STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

MICHAEL F. EASLEY
GOVERNOR

LYNDO TIPPETT
SECRETARY

January 17, 2006

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

ATTN: Mr. Willam Wescott
NCDOT Coordinator

Dear Sir:

SUBJECT: **Nationwide 23 Permit Application and Neuse Riparian Buffer Authorization Request** for the replacement of Bridge No. 21 over Great Swamp on NC 222 in Wayne County, Federal Aid Project No. BRSTP-222 (2), State Project No. 8.1332001, TIP No. B-4319.

The NC Department of Transportation (NCDOT) proposes to replace the Bridge No. 21 over Great Swamp on NC 222, with a new bridge at the existing location and approximate elevation. The new bridge will be a two-lane structure approximately 90 feet in length. The cross section of the new bridge will include two 12-foot lanes with 8-foot minimum offsets. The approach work will consist of earthwork, paving, some resurfacing, and tying back into the existing roadway for approximately 320 feet to the east. Traffic will be detoured offsite during construction. Impacts to 0.059 ac. of wetlands and 6,173 ft² of riparian buffer are proposed.

IMPACTS TO WATERS OF THE UNITED STATES

General Description:
Great Swamp [DWQ Index No. 27-86-9-3] is located in the Neuse River Basin, in the 03020203 HUC and has a classification of C; Sw; NSW.

Permanent Impacts:
The replacement of Bridge No. 21 will result in 0.059 acre of permanent impacts to jurisdictional wetland (0.034 ac. fill, 0.025 ac. excavation).

IMPACTS TO NEUSE RIVER BASIN BUFFERS

This project is located within the Neuse River Basin, with the Great Swamp being a blue-line stream. Therefore, this project is subject to the regulations pertaining to the riparian buffer rules.

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

TELEPHONE: 919-733-3141
FAX: 919-733-9794
WEBSITE: WWW.DOH.DOT.STATE.NC.US

LOCATION:
TRANSPORTATION BUILDING
1 SOUTH WILMINGTON STREET
RALEIGH NC

The construction of the new bridge will impact 3,954 ft² in zone 1 and 2,219 ft² in zone 2 (6,173 ft² total). These impacts are considered allowable, therefore no compensatory mitigation is proposed.

BRIDGE DEMOLITION

Best Management Practices for Bridge Demolition and Removal will be implemented. This bridge is classified as "Case 2" which states that no in water work will be performed during required moratoriums. Bridge No. 21 has a two-lane, three span superstructure composed of a concrete deck on timber joists. The substructure is composed of timber caps, piles and bulkheads. The anticipated temporary fill associated with the removal of Bridge No. 21 is approximately two cubic yards, as discussed in the Categorical Exclusion.

UTILITIES

There will be no jurisdictional impacts from utility relocations. Directional boring and other avoidance measures will be used to avoid impacts.

AVOIDANCE & MINIMIZATION

The NCDOT proposes to replace the Bridge No. 21 with a new bridge at the existing location and approximate low chord elevation using topdown construction. Traffic will be detoured offsite during construction. These factors will reduce the impacts to Waters of the United States. Best management practices (BMP's) will be utilized to minimize water quality impacts. In compliance with 15A NCAC 02B.0104(m) we have incorporated the use of BMP's in the design of the project. Additionally, an instream moratorium of February 15 through June 15 and Stream Crossing Guidelines for Anadromous Fish Passing will be adhered to throughout project construction

MITIGATION

The Department has avoided and minimized impacts to jurisdictional resources to the greatest extent possible. The necessary compensatory mitigation to offset unavoidable impacts to waters that are jurisdictional under the federal Clean Water Act will be provided by the EEP. The offsetting mitigation will derive from an inventory of assets already in existence within the same 8-digit cataloging unit. A copy of the EEP acceptance letter is included with this permit application.

FEDERALLY-PROTECTED SPECIES

As of January 29, 2003, the US Fish and Wildlife Service (USFWS) lists one federally protected species for Wayne County. A biological conclusion of "No Effect" was reached for the Red-cockaded woodpecker at this site in 2002 due to no suitable nesting or foraging habitat. This biological conclusion remains valid.

REGULATORY APPROVALS

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

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

Neuse Buffer Rules: This project lies within the Neuse River Basin; therefore, the regulations pertaining to the Neuse Buffer Rules will apply. These uses require written authorization from the Division or the delegated local authority. Therefore, NCDOT requests written authorization for a Buffer Certification from the Division of Water Quality.

We anticipate that the Corps of Engineers will request comments from the North Carolina Wildlife Resources Commission (NCWRC) prior to authorization. By copy of this letter and attachment, NCDOT hereby requests NCWRC review. NCDOT requests that NCWRC forward their comments to the Corps of Engineers.

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

If you have any questions or need additional information, please contact Mr. Chris Manley at (919) 715-1487 or cdmanley@dot.state.nc.us.

Sincerely,

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

cc list

W/attachment

Mr. John Hennessy, NCDWQ (5 Copies)
Mr. Travis Wilson, NCWRC
Mr. Gary Jordan, USFWS
Mr. Ron Sechler, NMFS
Mr. Michael Street, NCDMF
Dr. David Chang, P.E., Hydraulics
Mr. Greg Perfetti, P.E., Structure Design
Mr. Mark Staley, Roadside Environmental
Mr. Richard E. Greene , PE, Division 4 Engineer
Mr. Jamie Shern, Division 4 Environmental Officer

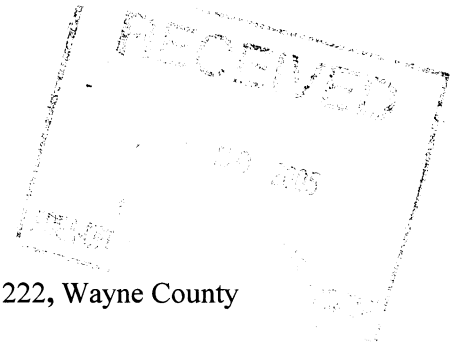
W/o attachment

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
Ms. Beth Harmon, EEP
Mr. Todd Jones, NCDOT External Audit Branch
Mr. William T. Goodwin, P.E., Project Development

Ecosystem Enhancement PROGRAM

December 13, 2005

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



Dear Dr. Thorpe:

Subject: EEP Mitigation Acceptance Letter:

B-4319, Bridge 21 over the Great Swamp on NC 222**,** Wayne County

The purpose of this letter is to notify you that the Ecosystem Enhancement Program (EEP) will provide the compensatory riverine wetland mitigation for the subject project. Based on the information supplied by you in a letter dated December 8, 2005, the impacts are located in CU 03020203 of the Neuse River Basin in the Northern Inner Coastal Plain (NICP) Eco-Region, and are as follows:

Riverine Wetlands: 0.059 acre

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

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

Sincerely,

William D. Gilmore, P.E.
EEP Director

cc: Mr. William Wescott, USACE-Washington
Mr. John Hennessy, Division of Water Quality, Wetlands/401 Unit
File: B-4319

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: NW 23

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: North Carolina Department of Transportation
   Mailing Address: 1548 Mail Service Center
   Raleigh, NC 27699-1548
   Telephone Number: 919-733-3147 Fax Number: 919-766-9794
   E-mail Address: gthorpe@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: Bridge No. 21 on NC 22 over Great Swamp

2. T.I.P. Project Number or State Project Number (NCDOT Only): B-4319

3. Property Identification Number (Tax PIN): _____

4. Location
   County: Wayne Nearest Town: Fremont
   Subdivision name (include phase/lot number): _____
   Directions to site (include road numbers/names, landmarks, etc.): On NC 222 heading Northwest out of Fremont

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): 35.5611 °N 78.0221 °W

6. Property size (acres): N/A

7. Name of nearest receiving body of water: Great Swamp

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: Two lane paved roadway leading into a two lane bridge over Great Swamp. Adjacent land use is wetlands with agriculture and a couple of houses.

10. Describe the overall project in detail, including the type of equipment to be used: The NC Department of Transportation (NCDOT) proposes to replace the Bridge No. 21 over Great Swamp on NC 222, with a new bridge at the existing location and approximate elevation. The new bridge will be a two-lane structure approximately 90 feet in length. The cross section of the new bridge will include two 12-foot lanes with 8-foot minimum offsets. The approach work will consist of earthwork, paving, some resurfacing, and tying back into the existing roadway for approximately 320 feet to the east. Traffic will be detoured offsite during construction. Impacts to 0.059 ac. of wetlands and 6,173 ft² of riparian buffer are proposed. Equipment will consist of typical grading machinery such as track hoes, dozers, dump trucks, and a crane for the bridge construction and new roadway approaches.

11. Explain the purpose of the proposed work: To replace a deteriorating bridge with a new bridge provide safer travel.

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. N/A

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. N/A

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: Proposed impacts include 0.059 acres of permanent fill and excavation in wetlands.

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)
1	Fill	Cypress-Gum Swamp	Yes	Adjacent	0.034
1	Excavation	Cypress-Gum Swamp	Yes	Adjacent	0.025
Total Wetland Impact (acres)					

3. List the total acreage (estimated) of all existing wetlands on the property: 0.059

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)
N/A						
Total Stream Impact (by length and acreage)						

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 (acre)
N/A				
Total Open Water Impact (acres)				

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

Stream Impact (acres):	N/A
Wetland Impact (acres):	0.059
Open Water Impact ($ft.^2$):	N/A
Total Impact to Waters of the U.S. (acres)	0.059
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.):_____
   Proposed use or purpose of pond (e.g., livestock watering, irrigation, aesthetic, trout pond, local stormwater requirement, etc.):_____
   Current land use in the vicinity of the pond:_____
   Size of watershed draining to pond:_____ Expected pond surface area:_____

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. The NCDOT proposes to replace the Bridge No. 21 with a new bridge at the existing location and approximate low chord elevation using topdown construction. Traffic will be detoured offsite during construction. These factors will reduce the impacts to Waters of the United States. Best management practices (BMP's) will be utilized to minimize water quality impacts. In compliance with 15A NCAC 02B.0104(m) we have incorporated the use of BMP's in the design of the project. Additionally, an instream moratorium of February 15 through June 15 and Stream Crossing Guidelines for Anadromous Fish Passing will be adhered to throughout project construction

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.
   The North Carolina Ecosystem Enhancement Program will provide compensatory mitigation for proposed impacts resulting from project construction.

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): N/A
   Amount of buffer mitigation requested (square feet): N/A
   Amount of Riparian wetland mitigation requested (acres): 0.059
   Amount of Non-riparian wetland mitigation requested (acres): N/A
   Amount of Coastal wetland mitigation requested (acres): N/A

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	3954	3 (2 for Catawba)	N/A
2	2219	1.5	N/A
Total	6173		

* 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. The proposed impervious surface area will remain approximately the same as the existing site conditions. NCDOT will use Best Management Practices for erosion control during construction.

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:

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

1/18/05

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

Manley

CATEGORICAL EXCLUSION ACTION CLASSIFICATION FORM

TIP Project No.	**B-4319**
State Project No.	**8.1332001**
WBS No.	**33656.1.1**
Federal Project No.	**BRSTP-222(2)**

A. Project Description:

This project proposes to replace Bridge No. 21 on NC 222 over Great Swamp in Wayne County (See Figure 1). The bridge will be replaced with a 95-foot long bridge at the existing location and approximate low chord elevation. The cross section of the new bridge will include two 12-foot lanes with 8-foot minimum offsets. The approach work will consist of earthwork, paving, some resurfacing and tying back into the existing roadway for approximately 320 feet to the west and 385 feet to the east. Guardrail will be installed where warranted. Traffic will be detoured offsite during construction (See Figure 1 and Section D, Studied Detour Route).

B. Purpose and Need:

Bridge Maintenance Records indicate that Bridge No. 21 has a sufficiency rating of 63.1out of a possible 100. The sufficiency rating of the bridge was 49.8 out of a possible 100 when it became eligible for placed in the Bridge Replacement and Rehabilitation Program. Bridge Maintenance completely replaced the cap and crown steps on Bent # 2 to improve the rating. The bridge's three-span superstructure is composed of a concrete deck on timber joists. The substructure is composed of timber caps, piles and bulkheads. The substructure appraisal is 4 out of a possible 9, which means the bridge is structurally deficient and needs to be replaced.

C. Proposed Improvements:

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

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

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

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

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

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

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

4. Transportation corridor fringe parking facilities.

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

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

7. Approvals for changes in access control.

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

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

10. Construction of bus transfer facilities (an open area consisting of passenger shelters, boarding areas, kiosks and related street improvements) when located in a commercial area or other high activity center in which there is adequate street capacity for projected bus traffic.

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

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

13. Acquisition and construction of wetland, stream and endangered species mitigation sites.

14. Remedial activities involving the removal, treatment or monitoring of soil or groundwater contamination pursuant to state or federal remediation guidelines.

D. Special Project Information:

Estimated Costs:

Total Construction	$ 709,750
Repaving SR 1341	$ 40,250
Right of Way	$ 39,800
Total	$ 789,800

Note: SR 1341 will be resurfaced from NC 222 to SR 1342 as requested by the Division Construction Engineer for use on the offsite detour.

Estimated Traffic:

Current	- 1,100 vpd
Year 2025	- 2,400 vpd
TTST	- 3%
Dual	- 2%

Proposed Typical Cross Section:

The proposed approach typical section will consist of two 12-foot lanes with eight-foot grass shoulders that extend to eleven feet where guardrail is required.

Design Speed:

60 mph

Functional Classification:

Rural Major Collector

Studied Detour Route:

The studied detour route utilizes SR 1367, SR 1342, and SR 1341. SR 1341 will be resurfaced as a part of the project. The total length of the detour is approximately four miles long with an estimated time of delay of approximately five minutes, which is acceptable based on the Draft NCDOT Guidelines for Evaluation of Offsite Detours.

estimated time of delay of approximately five minutes, which is acceptable based on the Draft NCDOT Guidelines for Evaluation of Offsite Detours.

Division Office Comments:

The Division Four Construction Offices concurs with replacing Bridge No. 21 at the existing location and elevation while detouring traffic offsite during construction.

Bridge Demolition:

Bridge No. 21 has a superstructure composed of reinforced concrete deck on timber joists with reinforced concrete rails. The substructure is composed of timber caps on timber piles and timber bulkheads. Some of the piles have been encased in concrete. These concrete encasements will be removed with the piles. The bridge demolition falls under Case 2, which states that no in water work will be performed during required moratoriums. The anticipated temporary fill associated with the removal of Bridge No. 21 is approximately two cubic yards.

Alternates Eliminated from Further Study

The no-build alternate for this project is not prudent or feasible. The existing bridge will continue to deteriorate necessitating eventual closure of the bridge. This is unacceptable due to the traffic that NC 222 serves.

Rehabilitation of the existing structure was eliminated from further study due to the substructure's timber composition. The timber substructure is showing signs of deterioration as evidenced by the concrete encasement around one of the timber piles.

Replacing the structure on new location was eliminated from further study due to the existing tangent alignment and the wetlands in the project vicinity.

Maintaining traffic onsite with a temporary detour is not prudent due to the wetlands in the project vicinity. The expected delay on the studied detour route is approximately five minutes, which is acceptable. Please reference the detour discussion under Section D, Studied Detour Route.

E. Threshold Criteria

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

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

PERMITS AND COORDINATION		YES	NO
(10)	If the project is located within a CAMA county, will the project significantly affect the coastal zone and/or any "Area of Environmental Concern" (AEC)?		X
(11)	Does the project involve Coastal Barrier Resources Act resources?		X
(12)	Will a U. S. Coast Guard permit be required?		X

(13)	Will the project result in the modification of any existing regulatory floodway?		X
(14)	Will the project require any stream relocations or channel changes?		X

SOCIAL, ECONOMIC, AND CULTURAL RESOURCES		**YES**	**NO**
(15)	Will the project induce substantial impacts to planned growth or land use for the area?		X
(16)	Will the project require the relocation of any family or business?		X
(17)	Will the project have a disproportionately high and adverse human health and environmental effect on any minority or low-income population?		X
(18)	If the project involves the acquisition of right of way, is the amount of right of way acquisition considered minor?	X	
(19)	Will the project involve any changes in access control?		X
(20)	Will the project substantially alter the usefulness and/or land use of adjacent property?		X
(21)	Will the project have an adverse effect on permanent local traffic patterns or community cohesiveness?		X
(22)	Is the project included in an approved thoroughfare plan and/or Transportation Improvement Program (and is, therefore, in conformance with the Clean Air Act of 1990)?	X	
(23)	Is the project anticipated to cause an increase in traffic volumes?		X
(24)	Will traffic be maintained during construction using existing roads, staged construction, or on-site detours?	X	
(25)	If the project is a bridge replacement project, will the bridge be replaced at its existing location (along the existing facility) and will all construction proposed in association with the bridge replacement project be contained on the existing facility?	X	

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

F. Additional Documentation Required for Unfavorable Responses in Part E

ITEM NO.

3. North Carolina Division of Marine Fisheries stated that anadromous fish are found in this section of Great Swamp. Therefore, an in stream work moratorium from February 15 to June 15 will be in effect. NCDOT will adhere to the "Stream Guidelines for Anadromous Fish Crossings."

4. The proposed project has avoided and minimized impacts to the wetlands to the extent possible. The project is replacing the existing bridge with a proposed bridge in the same location and approximate roadway elevation. The typical section is the minimal section that can safely be used for the functional classification of the roadway.

G. CE Approval

TIP Project No.	**B-4319**
State Project No.	**8.1332001**
WBS No.	**33656.1.1**
Federal Project No.	**BRSTP-222(2)**

Project Description:

This project proposes to replace Bridge No. 21 on NC 222 over Great Swamp in Wayne County (See Figure 1). The bridge will be replaced with a 95-foot long bridge at the existing location and approximate low chord elevation. The cross section of the new bridge will include two 12-foot lanes with 8-foot minimum offsets. The approach work will consist of earthwork, paving, some resurfacing and tying back into the existing roadway for approximately 320 feet to the west and 385 feet to the east. Guardrail will be installed where warranted. Traffic will be detoured offsite during construction (See Figure 1 and Section D, Studied Detour Route).

Categorical Exclusion Action Classification:

_____ TYPE II(A)
__X__ TYPE II(B)

Approved:

3-25-04 Teresa Hart
Date — Assistant Branch Manager
Project Development and Environmental Analysis Branch

3-25-04 William T. Goodwin
Date — Project Planning Unit Head
Project Development & Environmental Analysis Branch

3/25/04 Karen B. Capps, PE
Date — Project Development Engineer
Project Development & Environmental Analysis Branch

For Type II(B) projects only:

3/29/04 for Roddy G. Epps
Date — John F. Sullivan, III, PE, Division Administrator
Federal Highway Administration

PROJECT COMMITMENTS

Wayne County
Bridge No. 21 on NC 222 Over Great Swamp
Federal Aid Project No. BRSTP-222(2)
State Project No. 8.1332001
WBS No. 33656.1.1
T.I.P. No. B-4319

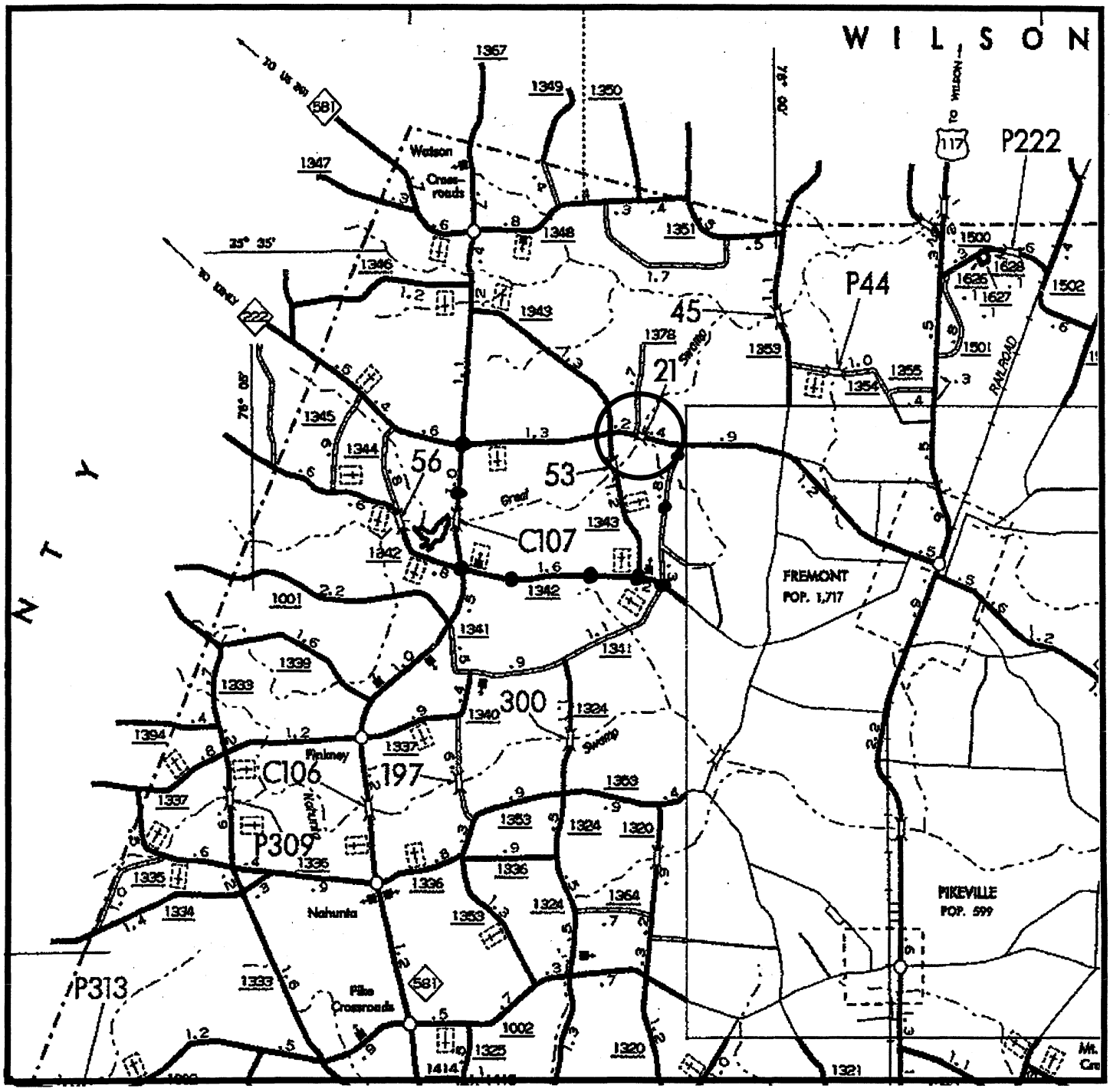
Division 1 Construction Engineer, Structure Design Unit, Project Development and Environmental Anaylsis Branch

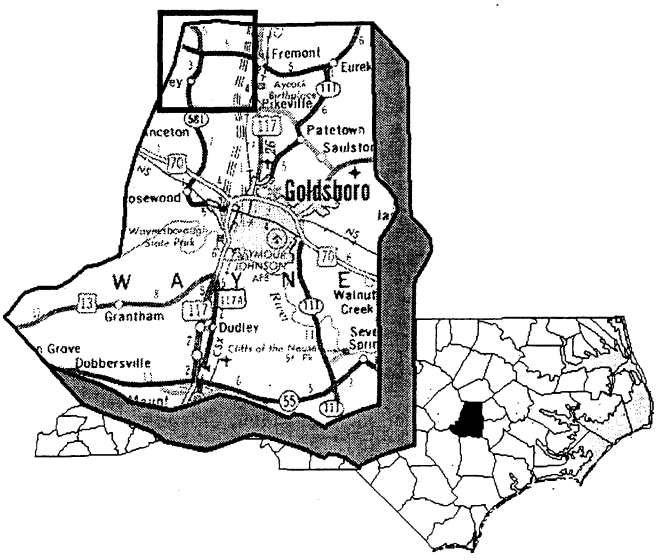
The proposed structure should be designed to facilitate top-down construction. If it is determined that top-down construction cannot be used, then additional coordination with the United States Army Corps of Engineers will be required.

No deck drains will be allowed to discharge directly into the Great Swamp.

Division 1 Construction Engineer, Structure Design Unit, Roadway Design Unit

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





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

WAYNE COUNTY
REPLACE BRIDGE NO. 21 ON NC 222
OVER GREAT SWAMP
B-4319

Figure 1

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

October 28, 2003

MEMORANDUM

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

FROM: David Brook for David Brook

SUBJECT: Replacement of Bridge No. 21 on NC 222 over Great Swamp, B-4319, Wayne County, ER03-0912

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

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

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

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

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

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

FINAL

NATURAL RESOURCES TECHNICAL REPORT

Replacement of Bridge No. 21
on NC 222 over Great Swamp
Wayne County, North Carolina
(B-4319)
(State Project No. 8.1332001)
(Federal Aid Project No. BRSTP-222(2))

NCDOT Consulting Project No. 02-LO-01

The North Carolina Department of Transportation
Raleigh, North Carolina

February 2003

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APPENDIX

1.0 INTRODUCTION

1.1 Project Description

This project includes the replacement of Bridge No. 21 on North Carolina Route (NC) 222 over Great Swamp in Wayne County, North Carolina (Figure 1). Bridge No. 21 is located approximately 1.5 miles (2.4 kilometers) west of the Town of Fremont, NC and approximately 1,450 feet (440 meters) east of the intersection of NC 222 and Aycock Dairy Farm Road (SR 1343).

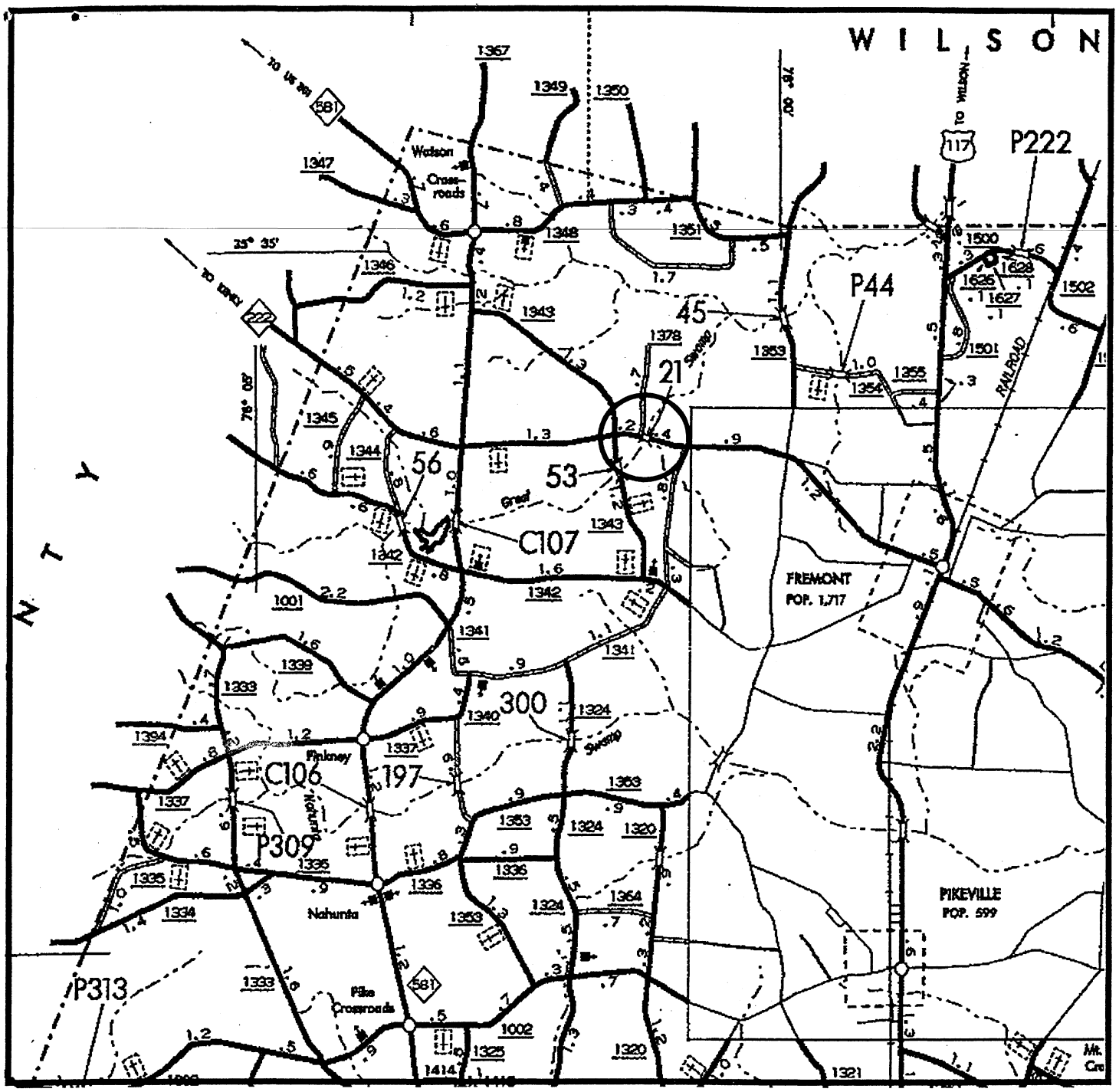
The existing bridge was built in 1962 and has a concrete deck on timber joists with timber caps and piles. The proposed project will replace the existing bridge with an undetermined structure. A temporary detour using Memorial Church Road (SR 1342) from Fremont, NC, and Aycock Dairy Farm Road (SR 1343) would eliminate the need for a temporary crossing during construction (Figure 2).

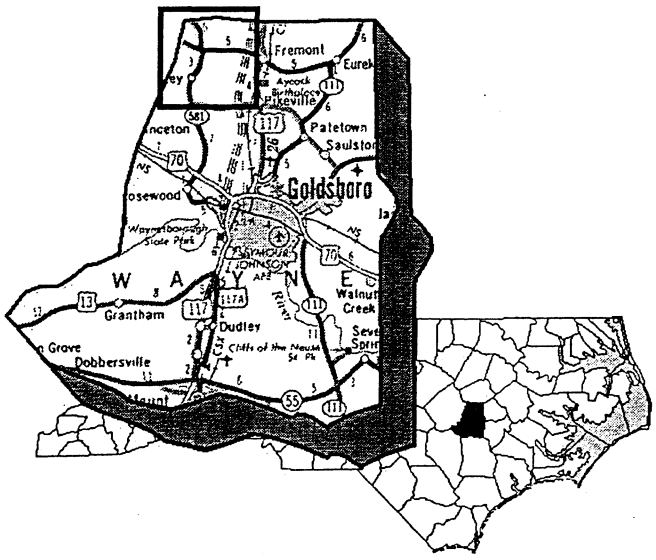
1.2 Definitions

A "bubble study" to obtain early environmental information for the project was undertaken since no alternatives for the replacement of the bridge have been developed at this time. The "bubble study" identifies a project study area around the existing structure to assist with the development of the project alternatives. The **project study area** is approximately 2,100 feet (640 meters) in length and approximately 500 feet (152 meters) in width. The **project vicinity** describes an area extending 0.5 mile (0.8 kilometer) on all sides of the project study area.

1.3 Purpose

The purpose of this Natural Resource Technical Report is to document this evaluation of existing natural resources in the project study area to assist with the development of project alternatives and the preparation of a Categorical Exclusion (CE). Specifically, the tasks performed for this report include: 1) an assessment of natural resource features within the project study area including descriptions of vegetation, wildlife, protected species, streams, wetlands, and water quality; 2) an evaluation of potential environmental impacts; 3) a preliminary assessment of on-site or adjacent mitigation potential; and 4) a preliminary determination of permit needs. The environmental impact analysis is based on potential impacts within the mapped project study area and does not take into account any specific limits for design, demolition, or construction.



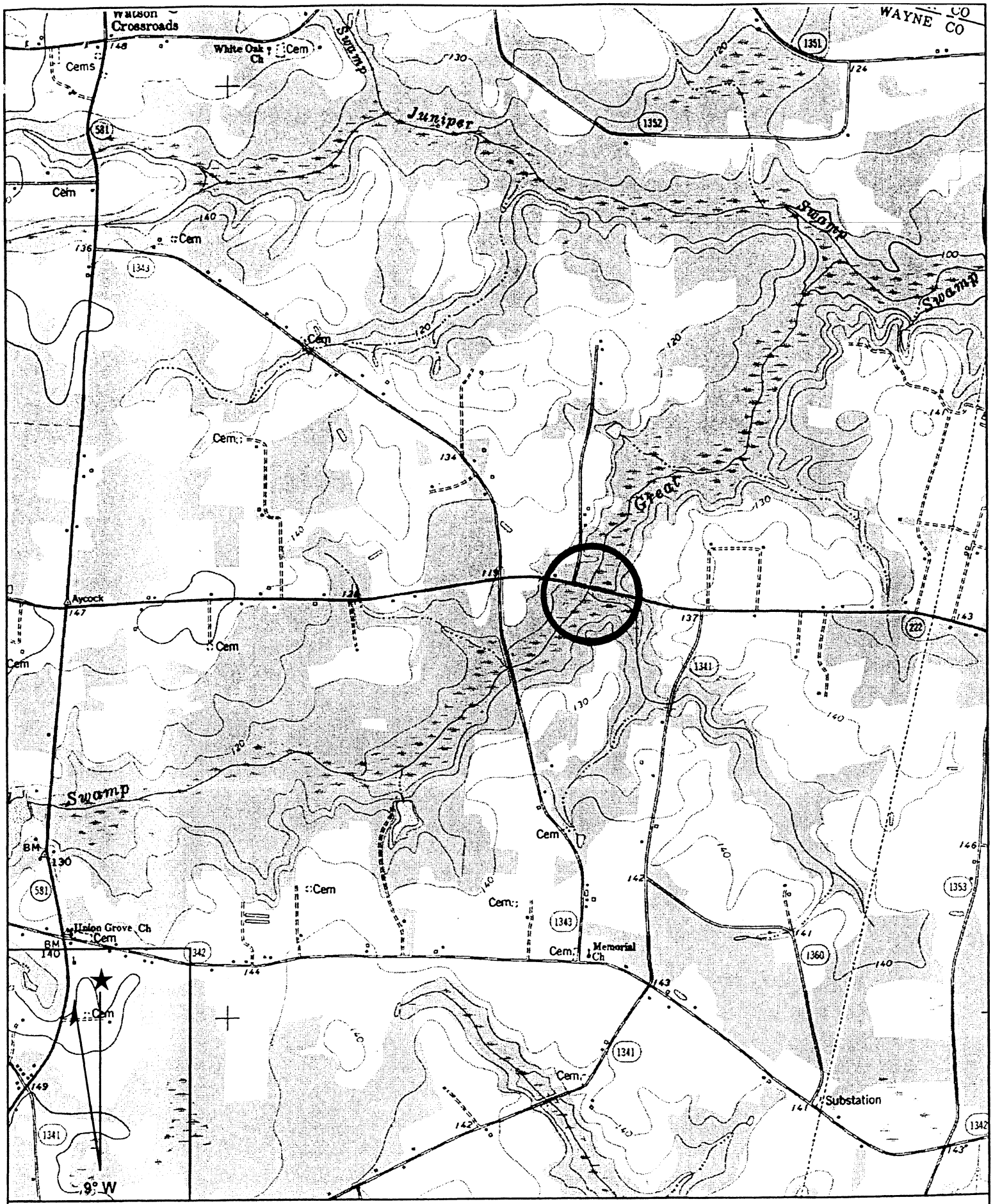


STATE OF NORTH CAROLINA · DEPARTMENT OF TRANSPORTATION

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

WAYNE COUNTY
REPLACE BRIDGE NO. 21 ON NC 222
OVER GREAT SWAMP
B-4319

Figure 1



Name: KENLY EAST
Date: 10/5/2001
Scale: 1 inch equals 2000 feet

Location: 035° 33' 37.1" N 078° 01' 37.2" W
Caption: B-4319

Figure 2

LOCHNER
H.W. LOCHNER, INC.
2840 PLAZA PLACE, SUITE 202
RALEIGH, NC 27612

FIGURE 3

REPLACEMENT OF BRIDGE NO. 21 ON NC 222 OVER GREAT SWAMP

STATE PROJECT NO. 8.1332001
T.I.P. NO. B-4319

- PAULSTRINE FORESTED WETLANDS (PFOIC)
- PAULSTRINE OPEN WATER WETLANDS (POW)
- PAULSTRINE SCRUB-SHRUB WETLANDS (PSSIC)
- PAULSTRINE EMERGENT WETLANDS (PEMIF)
- STREAM
- DIRECTION OF STREAM FLOW

1.4 Methodology

Data used in this investigation were obtained from a number of sources. The Kenly East, NC (1978), U.S. Geological Survey (USGS) 7.5-minute topographic map was reviewed to determine physiographic relief and to assess landscape characteristics. U.S. Fish and Wildlife Service (USFWS) National Wetlands Inventory (NWI) mapping was also reviewed to determine what wetland types may be encountered in the field. Recent aerial photography (1:2400 scale) taken in 2001 was also used in the evaluation of the study area.

An aerial photograph of the project area serves as the base for mapping plant communities and land uses. Plant community patterns were identified from available mapping sources and then field verified. Plant community descriptions are based on a classification system utilized by the North Carolina Natural Heritage Program (NHP) (Schafale and Weakley 1990). When appropriate, community classifications were modified to better reflect field observations. Vascular plant names typically follow nomenclature found in Radford *et al.* (1968).

Jurisdictional areas were identified using the three parameter approach (hydrophytic vegetation, hydric soils, wetland hydrology) following U.S. Army Corps of Engineers (USACE) delineation guidelines (DOA 1987). Jurisdictional areas were characterized according to a classification scheme established by Cowardin *et al.* (1979).

Water resource information for Great Swamp was derived from the *Neuse River Basinwide Water Quality Management Plan* (DWQ 2002) and the N.C. Division of Water Quality (DWQ) internet resources. Quantitative sampling was not undertaken to support existing data in the Management Plan.

The most current USFWS list (updated January 2003) of federally protected species with ranges extending into Wayne County was reviewed prior to initiation of the field investigation. In addition, NHP records (including those on the internet) documenting reported occurrences of federal and state listed species were consulted before commencing the field investigation (Amoroso 2001). Expected population distributions were determined through observations of available habitat and review of natural history and other documentation found in Martof *et al.* (1980), Webster *et al.* (1985), and Menhinick (1991).

1.5 Qualifications

Field investigations associated with this bridge replacement project (B-4319) were conducted on November 21, 2002. The H.W. Lochner Inc. environmental scientist team

for this project consisted of Ken Roeder Ph.D., Susan Smith, and Emily Fentress. Dr. Roeder is the lead Environmental Scientist and has a B.S degree in Forestry, a M.S. degree in Forest Genetics, and a Ph.D. in Forestry and Soils. He is a N.C. Licensed Soil Scientist and Registered Forester, a Certified Senior Ecologist, and has more than twenty years professional experience. Susan Smith is a Project Biologist with a B.S. degree in Forestry, a M.S. degree in Wildlife Management, and more than ten years of professional experience. Emily Fentress is a Staff Biologist with a B.S. degree in Biology and one year of professional experience.

2.0 PHYSICAL RESOURCES

The project study area is located in the Middle and Upper Coastal Plain Physiographic Province of the Atlantic Coastal Plain of North Carolina. The topography in the project study area is generally characterized as gently sloping to nearly level. Elevations in the project study area range from less than 120 to greater than 140 feet (36 to 43 meters) above mean sea level (USGS 1978). The project study area consists of existing maintained rights-of-way, mixed swamp forest, upland forest, rural residential, and agricultural areas. The project vicinity is rural residential/agricultural. Surrounding land uses include agricultural, rural residential, and forest/swamp lands.

There are old ponds, located in uplands, within the study area. One pond is located in a rural residential area on the north side of NC 222 near the intersection of NC 222 and Miller Road N.W. (SR 1378). The second pond is located on the south side of NC 222, surrounded by pine in an upland approximately 300 feet (90 meters) west of the existing bridge.

2.1 Soil

The project study area is located within the Johnston-Chewacla-Kinston and Norfolk-Goldsboro-Aycock soil associations (SCS 1974). Soil associations contain one or more mapping units occupying a unique natural landscape. The Johnston-Chewacla-Kinston association is found in the Great Swamp drainageway. The Norfolk-Goldsboro-Aycock association is in the surrounding uplands. Soil mapping units are named for the major soil series within the unit, but may contain minor inclusions of other soils. There are five soil mapping units mapped as present within the project study area. Two of these soil mapping units are listed as hydric soils (SCS 1991). These hydric soil units include Johnston loam (*Cumulic Humaquepts*) and Bibb sandy loam (*Typic Fluvaquents).* The remaining three non-hydric soil mapping units include: Wagram loamy sand (*Aernic Paleudults*) 0 to 6 percent slopes; Norfolk loamy sand (*Typic Paleudults)* 6 to 10 percent slopes; and Ruston sandy loam (*Typic Paleudults*) 2 to 6 percent slopes, eroded.

2.2 Water Resources

Stream Characteristics

Great Swamp is a blue-line perennial blackwater creek approximately 33 feet (10 meters) wide at the bridge and about 2 to 4 feet (0.6 to 1.2 meters) deep. Great Swamp flows to the northeast (Figure 2). The channel bottom appears to be typical of coastal plain blackwater creeks consisting of fine to sandy sediments and colored by organics. An unnamed tributary enters the study area from the southeast and flows into Great Swamp from the east (Figure 2). This tributary flows west parallel to NC 222 before joining Great Swamp and before flowing north under Bridge No. 21 (USGS 1978). Older Soil Conservation Service mapping shows this unnamed tributary flowing north under NC 222 before joining the Great Swamp north of the study area (SCS 1974). No abandoned stream channel is obvious.

The unnamed tributary is providing much of the flood waters in the area southeast of the bridge. North and south of the bridge the creeks were flooded over their banks, with surface waters flowing into mature swamp forest. Delineated wetlands directly abut NC 222, both east and west of the existing bridge site, and along the east side of Miller Road N.W. (SR 1378) (Figure 3).

The project study area is located within sub-basin 03-04-07 of the Neuse River Basin (DWQ 2002) and is part of the USGS hydrologic unit for the Contentnea (HUC No. 03020203) (USGS 1974). Great Swamp is a tributary of Black Creek, which is a tributary of Contentnea Creek, which flows into the Neuse River. Great Swamp is identified by Stream Index Number (SIN) 27-86-9-3 by the North Carolina Department of Environment and Natural Resources (DENR) (DENR 2002a) and is a blue-line stream recognized by USGS (1978). The Neuse River Basin is currently subject to vegetated riparian buffer requirements by the state.

A Best Usage Classification is assigned to waters of the State of North Carolina based on the existing or contemplated best usage of various streams or segments of streams in the basin. Great Swamp has been assigned a Best Usage Classification of **"C; Sw; NSW"** (DENR 2002a). The **C** designation indicates freshwaters designated for secondary recreation, fishing, aquatic life including propagation and survival, wildlife, and agriculture (15A NCAC 02B .0101(c)(1)). Secondary recreation is any activity involving human body contact with water on an infrequent or incidental basis. **Sw** (Swamp waters) and **NSW** (Nutrient Sensitive Waters) are supplemental classifications. **Sw** designates waters which have low velocities and other natural characteristics which are different from adjacent streams (15A NCAC 02B .0101(e)(2)). **NSW** are waters subject to growths of microscopic or macroscopic vegetation requiring limitations on nutrient inputs (15A NCAC 02B .0101(e)(3)).

No Outstanding Resource Waters (**ORW**), High Quality Waters (**HQW**), or Water Supply Waters (**WS-I**, or **WS-II)** occur within 3.0 miles (4.8 kilometers) upstream or downstream of the project study area. Great Swamp is not designated as a North Carolina Natural and Scenic River, or as a National Wild and Scenic River.

Water Quality Information

One method used by DWQ to monitor water quality is through long-term monitoring of macroinvertebrates (DEM 1989). There is a long-term macroinvertebrate monitoring station located on Great Swamp to the northeast of the project study area. However, this monitoring station is beyond 5.0 miles (8.0 kilometers) from the project study area (DENR 2002). Another measure of water quality being used by the DWQ is the North Carolina Index of Biotic Integrity (NCIBI), which assesses biological integrity using the structure and health of the fish communities. There are no NCIBI monitoring stations located on Great Swamp or within 5.0 miles (8.0 kilometers) upstream or downstream of the project study area (DENR 2002).

Section 303(d) Waters

Section 303(d) of the Clean Water Act (CWA) requires states to develop a list of waters not meeting water quality standards or which have impaired uses. A review of the 303(d) list for North Carolina indicates that Great Swamp in the Neuse River Basin is not listed as an impaired waterway (DWQ 2002).

Permitted Dischargers

Discharges that enter surface waters through a pipe, ditch, or other well-defined point of discharge are broadly referred to as "point sources." Wastewater "point source" discharges include municipal (city and county) and industrial wastewater treatment plants, and small domestic wastewater treatment systems serving schools, commercial offices, residential subdivisions and individual homes (DWQ 2002). Storm water "point source" discharges include storm water collection systems for municipalities and storm water discharges associated with certain industrial activities. "Point source" dischargers in North Carolina must apply for and obtain a National Pollutant Discharge Elimination System (NPDES) permit. Discharge permits are issued under the NPDES program, delegated to DWQ by the Environmental Protection Agency (EPA). The only permitted "point source" discharger located on Great Swamp is Memorial Church Road Water Treatment Plant (DENR 2002b), which is located approximately 2.1 miles upstream of the project study area.

Sources of "non-point source" pollution within the project study area include storm water runoff from existing roads and other impervious surfaces.

Essential Fish Habitat

In 1996 the Magnuson-Stevens Fishery Conservation and Management Act mandated the identification of Essential Fish Habitat (EFH) for managed species as well as measures to conserve and enhance the habitat necessary for fish to carry out their life cycles. Under this Act EFH is defined as:

> *"those waters and substrate necessary to fish for spawning, breeding, or growth to maturity"* (16 USC 1802(10)).

In North Carolina, EFH includes off shore areas as well as inland water habitats used by anadromous fish species, including Wayne County.

Impacts to Water Resources

Section 402-2 of NCDOT's *Standard Specifications for Roads and Structures* is labeled Removal of Existing Structure. This section outlines restrictions and Best Management Practices (BMPs) for Bridge Demolition and Removal, as well as guidelines for calculating maximum potential fill in the stream resulting from demolition. Bridge No. 21 is composed of timber and steel. The bridge is 51 feet (16 meters) long with a clear deck width of 25 feet (7 meters). The superstructure will be removed without dropping it into "Waters of the United States." Since the substructure consists of timber, this will also be removed without dropping any portion into "Waters of the United States." The replacement of Bridge No. 21 can be classified as a Case 2 by the BMPs for Bridge Demolition and Removal (NCDOT 1999). Case 2 bridge replacements allow no work at all in the water during moratorium periods associated with fish migration, spawning, and larval recruitment into nursery areas. All work potentially affecting the resource will be carefully coordinated with the agency having jurisdiction.

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

It is recommended that there be no temporary fill associated with demolition and removal of the superstructure and substructure. In-stream demolition and construction activities should be scheduled to avoid and minimize impacts to aquatic resources and organisms.

Other impacts to water quality could include changes in water temperature and storm water flow. Changes in water temperature result from increased exposure to sunlight due to the removal of stream-side vegetation or increased shade due to the construction of the bridge. Changes in storm water flows could occur due to changes in the amount of impervious surface adjacent to the stream channels if roadway or bridge surface area increases.

3.0 BIOTIC RESOURCES

3.1 Terrestrial Community

Existing Vegetation Patterns

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. Agriculture, logging, selective cutting, reforestation, and other forestry practices have resulted in the present vegetative patterns. Two natural plant communities occur within the project study area and three additional communities resulting from human activities have been identified. These communities total approximately 22.0 acres (8.9 hectares) and do not include any open water attributed to Great Swamp [0.4 acre (0.2 hectare)] or impervious road surface [1.4 acres (0.6 hectare)].

The plant communities and land uses within the project study area were mapped on an aerial photograph base and field verified (Figure 3). A summary of the coverage of each plant community and land use within the project study area is presented in Table 1.

Table 1. Plant Communities and Land Uses occurring within the Project Study Area for Bridge No. 21 (TIP B-4319).

Plant Community/Land Use	Study Area (acres)/(hectares)	Percent of Project Study Area
Cypress-Gum Swamp (Blackwater Subtype)	9.9/4.0	45%
Mesic Mixed Hardwood Forest (Coastal Plain Subtype)	1.4/0.6	6%
Agricultural Lands	3.8/1.5	17%
Cutover and Successional Lands	3.6/1.5	17%
Rural Residential/ Maintained/Disturbed Land	3.3/1.3	15%
Totals:	22.0/8.9	100%

Cypress-Gum Swamp (Blackwater Subtype)

The Cypress-Gum Swamp (Blackwater Subtype) forest (Schafale and Weakley 1990) occupies approximately 9.9 acres (4.0 hectares) [45 percent] of the project study area. This plant community type typically occurs in backswamps, sloughs, swales, and featureless floodplains of blackwater rivers. Hydrologically this type is palustrine, seasonally to semipermanently flooded. They have highly variable flow regimes with floods of short duration and periods of very low flow. Waters tend to be very acidic, low in mineral sediment and nutrients, and colored by tannins but relatively clear. This community is located both north and south of NC 222.

The Cypress-Gum Swamp (Blackwater Subtype) is typically dominated by tupelo (*Nyssa biflora*) and baldcypress (*Taxodium distichum*). The understory and shrub layer is usually poorly developed. Carolina ash, (*Fraxinus caroliniana*), tupelo (*Nyssa biflora*), and red maple (*Acer rubrum*) are the most typical species present in the shrub layer. Shrub species may also include swamp cyrilla (*Cyrilla racemiflora*), summersweet clethra (*Clethra alnifolia*), and fetterbush (*Lyonia lucida*). The herbaceous layer ranges from nearly absent to moderate cover. Species may include lizard's-tail (*Saururus cernuus*), giant sedge (*Carex gigantea*), water smartweed (*Polygonum amphibium*), and netted chain-fern (*Woodwardia areolata*). Spanish moss (*Tillandsia usneoides*) and resurrection fern (*Polypodium polypodioides*) are often common.

Mesic Mixed Hardwood Forest (Coastal Plain Subtype)

The Mesic Mixed Hardwood Forest (Coastal Plain Subtype) (Schafale and Weakley 1990) occupies approximately 1.4 acres (0.6 hectare) [6 percent] of the project study area. This plant community type is typically found on areas protected from fire, primarily on north-facing river bluffs and ravine slopes, less commonly on upland flats or islands surrounded by peatland or swamp communities. Mesic Mixed Hardwood Forests generally occur on sites that are sheltered by topography and moisture from fires. Under natural conditions these forests are uneven-aged, with old trees present. Reproduction occurs primarily in canopy gaps. Rare severe natural disturbances such as wind storms or severe fires may allow pulses of increased regeneration and allow the less shade-tolerant species to remain in the community. Disturbed areas have increased amounts of pine and weedy hardwoods such as yellow poplar (*Liriodendron tulipifera*) and sweetgum (*Liquidambar styraciflua*). Like floodplain forests, some of these communities are susceptible to invasion by exotic species such as Japanese honeysuckle (*Lonicera japonica*). Mesic Mixed Hardwood Forests usually border Coastal Plain Bottomland Forests, Cypress-Gum Swamp, or Small Stream Swamp on the lower elevation side.

In the study area for Bridge No. 21 over Great Swamp (B-4319), this community type is located upslope on the rolling terrace above the creek bottom where Cypress-Gum Swamp dominates. These areas are highly disturbed and have historically been cut-over several

times as seen in their current state. In some cases, pine plantations have replaced natural hardwoods.

The Mesic Mixed Hardwood Forest (Coastal Plain Subtype) is naturally dominated by various mixtures of mesophytic species of trees such as beech (*Fagus grandifolia*), yellow poplar (*Liriodendron tulipifera*), southern sugar maple (*Acer floridianum*), white oak (*Quercus alba*), red oak (*Q. rubra*), and sweetgum (*Liquidambar styraciflua*). Species such as swamp chestnut oak (*Q. michauxii*), cherrybark oak (*Q. pogoda* (*falcada* var. *pagodaefolia*), and shagbark hickory (*Carya ovata*), more typical of bottomland hardwood communities or non-riverine wet hardwood forests, are sometimes abundant. Dry community species such as white oak (*Q. alba*), Spanish oak (*Q. falcata*), and several hickory (*Carya* spp.) species can also be abundant at times. Understory species commonly include flowering dogwood (*Cornus florida*), American holly (*Ilex opaca*), hop-hornbeam (*Ostrya virginiana*), sourwood (*Oxydendrum arboretum*), ironwood (*Carpinus caroliniana*), red maple (*Acer rubrum*), and swamp red bay (*Persea palustris*).

Agricultural Lands

Agricultural Lands occupy approximately 3.8 acres (1.5 hectares) [17 percent] of the project study area. This plant community type is man-created and not identified as a natural community type by Schafale and Weakley (1990). Identified agricultural lands in the project study area consist of fields which were used to produce tobacco and soybeans during the 2002 growing season. There are also pasture lands included with this type.

Cutover and Successional Lands

Cutover and Successional Lands occupy approximately 3.6 acres (1.5 hectares) [17 percent] of the project study area. This plant community type is man-created and not identified as a natural community type by Schafale and Weakley (1990). In the project study area these cutover lands were previously vegetated by Mesic Mixed Hardwood Forest (Coastal Plain Subtype). The cutover is very recent. The area will be colonized by early successional herbaceous species during the spring of 2003 growing season.

Rural Residential/Maintained/Disturbed Lands

Rural Residential/Maintained/Disturbed Lands cover approximately 3.3 acres (1.3 hectares) [15 percent] of the study area. This plant community type (land use type) is man-created and not identified as a natural community type by Schafale and Weakley (1990). Rural Residential/Maintained/Disturbed areas include roadways, roadsides, maintained residential yards, sewerline corridors, and areas where other human related activities dominate the landscape. Roadsides and sewerlines are typically maintained by mowing and/or herbicides. Vegetation within this type is diverse and has not been specifically identified. Species observed within the road rights-of-way include blackberry (*Rubus* spp.), trumpet creeper (*Campsis radicans*), lespedeza (*Lespedeza cuneata*), white clover (*Trifolium*

repens), and other various roadside grasses. Residential areas are dominated by loblolly pine (*Pinus taeda*), numerous ornamental plants, and various grasses.

Terrestrial Wildlife

The project study area was visually surveyed for signs of terrestrial wildlife. The only evidence of mammals in the area was the presence of deer stands, used for hunting white-tail deer (*Odocoileus virginianus)*. Other mammals expected to occur in and around the project study area include Virginia opossum (*Didelphis virginiana*), raccoon (*Procyon lotor*), and eastern cottontail (*Sylvilagus floridanus*), as well as rodents such as beaver (*Castor canadensis*), gray squirrel (*Sciurus carolinensis*), white-footed mouse (*Peromyscus leucopus*), and golden mouse (*Ochrotomys nuttalli*). Insectivores such as eastern mole (*Scalopus aquaticus*), southeastern shrew (*Sorex longirostris*), and northern short-tailed shrew (*Blarina brevicauda*) may also be present in the project study area. No terrestrial reptiles were seen, but the following species are expected to occur in the project area: five-lined skink (*Eumeces fasciatus*); broadhead skink (*Eumeces laticeps*); fence lizard (*Sceloporus undulatus*); eastern box turtle (*Terrapene carolina*); copperhead (*Agkistrodon contortrix*); black racer (*Coluber constrictor*); and rat snake (*Elaphe obsoleta*). No terrestrial or arboreal amphibians were observed within the project area, but species expected to occur in the area include pickerel frog (*Rana palustris*), Fowler's toad (*Bufo woodhouseii*), and spring peeper (*Pseudacris crucifer*).

No birds were observed during the field assessment. Avian species expected to inhabit the study area include American Crow (*Corvus brachyrhynchos*), Turkey Vulture (*Cathartes aura*), Eastern Bluebird (*Sialia sialis*), American Robin (*Turdus migratorius*), and Northern Cardinal (*Cardinalis cardinalis*). Other common species likely to occur in the project area include Mourning Dove (*Zenaida macroura*), Blue Jay (*Cyanocitta cristata*), Northern Mockingbird (*Mimus polyglottos*), Carolina Wren (*Thryothorus ludovicianus*), Carolina Chickadee (*Poecile carolinensis*), Pileated Woodpecker (*Dryocopus pileatus*), Hairy Woodpecker (*Picoides villosus),* Downy Woodpecker (*Picoides pubescens*), and Red-shouldered Hawk (*Buteo lineatus*).

Most of the terrestrial wildlife species occurring in the project study area are typically adapted to life in fragmented landscapes. Vegetated water courses (or drainageways) provide important wildlife corridors by connecting and allowing travel between habitat fragments. Keeping the bridge replacement within the existing road corridor of the stream crossing would minimize potential impacts to wildlife. A wider and higher opening under the new bridge structure would also enhance wildlife movement at this stream crossing.

3.2 Aquatic Community

Great Swamp and the unnamed tributary flowing from the southeast provide the only aquatic habitat located within the immediate project study area. No distinct areas containing significant amounts of aquatic vegetation were observed in the channel during the field assessment.

A visual survey of the stream banks and channel associated with Great Swamp within the project study area was conducted to document the aquatic community. Seasonably high water, however, restricted access and limited visibility for assessments.

Aquatic Wildlife

Fish sampling was not conducted in any of the surface waters within the project study area. Species expected to occur in Great Swamp include American eel (*Anguilla rostrata*), redfin pickerel (*Esox americanus*), golden shiner (*Notemigonus crysoleucas*), satinfin shiner (*Notropis analostanus*), creek chubsucker (*Erimyzon oblongus*), margined madtom (*Noturus insignis*), and tadpole madtom (*Noturus gyrinus*).

Although Menhinick (1991) does not document anadromous fish species as occurring in the project study area, past sampling of other area creeks indicate that anadromous fish species use this part of the Neuse River Basin for spawning and as nursery areas (Personal Communication, Shawn McKenna, NC Division of Marine Resources). Anadromous species expected to occur here include herring and shad (*Alosa* spp.).

Great Swamp most likely provides riparian and benthic habitat for a variety of amphibians and aquatic reptiles. High water following precipitation events dominated the study site during field assessments in November 2002. No sampling for amphibians was undertaken. No amphibians or aquatic reptiles were found in the course of the survey for other biotic factors. Aquatic herpetofauna expected to occur in the project study area include northern dusky salamander (*Desmognathus fuscus*), green frog (*Rana clamitans*), pickerel frog (*Rana palustris*), and common snapping turtle (*Chelydra serpentina*).

Although none were observed, aquatic avian species expected to utilize this portion of Great Swamp and its unnamed tributary include Wood Duck (*Aix sponsa*), Mallard (*Anas platyrhynchos*), Canada Goose (*Branta canadensis*), and Great Blue Heron (*Ardea herodias*).

No in-stream benthic macroinvertebrate surveys were conducted. All streambanks in the study area were visually surveyed to locate freshwater mussel middens or other indicators of benthic macroinvertebrates. Visual observation of Great Swamp and its streambanks revealed no evidence of benthic macroinvertebrates. This may be due to the time of year that the work was completed.

3.3 Summary of Anticipated Impacts

Terrestrial Communities

An in-place replacement of the existing structure will reduce permanent impacts to plant communities and limit further community fragmentation. Impacts resulting from in-place bridge replacements are generally limited to narrow strips at or adjacent to the existing bridge structure and roadway segments. Potential impacts to plant communities within the project study area would therefore be limited to areas at the bridge and immediately adjacent to the road.

The least amount of impacts to terrestrial communities will occur if the bridge is replaced along the center line of the existing bridge. The Cypress-Gum Swamp (Blackwater Subtype) forest community will potentially receive the largest area of impacts if the alignment is shifted. If the alignment is shifted north, approximately 450 linear feet (140 meters) of Cypress-Gum Swamp (PFO and PSS wetlands) may be exposed to impacts. There is also a power line right-of-way running along the north side of the road here. If the alignment is shifted south, approximately 1,100 linear feet (325 meters) of Cypress-Gum Swamp may be exposed to impacts. There is an excavated farm pond on each side of NC 222, west of the bridge site. These ponds are in areas classified as Rural Residential/Maintained/Disturbed. Both of these ponds are equally vulnerable if the road is shifted off the centerline.

Wildlife expected to utilize the project study area are generally acclimated to fragmented landscapes. Designing the new bridge on the existing alignment would limit impacts to near current levels. Shifting the bridge location slightly north or south would not extensively further fragment the habitat. If the current size opening under the bridge is maintained, access for wildlife movement will be maintained at current levels. Any design options which increase the under-bridge opening over the current size should be considered to enhance wildlife movement. Reduction of opening size will reduce access for movement by some species. Animals are also crossing the road in this area.

Aquatic Communities

Potential impacts to downstream aquatic habitat would be avoided by bridging Great Swamp to maintain normal flow and stream integrity. Support structures should be designed to avoid wetland or open water habitats whenever possible. In addition, temporary impacts to downstream habitat from increased sedimentation during demolition and construction are expected to be reduced by limiting in-stream work to an absolute minimum. Removal of the portion of the substructure in the creek bottom should be avoided if possible. If a small cofferdam is used to redirect stream flow away from where demolition and construction of the bridge abutments and piers is occurring, the stream bottom should be restored immediately following completion of construction activities.

Waterborne sediment flowing downstream can be minimized by use of a floating silt curtain. Stockpiled material should be kept a minimum of 50 feet (15 meters) from this stream channel. Silt fences should also be erected around any stockpiled material in order to minimize the chance of erosion or run-off from affecting the stream channel. Bridge Demolition and Removal (BDR) will follow current NCDOT Guidelines. Best Management Practices (BMPs) for the protection of surface waters should be strictly enforced to reduce impacts during all construction phases.

Aquatic wildlife including transient and resident species may be temporarily displaced during bridge demolition and construction. Anadromous fish species have been documented to use this part of the river basin for spawning and as a nursery area (Personal Communication, Shawn McKenna, NC Division of Marine Resources). A moratorium on in-water work extends from February 15 to September 30.

4.0 JURISDICTIONAL TOPICS

4.1 Waters of the United States

Wetlands

Water bodies such as rivers, lakes, and streams are subject to jurisdictional consideration under the Section 404 program of the Clean Water Act (CWA). Additionally, wetlands are also classified as "Waters of the United States" and are subject to jurisdictional consideration. Wetlands have been defined by EPA and USACE as:

> *"Those areas that are inundated or saturated by groundwater at a frequency and duration sufficient to support, and under normal circumstances do support a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas"* [33 CFR 328.3(b)(1986)].

Wetlands subject to review under Section 404 of the CWA (33 U.S.C. 1344) are defined by the presence of three primary criteria: hydric soils, hydrophytic vegetation, and evidence of hydrology at or near the surface for a portion (12.5 percent) of the growing season (DOA 1987).

Salt and brackish water wetlands are defined under The Coastal Area Management Act (CAMA) (15A NCAC 07A). Under these regulations, Wayne County is not identified as a coastal county where coastal wetlands occur and the CAMA regulations are not applicable to this project site.

The NWI mapping (USFWS 1978) for this segment of Great Swamp identifies wetlands adjacent to the creek throughout the study area. These wetlands are identified as palustrine, forested, broad-leaved deciduous, seasonally flooded (PFO1C) (Cowardin *et al.* 1979). Additionally, the two "farm" ponds in the uplands are not identified or classified. The field assessment identified additional NWI wetlands in the project study area as palustrine, scrub-shrub, broad-leaved deciduous, seasonally flooded (PSS1C), palustrine, emergent, persistent, semipermanently flooded (PEM1F), and palustrine, open water (POW) (Cowardin *et al.* 1979). Two excavated "farm" ponds in uplands were also identified in the project study area. One pond is in a wooded residential area adjacent to PFO1C wetlands and a residence south of NC 222. The other excavated "farm" pond, north of NC 222 and west of SR 1378, was not delineated and is located on a residential property.

Some of the POW wetlands may be a function of the high waters present during the time (November 2002) of assessment. The PFO1C wetlands (Cowardin *et al.* 1979) are comprised of the Cypress-Gum Swamp (Blackwater Subtype) forest community type (Schafale and Weakley 1990) discussed previously.

The H.W. Lochner team delineated the extent of the jurisdictional wetland boundaries based on current COE methodology (DOA 1987), and the wetland/non-wetland boundaries were subsequently located with Trimble™ Global Positioning System (GPS) units (Exhibit A). A map of delineated wetland areas, a list of GPS point coordinates, and the Wetland Field Data Forms are provided in the Appendix. The wetland areas comprise approximately 9.4 acres (3.8 hectares) of the project study area. The PFO1C wetlands (DWQ Wetland Rating Score 79) total approximately 3.8 acres (1.5 hectares), the PSS1C wetlands (DWQ Wetland Score 50) total 2.8 acres (1.1 hectares), the PEM1F wetlands (DWQ Wetland Score 57) total 1.0 acre (0.4 hectare) and the POW wetlands total 1.8 acres (0.7 hectare).

Jurisdictional Streams

Great Swamp is classified as a palustrine system (Cowardin *et al.* 1979). Palustrine systems are identified as those non-tidal wetlands that are dominated by trees, shrubs, persistent emergents, emergent mosses, or lichens, and all such tidal wetlands where the ocean-derived salinities are below 0.5 parts per thousand (ppt). This category of non-tidal wetlands also includes wetlands that: a) lack such vegetation; b) occupy less than 20 acres (8 hectares) in area; and c) lack a wave formed or bedrock boundary. These wetlands can also occupy a basin where the deepest part is less than 6 feet (2 meters) at low water and where the ocean-derived salinities are below 0.5 parts per thousand (ppt). Slow moving creeks originating in the Coastal Plain are also referred to as blackwater creeks due to the amounts of tannins and other organics that make their waters tea colored.

Cowardin Classification

U.S. Geological Survey classifies Great Swamp as a blue-line perennial stream (USGS 1978) with slow flow over substrate consisting of fine sediments, sand, and gravel. The channel ranges from approximately 20 to 30 feet (6 to 10 meters) in width within the project study area. Perennial systems in the Coastal Plain generally have slow flowing water and are generally associated with well-developed swamps and floodplains which may flood temporarily, intermittently, seasonally, semipermanently, or permanently The waters of Great Swamp are classified as palustrine, forested, broad-leaved deciduous, seasonally flooded (PFO1C) (Cowardin *et al.* 1979). The field assessment identified additional areas of adjacent wetlands of Great Swamp as palustrine, scrub-shrub, broad-leaved deciduous, seasonally flooded (PSS1C), palustrine, emergent, persistent, semipermanently flooded (PEM1F), and palustrine, open water (POW) (Cowardin *et al.* 1979).

No channelization of this creek was obvious at the time of assessment in November 2002 other than the areas immediately adjacent to the bridge. However, it appears that the unnamed tributary may have been relocated and may be channelized south and parallel to NC 222. Great Swamp has a well developed floodplain on both the north and south sides of the roadway. At this time of high seasonal precipitation and water flow, the creek was flooding the swamp forest community both upstream and downstream of the bridge.

Natural Stream Channel Classification

The Natural Stream Channel Classification System uses several definitive criteria for classification: 1) number of channels associated with a stream; 2) slope; 3) width-to-depth ratio; 4) entrenchment ratio; 5) sinuosity; and 6) bed material (Rosgen 1996). This classification system uses the first five criteria to assign one of eight channel types to a reach of a stream. The eight types are designated A, B, C, D, DA, E, F, and G. Use of the Natural Stream Channel Classification System for a Level 1 classification requires the identification of several features in the field including bankfull width and depth (the stage at which the controlling channel forming flow occurs), slope, sinuosity, and valley morphology.

At the time of assessment in November 2002 the water in the creek was seasonally high. As a result, some of the classification criteria were estimated in order to determine the Level 1 Rosgen Stream Type. Rosgen methodology allows estimates of stream type to be made from calculations from USGS mapping and field observations and measurements when they are possible to obtain. Estimates of stream type were therefore made from measurements taken on USGS mapping of the bridge crossing site. Where possible, the stream channel was traversed to identify any significant changes in channel type both upstream and downstream of the bridge. Estimates of bankfull channel width and depth were made at selected locations to verify channel type.

Preliminary observations within the project study area indicate that at the Great Swamp bridge crossing site, a "C" type stream segment is found in the project study area (Rosgen 1996). "C" Stream Type segments have a gently sloped, relatively wide and shallow, entrenched channel with moderate to high sinuosity, and are characterized by an active, well developed floodplain and a meandering channel. This channel segment has a well developed and active floodplain at the bridge location.

Anticipated Impacts to Waters of the United States

Estimated wetland area is based upon identification of the wetland/non-wetland boundaries by field delineation described above and aerial photography interpretation; however, the total wetland acreage is based upon the GPS mapping results and the approximately defined project study limits shown in Figure 3. Wetlands extend along both sides of the NC 222 right-of-way. Shifting the bridge alignment north or south could result in wetland impacts from the road realignment. North of NC 222, wetlands extend approximately 500 linear feet (150 meters), while the wetlands south of the road extend approximately 1,100 linear feet (335 meters) (Figure 3).

Temporary impacts include those impacts that will result from temporary demolition and construction activities associated with staging areas and/or temporary detours. These temporary impact areas will be restored to their original condition after the project has been completed. Permanent impacts are those areas that will be in the final construction limits and/or the final right-of-way of the new structure and approaches.

No temporary crossing of Great Swamp during demolition and construction appears necessary. During the construction period, a detour of traffic along Memorial Church Road (SR 1342) from Fremont, NC, and Aycock Dairy Farm Road (SR 1343) may be feasible. An assessment of these routes may be necessary, however, to ensure that they can handle the additional traffic volumes.

4.2 Permits and Consultations

The design and construction of the proposed project will determine if any impacts to surface waters and jurisdictional wetlands will occur. If impacts occur, permits and certifications will be required from various regulatory agencies in charge of protecting the water quality of public water resources. Surface water systems and wetlands receive similar protection and consideration from the regulatory agencies. These permits are authorized under the CWA and are under separate state laws regarding significant water resources.

Section 404 Permits

In accordance with provisions of Section 404 of the CWA (33 U.S.C. 1344), a permit will be required from the USACE for the discharge of dredged or fill material into "Waters of the United States." Potential impacts to "Waters of the United States" may be avoided if the wetlands are bridged, no disturbance to the wetlands occurs during construction activities, and bridge demolition does not result in material falling into the wetlands.

It is anticipated that this proposed project will qualify as a CE under National Environmental Policy Act (NEPA) and Federal Highway Administration (FHWA) guidelines. Categorical Exclusions can be prepared for projects with no significant impact to the human and natural environment. If permits are required under the CWA, it is expected that the project will qualify for a Nationwide or General Permit.

Nationwide Permit (NWP) No. 23 [33 CFR 330.5(a)(23)] is issued by the USACE for projects having minor impacts. In the event that NWP No. 23 will not suffice, minor impacts attributed to bridging and associated approach improvements are expected to qualify under a Regional General Bridge Permit designated for NCDOT bridges (Permit No. 031) issued by the Wilmington USACE District (USACOE-WD 1998). Notification to the Wilmington USACE office is required if this general permit is to be utilized. Nationwide Permit No. 33 may be required if temporary construction including cofferdams, access, and dewatering are required for this project. The USACE will determine final permit requirements.

Water Quality Certification

This project will also require a 401 Water Quality General Certification from the DWQ prior to the issuance of a Section 404 Nationwide Permit. Section 401 of the CWA requires that the state issue or deny water quality certification for any federally 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.

Potential impacts to open water areas will be limited to the actual right-of-way width and will be determined by NCDOT during the design phase of this project. Impacts to open water areas of Great Swamp are not expected due to the use of channel-spanning structures. During bridge removal procedures, NCDOT's BMPs will be utilized, including erosion control measures. Floating turbidity curtains are also recommended to minimize the amount of turbid water flowing off-site.

Riparian Buffers

North Carolina rules are in place for the protection and maintenance of riparian buffers in the Neuse River Basin (15A NCAC 02B .0233). These rules require wooded buffers of 50 feet (15.3 meters) along all blue-line stream channels in this river basin. In order to impact these buffers there must be a demonstrated "no practical alternative" and an *Authorization Certificate* pursuant to 15A NCAC 2B .0259 must be obtained for a proposed use that is designated as allowable with mitigation. It is also possible within the rules to obtain a variance (15A NCAC 2B .0259) or to pay into a state Riparian Buffer Restoration Fund. Great Swamp is a blue-line stream in the Neuse River Basin and is subject to these rules (Figure 2).

Section 9

Bridge construction or replacement over navigable waters may require United States Coast Guard Service (USCGS) authorization pursuant to 33 CFR 114-115. 33 CFR 115.70 gives

> *"advanced approval to the location and plans of bridges to be constructed across reaches of waterways navigable in law, but not actually navigated other than by logs, log rafts, rowboats, canoes and small motorboats. In such cases the clearances provided for high water stages will be considered adequate to meet reasonable needs of navigation".*

The open water area of Bridge No. 21 over Great Swamp is small in size and would be given advanced approval by the USCGS.

4.3 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 CFR 1508.20 (a-e)]. Mitigation of wetland impacts is recommended in accordance with Section 404(b)(1) Guidelines of the CWA (40 CFR 230), FHWA step-down procedures (23 CFR 777.1 *et seq.*), mitigation policy mandates articulated in the USACE/EPA Memorandum of Agreement (MOA), Executive Order 11990 (42 FR 26961) (1977), and USFWS mitigation policy directives (46 FR 7644-7663) (1981).

Section 404(b)(1) Guidelines, the USACE/EPA MOA, and Executive Order 11990 stress avoidance and minimization as primary considerations for protection of wetlands. Practicable alternatives analysis must be fully evaluated before compensatory mitigation can be discussed.

Federal Highway Administration policy stresses that all practicable measures should be taken to avoid or minimize harm to wetlands which will 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 – Surface waters and jurisdictional wetland areas are present within the project study area. Potential wetland and stream impacts are discussed in Section 4.1. Actual impacts to surface waters and jurisdictional wetland areas will be addressed when alternatives are developed. It may not be possible to avoid all impacts to jurisdictional areas. Impacts can be avoided to specific wetlands and streams with the use of environmentally sensitive design. Impacts to the jurisdictional surface waters can be avoided by bridging the stream channel, avoiding construction activities in the stream channels, and avoiding deposition into the stream channel during bridge demolition and construction.

Minimization – Impacts to the stream can be minimized by designing support structures to avoid wetland or open water habitats whenever possible. The jurisdictional delineation within the project study area will be utilized to further minimize wetland and stream impacts when designing the proposed alignment within the project study area. Minimization of jurisdictional impacts can be achieved by the replacement of a bridge in-place and utilizing as much of the existing bridge corridor as possible. This should result in a minimal amount of new impact depending on the final design of the new bridge. Utilization of BMPs is recommended in an effort to minimize impacts, including avoiding placing staging areas within wetlands.

Compensatory mitigation – Impacts to surface waters and jurisdictional wetland areas are not known at this time. Impacts associated with the project could be mitigated by replanting disturbed areas with native species and removal of any temporary fill material within the floodplain upon project completion. If impacts are greater than 0.1 acre (0.04 hectare) compensatory mitigation may be required, and if impacts are greater than 0.5 acre (0.2 hectare) compensatory mitigation is mandatory.

North Carolina Riparian Buffers - Unavoidable impacts to stream buffers require mitigation on the basis of 3:1 or 1.5:1 depending on the zone in the buffer that the impact occurred. Mitigation may consist of payment of a compensatory mitigation fee into the state Riparian Buffer Restoration Fund, donation of real property, or restoration or enhancement of a non-forested riparian buffer.

Potential mitigation opportunities - An on-site stream restoration opportunity may also be present northeast of Bridge No. 21. This area may be the historic site of a stream segment of the unnamed tributary currently connecting with Great Swamp south of NC 222.

A wetland enhancement opportunity may exist south of NC 222. There are areas here where baldcypress (*Taxodium distichum*) could be planted in the flooded palustrine scrub-shrub and emergent communities to extend the Cypress-Gum Swamp (Blackwater Subtype) community successionally.

In the project study area, Great Swamp has adequate wooded riparian buffers of the required minimum size. It does not appear that on-site opportunities for riparian buffer mitigation exist within the study area.

4.4 Protected Species

Species with the federal classification of Endangered (E) or Threatened (T), or Officially Proposed (P) for such listing, are protected under the Endangered Species Act (ESA) of 1973, as amended (16 U.S.C. 1531 *et seq.*). Only one federally protected species is listed for Wayne County (USFWS list dated January 2003) (Table 2). This species has not been reported by the North Carolina Natural Heritage Program (Appendix) to occur or have occurred in the area of the Kenly East, N.C. (1978), 7.5-minute USGS Quad Sheet. No other protected species were identified which may occur in the project area.

Table 2. Federally Protected Species Listed for Wayne County, NC.

Common Name	Scientific Name	Federal Status	Biological Conclusion
Red-cockaded Woodpecker	*Picoides borealis*	E	No Effect

E- Endangered

Red-cockaded Woodpecker (*Picoides borealis*)

Red-cockaded Woodpecker is a small, non-migratory woodpecker, 7 to 8.5 inches (17.8 to 21.6 centimeters) long, has a black head, prominent white cheek patch, and black-and-white barred back (USFWS 2001c). Males often have red markings (cockades) behind the eye, but the cockades may be absent or difficult to see (Potter *et al.* 1980). Primary nest sites for Red-cockaded Woodpecker include open pine stands greater than 60 years of age with little or no mid-story development. Foraging habitat is comprised of open pine or pine/mixed hardwood stands 30 years of age or older (Henry 1989). Primary habitat consists of mature to over-mature southern pine forests dominated by loblolly (*Pinus taeda*), long-leaf (*P. palustris*), slash (*P. elliottii*), pond (*P. serotina*), or other southern pine species.

Nest cavities are constructed in the heartwood of living pine trees, generally older than 60 years, that have been infected with red-heart disease. Excavation of a cavity usually initiates through an old dead branch opening in the bole of the tree. An aggregate of

cavity trees is called a cluster and may include 1 to 20 or more cavity trees on 3 to 60 acres (1.2 to 24 hectares). The average size of a cluster is about 10 acres (4 hectares). The typical cluster is occupied by a related group of individuals called a clan. The woodpecker drills holes into the bark around the excavated cavity entrance, resulting in a shiny, resinous buildup around the entrance that allows for easy detection of active nest trees.

The typical territory for a clan will range from 60 to 600 acres (24 to 240 hectares) in size. Red-cockaded Woodpecker prefers mature, open, pine forests and will not generally range greater than about 130 feet (40 meters) over cleared ground or hardwood stands. The clan will only exploit those pine stands for food that are contiguous with their nesting habitat. Pine flatwoods or pine-dominated savannas which have been maintained by frequent natural fires serve as ideal nesting and foraging sites for this woodpecker. Development of a thick understory may result in abandonment of cavity trees.

No large scale field surveys were conducted for Red-cockaded Woodpecker outside of the designated project study area. A review of available aerial mapping indicates that contiguous forest land may be present within 0.5 mile (0.8 kilometer) of the project site. The suitability of this habitat is undetermined.

BIOLOGICAL CONCLUSION: No Effect

The project study area and areas adjacent to it are dominated by dense hardwood swamp lands. For the most part, the uplands have been cleared for agriculture to the edges of the swamps or edges of the first terrace. No suitable nesting or foraging habitat for the Red-cockaded Woodpecker exists within or contiguous to the project study area. Natural Heritage Program records do not document any known Red-cockaded Woodpecker populations within 3.0 miles (4.8 kilometers) of the project study area (NHP records review November 2002). This project will have No Effect on Red-cockaded Woodpecker.

Analysis Details -

Methodology: identification of potential habitat for Red-cockaded Woodpecker was conducted as an assessment of available information and preliminary site review by the primary investigators of the habitat requirements of Red-cockaded Woodpecker. Specifically, available records at the NHP were reviewed to assess the possible presence of Red-cockaded Woodpecker in the project vicinity. Aerial photos were also assessed for the identification of potential habitat.

Qualifications: this analysis was conducted by Dr. Ken Roeder and Susan Smith whose credentials are listed in Section 1.5 of this report.

Federal Species of Concern

The January 2003 USFWS list also includes a category of species designated as "Federal Species of Concern" (FSC) (Appendix). The FSC designation provides no federal protection under the ESA for the species listed. However, these are listed since they may attain federally protected status in the future. Federal Species of Concern listed for Wayne County include six species (Table 3). None of these species are reported to occur in the area covered by the Kenly East, NC, 7.5-minute USGS Quad Sheet in which this bridge replacement project is located.

Table 3. Federal Species of Concern (FSC) Listed for Wayne County, NC.

Common Name	Scientific Name	State Status	Potential Habitat
Rafinesque's Big-eared Bat	*Corynorhinus rafinesquii*	T	Yes
Southern Hog-nosed Snake	*Heterodon simus*	SC	No
Pinewoods Shiner	*Lythrurus matutinus*	SR	No
Yellow Lance	*Elliptio lanceolata*	E	No
Atlantic Pigtoe	*Fusconaia masoni*	E	No
Pondspice	*Litsea aestivalis*	SR_T	No

E- Endangered, T- Threatened, SR- Significantly Rare, SC- Special Concern, _T- Rare throughout its range.

4.5 State Protected Species

Species of mammals, birds, reptiles, amphibians, and plants with the North Carolina status of Endangered (E), Threatened (T), and Special Concern (SC) receive limited protection under the North Carolina Endangered Species Act (G.S. 113-331 *et seq.*) and the North Carolina Plant Protection Act of 1979 (G.S. 106-202.12 *et seq.*). A review of the NHP records indicates that no state listed species have been documented within 3.0 miles (4.8 kilometers) of the project study area. This project will not affect any known occurrences of state listed species.

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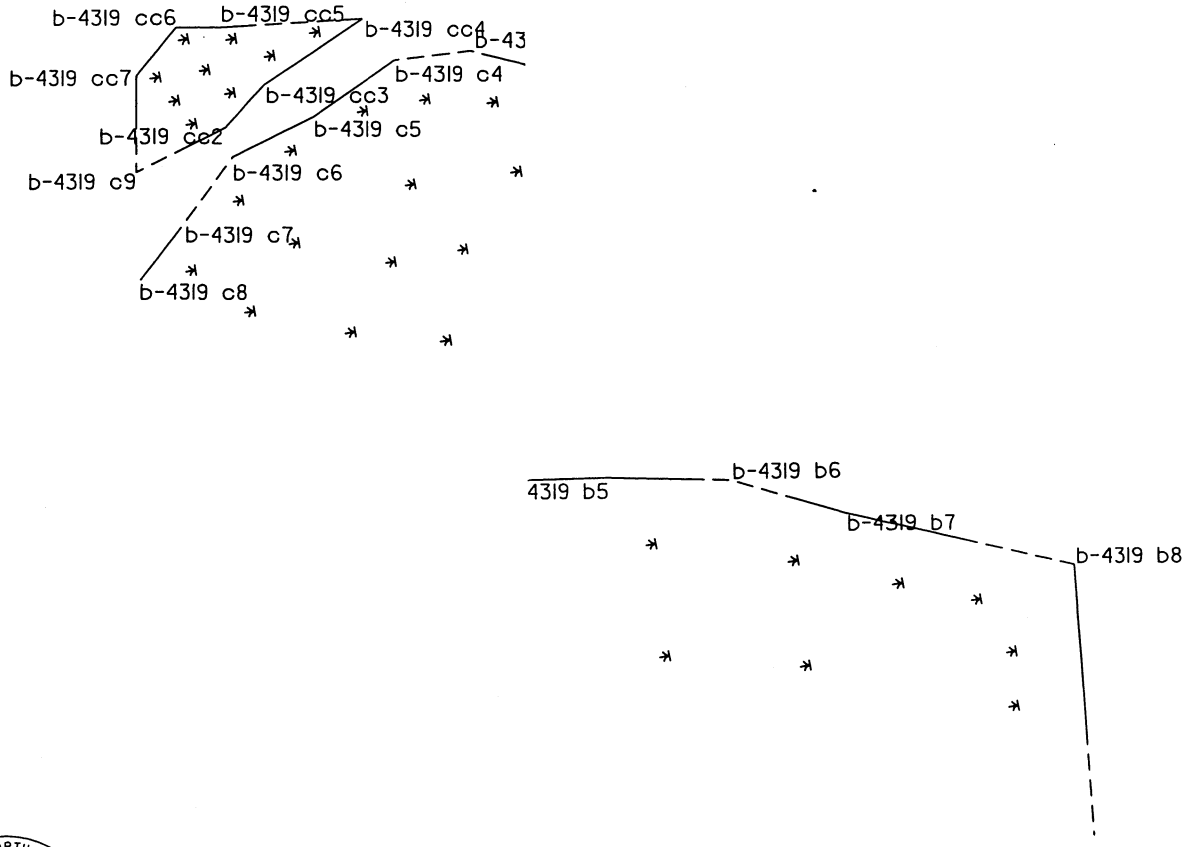
APPENDIX

Exhibit A. GPS Located "Waters of the United States" and Jurisdictional Wetlands
GPS Located Wetland Points
USACE and DWQ Wetland and Stream Data Forms
Natural Heritage Program Endangered Species List



STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

LOCHNER
H.W. LOCHNER, INC.
2840 PLAZA PLACE, SUITE 202
RALEIGH, NC 27612

REPLACEMENT OF BRIDGE NO. 21 ON NC 22 OVER GREAT SWAMP

STATE PROJECT NO. 8.1332001
T.I.P. NO. B-4319

EXHIBIT A

GPS LOCATED WETLANDS

GPS LOCATED STREAM

B-4319 GPS Located Wetland Points

POINT NAME	LONGITUDE	LATITUDE
b-4319 a1	78°01'18.22"	35°33'40.27"
b-4319 a2	78°01'17.60"	35°33'39.97"
b-4319 a3	78°01'15.09"	35°33'39.41"
b-4319 a4	78°01'14.82"	35°33'39.72"
b-4319 a5	78°01'14.23"	35°33'39.76"
b-4319 a6	78°01'14.57"	35°33'40.56"
b-4319 a7	78°01'14.82"	35°33'40.96"
b-4319 b1	78°01'18.46"	35°33'39.49"
b-4319 b2	78°01'14.72"	35°33'38.72"
b-4319 b3	78°01'12.55"	35°33'38.23"
b-4319 b4	78°01'11.99"	35°33'37.85"
b-4319 b5	78°01'11.10"	35°33'37.86"
b-4319 b6	78°01'10.30"	35°33'37.84"
b-4319 b7	78°01'09.59"	35°33'37.66"
b-4319 b8	78°01'08.14"	35°33'37.37"
b-4319 b9	78°01'08.04"	35°33'35.98"
b-4319 c1	78°01'19.22"	35°33'39.58"
b-4319 c2	78°01'25.06"	35°33'34.45"
b-4319 c3	78°01'22.22"	35°33'40.17"
b-4319 c4	78°01'22.71"	35°33'40.12"
b-4319 c5	78°01'23.22"	35°33'39.83"
b-4319 c6	78°01'23.74"	35°33'39.63"
b-4319 c7	78°01'24.05"	35°33'39.28"
b-4319 c8	78°01'24.32"	35°33'39.00"
b-4319 c9	78°01'24.35"	35°33'39.56"
b-4319 cc2	78°01'23.78"	35°33'39.78"
b-4319 cc3	78°01'23.53"	35°33'40.00"
b-4319 cc4	78°01'22.91"	35°33'40.91"
b-4319 cc5	78°01'23.81"	35°33'40.30"
b-4319 cc6	78°01'24.09"	35°33'40.30"
b-4319 cc7	78°01'24.34"	35°33'40.05"
b-4319 d1	78°01'20.61"	35°33'43.01"
b-4319 d2	78°01'20.86"	35°33'42.05"
b-4319 d3	78°01'21.20"	35°33'40.91"
b-4319 d4	78°01'20.97"	35°33'40.66"
b-4319 d5	78°01'19.98"	35°33'40.41"
b-4319 d6	78°01'19.35"	35°33'40.30"
b-4319 d7	78°01'19.10"	35°33'40.46"
b-4319 d8	78°01'18.89"	35°33'40.24"
b-4319 se bank 60ft to sw bank	78°01'19.13"	35°33'39.71"
b-4319 se bank 60ft to sw bank	78°01'18.52"	35°33'39.58"
b-4319 nw bank 50ft to ne bank	78°01'18.92"	35°33'40.26"

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE WETLAND DELINEATION MANUAL)

PROJECT:	B-4319	DATE:	21 November 2002
APPLICANT:	NCDOT	COUNTY:	Wayne
INVESTIGATOR:	E. Fentress, K. Roeder	QUAD MAP:	Kenly East, NC

~~Do normal circumstances exist on this site?~~	~~Yes~~	~~Community ID:~~	~~UPL~~
Is the site significantly disturbed (Atypical Situation)?	No	Transect ID:	
Is this area a Potential Problem Area? (if needed, explain on reverse)	No	Plot ID:	B-4319 D UPL

VEGETATION

	Dominant Plant Species	Stratum	Indicator		Dominant Plant Species	Stratum	Indicator
1.	*Various grasses*						
2.							
3.							
4.							
5.							
6.				13.			
7.				14.			

Percent of Dominant Species that are OBL, FACW, or FAC (Excluding FAC-): 0 %

Remarks: Maintained roadside; slope; power line right of way

HYDROLOGY

Recorded Data (Describe in Remarks)

- Stream, Lake, or Tide Gauge
- Aerial Photographs
- Other

No Recorded Data Available

Field Observations:

Depth of Surface Water:	0	Inches
Depth to Free Water in Pit:	>24	Inches
Depth to Saturated Soil:	>24	Inches

Wetlands Hydrology Indicators:

Primary Indicators

- Inundated
- Saturated in Upper 12 inches
- Water Marks
- Drift Lines
- Sediment Deposits
- Drainage Patterns in Wetlands

Secondary Indicators (2 or more required)

- Oxidized Root Channels in Upper 12 in.
- Water-Stained Leaves
- Local Soil Survey Data
- Fac-Neutral Test
- Other (Explain)

Remarks:

SOILS

B-43PD UPL

Map Unit Name: (Series and Phase)	Johnston loam	Drainage Class:	Poorly drained
Taxonomy (Subgroup):	Typic Fluvaquents	Field Observations Confirmed Mapped Type?	No

Profile Description:

Depth (Inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture/Concretions
0-6	A	10YR 3/3	None	None	Sandy loam
6+	B	10YR 5/6	None	None	Sandy loam

Hydric Soil Indicators:

	Histosol		Concretions
	Histic Epipedon		High Organic Content in Surface Layer in Sandy Soil
	Sulfidic Odor		Organic Streaking in Sandy Soil
	Aquic Moisture Regime	X	Listed on Local Hydric Soils List
	Reducing Conditions	X	Listed on National Hydric Soils List
	Gleyed or Low-Chroma Colors		Other (Expain in Remarks)

Remarks:

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	No	Is this Sampling Point within a Wetland?	No
Wetland Hydrology Present?	No		
Hydric Soils Present?	No		

Remarks:

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE WETLAND DELINEATION MANUAL)

PROJECT:	B-4319	DATE:	21 November 2002
APPLICANT:	NCDOT	COUNTY:	Wayne
INVESTIGATOR:	E. Fentress, K. Roeder	QUAD MAP:	Kenly East, NC

Do normal circumstances exist on this site?	Yes	Community ID:	UPL
Is the site significantly disturbed (Atypical Situation)?	No	Transect ID:	
Is this area a Potential Problem Area? (if needed, explain on reverse)	No	Plot ID:	B-4319 UPL

VEGETATION

	Dominant Plant Species	Stratum	Indicator		Dominant Plant Species	Stratum	Indicator
1.	*Platanus occidentalis*	C, S	FAC+				
2.	*Pinus taeda*	C	FAC				
3.	*Acer rubrum*	S	FACW-				
4.	*Lonicera japonica*	V	FAC-				
5.	*Smilax rotundifolia*	V	FAC				
6.				13.			
7.				14.			

Percent of Dominant Species that are OBL, FACW, or FAC (Excluding FAC-): 80 %

Remarks:

HYDROLOGY

Recorded Data (Describe in Remarks)

_____ Stream, Lake, or Tide Gauge

_____ Aerial Photographs

_____ Other

_____ No Recorded Data Available

Field Observations:

Depth of Surface Water: 0 Inches

Depth to Free Water in Pit: >24 Inches

Depth to Saturated Soil: >24 Inches

Wetlands Hydrology Indicators:

Primary Indicators

_____ Inundated

_____ Saturated in Upper 12 inches

_____ Water Marks

_____ Drift Lines

_____ Sediment Deposits

_____ Drainage Patterns in Wetlands

Secondary Indicators (2 or more required)

_____ Oxidized Root Channels in Upper 12 in.

_____ Water-Stained Leaves

_____ Local Soil Survey Data

_____ Fac-Neutral Test

_____ Other (Explain)

Remarks:

SOILS

B-4319 UPL (for PSS)

Map Unit Name: (Series and Phase)	Johnston loam	Drainage Class:	Very poorly drained
Taxonomy (Subgroup):	Cumulic Humaquepts	Field Observations Confirmed Mapped Type?	No

Profile Description:

Depth (Inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture/Concretions
0-8+	A	10YR 4/4	None	None	Sandy clay w/small gravel

Hydric Soil Indicators:

	Histosol		Concretions
	Histic Epipedon		High Organic Content in Surface Layer in Sandy Soil
	Sulfidic Odor		Organic Streaking in Sandy Soil
	Aquic Moisture Regime	X	Listed on Local Hydric Soils List
	Reducing Conditions	X	Listed on National Hydric Soils List
	Gleyed or Low-Chroma Colors		Other (Expain in Remarks)

Remarks:

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	Yes	Is this Sampling Point within a Wetland?	No
Wetland Hydrology Present?	No		
Hydric Soils Present?	No		

Remarks:

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE WETLAND DELINEATION MANUAL)

PROJECT:	B-4319	DATE:	21 November 2002
APPLICANT:	NCDOT	COUNTY:	Wayne
INVESTIGATOR:	E. Fentress, K. Roeder	QUAD MAP:	Kenly East, NC

Do normal circumstances exist on this site?	Yes	Community ID:	UPL
Is the site significantly disturbed (Atypical Situation)?	No	Transect ID:	
Is this area a Potential Problem Area? (if needed, explain on reverse)	No	Plot ID:	B-4319 UPL

VEGETATION

	Dominant Plant Species	Stratum	Indicator		Dominant Plant Species	Stratum	Indicator
1.	*Liquidambar styraciflua*	C	FAC+				
2.	*Liriodendron tulipifera*	C	FAC				
3.	*Acer rubrum*	C, U	FACW-				
4.	*Lonicera japonica*	V	FAC-				
5.	*Ligustrum sinense*	S	FAC				
6.				13.			
7.				14.			

Percent of Dominant Species that are OBL, FACW, or FAC (Excluding FAC-): 80 %

Remarks:

HYDROLOGY

Recorded Data (Describe in Remarks)

_____ Stream, Lake, or Tide Gauge

_____ Aerial Photographs

_____ Other

_____ No Recorded Data Available

Field Observations:

Depth of Surface Water: 0 Inches

Depth to Free Water in Pit: >24 Inches

Depth to Saturated Soil: >24 Inches

Wetlands Hydrology Indicators:

Primary Indicators

_____ Inundated

_____ Saturated in Upper 12 inches

_____ Water Marks

_____ Drift Lines

_____ Sediment Deposits

_____ Drainage Patterns in Wetlands

Secondary Indicators (2 or more required)

_____ Oxidized Root Channels in Upper 12 in.

_____ Water-Stained Leaves

_____ Local Soil Survey Data

_____ Fac-Neutral Test

_____ Other (Explain)

Remarks:

SOILS

B-439 UPL (for PEM)

Map Unit Name: (Series and Phase)	Bibb sandy loam	Drainage Class:	Poorly drained
Taxonomy (Subgroup):	Typic Fluvaquents	Field Observations Confirmed Mapped Type?	No

Profile Description:

Depth (Inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture/Concretions
2	A	10YR 4/2	None	None	Sandy loam
2+	B	10YR 4/2	None	None	Sandy loam

Hydric Soil Indicators:

	Histosol		Concretions
	Histic Epipedon		High Organic Content in Surface Layer in Sandy Soil
	Sulfidic Odor		Organic Streaking in Sandy Soil
	Aquic Moisture Regime	X	Listed on Local Hydric Soils List
	Reducing Conditions	X	Listed on National Hydric Soils List
	Gleyed or Low-Chroma Colors		Other (Expain in Remarks)

Remarks:

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	Yes	Is this Sampling Point within a Wetland?	No
Wetland Hydrology Present?	No		
Hydric Soils Present?	No		

Remarks:

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE WETLAND DELINEATION MANUAL)

PROJECT:	B-4319	DATE:	21 November 2002
APPLICANT:	NCDOT	COUNTY:	Wayne
INVESTIGATOR:	E. Fentress, K. Roeder	QUAD MAP:	Kenly East, NC

Do normal circumstances exist on this site?	Yes	Community ID:	PFO
Is the site significantly disturbed (Atypical Situation)?	No	Transect ID:	
Is this area a Potential Problem Area? (if needed, explain on reverse)	No	Plot ID:	B-4319 D

VEGETATION

	Dominant Plant Species	Stratum	Indicator		Dominant Plant Species	Stratum	Indicator
1.	*Acer rubrum*	C, U	FACW-	8.			
2.	*Liquidambar styraciflua*	C	FAC+	9.			
3.	*Nyssa sylvatica*	C	FAC	10.			
4.	*Smilax rotundifolia*	V	FAC	11.			
5.				12.			
6.				13.			
7.				14.			

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

Remarks:

HYDROLOGY

Recorded Data (Describe in Remarks)

- Stream, Lake, or Tide Gauge
- Aerial Photographs
- Other

No Recorded Data Available

Field Observations:

- Depth of Surface Water: 4-6+ Inches
- Depth to Free Water in Pit: 2 Inches
- Depth to Saturated Soil: 2 Inches

Wetlands Hydrology Indicators:

Primary Indicators

- X Inundated
- X Saturated in Upper 12 inches
- Water Marks
- Drift Lines
- Sediment Deposits
- Drainage Patterns in Wetlands

Secondary Indicators (2 or more required)

- Oxidized Root Channels in Upper 12 in.
- Water-Stained Leaves
- Local Soil Survey Data
- Fac-Neutral Test
- X Other (Explain) Buttressing

Remarks:

SOILS

B-4319D

Map Unit Name: (Series and Phase)	Johnston loam	Drainage Class:	Very poorly drained
Taxonomy (Subgroup):	Cumulic Humaquepts	Field Observations Confirmed Mapped Type?	Yes

Profile Description:

Depth (Inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture/Concretions
10	A	10YR 2/1	None	None	Sandy loam

Hydric Soil Indicators:

	Histosol		Concretions
	Histic Epipedon		High Organic Content in Surface Layer in Sandy Soil
	Sulfidic Odor		Organic Streaking in Sandy Soil
	Aquic Moisture Regime	X	Listed on Local Hydric Soils List
	Reducing Conditions	X	Listed on National Hydric Soils List
X	Gleyed or Low-Chroma Colors		Other (Expain in Remarks)

Remarks:

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	Yes	Is this Sampling Point within a Wetland?	Yes
Wetland Hydrology Present?	Yes		
Hydric Soils Present?	Yes		

Remarks:

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE WETLAND DELINEATION MANUAL)

PROJECT:	B-4319	DATE:	21 November 2002
APPLICANT:	NCDOT	COUNTY:	Wayne
INVESTIGATOR:	E. Fentress, K. Roeder	QUAD MAP:	Kenly East, NC

Do normal circumstances exist on this site?	Yes	Community ID:	PSS
Is the site significantly disturbed (Atypical Situation)?	No	Transect ID:	
Is this area a Potential Problem Area? (if needed, explain on reverse)	No	Plot ID:	B-4319 B

VEGETATION

	Dominant Plant Species	Stratum	Indicator		Dominant Plant Species	Stratum	Indicator
1.	*Liquidambar styraciflua*	S	FAC+	8.			
2.	*Liriodendron tulipifera*	S	FAC	9.			
3.	*Carpinus caroliniana*	S	FAC	10.			
4.	*Quercus nigra*	S	FAC	11.			
5.	*Smilax rotundifolia*	V	FAC	12.			
6.				13.			
7.				14.			

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

Remarks:

HYDROLOGY

Recorded Data (Describe in Remarks)

- Stream, Lake, or Tide Gauge
- Aerial Photographs
- Other

No Recorded Data Available

Field Observations:

- Depth of Surface Water: 4-6 Inches
- Depth to Free Water in Pit: 2 Inches
- Depth to Saturated Soil: 2 Inches

Wetlands Hydrology Indicators:

Primary Indicators

- X Inundated
- X Saturated in Upper 12 inches
- Water Marks
- Drift Lines
- Sediment Deposits
- Drainage Patterns in Wetlands

Secondary Indicators (2 or more required)

- Oxidized Root Channels in Upper 12 in.
- Water-Stained Leaves
- Local Soil Survey Data
- Fac-Neutral Test
- Other (Explain)

Remarks:

SOILS

B-4319B (PSS)

Map Unit Name: (Series and Phase)	Johnston loam	Drainage Class:	Very poorly drained
Taxonomy (Subgroup):	Cumulic Humaquepts	Field Observations Confirmed Mapped Type?	Yes

Profile Description:

Depth (Inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture/Concretions
6	A	10YR 4/1	None	None	Loamy

Hydric Soil Indicators:

	Histosol		Concretions
	Histic Epipedon		High Organic Content in Surface Layer in Sandy Soil
	Sulfidic Odor		Organic Streaking in Sandy Soil
	Aquic Moisture Regime	X	Listed on Local Hydric Soils List
	Reducing Conditions	X	Listed on National Hydric Soils List
X	Gleyed or Low-Chroma Colors		Other (Expain in Remarks)

Remarks:

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	Yes	Is this Sampling Point within a Wetland?	Yes
Wetland Hydrology Present?	Yes		
Hydric Soils Present?	Yes		

Remarks:

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE WETLAND DELINEATION MANUAL)

PROJECT:	B-4319	DATE:	21 November 2002
APPLICANT:	NCDOT	COUNTY:	Wayne
INVESTIGATOR:	E. Fentress, K. Roeder	QUAD MAP:	Kenly East, NC

Do normal circumstances exist on this site?	Yes	Community ID:	PEM
Is the site significantly disturbed (Atypical Situation)?	No	Transect ID:	
Is this area a Potential Problem Area? (if needed, explain on reverse)	No	Plot ID:	B-4319 B

VEGETATION

	Dominant Plant Species	Stratum	Indicator		Dominant Plant Species	Stratum	Indicator
1.	*Salix nigra*	S	OBL	8.			
2.	*Liriodendron tulipifera*	S	FAC	9.			
3.	*Acer rubrum*	S	FACW-	10.			
4.	*Arundinaria gigantea*	H	FACW	11.			
5.	*Typha latifolia*	H	OBL	12.			
6.				13.			
7.				14.			

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

Remarks:

HYDROLOGY

Recorded Data (Describe in Remarks)

_____ Stream, Lake, or Tide Gauge

_____ Aerial Photographs

_____ Other

_____ No Recorded Data Available

Field Observations:

Depth of Surface Water: 6 Inches

Depth to Free Water in Pit: 0 Inches

Depth to Saturated Soil: 0 Inches

Wetlands Hydrology Indicators:

Primary Indicators

X Inundated

X Saturated in Upper 12 inches

_____ Water Marks

_____ Drift Lines

_____ Sediment Deposits

_____ Drainage Patterns in Wetlands

Secondary Indicators (2 or more required)

_____ Oxidized Root Channels in Upper 12 in.

_____ Water-Stained Leaves

_____ Local Soil Survey Data

_____ Fac-Neutral Test

_____ Other (Explain)

Remarks:

SOILS

B-4319 B (PEM)

Map Unit Name: (Series and Phase)	Bibb sandy loam	Drainage Class:	Poorly drained
Taxonomy (Subgroup):	Typic Fluvaquents	Field Observations Confirmed Mapped Type?	Yes

Profile Description:

Depth (Inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture/Concretions
10	A	10YR 3/1	None	None	Loamy

Hydric Soil Indicators:

	Histosol		Concretions
	Histic Epipedon		High Organic Content in Surface Layer in Sandy Soil
	Sulfidic Odor		Organic Streaking in Sandy Soil
	Aquic Moisture Regime	X	Listed on Local Hydric Soils List
	Reducing Conditions	X	Listed on National Hydric Soils List
X	Gleyed or Low-Chroma Colors		Other (Expain in Remarks)

Remarks:

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	Yes	Is this Sampling Point within a Wetland?	Yes
Wetland Hydrology Present?	Yes		
Hydric Soils Present?	Yes		

Remarks:

WETLAND RATING WORKSHEET (4th Version)

Project Name: B-4319
County: Wayne
Nearest Road: NC 222
Evaluation Team: E.Fentress, K. Roeder

Wetland Site Number: Wetland B-4319D
Wetland Area (acres): 1.1
Wetland Width (feet): 197'
Date: 21 November 02

Wetland Location
_____on pond or lake
__X__on perennial stream
_____on intermittent stream
_____within interstream divide
_____other _____

Adjacent Land Use:
(within 1/2 mile upstream, upslope, or radius)
forested/natural vegetation 80 %
agriculture, urban/suburban 15 %
impervious surface 5 %

Soil Series: Johnston
_____predominantly organic (humus, muck, peat)
__X__predominantly mineral (non-sandy)
_____predominantly sandy

Dominant Vegetation
(1) Acer rubrum
(2) Liquidambar styraciflua
(3) Nyssa sylvatica

Hydraulic Factors
_____steep topography
_____ditched or channelized
197' total riparian wetland width

Flooding and Wetness
__X__semi to permanently flooded or inundated
_____seasonally flooded/inundated
_____intermittently flooded or temporary surface water
_____no evidence of flooding or surface water

Wetland Type (select one)*

_____ Bottomland Hardwood Forest	_____ Headwater Forest
__X__ Swamp Forest	_____ Wet Flat
_____ Pocosin	_____ Pine Savannah
_____ Freshwater Marsh	_____ Estuarine fringe forest
_____ Ephemeral Wetland	_____ Carolina Bay
_____ Bog forest	_____ Bog/fen
_____ Seep	_____ Other _____

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

DEM RATING

Water Storage	3	X 4.00 =	12
Bank/Shoreline Stability	3	X 4.00 =	12
Pollution Removal	5 *	X 5.00 =	25
Wildlife Habitat	4	X 2.00 =	8
Aquatic Life Value	5	X 4.00 =	20
Recreation/ Education	2	X 1.00 =	2

Wetland Score = 79

* Add 1 point if in sensitive watershed and > 10% nonpoint disturbance within ½ mile upstream, upslope, or radius

WETLAND RATING WORKSHEET (4th Version)

Project Name: B-4319
County: Wayne
Nearest Road: NC 222
Evaluation Team: E.Fentress, K. Roeder

Wetland Site Number: Wetland B-4319B (PSS)
Wetland Area (acres): 2.8
Wetland Width (feet): 547'
Date: 21 November 02

Wetland Location
_____on pond or lake
__X__on perennial stream
_____on intermittent stream
_____within interstream divide
_____other _____

Adjacent Land Use:
(within 1/2 mile upstream, upslope, or radius)
forested/natural vegetation 80 %
agriculture, urban/suburban 15 %
impervious surface 5 %

Soil Series: Johnston
_____predominantly organic (humus, muck, peat)
__X__predominantly mineral (non-sandy)
_____predominantly sandy

Dominant Vegetation
(1) Liquidambar styraciflua
(2) Liriodendron tulipifera
(3) Quercus nigra

Hydraulic Factors
_____steep topography
_____ditched or channelized
547' total riparian wetland width

Flooding and Wetness
__X__semi to permanently flooded or inundated
_____seasonally flooded/inundated
_____intermittently flooded or temporary surface water
_____no evidence of flooding or surface water

Wetland Type (select one)*
__X__ Bottomland Hardwood Forest
_____ Swamp Forest
_____ Pocosin
_____Freshwater Marsh
_____ Ephemeral Wetland
_____ Bog forest
_____ Seep
_____ Headwater Forest
_____Wet Flat
_____ Pine Savannah
_____ Estuarine fringe forest
_____ Carolina Bay
_____Bog/fen
_____ Other _____

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

DEM RATING

Water Storage	2	X 4.00 =	8
Bank/Shoreline Stability	1	X 4.00 =	4
Pollution Removal	4 *	X 5.00 =	20
Wildlife Habitat	4	X 2.00 =	8
Aquatic Life Value	2	X 4.00 =	8
Recreation/ Education	2	X 1.00 =	2

Wetland Score = 50

* Add 1 point if in sensitive watershed and > 10% nonpoint disturbance within ½ mile upstream, upslope, or radius

WETLAND RATING WORKSHEET (4th Version)

Project Name: B-4319
County: Wayne
Nearest Road: NC 222
Evaluation Team: E.Fentress, K. Roeder

Wetland Site Number: Wetland B-4319B (PEM)
Wetland Area (acres): 0.7
Wetland Width (feet): 240'
Date: 21 November 02

Wetland Location
_____on pond or lake
__X__on perennial stream
_____on intermittent stream
_____within interstream divide
_____other _____

Adjacent Land Use:
(within 1/2 mile upstream, upslope, or radius)
forested/natural vegetation 80 %
agriculture, urban/suburban 15 %
impervious surface 5 %

Soil Series: Bibb
_____predominantly organic (humus, muck, peat)
__X__predominantly mineral (non-sandy)
_____predominantly sandy

Dominant Vegetation
(1) Salix nigra
(2) Acer rubrum
(3) Typha latifolia

Hydraulic Factors
_____steep topography
_____ditched or channelized
547' total riparian wetland width

Flooding and Wetness
__X__semi to permanently flooded or inundated
_____seasonally flooded/inundated
_____intermittently flooded or temporary surface water
_____no evidence of flooding or surface water

Wetland Type (select one)*

_____ Bottomland Hardwood Forest	_____ Headwater Forest
_____ Swamp Forest	_____ Wet Flat
_____ Pocosin	_____ Pine Savannah
__X__ Freshwater Marsh	_____ Estuarine fringe forest
_____ Ephemeral Wetland	_____ Carolina Bay
_____ Bog forest	_____ Bog/fen
_____ Seep	_____ Other _____

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

DEM RATING

Water Storage	3	X 4.00 =	12
Bank/Shoreline Stability	1	X 4.00 =	4
Pollution Removal	5 *	X 5.00 =	25
Wildlife Habitat	3	X 2.00 =	6
Aquatic Life Value	2	X 4.00 =	8
Recreation/ Education	2	X 1.00 =	2

Wetland Score = 57

* Add 1 point if in sensitive watershed and > 10% nonpoint disturbance within ½ mile upstream, upslope, or radius

NCDWQ Stream Classification Form

Project Name: Bridge Replacement | River Basin: Neuse | County: Wayne | Evaluator: E. Fentress, K. Roeder

DWQ Project Number: B-4319 | Nearest Named Stream: Great Swamp | Latitude: 35° 33' 39" | Signature:

Date: 21 Nov. 2002 | USGS QUAD: Kenly East | Longitude: 78° 1' 19" | Location/Directions:

PLEASE NOTE:** ***If evaluator and landowner agree that the feature is a man-made ditch, then use of this form is not necessary. Also, if in the best professional judgement of the evaluator, the feature is a man-made ditch and not a modified natural stream—this rating system should not be used*

Primary Field Indicators: *(Circle One Number Per Line)*

I. Geomorphology	Absent	Weak	Moderate	Strong
1) Is There A Riffle-Pool Sequence?	0	(1)	2	3
2) Is The USDA Texture In Streambed Different From Surrounding Terrain?	(0)	1	2	3
3) Are Natural Levees Present?	(0)	1	2	3
4) Is The Channel Sinuous?	0	1	(2)	3
5) Is There An Active (Or Relic) Floodplain Present?	0	1	2	(3)
6) Is The Channel Braided?	(0)	1	2	3
7) Are Recent Alluvial Deposits Present?	(0)	1	2	3
8) Is There A Bankfull Bench Present?	(0)	1	2	3
9) Is A Continuous Bed & Bank Present?	(0)	1	2	3

*(*NOTE: If Bed & Bank Caused By Ditching And WITHOUT Sinuosity Then Score=0*)*

10) Is A 2nd Order Or Greater Channel (As Indicated On Topo Map ***And/Or*** In Field) Present? *Yes*=(3) *No*=0

PRIMARY GEOMORPHOLOGY INDICATOR POINTS: 9

II. Hydrology	Absent	Weak	Moderate	Strong
1) Is There A Groundwater Flow/Discharge Present?	0	1	2	(3)

PRIMARY HYDROLOGY INDICATOR POINTS: 3

III. Biology	Absent	Weak	Moderate	Strong
1) Are Fibrous Roots Present In Streambed?	(3)	2	1	0
2) Are Rooted Plants Present In Streambed?	3	2	1	(0)
3) Is Periphyton Present?	(0)	1	2	3
4) Are Bivalves Present?	(0)	1	2	3

PRIMARY BIOLOGY INDICATOR POINTS: 3

Secondary Field Indicators: *(Circle One Number Per Line)*

I. Geomorphology	Absent	Weak	Moderate	Strong
1) Is There A Head Cut Present In Channel?	(0)	.5	1	1.5
2) Is There A Grade Control Point In Channel?	(0)	.5	1	1.5
3) Does Topography Indicate A Natural Drainage Way?	0	.5	1	(1.5)

SECONDARY GEOMORPHOLOGY INDICATOR POINTS: 1.5

II. Hydrology	Absent	Weak	Moderate	Strong
1) Is This Year's (Or Last's) Leaflitter Present In Streambed?	(1.5)	1	.5	0
2) Is Sediment On Plants (Or Debris) Present?	(0)	.5	1	1.5
3) Are Wrack Lines Present?	(0)	.5	1	1.5
4) Is Water In Channel ***And*** >48 Hrs. Since Last ***Known*** Rain? *(*NOTE: If Ditch Indicated In #9 Above Skip This Step And #5 Below*)*	0	.5	1	(1.5)
5) Is There Water In Channel During Dry Conditions ***Or*** In Growing Season)?	0	.5	1	(1.5)

6) Are Hydric Soils Present In Sides Of Channel (Or In Headcut)? *Yes*=(1.5) *No*=0

SECONDARY HYDROLOGY INDICATOR POINTS: 6

III. Biology	Absent	Weak	Moderate	Strong
1) Are Fish Present?	0	.5	(1)	1.5
2) Are Amphibians Present?	(0)	.5	1	1.5
3) Are AquaticTurtles Present?	(0)	.5	1	1.5
4) Are Crayfish Present?	(0)	.5	1	1.5
5) Are Macrobenthos Present?	(0)	.5	1	1.5
6) Are Iron Oxidizing Bacteria/Fungus Present?	(0)	.5	1	1.5
7) Is Filamentous Algae Present?	(0)	.5	1	1.5

8) Are Wetland Plants In Streambed?	SAV	Mostly OBL	Mostly FACW	Mostly FAC	Mostly FACU	Mostly UPL
(NOTE: If Total Absence Of All Plants In Streambed As Noted Above Skip This Step UNLESS SAV Present*)*	2	1	.75	.5	0	0

SECONDARY BIOLOGY INDICATOR POINTS: 1

TOTAL POINTS *(Primary + Secondary)*=23.5 *(If Greater Than Or Equal To 19 Points The Stream Is At Least Intermittent)*

INTERMITTENT CHANNEL EVALUATION FORM

ACTION ID B-4319 APPLICANT NAME NCDOT DATE 21 Nov. 2002

PROPOSED CHANNEL WORK (i.e., culvert, relocation, etc.) Bridge Replacement

WATERBODY/RIVER BASIN Great Swamp COUNTY/CITY Wayne County

RECENT WEATHER CONDITIONS Rainy, cool

P	SP	NP	Observation	Comments or Description
✓			Fish/Shellfish/Crustaceans Present	
		✓	Benthic Macro Invertbrates	
		✓	Amphibians Present/Breeding	
		✓	Algae And/Or Fungus (water quality function)	
		✓	Wildlife Channel Use (i.e. tracks, feces, shells, others)	
		✓	Federally Protected Species Present (Discontinue)	
✓			Riffle/Pool Structure	
		✓	Stable Streambanks	
		✓	Channel Substrate (i.e. gravel, cobble, rock, coarse sand)	
	✓		Riparian Canopy Present (SP =/> 50% closure)	
		✓	Undercut Banks/Instream Habitat Structure	
	✓		Flow In Channel	
	✓		Wetlands Adjacent To/Contig. With Channel (Discontinue)	
	✓		Persistent Pools/Saturated Bottom (June thru Sept.)	
	✓		Seeps/Groundwater Discharge (June thru Sept.)	
	✓		Adjacent Floodplain Present	
		✓	Wrack Material or Drift Lines	
	✓		Hydrophytic Vegetation in/adjacent to channel	

Important To Domestic Water Supply? Y (N)

Does Channel Appear On A Quad Or Soils Map? (Y)/ N **Approx. Drainage Area:** _____

Determination:

- [✓] Perennial Channel (stop)
- [ ] Intermittent Channel (proceed)
- [ ] Ephemeral Channel (no jd)
- [ ] Ditch Through Upland (no jd)

- [✓] Important Channel: _____ LF
- [ ] Unimportant Channel: _____ LF

(attach map indicating location of important/unimportant channel)

PROJECT MGR. Initials _____

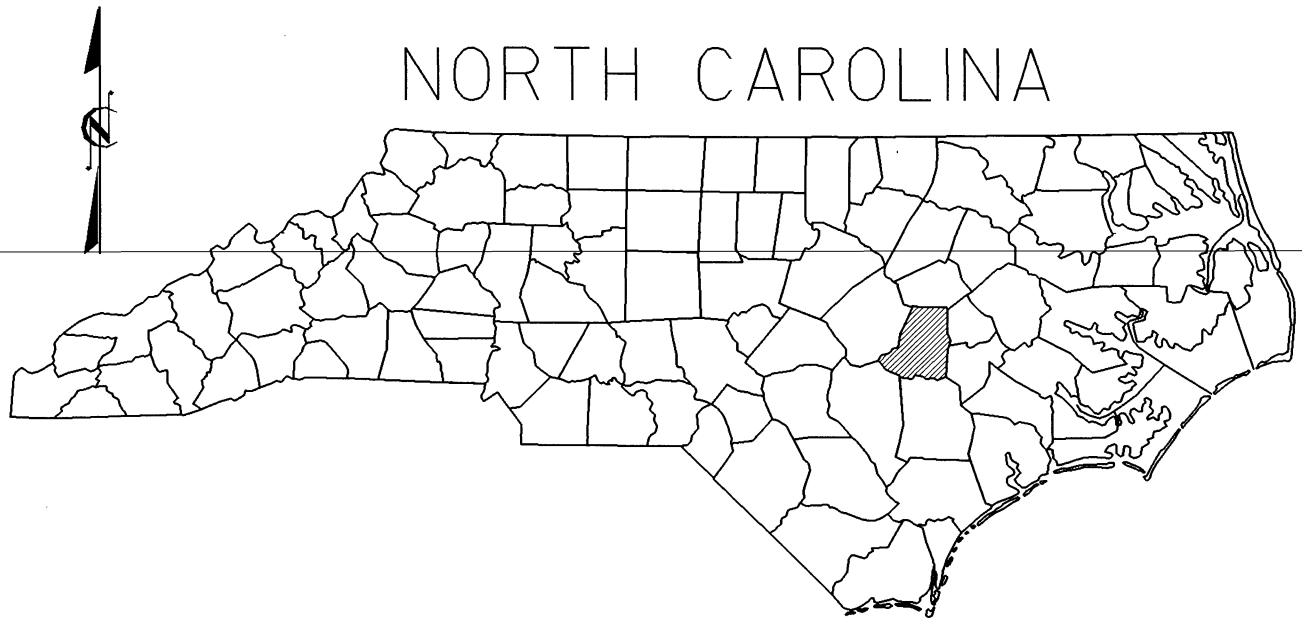
Evaluator's Signature: _____
(if other than C.O.E. project manager)

P=Present SP=Stongly Present NP=Not Present

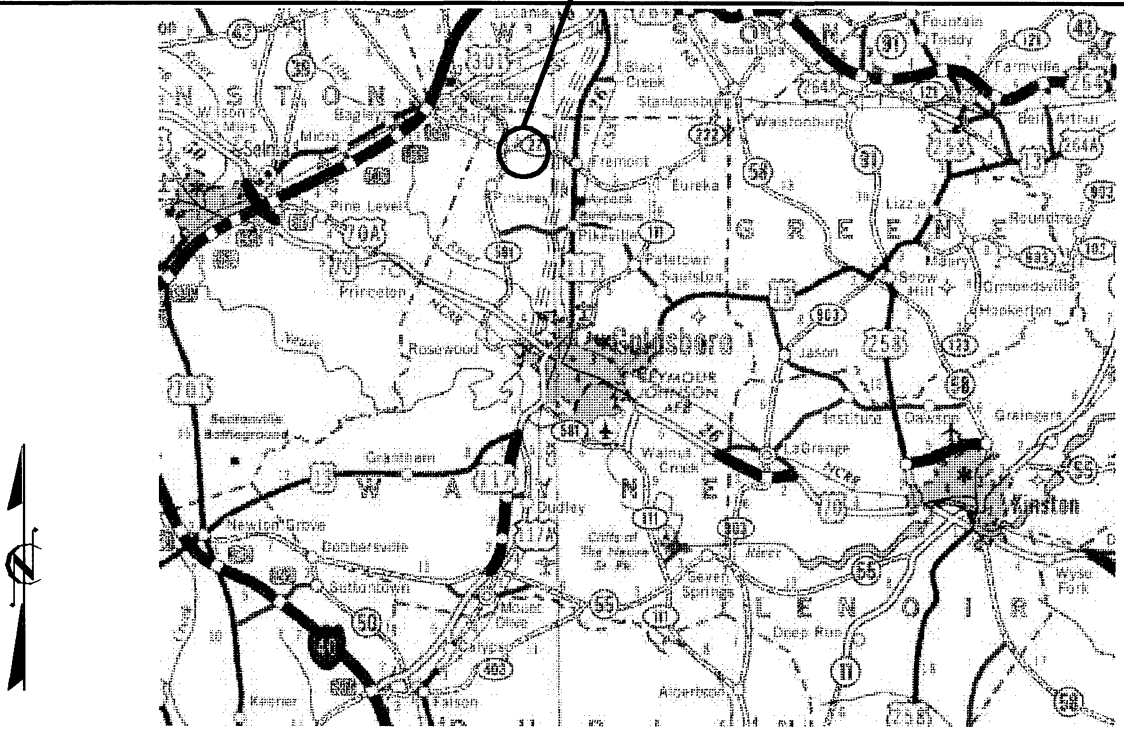
Search Criteria: Wayne, Listed
Search Results: 12 records found.

Major Group	Scientific Name	Common Name	State Status	Federal Status	State Rank	Global Rank	County Status
Mammal	Corynorhinus rafinesquii	Rafinesque's Big-eared Bat	T	FSC	S3	G3G4	Historic - Wayne - MAP - HABITAT
Bird	Lanius ludovicianus ludovicianus	Loggerhead Shrike	SC	-	S3B,S3N	G4T4	Current - Wayne - MAP - HABITAT
Bird	Picoides borealis	Red-cockaded Woodpecker	E	E	S2	G3	Current - Wayne - MAP - HABITAT
Reptile	Crotalus horridus	Timber Rattlesnake	SC	-	S3	G4	Obscure - Wayne - MAP - HABITAT
Reptile	Heterodon simus	Southern Hognose Snake	SC	FSC	S2	G2	Obscure - Wayne - MAP - HABITAT
Amphibian	Necturus lewisi	Neuse River Waterdog	SC	-	S3	G3	Historic - Wayne - MAP - HABITAT
Fish	Lythrurus matutinus	Pinewoods Shiner	SR	FSC	S3	G3	Obscure - Wayne - MAP - HABITAT
Fish	Noturus furiosus pop 1	Carolina Madtom - Neuse River Population	SC	-	S2	G3T2Q	Current - Wayne - MAP - HABITAT
Mollusk	Elliptio lanceolata	Yellow Lance	E	FSC	S1	G2G3	Current - Wayne - MAP - HABITAT
Mollusk	Elliptio roanokensis	Roanoke Slabshell	T	-	S1	G2G3	Current - Wayne - MAP - HABITAT
Mollusk	Fusconaia masoni	Atlantic Pigtoe	E	FSC	S1	G2	Current - Wayne - MAP - HABITAT
Vascular Plant	Litsea aestivalis	Pondspice	SR-T	FSC	S2	G3	Current - Wayne - MAP - HABITAT

NC NHP database updated: January, 2003. Search performed on Thursday, February 6, 2003 at 10:16:50 Eastern Standard Time.
Total number of searches since 01/01/03: 406
Explanation of Codes
Do NOT bookmark this search results page, instead bookmark: www.ncsparks.net/nhp/county.html



PROJECT



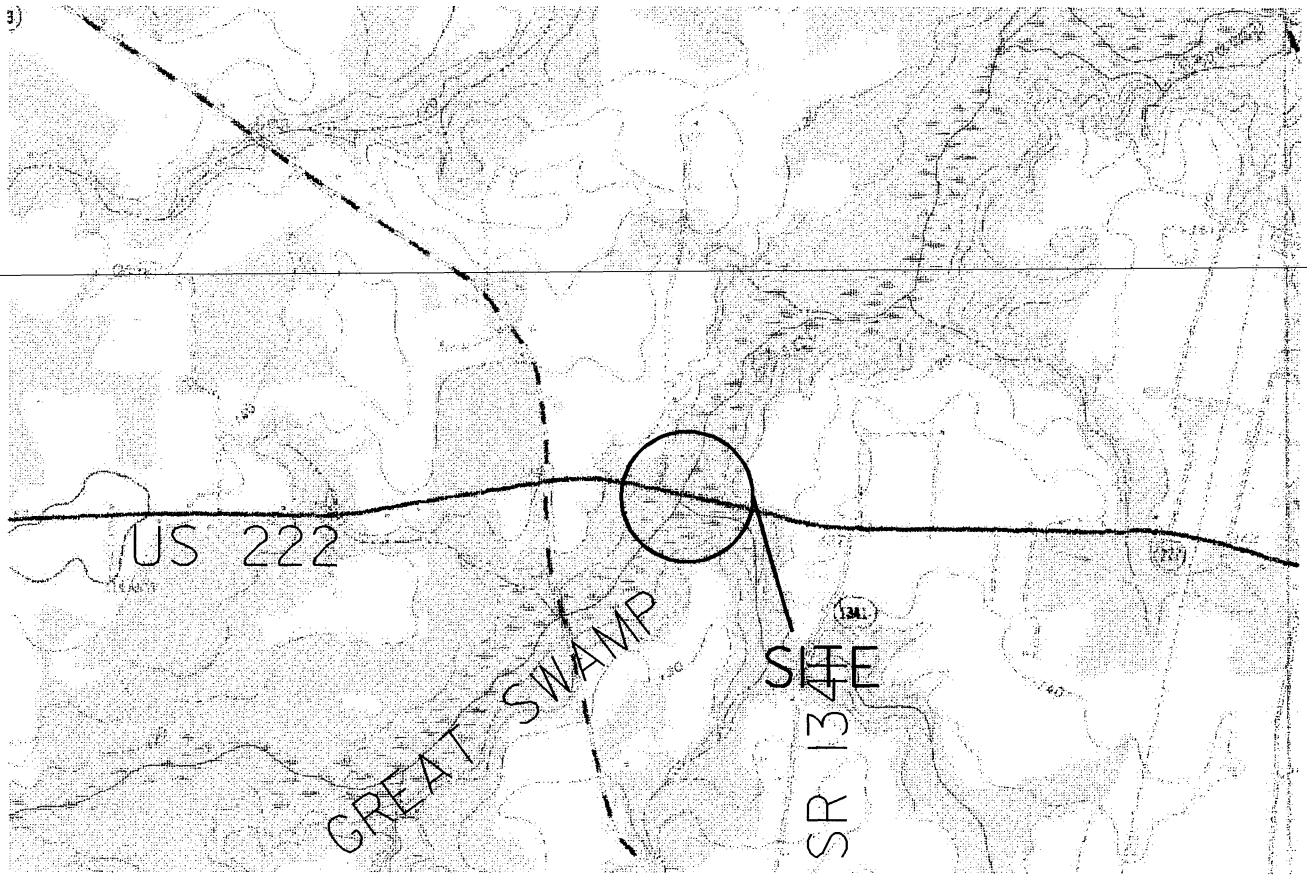
VICINITY MAPS

NCDOT

DIVISION OF HIGHWAYS
WAYNE COUNTY
PROJECT: 33656.1.1 (B-4319)
REPLACE BRIDGE NO. 21
OVER GREAT SWAMP
ALONG NC 222

SHEET 1 **OF** 10

04/05/05
REV. 11/02/05



TOPOGRAPHIC MAPS

NCDOT

DIVISION OF HIGHWAYS

WAYNE COUNTY

PROJECT: 33656.1.1 (B-4319)

REPLACE BRIDGE NO. 21

OVER GREAT SWAMP

ALONG NC 222

SHEET 2 **OF** 10

04/05/05

REV. 11/02/05

Property Owner Contact Report

TIP # B-4319

	Owner Last Name/ Business	Owner First Name	Address	City/Town	State	Zip Code	Contact/ Relationship		Home Phone	Contacted By	Contact Date	How Contacted	Comments
1	Byers	James R.	129 Miller Road	Fremont	NC	27830	James R. Hooks	Self		Stephen R. Wolfe	3/17/04	Letter	
2	Hollowell	Wilbert Oscar	1681 NC 222 Hwy West	Fremont	NC	27830	Wilbert Oscar Hollowell	Self		Stephen R. Wolfe	3/17/04	Letter	
4	Hooks	James Edwin	211 Emerson Drive	Mebane	NC	27302	James Edwin Hooks	Self		Stephen R. Wolfe	3/17/04	Letter	
	Hooks	Kenneth Wayne	P.O. Box 155	Fremont	NC	27830	Kenneth Wayne Hooks	Self		Stephen R. Wolfe	3/17/04	Letter	
3	Lukens	Cynthia Fisher	168 Miller Road	Fremont	NC	27830	Cynthia F. Lukens	Self		Stephen R. Wolfe	3/17/04	Letter	

WETLAND PERMIT IMPACT SUMMARY

			WETLAND IMPACTS				SURFACE WATER IMPACTS				
Site No.	Station (From/To)	Structure Size / Type	Fill In Wetlands (ac)	Temp. Fill In Wetlands (ac)	Excavation In Wetlands (ac)	Mechanized Clearing (Method III) (ac)	Fill In SW (Natural) (ac)	Fill In SW (Pond) (ac)	Temp. Fill In SW (ac)	Existing Channel Impacted (ft)	Natural Stream Design (ft)
1	12+68 to	N/A	0.001	0	0	0	0	0	0	0	0
	12+85 -L- RT										
	13+67 TO	15" CMP	0.004	0	0.006	0	0	0	0	0	0
	14+22 -L- RT										
	14+48 TO	15" CMP	0	0	0.009	0	0	0	0	0	0
	14+69 -L- LT										
	15+83 TO	BRIDGE	0.003	0	0	0	0	0	0	0	0
	16+00 -L- RT										
	16+61 TO	BRIDGE	0.014	0	0	0	0	0	0	0	0
	19+90 -L- RT										
	17+20 TO	N/A	0.003	0	0	0	0	0	0	0	0
	17+70 -L- LT										
	18+00 TO	15" CMP	0	0	0.010	0	0	0	0	0	0
	18+20 -L- LT										
	18+70 TO	N/A	0.009	0	0	0	0	0	0	0	0
	19+36 -L- LT										
TOTALS:			0.034	0	0.025	0	0	0	0	0	0

Form Revised 3/22/01

NC DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

WAYNE COUNTY
PROJECT: 33656.1.1 (B-4319)

REV. 11/02/05
4/10/2005

PROJECT REFERENCE NO.	SHEET NO.
B-4319	4 5 of 10

R/W SHEET NO.

ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

F F F F — DENOTES FILL IN WETLAND

E E E E — DENOTES EXCAVATION IN WETLAND

WETLAND PERMIT
DRAWINGS
11/02/05

METHOD II CLEARING

TOP DOWN CONSTRUCTION

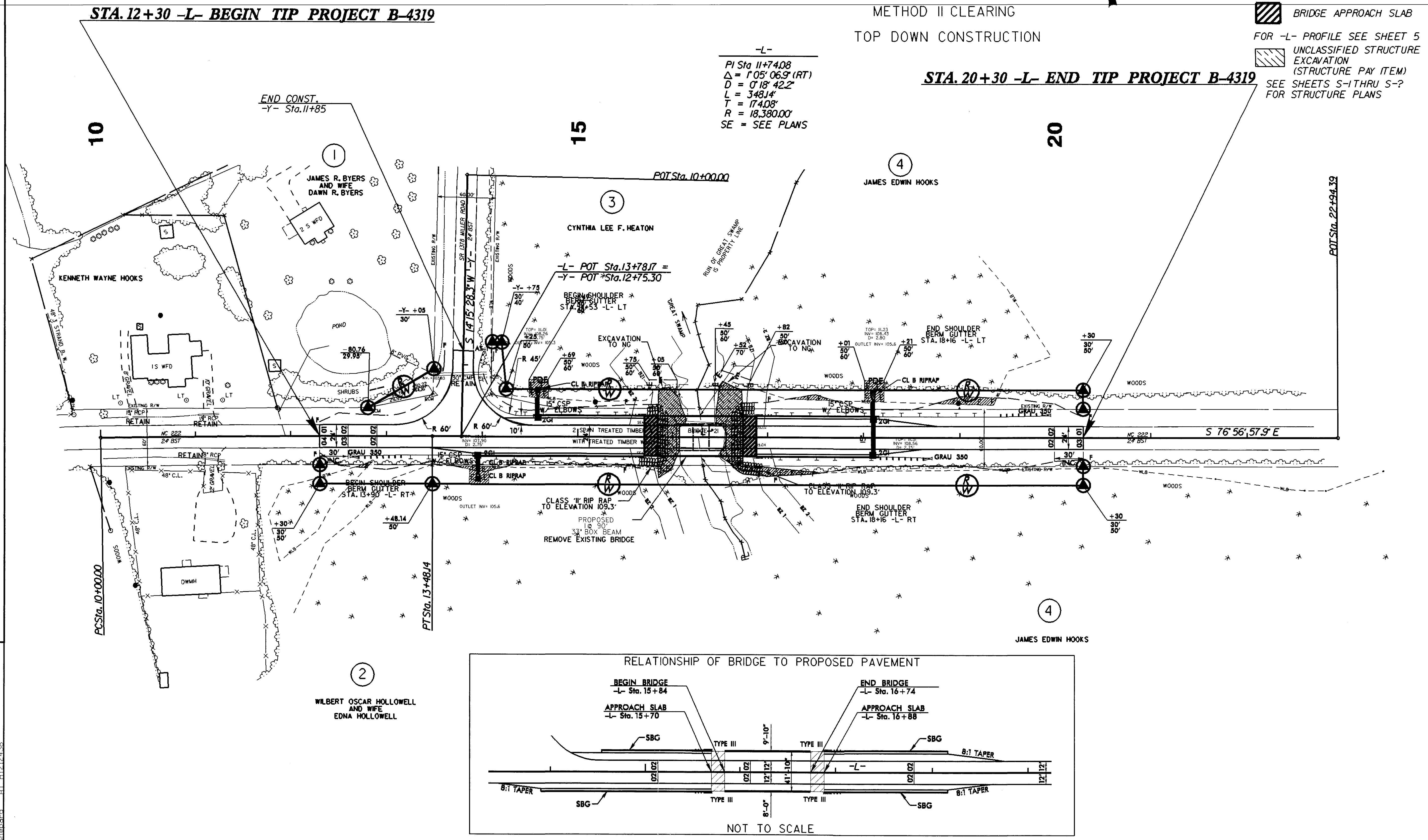
NAD 83/95

BRIDGE APPROACH SLAB

FOR -L- PROFILE SEE SHEET 5

UNCLASSIFIED STRUCTURE EXCAVATION (STRUCTURE PAY ITEM)

SEE SHEETS S-1 THRU S-? FOR STRUCTURE PLANS



STA. 12+30 -L- BEGIN TIP PROJECT B-4319
STA. 20+30 -L- END TIP PROJECT B-4319
-L-
PI Sta 11+74.08
Δ = 1°05' 06.9" (RT)
D = 0°18' 42.2"
L = 348.14'
T = 174.08'
R = 18,380.00'
SE = SEE PLANS
END CONST. -Y- Sta. 11+85
10
15
20
1
JAMES R. BYERS AND WIFE DAWN R. BYERS
2
WILBERT OSCAR HOLLOWELL AND WIFE EDNA HOLLOWELL
3
CYNTHIA LEE F. HEATON
4
JAMES EDWIN HOOKS
KENNETH WAYNE HOOKS
POT Sta. 10+00.00
POT Sta. 22+94.39
PC Sta. 10+00.00
PT Sta. 13+48.14
-L- POT Sta. 13+78.17 = -Y- POT Sta. 12+75.30
SR 1378 MILLER ROAD
S 14°15' 28.3" W -Y-
S 76°56' 57.9" E
NC 222
POND
WOODS
SHRUBS
RUN OF GREAT SWAMP IS PROPERTY LINE
GREAT SWAMP
BEGIN SHOULDER BERM GUTTER STA. 14+53 -L- LT
BEGIN SHOULDER BERM GUTTER STA. 13+90 -L- RT
END SHOULDER BERM GUTTER STA. 18+16 -L- LT
END SHOULDER BERM GUTTER STA. 18+16 -L- RT
EXCAVATION TO NG
CLASS 'II' RIP RAP TO ELEVATION 109.3'
PROPOSED 1 @ 90' 33" BOX BEAM
REMOVE EXISTING BRIDGE
CL B RIPRAP
15" CSP W/ ELBOWS
GRAU 350
RELATIONSHIP OF BRIDGE TO PROPOSED PAVEMENT
BEGIN BRIDGE -L- Sta. 15+84
APPROACH SLAB -L- Sta. 15+70
END BRIDGE -L- Sta. 16+74
APPROACH SLAB -L- Sta. 16+88
SBG
TYPE III
8:1 TAPER
-L-
NOT TO SCALE

REVISIONS

8/17/99

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PROJECT REFERENCE NO.	SHEET NO.
B-4319	14 of 10
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

DENOTES FILL IN WETLAND

DENOTES EXCAVATION IN WETLAND

WETLAND PERMIT DRAWINGS
11/02/05

METHOD II CLEARING

TOP DOWN CONSTRUCTION

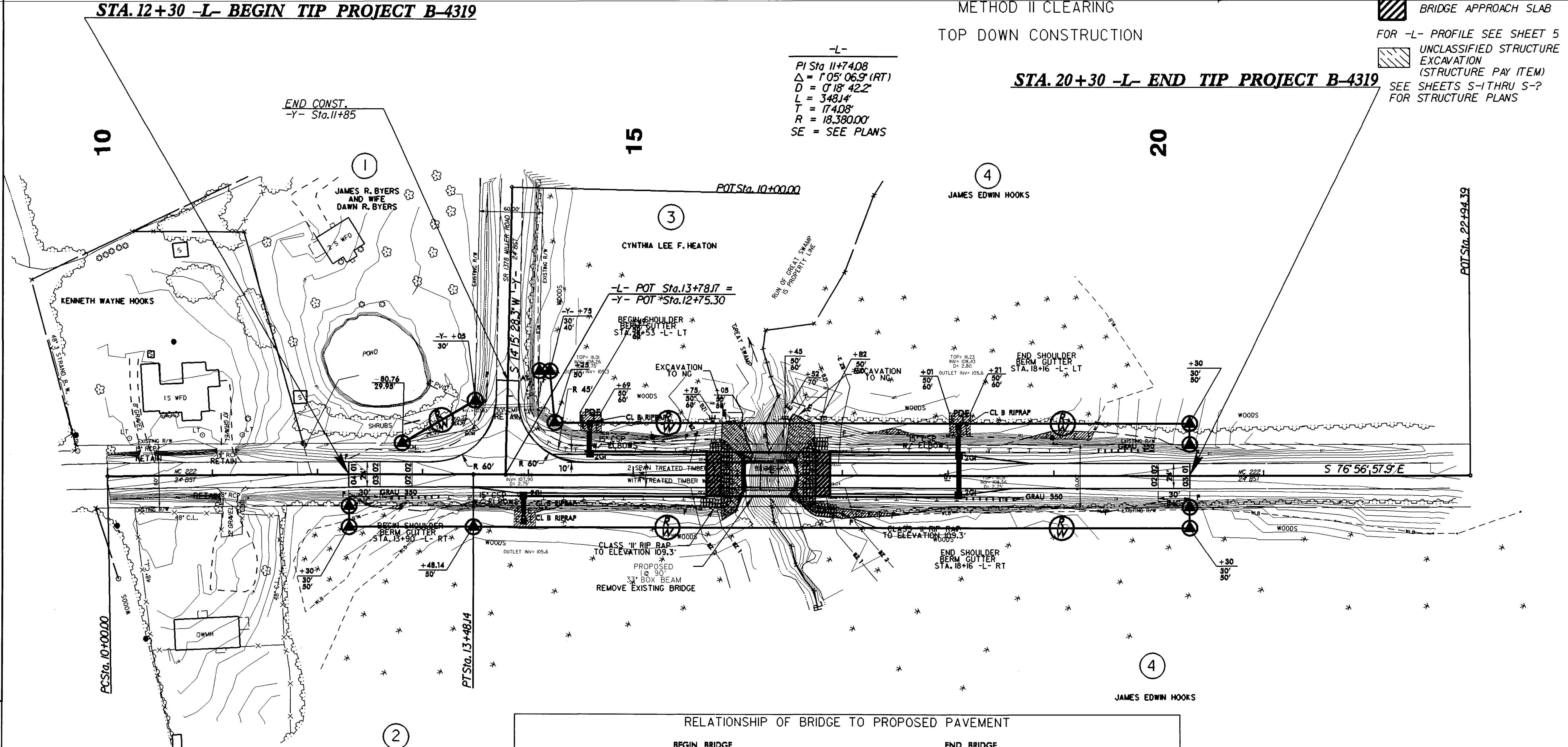
NAD 83/95

BRIDGE APPROACH SLAB

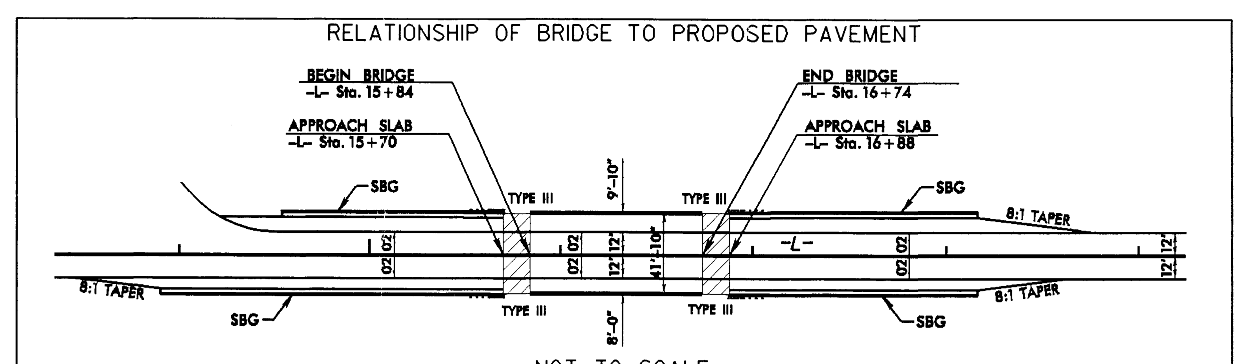
FOR -L- PROFILE SEE SHEET 5

UNCLASSIFIED STRUCTURE EXCAVATION (STRUCTURE PAY ITEM)

SEE SHEETS S-1 THRU S-? FOR STRUCTURE PLANS



STA. 12+30 -L- BEGIN TIP PROJECT B-4319
STA. 20+30 -L- END TIP PROJECT B-4319
-L-
PI Sta 11+74.08
Δ = 1°05' 06.9" (RT)
D = 0°18' 42.2"
L = 348.14'
T = 174.08'
R = 18,380.00'
SE = SEE PLANS
END CONST. -Y- Sta. 11+85
POT Sta. 10+00.00
-L- POT Sta. 13+78.17 = -Y- POT Sta. 12+75.30
JAMES R. BYERS AND WIFE DAWN R. BYERS
CYNTHIA LEE F. HEATON
JAMES EDWIN HOOKS
KENNETH WAYNE HOOKS
WILBERT OSCAR HOLLOWELL AND WIFE EDNA HOLLOWELL
POND
EXCAVATION TO NG
CLASS 'II' RIP RAP TO ELEVATION 109.3'
PROPOSED 1 @ 90' 33" BOX BEAM
REMOVE EXISTING BRIDGE
BEGIN SHOULDER BERM GUTTER STA. 13+90 -L- RT
END SHOULDER BERM GUTTER STA. 18+16 -L- LT
END SHOULDER BERM GUTTER STA. 18+16 -L- RT
S 76°56'57.9" E
PC Sta. 10+00.00
PT Sta. 13+48.14
POT Sta. 22+94.39
RUN OF GREAT SWAMP IS PROPERTY LINE
WOODS



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5/14/99

PROJECT REFERENCE NO.	SHEET NO.
	7 OF 10
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

-L-

BM #1 RR SPIKE SET IN POWER POLE
-L- STA.10+100.11 25°08' 44.6"W, 49.18'
ELEV = 114.16'

BM #2 RR SPIKE SET IN 30" OAK
-L- STA.14+55.46' LEFT
ELEV = 109.22'

BM #3 RR SPIKE SET IN 14" GUM
-L- STA.22+51.57' LEFT
ELEV = 114.42'

BRIDGE HYDRAULIC DATA

DESIGN DISCHARGE	= 1500 CFS
DESIGN FREQUENCY	= 50 YRS
DESIGN HW ELEVATION	= 108.61 FT
BASE DISCHARGE	= 1800 CFS
BASE FREQUENCY	= 100 YRS
BASE HW ELEVATION	= 109.11 FT
OVERTOPPING DISCHARGE	= 2800+ CFS
OVERTOPPING FREQUENCY	= 500+ YRS
OVERTOPPING ELEVATION	= 111.87 FT
DATE OF SURVEY	= 9-14-04
W.S ELEVATION AT DATE OF SURVEY	= 104.2 FT

BEGIN GRADE -L- STA.12+30
EL 112.30'

BEGIN BRIDGE
-L- STA.15+84 +/-

END BRIDGE
-L- STA.16+74 +/-

END GRADE -L- STA.20+30
EL 112.30'

PI = 13+75.00
EL = 111.29'
VC = 180'
K = 158

PI = 16+10.00
EL = 112.33'
VC = 200'
K = 267

PI = 18+00.00
EL = 111.75'
VC = 180'
K = 331

℄ STA. 15+29.00 -L-
℄ 90° 33" BOX BEAM
℄ ELEV. = 112.15'
SKEW = 90°

LOW POINT
STA.16+09+

EXCAVATION (TYP.)

EXCAVATION

PROPOSED GRADE

(-)0.6966%

(+)0.1426%

(-)0.3053%

(+)0.2194%

EXISTING GRADE

NC

+/- 300' TO EDGE OF FLOODPLAIN

NC

+/- 500' TO EDGE OF FLOODPLAIN

TYP.

CLASS "I" RIP RAP (BOTH SIDES)

NEUSE RIVER BUFFER ZONE

8/23/99

0 10	PROJ. REFERENCE NO.	SHEET NO.
	B-4319	8 OF 10

LIMIT OF WETLAND IMPACT

WETLAND

RESURFACING

M139
14+00.00

RESURFACING

M142
13+50.00

M170
13+00.00

M189
12+50.00

BEGIN PROJECT -L- STA.12+30

M236
12+00.00

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

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psheppard
AT H212428

8/23/99

0 10	PROJ. REFERENCE NO.	SHEET NO.
	B-4319	TOTAL SHEETS 10

FILL IN WETLAND

17+00.00

END BRIDGE -L- STA.16+74 +/-

16+50.00

16+00.00

BEGIN BRIDGE -L- STA.15+84 +/-

15+50.00

15+00.00

LIMIT OF WETLAND IMPACT

14+50.00

-L-

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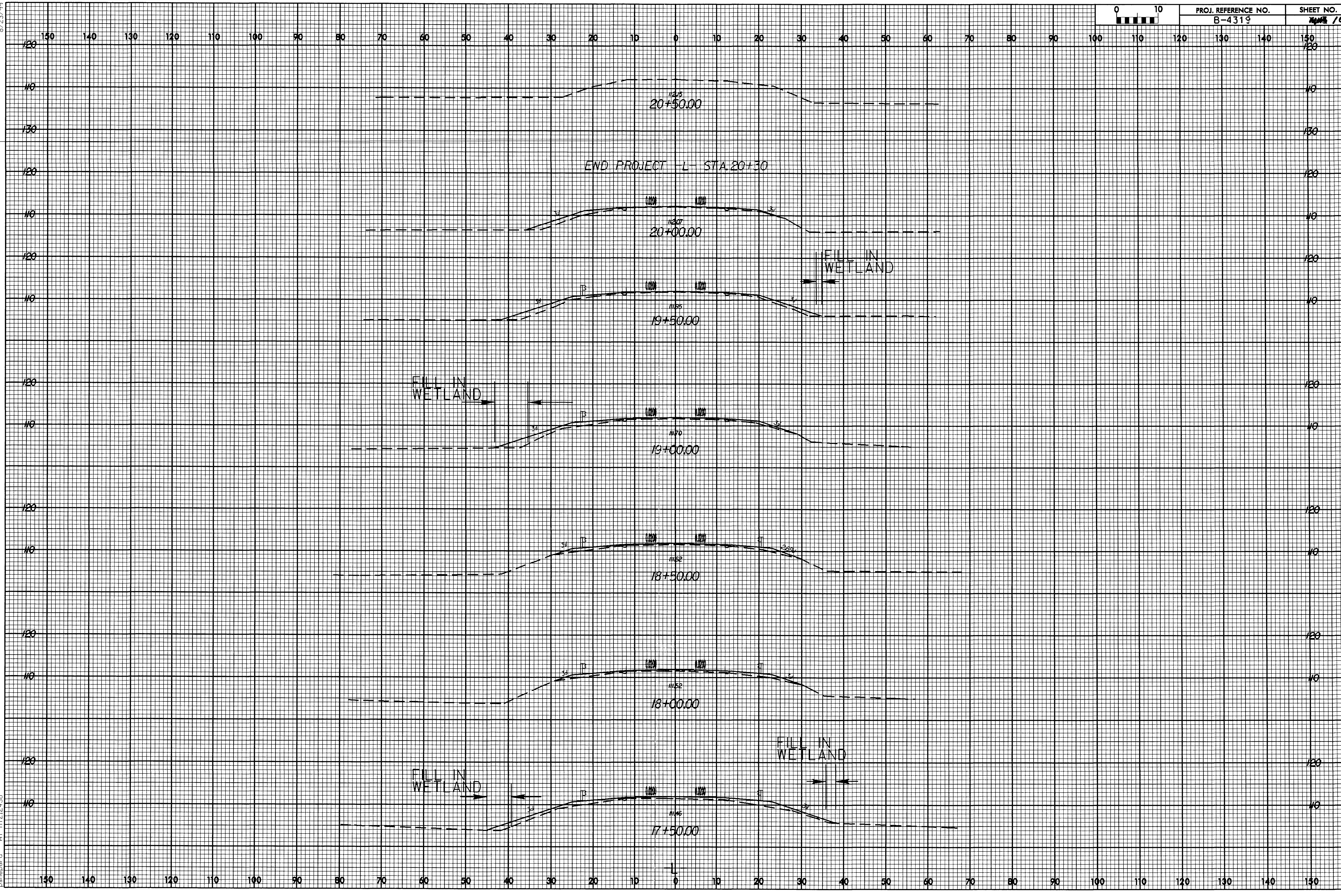
pshepard AT HY212438

PROJ. REFERENCE NO.	SHEET NO.
B-4319	10 of 10



8/23/99

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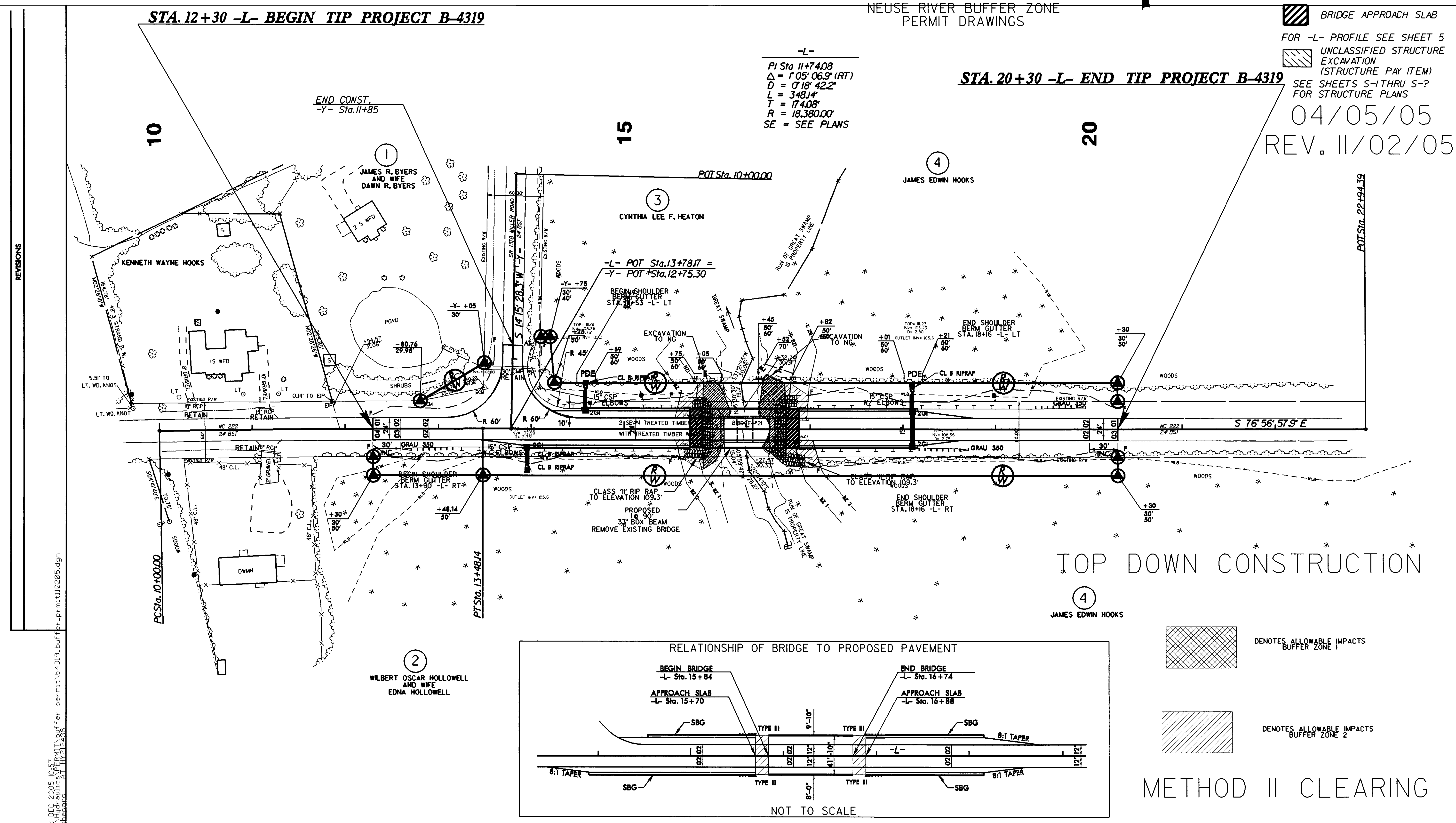
pshepard AT HY212438

PROJECT REFERENCE NO.	SHEET NO.
B-4319	R5 of 8
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

NEW
CHRIS
MANLEY

NEUSE RIVER BUFFER ZONE
PERMIT DRAWINGS



NAD 83/95
STA. 12+30 -L- BEGIN TIP PROJECT B-4319
STA. 20+30 -L- END TIP PROJECT B-4319
BRIDGE APPROACH SLAB
FOR -L- PROFILE SEE SHEET 5
UNCLASSIFIED STRUCTURE EXCAVATION (STRUCTURE PAY ITEM)
SEE SHEETS S-1 THRU S-? FOR STRUCTURE PLANS
04/05/05
REV. 11/02/05
-L-
PI Sta 11+74.08
Δ = 1°05' 06.9" (RT)
D = 0°18' 42.2"
L = 348.14'
T = 174.08'
R = 18,380.00'
SE = SEE PLANS
END CONST. -Y- Sta.11+85
10
15
20
1 JAMES R. BYERS AND WIFE DAWN R. BYERS
2 WILBERT OSCAR HOLLOWELL AND WIFE EDNA HOLLOWELL
3 CYNTHIA LEE F. HEATON
4 JAMES EDWIN HOOKS
KENNETH WAYNE HOOKS
POT Sta. 10+00.00
POT Sta. 22+94.39
PC Sta. 10+00.00
PT Sta. 13+48.14
-L- POT Sta.13+78.17 = -Y- POT Sta.12+75.30
SR 1378 MILLER ROAD
S 14°15' 28.3" W -Y-
S 76°56' 57.9" E
NC 222 24' BST
POND
WOODS
SHRUBS
BEGIN SHOULDER BERM GUTTER STA. 13+90 -L- RT
END SHOULDER BERM GUTTER STA. 18+16 -L- LT
END SHOULDER BERM GUTTER STA. 18+16 -L- RT
EXCAVATION TO NG
CLASS 'II' RIP RAP TO ELEVATION 109.3'
PROPOSED 1 @ 90' 33" BOX BEAM
REMOVE EXISTING BRIDGE
RUN OF GREAT SWAMP IS PROPERTY LINE
GREAT SWAMP
CL B RIPRAP
15" CSP W/ ELBOWS
GRAU 350
TOP DOWN CONSTRUCTION
DENOTES ALLOWABLE IMPACTS BUFFER ZONE 1
DENOTES ALLOWABLE IMPACTS BUFFER ZONE 2
METHOD II CLEARING
RELATIONSHIP OF BRIDGE TO PROPOSED PAVEMENT
BEGIN BRIDGE -L- Sta. 15+84
APPROACH SLAB -L- Sta. 15+70
END BRIDGE -L- Sta. 16+74
APPROACH SLAB -L- Sta. 16+88
SBG
TYPE III
8:1 TAPER
NOT TO SCALE
REVISIONS

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PROJECT REFERENCE NO.	SHEET NO.
B-4319	N6 of 8
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

NAD 83/95

NEUSE RIVER BUFFER ZONE
PERMIT DRAWINGS

BRIDGE APPROACH SLAB

FOR -L- PROFILE SEE SHEET 5

UNCLASSIFIED STRUCTURE EXCAVATION (STRUCTURE PAY ITEM)

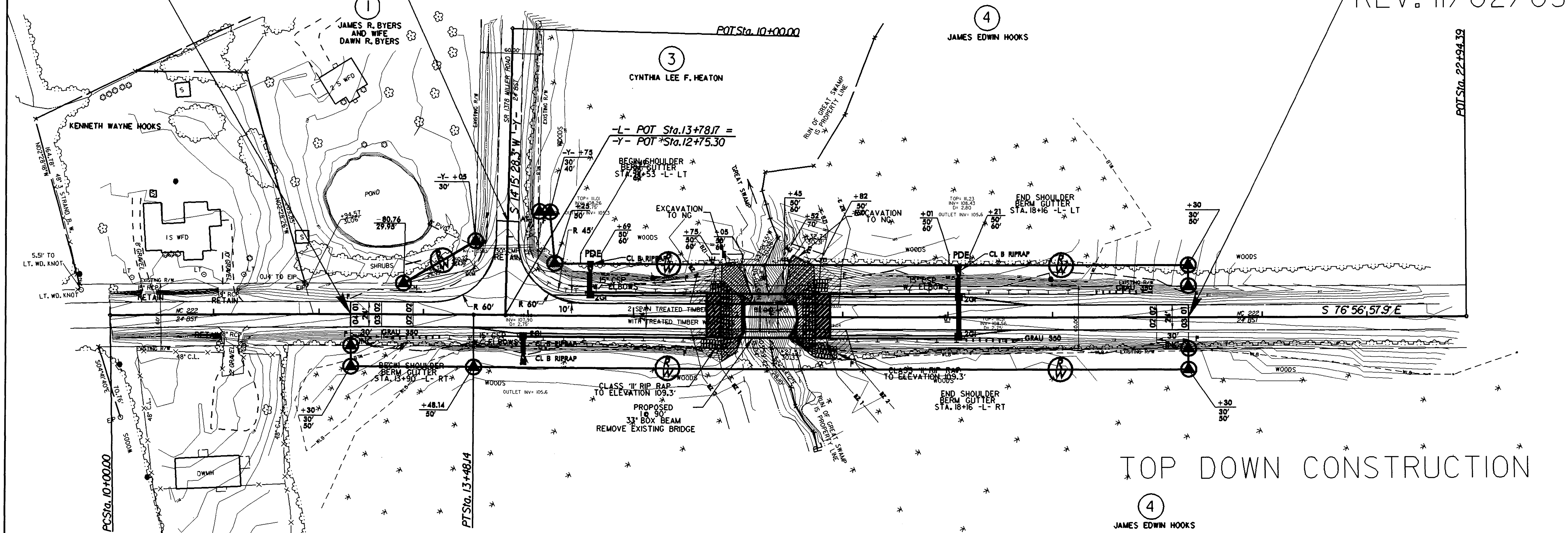
SEE SHEETS S-1 THRU S-? FOR STRUCTURE PLANS

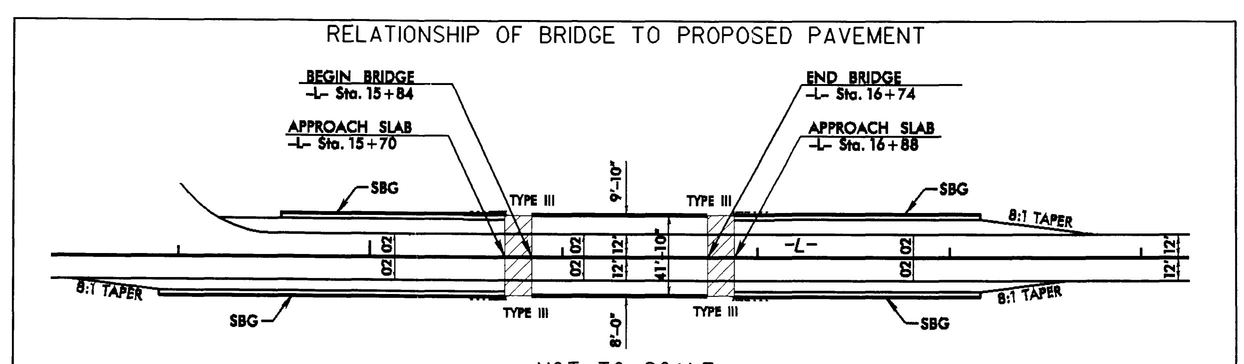
04/05/05
REV. 11/02/05

STA. 12+30 -L- BEGIN TIP PROJECT B-4319

STA. 20+30 -L- END TIP PROJECT B-4319

-L-
PI Sta 11+74.08
Δ = 1° 05' 06.9" (RT)
D = 0° 18' 42.2"
L = 348.14'
T = 174.08'
R = 18,380.00'
SE = SEE PLANS





TOP DOWN CONSTRUCTION

DENOTES ALLOWABLE IMPACTS BUFFER ZONE 1

DENOTES ALLOWABLE IMPACTS BUFFER ZONE 2

METHOD II CLEARING

REVISIONS

8/17/99

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pshepard AT HY212438

7/2/99

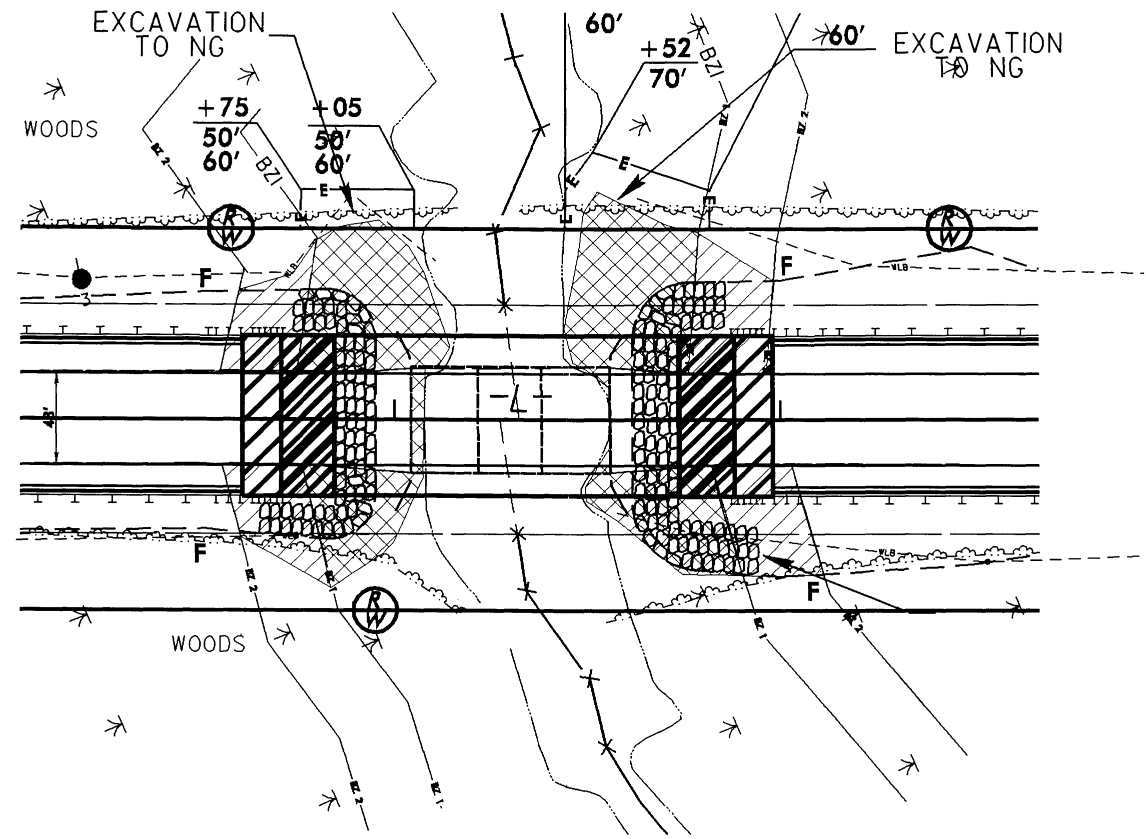
REVISIONS

PROJECT REFERENCE NO.	SHEET NO.
B-4319	7 of 8
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

NEUSE RIVER BUFFER ZONE PERMIT DRAWINGS

04/05/05

REV. 11/02/05



SCALE: 1"= 50' HORIZ.

DENOTES ALLOWABLE IMPACTS BUFFER ZONE 1

DENOTES ALLOWABLE IMPACTS BUFFER ZONE 2

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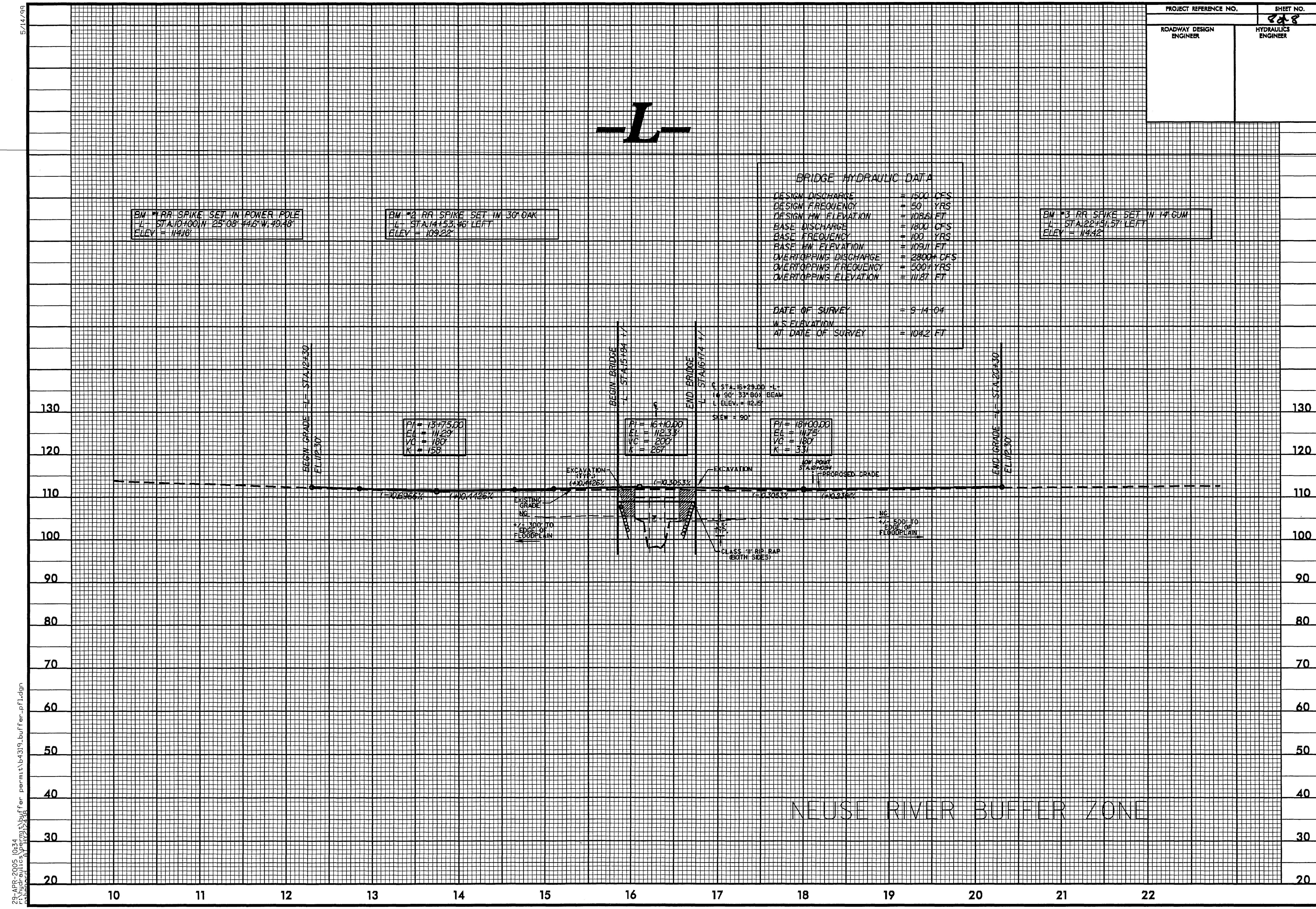
psheppard AT HY212438


PROJECT REFERENCE NO.
SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
-L-
BRIDGE HYDRAULIC DATA
DESIGN DISCHARGE = 1500 CFS
DESIGN FREQUENCY = 50 YRS
DESIGN HW ELEVATION = 108.61 FT
BASE DISCHARGE = 1800 CFS
BASE FREQUENCY = 100 YRS
BASE HW ELEVATION = 109.11 FT
OVERTOPPING DISCHARGE = 2800+ CFS
OVERTOPPING FREQUENCY = 500+ YRS
OVERTOPPING ELEVATION = 111.87 FT
DATE OF SURVEY = 9-14-04
W.S. ELEVATION AT DATE OF SURVEY = 104.2 FT
BM #1 RR SPIKE SET IN POWER POLE -L- STA.10+00, N 25°08' 44.6"W, 49.48' ELEV = 114.16'
BM #2 RR SPIKE SET IN 30" OAK -L- STA.14+53, 46' LEFT ELEV = 109.22'
BM #3 RR SPIKE SET IN 14" GUM -L- STA.22+51, 57' LEFT ELEV = 114.42'
BEGIN GRADE -L- STA.12+30 EL.112.30'
END GRADE -L- STA.20+30 EL.112.30'
BEGIN BRIDGE -L- STA.15+84 +/-
END BRIDGE -L- STA.16+74 +/-
℄ STA.16+29.00 -L-
1@ 90' 33" BOX BEAM
℄ ELEV. = 112.15'
SKEW = 90°
PI = 13+75.00 EL = 111.29' VC = 180' K = 155
PI = 16+10.00 EL = 112.33' VC = 200' K = 267
PI = 18+00.00 EL = 111.75' VC = 180' K = 331
(-)0.6966%
(+)0.4426%
(+)0.4426%
(-)0.3053%
(-)0.3053%
(+)0.2391%
EXCAVATION (TYP.)
EXCAVATION
LOW POINT STA.18+10.94
PROPOSED GRADE
EXISTING GRADE
NC
+/- 300' TO EDGE OF FLOODPLAIN
+/- 500' TO EDGE OF FLOODPLAIN
3.5' TYP.
CLASS 'II' RIP RAP (BOTH SIDES)
NEUSE RIVER BUFFER ZONE
130
120
110
100
90
80
70
60
50
40
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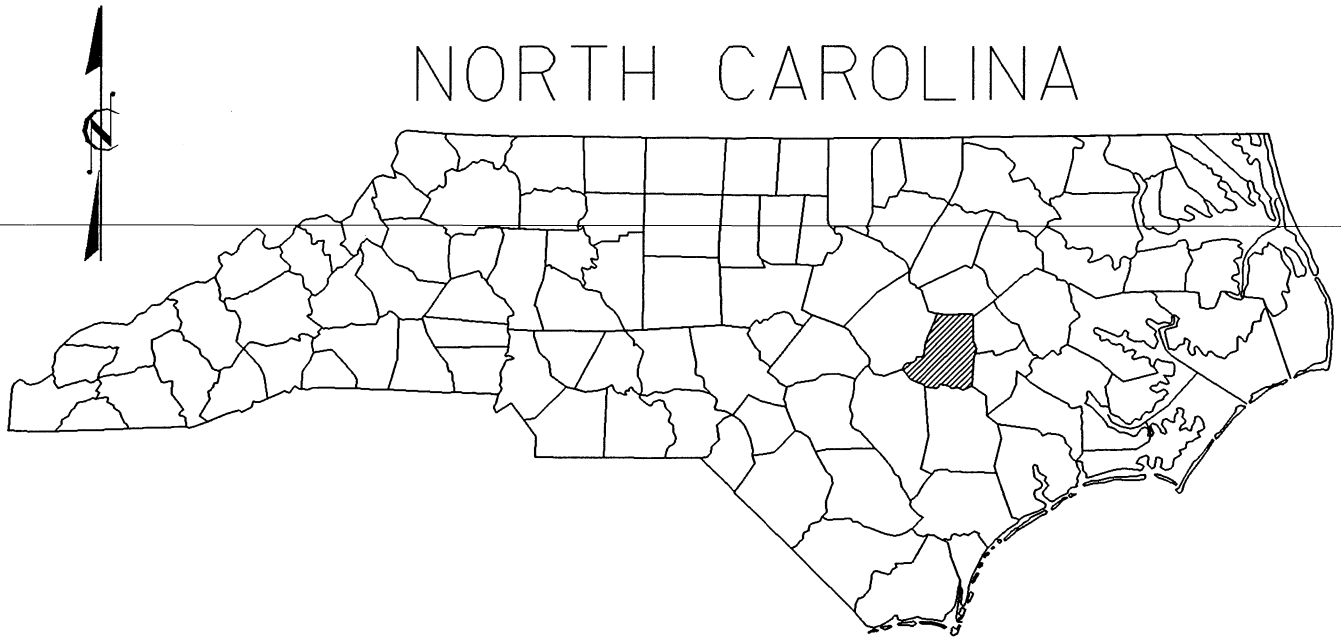
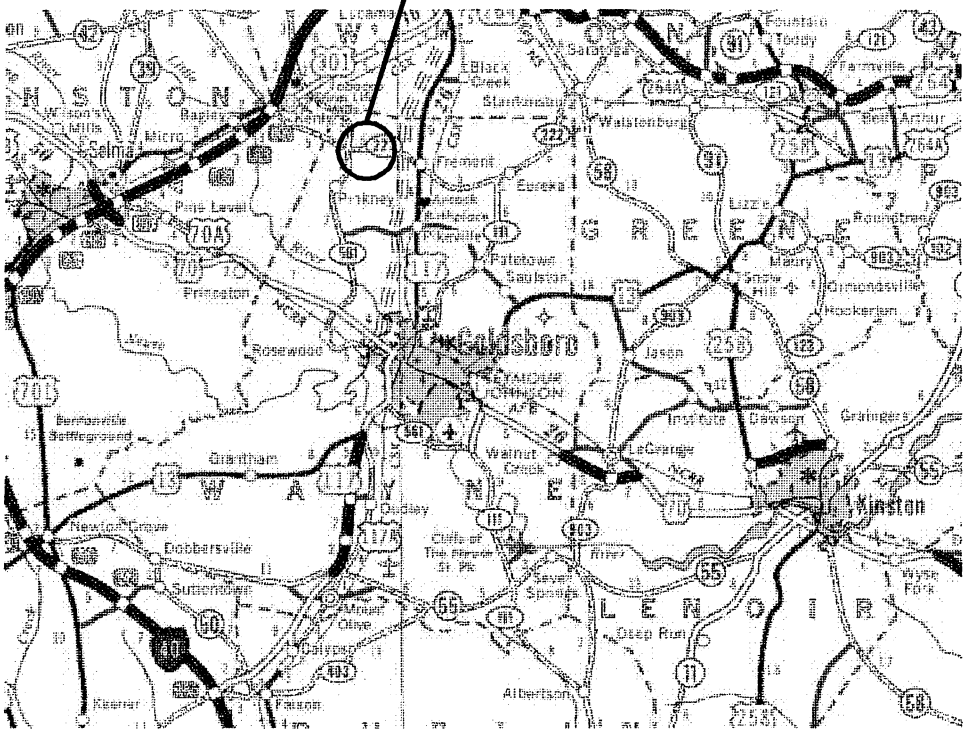


PROJECT



VICINITY MAPS

NEUSE RIVER BUFFER ZONE

NCDOT

DIVISION OF HIGHWAYS

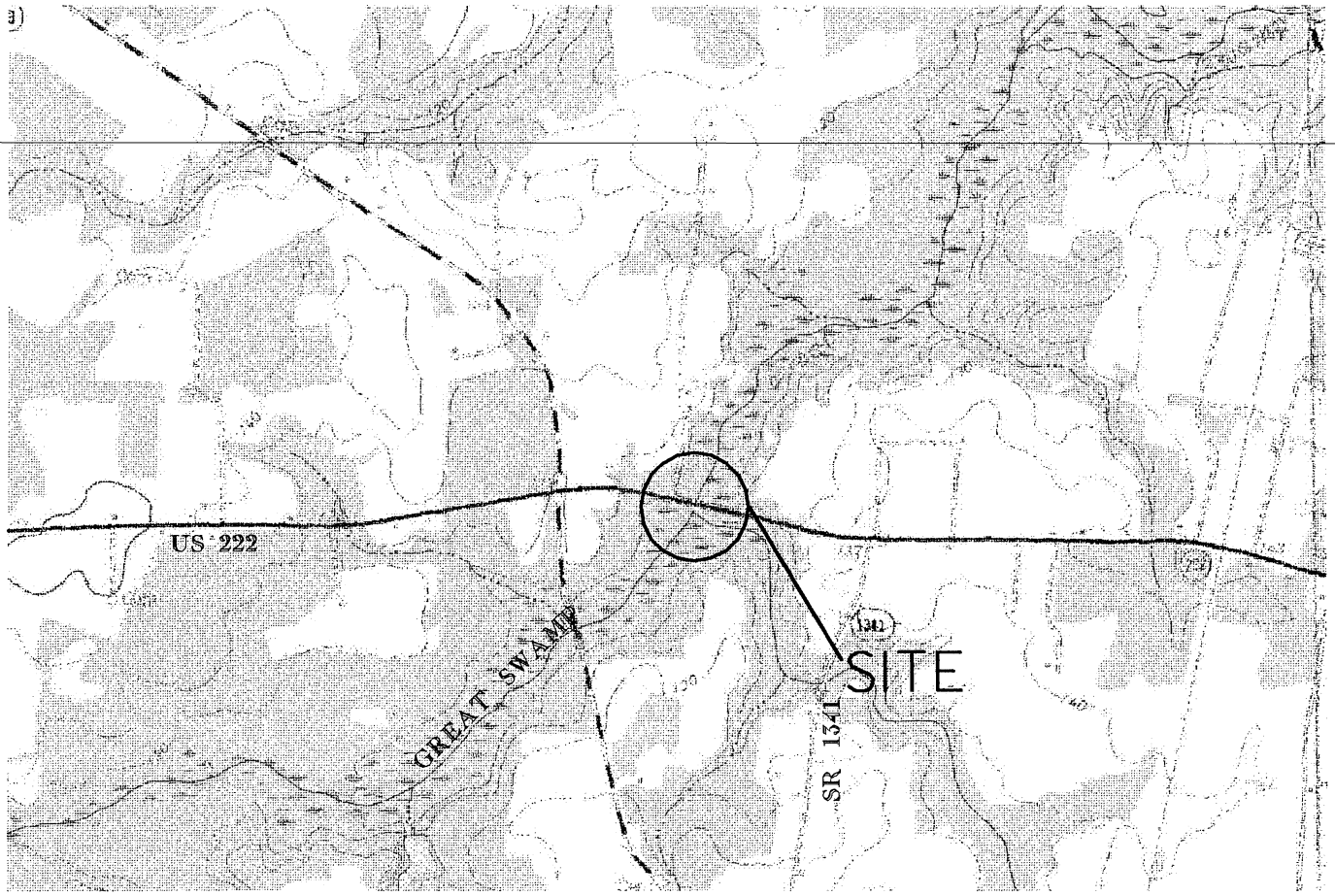
WAYNE COUNTY

PROJECT: 33656.1.1 (B-4319)

REPLACE BRIDGE NO. 21

OVER GREAT SWAMP

ALONG NC 222



TOPOGRAPHIC MAPS

NEUSE RIVER BUFFER ZONE

NCDOT

DIVISION OF HIGHWAYS

WAYNE COUNTY

PROJECT: 33656.1.1 (B-4319)

REPLACE BRIDGE NO. 21

OVER GREAT SWAMP

ALONG NC 222

Property Owner Contact Report

TIP # B-4319

Owner Last Name/ Business	Owner First Name	Address	City/Town	State	Zip Code	Contact/ Relationship	Home Phone	Contacted By	Contact Date	How Contacted	Comments
1 Byers	James R.	129 Miller Road	Fremont	NC	27830	James R. Hooks Self		Stephen R. Wolfe	3/17/04	Letter	
2 Hollowell	Wilbert Oscar	1681 NC 222 Hwy West	Fremont	NC	27830	Wilbert Oscar Hollowell Self		Stephen R. Wolfe	3/17/04	Letter	
4 Hooks	James Edwin	211 Emerson Drive	Mebane	NC	27302	James Edwin Hooks Self		Stephen R. Wolfe	3/17/04	Letter	
Hooks	Kenneth Wayne	P.O. Box 155	Fremont	NC	27830	Kenneth Wayne Hooks Self		Stephen R. Wolfe	3/17/04	Letter	
3 Lukens	Cynthia Fisher	168 Miller Road	Fremont	NC	27830	Cynthia F. Lukens Self		Stephen R. Wolfe	3/17/04	Letter	

BUFFER IMPACTS SUMMARY

			IMPACT								BUFFER REPLACEMENT	
			TYPE		ALLOWABLE			MITIGABLE				
SITE NO.	STRUCTURE SIZE / TYPE	STATION (FROM/TO)	ROAD CROSSING	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+53 TO	X		1910	1001	2911					
		16+14 -L-										
	Bridge	16+44 TO	X		2044	1218	3262					
		17+14 -L-										
TOTAL:					3954	2219	6173	0.0	0.0	0.0		

N.C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS

WAYNE COUNTY
PROJECT: 33656.1.1 (B-4319)

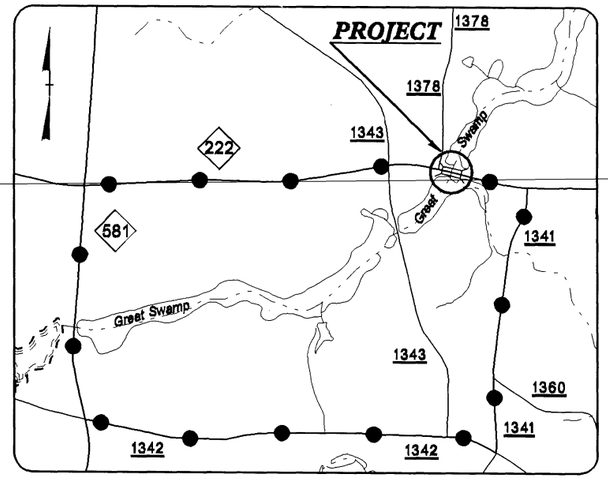
4/5/2005
SHEET 4 OF 8

09/08/99

TIP PROJECT: B-4319

CONTRACT:

SEE SHEET 1-A FOR INDEX OF SHEETS
SEE SHEET 1-B FOR CONVENTIONAL SYMBOLS



VICINITY MAP
DENOTES PROPOSED DETOUR ROUTE

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

WAYNE COUNTY

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-4319	1	7

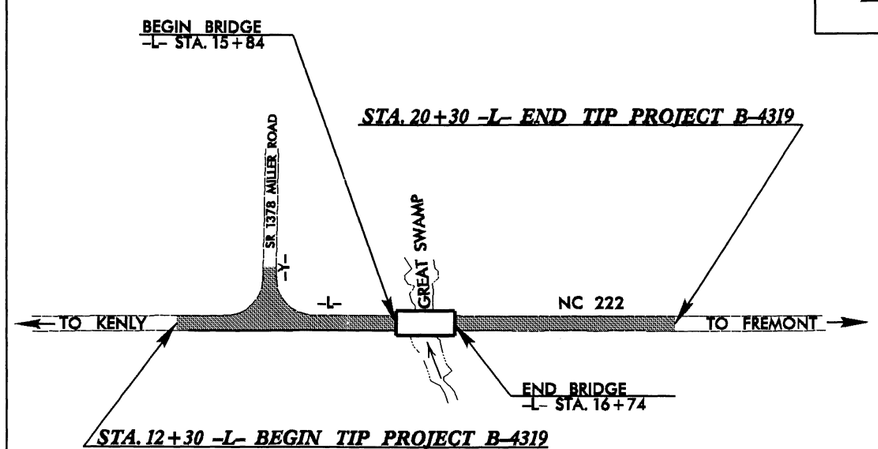
STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
33656.1.1	BRSTP-222(2)	PE
33656.2.1	BRSTP-222(2)	R/W, UTIL.

LOCATION: BRIDGE NO. 21 OVER GREAT SWAMP ON NC 222

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

NAD 83/95

4



THIS PROJECT IS NOT WITHIN ANY MUNICIPAL BOUNDARIES.
CLEARING ON THIS PROJECT SHALL BE PERFORMED TO THE LIMITS ESTABLISHED BY METHOD II.

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 2006	=	1412
ADT 2026	=	2452
DHV	=	10 %
D	=	60 %
T	=	5 % *
V	=	60 MPH
FUNC. CLASS	=	RURAL COLLECTOR

* TTST=3% DUAL=2%

PROJECT LENGTH

LENGTH OF ROADWAY TIP PROJECT B-4319 = 0.135 MI
LENGTH OF STRUCTURE TIP PROJECT B-4319 = 0.017 MI
TOTAL LENGTH OF TIP PROJECT B-4319 = 0.152 MI

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

2002 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE: APRIL 8, 2005

LETTING DATE: APRIL 18, 2006

GARY LOVERING, PE
PROJECT ENGINEER

RON McCOLLUM, PE
PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER

SIGNATURE: P.E.

ROADWAY DESIGN ENGINEER

SIGNATURE: P.E.

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

P.E.
STATE DESIGN ENGINEER

DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

APPROVED
DIVISION ADMINISTRATOR *DATE*

22-JUN-2005 08:17
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tisnell AT R0223246

6/2/99

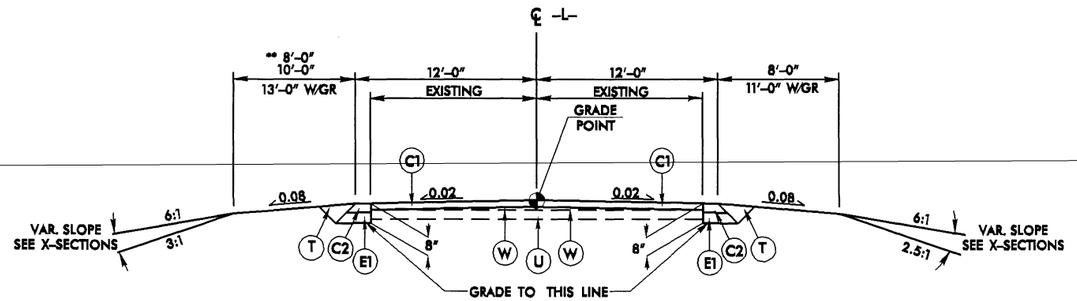
PROJECT REFERENCE NO.	SHEET NO.
B-4319	2 47
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

PAVEMENT SCHEDULE
FINAL DESIGN

C1	PROP. APPROX. 1.25" ASPHALT CONCRETE SURFACE COURSE, TYPE SF9.5A, AT AN AVERAGE RATE OF 137.5 LBS. PER SQ. YD.
C2	PROP. APPROX. 2.5" ASPHALT CONCRETE SURFACE COURSE, TYPE SF9.5A, AT AN AVERAGE RATE OF 137.5 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.
C3	PROP. VAR. DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE SF9.5A, AT AN AVERAGE RATE OF 110 LBS. PER SQ. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NOT TO EXCEED 2" IN DEPTH.
E1	PROP. APPROX. 5.5" ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 627 LBS. PER SQ. YD.
E2	PROP. VAR. DEPTH ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NOT LESS THAN 3" IN DEPTH OR GREATER THAN 5½" IN DEPTH.
T	EARTH MATERIAL.
U	EXISTING PAVEMENT.
W	VARIABLE DEPTH ASPHALT PAVEMENT (SEE WEDGING DETAIL).

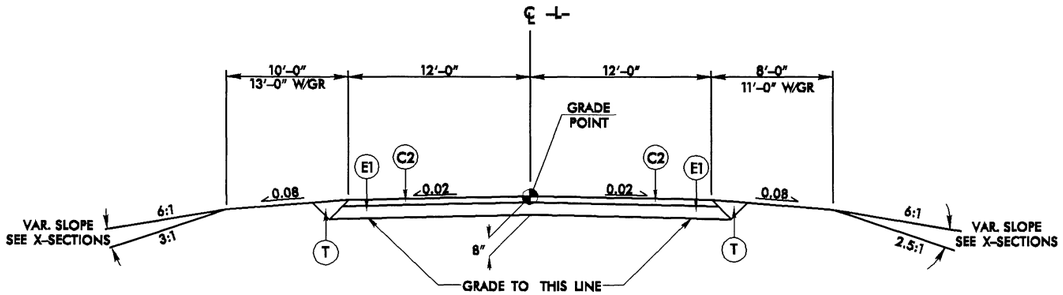
NOTE: PAVEMENT EDGE SLOPES ARE 1:1 UNLESS SHOWN OTHERWISE.



TYPICAL SECTION NO. 1

USE TYPICAL SECTION NO. 1

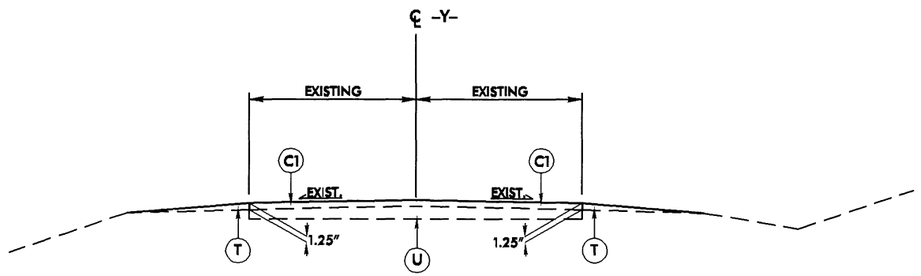
-L- STA. 12+30 TO -L- STA. 15+34
-L- STA. 17+24 TO -L- STA. 20+30
** -L- STA. 12+30 TO -L- STA. 13+78.17



TYPICAL SECTION NO. 2

USE TYPICAL SECTION NO. 2

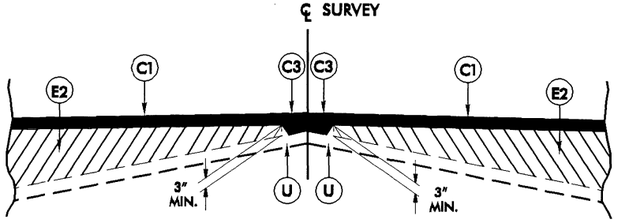
-L- STA. 15+34 TO -L- STA. 15+84 (BEGIN BRIDGE)
-L- STA. 16+74 (END BRIDGE) TO -L- STA. 17+24



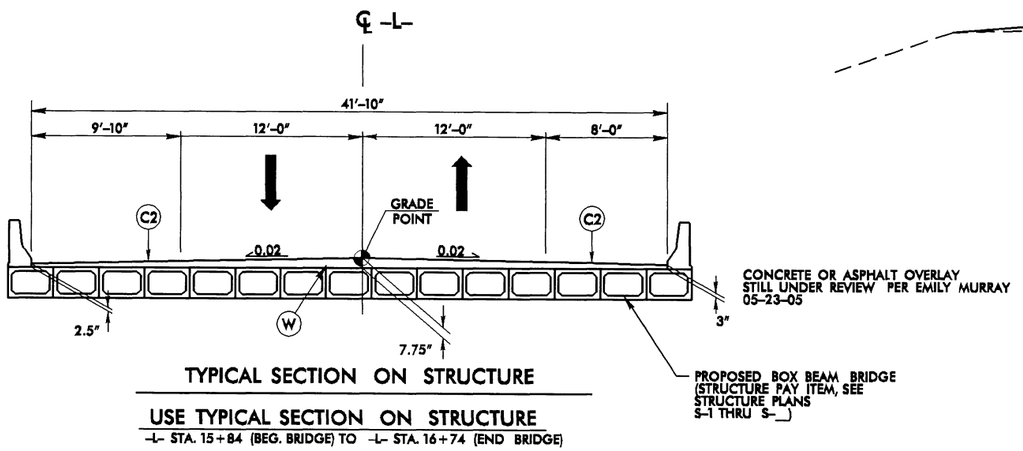
TYPICAL SECTION NO. 3

USE TYPICAL SECTION NO.3

-Y- STA. 11+85 TO -Y- STA. 12+63.30



WEDGING DETAIL



TYPICAL SECTION ON STRUCTURE

USE TYPICAL SECTION ON STRUCTURE

-L- STA. 15+84 (BEG. BRIDGE) TO -L- STA. 16+74 (END BRIDGE)

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PROJECT REFERENCE NO.	SHEET NO.
B-4319	#3 of 7
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

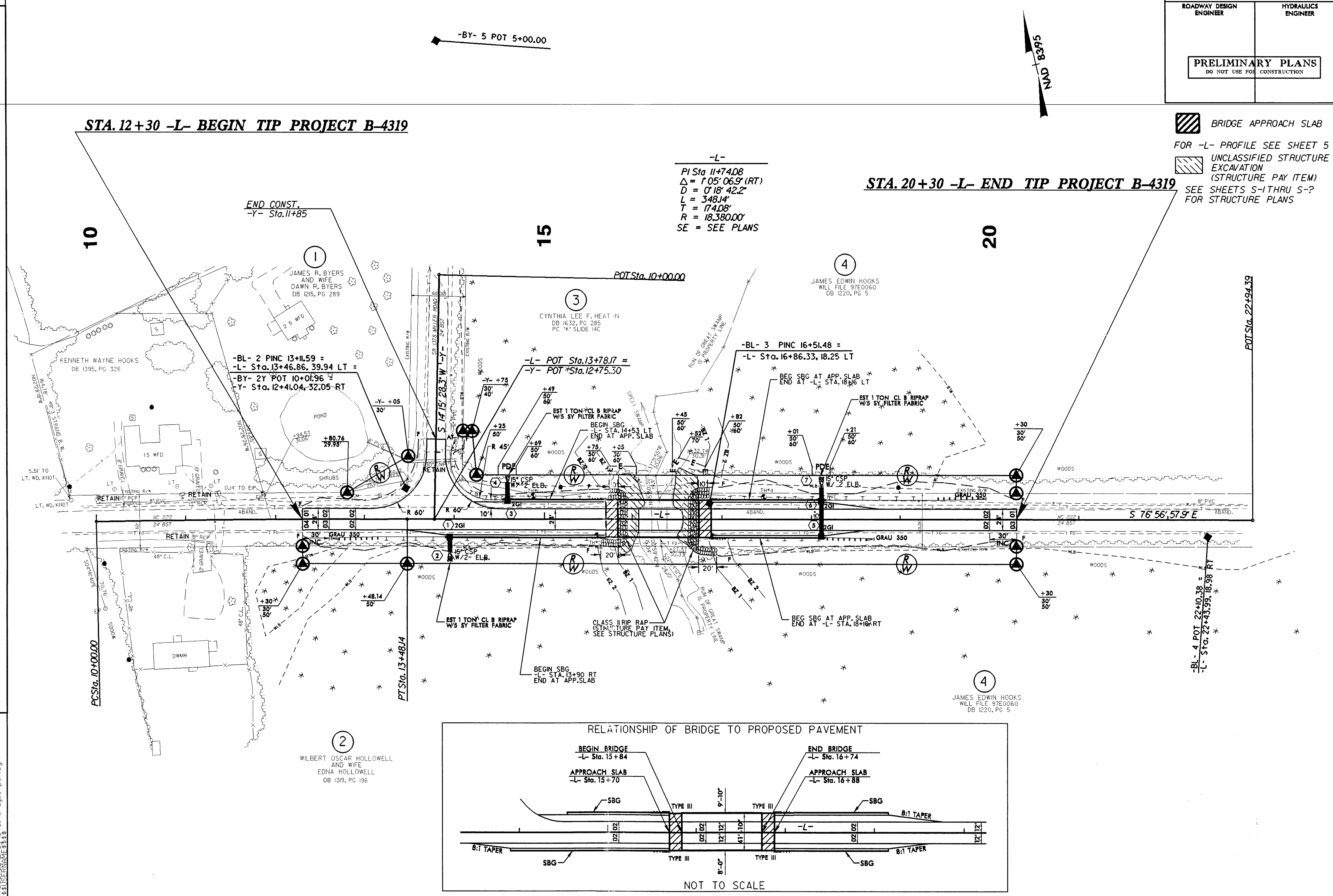
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

BRIDGE APPROACH SLAB

FOR -L- PROFILE SEE SHEET 5

UNCLASSIFIED STRUCTURE EXCAVATION (STRUCTURE PAY ITEM)

SEE SHEETS S-1 THRU S-? FOR STRUCTURE PLANS



-BY- 5 POT 5+00.00
NAD 83/95
STA. 12+30 -L- BEGIN TIP PROJECT B-4319
STA. 20+30 -L- END TIP PROJECT B-4319
-L-
PI Sta 11+74.08
Δ = 1°05' 06.9" (RT)
D = 0°18' 42.2"
L = 348.14'
T = 174.08'
R = 18,380.00'
SE = SEE PLANS
END CONST. -Y- Sta.11+85
10
15
20
JAMES R. BYERS AND WIFE DAWN R. BYERS DB 1215, PG 289
CYNTHIA LEE F. HEATON DB 1632, PG 285 PC 'K' SLIDE 14C
JAMES EDWIN HOOKS WILL FILE 97E0060 DB 1220, PG 5
KENNETH WAYNE HOOKS DB 1395, PG 326
WILBERT OSCAR HOLLOWELL AND WIFE EDNA HOLLOWELL DB 1319, PG 196
POT Sta. 10+00.00
POT Sta. 22+94.39
-BL- 2 PINC 13+11.59 = -L- Sta. 13+46.86, 39.94 LT =
-BY- 2Y POT 10+01.96 = -Y- Sta. 12+41.04, 32.05 RT
-L- POT Sta.13+78.17 = -Y- POT Sta.12+75.30
-BL- 3 PINC 16+51.48 = -L- Sta. 16+86.33, 18.25 LT
-BL- 4 POT 22+10.38 = -L- Sta. 22+43.99, 18.98 RT
PC Sta. 10+00.00
PT Sta. 13+48.14
S 76°56'57.9" E
EST 1 TON CL B RIPRAP W/5 SY FILTER FABRIC
BEGIN SBG -L- STA. 14+53 LT END AT APP. SLAB
BEG SBG AT APP. SLAB END AT -L- STA. 18+16 LT
BEG SBG AT APP. SLAB END AT -L- STA. 18+16 RT
BEGIN SBG -L- STA. 13+90 RT END AT APP. SLAB
CLASS II RIP RAP (STRUCTURE PAY ITEM, SEE STRUCTURE PLANS)
RUN OF GREAT SWAMP IS PROPERTY LINE
POND
WOODS
RETAIN
RELATIONSHIP OF BRIDGE TO PROPOSED PAVEMENT
BEGIN BRIDGE -L- Sta. 15+84
APPROACH SLAB -L- Sta. 15+70
END BRIDGE -L- Sta. 16+74
APPROACH SLAB -L- Sta. 16+88
SBG
TYPE III
8:1 TAPER
NOT TO SCALE

REVISIONS

8/17/99

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5/14/99

PROJECT REFERENCE NO.	SHEET NO.
B-4319	4 of 7
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

-L-

BM #1 RR SPIKE SET IN POWER POLE
-L- STA. 10+00, N 25° 08' 44.5" W, 49.48'
ELEV = 114.16'

BM #2 RR SPIKE SET IN 30" OAK
-L- STA. 14+53.46' LEFT
ELEV = 109.22'

BM #3 RR SPIKE SET IN 14" GUM
-L- STA. 22+51.57' LEFT
ELEV = 114.42'

BRIDGE HYDRAULIC DATA

DESIGN DISCHARGE	= 1500 CFS
DESIGN FREQUENCY	= 50 YRS
DESIGN HW ELEVATION	= 108.44FT
BASE DISCHARGE	= 1800 CFS
BASE FREQUENCY	= 100 YRS
BASE HW ELEVATION	= 108.90FT
OVERTOPPING DISCHARGE	= 2800+ CFS
OVERTOPPING FREQUENCY	= 500+ YRS
OVERTOPPING ELEVATION	= 111.87 FT
DATE OF SURVEY	= 9-14-04
W.S. ELEVATION AT DATE OF SURVEY	= 104.2 FT

BEGIN GRADE -L- STA. 12+50
EL. 112.50'

PI = 13+75.00
EL = 111.29'
VC = 180'
K = 158

BEGIN BRIDGE
-L- STA. 15+04

END BRIDGE
-L- STA. 16+74

PI = 16+10.00
EL = 112.33'
VC = 200'
K = 267

PI = 18+00.00
EL = 111.75'
VC = 180'
K = 331

END GRADE -L- STA. 20+50
EL. 112.50'

(+)0.4426%
(-)0.3053%
(-)0.6966%
(+)0.1426%
(+)0.4426%
(-)0.3053%
(+)0.2307%

POT -L- STA. 13+78.11
POT -Y- STA. 12+75.36

130
120
110
100
90
80
70
60
50
40
30
20

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

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0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	B-4319	TOTAL SHEETS 7

14+50.00

RESURFACING

111.48

SS. 108.344

14+00.00

RESURFACING

111.39

SS. 105.501

13+50.00

RESURFACING

111.42

SS. 109.378

13+00.00

111.70

SS. 108.652

12+50.00

111.59

SS. 107.506

BEGIN PROJECT -L- STA 12+30.00

12+00.00

111.36

-L-

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

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0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	B-4319	7

17+50.00

11.46

SS. 05736

17+00.00

11.55

SS. 04885

END BRIDGE -L- STA. 16+74

16+50.00

16+00.00

11.71

BEGIN BRIDGE -L- STA. 15+84

15+50.00

11.60

SS. 04006

15+00.00

11.52

SS. 03485

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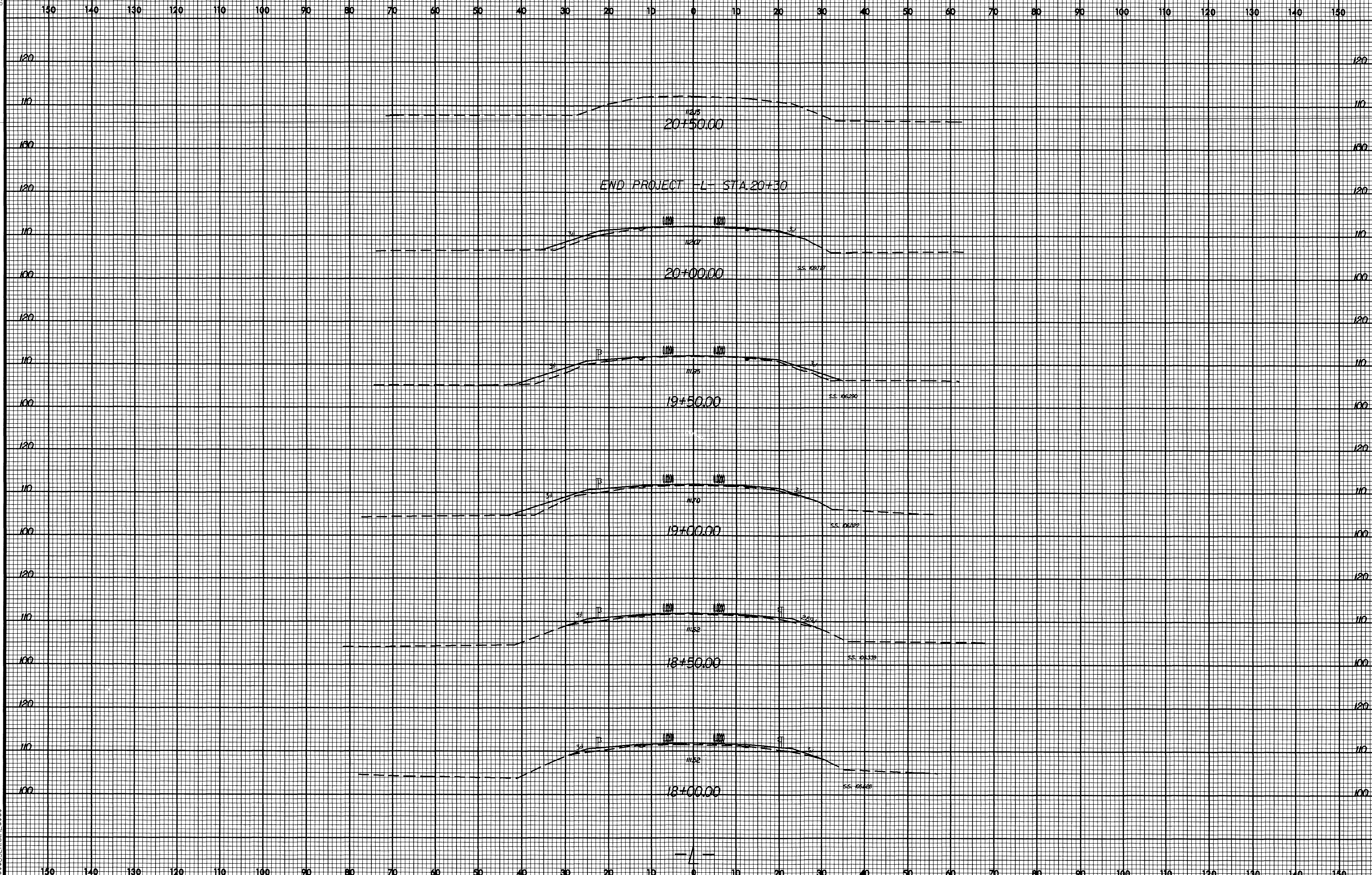
0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	B-4319	7 of 7



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