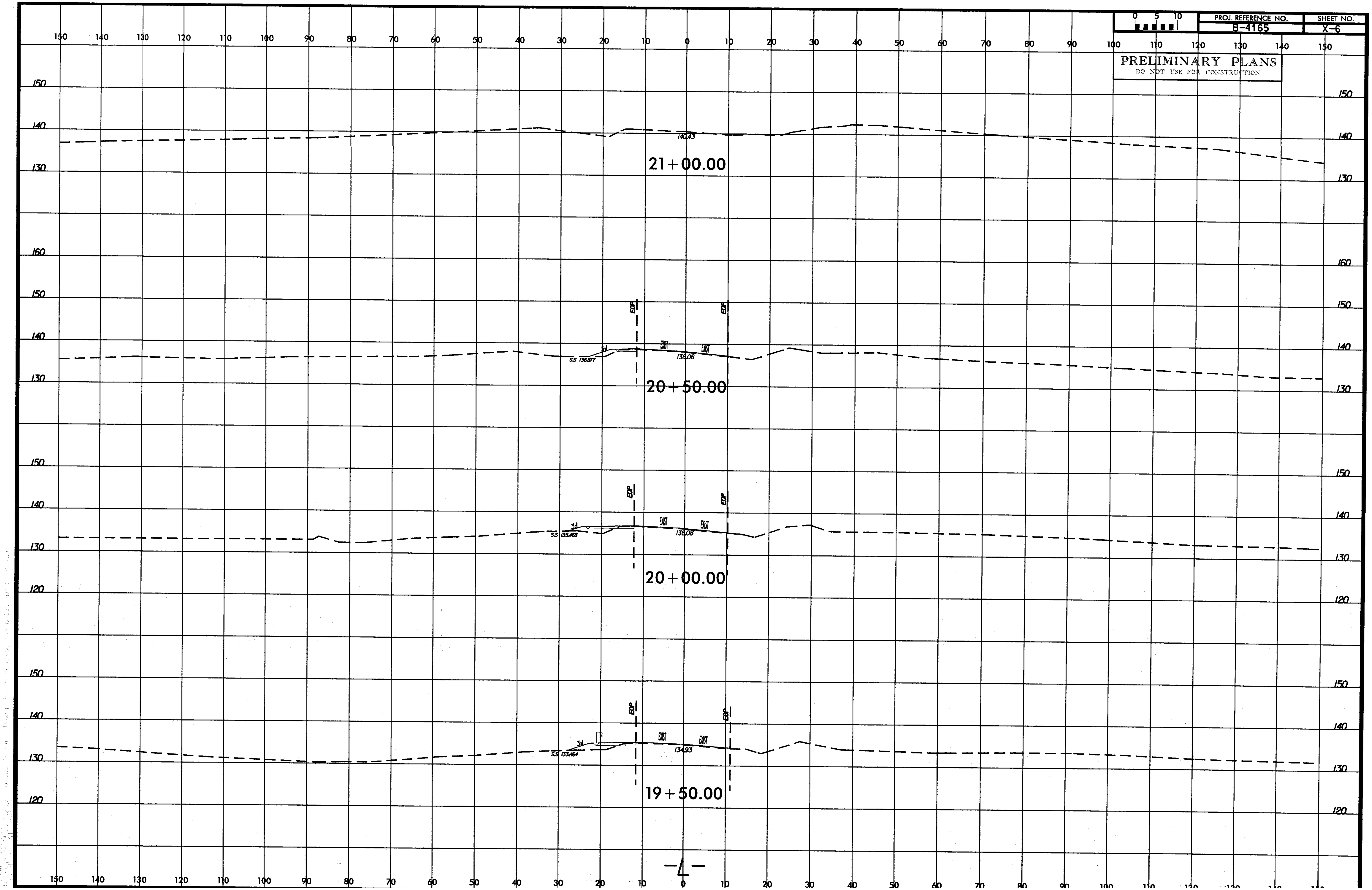
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

19+00.00

18+50.00

18+00.00

17+50.00



PROJ. REFERENCE NO.
B-4165
SHEET NO.
X-6
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
21+00.00
140.43
20+50.00
S.S 136.877
EXIST
138.06
EDP
20+00.00
S.S 135.468
138.08
19+50.00
S.S 133.464
134.93

Johnston County
Bridge No. 89 on SR 1162
Over Sassarixa Swamp
Federal-Aid Project No. BRZ-1162(5)
State Project No. 8.2313301
WBS No. 33513.1.1
TIP No. B-4165

Categorical Exclusion
United States Department of Transportation
Federal Highway Administration
And
North Carolina Department of Transportation

Approved:

5/24/06
Date

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

5/24/06
Date

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

Johnston County
Bridge No. 89 on SR 1162
Over Sassarixa Swamp
Federal-Aid Project No. BRZ-1162(5)
State Project No. 8.2313301
WBS No. 33513.1.1
TIP No. B-4165

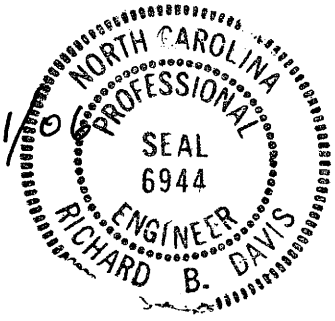
Categorical Exclusion

May 2006

Document Prepared by:

THE LPA GROUP OF NORTH CAROLINA, P.A.

5/11/06



Richard B. Davis, P.E.
Project Manager

For the North Carolina Department of Transportation

Vincent J. Rhea, P.E.
Project Development Engineer

PROJECT COMMITMENTS

Johnston County
Bridge No. 89 on SR 1162
Over Sassarixa Swamp
Federal-Aid Project No. BRZ-1162(5)
State Project No. 8.2313301
WBS No. 33513.1.1
TIP No. B-4165

In addition to the standard Nationwide Permit #23 and #33 Conditions, the General Nationwide Permit Conditions, Section 404 Conditions, Regional Conditions, State Consistency Conditions, the North Carolina Department of Transportation's (NCDOT) Guidelines for Best Management Practices for the Protection of Surface Waters, NCDOT's Guidelines for Best Management Practices for Bridge Demolition and Removal, General Certification Conditions, and Section 401 Conditions of Certification, the following special commitments have been agreed to by NCDOT:

Neuse Buffer Rules

The proposed bridge replacement is in the Neuse River Basin. According to 15A NCAC 2B .0233 of the Neuse Riparian Buffer Protection Rules the proposed bridge replacement project is considered to be allowable (without mitigation) under the Neuse Buffer Rules since replacing the bridge in place and using an off-site detour was selected as the Preferred Alternative. Consultation with the North Carolina Division of Water Quality (NCDWQ) would be necessary to ultimately determine if the project would be allowable (without mitigation) under the Neuse Buffer Rules.

Federally Protected Species

The NCDOT Biological Surveys Unit has determined that a mussel survey for the presence or absence of specimens, or suitable habitat for the dwarf wedgemussel (*Alasmidonta heterodon*) and the Tar River spinymussel (*Elliptio steinstansana*) is needed. This survey did not occur in time to meet the document deadline. Therefore, the Biological Conclusion for both species is currently Unresolved. All surveys should be conducted at least one year prior to the scheduled construction let date.

Johnston County
Bridge No. 89 on SR 1162
Over Sassarixa Swamp
Federal-Aid Project No. BRZ-1162(5)
State Project No. 8.2313301
WBS No. 33513.1.1
TIP No. B-4165

Table of Contents

LIST OF TABLES

PROJECT COMMITMENTS

Johnston County
Bridge No. 89 on SR 1162
Over Sassarixa Swamp
Federal-Aid Project No. BRZ-1162(5)
State Project No. 8.2313301
WBS No. 33513.1.1
TIP No. B-4165

In addition to the standard Nationwide Permit #23 and #33 Conditions, the General Nationwide Permit Conditions, Section 404 Conditions, Regional Conditions, State Consistency Conditions, the North Carolina Department of Transportation's (NCDOT) Guidelines for Best Management Practices for the Protection of Surface Waters, NCDOT's Guidelines for Best Management Practices for Bridge Demolition and Removal, General Certification Conditions, and Section 401 Conditions of Certification, the following special commitments have been agreed to by NCDOT:

Neuse Buffer Rules

The proposed bridge replacement is in the Neuse River Basin. According to 15A NCAC 2B .0233 of the Neuse Riparian Buffer Protection Rules the proposed bridge replacement project is considered to be allowable (without mitigation) under the Neuse Buffer Rules since replacing the bridge in place and using an off-site detour was selected as the Preferred Alternative. Consultation with the North Carolina Division of Water Quality (NCDWQ) would be necessary to ultimately determine if the project would be allowable (without mitigation) under the Neuse Buffer Rules.

Federally Protected Species

The NCDOT Biological Surveys Unit has determined that a mussel survey for the presence or absence of specimens, or suitable habitat for the dwarf wedgemussel (*Alasmidonta heterodon*) and the Tar River spinymussel (*Elliptio steinstansana*) is needed. This survey did not occur in time to meet the document deadline. Therefore, the Biological Conclusion for both species is currently Unresolved. All surveys should be conducted at least one year prior to the scheduled construction let date.

Johnston County
Bridge No. 89 on SR 1162
Over Sassarixa Swamp
Federal-Aid Project No. BRZ-1162(5)
State Project No. 8.2313301
WBS No. 33513.1.1
TIP No. B-4165

INTRODUCTION: The replacement of Bridge No. 89 is included in the North Carolina Department of Transportation (NCDOT) 2006-2012 Transportation Improvement Program and in the Federal-Aid Bridge Replacement Program. The location is shown on Figure 1. No substantial environmental impacts are anticipated. The project is classified as a Federal "Categorical Exclusion."

I. PURPOSE AND NEED

The NCDOT Bridge Maintenance Unit records indicate the bridge has a sufficiency rating of 7.0 out of a possible 100 for a new structure. The bridge is considered to be structurally deficient due to a substructural appraisal of 4 out of 9 and functionally obsolete due to a structural evaluation of 2 out of 9 and a deck geometry rating of 2 out of 9. The replacement of this inadequate structure would result in safer and more efficient traffic operations.

II. EXISTING CONDITIONS

The project is located in Johnston County on SR 1162 approximately 0.5-mile west of the junction of SR 1385 (Figure 1). The surrounding land uses include, forested areas, residential properties, wetland areas, and agricultural areas (fields/pasture).

Bridge No. 89 was constructed in 1965 and currently has a posted weight limit of 20 tons for single vehicles and 29 tons for truck tractors with semi trailers (TTST). The overall length of the four span bridge is 69.5 feet, with a bed to crown height of 12.5 feet. It has a clear roadway width of 24.2 feet carrying two travel lanes. Bridge No. 89 has a reinforced concrete deck on timber joists supported by a substructure consisting of timber piles with timber caps.

In the vicinity of the bridge, SR 1162 is a 22-foot, two-lane roadway with 4 to 6-foot unpaved shoulders. The existing bridge is in a horizontal tangent and is skewed 90 degrees to the roadway. The east and west approaches both have curves beginning at each end of the bridge. Both approaches have poor sight distances. The existing bridge is slightly perched with the east vertical grade falling toward the bridge and a sag located approximately 100 feet from the east end of the bridge. The west vertical grade falls

away from the bridge with another sag forming approximately 220 feet from the west end of the bridge. The speed limit is posted at 55 miles per hour (mph) and SR 1162 is classified as a Rural Minor Collector in the Statewide Functional Classification System.

The current (2006) traffic volume of approximately 2,900 vehicles per day (vpd) is expected to increase to 6,000 vpd by the year 2025. These volumes include 2 percent dual tired vehicles and 1 percent TTSTs.

Four crashes were reported in the vicinity of the bridge during a recent three-year period. One of the crashes resulted in a non-fatal injury and the other three were property damage only.

There are no utilities attached directly to the structure; however there are overhead power transmission lines and underground telephone lines (overhead at the bridge) along the north side of SR 1162. An underground fiber optic line is located along the south side of the roadway.

There are 11 school buses that cross the bridge twice daily. In a letter dated January 6, 2004, the transportation director for Johnston County Schools, John R. Evans stated that rerouting buses would greatly increase ride time for students. Mr. Evans stated that an onsite detour would be the best option for school buses. A copy of the letter is included in the Appendix.

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

A letter dated December 7, 2005 was sent to the Johnston County Emergency Services soliciting comments on the possible alternatives for the proposed bridge replacement. In a memorandum dated December 27, 2005 Johnston County Emergency Services concurred with the selection of the off-site detour as the Preferred Alternative. A copy of memorandum is included in the Appendix.

III. ALTERNATIVES

A. Project Description

The proposed project would consist of the replacement of Bridge No. 89 on SR 1162 over Sassarixa Swamp, with a 125-foot long bridge, providing a wider and safer structure that would lead to safer and more efficient traffic operations in the area.

Based on a preliminary hydraulic analysis that was conducted in conjunction with a field reconnaissance of the site, the proposed replacement structure for Bridge No. 89 would be a 125-foot long bridge. The replacement bridge would provide a clear roadway width of 30 feet, carrying two 12-foot travel lanes with 3-foot offsets (Figure 3B).

The roadway approaches would provide two 12-foot travel lanes, 2-foot paved shoulders, and a total shoulder width of 8-feet (Figure 3A). The roadway grade would be approximately the same as the existing roadway. The design speed of the roadway approaches is 60 mph, with a posted speed limit of 55 mph.

B. Build Alternatives

Alternative 1

Alternative 1 would replace the existing bridge with a new structure constructed in the same location as the existing bridge (Figures 2A, 2B, 2C). Permanent approach work would extend approximately 475 feet west of the bridge and approximately 500 feet east of the bridge, for a total length (including the bridge) of 1,100 feet. In order to keep costs reasonable for the project, it was decided that the alignment for the proposed bridge replacement should closely follow the existing alignment of SR 1162. This will require a design exception for both the horizontal and vertical alignment. During construction, traffic would be maintained on an off-site detour (Figure 1). Traffic would be detoured on NC 210, SR 1338 (Lassiter Pond Road), and SR 1385 (Lassiter Road). There are no posted structures on the proposed detour. The detour is approximately 7.7 miles long. With an additional travel time of 10 minutes over the expected detour period of six to eight months, the delay for this off-site detour is considered to be justifiable from a traffic operations standpoint under NCDOT guidelines.

Alternative 2

Alternative 2 would replace the existing bridge with a new structure constructed in the same location as the existing bridge (Figure 2A). With Alternative 2, a temporary on-site detour on the south side of the existing bridge would be used to maintain traffic during construction. Permanent approach work would extend approximately 475 feet west of the bridge and approximately 500 feet east of the bridge for a total length (including the bridge) of 1,100 feet. In order to keep costs reasonable for the project, it was decided that the alignment for the proposed bridge replacement should closely follow the existing alignment of SR 1162. This will require a design exception for both the horizontal and vertical alignment. The detour structure would consist of two 84-inch diameter corrugated steel pipes. The detour structure would be located approximately 45 feet, centerline to centerline, south of the existing bridge and the detour would provide two 12-foot travel lanes and 8-foot unpaved shoulders. The total length of the temporary detour is approximately 1,120 feet.

C. Alternatives Eliminated from Further Study

The "Do-Nothing" Alternative was eliminated from further study because the existing bridge is considered functionally obsolete and structurally deficient. Over time the bridge would continue to deteriorate and would eventually lead to the closing of the

bridge. Due to daily traffic flow considerations, the Do-Nothing Alternative is not an option.

D. Preferred Alternative

Alternative 1, replacing the bridge in its existing location and utilizing an off-site detour, was selected as the Preferred Alternative. Alternative 1 was selected because an off-site detour minimizes costs and temporary impacts to natural resources. The plan sheets for the Preferred Alternative are included in Figures 2B and 2C.

IV. ESTIMATED COSTS

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

Table 1. Estimated Project Costs

	Alternative 1 (Preferred Alternative)	Alternative 2
Roadway Approaches	$160,130	$348,040
Proposed New Bridge	$255,000	$255,000
Temporary Structure (Pipes)	$0	$33,600
Structure Removal	$21,740	$21,740
Misc. & Mobilization	$114,500	$203,550
Engineering & Contingencies	$83,000	$130,000
Total Construction Costs	**$634,370**	**$991,930**
Right of Way and Utilities	$14,450	$15,350
Total Project Cost	**$648,820**	**$1,007,280**

The estimated cost of the project, as shown in the 2006-2012 NCDOT Transportation Improvement Program is $665,000 including $150,000 spent in prior years, $15,000 for right-of-way and $500,000 for construction.

V. NATURAL RESOURCES

A. Methodology

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

- United States Geological Survey (USGS) 7.5-minute quadrangle maps (Four Oaks, NC 1997)
- NCDOT 1:1200 aerial photograph of the project area (2001)

- Soil maps and descriptions of the soils found in the project area (Johnston County Soil Survey, Natural Resources Conservation Service [NRCS] 1994)
- North Carolina Division of Water Quality (DWQ) basin-wide assessment information (DWQ 2002)
- United States Fish and Wildlife Service (USFWS) list of protected and candidate species (USFWS 2003)
- North Carolina Natural Heritage Program (NHP 2004) files of rare species and unique habitats

Water resources information was obtained from publications posted on the World Wide Web by North Carolina Department of Environment and Natural Resources (NCDENR), Division of Water Quality.

The USFWS provided a list of threatened and endangered species known to occur in Johnston County on December 30, 2003 (updated March 13, 2006), prior to the field investigation. Information concerning species under state protection was obtained from the NHP database of rare species and unique habitats. The NHP database was consulted to determine if known protected species occurrences were present in the coverage area of the USGS Four Oaks quadrangle prior to field investigation. NHP files were reviewed for known locations of species on state or federal lists and locations of significant natural areas on March 29, 2004.

A field investigation was conducted within the project study area on June 11, 2004. The project vicinity is an area extending 0.5-mile from the study area. The study area for B-4165 extends approximately 600 feet southwest of the existing bridge and approximately 650 feet northeast of the existing bridge (approximately 0.25 miles), and encompasses a 200-foot wide corridor centered along the existing centerline of SR 1162.

Water resources were identified, and their physical characteristics were recorded. For purposes of this study, a habitat assessment was performed within the project study area. Plant communities and their associated wildlife were identified using a variety of observation techniques, including active searching, visual observations, and identifying characteristic signs of wildlife (sounds, tracks, scats, and burrows). Terrestrial community classifications generally follow Schafale and Weakley (1990), where appropriate, and plant nomenclature follows Radford *et al.* (1968). Biotic communities were mapped using sub-meter accuracy Global Positioning System (GPS) equipment and aerial photography of the project site. Vertebrate nomenclature follows Potter *et al.* (1980), Martof *et al.* (1980), the American Ornithologists' Union (2001), and Webster *et al.* (1991).

Jurisdictional areas were identified using the three-parameter approach (hydrophytic vegetation, hydric soils, wetland hydrology) established in the *U.S. Army Corps of Engineers Wetlands Delineation Manual* (Environmental Laboratory 1987). The boundaries of the jurisdictional areas were flagged and mapped in the field using sub-

meter accuracy GPS equipment. Jurisdictional wetland areas were characterized according to a classification scheme established by Cowardin *et al.* (1979).

B. Physiography and Soils

The project study area is located within the Coastal Plain physiographic province of North Carolina, and is near the fall line. Topography in the project study area can be characterized as nearly level to gently sloping. Elevation in the project study area ranges from approximately 125 to 135 feet above mean sea level (MSL) (USGS Four Oaks, NC Quadrangle). Surrounding land uses include agricultural (active and fallow pasture), residential, and forested lands.

According to the Johnston County Soil Survey, the project study area is located within the Gilead-Uchee-Bibb soil association (NRCS 1994). Soil associations contain one or more mapping units occupying a unique natural landscape. Mapping units are named for the major soil series within the unit, but may contain minor inclusions of other soil series. The soil survey describes Gilead-Uchee-Bibb soil association as nearly level to moderately steep, moderately well drained, well drained, and poorly drained soils that have a loamy and sandy surface layer and a clayey and loamy subsoil; mainly on uplands of the Coastal Plain. This map unit is in the southwestern and southern parts of the county, mainly along the hill slopes of the major stream valleys.

There are four soil series mapped within the project study area which include:

- Bibb sandy loam, (*Typic Fluvaquents*), frequently flooded;
- Cowarts loamy sand, (*Typic Kanhapludults*), 2 to 6 percent slopes;
- Gilead sandy loam, (*Aquic Hapludults*), 8 to15 percent slopes; and,
- Lynchburg sandy loam, (*Aeric Paleaquults*).

Bibb sandy loam, frequently flooded, is listed as a hydric soil in Johnston County (USDA 1991). Lynchburg sandy loam is not listed as hydric, but has hydric inclusions of Toisnot, Grantham, and Rains in depressions.

C. Water Resources

1.0 Waters Impacted

The project study area is located in the 03-04-04 sub-basin of the Neuse River Basin (DWQ 2004a), and is part of the USGS hydrologic unit 03020201 (EPA 2004). The study area includes two water bodies, Sassarixa Swamp and an unnamed tributary to Sassarixa Swamp. Sassarixa Swamp originates northwest of the study area and flows southeast into Holts Lake near the town of Four Oaks in central Johnston County. Sassarixa Swamp has been assigned the Stream Index Number (SIN) 27-45-13 by the North Carolina Department of Environmental and Natural Resources, Division of Water Quality (DWQ 2004b).

2.0 Water Resource Characteristics

Sassarixa Swamp is a perennial stream with a moderate flow over substrate consisting of sand, silt, and gravel. Sassarixa Swamp would provide a warm water habitat. The stream channel is dammed by beavers approximately 100 feet upstream on the north side of the existing bridge leaving a large inundated impoundment. The flow from the dam confluences with a small unnamed tributary coming from the west before reaching the bridge. On the south side of the bridge the stream channel is braided. Water clarity at the time of the site inspection was moderate and was stained with tannic acid, leaving the water dark brown in color. Water depth at bridge was estimated at four to five feet. The channel width of Sassarixa Swamp at the bridge site is approximately 35 feet, with a bankfull width of approximately 40 feet. Bank height is approximately three to six feet, and has very little slope. Sassarixa Swamp, within the project study area, encompasses riffles, runs, and pools. Riffle areas are approximately 0.5 feet deep, run areas are approximately 1 to 2 feet deep, and pool areas are approximately 4 to 5 feet deep. A Rosgen analysis was not performed on Sassarixa Swamp, however based on visual observations of stream morphology the stream was assigned two stream types. Upstream of the bridge received a Rosgen stream type of B6 (based on visual observations), while the braided section downstream of the bridge received a stream type of D_A6 (based on visual observations) (SRI 2005).

2.1 Best Usage and Water Quality Classification

Sassarixa Swamp has been assigned a Best Usage Classification of C NSW (DWQ 2004b). The C indicates fresh waters that support aquatic life propagation and survival, fishing, wildlife, secondary recreation, and agriculture. Secondary recreation would include wading, boating, and other uses involving human body contact with the water where such activities take place in an infrequent, unorganized, or incidental matter. There are also no restrictions on watershed development or types of discharges (DWQ 2004c). Point source discharges of treated wastewater are permitted in these waters, pursuant to Rules .0104 and .0211 of 15A North Carolina Administrative Code (NCAC) 2B; local programs to control non-point source and stormwater discharge of pollution are required. The NSW stands for Nutrient Sensitive Waters which is a supplemental classification intended for waters needing additional nutrient management due to their being subject to excessive growth of microscopic or macroscopic vegetation. In general, management strategies for point and non-point source pollution control require control of nutrients (nitrogen and/or phosphorus usually) such that excessive growths of vegetation are reduced or prevented and there is no increase in nutrients over target levels. Management strategies are site-specific (DWQ 2004c).

There are no Outstanding Resource Waters (ORW), High Quality Waters (HQW), or Sensitive Water Supply Watersheds (WS-I, or WS-II) waters within three miles up, or downstream, of the study area (DWQ 2004b). Sassarixa Swamp is not designated as a North Carolina Natural and Scenic River (NCNSR), nor as a National Wild and Scenic River (NWSR) (NPS 2004).

2.2 Macroinvertebrate Monitoring

There are two basinwide monitoring stations located approximately 10 miles southeast of the study area, one on Mill Creek at SR 1009 and another on Hannah Creek at SR 1009 (DWQ 2003a). The Mill Creek site was sampled on August 15, 2000 by DWQ and received a rating of Good-Fair, the Hannah Creek site was also sampled on August 15, 2000 by DWQ and received a rating of Good (DWQ 2003a).

2.3 North Carolina Index of Biotic Integrity

There are no fish sampling stations located in this particular sub-basin. Therefore, there is not a NCIBI rating for Sassarixa Swamp, or any other nearby water bodies (DWQ 2003b).

2.4 Section 303(d) Waters

None of the water resources within the project study area are designated as biologically impaired water bodies regulated under the provisions of the Clean Water Act (CWA) §303(d) (DWQ 2004d).

2.5 Permitted Dischargers

There are no permitted discharges within a five-mile radius of the study area, and there are only three in the entire sub-basin (DWQ 2003a).

2.6 Non-Point Source Discharges

LPA biologists reviewed aerial photography and conducted a limited visual observation of potential NPS discharges located within and near the project study area. Atmospheric deposition from passing vehicles and fertilizers, herbicides, and insecticides from nearby residential roadways, as well as agriculture runoff (livestock have access to the stream on the south of the bridge) within and near the project study area were identified as potential sources of NPS pollution near the project study area.

3.0 Anticipated Impacts to Water Resources

Short term impacts to water quality such as sedimentation and turbidity, may occur during construction related activities. Impacts from sedimentation and erosion would be minimized during construction by the use of a stringent erosion control schedule and the use of Best Management Practices (BMPs). The contractor would follow contract specifications pertaining to erosion control measures as outlined in 23 CFR 650 Subpart B and Article 107-13 entitled Control of Erosion, Siltation, and Pollution pursuant to NCDOT's *Standard Specifications for Roads and Structures*. These measures include: the use of dikes, berms, silt basins, and other containment measures to control runoff and the elimination of construction staging areas in floodplains and adjacent waterways. Additional measures that could be taken to avoid water quality impacts would include

keeping heavy equipment out of the stream channel, keeping staging areas out of wetlands, and keeping live concrete out of the stream channel. After construction activities are completed, abandoned approaches associated with the existing structure and/or temporary detours would be removed and re-vegetated in accordance with NCDOT guidelines.

Other impacts to water quality that would be anticipated as a result of this project include: changes in water temperature due to more exposure to sunlight (from the removal of streamside vegetation), increased shade due to construction of new structures, and changes to stormwater flows due to changes in the amount of impervious surface adjacent to the stream channel. However, due to the limited amount of overall change in the surrounding areas, impacts would be expected to be minimal and temporary in nature.

Waters within the study area have been assigned a Best Usage Classification of C NSW, which falls into the category of a Case III stream according to BMP-BDRs. A Case III stream has no special restrictions other than those outlined in Best Management Practices for Protection of Surface Waters.

3.1 Impacts Related to Bridge Demolition and Removal

Section 404-2 of NCDOT's *Standard Specifications for Roads and Structures* is labeled **Removal of Existing Structure**. This section outlines restrictions and Best Management Practices for Bridge Demolition and Removal (BMP-BDRs), as well as guidelines for calculating maximum potential fill in the creek resulting from demolition. These standards would be followed during the replacement of Bridge No. 89.

There is the potential that the existing structure could be dropped into Waters of the United States during the demolition and removal of Bridge No. 89. The superstructure consists of a reinforced concrete deck on timber joists with a weather surface and concrete curbs, and the substructure consists of end and interior bents and timber piles with timber caps. The maximum (worst case) resulting potential fill resulting from demolition activities would be approximately 42 cubic yards.

D. Biotic Resources

Terrestrial and aquatic communities are included in the description of biotic resources. Systems described in the following sections refer to the dominant flora and fauna observed in each community during the field investigation. Descriptions of the terrestrial systems are presented in the context of plant community classifications. These classifications follow Schafale and Weakly (1990), where possible. Representative faunal species that are likely to occur in these habitats (based on published range distributions) are also cited. Scientific nomenclature and common names are used for the floral and faunal species described. Subsequent references to the same species are by the common name only. Fauna observed and/or heard (in the case of bird species) during field investigations are denoted with an asterisk (*).

1.0 Plant Communities

Distribution and composition of plant communities throughout the project study area reflect landscape-level variations in topography, soils, hydrology, and past and present land use practices. The presence of SR 1162, agriculture, development, and forestry practices have resulted in the present vegetation patterns. Three terrestrial plant communities occur within the study area, disturbed-maintained community, mesic mixed hardwood forest (coastal plain subtype), and a wetland community. A description of each community type follows.

1.1 Disturbed-Maintained Communities

This community includes habitat types that have recently been or are currently impacted by human disturbance, including regularly maintained road shoulders, a power-line right-of-way, a fallow pasture, and an active pasture. Photographs of these communities can be found in Appendix A. For purposes of this report, only the flora of the road shoulder and the power-line right-of-way has been included together into a more simplified "disturbed-maintained community". The majority of these habitats are kept in a low-growing or early successional state.

The road shoulder and power-line right-of-way within the project area are dominated by trumpet vine (*Campsis radicans*), ebony spleenwort (*Asplenium platyneuron*), eulalia (*Microstegium vimineum*), green briar (*Smilax* sp.), poison ivy (*Rhus radicans*), Virginia creeper (*Parthenocissus quinquefolia*), day lily (*Hemerocallis fulva*), poorman's pepper (*Lepidium virginicum*), wild lettuce (*Lactuca* sp.), dog fennel (*Eupatorium capillifolium*), ragweed (*Amdrosia artemisiifolia*), grasses, and blackberry (*Rubus* sp.).

1.2 Mesic Mixed Hardwood Forest (Coastal Plain Subtype)

This forest type is found throughout the coastal plain in mesic upland areas protected from fire. The community primarily occurs on north-facing river bluffs and ravine slopes, and occurs less commonly in upland flats or islands surrounded by peatland or swamp communities. This forest type occurs on various moist upland soils. The forest on the south side of SR 1162 is adjacent to a pasture and has very little undergrowth. The forest on the north side of SR 1162 has dense undergrowth. Both of these forests have very similar plant communities. The dominant tree species in the canopy include: sweet gum, red maple (*Acer rubrum*), black gum (*Nyssa sylvatica*), tulip poplar, and loblolly pine (*Pinus taeda*). Additional dominant species observed in the understory include sweet bay (*Magnolia virginiana*), American holly (*Ilex opaca*), beauty berry (*Callicarpa americana*), muscadine grape (*Vitis rotundifolia*), and partridge berry (*Mitchella repens*).

1.3 Wetland Communities

There are two wetland areas in the study area, Wetlands A and B. Wetland A consists of hardwoods in the floodplain of Sassarixa Swamp and part of an inundated beaver dam. Wetland B consists predominately of an inundated beaver dam and wet hardwood forest.

The dominant tree species observed in the canopy of Wetlands A and B include: sweet gum, red maple, tulip poplar, black gum (*Nyssa biflora*), and bald cypress (*Taxodium distichum*). The dominant understory/shrub species observed is Chinese privet (*Ligustrum sinense*). Dominant herbaceous species observed include: cinnamon fern (*Osmunda cinnamomea*), netted chain fern (*Woodwardia aerolata*), jewel-weed (*Impatiens capensis*), giant cane (*Arundinaria gigantea*), and elderberry (*Sambucus canadensis*). The dominant woody vine observed in the study area is poison ivy (*Rhus radicans*). Additional non-dominant species include loblolly pine. The beaver dam can be classified as a Coastal Plain Semipermanent Impoundment by Schafale and Weakly (1990), and the alluvial wetlands can be classified as Coastal Plain Small Stream Swamp (Brownwater Subtype) by Schafale and Weakly (1990).

2.0 Wildlife

The study area was visually surveyed for signs of terrestrial and aquatic wildlife. Little wildlife was observed during the field investigation. Fauna likely to occur in the study area based on published ranges is also included.

2.1 Terrestrial Wildlife

Bird species observed or likely to occur in the study area include such species as American robin (*Turdus migratorius*), bobwhite quail (*Colinus virginianus*), American crow (*Corvus brachyrhynchos*), Carolina chickadee* (*Parus carolinensis*), cardinal* (*Cardinalis cardinalis*), brown thrasher (*Toxostoma rufum*), mockingbird* (*Mimus polyglottos*), catbird* (*Dumetella carolinensis*), yellow-billed cuckoo* (*Coccyzus americanus*), rufous-sided towhee (*Pipilo erythrophthalmus*), pileated woodpecker* (*Dryocopus pileatus*), yellow-bellied sapsucker (*Sphyrapicus varius*), ruby-throated hummingbird* (*Archilochus colubris*), blue jay (*Cyanocitta cristata*), tufted titmouse (*Parus bicolor*), and golden crowned kinglet (*Regulus satrapa*).

Mammals observed or likely to occur in the study area include such species as eastern cottontail (*Sylvilagus floridanus*), white-tailed deer* (*Odocoileus virginianus*), raccoon (*Procyon lotor*), opossum (*Didelphis virginiana*), gray squirrel (*Sciurus carolinensis*) and striped skunk (*Mephitis mephitis*). Also beaver* (*Castor Canadensis*) are present in the study area evident by presence of dams and gnawed tree trunks.

Terrestrial reptiles observed or likely to occur in the study area include such species as garter snake* (*Thamnophis sirtalis*), green anole (*Anolis carolinensis*), black rat snake (*Elaphe obsoleta*), milk snake (*Lampropeltis triangulum*), common king snake (*Lampropeltis getulus*), and eastern box turtle (*Terrapene carolina*).

Terrestrial amphibians likely to occur in the study area include such species as American toad (*Bufo americanus*), northern cricket frog (*Acris crepitans*), mud salamander (*Pseudotriton montamus*), and the four-toed salamander (*Hemidactylum scutatum*).

3.0 Aquatic Community

The aquatic community consists of the stream channel and associated inundated wetlands. A visual survey of the stream and wetlands was conducted to document the aquatic communities. No aquatic vegetation was observed in the stream channel during the field assessment. Vegetation found in the wetland community is described in Section 1.3, *Wetland Communities*.

3.1 Aquatic Wildlife

Fish species expected to occur in drainages within the project vicinity include mosquito fish* (*Gambusia affinis*), creek chub (*Semotilus atromaculatus*), and the redbreast sunfish (*Lepomis auritus*).

Aquatic reptiles observed or expected to occur in the study are include such species as snapping turtle (*Chelydra serpintina*), yellowbelly slider (*Trachemys scripta*), mud snake (*Farancia abacura*), and banded water snake (*Nerodia fasciata*)

No aquatic amphibians were observed in the study area. Species expected to occur in the study area include bull frog (*Rana catesbeiana*) and pickerel frog (*Rana palustris*).

Potential habitat exists in the study area to support wood duck (*Aix sponsa*), mallard (*Anas platyrhynchos*), and great blue heron (*Ardea herodias*).

4.0 Anticipated Impacts to Biotic Communities

Impacts to terrestrial and aquatic communities associated with the replacement of the existing bridge and related detours are discussed in the following sections.

4.1 Terrestrial Communities

Plant communities located within the study area total 5.33 acres (Table 2). These areas are based on a 1,250-foot long study area with a width of approximately 200 feet, situated on the centerline of existing SR 1162.

Table 2. Plant Communities Occurring within the B-4165 Study Area

Plant Community	Area (acres)	Potential Impacts (acres)			
		ALT 1 (Preferred Alternative)		ALT 2	
		Permanent Impacts	Temporary Impacts	Permanent Impacts	Temporary Impacts
Wetlands	0.5	0.02	None	0.02	None
Mixed Mesic Hardwood Forest	1.71	0.01	None	0.01	0.11
Man Dominated	1.90	0.35	None	0.35	0.57
Pasture Land	0.94	0.44	None	0.44	0.07
Agricultural Field	0.28	0.12	None	0.12	0.08
Total (acres)	**5.33**	0.94	None	0.94	0.83
Total for ALT (acres)		**0.94**		**1.77**	

Impacts to wildlife resulting from the proposed project would be minimal due to the limited amount of habitat that would be impacted. Permanent impacts would be confined to the existing road shoulders and minimal fill in the adjacent wetlands. Although some loss of habitat immediately adjacent to the existing road shoulders would result, these areas are of limited value to the wildlife that may utilize them.

4.2 Wetland Communities

Temporary impacts include those impacts that would result from demolition of the existing bridge and construction of the replacement bridge and temporary detours (see Table 3). An offsite detour could be used during construction, thereby avoiding additional temporary wetland or stream impacts that would result from an onsite detour. Alternative 1, the Preferred Alternative (off-site detour) would not result in temporary impacts to Waters of the United States. Alternative 2 (temporary on-site detour to the south) would result in 0.04 acres of temporary impacts to Waters of the United States (from the placement of the pipes in the stream). This includes two 84-inch diameter corrugated steel pipes to maintain flow during construction of the new bridge. The temporary fill and metal pipes would be removed upon completion of the bridge replacement and the ground would be restored to its original elevation. BMPs would be employed by the construction contractor to first avoid and then minimize impacts to Waters of the United States. Erosion and sedimentation would be controlled by implementation of a Sediment and Erosion Control Plan during construction. Any areas of Waters of the United States that are temporarily impacted would be restored to their original condition following completion of the disturbance activity.

Permanent impacts to Waters of the United States are those impacts that occur in areas within the construction limits where clearing would occur or areas would be permanently filled or excavated (see Table 3). Improvement to the bridge approaches would result in the placement of 0.02-acre of fill material in wetlands adjacent to the existing road shoulders. The existing bridge is 69.3 feet long and on timber piles. The proposed replacement structure is a 125-foot long bridge.

Table 3. Anticipated Impacts to Waters of the United States

Jurisdictional Areas	ALT. 1 (Preferred Alternative)		ALT. 2	
	Impacts	**Temp. Impacts**	**Impacts**	**Temp. Impacts**
Wetland A	0.01	None	0.01	None
Wetland B	0.01	None	0.01	None
Total (acres)	0.02	None	0.02	None
Total Wetland Impacts (acres)	**0.02**		**0.02**	
Stream Impacts (acres)	None	None	None	0.04
Stream Impacts (linear feet)	None	None	None	70
Total Stream Impacts (linear feet)	**No Impact**		**70**	

4.3 Aquatic Communities

Limited permanent impacts to water resources are expected to occur as a result of the proposed project. Therefore, impacts to aquatic communities would be minimal.

Temporary impacts to aquatic organisms could result from increased sedimentation during construction. Aquatic invertebrates would likely drift downstream during construction and recolonize the disturbed area once it has been stabilized. Sediments have the potential to affect fish and other aquatic life in several ways, including the clogging and abrading of gills and other respiratory surfaces, reducing the amount of available habitat due to the filling of wetlands, and altering water chemistry. Increased sedimentation may also cause decreased light penetration through an increase in turbidity. NCDOT's Best Management Practices (BMPs) for the protection of surface waters would be enforced to reduce impacts during demolition and construction phases.

E. Special Topics

1.0 Waters of the United States

1.1 Wetlands

Jurisdictional wetlands in the project study area are palustrine in nature, as defined in Cowardin et al. (1979). Palustrine systems include all non-tidal wetlands dominated by trees, shrubs, persistent emergents, emergent mosses and all wetlands where salinity due to ocean-derived salts is below 0.5% (Cowardin et al. 1979). Wetland A is dominated by broad-leaved deciduous vegetation and is seasonally flooded, giving it a Cowardin classification of PFO1C. Wetland B is also dominated by broad-leaved vegetation and is semi-permanently flooded due to beaver activity, giving it a Cowardin classification of PFO1Fb.

1.2 Jurisdictional Streams

Sassarixa Swamp and an unnamed tributary are located in the study area. Sassarixa Swamp and the unnamed tributary are classified as Waters of the United States. Based on a review of the USGS topographic map, the soil survey, and GPS mapping; there are approximately 389.0 linear feet of stream within the project study area. Alternative 2 would temporarily impact 70 linear feet of Sassarixa Swamp. The Preferred Alternative (Alternative 1) would not result in stream impacts.

2.0 Permits and Certifications

The following federal and state permits and certifications would be required prior to beginning construction.

2.1 Section 404

In accordance with provisions of Section 404 of the CWA (33 United States Code [USC] 1344), a permit would be required from the USACE for the discharge of dredged or fill material into Waters of the United States. Because of the project is being documented as a Categorical Exclusion, it is expected that the project would qualify for a Nationwide Permit 23, which applies to approved Categorical Exclusions. In addition, a Nationwide Permit 33 which applies to temporary construction, access, and dewatering would be required if temporary construction is required that is not described in the Categorical Exclusion.

2.2 Water Quality Certification

Section 401 of the CWA requires that the state issue or deny a Water Quality Certification for any permitted or licensed activity that may result in a discharge into Waters of the United States. Section 401 Certification allows surface waters to be temporarily impacted for the duration of the construction or other land manipulation.

Issuance of a 401 Certification from the DWQ is a prerequisite to the issuance of a Section 404 permit. If the general conditions of the corresponding WQC will be met, written concurrence from the DWQ will not be required.

2.3 Neuse Buffer Rules

The NCDWQ Neuse Buffer Rules require a 50-foot buffer along waterways within the Neuse River Basin. These buffers are designed to protect the watershed from runoff from the surrounding land uses. The proposed bridge replacement project is in the Neuse River Basin. According to 15A NCAC 2B .0233 of the Neuse Riparian Buffer protection rules, road crossings are allowable if riparian impacts are greater than 40 linear feet but less than or equal to 150 linear feet. Allowable activities require approval from the DWQ beforehand. Therefore, the bridge replacement project is expected to be allowable (without mitigation), because replacing the existing bridge in its current location with an off-site detour was selected as the Preferred Alternative. The on-site detour associated with Alternative 2 would have impacts of approximately 70 linear feet of Sassarixa Swamp and would have been allowable, requiring approval from NCDWQ. Riparian impacts associated with the recommended off-site detour are minimal, because the bridge would be replaced in its existing location. Therefore, the off-site detour is expected to be allowable (without mitigation) under the Neuse Buffer Rules. Coordination with DWQ would be required to ultimately determine if the project would be allowable (without mitigation).

3.0 Mitigation

Mitigation has been defined in NEPA regulations to include efforts which: a) avoid; b) minimize; c) rectify; d) reduce or eliminate; or e) compensate for adverse impacts to the environment (40 Code of Federal Regulations [CFR] 1508.20 [a-e]).

Federal Highway Administration policy stresses that all practicable measures should be taken to avoid or minimize impacts to wetlands that would be affected by federally funded highway construction. A sequencing (step-down) procedure is recommended in the event that avoidance is impossible. Mitigation employed outside of the highway right-of-way must be reviewed and approved on a case-by-case basis.

Avoidance – Wetlands and Waters of the United States are present along both sides of the proposed project. Because the project involves replacement of an existing structure, it may not be possible to avoid all impacts to adjacent wetlands caused by improvements to the existing bridge approaches and replacement of bridge piers. Impacts to streams and wetlands can be avoided with the incorporation of an environmentally sensitive design. Impacts to jurisdictional surface waters can be avoided by bridging the stream channel, avoiding construction in the stream channel, and avoiding deposition of fill material in the stream channel during construction. Wetland impacts can be avoided by selecting an alignment, temporary detour, or an off-site detour to avoid impacts when possible. The selection of Alternative 1 (off-site detour) as the Preferred Alternative

avoids impacts caused by temporary construction associated with temporary on-site detours.

Minimization – Impacts to the adjacent wetlands would be minimized by using 3:1 fill slopes through wetlands and insuring that no lateral ditches would be constructed in wetlands. Selecting an alignment, temporary detour, or off-site detour that minimizes wetland impacts can also be used to reduce wetland impacts. Stream impacts can be minimized by designing support structures that avoid open water habitats whenever possible. Utilization of BMPs would be required of the contractor to further minimize wetland impacts.

Compensatory mitigation – According to the conditions of the Nationwide Permit, the USACE would determine if the impacts are minimal and would at the same time determine if compensatory mitigation is required. Temporary impacts to Waters of the United States would be considered permanent by the USACE until areas are restored to their original condition. The restoration is subject to approval by the USACE. Alternatives 1 (Preferred) and 2 do have wetland impacts; therefore, wetland mitigation may be required by the USACE if either of these alternatives were selected. Alternative 1 (Preferred) would not require stream mitigation. Alternative 2 would impact 70 linear feet of stream; therefore, stream mitigation may be required if this alternative is selected. Final mitigation decision rests with the USACE.

F. Protected Species

Rare and protected species listed for Johnston County, and likely impacts to these species as a result of the proposed project are discussed in the following sections.

1.0 Species Under Federal Protection

Species with the federal classification of Endangered (E) or Threatened (T), or officially proposed (P) for such listing, are protected under the Endangered Species Act (ESA) of 1973, as amended (16 U.S.C. 1531 *et seq.*). Five federally protected species are listed for Johnston County (USFWS database dated March 7, 2002, Johnston County List updated March 14, 2006). See Table 4.

Table 4. Federally Protected Species Listed for Johnston County, NC.

Common Name	Scientific Name	Status*	Biological Conclusion
Vertebrates			
Bald Eagle	*Haliaeetus leucocephalus*	T (PD)	No Effect
Red-cockaded Woodpecker	*Picoides borealis*	E	No Effect
Invertebrates			
Dwarf Wedgemussel	*Alasmidonta heterodon*	E	Unresolved
Tar River Spinymussel	*Elliptio steinstansana*	E	Unresolved
Vascular Plants			
Michaux's Sumac	*Rhus michauxii*	E	No Effect
*E - Endangered, T - Threatened, T(PD) - Threatened, proposed delisting			

Bald Eagle (*Haliaeetus leucocephalus)*
Adult bald eagles have a white head, white tail, and a large yellow bill, with the rest of its plumage being dark in color. Immature bald eagles are dark with light splotching on the body, underwing coverts, flight feathers, and tail base. The bird averages 31 to 37 inches in length with a 70 to 90 inch wingspan (NatureServe 2003c).

Breeding areas are normally within 2.5 miles of coastal areas, bays, rivers, lakes, or other bodies of water that can provide them with their main food sources; fish, waterfowl and seabirds (NatureServe 2003c). Manmade reservoirs provide an excellent habitat for bald eagles (TPW 2004). Bald eagles prefer roosts in conifers or other sheltered sites in the winter, it would typically select large accessible trees for roosting areas. However, in some areas it is common to see eagles roosting in both coniferous and deciduous trees. Eagles avoid areas with nearby human activity (boat traffic, pedestrians) and development (buildings). Nest sites are usually in tall trees or on cliffs near water. The bald eagle would nest in a variety of trees including, pine, spruce, fir, cottonwood, oak, poplar, and beech. Ground nesting has been reported on the Aleutian Islands in Alaska, in Canada's Northwest Territories, and in Ohio, Michigan, and Texas. Nests located on cliffs and rock pinnacles have been reported historically in California, Kansas, Nevada, New Mexico and Utah, but currently are known to occur only in Alaska and Arizona (NatureServe 2003c). Nests are usually re-used and enlarged every year. They can reach 20 feet in diameter and weigh up to 4,000 pounds (FWS 1999).

Based on a review of NHP records, there are no documented occurrences of bald eagle within a three-mile radius of the project study area.

BIOLOGICAL CONCLUSION: No Effect
According to the NHP elemental occurrence database records, there are no known occurrences of bald eagle in the project vicinity. There are no large open waters near the project study area that could be used for nesting, or foraging habitat by

the bald eagle. The proposed project would have No Effect on this federally threatened species.

Analysis Details –
Methodology: Analysis of the possible presence of and potential impacts to the bald eagle was conducted using an evaluation of existing information, and an assessment of the habitat requirements. Additionally, the NHP elemental occurrence database was consulted on March 29, 2004.

Red-cockaded woodpecker (RCW) (*Picoides borealis*)
The RCW is a cardinal sized seven to eight inch long, black and white woodpecker with a black cap on its head. It has a ladder pattern on the back and large white cheeks, which are unique among woodpeckers in its range (Audubon 2004). It is distinguished by two red streaks on each side of the black cap, which are referred to as cockades. There are normally only visible on adult males (NWF 2004).

Nesting habitat for the RCW is made up of large open pine stands (pine flatwoods and pine dominated savannas) that are typically at least 80 years of age with little or no mid-story. This habitat is often maintained naturally by fires that occur as a result of lighting strikes. Foraging habitat is comprised of open pine or mixed pine/hardwood stands 30 years of age or older (Henry 1989). Nests are typically constructed 33 to 43 feet off of the ground in live pines that have been infected with red-heart disease. These nests can sometimes take several years to construct and are often reused. The RCW constructs resin wells below the opening to the nest to create a sticky coating on the bark of the tree; this coating protects the nest from predators such as rat snakes. The sticky coating has a shiny appearance, which allows the nest cavities to be easily seen from the ground. Red-cockaded woodpeckers forage in a wide variety of pine species and especially favor areas that contain large trees due to the large surface area of loose bark. They feed on adults, larvae, and eggs of arthropods, especially ants and termites, that they find by flaking bark from the tree (Audubon 2004).

Based on a review of NHP records, there are no documented occurrences of the red-cockaded woodpecker within a three-mile radius of the project area.

BIOLOGICAL CONCLUSION: No Effect
According to the NHP elemental occurrence database records, there are no known occurrences of the red-cockaded woodpecker in the project vicinity. There are no mature pine-dominated stands that could be used for nesting, or foraging habitat by the red-cockaded woodpecker. Also, no cavity trees were observed within a 0.5-mile radius of the study area. The proposed project would have No Effect on this federally endangered species.

Analysis Details –
Methodology: Analysis of the possible presence of and potential impacts to the red-cockaded woodpecker was conducted using an evaluation of existing

information, and an assessment of the habitat requirements. Additionally, the NHP elemental occurrence database was consulted on March 29, 2004.

Dwarf Wedgemussel (*Alasmidonta heterodon*)
The dwarf wedgemussel is small, rarely exceeding 1.5 inches in length. The outer shell is normally brown or yellowish brown in color with faint green rays that are most noticeable in young specimens. Unlike some mussel species, the male and female shells differ slightly, with the female being wider to allow greater space for egg development. A distinguishing characteristic of this mussel is its dentition pattern; the right valve possesses two lateral teeth, while the left valve has only one. This trait is opposite of all other North American species having lateral teeth (FWS 2003a).

The dwarf wedgemussel is typically found in shallow to deep quick running water on cobble, fine gravel, or on firm silt or sandy bottoms. Other habitats included are amongst submerged aquatic plants, and near stream banks underneath overhanging tree limbs (NatureServe 2003a).

Based on a review of NHP records, there are no documented occurrences of dwarf wedgemussel within a three-mile radius of the project area.

BIOLOGICAL CONCLUSION: Unresolved
According to the NHP elemental occurrence database records, there are no known occurrences of the dwarf wedgemussel in the project vicinity. The NCDOT Biological Surveys Unit has determined that a survey for the presence or absence of specimens, or suitable habitat for dwarf wedgemussel within the project study area is needed. This survey did not occur in time to meet the document deadline. Therefore, this biological conclusion is Unresolved. A biological conclusion for dwarf wedgemussel will be reached prior to right-of-way acquisition.

Analysis Details –
Methodology: Analysis of the possible presence of and potential impacts to the dwarf wedgemussel was conducted using an evaluation of existing information, and an assessment of the habitat requirements. Additionally, the NHP elemental occurrence database was consulted on March 29, 2004. The NCDOT Biological Surveys Unit survey for the presence or absence of specimens, or suitable habitat for the dwarf wedgemussel should be conducted at least one year prior to the scheduled construction let date.

Tar River Spinymussel (*Elliptio steinstansana*)
The Tar River spinymussel is one of only three freshwater mussel species in the world that have spines. It is a medium sized mussel reaching about 2.5 inches in length. In young specimens the shell's outer surface is an orange brown color with greenish rays, adult specimens are darker in color and have inconspicuous rays. The inside of the shell is yellow or pinkish at one end and bluish white at the other. Younger specimens have about 12 spines, and lose them as they mature (FWS 2003c).

The Tar River spinymussel is found in rivers and large creeks, with the preferred habitat being unconsolidated beds of coarse sand and pea gravel below consolidated beds of similar substrates (often mixed with cobble and boulder). Less often, this species can be found in the consolidated beds or in finer substrates. The best populations are closely associated with landscapes dominated by woodland, stable stream banks maintained by extensive root systems, limited point and non-point sources of pollution, very high overall aquatic biodiversity, and high abundances of various aquatic taxa, including insects, snails, other mussel species, and fish. Presently, the best populations are found in or above the Fall Line, where relief is sufficient to maintain relatively silt-free substrates (NatureServe 2003b).

Based on a review of NHP records, there are no documented occurrences of Tar River spinymussel within a three-mile radius of the project study area.

BIOLOGICAL CONCLUSION: Unresolved
According to the NHP elemental occurrence database records, there are no known occurrences of the Tar River spiny mussel in the project vicinity. The NCDOT Biological Surveys Unit has determined that a survey for the presence or absence specimens, or suitable habitat for the Tar River spinymussel within the project study area is needed. This survey did not occur in time to meet the document deadline. Therefore, this biological conclusion is Unresolved. A biological conclusion for Tar River spinymussel will be reached prior to right-of-way acquisition.

Analysis Details –
Methodology: Analysis of the possible presence of and potential impacts to the Tar River spiny mussel was conducted uisng an evaluation of existing information, and an assessment of the habitat requirements. Additionally, the NHP elemental occurrence database was consulted on March 29, 2004. The NCDOT Biological Surveys Unit survey for the presence or absence of specimens, or suitable habitat for the Tar River spinymussel should be conducted at least one year prior to the scheduled construction let date.

Michaux's Sumac (*Rhus michauxii*)
Michaux's sumac is a low-growing, densely soft-hairy, dioecious shrub with erect stems one to three feet tall. The shrub has compound leaves that are narrowly winged at their base, dull above, and veiny and slightly hairy beneath, with fine teeth on the edges of the leaflets (FWS 2003b). Michaux's sumac produces erect clusters of greenish-yellow to white flowers in June, followed (in the female plants) by conspicuous red fruits that persist from August through September or October (NatureServe 2003b).

Michaux's sumac typically grows in sandy or rocky open woods on basic soils (FWS 2003b). The plants growing in natural habitats are found in pine/scrub oak sandhill (loamy soil variant and blackjack-mixed oak variant) communities. Other sites include small wildlife food plots, forest clear cuts, abandoned building sites, and under sparse to moderately dense pine or pine/hardwood canopies. The species is shade-intolerant and is

therefore dependent on some type of disturbance to maintain the open condition of its habitat. Historically, this disturbance was in the form of naturally occurring fires, or possibly localized grazing by native wildlife (US Army 2003). Michaux's sumac will also grow in areas such as highway rights-of-way, roadsides, or on the edges of artificially maintained clearings (FWS 2003b).

Based on a review of NHP records, there are no documented occurrences of Michaux's sumac within a three-mile radius of the project area.

BIOLOGICAL CONCLUSION: No Effect
Suitable habitat for Michaux's sumac (disturbed power-line right-of-way) is present in the project study area. However, no specimens were observed within the project study area during the field survey. Although Michaux's sumac has been documented to occur in Johnston County, no known occurrences have been reported by the NCNHP within the project vicinity. A meandering pedestrian transect survey (with transects providing 100% visual coverage of suitable habitat) was completed for areas that appeared to be potential habitat, during the bloom period on June 11, 2004. A known location off of US 15-501 in Scotland County, NC was examined by LPA biologists on May 25, 2004. Since no specimens were observed during field surveys the proposed project would have No Effect on this federally endangered species.

Analysis Details –
Methodology: Analysis of the possible presence of and potential impacts to Michaux's sumac was conducted using an evaluation of existing information, and an assessment of the habitat requirements. Additionally, the NHP elemental occurrence database was consulted on March 29, 2004.

1.1 Federal Species of Concern

The March 7, 2002 USFWS list for Johnston County (updated March 14, 2006) also includes a category of species designated as "Federal Species of Concern" (FSC). The FSC designation provides no federal protection under the ESA for the species listed. The presence of potential suitable habitat within the project study area has been evaluated for the following FSC species listed for Johnston County are shown in Table 5.

Table 5: Federal Species of Concern (FSC) Listed for Johnston County, NC

Common Name	Scientific Name	State Status*	Habitat
Vertebrates			
Cerulean warbler	*Dendroica cerulea*	SR**	Yes
Neuse madtom	*Noturus furiosus*	SC(PT)	No
American eel	*Anguilla rostrata*	#	Yes
Roanoke bass	*Ambloplites cavifrons*	SR^	No
Pinewoods shiner	*Lythrurus matutinus*	SR^	No
Invertebrates			
Yellow lance	*Elliptio lanceolata*	E	Yes
Atlantic pigtoe	*Fusconaia masoni*	E	No
Yellow lampmussel	*Lampsilis cariosa*	E	No
Green floater	*Lasmigona subviridis*	E	Yes
Tar River crayfish	*Procambarus medialis*	#	No
Vascular Plants			
Sandhills bog lily	*Lilium pyrophilum*	#	No
Bog spicebush	*Lindera subcoriacea*	T**	No
Long beach seedbox	*Ludwigia brevipes*	SR-T~	No
Carolina bogmint	*Macbridea caroliniana*	T	No
Spring-flowering goldenrod	*Solidago verna*	SR-L	No
Carolina asphodel	*Tofieldia glabra*	#~	No
Carolina least trillium	*Trillium pusillum var pusillum*	E	Yes

E - Endangered, T - Threatened, SR - Significantly Rare, SC - Special Concern, SR-T - Rare throughout its range, SR-L – Range is limited to NC and adjacent states, SR-P – Periphery of its range in NC, * - No longer tracked by NCNHP, ** - Occurs on NCNHP list but not on USFWS list, # - Not listed as a FSC on NCNHP list, ^ - Obscure record, ~ - Historic record (last observed over 50 years ago)

NHP records were reviewed to determine the known locations of FSC within the project vicinity. NHP records do not document any occurrences of FSC within a three-mile radius of the project area.

VI. CULTURAL RESOURCES

A. Compliance Guidelines

This project is subject to compliance with Section 106 of the National Historic Preservation Act of 1966, as amended, implemented by the Advisory Council on Historic Preservation's Regulations for Compliance with Section 106, codified at 36 CFR Part 800. Section 106 requires that for federally funded, licensed, or permitted projects having effects on properties listed in or eligible for the National Register of Historic

Places, the Advisory Council on Historic Preservation be given the opportunity to comment.

B. Historic Architecture

In a memorandum August 9, 2004 the State Historic Preservation Office (SHPO) stated that they are "aware of no historic resources which would be affected by the project." A copy of memorandum is included in the Appendix.

C. Archaeology

The SHPO, in a memorandum dated August 9, 2004 stated that they are, "aware of no historic resources which would be affected by the project." A copy of the SHPO memorandum is included in the Appendix.

VII. SECTION 4(f) RESOURCES

Section 4(f) of the Department of Transportation Act of 1966, as amended, states in part "The Secretary may approve a transportation project or program requiring the use of publicly owned land of a park, recreation area, or wildlife and waterfowl refuge, or land of a historic site of national, state, or local significance (as determined by the Federal, State, or local officials having jurisdiction over the park, recreation area, refuge, or site) only if-

(1) there is no prudent or feasible alternative to using that land; and

(2) the program or project includes all possible planning to minimize harm to the park, recreation area, wildlife and waterfowl refuge, or historic site resulting from such use."

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

VIII. ENVIRONMENTAL EFFECTS

The project is expected to have a positive affect on transportation and the community. The replacement of the inadequate bridge would result in safer and more efficient traffic operations.

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

Replacement of Bridge No. 89 would not have a negative effect on the quality of the human or the natural environment.

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

No adverse impact on families or the community is expected. Right-of-way acquisition would be limited; no relocations are expected with the implementation of the proposed alternative.

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

No adverse effect on public facilities or services is expected. The project is not expected to adversely affect social, economic, or religious opportunities in the area. There would be some inconvenience to local travel due to construction activities on SR 1162.

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

This project has been coordinated with the United States Department of Agriculture, Natural Resources Conservation Service (NRCS). The Farmland Protection Policy Act requires all federal agencies or their representatives to consider the potential impact to prime farmland for all land acquisition and construction projects. Soils were identified within a 0.5-mile radius of the project area, and checked to see if they were classified as prime, unique, or have state or local importance. Ten of the soils identified were on the NRCS list, *Important Farmlands of North Carolina, May 1998*. Soils in which all areas are considered prime farmland included, Gilead Sandy Loam, 2 to 8 percent slopes (GeB), Norfolk Loamy Sand, 0 to 2 percent slopes (NoA), and Marlboro-Cecil Complex, 2 to 8 percent slopes (McB). Soils in which only drained areas are considered prime farmland included, Lynchburg Sandy Loam (Ly) and Rains Sandy Loam (Ra). Soils in which all areas are considered of statewide importance included, Gilead Sandy Loam, 8 to 15 percent slopes (GeD), Cowarts Loamy Sand, 2 to 6 percent slopes (CoB), Uchee Loamy Coarse Sand, 2 to 6 percent slopes (UcB), Uchee Loamy Coarse Sand, 6 to 12 percent slopes (UcC), and Bonneau Sand, 0 to 3 percent slopes (BoA). If impacts to these soils occur as a result of the proposed project, they are expected to be limited in nature.

The project is located in Johnston County, which is within the Raleigh-Durham-Chapel Hill non-attainment area for ozone (O_3) as defined by the EPA. The area was designated non-attainment for O_3 under the eight-hour ozone standard effective June 15, 2004.

Section 176(c) of the CAAA requires that transportation plans, programs, and projects conform to the intent of the state air quality implementation plan (SIP). The current SIP does not contain any transportation control measures for Johnston County. For the donut area of Johnston County, the projects from the 2006-2012 State Transportation Improvement Program (STIP) conform to the intent of the SIP (or base year emissions, in areas where no SIP is approved or found adequate). The USDOT made a conformity determination on Johnston County projects from the STIP on October 1, 2005. The current conformity determination is consistent with the final conformity rule found in 40 CFR Parts 51 and 93. There are no significant changes in the project's design concepts or scope, as used in the conformity analysis.

If vegetation or wood debris are disposed of by open burning, it shall be done in accordance with applicable local laws and regulations of the North Carolina Implementation Plan (SIP) for air quality in compliance with 15 NCAC 2D.0520 and the 1990 Clean Air Act Amendments and the National Environmental Policy Act. This evaluation completes the assessments for air quality, and no additional reports are required.

Ambient noise levels may increase during the construction of this project; however this increase would be only temporary and usually confined to daylight hours. There should be no notable change in traffic volumes after the project is complete. Therefore, this project would have no adverse effect on existing noise levels. Noise receptors in the project area would not be impacted by this project. This evaluation completes the assessment requirements for highway noise set forth in 23 CFR Part 722. No additional reports are required.

A "Geo-Environmental Impact Evaluation" was conducted by the NCDOT at the project site to identify any properties that may contain hazardous waste materials and result in future environmental liability if acquired. These hazards include, underground storage tanks (USTs), hazardous waste sites, regulated landfills, unregulated dumpsites, and any other site or materials that are considered hazardous. A field reconnaissance survey, a file search of appropriate environmental agencies, and a Geographical Information System (GIS) were used to identify any known problem sites along the proposed project alignment. The field reconnaissance survey yielded no anticipated UST sites within the project area. A GIS analysis of the project corridor showed no regulated landfills, or unregulated dumpsites were within the project limits. GIS analysis and field reconnaissance found no potential RCRA or CERCLA sites within the project limits. Based on field reconnaissance and a records search there should be no contamination issues for the B-4165 project.

Johnston County is a participant in the Federal Flood Insurance Program. The bridge is located within a Detailed Study Area. No study is available for this stream as the delineation is a result of backwater from Black Creek. The new structure will be designed to match or lower the existing 100-year storm elevation upstream of the roadway. Since the proposed replacement of Bridge No. 89 would be a structure similar in waterway opening size, it is not anticipated that it would have any substantial adverse

impact on the existing floodplain, and it would not raise floodplain levels. The Federal Emergency Management Agency, Flood Insurance Rate Map (FIRM) for the project study area is attached.

Based on the above discussion, it is concluded that no substantial environmental impacts would result from the replacement of Bridge No. 89.

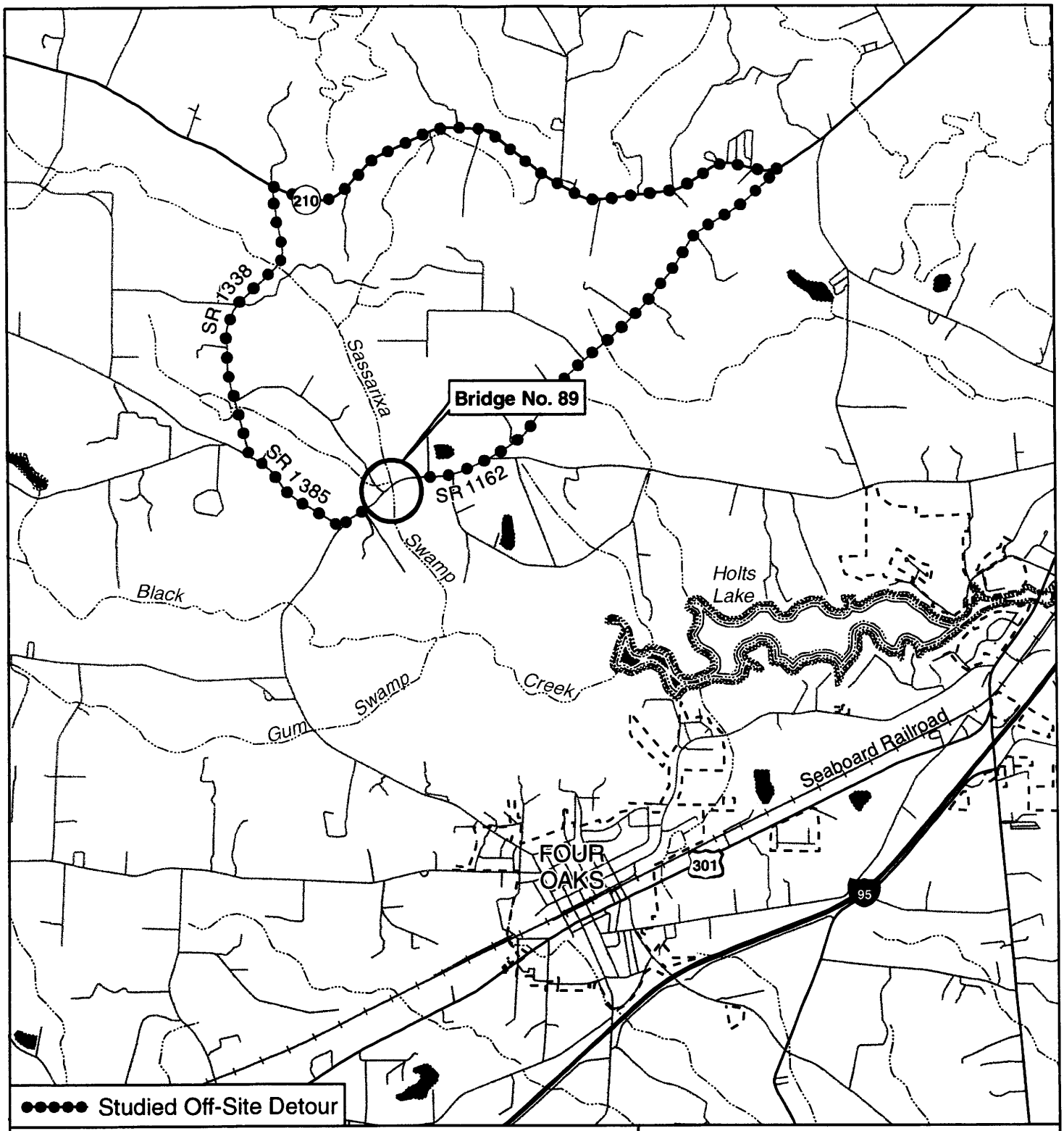
IX. PUBLIC INVOLVEMENT

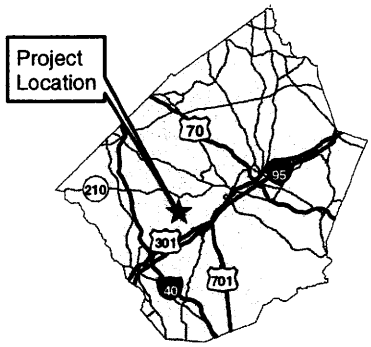
Newsletters describing the proposed bridge replacement project were sent to local residents. The newsletters give the public an opportunity to comment on the possible alternatives for the proposed bridge replacement. No comments were received.

X. AGENCY COMMENTS

Comments on the proposed project were requested from federal, state and local agencies. Several agencies have commented upon the proposed bridge alignment. These comments have been considered during the environmental and design process and are included in the appendix.

FIGURES





Johnston
County, NC

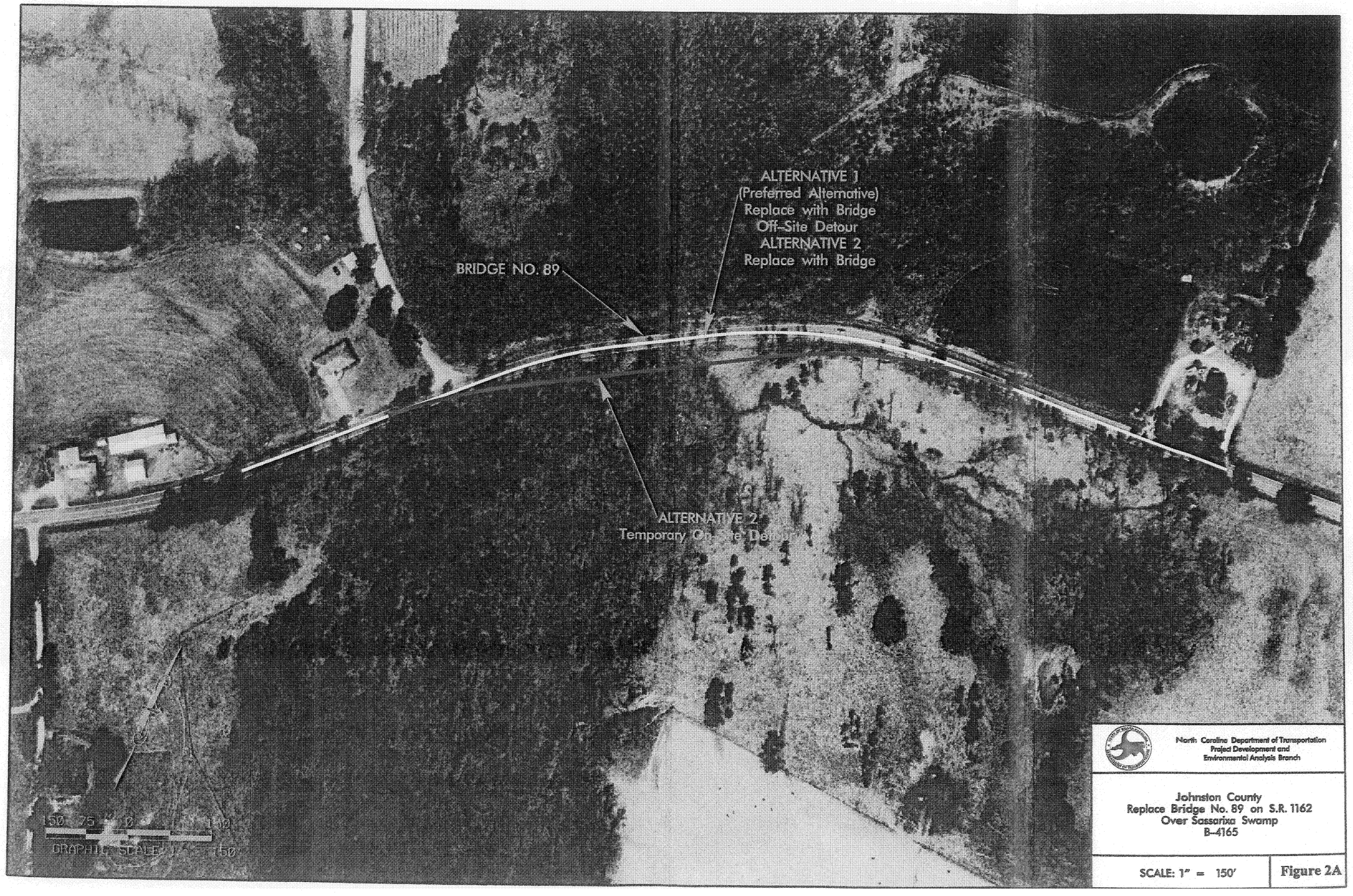
N
W E
S

0 4,000
Feet

North Carolina Department of Transportation
Project Development and
Environmental Analysis Branch

Johnston County
Replace Bridge No. 89 on SR 1162
Over Sassarixa Swamp
B-4165

PROJECT VICINITY MAP | Figure 1



North Carolina Department of Transportation
Project Development and
Environmental Analysis Branch

Johnston County
Replace Bridge No. 89 on S.R. 1162
Over Sassafrax Swamp
B-4165

SCALE: 1" = 150'

Figure 2A

PROJECT REFERENCE NO.	SHEET NO.
B-4165	1
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

REVISIONS

8/17/95

-ALTI-
PI Sta 14+54.79
Δ = 14° 40' 47.3" (RT)
D = 6° 09' 39.0"
L = 238.28'
T = 119.79'
R = 930.00'
e = 0.04 FT/FT

-ALTI- POT Sta 10+00.00

-ALTI- POS Sta 13+35.00

-ALTI- PT Sta 15+73.28

-ALTI- POS Sta 17+52.83

ASSUMED 60' EXIST R/W

N 44° 14' 33.0" E

N 58° 55' 20.3" E

BEGIN BRIDGE
STA 15+75.00

END BRIDGE
STA 17+00.00

-ALTI-
PI Sta 19+82.84
Δ = 27° 41' 01.7" (RT)
D = 6° 09' 39.0"
L = 450.97'
T = 230.01'
R = 930.00'
e = 0.04 FT/FT

MATCH LINE STA. 22+00

BEGIN PROJECT B-4165
ALTERNATE 1
-ALTI- STA 11+00.00

TYPE-III
GRAU 350

B4165 (ALTERNATE 1)

BEGIN PROJECT B-4165
ALTERNATE 1
-ALTI- STA 11+00.00

PI = 12+90.00
EL = 130.60'
K = 97
VC = 355'

PI = 16+20.00
EL = 133.95'
K = 86
VC = 110'

PI = 19+10.00
EL = 133.21'
K = 96
VC = 410'

PI = 22+20.00
EL = 145.61'
K = 102
VC = 100'

355.60

(-)2.8353%

(+)1.0169%

(-)0.2549%

(+)3.9995%

MATCH LINE STA. 22+00

160
150
140
130
120

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

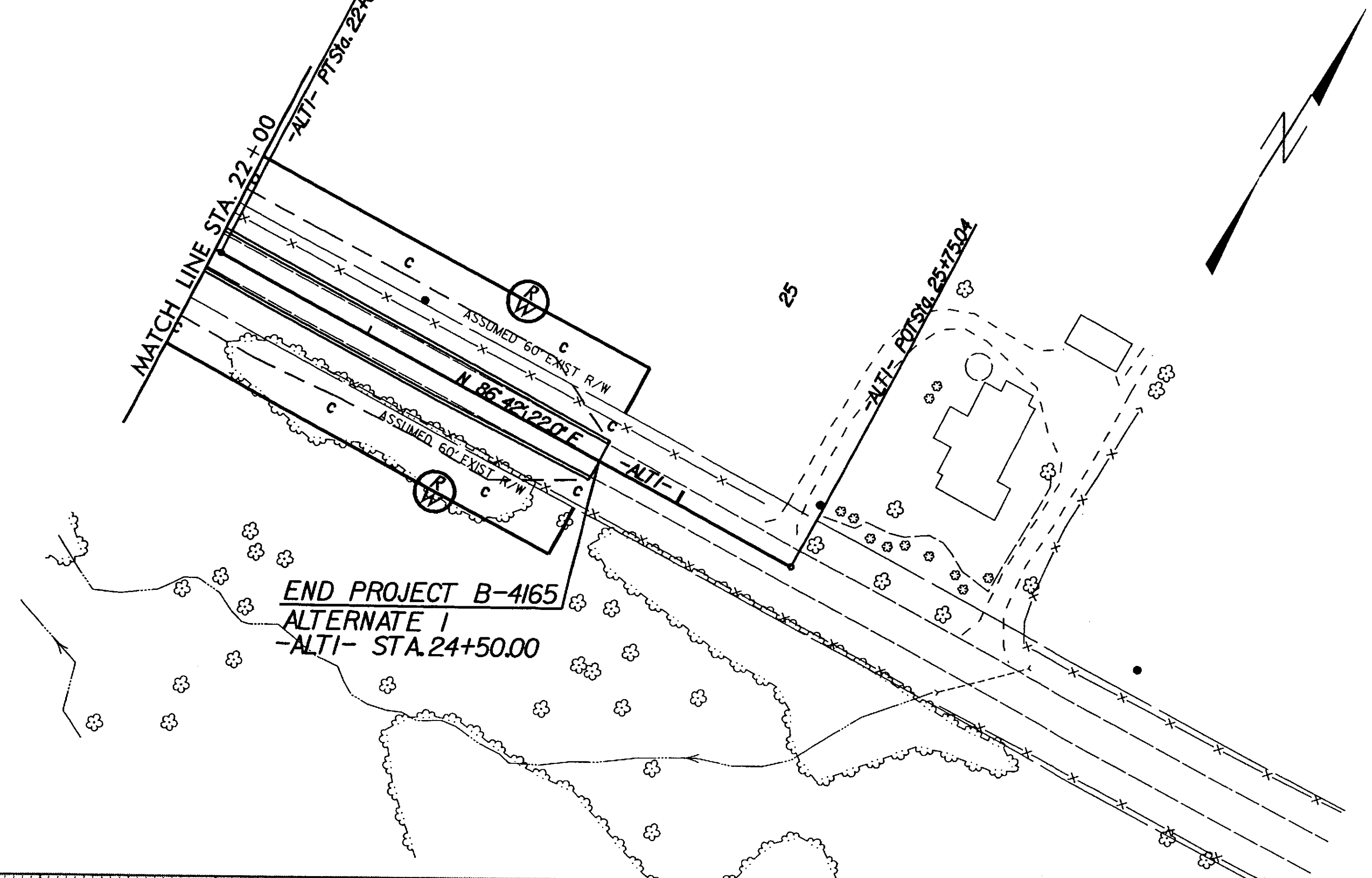
FIGURE 2B

22-MAY-2006 11:33
I:\Projects\NCDOT\Bridge Group 46\B4165\proj\B4165_rdy_alt1_pshl.dgn
User: AT LPA20625

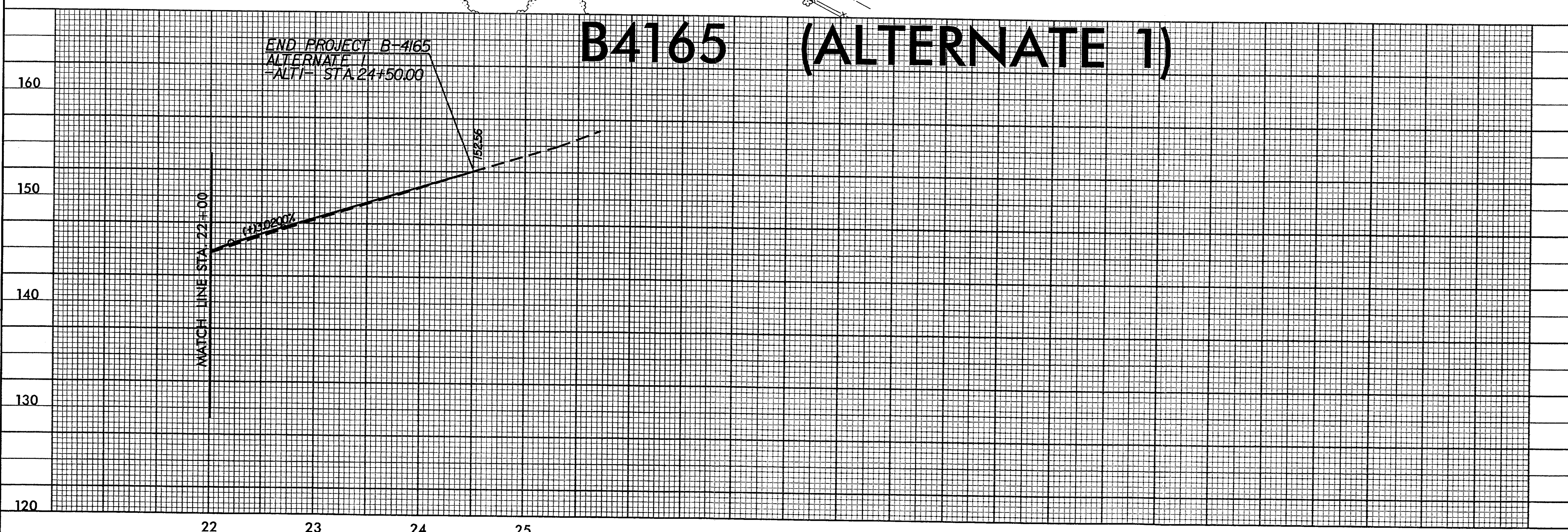
PROJECT REFERENCE NO.	SHEET NO.
B-4165	2
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION



B4165 (ALTERNATE 1)

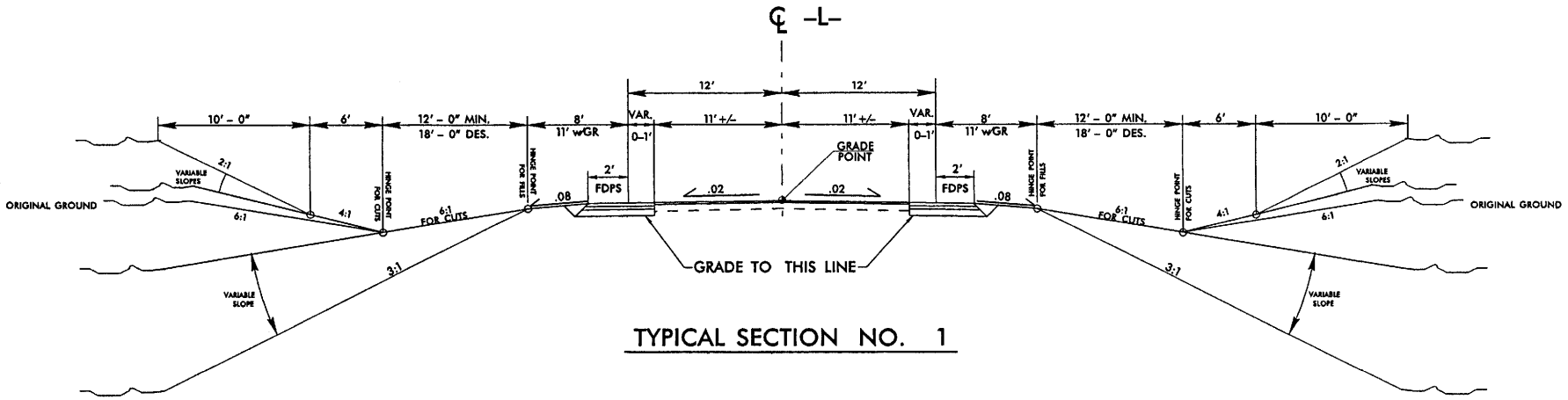


REVISIONS

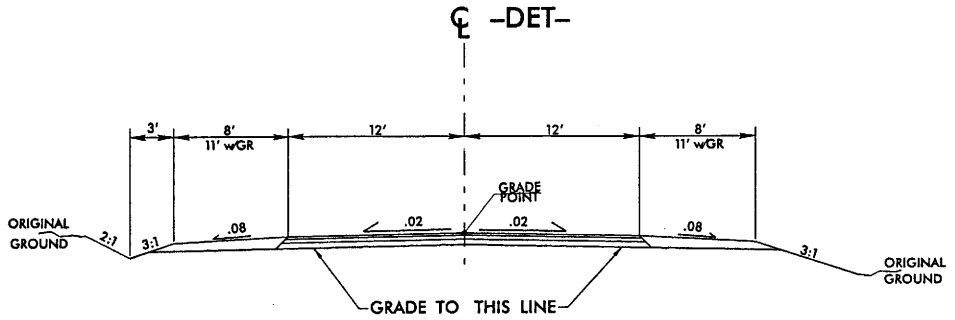
8/17/99

22-MAY-2006 11:33
\Projects\NCDOT\Bridge Group 46\B4165\proj\b4165_rdy_alt1_psh2.dgn

FIGURE 2C



TYPICAL SECTION NO. 1



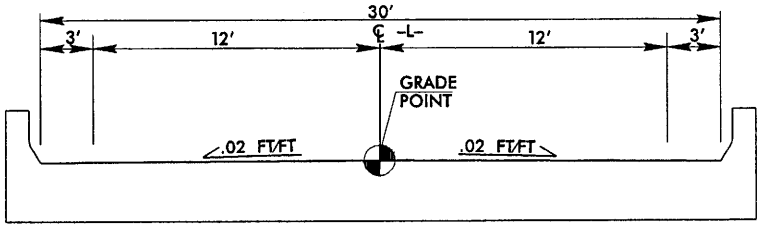
TYPICAL SECTION NO. 2

North Carolina Department of Transportation
Project Development and
Environmental Analysis Branch

Replace Bridge No. 89 on S.R. 1162
Over Sassarixa Swamp
Johnston County
B-4165

NOT TO SCALE

Figure 3A



TYPICAL BRIDGE SECTION

North Carolina Department of Transportation
Project Development and
Environmental Analysis Branch

Replace Bridge No. 89 on S.R. 1162
Over Sassarixa Swamp
Johnston County
B-4165

NOT TO SCALE

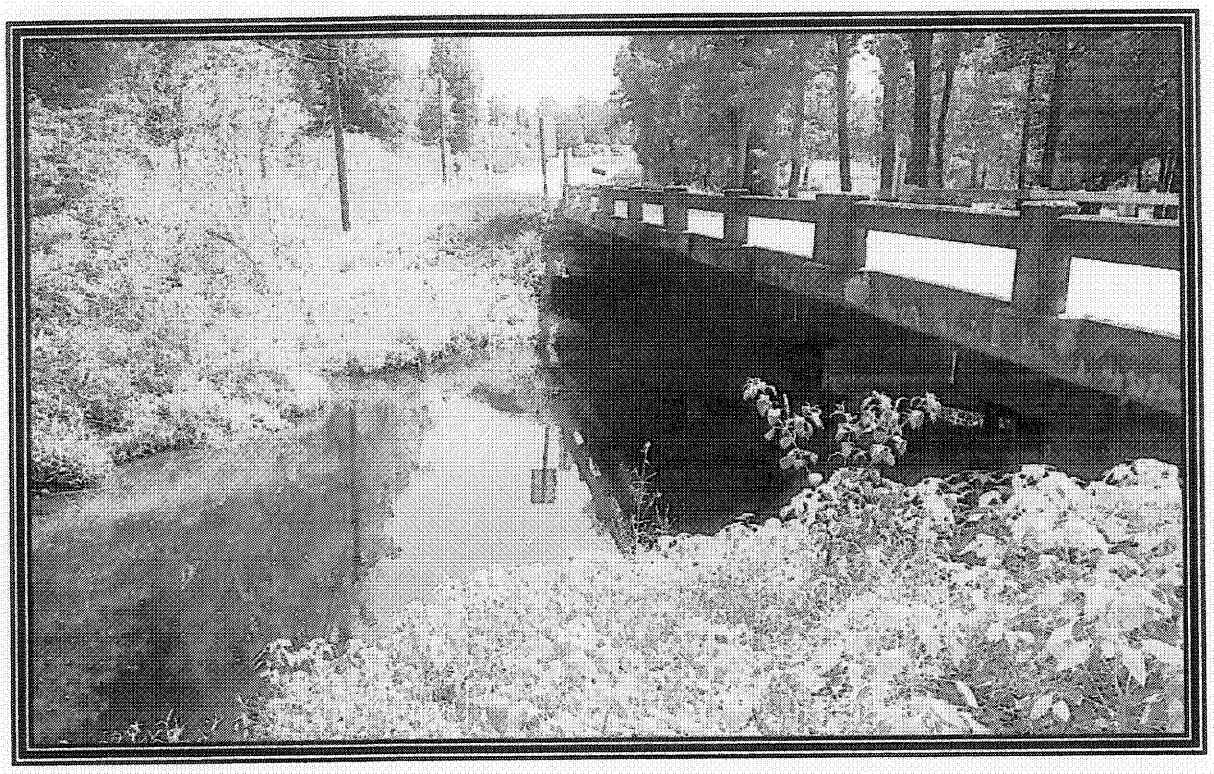
Figure 3B

JOHNSTON
COUNTY
BRIDGE No. 89
B-4165

Looking West
on SR 1162

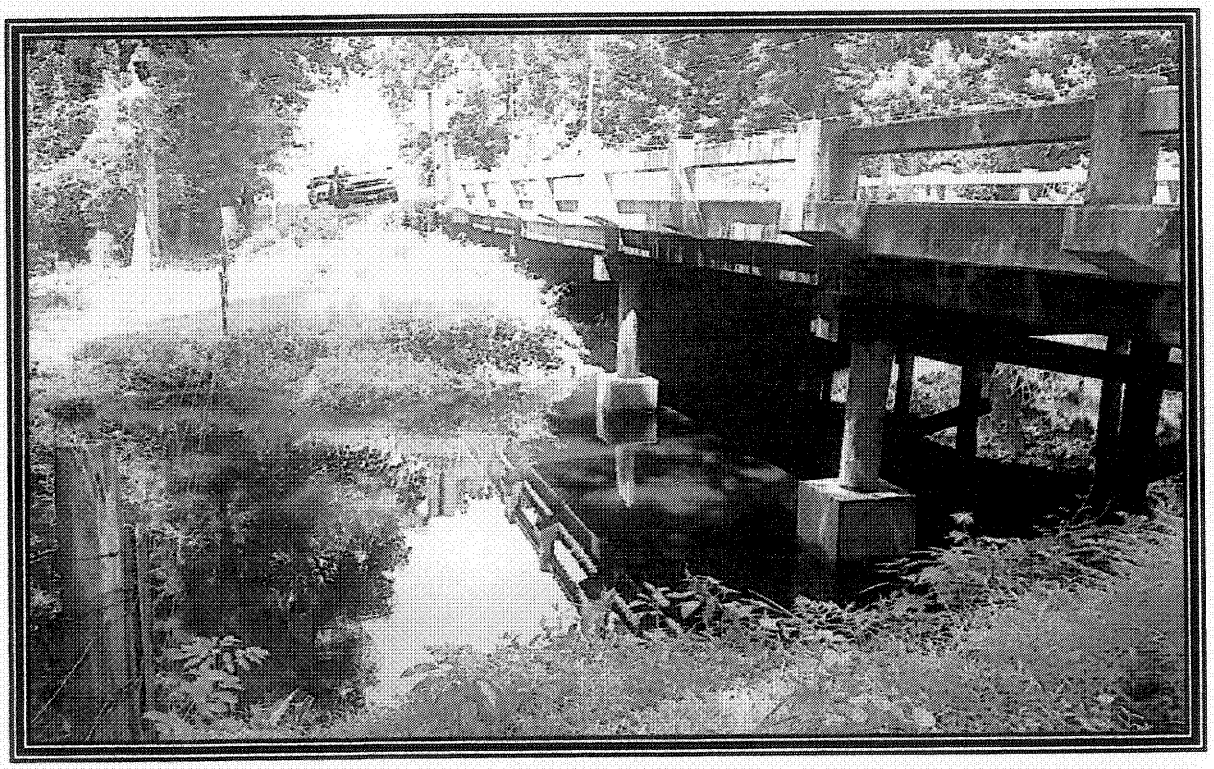
Looking East
on SR 1162

FIGURE 4A



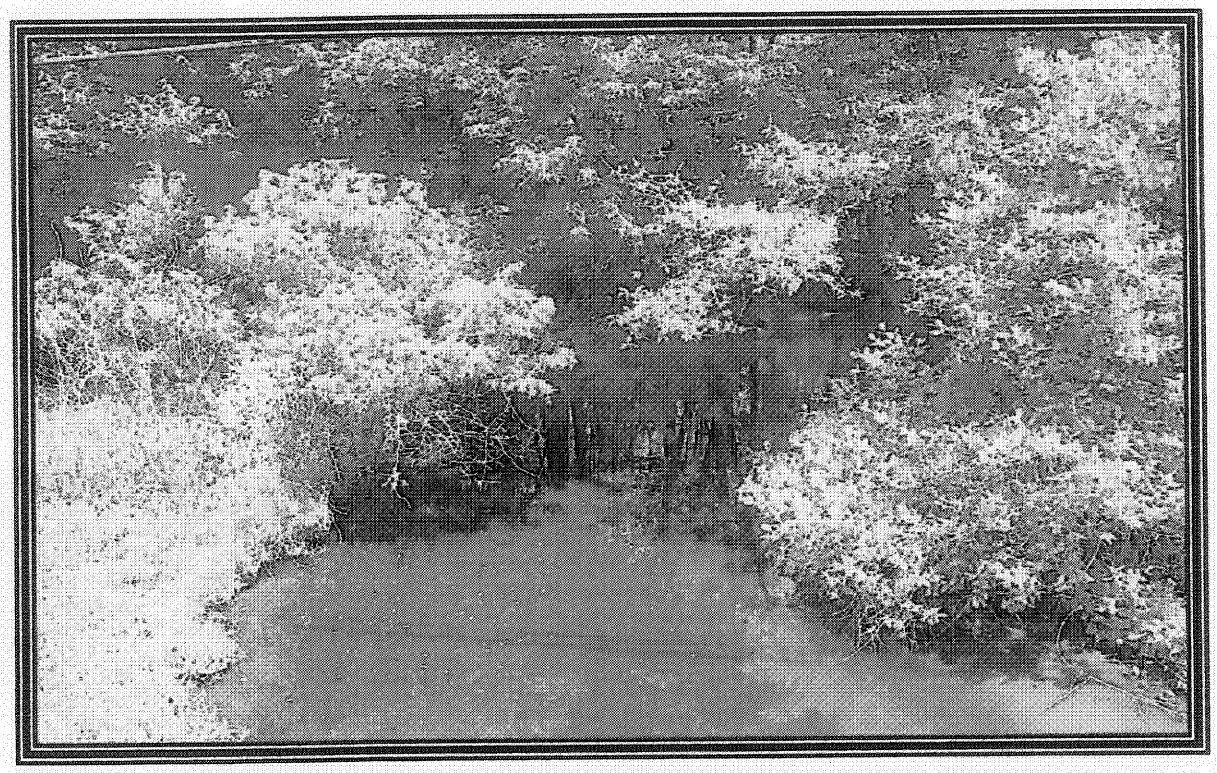
JOHNSTON COUNTY BRIDGE No. 89 B-4165

Looking at the North Side of Bridge No. 89



Looking at the South Side of Bridge No. 89

FIGURE 4B



JOHNSTON COUNTY
BRIDGE No. 89
B-4165

Looking Upstream at Sassarixa Swamp

Looking Downstream at Sassarixa Swamp

FIGURE 4C

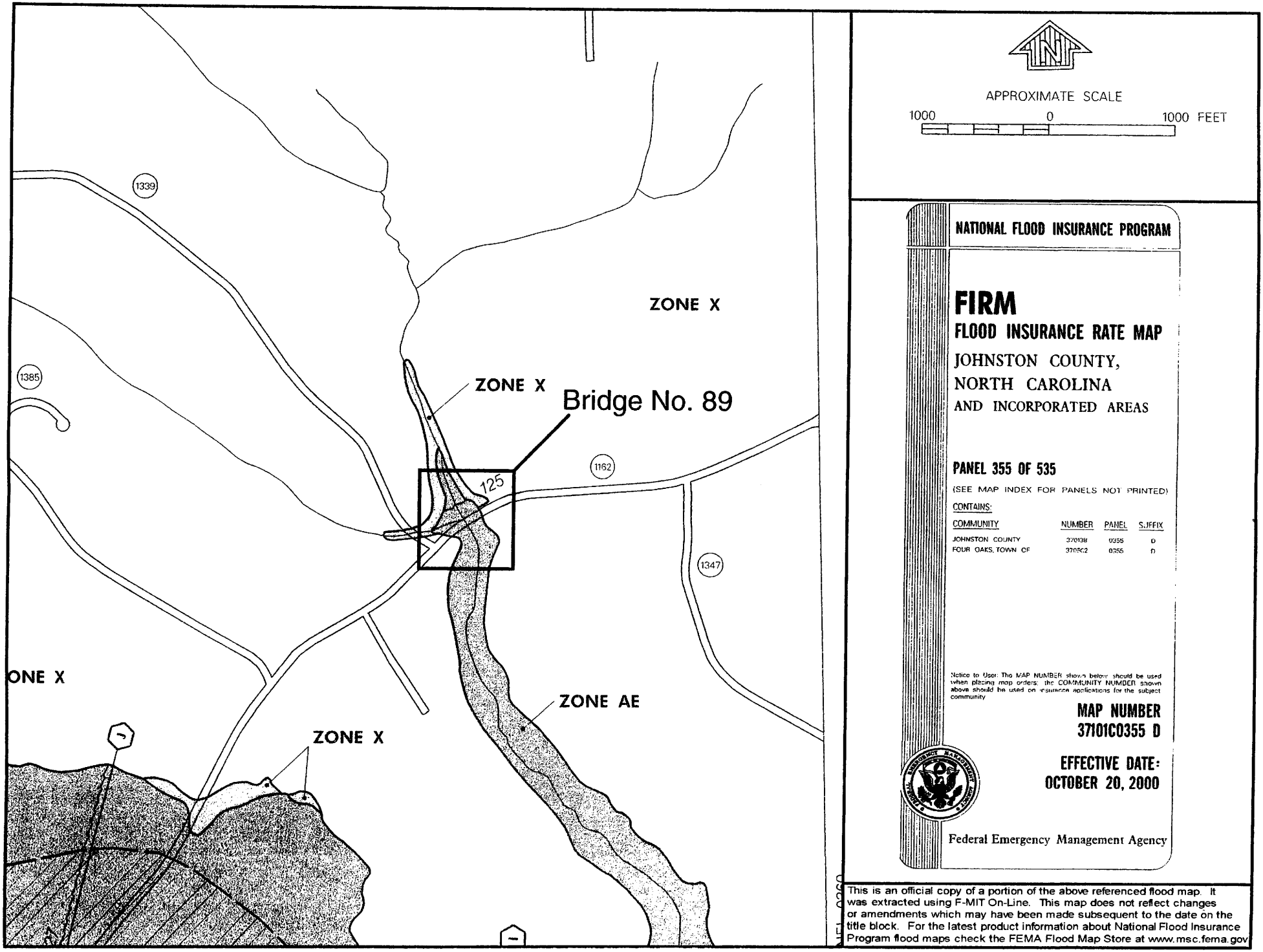

1339
1385
1162
1347
125
ZONE X
ZONE X
Bridge No. 89
ONE X
ZONE X
ZONE AE
APPROXIMATE SCALE
1000 0 1000 FEET
NATIONAL FLOOD INSURANCE PROGRAM
FIRM
FLOOD INSURANCE RATE MAP
JOHNSTON COUNTY,
NORTH CAROLINA
AND INCORPORATED AREAS
PANEL 355 OF 535
(SEE MAP INDEX FOR PANELS NOT PRINTED)
CONTAINS:
COMMUNITY NUMBER PANEL SUFFIX
JOHNSTON COUNTY 370138 0355 D
FOUR OAKS, TOWN OF 370562 0355 D
Notice to User: The MAP NUMBER shown below should be used when placing map orders; the COMMUNITY NUMBER shown above should be used on insurance applications for the subject community.
MAP NUMBER
37101C0355 D
EFFECTIVE DATE:
OCTOBER 20, 2000
Federal Emergency Management Agency
This is an official copy of a portion of the above referenced flood map. It was extracted using F-MIT On-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at www.msc.fema.gov

FIGURE 5

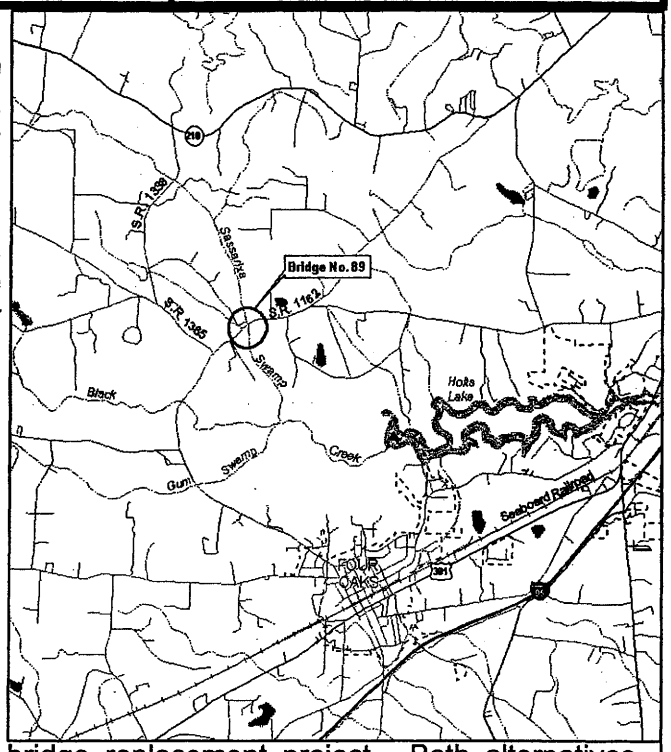
APPENDIX

Newsletter

NCDOT
T.I.P. B-4165

Volume I, Issue I

Proposed Replacement of Bridge No. 89 over Sassarixa Swamp on SR 1162 (Black Creek Road)



This newsletter is published by the North Carolina Department of Transportation to provide information on the status of the proposed replacement of the bridge over Sassarixa Swamp on SR 1162 (Black Creek Road) illustrated in the vicinity map to the right. The proposed project is needed to improve safety due to the deteriorated condition of the existing bridge.

PROJECT SCHEDULE

The acquisition of right-of-way is scheduled for federal fiscal year (FFY) 2005, with construction in FFY 2006.

PROJECT DESCRIPTION

Two (2) alternatives have been studied for the proposed bridge replacement project. Both alternatives propose to replace the bridge in its existing location. Alternative 1 would utilize an off-site detour to maintain traffic during construction. The off-site detour route is SR 1162 (Black Creek Road) to NC 210 to SR 1338 (Lassiter Pond Road) to SR 1385 (Lassiter Road) and back to SR 1162 (Black Creek Road). Alternative 2 would maintain traffic with an on-site detour on the downstream (south side) of the existing bridge. Please see the figures shown on the back of this newsletter. Alternative 1 has been recommended as the preferred alternative because it minimizes recommended costs and impacts to the environment.

NCDOT WELCOMES CITIZEN INPUT

Public involvement is an important part of the planning process. The North Carolina Department of Transportation is committed to ensuring all issues of concern to the public are addressed and considered before any final decisions are made. If you have any questions or comments concerning the project, please feel free to contact the study team members below:

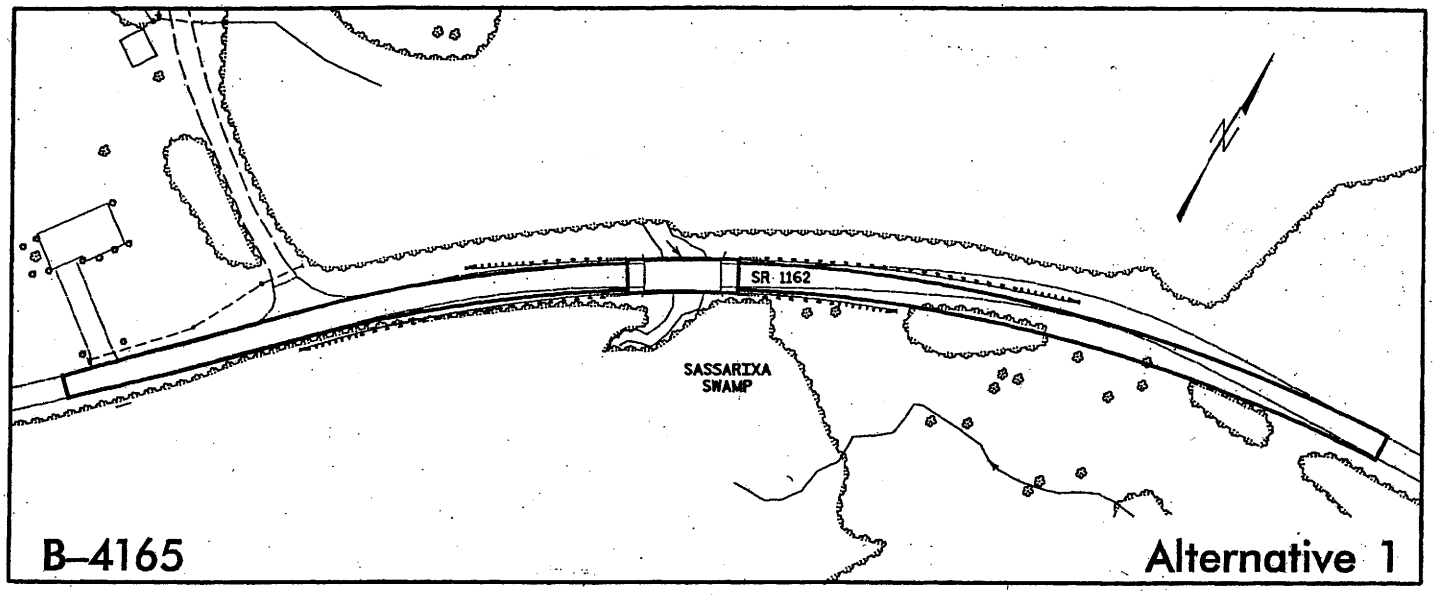
Mr. Vincent J. Rhea, PE
Project Manager
NCDOT-PDEA
1548 Mail Service Center
Raleigh, NC 27699-1548
(919) 733-7844 ext. 261
vrhea@dot.state.nc.us

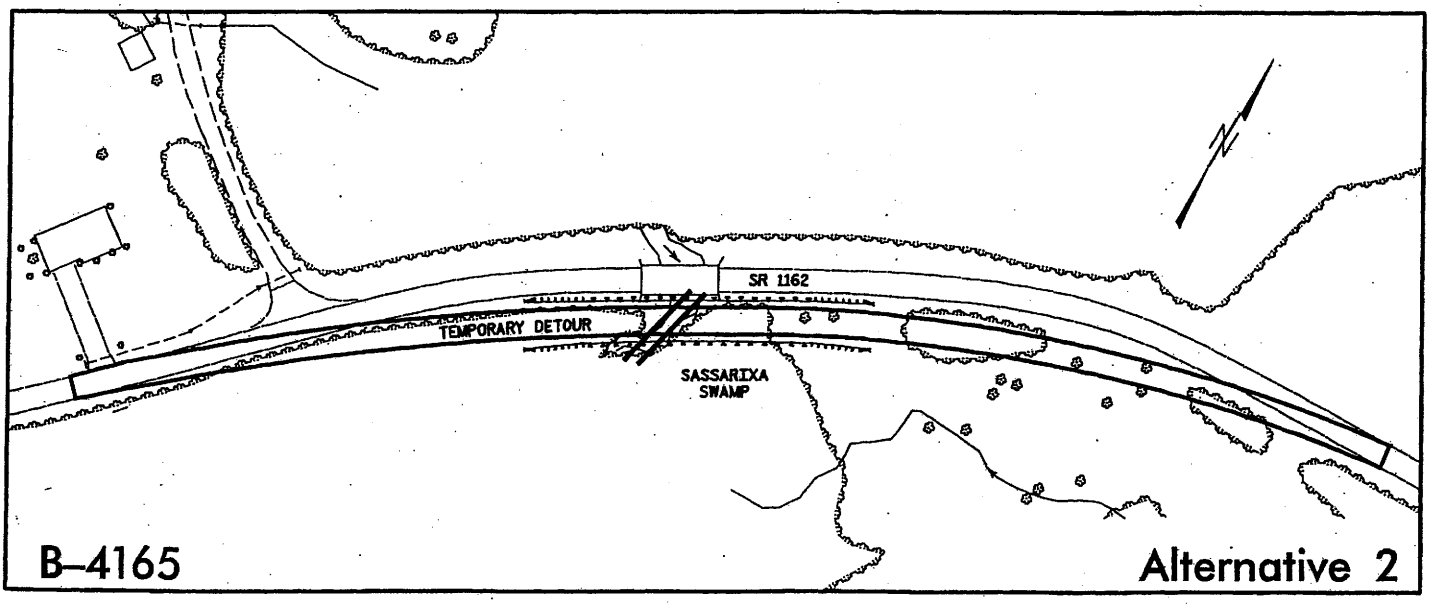
Mr. Richard Davis
Project Manager
The LPA GROUP of North Carolina, P.A.
4904 Professional Ct., Suite 201
Raleigh, NC 27609
(919) 954-1244
rdavis@lpagroup.com

NCDOT
T.I.P. B-4165

North Carolina Department of Transportation
Project Development & Environmental Branch
1548 Mail Service Center
Raleigh, NC 27699-1548

Postal Customer





United States Department of the Interior

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

December 30, 2003

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

Dear Dr. Thorpe:

This letter is in response to your request for comments from the U.S. Fish and Wildlife Service (Service) on the potential environmental impacts of the proposed replacement of Bridge No. 89 on SR 1162 over Sassarixa Creek, Johnston County, North Carolina (TIP No. B-4165). These comments provide scoping information in accordance with provisions of the Fish and Wildlife Coordination Act (16 U.S.C. 661-667d) and section 7 of the Endangered Species Act (ESA) of 1973, as amended (16 U.S.C. 1531-1543).

For bridge replacement projects, the Service recommends the following general conservation measures to avoid or minimize environmental impacts to fish and wildlife resources:

1. Wetland, forest and designated riparian buffer impacts should be avoided and minimized to the maximum extent practical;

2. If unavoidable wetland impacts are proposed, every effort should be made to identify compensatory mitigation sites in advance. Project planning should include a detailed compensatory mitigation plan for offsetting unavoidable wetland impacts. Opportunities to protect mitigation areas in perpetuity via conservation easements, land trusts or by other means should be explored at the outset;

3. Off-site detours should be used rather than construction of temporary, on-site bridges. For projects requiring an on-site detour in wetlands or open water, such detours should be aligned along the side of the existing structure which has the least and/or least quality of fish and wildlife habitat. At the completion of construction, the detour area should be entirely removed and the impacted areas be planted with appropriate vegetation, including trees if necessary;

4. Wherever appropriate, construction in sensitive areas should occur outside fish spawning and migratory bird nesting seasons. In waterways that may serve as travel corridors for

fish, in-water work should be avoided during moratorium periods associated with migration, spawning and sensitive pre-adult life stages. The general moratorium period for anadromous fish is February 15 - June 30;

5. New bridges should be long enough to allow for sufficient wildlife passage along stream corridors;

6. Best Management Practices (BMP) for Protection of Surface Waters should be implemented;

7. Bridge designs should include provisions for roadbed and deck drainage to flow through a vegetated buffer prior to reaching the affected stream. This buffer should be large enough to alleviate any potential effects from run-off of storm water and pollutants;

8. The bridge designs should not alter the natural stream and stream-bank morphology or impede fish passage. To the extent possible, piers and bents should be placed outside the bank-full width of the stream;

9. Bridges and approaches should be designed to avoid any fill that will result in damming or constriction of the channel or flood plain. If spanning the flood plain is not feasible, culverts should be installed in the flood plain portion of the approach to restore some of the hydrological functions of the flood plain and reduce high velocities of flood waters within the affected area.

There are four federally endangered species listed for Johnston County: the red-cockaded woodpecker (*Picoides borealis*), dwarf wedgemussel (*Alasmidonta heterodon*), Tar spinymussel (*Elliptio steinstansana*) and Michaux's sumac (*Rhus michauxii*). Although the North Carolina Natural Heritage Program (NCNHP) database does not indicate any known occurrences of these species near the project vicinity, use of the NCNHP data should not be substituted for actual field surveys if suitable habitat occurs near the project site. The NCNHP database only indicates the presence of known occurrences of federally protected species and does not necessarily mean that such species are not present. It may simply mean that the area has not been surveyed. Information about the habitats in which these species are often found is provided on our web site, http://endangered.fws.gov/ . If suitable habitat occurs within the project vicinity for any of the listed species, surveys should be conducted to determine presence or absence of the species. All survey documentation must include survey methodologies and results.

We reserve the right to review any federal permits that may be required for this project, at the public notice stage. Therefore, it is important that resource agency coordination occur early in the planning process in order to resolve any conflicts that may arise and minimize delays in project implementation. In addition to the above guidance, we recommend that the environmental documentation for this project include the following in sufficient detail to facilitate a thorough review of the action:

1. A clearly defined and detailed purpose and need for the proposed project;

2. A description of the proposed action with an analysis of all alternatives being considered, including the "no action" alternative;

3. A description of the fish and wildlife resources, and their habitats, within the project impact area that may be directly or indirectly affected;

4. The extent and acreage of waters of the U.S., including wetlands, that are to be impacted by filling, dredging, clearing, ditching, or draining. Acres of wetland impact should be differentiated by habitat type based on the wetland classification scheme of the National Wetlands Inventory (NWI). Wetland boundaries should be determined by using the 1987 Corps of Engineers Wetlands Delineation Manual and verified by the U.S. Army Corps of Engineers;

5. The anticipated environmental impacts, both temporary and permanent, that would be likely to occur as a direct result of the proposed project. The assessment should also include the extent to which the proposed project would result in secondary impacts to natural resources, and how this and similar projects contribute to cumulative adverse effects;

6. Design features and construction techniques which would be employed to avoid or minimize the fragmentation or direct loss of wildlife habitat and waters of the US;

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

The Service appreciates the opportunity to comment on this project. Please continue to advise us during the progression of the planning process, including your official determination of the impacts of this project. If you have any questions regarding our response, please contact Mr. Gary Jordan at (919) 856-4520, ext. 32.

Sincerely,

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

cc: Mike Bell, USACE, Washington, NC
David Franklin, USACE, Wilmington, NC
John Hennessy, NCDWQ, Raleigh, NC
Travis Wilson, NCWRC, Creedmoor, NC
Chris Militscher, USEPA, Raleigh, NC

North Carolina Wildlife Resources Commission

Charles R. Fullwood, Executive Director

MEMORANDUM

TO: Vincent J. Rhea
Project Development and Environmental Analysis Branch, NCDOT

FROM: Travis Wilson, Highway Project Coordinator
Habitat Conservation Program

DATE: February 5, 2004

SUBJECT: NCDOT Bridge Replacements in Johnston, Moore, Montgomery, Brunswick, Bladen, Cumberland, Scotland, and Columbus counties. TIP Nos. B-4165, B-4207, B-4204, B-4030, B-4029, B-4092, B-4274, B-4080, and B-4078.

Biologists with the N. C. Wildlife Resources Commission (NCWRC) have reviewed the information provided and have the following preliminary comments on the subject project. Our comments are provided in accordance with provisions of the National Environmental Policy Act (42 U.S.C. 4332(2)(c)) and the Fish and Wildlife Coordination Act (48 Stat. 401, as amended; 16 U.S.C. 661-667d).

Our standard recommendations for bridge replacement projects of this scope are as follows:

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

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

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

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

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

5. If temporary access roads or detours are constructed, they should be removed back to original ground elevations immediately upon the completion of the project. Disturbed areas should be seeded or mulched to stabilize the soil and native tree species should be planted with a spacing of not more than 10'x10'. If possible, when using temporary structures the area should be cleared but not grubbed. Clearing the area with chain saws, mowers, bush-hogs, or other mechanized equipment and leaving the stumps and root mat intact, allows the area to revegetate naturally and minimizes disturbed soil.

6. A clear bank (riprap free) area of at least 10 feet should remain on each side of the steam underneath the bridge.

7. In trout waters, the N.C. Wildlife Resources Commission reviews all U.S. Army Corps of Engineers nationwide and general '404' permits. We have the option of requesting additional measures to protect trout and trout habitat and we can recommend that the project require an individual '404' permit.

8. In streams that contain threatened or endangered species, NCDOT biologist Mr. Hal Bain should be notified. Special measures to protect these sensitive species may be required. NCDOT should also contact the U.S. Fish and Wildlife Service for information on requirements of the Endangered Species Act as it relates to the project.

9. In streams that are used by anadromous fish, the NCDOT official policy entitled "Stream Crossing Guidelines for Anadromous Fish Passage (May 12, 1997)" should be followed.

10. In areas with significant fisheries for sunfish, seasonal exclusions may also be recommended.

11. Sedimentation and erosion control measures sufficient to protect aquatic resources must be implemented prior to any ground disturbing activities. Structures should be maintained regularly, especially following rainfall events.

12. Temporary or permanent herbaceous vegetation should be planted on all bare soil within 15 days of ground disturbing activities to provide long-term erosion control.

13. All work in or adjacent to stream waters should be conducted in a dry work area. Sandbags, rock berms, cofferdams, or other diversion structures should be used where possible to prevent excavation in flowing water.

14. Heavy equipment should be operated from the bank rather than in stream channels in order to minimize sedimentation and reduce the likelihood of introducing other pollutants into streams.

15. Only clean, sediment-free rock should be used as temporary fill (causeways), and should be removed without excessive disturbance of the natural stream bottom when construction is completed.

16. During subsurface investigations, equipment should be inspected daily and maintained to prevent contamination of surface waters from leaking fuels, lubricants, hydraulic fluids, or other toxic materials.

If corrugated metal pipe arches, reinforced concrete pipes, or concrete box culverts are used:

1. The culvert must be designed to allow for aquatic life and fish passage. Generally, the culvert or pipe invert should be buried at least 1 foot below the natural streambed (measured from the natural thalweg depth). If multiple barrels are required, barrels other than the base flow barrel(s) should be placed on or near stream bankfull or floodplain bench elevation (similar to Lyonsfield design). These should be reconnected to floodplain benches as appropriate. This may be accomplished by utilizing sills on the upstream and downstream ends to restrict or divert flow to the base flow barrel(s). Silled barrels should be filled with sediment so as not to cause noxious or mosquito breeding conditions. Sufficient water depth should be provided in the base flow barrel(s) during low flows to accommodate fish movement. If culverts are longer than 40-50 linear feet, alternating or notched baffles should be installed in a manner that mimics existing stream pattern. This should enhance aquatic life passage: 1) by depositing sediments in the barrel, 2) by maintaining channel depth and flow regimes, and 3) by providing resting places for fish and other aquatic organisms. In essence, base flow barrel(s) should provide a continuum of water depth and channel width without substantial modifications of velocity.

2. If multiple pipes or cells are used, at least one pipe or box should be designed to remain dry during normal flows to allow for wildlife passage.

3. Culverts or pipes should be situated along the existing channel alignment whenever possible to avoid channel realignment. Widening the stream channel must be avoided. Stream channel widening at the inlet or outlet end of structures typically decreases water velocity causing sediment deposition that requires increased maintenance and disrupts aquatic life passage.

4. Riprap should not be placed in the active thalweg channel or placed in the streambed in a manner that precludes aquatic life passage. Bioengineering boulders or structures should be professionally designed, sized, and installed.

In most cases, we prefer the replacement of the existing structure at the same location with road closure. If road closure is not feasible, a temporary detour should be designed and located to avoid wetland impacts, minimize the need for clearing and to avoid destabilizing stream banks. If the structure will be on a new alignment, the old structure should be removed and the approach fills removed from the 100-year floodplain. Approach fills should be removed down to the natural ground elevation. The area should be stabilized with grass and planted with native tree species. If the area reclaimed was previously wetlands, NCDOT should restore the area to wetlands. If successful, the site may be utilized as mitigation for the subject project or other projects in the watershed.

Project specific comments:

1. B-4165, Johnston County, Bridge No. 89 over Sassarixa Swamp on SR 1162. We recommend replacing this bridge with a bridge. Standard recommendations apply.

2. B-4207, Moore County, Bridge No. 43 over McLendons Creek on NC 22-24-27. We recommend replacing this bridge with a bridge. McLendons Creek contains habitat suitable for the federally endangered Cape Fear shiner, a survey should be conducted to determine the presence or absence of this species. Standard recommendations apply.

3. B-4204, Montgomery County, Bridge No. 28 over Rock Creek on NC 109. We recommend replacing this bridge with a bridge. Standard recommendations apply.

4. B-4030, Brunswick County, Bridge No. 9 over Bear Branch on NC 103. We recommend replacing this bridge with a bridge. Standard recommendations apply.

5. B-4029, Bladen County, Bridge No. 8 over canal on NC 210. We recommend replacing this bridge with a bridge. Standard recommendations apply.

6. B-4092, Cumberland County, Bridge No. 80 over Little Rockfish Creek on SR 1108. We recommend replacing this bridge with a bridge. A significant fishery for sunfish exists at this site, therefore we request in in-water work moratorium for sunfish from April 1 to June 30. Standard recommendations apply.

7. B-4274, Scotland County, Bridge No. 14 over Big Shoe Heel Creek on NC 144. We recommend replacing this bridge with a bridge. A significant fishery for sunfish exists at this site, therefore we request in in-water work moratorium for sunfish from April 1 to June 30. Standard recommendations apply.

8. B-4080, Columbus County, Bridge No. 148 over Pine Log Swamp on SR 1437. We recommend replacing this bridge with a bridge. Standard recommendations apply.

9. B-4078, Columbus County, Bridge No. 10 over Waccamaw River Overflow on NC 130. We recommend replacing this bridge with a bridge. Standard recommendations apply.

NCDOT should routinely minimize adverse impacts to fish and wildlife resources in the vicinity of bridge replacements. Restoring previously disturbed floodplain benches should narrow and deepen streams previously widened and shallowed during initial bridge installation. NCDOT should install and maintain sedimentation control measures throughout the life of the project and prevent wet concrete from contacting water in or entering into these streams. Replacement of bridges with spanning structures of some type, as opposed to pipe or box culverts, is recommended in most cases. Spanning structures allow wildlife passage along streambanks and reduce habitat fragmentation.

If you need further assistance or information on NCWRC concerns regarding bridge replacements, please contact me at (919) 528-9886. Thank you for the opportunity to review and comment on these projects.

Cc: Gary Jordan, U.S. Fish and Wildlife Service, Raleigh

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

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

Division of Historical Resources

January 6, 2004

MEMORANDUM

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

FROM: David Brook P/S for David Brook

SUBJECT: Bridge No. 89 on SR 1162 over Sassafrixa Swamp, B-4165, Johnston County, ER03-3635

Thank you for your letter of December 8, 2003, concerning the above project.

We are unable to comment on the potential effect of this project on archaeological resources until we receive further information.

Please forward a United States Geological Survey (USGS) quadrangle for the appropriate location to us clearly detailing the exact location of any ground disturbing activities associated with this project. Information concerning previous land use of the areas to be disturbed would also aid in the completion of our review. If there are any structures on or immediately adjacent to the project area which appear to be more than fifty years old, please provide photographs of them, keyed to the map.

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.

cc: Mary Pope Furr, NCDOT
Matt Wilkerson, NCDOT

North Carolina Department of Cultural Resources

State Historic Preservation Office

Peter B. Sandbeck, Administrator

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

Office of Archives and History
Division of Historical Resources
David Brook, Director

August 9, 2004

MEMORANDUM

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

FROM: Peter B. Sandbeck PBS/w for Peter Sandbeck

SUBJECT: Johnston County, Bridge No. 89 on SR 1162 over Sassaroxa Swamp, Federal-Aid Project No. BRZ-1162(5), State Project No. 8.2313301, TIP No. B-4165, ER 03-3635

Thank you for your letter of January 6, 2004, concerning the above project.

We have conducted a review of the proposed undertaking and are aware of no historic resources which would be affected by the project. Therefore, we have no comment on the undertaking as proposed.

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

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

PBS:w

cc: Mary Pope Furr

PUBLIC SCHOOLS OF NORTH CAROLINA

STATE BOARD OF EDUCATION :: Howard N. Lee, *Chairman*
DEPARTMENT OF PUBLIC INSTRUCTION :: Michael E. Ward, *State Superintendent*
WWW.NCPUBLICSCHOOLS.ORG

January 13, 2004

MEMORANDUM

TO: Gregory J. Thorpe, Ph.D., Director
Project Development and Environmental Analysis Branch
Department of Transportation

FROM: J. David Edwards, Section Chief, School Planning de

RE: Johnston County, Bridge No. 89 on SR 1162 over Sassarixa Swamp, Federal-Aid Project No. BRZ-1162(5), State Project No. 8.2313301, TIP No. B-4165

Enclosed is a reply from Johnston County Schools regarding the above referenced project.

DE/ed
Enclosures

SCHOOL PLANNING - DIVISION OF SCHOOL SUPPORT : : www.schoolclearinghouse.org
6319 Mail Service Center : : Raleigh, North Carolina 27699-6319 : : 919.807.3554 : : Fax 919.807.3558

JOHNSTON COUNTY SCHOOLS

(919) 934-6031 P.O. Box 1336, Smithfield, NC 27577 (919) 989-6277 FAX

January 6, 2004

J. David Edwards, Ed.D.
Section Chief
School Planning

Subject: Johnston County, Bridge No. 89 on SR 1162 over Sassarixa Swamp,
Federal-Aid Project No. BRZ-1162(5), State Project No. 8.2313301
TIP No. B-4165

We have 11 buses that cross this bridge 2 times each day. Usually we can route around most construction projects, but this bridge is located in an area where the detour would be extremely long and would greatly increase the ride time for our students.

The attached memorandum to your letter indicated that two alternatives were being studied. Alternative # 2 indicated that there would be a temporary on-site detour for traffic during construction. The on-site detour for traffic in alternative 2 will be a better option for our buses.

Thank you for allowing us to provide information for this study.

Sincerely,

John R. Evans

John R. Evans
Transportation Director
Johnston County Schools

JOHNSTON COUNTY EMERGENCY SERVICES
Post Office Box 530, 120 South Third Street
Smithfield, NC 27577
(919) 989-5050
(919) 989-5052 (Fax)

Memorandum

TO: Mr. Edward J. Small, Environmental Scientist
The LPA Group of North Carolina, P.A.

FROM: Dewayne West, Director

DATE: December 27, 2005

RE: Bridge Replacement No. 89 project for Sassarixa Swamp (SR 1162)

In regard to your letter dated December 7, 2005, I concur with the detour route as outlined on the attached map. This will potentially cause delays in responding to emergencies in the area, but appears to be the best alternative.