STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

MICHAEL F. EASLEY
GOVERNOR

LYNDO TIPPETT
SECRETARY

September 28, 2007

US Army Corps of Engineers
Raleigh Regulatory Field Office
6508 Falls of Neuse Road, Suite 120
Raleigh, NC 27615

Attention: Eric Alsmeyer
NCDOT Coordinator, Division 5

Dear Sir:

Subject: **Application for Section 404 Nationwide Permits 23 and 33** for the replacement of Bridge No. 120 over Mud Creek on SR 1303 (Pickett Road), Durham County. Federal Aid Project Number BRZ-1303(3), WBS No. 33464.1.1, State Project No. 8.2353401, Division 5, T.I.P No. B-4109

The North Carolina Department of Transportation (NCDOT) proposes to replace Bridge No. 120 over Mud Creek. The existing bridge is currently in poor condition (bridge sufficiency rating of 52.9 out of 100 as of August 2004) and in need of replacement. The new bridge is intended to provide a safer bridge structure consistent with federal and state bridge standards.

The proposed structure will be approximately 90 feet in length with two spans at 50 feet and 40 feet. One interior bent will be placed in the streambed. The superstructure will be composed of pre-stressed 3-foot (width) by 21-inch (depth) cored slab units. The proposed bridge has 36.5 feet of clear roadway and will provide two travel lanes. The travel lanes will be 12 feet wide each with approximately 6-foot shoulders. The project will replace the current bridge on its existing location and traffic will be maintained through off-site detour during construction. Enclosed are the Pre-Construction Notification, permit drawings, and design plans for the subject project. A Categorical Exclusion (CE) was completed in November 2005 and distributed shortly thereafter. Additional copies of the CE are available upon request.

IMPACTS TO WATERS OF THE UNITED STATES

The project is located in the Cape Fear River Basin (subbasin 03-06-05). This area is part of the United States Geological Survey (USGS) Hydrologic Cataloging Unit 03030002 of the South Atlantic-Gulf Coast Region. Mud Creek [Division of Water Quality (DWQ) index # 16-41-1-10] is the only jurisdictional stream within the project area. Mud Creek has a best usage classification of Class C-NSW. No designated Outstanding Resource Waters (ORW), High Quality Waters (HQW), Water Supply I (WS-I), or Water Supply (WS-II), waters occur within 1.0 mile of the study corridor. Mud Creek is not

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

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

FAX: 919-715-5501

WEBSITE: WWW.NCDOT.ORG

LOCATION:
2728 CAPITAL BLVD. SUITE 240
RALEIGH NC 27604

listed on the Final 2006 Clean Water Act Section 303(d) list of impaired waterbodies. No Section 303(d) listed waterbodies are located within 1.0 mile of the project area.

Two wetlands (Site 2 in Permit Drawings) are located within the project area, one northeast (Wetland A in CE) and one southeast (Wetland B in CE) of the bridge. Wetland A is considered riverine based upon its location within the Mud Creek floodplain and is classified as a palustrine, seasonally flooded, forested wetland supporting broad-leaved deciduous vegetation (PFO1C, Cowardin classification). Wetland B is also considered riverine and is classified as a palustrine, emergent, persistent, temporarily flooded (PEM1A) wetland.

Permanent Impacts

Construction for the new bridge will require less than 0.01 acre of fill (one pier bent) in Mud Creek (Site 1 of Permit Drawings) and less than 0.01 acre of mechanized clearing in both wetlands (Site 2 of Permit Drawings). Overall it was determined that this alternative minimizes impacts to jurisdictional areas and is more cost effective than replacing the bridge at a new location.

Temporary Impacts

There will be 0.02 acre (80 linear feet) of temporary surface water impacts in Mud Creek (Site 1 of Permit Drawings) resulting from the construction of a causeway for the proposed bridge. The causeway will be removed upon completion of construction.

Utility Impacts

No utility impacts are anticipated from project construction.

Bridge Demolition

The existing bridge was constructed in 1950 and is 50 feet in length. It consists of two spans approximately 25 feet each. The superstructure is composed of a timber deck on steel girders with metal railing. The substructure consists of steel caps on timber piles. NCDOT will make every effort to extract the pile bents in their entirety. If complete extraction is not possible, then the piles will be cut at streambed levels as directed by the engineer. Best Management Practices for Bridge Demolition and Removal will be implemented during the demolition of this bridge.

RESTORATION PLAN

Following construction of the bridge, all material used in the construction of the structure will be removed. The impact area associated with the bridge is expected to recover naturally, since the natural streambed and plant material will not be removed. NCDOT does not propose any additional planting in this area. Class II riprap and filter fabric will be used for bank stabilization. Pre-project elevations will be restored.

REMOVAL AND DISPOSAL PLAN

The contractor will be required to submit a reclamation plan for the removal of and disposal of all material off-site at an upland location. The contractor will use excavation equipment for removal of any earthen material. Heavy–duty trucks, dozers, cranes and various other pieces of mechanical equipment necessary for construction of roadways and bridges will be used on site. All material placed in the stream will be removed from the stream at that time. The contractor will have the option of reusing any

of the materials that the engineer deems suitable in the construction of project. After the erosion control devices are no longer needed, all temporary materials will become the property of the contractor.

MITIGATION OPTIONS

Avoidance, Minimization, and Compensatory Mitigation

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

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

Avoidance/Minimization

- Temporary construction impacts due to erosion and sedimentation will be minimized through implementation of stringent erosion control methods and use of Best Management Practices (BMPs).
- Best Management Practices for Protection of Surface Waters will be implemented.
- The current bridge will be replaced on its existing location and traffic will be maintained through off-site detour during construction.
- Existing bridge will be replaced with a longer bridge.

Compensatory Mitigation

The project will impact surface waters (<0.01-acre permanent impacts and 0.02-acre temporary impacts) and wetlands (less than 0.01 acres permanent impacts). Compensatory mitigation is not proposed for the minimal impacts to these resources.

FEDERALLY PROTECTED SPECIES

Plants and animals with federal classifications of Endangered (E), Threatened (T), Proposed Endangered (PE), and Proposed Threatened (PT) are protected under provisions of Section 7 and Section 9 of the Endangered Species Act of 1973, as amended. The United States Fish and Wildlife Service (USFWS) lists 2 species for Durham County and 4 species for neighboring Orange County. While the project is located in Durham County, it is near the Orange County line. Therefore, surveys were conducted for federally protected species listed for both counties. One species (bald eagle) was officially delisted on August 8, 2007 (CFR 50 Part 17) for both counties. However, the bald eagle is still protected under the Golden and Bald Eagle Protection Act. No habitat for bald eagle exists within the project study area. Table 1 lists the species and their federal status.

Table 1. Federally Protected Species in Durham and Orange Counties, NC

Scientific Name	Common Name	Status	Habitat Present	Biological Conclusion	County
Alasmidonta heterodon	Dwarf wedgemussel	Endangered	No	No Effect	Orange
Echinacea laevigata	Smooth coneflower	Endangered	Yes	No Effect	Durham, Orange
Picoides borealis	Red-cockaded woodpecker	Endangered	No	No Effect	Orange
Rhus michauxii	Michaux's sumac	Endangered	Yes	No Effect	Durham, Orange

A biological conclusion of "No Effect" has been rendered for all the listed species in the CE. Habitat exists in the project area for Michaux's sumac and smooth coneflower. However, no individuals of Michaux's sumac or smooth coneflower were found during the survey conducted by NCDOT biologists Greg Price and Erica McLamb on October 9, 2006.

SCHEDULE

The project calls for a letting of May 20, 2008 (review date of April 8, 2008). It is expected that the contractor will choose to start construction in July 2008.

REGULATORY APPROVALS

Section 404 Permit: The project has been processed by the Federal Highway Administration as a "Categorical Exclusion" in accordance with 23 CFR 771.115(b). The NCDOT requests that these activities be authorized by a Nationwide Permit 23 (72 FR 11092; March 19, 2007). We are also requesting the issuance of a Nationwide Permit 33 for the temporary causeway associated with bridge construction within Mud Creek.

Section 401 Certification: We anticipate 401 General Certification numbers 3632 and 3634 will apply to this project. All general conditions of the Water Quality Certifications will be met. No written concurrence is required. Therefore, in accordance with 15A NCAC 2H, Section .0500(a) and 15A NCAC 2B.0200 we are providing two copies of this application to the North Carolina Department of Environmental and Natural Resources, Division of Water Quality, for their notification.

A copy of this permit application will be posted on the NCDOT website at: http://www.ncdot.org/doh/preconstruct/pe/. If you have any questions or need additional information, please call Greg Price at 715-5533.

Sincerely,

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

w/attachment
Mr. John Hennessy, NCDWQ (2 Copies)
Mr. Travis Wilson, NCWRC
Mr. Gary Jordan, USFWS
Dr. David Chang, P.E., Hydraulics
Mr. Mark Staley, Roadside Environmental
Mr. Greg Perfetti, P.E., Structure Design
Mr. Victor Barbour, P.E., Project Services Unit
Mr. J. Wally Bowman, P.E., Division 5 Engineer
Mr. Chris Murray, Division 5 Environmental Officer

w/o attachment
Mr. Jay Bennett, P.E., Roadway Design
Mr. Majed Alghandour, P. E., Programming and TIP
Mr. Art McMillan, P.E., Highway Design
Mr. Scott McLendon, USACE, Wilmington
Mr. Ahmad Al-Sharawneh, PDEA Planning Engineer

Office Use Only: Form Version March 05

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

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

I. Processing

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

2. Nationwide, Regional or General Permit Number(s) Requested: NWP 23 and 33

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

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

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

II. Applicant Information

1. Owner/Applicant Information
   Name: Gregory J. Thorpe, Ph.D., Environmental Management Director
   Mailing Address: 1598 Mail Service Center
   Raleigh, NC 27699-1548
   Telephone Number: (919) 733-3141 Fax Number: (919) 733-9794
   E-mail Address:

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: N/A
   Company Affiliation:
   Mailing Address:
   Telephone Number: Fax Number:
   E-mail Address:

III. Project Information

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

1. Name of project: Replacement of Bridge No.120 over Mud Creek on SR 1303

2. T.I.P. Project Number or State Project Number (NCDOT Only): B-4109

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

4. Location
   County: Durham Nearest Town: Durham
   Subdivision name (include phase/lot number):
   Directions to site (include road numbers/names, landmarks, etc.): see map in permit drawings

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): 35.9751 °N 78.9847 °W

6. Property size (acres): N/A

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

8. River Basin: Cape Fear
   (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: The land use in the surrounding area is primarily residential.

10. Describe the overall project in detail, including the type of equipment to be used: Bridge No. 120 will be replaced at its current location. Traffic will be maintained through offsite detour during construction. Heavy duty excavation equipment will be used such as trucks, dozers, cranes and other various equipment necessary for roadway construction.

11. Explain the purpose of the proposed work: To replace a deteriorating bridge

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: see cover letter

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)
Site 2	Mechanized clearing	Forested	Yes	130	<0.01
Site 2	Mechanized clearing	Marsh	Yes	100	<0.01
Total Wetland Impact (acres)					<0.01

3. List the total acreage (estimated) of all existing wetlands on the property: 0.32 acres

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)
Site 1	Mud Creek	Temp Fill (causeway)	Perennial	30 feet	80	0.02
Site 1	Mud Creek	Perm Fill (bent)	Perennial	30 feet	50	<0.01
Total Stream Impact (by length and acreage)					80	0.02

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

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

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

Stream Impact (acres): Temporary	0.02
Wetland Impact (acres):	<0.01
Open Water Impact (acres):	0
Total Impact to Waters of the U.S. (acres)	0.02
Total Stream Impact (linear feet): Temporary	80

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. Please refer to the attached cover letter

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.
   No mitigation is proposed for the minimal impacts.

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):_____
   Amount of buffer mitigation requested (square feet):_____
   Amount of Riparian wetland mitigation requested (acres):_____
   Amount of Non-riparian wetland mitigation requested (acres):_____
   Amount of Coastal wetland mitigation requested (acres):_____

IX. Environmental Documentation (required by DWQ)

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

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

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

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

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

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

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

Zone*	Impact (square feet)	Multiplier	Required Mitigation
1		3 (2 for Catawba)	
2		1.5	
Total			

* 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. _____

XI. Stormwater (required by DWQ)

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

XII. Sewage Disposal (required by DWQ)

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

N/A

XIII. Violations (required by DWQ)

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

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

XIV. Cumulative Impacts (required by DWQ)

Will this project (based on past and reasonably anticipated future impacts) result in additional development, which could impact nearby downstream water quality? Yes ☐ No ☒
If yes, please submit a qualitative or quantitative cumulative impact analysis in accordance with the most recent North Carolina Division of Water Quality policy posted on our website at http://h2o.enr.state.nc.us/ncwetlands. If no, please provide a short narrative description:

XV. Other Circumstances (Optional):

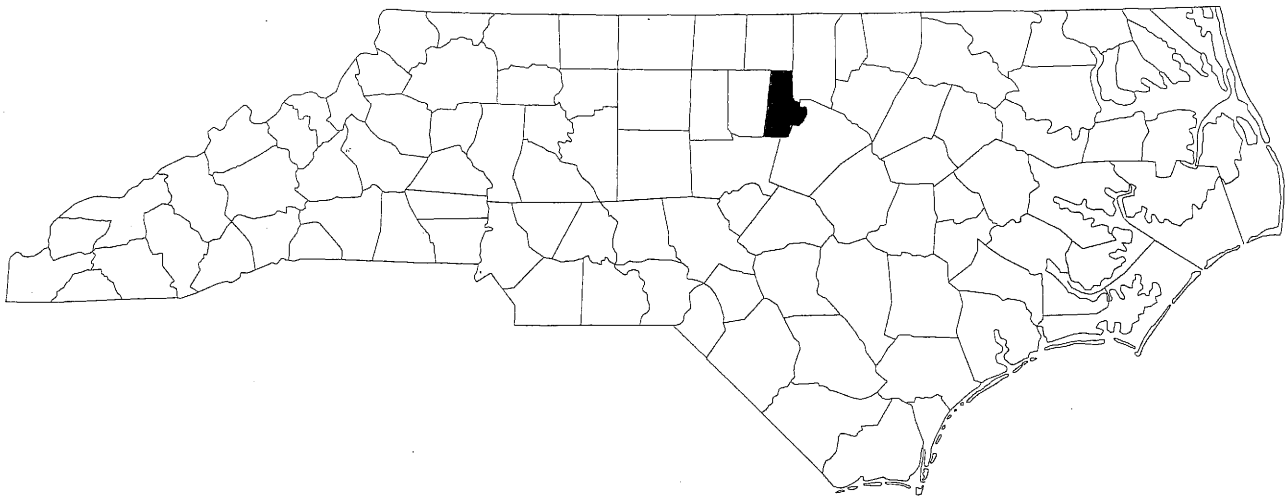
It is the applicant's responsibility to submit the application sufficiently in advance of desired construction dates to allow processing time for these permits. However, an applicant may choose to list constraints associated with construction or sequencing that may impose limits on work schedules (e.g., draw-down schedules for lakes, dates associated with Endangered and Threatened Species, accessibility problems, or other issues outside of the applicant's control).
None

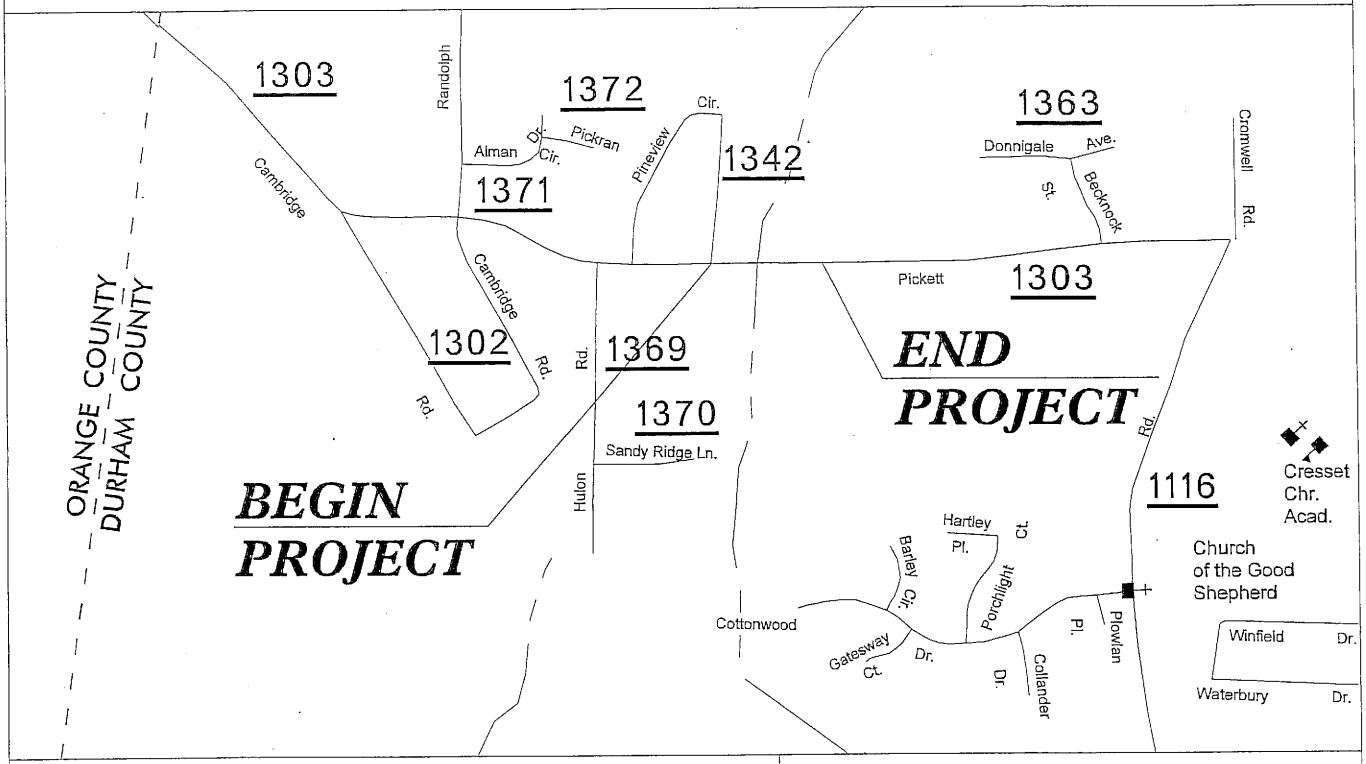
E. L. Lusk for Gregory J. Thorpe, PhD 9.28.07

Applicant/Agent's Signature **Date**

(Agent's signature is valid only if an authorization letter from the applicant is provided.)

NORTH CAROLINA



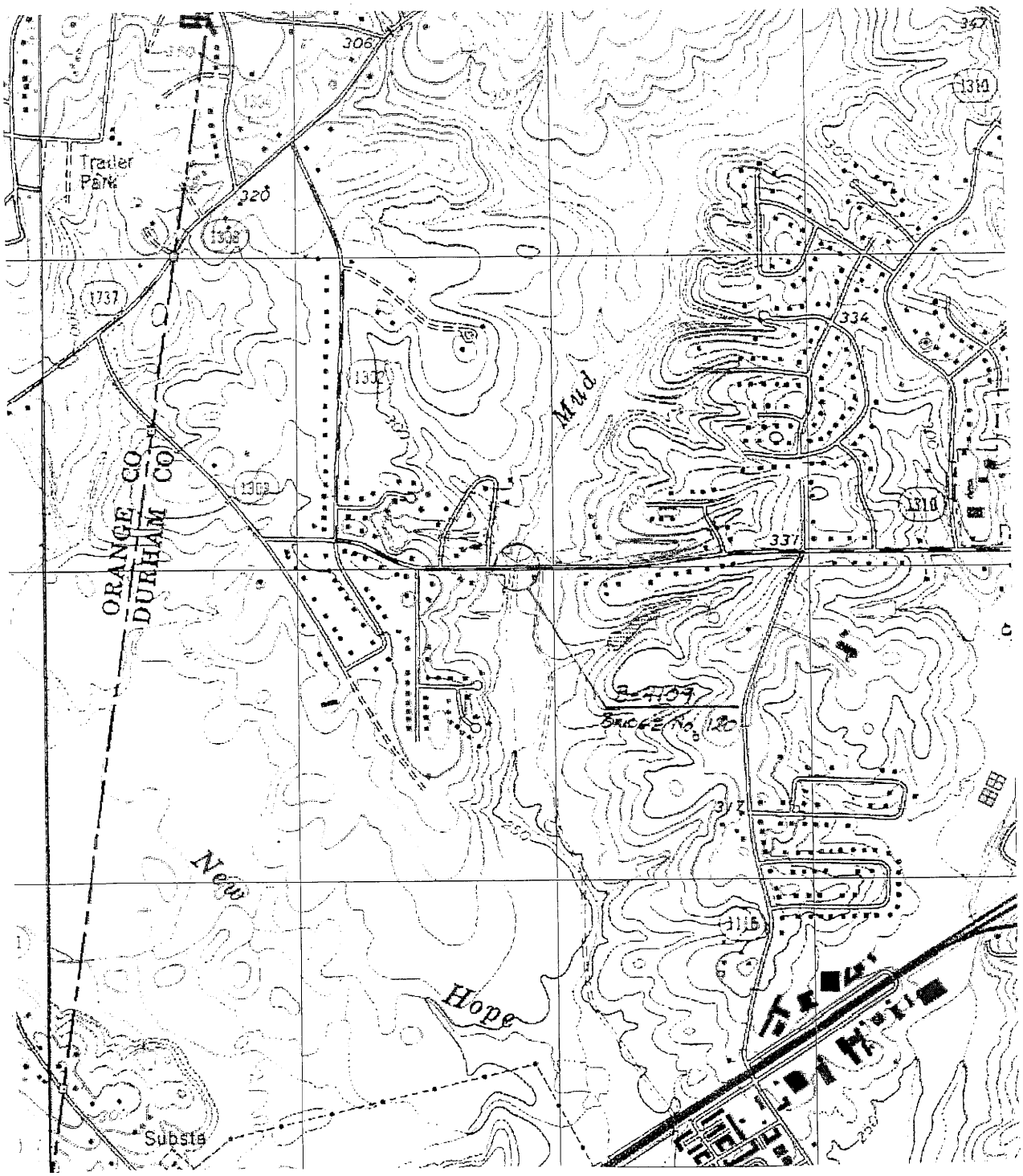


VICINITY MAPS

NCDOT

DIVISION OF HIGHWAYS
DURHAM COUNTY
PROJECT: B-4109 (BRIDGE #120)
BRIDGE NO. 120 OVER
MUD CREEK
ON SR 1303
(PICKETT ROAD)

SHEET 1 OF 8 06/28/2007



TOPO MAP

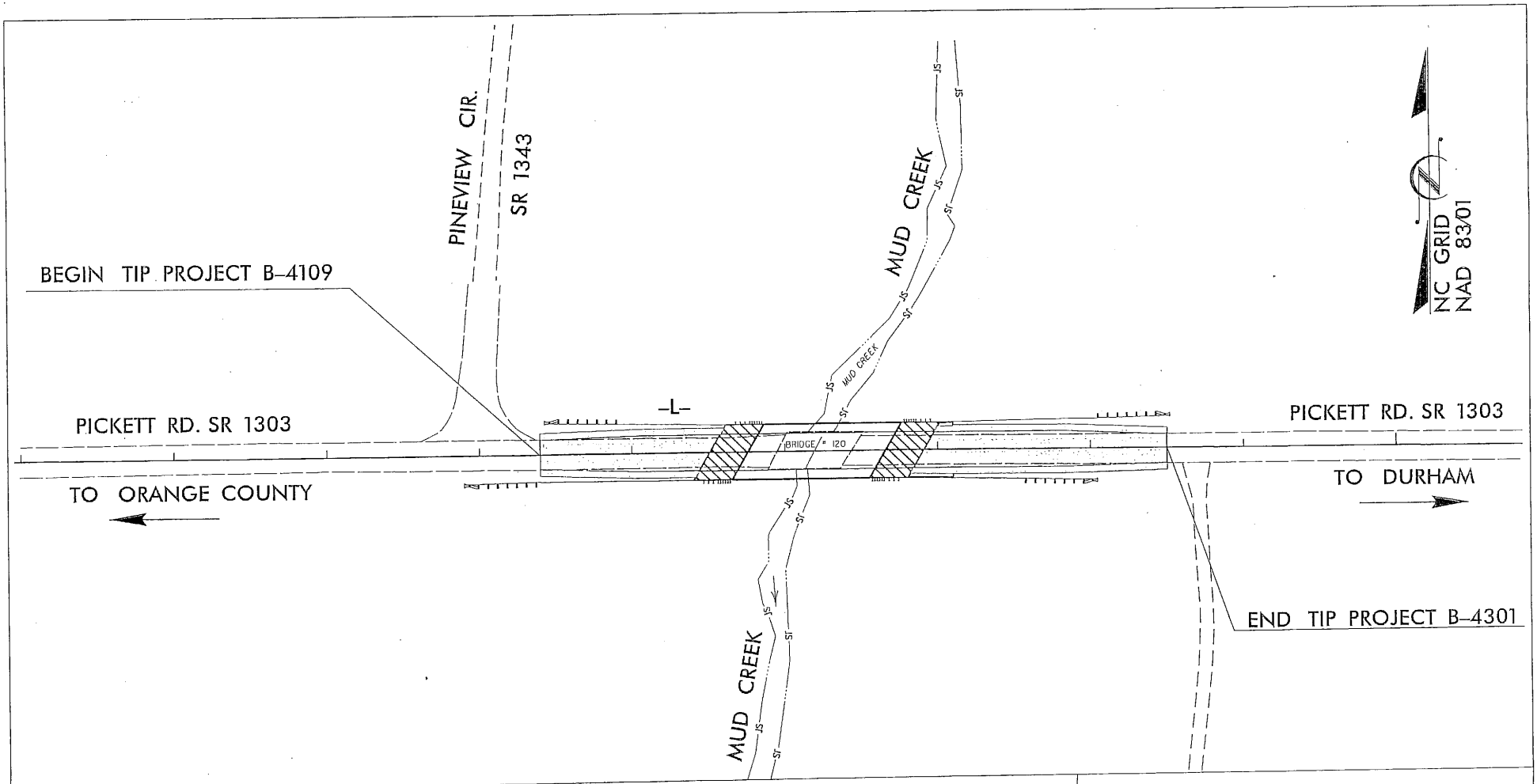
SCALE: 1" : 1500'

NCDOT

DIVISION OF HIGHWAYS
DURHAM COUNTY
PROJECT: B-4109 (BRIDGE #120)
BRIDGE NO. 120 OVER
MUD CREEK
ON SR 1303
(PICKETT ROAD)

SHEET 2 OF 8

06 / 28 / 2007



SITE MAP

NOT TO SCALE

NCDOT

DIVISION OF HIGHWAYS
DURHAM COUNTY
PROJECT: B-4109 (BRIDGE #120)
BRIDGE NO. 120 OVER
MUD CREEK
ON SR 1303
(PICKETT ROAD)

SHEET 3 OF 8

06 / 28 / 2007

PROPERTY OWNERS

NAMES AND ADDRESSES

	NAMES	ADDRESSES
6	Kathy Lynn Meekhof	3607 Pickett Road Durham, NC 27705
8	Kenneth Thomes Sims	6813 Cassam Road Bahama, NC 27503
9	Leonard J. Staunton	3501 Pickett Road Durham, NC 27705
10	Betsy Vatavuk	3512 Angus Road Durham, NC 27705

NCDOT

DIVISION OF HIGHWAYS
DURHAM COUNTY
PROJECT: B-4109 (BRIDGE #120)
BRIDGE NO. 120 OVER
MUD CREEK
ON SR 1303
(PICKETT ROAD)

06/28/2007

WETLAND PERMIT IMPACT SUMMARY

			WETLAND IMPACTS					SURFACE WATER IMPACTS				
Site No.	Station (From/To)	Structure Size / Type	Permanent Fill In Wetlands (ac)	Temp. Fill In Wetlands (ac)	Excavation in Wetlands (ac)	Mechanized Clearing in Wetlands (ac)	Hand Clearing in Wetlands (ac)	Permanent SW impacts (ac)	Temp. SW impacts (ac)	Existing Channel Impacts Permanent (ft)	Existing Channel Impacts Temp. (ft)	Natural Stream Design (ft)
1	16+25 -L-	21" CORED SLAB						<0.01	0.02		80	
		BRIDGE (1@50', 1@40')										
2	17+50 -L-	CLEARING				< 0.01						
TOTALS:						< 0.01		< 0.01	0.02		80	

NOTE: PERMANENT SURFACE WATER IMPACT DUE TO THE PROPOSED PIER IS 29 SQUARE FEET.

NC DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
Durham County
Project: B-4109 (Bridge #120)

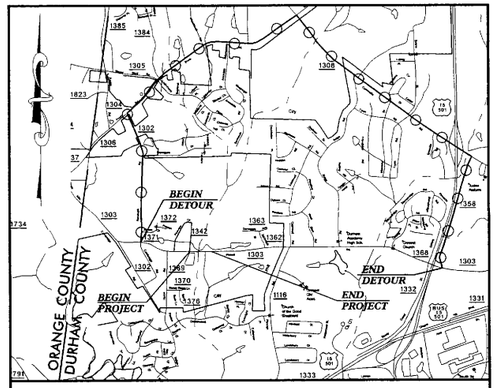
SHEET 5 of 8 9/13/2007

ATN Revised 3/31/05

TIP: B-4109

CONTRACT:

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



VICINITY MAP
(NOT TO SCALE)

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

DURHAM COUNTY

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-4109	1	

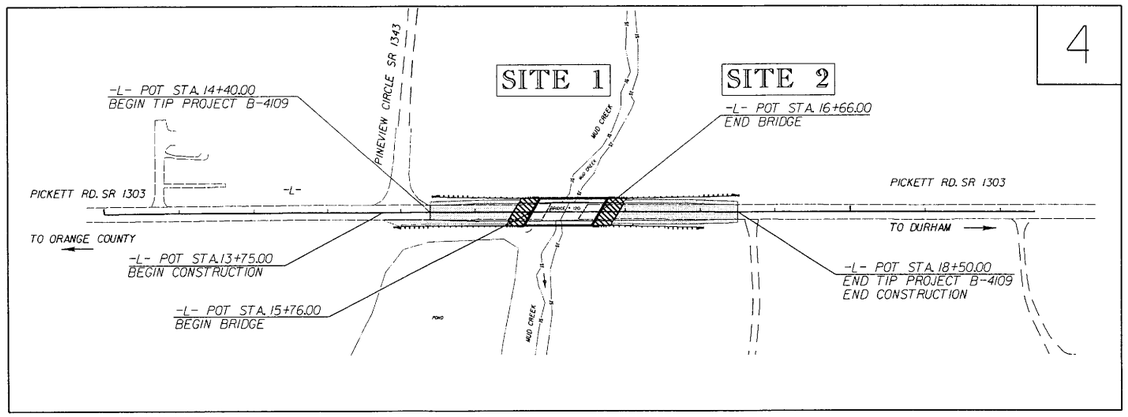
WBS NO.	F. A. PROJ. NO.	DESCRIPTION
33464.1.1	BRZ-1303(3)	P.E.
33464.2.1	BRZ-1303(3)	R/W, UTIL

Permit Drawing
Sheet 6 of 8

LOCATION: BRIDGE NO. 120 OVER MUD CREEK ON SR 1303 IN DURHAM

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

STREAM & WETLAND IMPACTS



NC GRID
NAD 83/95

MULKEY
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PO Box 33127
Raleigh, N.C. 27636
(919) 851-1912
(919) 851-1918 (FAX)
www.mulkeyinc.com

NCDOT CONTACT : DOUG TAYLOR, PE
PROJECT ENGINEER – ROADWAY DESIGN

THIS PROJECT IS NOT WITHIN ANY MUNICIPAL BOUNDARIES.

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

GRAPHIC SCALES

50 25 0 50 100
PLANS

50 25 0 50 100
PROFILE (HORIZONTAL)

10 5 0 10 20
PROFILE (VERTICAL)

DESIGN DATA

ADT 2008 = 6,100
ADT 2030 = 12,400
DHV = 13 %
D = 60 %
T = 3 % *
V = 40 MPH

FUNCTION. = URBAN
CLASS. LOCAL

* (TTST 1% + DUALS 2%)

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT B-4109 = 0.061 MI
LENGTH STRUCTURE TIP PROJECT B-4109 = 0.017 MI
TOTAL LENGTH TIP PROJECT B-4109 = 0.078 MI

Prepared in the Office of:
MULKEY ENGINEERS & CONSULTANTS
FOR THE NORTH CAROLINA DEPT. OF TRANSPORTATION

2006 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
MAY 18, 2007

LETTING DATE:
MAY 20, 2008

TIM S. HAYES, PE
PROJECT ENGINEER

JOHNNY R. BANKS
PROJECT MANAGER

HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
P.E.
SIGNATURE:

ROADWAY DESIGN ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
P.E.
SIGNATURE:

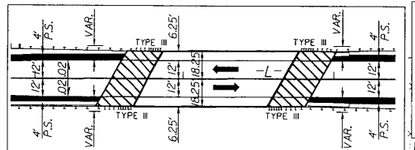
DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

STATE OF NORTH CAROLINA · DEPARTMENT OF TRANSPORTATION

ART McMILLAN, P.E.
STATE HIGHWAY DESIGN ENGINEER

7/11/2007 5:20:28 PM R:\Hydraulics\Permits\b4109_hyd_prm_wet_tsh.dgn

STREAM & WETLAND IMPACTS



SKETCH SHOWING PROPOSED BRIDGE WIDTH IN RELATION TO PROPOSED PAVEMENT WIDTH

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PROJECT REFERENCE NO.	SHEET NO.
B-4109	4
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

Permit Drawing
Sheet 7 of 8

DENOTES MECHANIZED CLEARING

DENOTES TEMPORARY FILL IN SURFACE WATER

DENOTES PERMANENT FILL IN SURFACE WATER

CAUSEWAY QUANTITIES
VOLUME OF CLASS II RIP RAP BELOW ORDINARY HIGH WATER = 80 YD³

NC GRID NAD 8395

SITE 1

SITE 2

1 MARKHAM FARMS LLC

2 RUSSELL E. HAMLET

3 JAMES G. PUGH & CAROLINE M. PUCH

4 KATHY L. MEEKHOF

5 MARKHAM FARMS LLC

6 KATHY L. MEEKHOF

7 MARKHAM FARMS LLC

8 KENNETH T. SIMS

9 LEONARD J. STAUNTON & SALLY A. STAUNTON

10 BETSY C. VATAVUK

11 JOSEPH P. EVANS, JR.

12 BETSY C. VATAVUK

10+00

15+00

20+00

TEMPORARY CAUSEWAY

CLASS II RIP RAP (STR. PAY ITEM)

HAUL ROAD

MECHANIZED CLEARING

PROP. R/W

RETAIN

N 89° 51' 57.9" E

S 89° 55' 26.1" E

15" CSP

45° ELBOW

PERMANENT IMPACT FOR BENT

CLASS I RIP RAP AT EMBANKMENT
-L- STA. 15+77 – 16+02 RT.
SEE DETAIL 'A'

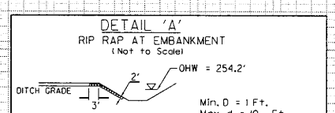
CLASS 'B' RIP RAP
EST. 2 TONS
F.F. =7 SY

TEMPORARY FILL IN SURFACE WATER (CAUSEWAY)

BRIDGE NO. 120

PERMANENT FILL IN SURFACE WATER (FOR BENT)

DETAIL 'A'
RIP RAP AT EMBANKMENT
(Not to Scale)



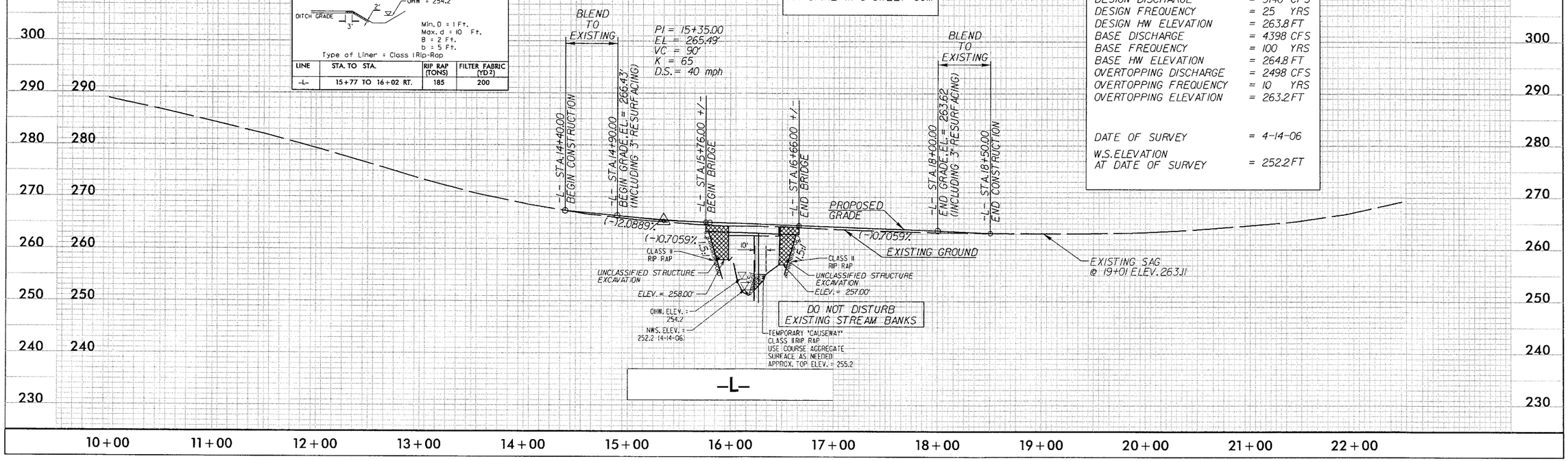
Type of Liner = Class I Rip-Rap

LINE	STA. TO STA.	RIP RAP (TONS)	FILTER FABRIC (YD²)
-L-	15+77 TO 16+02 RT.	185	200

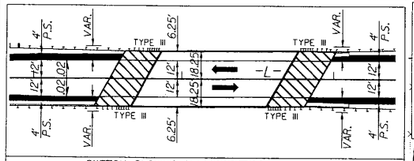
BM #51, ELEV. = 260.20'
-L- STA. 16+24.17, 152.50' RT.
RR SPIKE IN 9" SWEET GUM

BRIDGE HYDRAULIC DATA

DESIGN DISCHARGE	= 3140 CFS
DESIGN FREQUENCY	= 25 YRS
DESIGN HW ELEVATION	= 263.8 FT
BASE DISCHARGE	= 4398 CFS
BASE FREQUENCY	= 100 YRS
BASE HW ELEVATION	= 264.8 FT
OVERTOPPING DISCHARGE	= 2498 CFS
OVERTOPPING FREQUENCY	= 10 YRS
OVERTOPPING ELEVATION	= 263.2 FT
DATE OF SURVEY	= 4-14-06
W.S. ELEVATION AT DATE OF SURVEY	= 252.2 FT



STREAM & WETLAND IMPACTS



SKETCH SHOWING PROPOSED BRIDGE WIDTH IN RELATION TO PROPOSED PAVEMENT WIDTH

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WWW.MULKEYINC.COM

PROJECT REFERENCE NO.	SHEET NO.
B-4109	4
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

Permit Drawing Sheet 8 of 8

DENOTES MECHANIZED CLEARING

DENOTES TEMPORARY FILL IN SURFACE WATER

DENOTES PERMANENT FILL IN SURFACE WATER

CAUSEWAY QUANTITIES
VOLUME OF CLASS II RIP RAP BELOW ORDINARY HIGH WATER = 80 YD³

NC GRID NAD 8395

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RUSSELL E. HAMLET

LEONARD J. STAUNTON & SALLY A. STAUNTON

JOSEPH P. EVANS, JR.

10+00

15+00

20+00

-L-

N 89°51'57.9" E

S 89°55'26.1" E

TEMPORARY CAUSEWAY

CLASS II RIP RAP (STR. PAY ITEM)

HAUL ROAD

PROP R/W

MECHANIZED CLEARING

RETAIN

15" CSP

15" CSP ELBOW

PERMANENT IMPACT FOR BENT

TEMPORARY FILL IN SURFACE WATER (CAUSEWAY)

BRIDGE NO. 120

PERMANENT FILL IN SURFACE WATER (FOR BENT)

CLASS I RIP RAP AT EMBANKMENT -L- STA. 15+77 - 16+02 RT. SEE DETAIL 'A'

CLASS 'B' RIP RAP EST. 2 TONS F.F. = 7 SY

DETAIL 'A'
RIP RAP AT EMBANKMENT
(Not to Scale)

Min. D = 1 Ft.
Max. d = 10 Ft.
B = 2 Ft.
b = 5 Ft.

Type of Liner = Class I Rip-Rap

LINE	STA. TO STA.	RIP RAP (TONS)	FILTER FABRIC (YD²)
-L-	15+77 TO 16+02 RT.	185	200

BM #51, ELEV. = 260.20'
-L- STA. 16+24.7, 152.50' RT.
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DESIGN HW ELEVATION	= 263.8 FT
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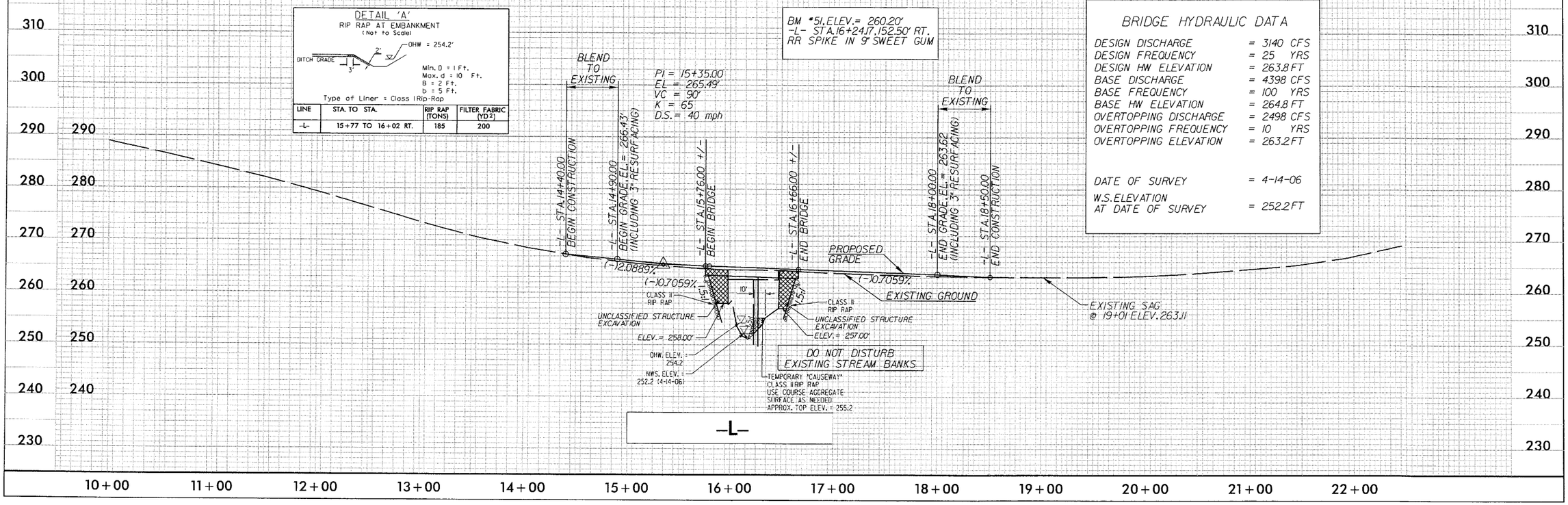
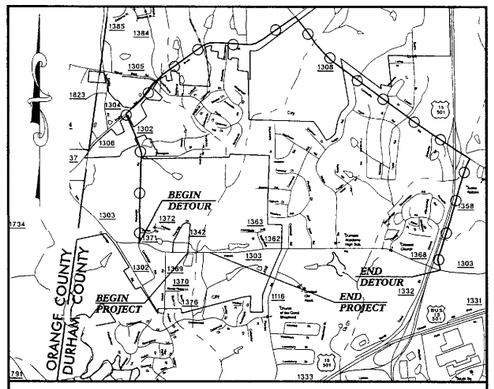
W.S. ELEVATION AT DATE OF SURVEY	= 252.2 FT



TIP: B-4109

CONTRACT:

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



VICINITY MAP
(NOT TO SCALE)

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

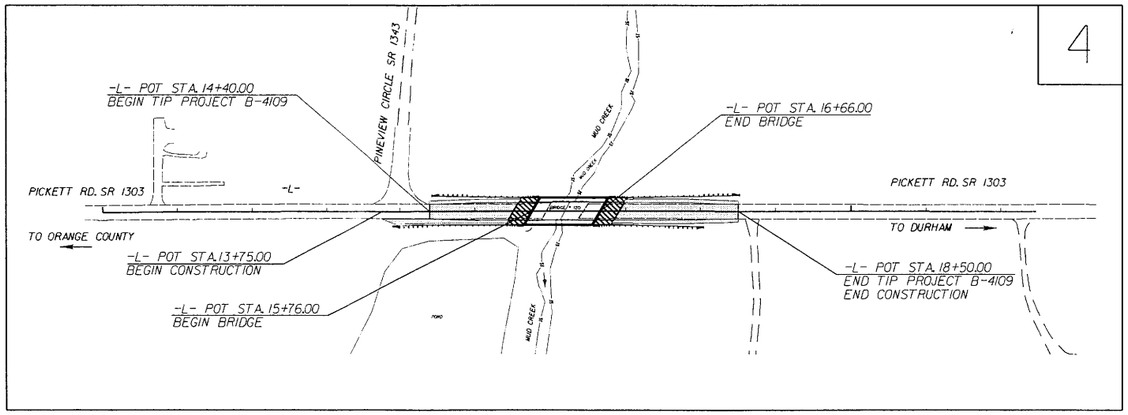
DURHAM COUNTY

LOCATION: BRIDGE NO. 120 OVER MUD CREEK ON SR 1303 IN DURHAM

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

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-4109	1	

WBS NO.	F. A. PROJ. NO.	DESCRIPTION
33464.1.1	BRZ-1303(3)	P.E.
33464.2.1	BRZ-1303(3)	R/W, UTIL



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WWW.MULKEYINC.COM

NCDOT CONTACT : DOUG TAYLOR, PE
PROJECT ENGINEER – ROADWAY DESIGN

THIS PROJECT IS NOT WITHIN ANY MUNICIPAL BOUNDARIES.

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

GRAPHIC SCALES

50 25 0 50 100
PLANS

50 25 0 50 100
PROFILE (HORIZONTAL)

10 5 0 10 20
PROFILE (VERTICAL)

DESIGN DATA

ADT 2008 = 6,100
ADT 2030 = 12,400
DHV = 13 %
D = 60 %
T = 3 % *
V = 40 MPH

FUNCTION. = URBAN
CLASS. LOCAL

* (TTST 1% + DUALS 2%)

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT B-4109 = 0.061 MI
LENGTH STRUCTURE TIP PROJECT B-4109 = 0.017 MI
TOTAL LENGTH TIP PROJECT B-4109 = 0.078 MI

Prepared in the Office of:
MULKEY ENGINEERS & CONSULTANTS
FOR THE NORTH CAROLINA DEPT. OF TRANSPORTATION

2006 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE: MAY 18, 2007

LETTING DATE: MAY 20, 2008

TIM S. HAYES, PE
PROJECT ENGINEER

JOHNNY R. BANKS
PROJECT MANAGER

HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
P.E.
SIGNATURE:

ROADWAY DESIGN ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
P.E.
SIGNATURE:

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

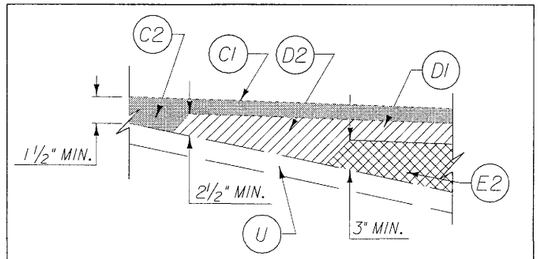
ART McMILLAN, P.E.
STATE HIGHWAY DESIGN ENGINEER

7/17/2007 5:07:53 PM R:\Roadway\Proj\b4109_rdy_tsh.dgn

PAVEMENT SCHEDULE

C1	PROPOSED APPROX. 3" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YARD IN EACH OF TWO LAYERS.
C2	PROPOSED VARIABLE DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 112 LBS. PER SQ. YARD, PER 1" DEPTH, TO BE PLACED IN LAYERS NOT LESS THAN 1 1/2" OR GREATER THAN 2" IN DEPTH.
D1	PROPOSED APPROX. 2 1/2" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE 119.0B, AT AN AVERAGE RATE OF 285 LBS. PER SQ. YARD
D2	PROPOSED VARIABLE DEPTH ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE 119.0B, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YARD, PER 1" DEPTH, TO BE PLACED IN LAYERS NOT LESS THAN 2 1/2" OR GREATER THAN 4" IN DEPTH.
E1	PROPOSED APPROXIMATE 4" ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YARD.
E2	PROPOSED VARIABLE DEPTH ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YARD, PER 1" DEPTH, TO BE PLACED IN LAYERS NOT LESS THAN 3" OR GREATER THAN 5 1/2" IN DEPTH.
T	EARTH MATERIAL
U	EXISTING PAVEMENT
W	WEDGING DETAIL

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



WEDGING DETAIL (W)

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RALEIGH, N.C. 27636
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(919) 851-1918 (FAX)
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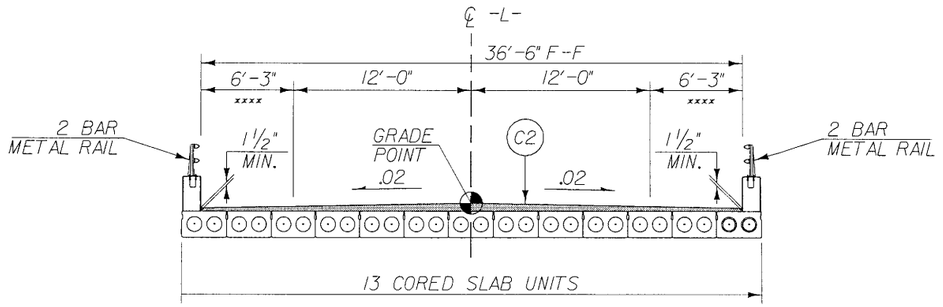
PROJECT REFERENCE NO.	SHEET NO.
B-4109	2
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

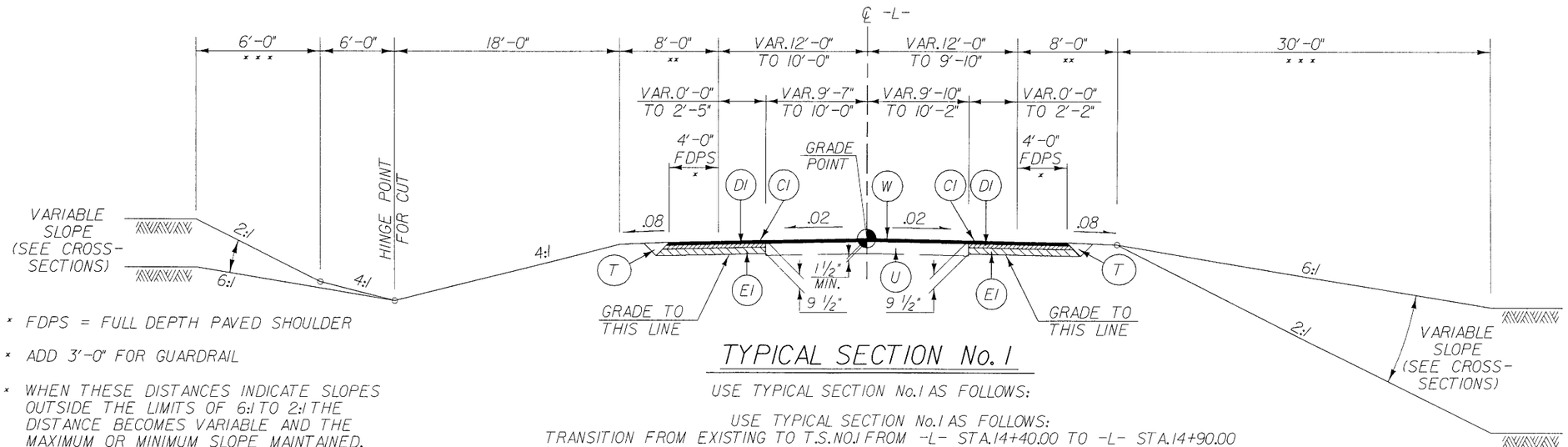
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



TYPICAL SECTION No. 2

USE TYPICAL SECTION No. 2 AS FOLLOWS:
FROM -L- STA. 15+76.00 (BEGIN BRIDGE) TO -L- STA. 16+66.00 (END BRIDGE)

xxxx OFFSET INCREASED TO 6'-3" TO ACCOUNT FOR HYDRAULIC SPREAD



TYPICAL SECTION No. 1

USE TYPICAL SECTION No. 1 AS FOLLOWS:

USE TYPICAL SECTION No. 1 AS FOLLOWS:
TRANSITION FROM EXISTING TO T.S. NO. 1 FROM -L- STA. 14+40.00 TO -L- STA. 14+90.00
FROM -L- STA. 14+90.00 TO -L- STA. 15+26.00
FROM -L- STA. 17+16.00 TO -L- STA. 18+00.00
TRANSITION FROM T.S. NO. 1 TO EXISTING FROM -L- STA. 18+00.00 TO -L- STA. 18+50.00

x FDPS = FULL DEPTH PAVED SHOULDER

xx ADD 3'-0" FOR GUARDRAIL

xxx WHEN THESE DISTANCES INDICATE SLOPES OUTSIDE THE LIMITS OF 6:1 TO 2:1 THE DISTANCE BECOMES VARIABLE AND THE MAXIMUM OR MINIMUM SLOPE MAINTAINED.

NOTE: 4'-0" FDPS WILL EXTEND A MINIMUM OF 100' FROM EACH SIDE OF THE PROP. APPROACH TO THE NEW BRIDGE TO ACCOMODATE BICYCLE ROUTE - SEE PLANS.

REVISIONS

5/6/01 PM R:\Roadway\Proj\b4109_rdy_typ.dgn

7/17/2001

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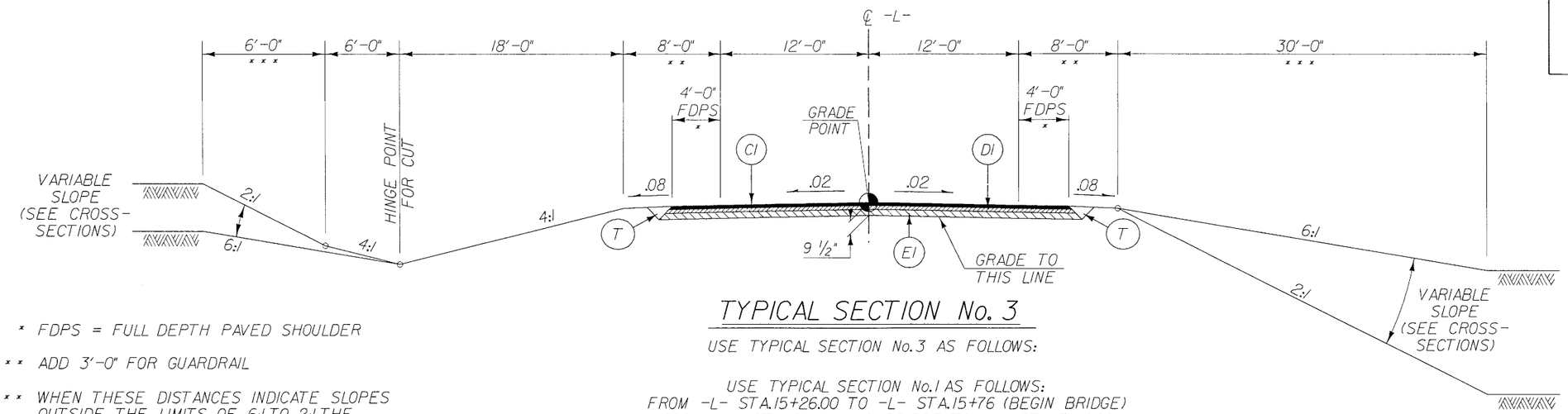
PROJECT REFERENCE NO.	SHEET NO.
B-4109	2-A
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



TYPICAL SECTION No. 3

USE TYPICAL SECTION No.3 AS FOLLOWS:

USE TYPICAL SECTION No.1 AS FOLLOWS:
FROM -L- STA.15+26.00 TO -L- STA.15+76 (BEGIN BRIDGE)
FROM -L- STA.16+66 (END BRIDGE) TO -L- STA.17+16.00

* FDPS = FULL DEPTH PAVED SHOULDER

** ADD 3'-0" FOR GUARDRAIL

*** WHEN THESE DISTANCES INDICATE SLOPES OUTSIDE THE LIMITS OF 6:1 TO 2:1 THE DISTANCE BECOMES VARIABLE AND THE MAXIMUM OR MINIMUM SLOPE MAINTAINED.

C1	3" SF9.5B
C2	VAR. DEPTH SF9.5B
D1	2 1/2" I19.0B
D2	VAR. DEPTH I19.0B
E1	4" B25.0B
E2	VAR. DEPTH B25.0B
T	EARTH MATERIAL
U	EXIST. PAVEMENT
W	WEDGING

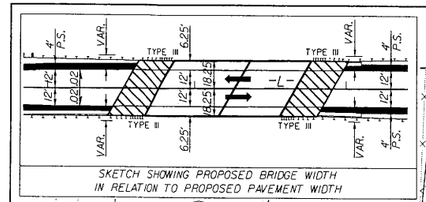
NOTE:

1. SEE SHEET 2 FOR DETAILED DESCRIPTION OF PAVEMENT SCHEDULE

2. ALL PAVEMENT EDGES ARE 1:1 UNLESS OTHERWISE NOTED

REVISIONS

1/17/2007 5:46:04 PM R:\Roadway\Proj\b4109_rdy_typ.dgn



SKETCH SHOWING PROPOSED BRIDGE WIDTH IN RELATION TO PROPOSED PAVEMENT WIDTH

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PROJECT REFERENCE NO.	SHEET NO.
B-4109	4
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

-L-
PI Sta 10+75.32
Δ = 0° 47' 04.7" (RT)
D = 0° 31' 15.1"
L = 150.64'
T = 75.32'
R = 11,000.00'
SE = NC

NC GRID NAD 8395

1 MARKHAM FARMS LLC
DB 4188 PG 196
BM 160 PG 337

3 JAMES G. PUGH & CAROLINE M. PUGH
DB 4855 PG 210
BM 160 PG 337

5 MARKHAM FARMS LLC
DB 4188 PG 196
BM 160 PG 337

7 MARKHAM FARMS LLC
DB 4188 PG 196
BM 160 PG 337

8 KENNETH T. SIMS
DB 951 PG 239
BM 28 PG 101

10 BETSY C. VATAVUK
DB 1326 PG 328

12 BETSY C. VATAVUK
DB 1326 PG 328
BM 14 PG 16

2 RUSSELL E. HAMLET
DB 3591PG 036
BM 131PG 130

6 KATHY L. MEEKHOF
DB 2648 PG 069
BM 148 PG 155

4 KATHY L. MEEKHOF
DB 2648 PG 069
BM 27 PG 103

9 LEONARD J. STAUNTON & SALLY A. STAUNTON
DB 396 PG 261

11 JOSEPH P. EVANS, JR.
DB 2047 PG 26
BM 103 PG 132

13 JOSEPH P. EVANS, JR.
DB 2047 PG 26
BM 103 PG 132

BL 102 POT 5+00.00 =
-L- POT 10+00.00, 14.00' RT.

-L- PT 11+50.64

-L- PC 10+00.00

BL-101 PINC 8+74.43 =
BY 101POT 5+00.00 =
-L- POT 13+74.43, 12.79' RT.

BY-10 POT 7+21.83 =
-L- POT 13+97.60, 207.83' LT.

-L- POT 14+40.00
BEGIN TIP PROJECT B-4109

-L- POT 13+75.00
BEGIN CONSTRUCTION

+29.42 -L-
32.00' (LT)

-L- POT 15+76.00
BEGIN BRIDGE

-L- POT 15+51.00
BEGIN APPROACH SLAB

-L- POT 16+66.00
END BRIDGE

-L- PINC 16+77.59

-L- POT 16+91.00
END APPROACH SLAB

-L- POT 18+50.00
END TIP PROJECT B-4109
END CONSTRUCTION

-L- POT 22+46.35

BL-100 PINC 10+80.61 =
-L- POT 15+80.62, 12.67' RT.

TBM 51
-L- POT 16+24.17,
152.50' RT.
ELEV. 260.20'

BL-2 POT 17+69.17 =
NCDOT GPS MON. B4109-2

N 89°51'57.9" E

S 89°55'26.1" E

N 89°58'50" W

N 89°58'50" W

N 89°51'57.9" W

N 89°51'56" E
468.79'

S 89°55'26.1" E

RETAIN

GRAU-350

15" CSP

45° ELBOW

+00 BEGIN SHLDR. BERM GUTTER - RT.

+80.00 -L-
EXIST.R/W

+00.00 -L-
37.00' (RT)

+40.00 -L-
35.00' (RT)

+55.00 -L-
EXIST.R/W

+80.00 -L-
43.00' (RT)

+00.00 -L-
43.00' (LT)

+50.00 -L-
43.00' (LT) &
EXIST.R/W

+0 END SHLDR.BERM GUTTER - LT.& RT.

65.0' UNIFORM TAPER - LT.& RT.

+50.00 -L-
36.00' (LT)

+60.00 -L-
EXIST.R/W

+63.00 -L-
EXIST.R/W

+20.00 -L-
43.00' (RT) &
EXIST.R/W

CLASS II RIP RAP (STR. PAY ITEM)

CLASS 'B' RIP RAP
EST. 2 TONS
F.F. =7 SY

A/G 35 PIPE CROSSES MUD CREEK

CLASS I RIP RAP AT EMBANKMENT
-L- STA. 15+77 - 16+02 RT.
SEE DETAIL 'A'

PROP. R/W

EXIST. R/W

PROJECT REF. STR. B4109

DETAIL 'A'
RIP RAP AT EMBANKMENT
(Not to Scale)

Min. D = 1 Ft.
Max. d = 10 Ft.
B = 2 Ft.
b = 5 Ft.

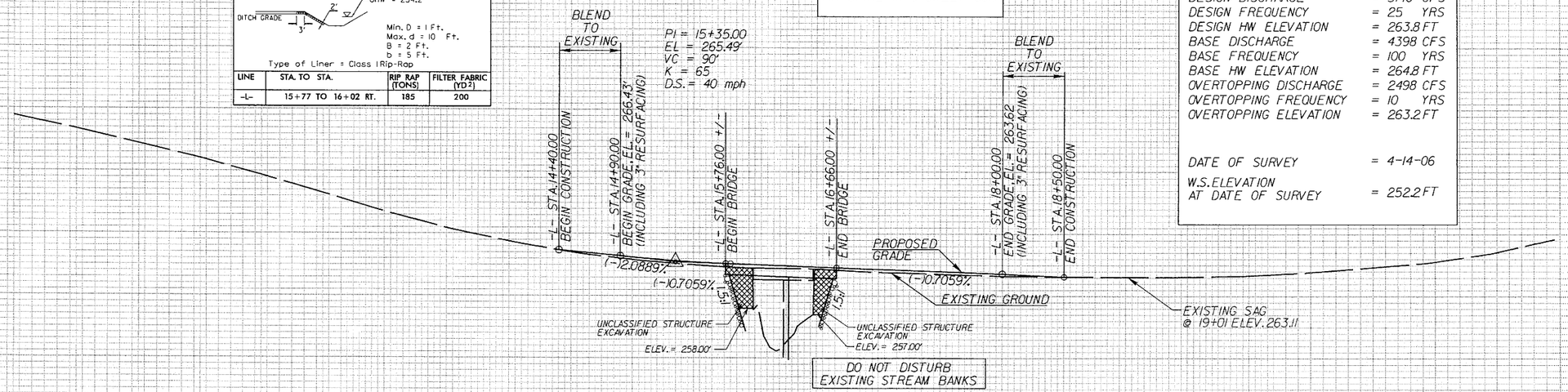
Type of Liner = Class I Rip-Rap

LINE	STA. TO STA.	RIP RAP (TONS)	FILTER FABRIC (YD2)
-L-	15+77 TO 16+02 RT.	185	200

BM #51, ELEV.= 260.20'
-L- STA.16+24.17, 152.50' RT.
RR SPIKE IN 9" SWEET GUM

BRIDGE HYDRAULIC DATA

DESIGN DISCHARGE	= 3140 CFS
DESIGN FREQUENCY	= 25 YRS
DESIGN HW ELEVATION	= 263.8 FT
BASE DISCHARGE	= 4398 CFS
BASE FREQUENCY	= 100 YRS
BASE HW ELEVATION	= 264.8 FT
OVERTOPPING DISCHARGE	= 2498 CFS
OVERTOPPING FREQUENCY	= 10 YRS
OVERTOPPING ELEVATION	= 263.2 FT
DATE OF SURVEY	= 4-14-06
W.S. ELEVATION AT DATE OF SURVEY	= 252.2 FT



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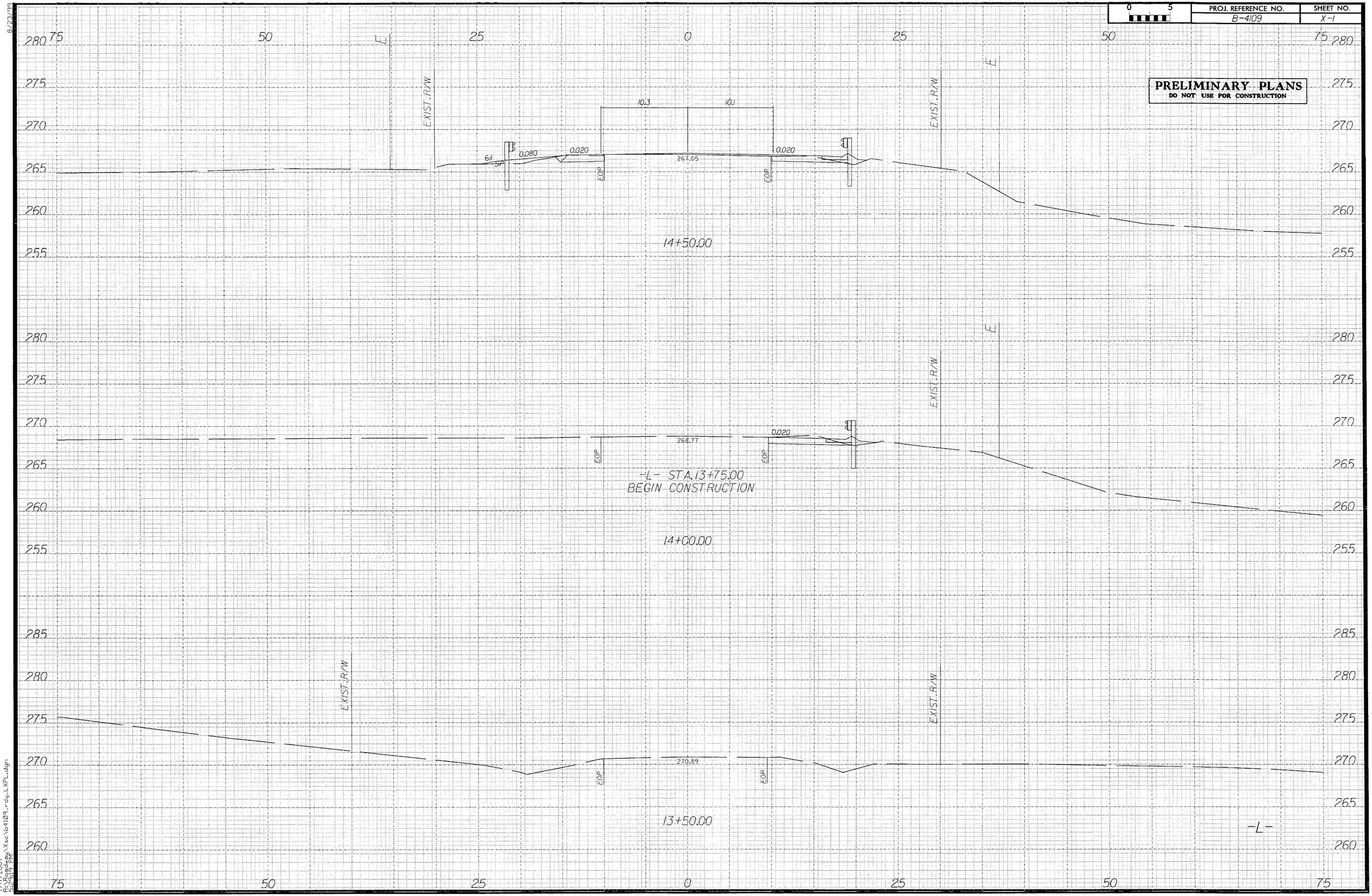
0 5	PROJ. REFERENCE NO.	SHEET NO.
	B-4109	X-1

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



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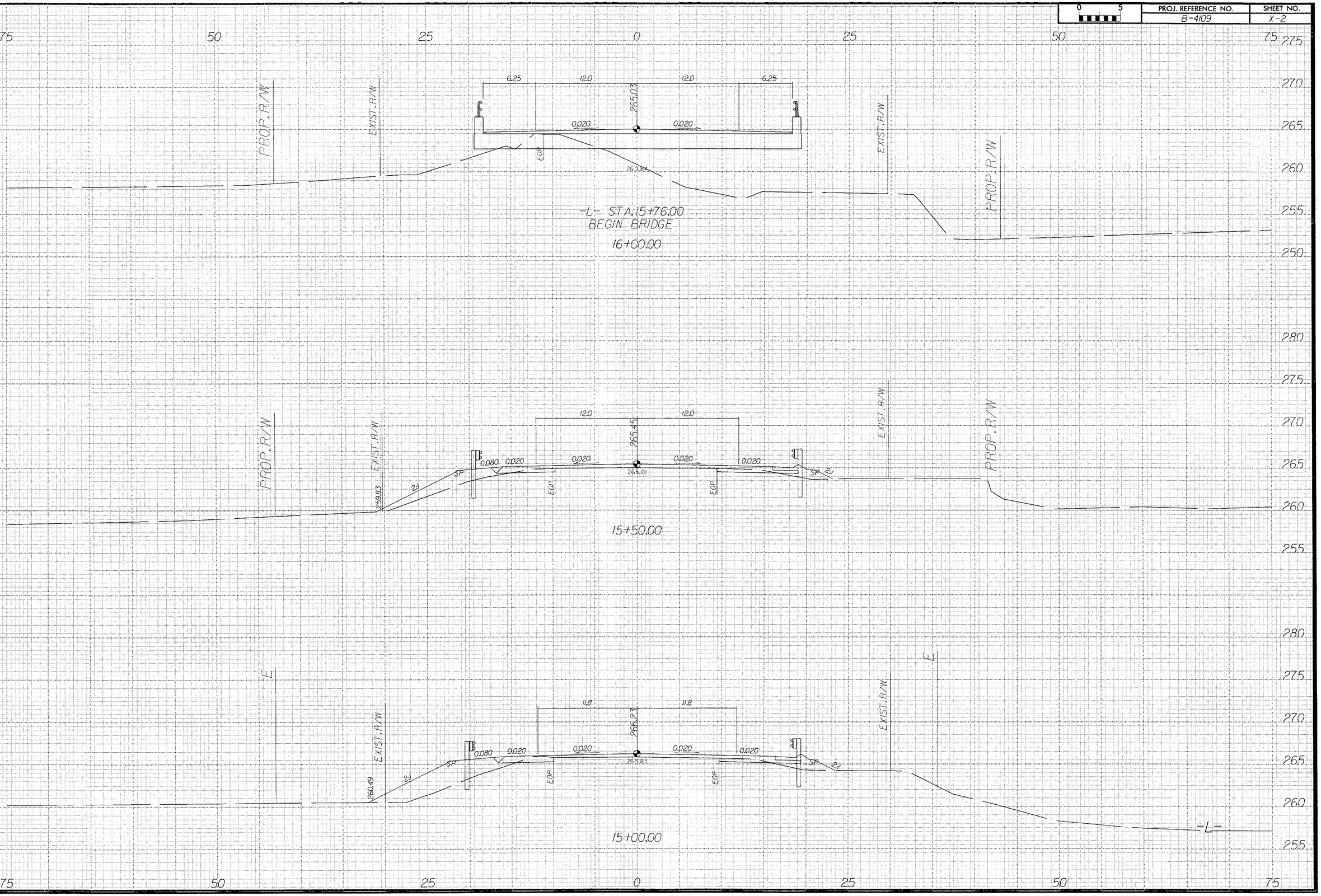

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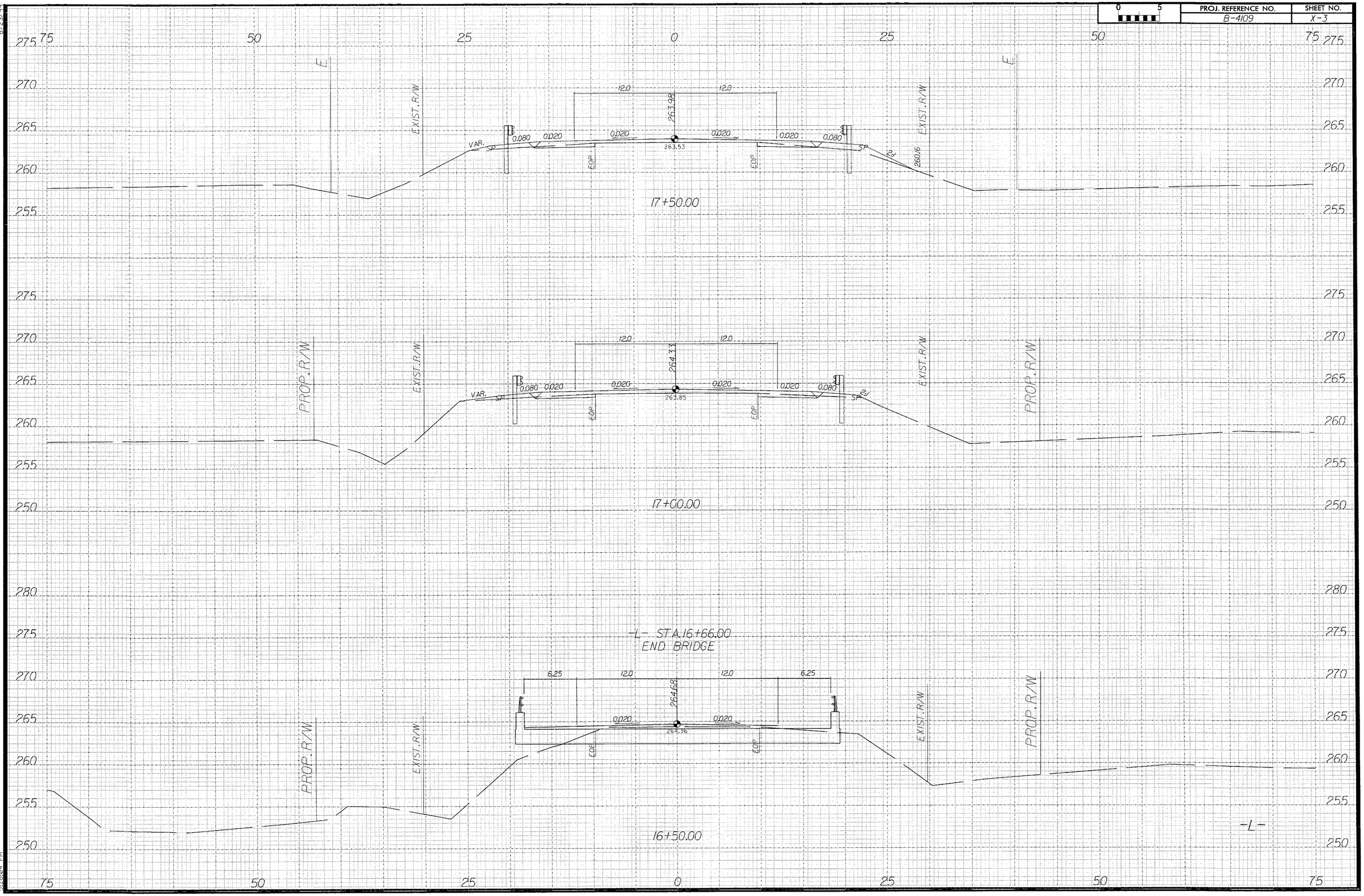
	B-4109	X-3



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0 5	PROJ. REFERENCE NO.	SHEET NO.
	B-4109	X-4

75 50 25 0 25 50 75

275 270 265 260 255

EXIST. R/W

EOP

263.11

EOP

EXIST. R/W

19+00.00

℄

-L- STA. 18+50.00
END CONSTRUCTION

℄

EXIST. R/W

12.0 10.2

0.080 0.020 263.15 0.020 0.080 VAR.

2:1 SP EOP EOP

EXIST. R/W

18+50.00

℄

EXIST. R/W

11.4 11.6

263.20

0.080 0.020 0.020 0.020 0.020 0.080

2:1 SP EOP 263.26 EOP SP 2:1

EXIST. R/W

18+00.00

℄

-L-

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DURHAM COUNTY
BRIDGE NO. 120 ON SR 1303 (PICKETT ROAD)
OVER MUD CREEK
FEDERAL-AID PROJECT NO. BRZ-1303(3)
STATE PROJECT NO. 8.2353401
WBS NO. 33464.1.1
T.I.P. NO. B-4109

CATEGORICAL EXCLUSION

UNITED STATES DEPARTMENT OF TRANSPORTATION

FEDERAL HIGHWAY ADMINISTRATION

AND

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

DIVISION OF HIGHWAYS

APPROVED:

11/01/05
Date

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

11/01/05
Date

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

DURHAM COUNTY
BRIDGE NO. 120 ON SR 1303 (PICKETT ROAD)
OVER MUD CREEK
FEDERAL-AID PROJECT NO. BRZ-1303(3)
STATE PROJECT NO. 8.2353401
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CATEGORICAL EXCLUSION

OCTOBER 2005

DOCUMENT PREPARED BY:
MULKEY ENGINEERS & CONSULTANTS
CARY, NORTH CAROLINA

10/28/05
Date

J. A. Bissett, Jr., P.E.
Vice President

NORTH CAROLINA PROFESSIONAL SEAL 14842 ENGINEER JAMES A. BISSETT, JR.

10/28/05
Date

Pamela R. Williams
Project Manager

FOR THE NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

10/28/05
Date

Theresa Ellerby
Project Manager
Consultant Engineering Unit

Project Commitments

Durham County
Bridge No. 120 on SR 1303 (Pickett Road)
Over Mud Creek
Federal-Aid Project No. BRZ-1303(3)
State Project No. 8.2353401
WBS No. 33464.1.1
T.I.P. No. B-4109

In addition to the standard Nationwide Permit No. 23 Conditions, the General Nationwide Permit Conditions, Section 404 Only Conditions, Regional Conditions, State Consistency Conditions, NCDOT's Guidelines for Best Management Practices for the Protection of Surface Waters, Erosion and Sediment Control Guidelines for Contract Construction, Best Management Practices for Construction and Maintenance Activities, General Certification Conditions, and Section 401 Conditions of Certification, the following special commitments have been agreed to by NCDOT:

Roadway / Structures

Standard 54 inch bicycle safe bridge railing will be provided.

Division

Construction will be scheduled to minimize school bus rerouting.

DURHAM COUNTY
BRIDGE NO. 120 ON SR 1303 (PICKETT ROAD)
OVER MUD CREEK
FEDERAL-AID PROJECT NO. BRZ-1303(3)
STATE PROJECT NO. 8.2353401
WBS NO. 33464.1.1
T.I.P. NO. B-4109

INTRODUCTION: The replacement of Bridge No. 120 is included in the *2006-2012 North Carolina Department of Transportation* (NCDOT) *Transportation Improvement Program* (T.I.P.) and in the Federal-Aid Bridge Replacement Program. The location is shown in Figure 1. No substantial environmental impacts are anticipated. The project is classified as a Federal "Categorical Exclusion."

I. PURPOSE AND NEED STATEMENT

In 2002 the sufficiency rating was 37.7 out of a possible 100 and considered structurally deficient. The timber piles in the bridge are considered soft with longitudinal cracks. Prompt action was required to repair Pile No. 1 in Bent No. 1. NCDOT's Bridge Maintenance Unit records indicate that Bridge No. 120 after the repairs has a sufficiency rating of 52.9 as of August 2004 and is considered functionally obsolete. The remainder of the timber piles has a conditional grade of 5 out of 10 and is considered soft with longitudinal cracks. A change in the superstructure or substructure condition rating from 5 to 4 will result in a minimum sufficiency rating drop of 15 points. NCDOT's Bridge Maintenance Unit recommends replacing the bridge because the timber piles continue to deteriorate and the replacement of this inadequate structure will result in safer, more efficient traffic operations.

II. EXISTING CONDITIONS

Bridge No. 120 is located on SR 1303 (Pickett Road) in Durham County, approximately one mile east of the Orange County line and one mile west of US 15-501. SR 1303 is classified as Urban Local by the statewide functional classification system. Land use in the project area is primarily residential.

The 2005 estimated average daily traffic (ADT) volume is 5,300 vehicles per day (vpd). The projected 2030 ADT is 12,400 vpd. The percentages of truck traffic are two percent dual tired vehicles and one percent truck-tractor semi trailer (TTST). The posted speed limit on SR 1303 in the vicinity of the project is 35 miles per hour (mph).

Bridge No. 120 was built in 1950 (Figure 2). It is a tangent two-lane facility with a clear roadway width of 23.3 feet. The bridge has two spans and totals 50 feet in length. The superstructure is composed of a timber deck on steel girders with metal railing. The substructure consists of steel caps on timber piles. Crown to streambed height is 14 feet. Bridge No. 120 is posted at 29 tons for single vehicle and 36 tons for TTST.

SR 1303 in the vicinity of Bridge No. 120 is a 20-foot tangent two-lane paved roadway with five foot grass shoulders on both sides.

A City of Durham eight inch sewer line is located approximately six feet south of the existing structure. The sewer line is visible at the stream crossing. Overhead utility lines are located along the

south side of SR 1303. Underground telephone lines are located on the north side of SR 1303 and are aerial at the stream crossing. Sanitary sewer manholes are visible east of the project site along the south side of SR 1303. The sewer line follows an easement that crosses SR 1303 and extends in a southerly direction. Utility impact is anticipated to be low.

There are approximately 22 public school bus crossings per day on Bridge No. 120. There are three private schools located within one mile of Bridge No. 120.

One accident was reported in the project area during the period from September 2001 to August 2004. The accident occurred on the bridge with only property damage.

This section of SR 1303 is part of a designated Bicycling Route in accordance with the *Durham-Chapel Hill-Carrboro Metropolitan Planning Area 2030 Long Range Transportation Plan.* A map of the bicycle route is included in the Appendix.

III. ALTERNATIVES

A. PROJECT DESCRIPTION

Based on preliminary hydraulic analysis, the proposed replacement structure is a bridge approximately 100 feet in length. The length may increase or decrease as necessary to accommodate peak flows as determined by further hydrologic studies during the design phase of the project. The bridge will provide a minimum clear roadway width of 32 feet including two 12-foot travel lanes with minimum four-foot lateral clearance both sides (Figure 3). Standard bicycle safe bridge railing, 54 inches in height, is recommended. A minimum 0.3 percent grade is recommended to facilitate deck drainage.

The approach roadway will provide two 12-foot lanes with eight foot shoulders, including four-foot paved shoulders (Figure 3). The proposed design speed is 40 mph. No design exceptions are anticipated.

B. BUILD ALTERNATIVES

Two build alternatives were studied for this project. They are described below.

Alternative A (preferred) replaces the bridge at the existing location (Figure 4A). During construction, traffic will be maintained by an off-site detour that follows SR 1302 (Randolph Road), SR 1307 (Erwin Road), SR 1308 (Cornwallis Road), and SR 1358 (Western Bypass Road). The detour length is approximately 3.8 miles in length. Resurfacing of SR 1302 and SR 1308 is anticipated.

Alternative B replaces the bridge at the existing location (Figure 4B). During construction, traffic would be maintained by an on-site detour north of the existing bridge. The detour structure would provide two 12-foot travel lanes with 2-foot lateral clearance. The detour approach roadway would provide two 12-foot travel lanes with 8-foot grass shoulders, and a design speed of 30 mph. Alternative B is not recommended because of the impacts to mature woods and wetlands north of the bridge.

C. Alternatives Eliminated From Further Study

A new alignment alternative was not considered because it would introduce reverse curves to an existing tangent section of the roadway and would increase wetland impacts and construction cost.

An on-site temporary detour structure on the south side of the bridge was not considered because of the impacts it would do to the pond.

The "do-nothing" alternative would eventually necessitate closure of the bridge. This is not desirable because of the traffic service provided by SR 1303 and Bridge No. 120.

Investigation of the existing structure by the Bridge Maintenance Unit indicates that "rehabilitation" of this bridge is not feasible due to its age and deteriorated condition.

D. Preferred Alternative

Alternative A is the preferred alternative. This alternative was selected because it minimizes impacts to area residents' property and wetlands, has a shorter construction period, and is more economical than Alternative B. Construction will be scheduled to minimize school bus rerouting.

The Division Engineer concurs with Alternative A as the preferred alternative.

IV. Estimated Cost

Table 1 shows estimated costs based on current prices.

Table 1. Estimated Costs

	Alternative A (preferred)	**Alternative B**
Structure Removal (Existing)	$ 18,000	$ 9,600
Proposed Structure	357,000	302,400
Roadway Approaches	139,400	100,900
Temporary Detour Bridge	0	106,400
Detour Approaches/Resurfacing	70,000	172,700
Miscellaneous and Mobilization	120,600	186,000
Engineering Contingencies	115,000	122,000
ROW/Const. Easements/Utilities	85,000	145,000
Total	$905,000	$1,145,000

The estimated cost of the project as shown in the *2006-2012 Transportation Improvement Program* is $1,265,000, including $150,000 in prior years, $115,000 for right-of-way, and $1,000,000 for construction.

V. NATURAL RESOURCES

A. METHODOLOGY

Field investigations within the project study corridor were conducted by qualified biologists on January 14, 2004. These field surveys were undertaken to determine natural resource conditions and to document natural communities, wildlife, Waters of the United States, and the presence of protected species or their habitats.

Published information regarding the project area and region was derived from a number of resources including:

- USGS 7.5-minute topographic quadrangle map: Southwest Durham, North Carolina, 1973 (photorevised 1987)
- US Fish and Wildlife Service (USFWS) National Wetlands Inventory (NWI) maps
- USGS and NCDOT aerial photomosaics of the project area (1"=100')
- Natural Resources Conservation Service (NRCS) soil survey maps of Durham County
- Water resources information was obtained from publications of the North Carolina Division of Water Quality (NCDWQ)
- USFWS list of protected species for Durham and Orange Counties
- North Carolina Natural Heritage Program (NCNHP) database of rare species and unique habitats

Dominant plant species were identified in each stratum for all natural communities encountered. Plant community descriptions are based on those classified in Schafale and Weakley (1990), where applicable. Names and descriptions of plant species generally follow Radford *et al.* (1968), unless more current information is available. Animal names and descriptions follow Bogan (2002), Conant and Collins (1998), Lee *et al.* (1980 *et seq.*), Martof *et al.* (1980), Stokes (1996), and Webster *et al.* (1985). Scientific names and common names (when applicable) are provided for each plant and animal species listed. Subsequent references to the same organism include the common name only.

During field surveys, wildlife identification involved a variety of observation techniques: active searching and capture, visual observations (both with and without the use of binoculars), and observing the characteristic signs of wildlife (sounds, scat, tracks, and burrows). Any organisms that may have been captured during these searches were identified and released without injury. Quantitative water sampling was not undertaken to support existing data.

Jurisdictional wetland determinations were performed using the three-parameter approach as prescribed in the 1987 *Corps of Engineers Wetlands Delineation Manual.* Supplementary technical literature describing the parameters of hydrophytic vegetation, hydric soils, and hydrological indicators was also utilized. Wetland functions were evaluated according to the NCDWQ's rating system, fourth version. Surface waters in the project area were evaluated and classified based on a

preponderance of perennial stream characteristics as defined in NCDWQ's *Stream Classification Method*, second version and evaluated using the most recent version of the USACE *Stream Quality Assessment Worksheet.*

B. Physiography and Soils

The project site is located in southwestern Durham County and encompasses an area outside the Durham city limits near the Durham and Orange County boundaries. Durham County is situated in the north-central part of the state in the Piedmont physiographic province. The geography of Durham County consists predominantly of rolling hills, with steep areas surrounding major streams. Narrow, nearly level floodplains exist along most of the streams. The county is characterized by rolling terrain.

Elevations in the project area range from approximately 250 feet above mean sea level (msl) along Mud Creek to approximately 350 feet above msl at the northeastern perimeter of the project area, as depicted on the Southwest Durham, North Carolina, USGS topographic quadrangle map. The geology underlying the area is part of the Chatham Group in the Triassic Basin and consists of tan, medium- to very coarse-grained, micaceous arkosic sandstone. The soil systems in this area developed from the shales, sandstones, mudstones, siltstones, and conglomerates that make up the Triassic Basin soil region.

The Chewacla-Wehadkee-Congaree soil association occurs along the stream basin at the project area. Soils mapped at the site are a Chewacla-Wehadkee complex. Surrounding this stream basin is the White Store-Creedmoor association. The soil mapping unit and soil associations are described below.

The Chewacla-Wehadkee-Congaree association is comprised of soils formed in alluvial materials. They are found on nearly level floodplains along streams and rivers. Chewacla soils make up 45 percent of the map unit, and are somewhat poorly drained. The surface layer is a silt loam underlain by mottled silt loam and silty clay loams. Wehadkee soils comprise 30 percent of the soil unit and are found farthest from the stream channels on the lowest parts of the landscape. These soils are poorly drained and have a silt loam surface layer underlain by a silty clay loam and mottled clay loam. The remaining portion of this association, or about 10 percent, is made up of Cartecay, Roanoke, and Altavista soils.

The White Store-Creedmoor association is comprised of soils formed from shale and sandstone Triassic material. They are found on fairly broad, gently sloping ridges and rolling to strongly sloping side slopes. White Store soils make up about 65 percent of the map unit. They are moderately well drained and have a sandy loam surface layer underlain by firm clay loam and very firm clay. Creedmoor soils make up about 10 percent of the map unit and are moderately well drained. The surface layer is sandy loam, with a sandy clay loam subsoil and a firm, very firm, or silty clay bottom layer. The remaining 25 percent of this association is made up of Mayodan, Pinkston, and Iredell soils.

- The Chewacla and Wehadkee (Ch) soil unit in Durham County is about 60 percent Chewacla soil and 35 percent Wehadkee soil. They are somewhat poorly drained soils found on floodplains as long, level areas parallel to major streams and rivers. The Chewacla (Cm)

portion is better drained and is found at slightly higher elevations than the Wehadkee portion. Both soils have a silt loam surface layer.

- Creedmoor soils (CrC) at the site are well drained sandy loams found on narrow upland side slopes. Subsoils consist of sandy clay loams in the upper areas and very firm clays in the lower layers. Permeability is very slow and available water capacity is medium. Shrink-swell potential is moderate and depth to the seasonal water table is about 1.5 feet.

- The White Store series (WsC, WsE) are well drained sandy loam upland soils found on divides and steep side slopes. They have very firm clays throughout the subsoil which makes infiltration moderate and runoff rapid. Permeability is very slow and available water capacity is medium. The shrink-swell potential is high and depth to the seasonal water table is about 1.5 feet. In some areas the water table may be perched above the clay subsoil layers.

Hydric soils are defined as soils that are saturated, flooded, or ponded long enough during the growing season to develop anaerobic conditions that favor the growth and regeneration of hydrophytic vegetation. Soils referred to as "Hydric A" are completely hydric throughout the mapped soil unit. "Hydric B" soils are non-hydric soils that contain inclusions of hydric soils, usually in depressional areas or along the border with other soil units. Based on the Durham County soil survey, one Hydric A soil map unit occurs in the project area: Chewacla and Wehadkee soils.

C. WATER RESOURCES

1. Waters Impacted

Streams, creeks, and tributaries within the project vicinity are completely within the Cape Fear River Basin. Mud Creek is the only perennial stream located within the study area. The drainage area of Mud Creek at the proposed crossings is 5.37 square miles. It flows in a southerly direction to its confluence with New Hope Creek, approximately 1.2 miles downstream of the bridge. Mud Creek is located within Cape Fear River subbasin 03-06-05. The DWQ stream index number for Mud Creek is 16-41-1-10 and the USGS 8-digit hydrologic unit is 03030002.

2. Water Resource Characteristics

The NCDWQ classifies surface waters of the state based on their intended best uses. Mud Creek and its tributaries and one man-made pond are the only surface waters in the project study area. Mud Creek has been designated as Class "C-NSW" waters. The class "C" designation denotes freshwaters protected for secondary recreation, fishing, wildlife, fish and aquatic life propagation and survival, and others uses. Nutrient Sensitive Waters (NSW) is a supplemental surface water classification intended for waters needing additional nutrient management due to their being subject to excessive growth of microscopic or macroscopic vegetation. No Outstanding Resource Waters (ORW), High Quality Waters (HQW), or drinking water supply (WS-I or WS-II) waters occur within a one-mile radius of the project study area.

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. North Carolina's 303(d) report is a comprehensive public accounting of all impaired water bodies in the state. New Hope Creek, from

the Sandy Creek confluence to the confluence with the Morgan Creek and New Hope River Arms of Jordan Lake, is the only surface water near the project area currently listed in the 303(d) report. The northernmost segment of New Hope Creek, which is designated as impaired waters, is located within 1.2 miles downstream from the project site. The NCDWQ has indicated this impaired rating is due to fecal coliform, chlorophyll *a*, habitat degradation, and a historical listing for sediment based on biological impairment.

The Ambient Monitoring System (AMS) is a network of stream, lake, and estuarine water quality monitoring stations strategically located for the collection of physical and chemical water quality data. There are two AMS monitoring stations in subbasin 05; one of these stations is located on New Hope Creek at SR 1107 (Stagecoach Road) approximately 6.5 miles south of the project site. Mud Creek is currently not rated for use support due to insufficient data. Waters that are not rated generally carry the same use support rating as the receiving waters. The nearest stream with a use support rating is New Hope Creek, which has a "fully supporting" (FS) rating. An "FS" rating is given to waterbodies that fully support their designated uses and generally have good or excellent water quality.

The North Carolina Index of Biotic Integrity (NCIBI) is used to assess the biological integrity of streams by examining the structure and health of the fish community. An NCIBI monitoring site is located approximately 2.3 miles south of the project study area on New Hope Creek at SR 2220 (Old Chapel Hill Road). This site was last sampled in 1998 and received a poor NCIBI rating. The poor classification was due to the low number of fish collected in the sample, low number of darter species, the absence of any sucker or intolerant species, and the high percentage of tolerant fish species in the sample.

Bioclassification criteria have been developed that are based on the number of benthic macroinvertebrates (primarily Ephemeroptera, Plecoptera, and Tricoptera) present in streams and rivers because they are very sensitive to the effects of water pollution. Ratings range from Excellent to Poor. Benthic macroinvertebrate sampling site B-4 is located on New Hope Creek at Stagecoach Road (SR 1107) downstream from the project site. This site was last sampled in 1998 and was given a bioclassification rating of "Fair" based on the very low EPT abundance values.

Point source dischargers throughout North Carolina are regulated through the National Pollutant Discharge Elimination System (NPDES) program. Dischargers are required by law to register for a permit. According to the December 8, 2003 list of active NPDES permits issued by NCDWQ, there are 11 permitted dischargers within the 03-06-05 subbasin. Two facilities have discharges greater than one million gallons per day. These facilities are the Durham County Triangle Waste Water Treatment Plant, which discharges to Northeast Creek, and the South Durham Water Reclamation Facility, which discharges to New Hope Creek. There are no permitted dischargers on Mud Creek.

A classification system for stream channels based on fluvial geomorphologic principles and landscape position was used for stream analysis. Based on this classification method and field observations during the site visit, the stream appears to be a Type G5. Mud Creek's channel is about 18 to 22 feet wide at the top of the banks near the bridge, with slow flowing turbid water over a substrate of sand and small gravel. Turbidity was related to suspended sediment in the water during the field visit. Water depths averaged four to six inches at riffles and two to three feet deep in runs and pools. Bank heights averaged five to seven feet above the water surface. Evidence of active

bank erosion was observed during the field survey and the channel appears to have been straightened at some time during the past. Stream evaluation forms are included in the Appendix.

3. Anticipated Impacts to Water Resources

a. General Impacts

The removal of streamside vegetation and placement of fill material during construction contributes to erosion and possible sedimentation of nearby streams. Quick revegetation of these areas helps to reduce the impacts by supporting the underlying soils. Erosion may carry soils, toxic compounds, trash, and other materials into the aquatic communities at the construction site. As a result, sand bars may be formed both at the site and downstream. Increased light penetration from the removal of streamside vegetation may increase water temperatures. Warmer water contains less oxygen, thus reducing aquatic life that may depend on high oxygen concentrations and/or lower temperature regions.

The proposed project calls for replacing the bridge at the existing location. This will allow for continuation of present stream flow within the existing channel, thereby protecting stream integrity. No adverse long-term impacts are expected to result from the preferred alternative.

b. Impacts Related to Bridge Demolition and Removal

Bridge No. 120 is composed entirely of timber and steel. It will be removed without dropping any components into the water.

D. Biotic Resources

1. Plant Communities

Two plant communities occur in the study area: bottomland hardwood forest and man-dominated community. Two wetlands were delineated within the project boundaries. Refer to Section III.D.4.b in this report for additional discussion of wetlands.

a. Bottomland Hardwood Forest

The bottomland hardwood forest is the dominant community in the project area and is generally located on undeveloped land along the floodplain terrace. This community appears to be a variation of the Piedmont/Mountain Bottomland Forest identified by Schafale and Weakley. These communities occur on floodplain ridges and terraces other than active levees adjacent to stream and river channels. In the project area, this community covers approximately 3.6 acres within the project study corridor. Dominant canopy and subcanopy species include tulip poplar (*Liriodendron tulipifera*), sweetgum (*Liquidambar styraciflua*), red maple (*Acer rubrum*), green ash (*Fraxinus pennsylvanica*), willow oak (*Quercus phellos*), and loblolly pine (*Pinus taeda*). Shrubs and woody vines include flowering dogwood (*Cornus florida*), highbush blueberry (*Vaccinium corymbosum*), privet (*Ligustrum sinense*), strawberry bush (*Euonymus americana*), blackberry (*Rubus* sp.), greenbrier (*Smilax rotundifolia*), wild grape (*Vitis rotundifolia.*), and Japanese honeysuckle (*Lonicera japonica*). The herbaceous vegetation

includes creeping grass (*Microstegium vimineum*), chickweed (*Stellaria media*), and wild garlic (*Allium vineale*).

b. Man-dominated Community

The man-dominated community is comprised of the lawns, open areas, and maintained right-of-way along Pickett Road. This community covers approximately three acres within the study corridor. Vegetation is dominated by various grass species (Poaceae family) and common weed species such as mullein (*Verbascum* spp.), plantain (*Plantago* spp.), and dandelion (*Taraxacum officinale*). A man-made pond is also located on the southwest side of the bridge and adjacent to a private residence.

2. Wildlife

The project area was visually surveyed for signs of terrestrial and aquatic wildlife. The bottomland hardwood forest and man-dominated communities offer a moderate diversity of foraging, nesting, and cover habitat for many species of amphibians, reptiles, birds, and mammals, especially those adapted to developed areas. Species that may be associated with these types of communities are described below. An asterisk (*) indicates the species that were directly observed or for which evidence was noted during field reconnaissance.

Reptile species associated with the project area may include snakes such as the rough green snake (*Opheodrys aestivus*), eastern milk snake (*Lampropeltis triangulum triangulum*), and mole kingsnake (*L. calligaster rhombomaculata*) which inhabit fields, woodlands, river bottoms, and stream edges of the Piedmont and lower mountains in North Carolina. No reptiles were observed during the site visit.

Many bird species may inhabit or migrate through the project area. Inhabitants may include red-bellied woodpecker* (*Melanerpes carolinus*), hairy woodpecker (*Picoides villosus*), downy woodpecker (*P. pubescens*), Carolina chickadee (*Parus carolinensis*), tufted titmouse (*P. bicolor*), white-breasted nuthatch (*Sitta carolinensis*), American robin (*Turdus migratorius*), northern cardinal* (*Cardinalis cardinalis*), mockingbird (*Mimus polyglottos*), blue jay* (*Cyanocitta cristata*), house finch (*Carpodacus mexicanus*), Carolina wren (*Thryothorus ludovicianus*), dark-eyed junco (*Junco hyemalis*), American goldfinch (*Carduelis tristis*), and brown-headed cowbird (*Molothrus ater*). Predatory species may include red-tailed hawk (*Buteo jamaicensis*), eastern screech owl (*Otus asio*), and barred owl (*Strix varia*).

A wide variety of mammals are expected to inhabit the project area and surrounding landscape. Virginia opossum* (*Didelphis virginiana*), woodchuck (*Marmota monax*), gray squirrel* (*Sciurus carolinensis*), eastern harvest mouse (*Reithrodontomys humulis*), raccoon* (*Procyon lotor*), eastern spotted skunk (*Spilogale putorius*), and white-tailed deer* (*Odocoileus virginianus*) are species mostly likely to be found. In addition, bats such as the little brown myotis (*Myotis lucifugus*), Eastern red (*Lasiurus borealis*), and big brown bat (*Eptesicus fuscus*) may also be present in the project study area.

3. Aquatic Communities

The aquatic habitat in the Mud Creek drainage area is expected to be minimal based on the observed fluvial geomorphological conditions and the water quality at the time of the field visit. Both the upstream and downstream reaches of Mud Creek appear to be incising due to active bank erosion

and sediment deposition. A visual survey of the stream found no evidence of macroinvertebrate species, mollusks, or fish.

The amphibian population in the study area may include salamanders and frogs. Common species include the eastern newt (*Notophthalmus viridescens*) and the spotted salamander (*Ambystoma maculatum*). Spring peepers (*Hyla crucifer*) and pickerel frogs (*Rana palustris*) may also be present. No amphibians were observed during the field visit.

4. Anticipated Impacts to Biotic Communities

a. Terrestrial Communities

The study area consists of approximately 3.6 acres of bottomland hardwood forest and 3.0 acres of maintained/man-dominated land. Anticipated impacts to terrestrial biotic communities (Table 2) are estimated based on the approximate construction limits for cut and fill slopes and roadway approaches to the bridge.

Table 2. Anticipated Terrestrial Biotic Community Impacts (Acre)

Vegetative Community	Alternative A (preferred) Permanent Impacts	Alternative B Permanent Impacts	Alternative B Temporary Impacts
Bottomland Hardwood Forest	0.26	0.26	0.71
Man-Dominated/ Maintained	0.73	0.73	0.47
Total Impacts	0.99	0.99	1.18

b. Wetland Communities

Construction is expected to have minimal impacts to wetlands in the study area. Alternative A (preferred) and Alternative B will potentially create less than 0.01 acre of permanent wetland impacts. Alternative B is estimated to have approximately 0.01 acre of temporary wetland impacts.

c. Aquatic Communities

Aquatic organisms are very sensitive to the discharges and inputs resulting from construction activities. Impacts usually associated with in-stream construction include increased channelization and scouring of the streambed. In-stream construction alters the substrate and impacts adjacent streamside vegetation. Such disturbances within the substrate lead to increased siltation, which can clog the gills and feeding mechanisms of benthic organisms, fish, and amphibian species. Siltation may also cover benthos with excessive amounts of sediments that inhibit their ability to obtain oxygen.

Appropriate measures will be taken to avoid spillage of construction materials and control runoff. Such measures will include an erosion and sedimentation control plan, provisions for storing and handling waste materials, stormwater management measures, and appropriate road maintenance measures. NCDOT's *Best Management Practices for Protection of Surface Waters* (BMP-PSW) and Sedimentation Control guidelines will be enforced during the construction stages of the project.

E. SPECIAL TOPICS

1. "Waters of the United States:" Jurisdictional Issues

Surface waters and wetlands within the project area are subject to jurisdictional consideration under Section 404 of the Clean Water Act (CWA) as "Waters of the United States." The USACE has the responsibility for implementation, permitting, and enforcement of the provisions of the CWA. The USACE regulatory program is defined in 33 CFR 320-330.

Section 401 of the CWA grants authority to individual States for regulation of discharges into Waters of the United States. Under North Carolina General Statutes, 113A "Pollution Control and Environment" and codified in North Carolina Administrative Code (NCAC) 15A, the NCDWQ has the responsibility for implementation, permitting, and enforcement of the provisions of the CWA.

Jurisdictional surface waters include perennial and intermittent streams and certain impoundments. Mud Creek is a perennial stream in the study area. Stream rating forms are included in the Appendix. The man-made pond adjacent in the southwest quadrant of the bridge was constructed in an upland area and is not subject to jurisdiction of the USACE.

Two wetlands were identified and delineated during the field survey. The delineated boundaries of these wetlands were reviewed and confirmed during a field meeting with the USACE regulatory agent on June 8, 2004. Copies of the wetland data sheets are included in the Appendix.

Wetland A is located on the northeast side of the bridge and covers approximately 0.26 acres. This wetland is shown on the NWI map (Southwest Durham, NC) as a Palustrine Forested Broadleaf Deciduous Seasonally Flooded (PFO1C) wetland.

Wetland B is located on the southeast side of the bridge at the toe of the roadway slope and is approximately 0.06 acres in area. It is shown on the NWI map as a Palustrine Emergent Persistent Temporarily Flooded (PEM1A) wetland. Its small size indicates it may have been impacted by past land use practices and urban development.

Since the new bridge will be approximately 50 feet longer than the existing bridge, end bents will be located approximately 25 feet from the edge of the stream. Only temporary impacts will occur to the stream channel during removal of the existing end bents. Mechanized clearing is generally considered a temporary impact. NCWRC indicated that no moratorium is required for work occurring in the water. Estimated impacts to Waters of the United States are shown in Table 3.

Table 3. Anticipated Impacts to Waters of the United States

Proposed Alternative	Wetland Impacts (permanent)	Wetland Impacts (temporary)	Stream Impacts (permanent)	Stream Impacts (temporary)	Mechanized Clearing (temporary)
Alternative A (preferred)	<0.01 acre	0	0	0	0.01 acre
Alternative B	<0.01 acre	0.01 acre	0	54 linear feet	0.04 acre

2. Permits

Section 404 of the Clean Water Act – In accordance with Section 404 of the Clean Water Act (33 U.S.C. 1344), a permit is required from the USACE for projects of this type for the discharge of dredged or fill material into "Waters of the United States." The USACE issues two types of permits for these activities. A general permit may be issued on a nationwide or regional basis for a category or categories of activities when: those activities are substantially similar in nature and cause only a minimal individual or cumulative environmental impacts, or when the general permit would result in avoiding unnecessary duplication or regulatory control exercised by another Federal, state or local agency provided that the environmental consequences of the action are individually and cumulatively minimal. If a general permit is not appropriate for a particular activity, then an individual permit must be utilized. Individual permits are authorized on a case-by-case evaluation of a specific project involving the proposed discharges.

It is anticipated that this project will fall under Nationwide Permit 23, which is a type of general permit. Nationwide Permit 23 is relevant to approved Categorical Exclusions. This permit authorizes any activities, work and discharges undertaken, assisted, authorized, regulated, funded or financed, in whole or in part, by another federal agency and that the activity is "categorically excluded" from environmental documentation because it is included within a category of actions which neither individually nor cumulatively have a significant effect on the environment. Activities authorized under nationwide permits must satisfy all terms and conditions of the particular permit. However, final permit decisions are left to the discretionary authority of the USACE.

Section 401 General Water Quality Certification (WQC) – A Section 401 General Water Quality Certification is necessary for projects that require Section 404 permits. The state has General Certifications which will match the permit type authorized by the USACE. The NCDWQ must issue the 401 Certification before the USACE will issue the 404 Permit. Compensatory mitigation may be required when more than 150 linear feet of stream and/or more than one acre of wetland impacts occur. Written concurrence from the NCDWQ is not required.

Bridge Demolition and Removal - The bridge demolition activities associated with this replacement will strictly follow NCDOT's *Best Management Practices for Construction and Maintenance.* Bridge No. 120 is composed entirely of timber and steel. It will be removed without dropping any components into the water.

3. Mitigation

Mitigation of wetland impacts has been defined by the Council on Environmental Quality to include avoidance, minimization, and compensation. These activities will be considered in sequential order.

Avoidance examines all appropriate and practicable possibilities of averting impacts to Waters of the U.S. It is not feasible to completely avoid all impacts to Waters of the U.S. within the project area since wetlands occur north and south of the bridge and the project will cross Mud Creek. Alternative A is the preferred alternative because it avoids impacts to wetlands north of Bridge No. 120.

Minimization includes the examination of appropriate and practicable steps to reduce adverse impacts to Waters of the U.S. Alternative A minimizes impacts because it uses an off-site detour during construction. Best Management Practices will also be used to minimize impacts.

Compensatory mitigation includes restoration, enhancement, creation, or preservation of wetland and stream functions and values that are lost when these systems are converted to other uses. The USACE usually requires compensatory mitigation for activities authorized under Section 404 of the Clean Water Act when unavoidable impacts total more than 0.10 acre of wetlands or 150 linear feet of perennial or intermittent streams. The NCDWQ may require compensatory mitigation for activities authorized under Section 401 of the Clean Water Act for unavoidable impacts to more than 1.0 acre of wetlands or more than 150 linear feet of perennial or intermittent streams.

Compensatory wetland mitigation is not anticipated for either project alternative.

F. Rare and Protected Species

Federal law (under the provisions of Section 7 of the Endangered Species Act [ESA] of 1973, as amended) requires that any federal action likely to adversely affect a species listed as federally protected be subject to review by the USFWS or National Marine Fisheries Service (NMFS). Other species may receive additional protection under separate laws such as the Lacey Act Amendments of 1981, the Migratory Bird Treaty of 1999, the Marine Mammal Protection Act of 1972, or the Eagle Protection Act of 1940.

Species identified as Endangered, Threatened, or Special Concern (SC) by the NCNHP list of rare plant and animal species are afforded state protection under the State Endangered Species Act and the North Carolina Plant Protection and Conservation Act of 1979.

1. Federally Protected Species

As of February 2003 and reviewed June 2005, the USFWS identified two Endangered (E) species and one Threatened (T) species (proposed for de-listing) for Durham County. Since the project study area is located in close proximity to Orange County, a review of protected species for this county was also conducted. As of February 2003 and reviewed June 2005, the USFWS identified

four Endangered (E) species and one Threatened (T) species for Orange County. Table 4 lists the species identified for Durham and Orange Counties. Species descriptions follow.

Natural Heritage Program maps of element occurrences were reviewed on December 22, 2003 and in March 2005 to determine if any protected species have been identified near the project area. This map review confirmed that no species identified as Endangered or Threatened by the USFWS have been identified within a one-mile radius of the project site.

Table 4. Federally Protected Species for Durham and Orange Counties

Common Name	Scientific Name	Status
Red-cockaded woodpecker	*Picoides borealis*	Endangered
Dwarf wedge mussel	*Alasmidonta heterodon*	Endangered
Michaux's sumac	*Rhus michauxii*	Endangered
Smooth coneflower	*Echinacea laevigata*	Endangered
Bald eagle	*Haliaeetus leucocephalus*	Threatened (Proposed for Delisting)

Red-cockaded woodpecker (*Picoides borealis)*
Federal Status: Endangered
State Status: Endangered

This bird is a small, seven to eight inch tall woodpecker with a black and white barred back, and a conspicuous large white cheek surrounded by a black cap, nape, and throat. Males have a very small red mark at the upper edge of the white cheek and just behind the eye. The red-cockaded woodpecker (RCW) is found in open pine forests in the southeastern United States. The RCW uses open old growth stands of southern pines, particularly longleaf pine, for foraging and nesting habitat. A forested stand optimally should contain at least 50 percent pine and lack a thick understory. The RCW is unique among woodpeckers because it nests almost exclusively in living pine trees. These birds excavate nests in pines greater than 60 years old that are contiguous with open, pine dominated foraging habitat. The foraging range of the RCW may extend 500 acres and must be contiguous with suitable nesting sites.

Living pines infected with red-heart disease (*Formes pini*) are often selected for cavity excavation because the inner heartwood is usually weakened and therefore easier to excavate. Cavities are located from 12 to 100 feet above ground level and below live branches. These trees can be identified by "candles," a large encrustation of running sap that encrusts the tree trunk. The sap encrustation serves as a deterrent for predatory species such as snakes and may be used by the RCW as a visual indicator of nesting or foraging territories. Colonies consist of one to many of these candle trees. The RCW lays its eggs in April, May, and June; the eggs hatch approximately 10 to 12 days later.

Biological Conclusion: *No Effect*

Suitable habitat for RCW does not exist within the project area. No pine dominated stands of appropriate diameter or age are present in the project area. The pines that are present in the project area are a minor component of the mixed hardwood stands in the study area. Natural Heritage Program maps were reviewed on December 22, 2003 and in March 2005 to determine if any RCW populations have been identified at or near the project area. This map review confirmed that no known RCWs are located within a two-mile radius of the project site. Based on this analysis, the proposed project will have **No Effect** on the red-cockaded woodpecker.

Bald eagle (*Haliaeetus leucocephalus*)
Federal Status: Threatened (Proposed for Delisting)
State Status: Threatened

The bald eagle is a very large bird of prey that ranges in size from 32 inches to 43 inches tall and has a wingspan of more than six feet. Adult body plumage is dark brown to chocolate-brown with a white head and tail, while immature birds are brown and irregularly marked with white until their fourth year. They are primarily associated with large bodies of water where food is plentiful. Eagle nests are found in close proximity to large, open expanses of water (usually within one-half mile) with a clear flight path to the water. Nests are made in the largest living tree within the area, with an open view of the surrounding land. Human disturbance can cause nest abandonment. Nests can be as large as six feet across and are made of sticks and vegetation. These platform nests may be used by the same breeding pair for many years. Breeding begins in December or January and the young remain in the nest at least 10 weeks after hatching. Bald eagles eat mostly fish robbed from ospreys or picked up dead along shorelines. They may also capture small mammals such as rabbits, some birds, wounded ducks, and carrion. Bald eagles are a year-round and transient species in North Carolina.

As of July 6, 1999, the bald eagle is under consideration by the USFWS for a proposed de-listing of the threatened status. However, this raptor will still be protected under the Migratory Bird Treaty Act and the Bald and Golden Eagle Protection Act. Populations will continue to be monitored for at least another five years under provisions of the Endangered Species Act.

Biological Conclusion: *No Effect*

Suitable nesting and foraging habitat for bald eagles does not exist in the study area. Natural Heritage Program maps were reviewed on December 22, 2003 and in March 2005 to determine if any bald eagles have been identified at or near the project area. This map review confirmed that no bald eagles are located within a two-mile radius of the project site. Based on this analysis, the proposed project will have **No Effect** on the bald eagle.

Dwarf wedge mussel (*Alasmidonta heterodon*)
Federal Status: Endangered
State Status: Endangered

The dwarf wedge mussel is relatively small, rarely exceeding 1.5 inches in length. The shell's outer surface is usually brown or yellowish brown in color, with faint green rays that are most noticeable

in young specimens. Unlike some mussel species, the male and female shells differ slightly, with the female being wider to allow greater space for egg development. A distinguishing characteristic of this mussel is its dentition pattern: the right valve possesses two lateral teeth, while the left valve has only one. This trait is opposite of all other North American species having lateral teeth. This mussel inhabits creeks and rivers that have a slow to moderate current with a sand, gravel, or muddy bed. These streams must be nearly silt free in order to support dwarf wedge mussels.

The dwarf wedge mussel is considered to be a long-term brooder, with gravid females reportedly observed in fall months. Like other freshwater mussels, this species' eggs are fertilized in the female by sperm that are taken in through their siphons as they respire. The eggs develop within the female's gills into larvae (glochidia). The females later release these glochidia, which then attach to the gills or fins of specific host fish species. Based on anecdotal evidence, such as dates when gravid females are present or absent, it appears that release of glochidia occurs primarily in April in North Carolina. While the USFWS notes that the host fish species is unknown, evidence indicates that an anadromous fish which migrates from ocean waters to fresh waters for spawning may be the likely host species. However, recent research has confirmed at least three potential fish host species for the dwarf-wedge mussel in North Carolina to be the tessellated darter, Johnny darter, and mottled sculpin. These fish species are found in Atlantic coast drainages of North Carolina.

Biological Conclusion: ***No Effect***

Mud Creek is completely located within the Cape Fear River basin. Mussel surveys were conducted by qualified biologists on November 24, 2004, from a point approximately 1,300 feet downstream to a point approximately 300 feet upstream. No dwarf wedge mussels were observed. According to the Natural Heritage Program the dwarf wedge mussel does not occur in this river basin. Based on this information, the proposed project will have **No Effect** on the dwarf wedge mussel.

Michaux's sumac (*Rhus michauxii*)
Federal Status: Endangered
State Status: Endangered – Special Concern

Michaux's sumac is a rhizomatous, densely hairy shrub, with erect stems from one to three feet in height. The compound leaves contain evenly serrated, oblong to lanceolate, acuminate leaflets. Most plants are unisexual; however, more recent observations have revealed plants with both male and female flowers on one plant. The flowers are small, borne in a terminal, erect, dense cluster, and colored greenish yellow to white. Flowering usually occurs from June to July; while the fruit, a red drupe, is produced through the months of August to October. Only 36 extant populations are known, with 31 in North Carolina, three in Virginia, and two populations in Georgia.

Michaux's sumac grows in sandy or rocky open woods in association with basic soils. It spreads by producing cloning shoots from the roots of mature plants. Apparently, this plant survives best in areas where some form of periodic disturbance provides open areas. At least twelve of the plant's populations in North Carolina are on highway rights-of way, roadsides, or on the edges of artificially maintained clearings.

Biological Conclusion: ***No Effect***

Suitable habitat for Michaux's sumac does not exist at the project site. The study area is characterized by a closed canopy forest on thin acidic soils. Natural Heritage Program maps were reviewed on December 22, 2003 and in March 2005 to determine if any Michaux's sumac populations have been identified at or near the project area. This map review confirmed that no populations are located within a two-mile radius of the project site. Based on this analysis, the proposed project will have **No Effect** on Michaux's sumac.

Smooth coneflower (*Echinacea laevigata*)
Federal Status: Endangered
State Status: Endangered – Special Concern

Smooth coneflower is a rhizomatous perennial herb that grows up to five feet tall from a vertical root stock. The stems are smooth, with few leaves. The largest leaves are the basal leaves, which reach eight inches in length and three inches in width, have long stems, and are elliptical to broadly lanceolate, tapering to the base, and smooth to slightly rough. Mid-stem leaves have shorter stems or no stems and are smaller in size than the basal leaves. The rays of the flowers (petal-like structures) are light pink to purplish, usually drooping, and two to 3.2 inches long. Flower heads are usually solitary, with flowering occurring from May through July. The species is now known to survive only in Virginia, North Carolina, South Carolina, and Georgia. Six populations survive in North Carolina. The North Carolina populations are in Durham and Granville Counties.

The habitat of smooth coneflower is open woods, cedar barrens, roadsides, clearcuts, dry limestone bluffs, and power line rights-of-way, usually on magnesium- and calcium-rich soils associated with limestone (in Virginia), gabbro (in North Carolina and Virginia), diabase (in North Carolina and South Carolina), and marble (in South Carolina and Georgia). Optimal sites are characterized by abundant sunlight and little competition in the herbaceous layer. Natural fires, as well as large herbivores, are part of the history of the vegetation in this species' range.

Biological Conclusion: ***No Effect***

Suitable habitat for smooth coneflower does not exist at the project site. The study area is characterized by a closed canopy forest on thin acidic soils. Natural Heritage Program maps were reviewed on December 22, 2003 and in March 2005 to determine if any smooth coneflower populations have been identified at or near the project area. This map review confirmed that no populations are located within a two-mile radius of the project site. Based on this analysis, the proposed project will have **No Effect** on smooth coneflower.

2. Federal Species of Concern

Federal Species of Concern (FSC) are not legally protected under the Endangered Species Act and are not subject to any of its provisions, including Section 7. Species designated as FSC are defined as taxa which may or may not be listed in the future. These species were formerly Candidate 2 (C2) species or species under consideration for listing for which there is insufficient information to support listing.

Tables 5 and 6 show FSCs for Durham and Orange Counties as of the USFWS February 2003 list, their state status, and the potential for habitat in the study area. On December 22, 2003, review of NCNHP maps found that one FSC and one state protected species have been identified within one mile northwest of the project site. Sweet pinesap (*Monotropsis odorata*) is a vascular plant listed as an FSC in both Durham and Orange Counties. An amphibian species listed for state protection, the four-toed salamander (*Hemidactylium scutatum*), is listed as an SC species in both Durham and Orange Counties. An additional map review in March 2005 found no changes from the previous review.

Table 5. Federal Species of Concern in Durham County, State Status, and Potential Habitat

Common Name	Scientific Name	State Status	Habitat Available
Carolina darter (Eastern Piedmont population)**	*Etheostoma collis* pop. 2	SC	Yes
Pinewoods shiner**	*Lythrurus matutinus*	SR	Yes
Atlantic pigtoe	*Fusconaia masoni*	E	No
Septima's clubtail*	*Gomphus septima*	SR	No
Yellow lampmussel	*Lampsillis cariosa*	E	No
Green floater	*Lasmigona subviridis*	E	Yes
Panhandle pebblesnail	*Somatogyrus virginicus*	SR	No
Tall larkspur	*Delphinium exaltatum*	E-SC	No
Sweet pinesap	*Monotropsis odorata*	SR-T	No
Liverwort	*Plagiochila Columbiana*	None	No

Table 6. Federal Species of Concern in Orange County, State Status, and Potential Habitat

Common Name	Scientific Name	State Status	Habitat Available
Carolina darter (Eastern Piedmont population)*	*Etheostoma collis* pop. 2	SC	Yes
Carolina redhorse	*Moxostoma* sp.	None	Yes
Brook floater	*Alasmidonta varicosa*	E	No
Carolina well diacyclops*	*Diacyclops jeanneli putei*	SR	No
Atlantic pigtoe	*Fusconaia masoni*	E	No
Yellow lampmussel	*Lampsilis cariosa*	E	No
Green floater	*Lasmigona subviridis*	E	Yes
Savannah lilliput	*Toxolasma pullus*	E	No
Creamy tick-trefoil*	*Desmodium ochroleucum*	SR-T	No
Butternut	*Juglans cinerea*	None	Yes
Sweet pinesap*	*Monotropsis odorata*	SR-T	No
Torrey's mountain-mint	*Pycnanthemum torrei*	SR-T	No
Liverwort	*Plagiochila columbiana*	None	No

Notes for Tables 5 and 6:
*-Historic Record, **-Obscure, SC-Special Concern, E-Endangered, SR-Significantly Rare, -T-Throughout

VI. Cultural Resources

A. Compliance Guidelines

This project is subject to compliance with Section 106 of the National Historic Preservation Act of 1966, as amended, and implemented by the Advisory Council on Historic Preservation's Regulations for Compliance Section 106, codified at 36 CFR Part 800. Section 106 requires federal agencies to take into account the effect of their undertakings (federally funded, licensed, or permitted) on properties listed in or eligible for the National Register of Historic Places, and to afford the Advisory Council on Historic Preservation a reasonable opportunity to comment on such undertakings.

B. Historic Architecture

A field survey of the Area of Potential Effects (APE) was conducted on July 22, 2003. All structures within the APE were photographed, and later reviewed by NCDOT architectural historians and staff at the State Historic Preservation Office (HPO). In a concurrence form dated October 14, 2003, NCDOT, HPO, and FHWA concurred that there are no historic architectural resources either listed in or eligible for listing in the National Register of Historic Places within the APE. A copy of the concurrence form is included in the Appendix.

C. ARCHAEOLOGY

The SHPO, in a memorandum dated March 4, 2004, stated that there are no known archaeological sites within the project area and therefore the SHPO recommended that "no archaeological investigation be conducted in connection with this project." A copy of the SHPO memorandum is included in the Appendix.

VII. ENVIRONMENTAL EFFECTS

The project is expected to have an overall positive impact. Replacement of the structurally deficient and functionally obsolete bridge will result in safer traffic operations.

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

The bridge replacement will not have an adverse effect on the quality of the human or natural environment with the use of current NCDOT standards and specifications.

The project is not in conflict with any plan, existing land use, or zoning regulation. No substantial change in land use is expected to result from construction of the project.

No adverse impact on families or communities is anticipated. Right-of-way acquisition will be limited. No relocations of residents or businesses are expected with implementation of the proposed alternative.

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

No adverse effect on public facilities or services is anticipated. The project is not expected to adversely affect social, economic, or religious opportunities in the area.

There are no publicly owned recreational facilities, or wildlife and waterfowl refuges of national, state, or local significance in the vicinity of the project.

The Farmland Protection Policy Act requires all federal agencies or their representatives to consider the potential impacts to prime and important farmland soils by all land acquisition and construction projects. Prime and important farmland soils are defined by the Natural Resources Conservation Service (NRCS). Since the proposed bridge will be replaced at the existing location the Farmland Protection Policy Act does not apply.

The project is located in Durham County, which is within the Raleigh-Durham-Chapel Hill nonattainment area for ozone (O_3) and the Raleigh-Durham for carbon monoxide (CO) as defined by the EPA. The 1990 Clean Air Act Amendments (CAAA) designated these areas as moderate nonattainment area for CO. However, due to improved monitoring data, these areas were

redesignated as maintenance areas for CO on September 18, 1995. The area was designated nonattaninment for O_3 under the eight-hour ozone standard effective June 15, 2004. Section 176 (c) of the CAAA requires that transportation plans, programs, and projects conform to the intent of the state air quality implementation plan (SIP). The current SIP does not contain any transportation control measures for Durham County. The *Durham-Chapel Hill-Carrboro MPO* 2030 *Long Range Transportation Plan* (LRTP) and the 2004-2010 Metropolitan Transportation Improvement Program (MTIP) has been determined to conform to the intent of the SIP. The USDOT made a conformity determination on the LRTP on June 15, 2005 and the MTIP on June 15 2005. The current conformity determination is consistent with the final conformity rule found in 40 CFR Parts 51 and 93. There have been no significant changes in the project's design concept or scope, as used in the conformity analyses.

The traffic volumes will not increase or decrease because of this project. There are no receptors located in the immediate project area. The project's impact on noise and air quality will not be substantial.

Noise levels could increase during construction but will be temporary. This evaluation completes the assessment requirements for highway traffic noise (23 CFR Part 772) and for air quality (1990 CAAA and NEPA) and no additional reports are required.

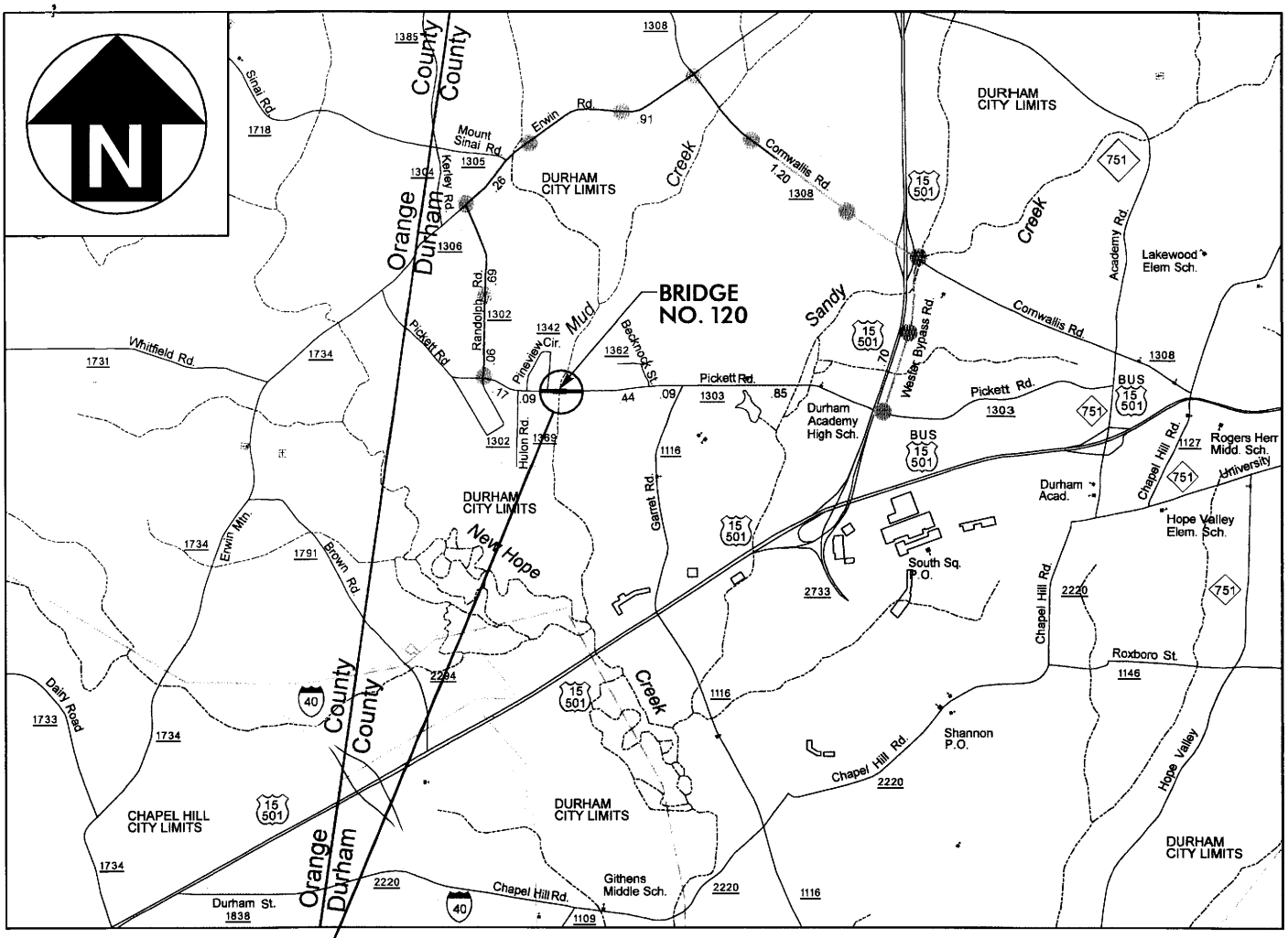
An examination of records at the North Carolina Department of Environment and Natural Resources, Division of Water Quality, Groundwater Section and the North Carolina Division of Solid Waste Management revealed no hazardous waste sites in the project area. A field reconnaissance survey and records search was performed and no underground storage tank (UST) sites were found within the project area. If any unregulated USTs or any potential source of contamination is discovered during right-of-way initial contacts with impacted property owners, then an assessment will be conducted to determine the extent of any contamination at that time.

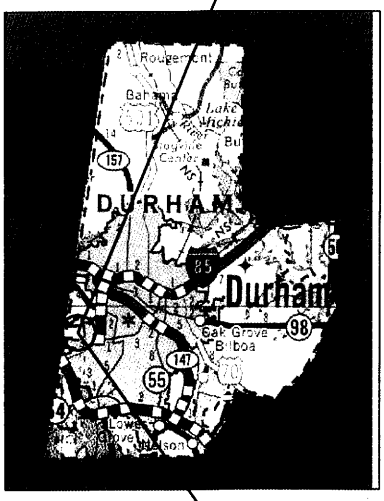
The drainage area of Mud Creek at the proposed crossing is 5.37 square miles. Durham County is currently participating in the National Flood Insurance Program. This crossing of Mud Creek is in Zone AE, a FEMA Special Flood Hazard Zone. A Flood Insurance Rate Map is attached (Figure 5). It is not anticipated that a floodway modification will be required since the bridge will be an "in kind" replacement. It is not anticipated that this project will have any substantial impact on the existing floodplain or floodway.

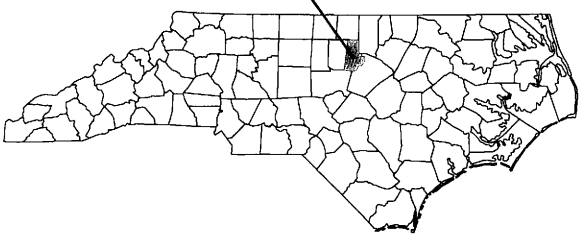
On the basis of the above discussion, it is concluded that no substantial adverse environmental effects will result from implementation of the project.

VIII. Public Involvement

Efforts were undertaken early in the planning process to contact local officials to involve them in the project development with scoping letters. Scoping letters were also sent to various agencies. An informational newsletter was mailed to area residents and appropriate officials in February 2005. No comments were received in response to the newsletter.



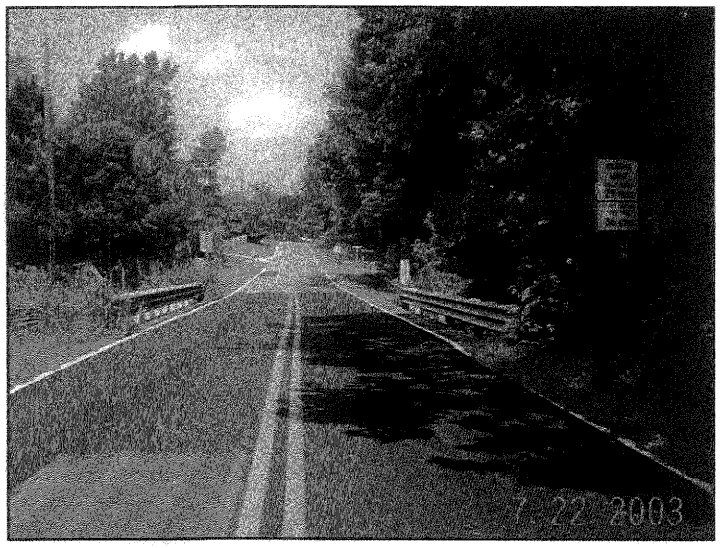




North Carolina Department of Transportation
Project Development & Environmental Analysis

DURHAM COUNTY
BRIDGE NO. 120 ON SR 1303
OVER MUD CREEK
B-4109

FIGURE 1



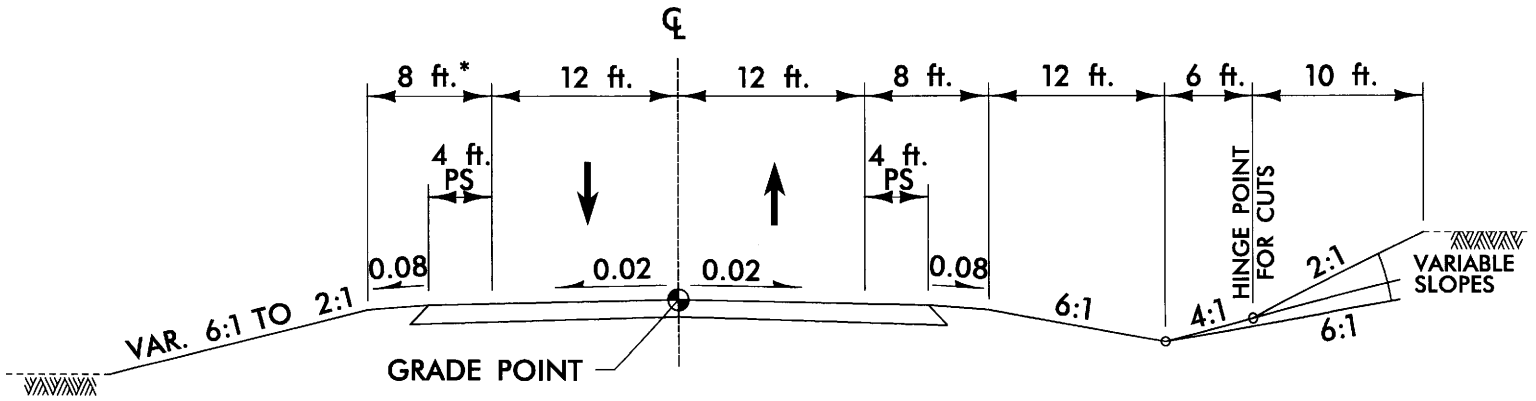
View of west approach from Bridge No. 120.

View of east approach from Bridge No. 120.

Bridge No. 120 side view from south.

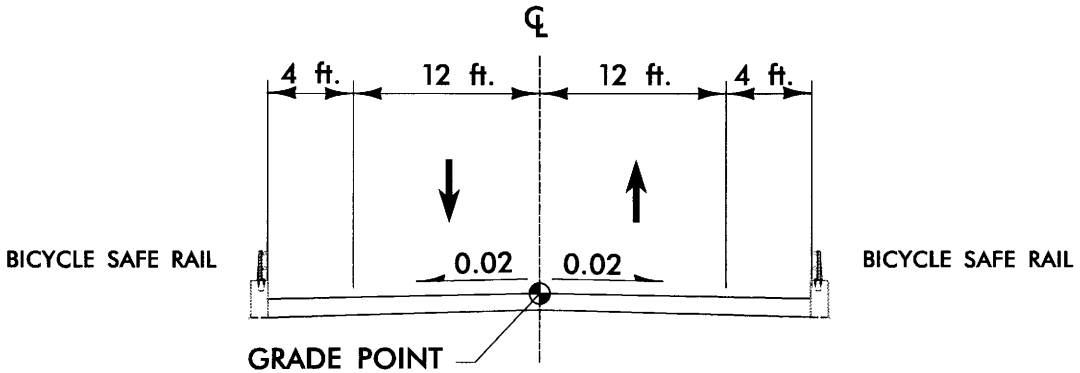
Figure 2

B-4109 Bridge No. 120 on SR 1303 over Mud Creek



TYPICAL APPROACH SECTION
(PROPOSED)

* 11 ft. WITH GUARDRAIL IS WARRANTED



TYPICAL BRIDGE SECTION
(PROPOSED)

TRAFFIC DATA

(CONST. YR.) 2006 ADT = 5,550
(DESIGN YR.) 2030 ADT = 12,400
DUAL 2%
TTST 1%

EXISTING BRIDGE LENGTH = 50 ft.

FUNCTIONAL CLASSIFICATION :
URBAN LOCAL

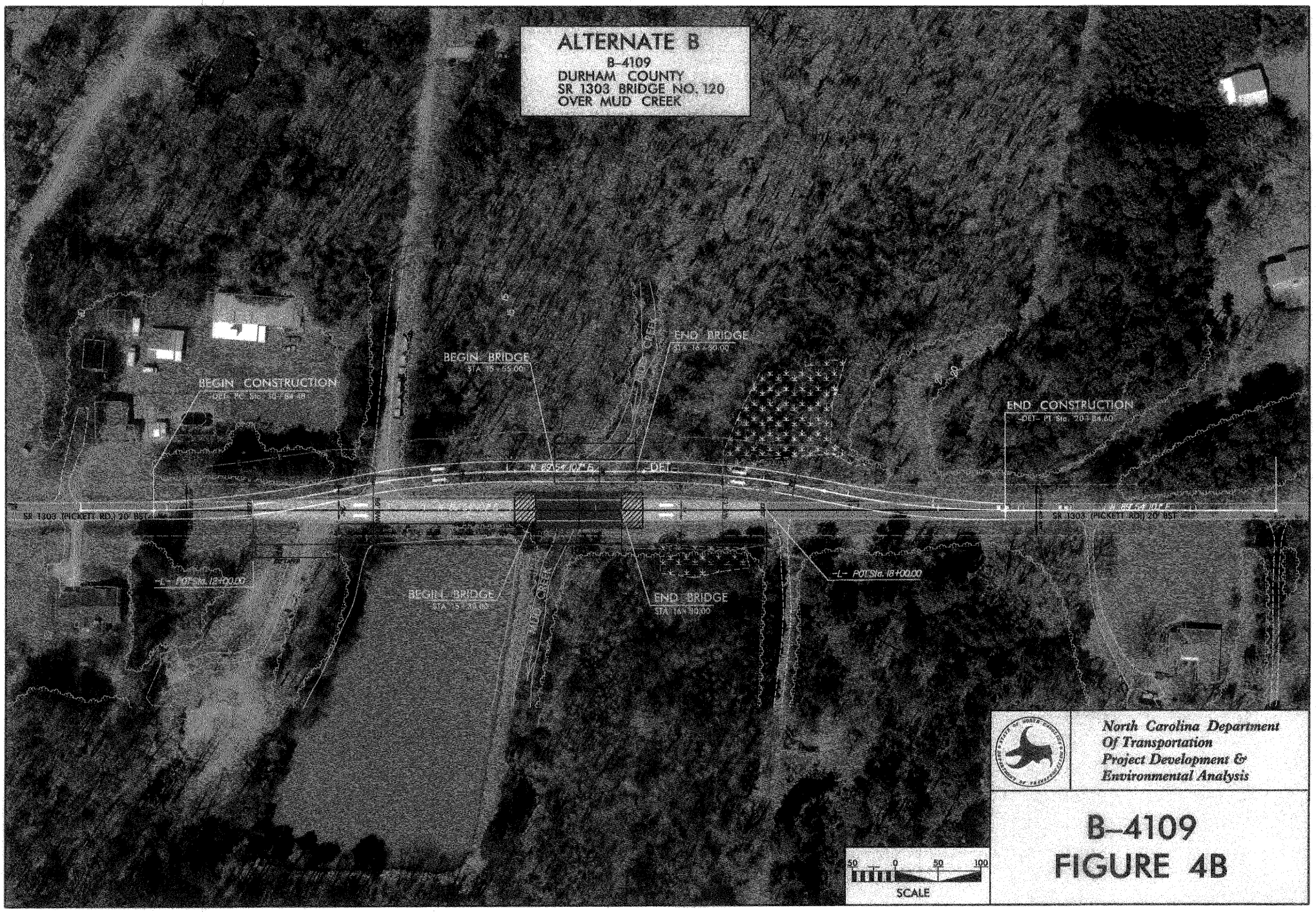
North Carolina Department of Transportation
Project Development & Environmental Analysis

DURHAM COUNTY
BRIDGE NO. 120 ON SR 1303
(PICKETT RD)
OVER MUD CREEK
TIP NO: B-4109

FIGURE 3

North Carolina Department
Of Transportation
Project Development &
Environmental Analysis

B-4109
FIGURE 4A


ALTERNATE B
B-4109
DURHAM COUNTY
SR 1303 BRIDGE NO. 120
OVER MUD CREEK
BEGIN CONSTRUCTION
-DET- PC Sta. 12+84.49
BEGIN BRIDGE
-L- Sta. 15+65.00
END BRIDGE
-L- Sta. 16+30.00
END CONSTRUCTION
-DET- PT Sta. 20+84.60
-DET-
SR 1303 (PICKETT RD.) 20' BST
-L- POT Sta. 18+00.00
BEGIN BRIDGE
-L- Sta. 15+34.85
END BRIDGE
-L- Sta. 16+30.00
-L- POT Sta. 18+00.00
SR 1303 (PICKETT RD.) 20' BST
50 0 50 100
SCALE
North Carolina Department
Of Transportation
Project Development &
Environmental Analysis
B-4109
FIGURE 4B

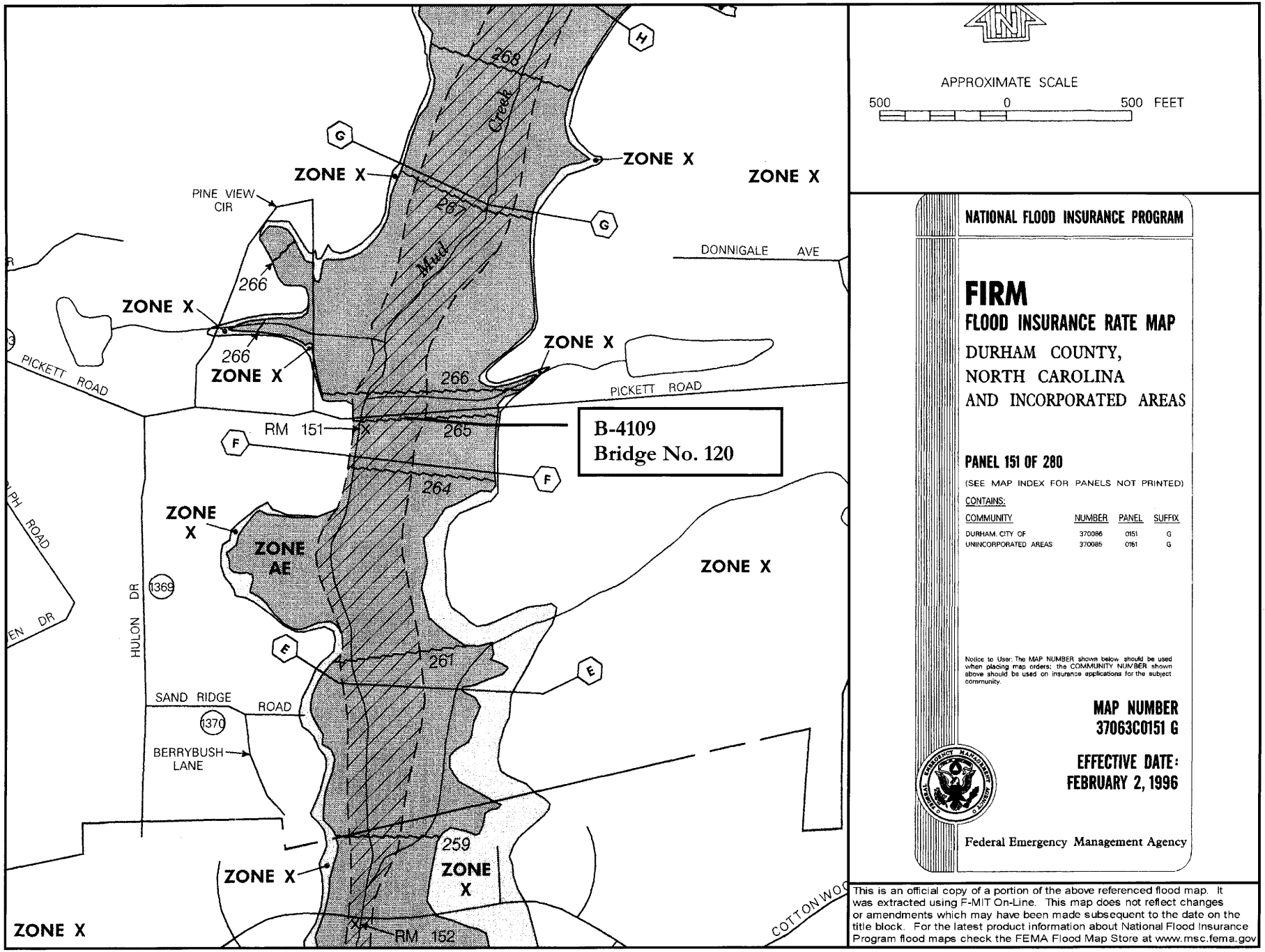

APPROXIMATE SCALE
500 0 500 FEET
NATIONAL FLOOD INSURANCE PROGRAM
FIRM
FLOOD INSURANCE RATE MAP
DURHAM COUNTY,
NORTH CAROLINA
AND INCORPORATED AREAS
PANEL 151 OF 280
(SEE MAP INDEX FOR PANELS NOT PRINTED)
CONTAINS:
COMMUNITY NUMBER PANEL SUFFIX
DURHAM, CITY OF 370086 0151 G
UNINCORPORATED AREAS 370085 0151 G
Notice to User: The MAP NUMBER shown below should be used when placing map orders; the COMMUNITY NUMBER shown above should be used on insurance applications for the subject community.
MAP NUMBER
37063C0151 G
EFFECTIVE DATE:
FEBRUARY 2, 1996
Federal Emergency Management Agency
B-4109
Bridge No. 120
ZONE X
ZONE AE
PINE VIEW CIR
PICKETT ROAD
DONNIGALE AVE
HULON DR
SAND RIDGE ROAD
BERRYBUSH LANE
RM 151
RM 152
Mud Creek
268
267
266
265
264
261
259
This is an official copy of a portion of the above referenced flood map. It was extracted using F-MIT On-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at www.msc.fema.gov

Figure 5

APPENDIX

COPY

U.S. ARMY CORPS OF ENGINEERS
WILMINGTON DISTRICT

Action ID. 200420704 County: Durham U.S.G.S. Quad: Southwest Durham

NOTIFICATION OF JURISDICTIONAL DETERMINATION

Property Owner/Agent: NCDOT - Division of Highways
Address: Attn: Gregory J. Thorpe, Ph.D., Dir., PDEA
1548 Mail Service Center
Raleigh, NC 27699
Telephone No.: (919) 733-7844, ext. 266

Property description:
Size (acres) n/a Nearest Town Durham
Nearest Waterway Mud Creek River Basin Cape Fear
USGS HUC 03030002 Coordinates N 35.9752 W 78.9843
Location description Study area for bridge replacement (TIP B-4109) as shown on the drawings submitted on June 25, 2004.

Indicate Which of the Following Apply:

_ Based on preliminary information, there may be wetlands on the above described property. We strongly suggest you have this property inspected to determine the extent of Department of the Army (DA) jurisdiction. To be considered final, a jurisdictional determination must be verified by the Corps. This preliminary determination is not an appealable action under the Regulatory Program Administrative Appeal Process (Reference 33 CFR Part 331).

_ There are Navigable Waters of the United States within the above described property subject to the permit requirements of Section 10 of the Rivers and Harbors Act and Section 404 of the Clean Water Act. Unless there is a change in the law or our published regulations, this determination may be relied upon for a period not to exceed five years from the date of this notification.

X There are waters of the U.S. including wetlands on the above described project area subject to the permit requirements of Section 404 of the Clean Water Act (CWA)(33 USC § 1344). Unless there is a change in the law or our published regulations, this determination may be relied upon for a period not to exceed five years from the date of this notification.

_ We strongly suggest you have the wetlands on your project area delineated. Due to the size of your property and/or our present workload, the Corps may not be able to accomplish this wetland delineation in a timely manner. For a more timely delineation, you may wish to obtain a consultant. To be considered final, any delineation must be verified by the Corps.

X The waters of the U.S. including wetland on your project area have been delineated and the delineation has been verified by the Corps. We strongly suggest you have this delineation surveyed. Upon completion, this survey should be reviewed and verified by the Corps. Once verified, this survey will provide an accurate depiction of all areas subject to CWA jurisdiction on your property which, provided there is no change in the law or our published regulations, may be relied upon for a period not to exceed five years.

_ The wetlands have been delineated and surveyed and are accurately depicted on the plat signed by the Corps Regulatory Official identified below on _____. Unless there is a change in the law or our published regulations, this determination may be relied upon for a period not to exceed five years from the date of this notification.

_ There are no waters of the U.S., to include wetlands, present on the above described project area which are subject to the permit requirements of Section 404 of the Clean Water Act (33 USC 1344). Unless there is a change in the law or our published regulations, this determination may be relied upon for a period not to exceed five years from the date of this notification.

_ The property is located in one of the 20 Coastal Counties subject to regulation under the Coastal Area Management Act (CAMA). You should contact the Division of Coastal Management in Wilmington, NC, at (910) 395-3900 to determine their requirements.

Action ID. 200420704

Placement of dredged or fill material within waters of the US and/or wetlands without a Department of the Army permit may constitute a violation of Section 301 of the Clean Water Act (33 USC § 1311). If you have any questions regarding this determination and/or the Corps regulatory program, please contact Eric Alsmeyer at (919) 876-8441, ext. 23.

Basis For Determination: The study area contains a stream channel of Mud Creek, a tributary of New Hope Creek and the Cape Fear River, with indicators of ordinary high water marks, and wetlands adjacent to the tributaries.

Remarks: The bermed pond west of Mud Creek and south of SR 1303 appears to have been excavated from a non-wetland area of the floodplain of Mud Creek, and as such, is not regulated under Section 404 of the Clean Water Act.

Corps Regulatory Official: Erin C. Kay

Date 02/15/2005 Expiration Date 02/15/2010

Copy furnished:

Ms. Cindy Carr
Mulkey Engineers
P.O. Box 33127
Raleigh, NC 27626

NOTIFICATION OF ADMINISTRATIVE APPEAL OPTIONS AND PROCESS AND REQUEST FOR APPEAL

Applicant: NCDOT (**TIP B-4109**)	File Number: **200420704**	Date: **02/15/2005**
Attached is:		See Section below
☐ INITIAL PROFFERED PERMIT (Standard Permit or Letter of permission)		A
☐ PROFFERED PERMIT (Standard Permit or Letter of permission)		B
☐ PERMIT DENIAL		C
☒ APPROVED JURISDICTIONAL DETERMINATION		D
☐ PRELIMINARY JURISDICTIONAL DETERMINATION		E

SECTION I - The following identifies your rights and options regarding an administrative appeal of the above decision. Additional information may be found at http://www.usace.army.mil/inet/functions/cw/cecwo/reg or Corps regulations at 33 CFR Part 331.

A: INITIAL PROFFERED PERMIT: You may accept or object to the permit.

- ACCEPT: If you received a Standard Permit, you may sign the permit document and return it to the district engineer for final authorization. If you received a Letter of Permission (LOP), you may accept the LOP and your work is authorized. Your signature on the Standard Permit or acceptance of the LOP means that you accept the permit in its entirety, and waive all rights to appeal the permit, including its terms and conditions, and approved jurisdictional determinations associated with the permit.
- OBJECT: If you object to the permit (Standard or LOP) because of certain terms and conditions therein, you may request that the permit be modified accordingly. You must complete Section II of this form and return the form to the district engineer. Your objections must be received by the district engineer within 60 days of the date of this notice, or you will forfeit your right to appeal the permit in the future. Upon receipt of your letter, the district engineer will evaluate your objections and may: (a) modify the permit to address all of your concerns, (b) modify the permit to address some of your objections, or (c) not modify the permit having determined that the permit should be issued as previously written. After evaluating your objections, the district engineer will send you a proffered permit for your reconsideration, as indicated in Section B below.

B: PROFFERED PERMIT: You may accept or appeal the permit

- ACCEPT: If you received a Standard Permit, you may sign the permit document and return it to the district engineer for final authorization. If you received a Letter of Permission (LOP), you may accept the LOP and your work is authorized. Your signature on the Standard Permit or acceptance of the LOP means that you accept the permit in its entirety, and waive all rights to appeal the permit, including its terms and conditions, and approved jurisdictional determinations associated with the permit.
- APPEAL: If you choose to decline the proffered permit (Standard or LOP) because of certain terms and conditions therein, you may appeal the declined permit under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer. This form must be received by the division engineer within 60 days of the date of this notice.

C: PERMIT DENIAL: You may appeal the denial of a permit under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer. This form must be received by the division engineer within 60 days of the date of this notice.

D: APPROVED JURISDICTIONAL DETERMINATION: You may accept or appeal the approved JD or provide new information.

- ACCEPT: You do not need to notify the Corps to accept an approved JD. Failure to notify the Corps within 60 days of the date of this notice, means that you accept the approved JD in its entirety, and waive all rights to appeal the approved JD.
- APPEAL: If you disagree with the approved JD, you may appeal the approved JD under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer. This form must be received by the division engineer within 60 days of the date of this notice.

E: PRELIMINARY JURISDICTIONAL DETERMINATION: You do not need to respond to the Corps regarding the preliminary JD. The Preliminary JD is not appealable. If you wish, you may request an approved JD (which may be appealed), by contacting the Corps district for further instruction. Also you may provide new information for further consideration by the Corps to reevaluate the JD.

SECTION II - REQUEST FOR APPEAL or OBJECTIONS TO AN INITIAL PROFFERED PERMIT

REASONS FOR APPEAL OR OBJECTIONS: (Describe your reasons for appealing the decision or your objections to an initial proffered permit in clear concise statements. You may attach additional information to this form to clarify where your reasons or objections are addressed in the administrative record.)

ADDITIONAL INFORMATION: The appeal is limited to a review of the administrative record, the Corps memorandum for the record of the appeal conference or meeting, and any supplemental information that the review officer has determined is needed to clarify the administrative record. Neither the appellant nor the Corps may add new information or analyses to the record. However, you may provide additional information to clarify the location of information that is already in the administrative record.

POINT OF CONTACT FOR QUESTIONS OR INFORMATION:

If you have questions regarding this decision and/or the appeal process you may contact: Eric Alsmeyer Raleigh Regulatory Field Office US Army Corps of Engineers 6508 Falls of the Neuse Road, Suite 120 Raleigh, North Carolina 27615	If you only have questions regarding the appeal process you may also contact: Mr. Michael Bell, Administrative Appeal Review Officer CESAD-ET-CO-R U.S. Army Corps of Engineers, South Atlantic Division 60 Forsyth Street, Room 9M15 Atlanta, Georgia 30303-8801

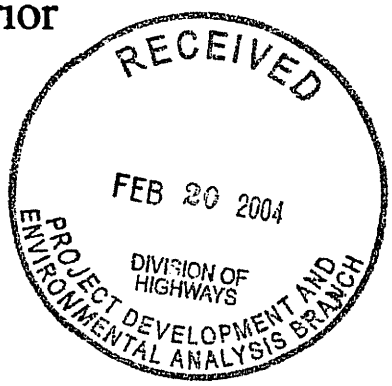
RIGHT OF ENTRY: Your signature below grants the right of entry to Corps of Engineers personnel, and any government consultants, to conduct investigations of the project site during the course of the appeal process. You will be provided a 15 day notice of any site investigation, and will have the opportunity to participate in all site investigations.

_____ Signature of appellant or agent.	Date:	Telephone number:

DIVISION ENGINEER:
Commander
U.S. Army Engineer Division, South Atlantic
60 Forsyth Street, Room 9M15
Atlanta, Georgia 30303-3490

United States Department of the Interior

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



February 18, 2004

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

Dear Dr. Thorpe:

This letter is in response to your request for comments from the U.S. Fish and Wildlife Service (Service) on the potential environmental impacts of the proposed replacement of the following ten bridges:

- B-4002, Alamance County, Bridge No. 96 on SR 2116 over Meadow Creek
- B-4063, Chatham County, Bridge No. 20 on NC 902 over Sandy Branch
- B-4109, Durham County, Bridge No. 120 on SR 1303 over Mud Creek
- B-4216, Orange County, Bridge No. 66 on SR 1002 over Strouds Creek
- B-4300, Wake County, Bridge No. 29 on SR 1007 over Clarks Creek
- B-4301, Wake County, Bridge No. 229 on SR 1007 over Poplar Creek
- B-4302, Wake County, Bridge No. 336 on SR 1301 over Terrible Creek
- B-4303, Wake County, Bridge No. 102 on SR 1844 over Lower Bartons Creek
- B-4304, Wake County, Bridge No. 143 on SR 2217 over Beaver Dam Creek
- B-4592, Orange County, Bridge No. 64 on SR 1561 over Eno River

These comments provide scoping information in accordance with provisions of the Fish and Wildlife Coordination Act (16 U.S.C. 661-667d) and section 7 of the Endangered Species Act (ESA) of 1973, as amended (16 U.S.C. 1531-1543).

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

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

2. If unavoidable wetland impacts are proposed, every effort should be made to identify compensatory mitigation sites in advance. Project planning should include a detailed compensatory mitigation plan for offsetting unavoidable wetland impacts. Opportunities

to protect mitigation areas in perpetuity via conservation easements, land trusts or by other means should be explored at the outset;

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

4. Wherever appropriate, construction in sensitive areas should occur outside fish spawning and migratory bird nesting seasons. In waterways that may serve as travel corridors for fish, in-water work should be avoided during moratorium periods associated with migration, spawning and sensitive pre-adult life stages. The general moratorium period for anadromous fish is February 15 - June 30;

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

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

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

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

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

A list of federally protected species for each county in North Carolina can be found at http://nc-es.fws.gov/es/countyfr.html . Additional information about the habitats in which each species is often found can also be found at http://endangered.fws.gov . Please note, the use of the North Carolina Natural Heritage Program data should not be substituted for actual field surveys if suitable habitat occurs near the project site. If suitable habitat exists in the project area, we recommend that biological surveys for the listed species be conducted and submitted to us for review. All survey documentation must include survey methodologies and results.

We reserve the right to review any federal permits that may be required for these projects, at the public notice stage. Therefore, it is important that resource agency coordination occur early in

the planning process in order to resolve any conflicts that may arise and minimize delays in project implementation. In addition to the above guidance, we recommend that the environmental documentation for these projects include the following in sufficient detail to facilitate a thorough review of the action:

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

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

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

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

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

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

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

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

Sincerely,

John E. Ellis

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

cc: Eric Alsmeyer, USACE, Raleigh, NC
John Thomas, USACE, Raleigh, NC
Richard Spencer, USACE, Wilmington, NC
John Hennessy, NCDWQ, Raleigh, NC
Travis Wilson, NCWRC, Creedmoor, NC
Chris Militscher, USEPA, Raleigh, NC

Federal Aid # BRZ-1303(3) *TIP* # B-4109 *County*: Durham

CONCURRENCE FORM FOR PROPERTIES NOT ELIGIBLE FOR THE NATIONAL REGISTER OF HISTORIC PLACES

Project Description: Replace Bridge No. 120 on SR 1303 over Mud Creek

On 10/14/2003, representatives of the

- [x] North Carolina Department of Transportation (NCDOT)
- [x] Federal Highway Administration (FHWA)
- [x] North Carolina State Historic Preservation Office (HPO)
- [ ] Other

Reviewed the subject project at

- [ ] Scoping meeting
- [x] Historic architectural resources photograph review session/consultation
- [ ] Other

All parties present agreed

- [ ] There are no properties over fifty years old within the project's area of potential effects.
- [x] There are no properties less than fifty years old which are considered to meet Criteria Consideration G within the project's area of potential effects.
- [x] There are properties over fifty years old within the project's Area of Potential Effects (APE), but based on the historical information available and the photographs of each property, the property identified as Prop A-F Bridge #120 is considered not eligible for the National Register and no further evaluation of it is necessary.
- [x] There are no National Register-listed or Study Listed properties within the project's area of potential effects.
- [x] All properties greater than 50 years of age located in the APE have been considered at this consultation, and based upon the above concurrence, all compliance for historic architecture with Section 106 of the National Historic Preservation Act and GS 121-12(a) has been completed for this project.
- [x] There are no historic properties affected by this project. (*Attach any notes or documents as needed*)

Signed:

Mary Pope Furr — 10·14·2003
Representative, NCDOT — Date

Ruth A — 10/14/03
FHWA, for the Division Administrator, or other Federal Agency — Date

Renee Gledhill-Earley — 10/14/03
Representative, HPO — Date

David Brook — 10-14-03
State Historic Preservation Officer — Date

If a survey report is prepared, a final copy of this form and the attached list will be included.

North Carolina Department of Cultural Resources
State Historic Preservation Office

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

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

March 4, 2004

MEMORANDUM

TO: Stacey Baldwin
Project Development and Environmental Analysis Branch
NCDOT Division of Highways

FROM: David Brook for David Brook

SUBJECT: Request for comments on Bridge Replacement projects
B-4002, Alamance County
B-4063, Chatham County
B-4109, Durham County
B-4216, Orange County
B-4300, Wake County
B-4301, Wake County
B-4302, Wake County
B-4303, Wake County
B-4304, Wake County
B-4592, Orange County
ER03-0389 through ER03-0398

Thank you for your letters of February 5, 2004, concerning the above projects.

We are unable to comment on the potential effect of these projects on historic resources until we receive further information.

Please forward a labeled 7.5 minute USGS quadrangle map for each of the above projects clearly indicating the project vicinity, location, and termini. In addition, please include the name of the quadrangle map.

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

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

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

cc: Mary Pope Furr, NCDOT
Matt Wilkerson, NCDOT

North Carolina Wildlife Resources Commission

Charles R. Fullwood, Executive Director

MEMORANDUM

TO: Gregory J. Thorpe
Environmental Management Director, PDEA

FROM: Travis Wilson, Highway Project Coordinator
Habitat Conservation Program

DATE: February 27, 2004

SUBJECT: NCDOT Bridge Replacements in Alamance, Chatham, Durham, Orange, and Wake counties. TIP Nos. B-4002, B-4063, B-4109, B-4216, B-4300, B-4301, B-4302, B-4303, B-4304, and B-4592.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Project specific comments:

1. B-4002, Alamance County, Bridge No. 96 over Meadow Creek on SR 2116. We recommend replacing this bridge with a bridge. Standard recommendations apply.

2. B-4063, Chatham County, Bridge No. 20 over Sandy Branch on NC 902. We recommend replacing this bridge with a bridge. Standard recommendations apply.

3. B-4109, Durham County, Bridge No. 120 over Mud Creek on SR 1303. We recommend replacing this bridge with a bridge. Standard recommendations apply.

4. B-4216, Orange County, Bridge No. 66 over Strouds Creek on SR 1002. We recommend replacing this bridge with a bridge. Due to the close proximity of the Eno River we request conducting a survey for the following state endangered and federal species of concern mussels: Yellow lampmussel and Atlantic pigtoe. Also, a significant fishery for sunfish exists at this site, therefore we request an in-water work moratorium for sunfish from April 1 to June 30. Standard recommendations apply.

5. B-4300, Wake County, Bridge No. 29 over Clarks Creek on SR 1007. We recommend replacing this bridge with a bridge. NCDOT should follow all stream crossing guidelines for anadromous fish passage, including an in-water work moratorium from February 15 to June 30. Standard recommendations apply.

6. B-4301, Wake County, Bridge No. 229 over Poplar Creek on SR 1007. We recommend replacing this bridge with a bridge. NCDOT should follow all stream crossing guidelines for anadromous fish passage, including an in-water work moratorium from February 15 to June 30. Standard recommendations apply.

7. B-4302, Wake County, Bridge No. 336 over Terrible Creek on SR 1301. We recommend replacing this bridge with a bridge. Standard recommendations apply.

8. B-4303, Wake County, Bridge No. 102 over Lower Bartons Creek on SR 1844. We recommend replacing this bridge with a bridge. Standard recommendations apply.

9. B-4304, Wake County, Bridge No. 143 over Beaver Dam Creek on SR 2217. We recommend replacing this bridge with a bridge. Standard recommendations apply.

10. B-4592, Orange County, Bridge No. 64 over the Eno River on SR 1561. We recommend replacing this bridge with a bridge. We request conducting a survey for the following state endangered and federal species of concern mussels: Yellow lampmussel and Atlantic pigtoe. Also, a significant fishery for sunfish exists at this site, therefore we request an in-water work moratorium for sunfish from April 1 to June 30. Standard recommendations apply.

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

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

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

NCDENR

North Carolina Department of Environment and Natural Resources
Division of Parks and Recreation

Michael F. Easley, Governor William G. Ross, Jr., Secretary Philip K. McKnelly, Director

MEMORANDUM

TO: William T. Goodwin, Jr., PE, Bridge Replacement Unit
Department of Transportation

FROM: Brian Strong, Environmental Review Coordinator 324
DENR, Division of Parks and Recreation

DATE: September 6, 2002

SUBJECT: Review of Department of Transportation Bridge Replacement Projects

The purpose of this memorandum is to transmit comments prepared by the Division of Parks and Recreation (Division) on a number of proposed bridge replacement projects. These projects were received from Mr. William T. Goodwin (dated April 24, 2002) and John Williams (received June 25, 2002).

Prior to discussing individual comments on specific projects I would like to make one general comment. A number of projects are listed as replacement of bridges with culverts. The Division would like to express concern with this type of replacement. As you know, culverts are often beset by a number of persistent problems associated with their installation and maintenance. Culverts are frequently the focus of restoration projects as either culvert removal or mitigation efforts designed to remediate their destabilizing influence. Since culverts are often used in lieu of bridges as a cost savings alternative, the proper design of the culvert is often not factored into the cost of the project. Impacts of improper design and installation include the angle of insertion (too high or too low), sizing of culverts, culvert placement (too low or too high), and lack of culvert maintenance resulting in degradation of streams. In addition, culvert are often insufficiently designed to handle fish passage due to inadequate depth of water at time of passage, inappropriate water velocity, inadequate resting places above and below the stream structure, and physical obstructions to passage. Culverts have been identified as one of the greatest sources of stream morphology change in the United States. In general, the Division recommends that bridges be used in all instances where practical.

Enclosure 1 presents the bridge replacement projects were potential environmental impacts were identified. The majority of the impacts involve impacts to significant natural heritage areas, rare plant and animal species. Other impacts include proximity to state trails, state parks, and natural heritage aquatic habitats. Enclosure 2 presents the accompanying maps discussed in Enclosure 1.

Please let me know if there is any further information you need or if you have any questions regarding the enclosed material, my telephone number is (919) 715-8711.

1615 Mail Service Center, Raleigh, North Carolina 27699-1615
Phone: 919-733-4181 Fax: 919-715-3085 Internet: www.ncparks.net

Bridge Replacement Project	Potential Impact
Durham County Replace Bridge No. 120 on SR 1303 over Mud Creek B-4109 PEF	Impacts to SNHA: Regional significance
Harnett County Rehabilitate Bridge Deck No. 46 on US 401 over Cape Fear River B-4138 Johnson	Impacts several rare mussel species
Jackson County Replace Bridge No. 108 on SR 1002 over Tuckasegee Creek B-4159 Williams	Impacts to SNHA river: National significance
Jackson County Replace Bridge No. 82 on SR 1002 over Tuckasegee River B-4160 Williams	Impacts to SNHA river: National significance
Montgomery County Replace Bridge No. 28 on NC 109 over Rock Creek B-4204 PEF	Impacts to SNHA: State significance
Montgomery County Replace Bridge No. 128 on SR 1315 over Densons Creek B-4206 Pipkin	Impacts to SNHA: State significance
Orange County Replace Bridge No. 66 on SR 1002 over Strounds Creek B-4216 PEF	Trib is located 250 yards from Eno River State Park and 450 yards from the Eno River
Rutherford County Replace Bridge Nol 41 on SR 1549 over Cathey's Creek B-4263 Young	Impacts to rare fish
Sampson County Replace Bridge No. 90 on SR 1214 over Little Coharie Creek B-4269 Johnson	Impacts to rare mussel

NCDENR
North Carolina Department of Environment and Natural Resources

Michael F. Easley, Governor

William G. Ross Jr., Secretary

February 27, 2004

Dr. Gregory J. Thorpe
N.C. Department of Transportation
Project Development and Environmental Analysis
1548 MSC
Raleigh, NC 27699-1548

Subject: Replacement of Bridges in Alamance, Chatham, Durham, Orange, and Wake counties

Dear Dr. Thorpe:

The Natural Heritage Program has no record of rare species, significant natural communities, or priority natural areas at the site nor within a mile of the project area, for the projects listed below:

B-4002, Alamance County, Bridge No. 96 over Meadow Creek on SR 2116 (Preacher Holmes Road)
B-4063, Chatham County, Bridge No. 20 over Sandy Branch on NC 902
B-4109, Durham County, Bridge No. 120 over Mud Creek on SR 1303 (Pickett Road)
B-4300, Wake County, Bridge No. 29 over Clarks Creek on SR 1007 (Poole Road)
B-4301, Wake County, Bridge No. 229 over Poplar Creek on SR 1007 (Poole Road)
B-4302, Wake County, Bridge No. 336 over Terrible Creek on SR 1301 (Sunset Lake Road).

Our Program does have records of rare species, significant natural communities, or priority natural areas at the site or within a mile of the project area, for the projects listed below:

B-4216, Orange County, Bridge No. 66 over Strouds Creek on SR 1002 (St. Marys Road). This site lies just upstream of the Eno River, where there are numerous rare aquatic animal species. Species recorded at the confluence of Strouds Creek and the river (at Lawrence Road) are –

yellow lampmussel (*Lampsilis cariosa*), State Endangered and Federal Species of Concern
eastern lampmussel (*Lampsilis radiata radiata*), State Threatened
notched rainbow (*Villosa constricta*), State Special Concern
Neuse River waterdog (*Necturus lewisi*), State Special Concern

1601 Mail Service Center, Raleigh, North Carolina 27699-1601
Phone: 919-733-4984 \ FAX: 919-715-3060 \ Internet: www.enr.state.nc.us/ENR/

B-4303, Wake County, Bridge No. 102 over Lower Bartons Creek on SR 1844 (Mt. Vernon Church Road). The Lower Barton Creek Ultramafic Slopes natural area lies on the south side of the road; this is an unprotected site of Local significance. Just downstream of the bridge is the following –

Carolina ladle crayfish (*Cambarus davidi*), State Significantly Rare

B-4304, Wake County, Bridge No. 143 over Beaver Dam Creek on SR 2217 (Old Milburnie Road). There is a vague, historic record of the following, just downstream –

veined skullcap (*Scutellaria nervosa*), State Significantly Rare

B-4592, Orange County, Bridge No. 64 over the Eno River on SR 1561 (Lawrence Road). See comments for project B-4216. This site is a few miles above Eno River State Park. Also, a tract just upstream of the bridge has been recently acquired, or is in the process of being acquired. In addition, the section of the Eno River from Hillsborough to the confluence with the Neuse River is a Nationally significant aquatic habitat, for many additional rare species than those listed above.

Our program recommends that NC DOT enact strong sedimentation controls to ensure that populations of these rare species, and particularly the water quality of the Eno River, not be impacted during the bridge replacements. The use of Natural Heritage Program data should not be substituted for actual field surveys, particularly if the project area contains suitable habitat for rare species, significant natural communities, or priority natural areas.

You may wish to check the Natural Heritage Program database website at <www.ncsparks.net/nhp/search.html> for a listing of rare plants and animals and significant natural communities in the county and on the topographic quad map. Please do not hesitate to contact me at 919-715-8697 if you have questions or need further information.

Sincerely,

Harry E. LeGrand, Jr.

Harry E. LeGrand, Jr., Zoologist
Natural Heritage Program

HEL/hel

cc: Brian Strong, Division of Parks and Recreation, Resource Management Program
David Cook, Superintendent, Eno River State Park

DURHAM PUBLIC SCHOOLS

Office of Operational Services

TO: William T. Goodwin, Jr. PE
Project Development and Environmental Analysis

FROM: Henry Kirby
Executive Director of Transportation
Durham Public Schools

DATE: October 2, 2002

SUBJECT: Replacement of Bridge No. 120 on SR 1303 over Mud Creek, Durham County, Federal Aid Project No. BRZ-1303(3), State Project No. 8.2353401, TIP No. B-4109

You requested, on August 21, 2002, the specific number of bus crossings per day and if road closure could be handled by re-routing or other changes.

Our staff has researched your request and found that we have 22 bus crossings per day. We will, of course, make every effort to route our buses around the site during the time of construction.

If you have any further questions, please let me know.

c: Hugh Osteen

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Determination Manual)

Project / Site: B-4109, Bridge No. 120 on SR 1303	**Date:** 1/14/04
Applicant / Owner: NC Department of Transportation	**County:** Durham
Investigator: Cindy Carr, Mulkey Engineers & Consultants, Inc.	**State:** NC
Do normal circumstances exist on the site? Yes X No ____	**Community ID:** Wetland
Is the site significantly disturbed (Atypical situation)? Yes ____ No X	**Transect ID:** WA
Is the area a potential problem area? Yes ____ No X	**Plot ID:** WA3
(explain on reverse if needed)	

VEGETATION

	Dominant Plant Species	Stratum	Indicator
1.	Liriodendron tulipifera	Tree	FAC
2.	Liquidambar styraciflua	Tree/Shrub	FAC
3.	Acer rubrum	Tree/Shrub	FAC
4.	Ulmus americana	Shrub	FACW
5.	Dulichium arundinaceum	Herb	OBL
6.	Carex spp.	Herb	
7.			
8.			
9.			
10.			
11.			
12.			
13.			
14.			
15.			
16.			
17.			
18.			

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

Remarks: Herbaceous vegetation limited due to time of year.

HYDROLOGY

___ **Recorded Data (Describe In Remarks):**
- ___ **Stream, Lake, or Tide Gauge**
- X **Aerial Photographs**
- ___ **Other**

___ **No Recorded Data Available**

Field Observations:

Depth of Surface Water: 3 (in.)

Depth to Free Water in Pit: 1 (in.)

Depth to Saturated Soil: 0 (in.)

Wetland Hydrology Indicators

Primary Indicators:
- X **Inundated**
- ___ **Saturated in Upper 12"**
- X **Water Marks**
- ___ **Drift Lines**
- ___ **Sediment Deposits**
- X **Drainage Patterns in Wetlands**

Secondary Indicators:
- ___ **Oxidized Roots Channels in Upper 12"**
- X **Water-Stained Leaves**
- ___ **Local Soil Survey Data**
- ___ **FAC-Neutral Test**
- ___ **Other (Explain in Remarks)**

Remarks: Rainfall recorded at Raleigh/Durham Airport for Durham County at 0.06 inches on 1/17/04 and 0.28 inches on 1/18/04.

1. WATER STORAGE

Interstream divide w/in 100 FT. of stream w/out overbank flooding. Little topo relief, >70% coverage by veg, <20 ac.

(1)

2. BANK, SHORELINE STABILIZATION

Contiguous & w/in 50' of stream, no surface flow evidence. <10% imp. surface, <40' wide

(1)

3. POLLUTANT REMOVAL

<10% urbanized, 3rd+ order stream, >80% coverage veg., gradual topo w/in ½ mi, <50' wide

(1)

4. WILDLIFE HABITAT

Cover: >50% cover veg

Food: Shrubs & Trees w/ fleshy fruit poor

Poor little food & Cover

Non-riparian FW marsh, >50% coverage forest w/in 300'

<10 acres

(1)

5. AQUATIC LIFE HABITAT

Ephemeral, <2 feet wide, >50% veg cover within 300'

(4)

6. RECREATION/EDUCATION

Not publically accessible

(0)

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Determination Manual)

Project / Site: B-4109, Bridge No. 120 on SR 1303 **Applicant / Owner:** NC Department of Transportation **Investigator:** Cindy Carr, Mulkey Engineers & Consultants, Inc.	**Date:** 1/14/04 **County:** Durham **State:** NC
Do normal circumstances exist on the site? Yes X No ____ **Is the site significantly disturbed (Atypical situation)?** Yes ____ No X **Is the area a potential problem area?** Yes ____ No X **(explain on reverse if needed)**	**Community ID:** Upland **Transect ID:** WA **Plot ID:** WA3

VEGETATION

Dominant Plant Species		Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1.	Liriodendron tulipifera	Tree	FAC	10.		
2.	Ligustrum sinense	Shrub	FAC	11.		
3.	Smilax rotundifolia	Vine	FAC	12.		
4.	Microstigeum vimenium	Herb	FAC+	13.		
5.				14.		
6.				15.		
7.				16.		
8.				17.		
9.				18.		

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

Remarks: Herbaceous vegetation limited due to time of year.

HYDROLOGY

___ **Recorded Data (Describe In Remarks):**
- ___ **Stream, Lake, or Tide Gauge**
- X **Aerial Photographs**
- ___ **Other**

___ **No Recorded Data Available**

Field Observations:

Depth of Surface Water: 0 (in.)

Depth to Free Water in Pit: 0 (in.)

Depth to Saturated Soil: 0 (in.)

Wetland Hydrology Indicators

Primary Indicators:
- ___ **Inundated**
- ___ **Saturated in Upper 12"**
- ___ **Water Marks**
- ___ **Drift Lines**
- ___ **Sediment Deposits**
- ___ **Drainage Patterns in Wetlands**

Secondary Indicators:
- ___ **Oxidized Roots Channels in Upper 12"**
- ___ **Water-Stained Leaves**
- ___ **Local Soil Survey Data**
- ___ **FAC-Neutral Test**
- ___ **Other (Explain in Remarks)**

Remarks:

1. WATER STORAGE Interstream divide, within 100 ft. of stream no overbank flooding; medium topo relief, >70% veg cover, <20 acres

(1)

2. BANK, SHORELINE STABILIZATION Contiguous to stream w/in 100 Ft. Evidence of surface flow within wetland - not urbanized, no steep gradient, >40' forested veg.

(1)

3. POLLUTANT REMOVAL <10% urbanized, >2nd order stream >80% tree cover, gradual topo w/in ½ mile upstream wetland ≥50 Ft. wide, intermittent water

(1)

4. WILDLIFE HABITAT
COVER: snags, mature trees, >80% canopy
Food: HW mast, cone trees, fleshy fruits, trees & shrubs
Riparian System BLH, 50-90% forested w/in 300 Ft, smaller than 300 FT

(2)

5. AQUATIC LIFE HABITAT
Ephemeral wetland: holds <2 feet water
>50% forested w/in 300 feet

(4)

6. RECREATION/EDUCATION
Not publically accessible

(0)

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Determination Manual)

Project / Site: B-4109, Bridge No. 120 on SR 1303 **Applicant / Owner:** NC Department of Transportation **Investigator:** Cindy Carr, Mulkey Engineers & Consultants, Inc.	**Date:** 1/14/04 **County:** Durham **State:** NC
Do normal circumstances exist on the site? Yes X No ____ **Is the site significantly disturbed (Atypical situation)?** Yes ____ No X **Is the area a potential problem area?** Yes ____ No X **(explain on reverse if needed)**	**Community ID:** Wetland **Transect ID:** WB **Plot ID:** WB5

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Acer rubrum	Tree	FAC	9.		
2. Liquidambar styraciflua	Tree	FAC	10.		
3. Rosa palustris	Vine	OBL	11.		
4. Dulichium arundinaceum	Herb	OBL	12.		
5. Typha latifolia	Herb	OBL	13.		
6. Carex grayi	Herb	FACW	14.		
7.			15.		
8.			16.		

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
- X Aerial Photographs
- ___ Other

___ **No Recorded Data Available**

Field Observations:

Depth of Surface Water: 0 (in.)

Depth to Free Water in Pit: 0 (in.)

Depth to Saturated Soil: 0 (in.)

Wetland Hydrology Indicators

Primary Indicators:
- ___ Inundated
- ___ Saturated in Upper 12"
- ___ Water Marks
- ___ Drift Lines
- ___ Sediment Deposits
- X Drainage Patterns in Wetlands

Secondary Indicators:
- ___ Oxidized Roots Channels in Upper 12"
- X Water-Stained Leaves
- ___ Local Soil Survey Data
- ___ FAC-Neutral Test
- ___ Other (Explain in Remarks)

Remarks:

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: 0.5

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: 3

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
2	1	.75	0.5	0	0

(NOTE: If Total Absence Of All Plants In Streambed As Noted Above Skip This Step UNLESS SAV Present*).*

SECONDARY BIOLOGY INDICATOR POINTS: 0

25 3.5

TOTAL POINTS *(Primary + Secondary)*= 28.5

(If Greater Than Or Equal To 19 Points The Stream Is At Least Intermittent)

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Determination Manual)

Project / Site: B-4109, Bridge No. 120 on SR 1303 **Applicant / Owner:** NC Department of Transportation **Investigator:** Cindy Carr, Mulkey Engineers & Consultants, Inc.	**Date:** 1/14/04 **County:** Durham **State:** NC
Do normal circumstances exist on the site? Yes X No ____ **Is the site significantly disturbed (Atypical situation)?** Yes ____ No X **Is the area a potential problem area?** Yes ____ No X **(explain on reverse if needed)**	**Community ID:** Upland **Transect ID:** WB **Plot ID:** WB5

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Acer rubrum	Tree	FAC	9. Stellaria media	Herb	FACU
2. Liquidambar styraciflua	Tree	FAC	10. Microstegium vimineum	Grass	FAC+
3. Liriodendron tulipifera	Tree	FAC	11.		
4. Juniperus virginiana	Tree	FACU	12.		
5. Fraxinus pennsylvanica	Tree	FACW	13.		
6. Lonicera japonica	Vine	FAC	14.		
7. Rosa multiflora	Shrub	NI	15.		
8. Allium vineale	Herb	FACU	16.		

Percent of Dominant Species that are OBL, FACW, or FAC (excluding FAC-). 75

Remarks:

HYDROLOGY

___ **Recorded Data (Describe In Remarks):**
- ___ Stream, Lake, or Tide Gauge
- X Aerial Photographs
- ___ Other

___ **No Recorded Data Available**

Field Observations:

Depth of Surface Water: 0 (in.)

Depth to Free Water in Pit: 0 (in.)

Depth to Saturated Soil: 0 (in.)

Wetland Hydrology Indicators

Primary Indicators:
- ___ Inundated
- ___ Saturated in Upper 12"
- ___ Water Marks
- ___ Drift Lines
- ___ Sediment Deposits
- ___ Drainage Patterns in Wetlands

Secondary Indicators:
- ___ Oxidized Roots Channels in Upper 12"
- ___ Water-Stained Leaves
- ___ Local Soil Survey Data
- ___ FAC-Neutral Test
- ___ Other (Explain in Remarks)

Remarks: 2 to 4 % slopes.

STREAM QUALITY ASSESSMENT WORKSHEET

	#	CHARACTERISTICS	ECOREGION POINT RANGE			SCORE
			Coastal	Piedmont	Mountain	
PHYSICAL	1	**Presence of flow / persistent pools in stream** (no flow or saturation = 0; strong flow = max points)	0 – 5	0 – 4	0 – 5	3
	2	**Evidence of past human alteration** (extensive alteration = 0; no alteration = max points)	0 – 6	0 – 5	0 – 5	4
	3	**Riparian zone** (no buffer = 0; contiguous, wide buffer = max points)	0 – 6	0 – 4	0 – 5	4
	4	**Evidence of nutrient or chemical discharges** (extensive discharges = 0; no discharges = max points)	0 – 5	0 – 4	0 – 4	4
	5	**Groundwater discharge** (no discharge = 0; springs, seeps, wetlands, etc. = max points)	0 – 3	0 – 4	0 – 4	2
	6	**Presence of adjacent floodplain** (no floodplain = 0; extensive floodplain = max points)	0 – 4	0 – 4	0 – 2	4
	7	**Entrenchment / floodplain access** (deeply entrenched = 0; frequent flooding = max points)	0 – 5	0 – 4	0 – 2	2
	8	**Presence of adjacent wetlands** (no wetlands = 0; large adjacent wetlands = max points)	0 – 6	0 – 4	0 – 2	2
	9	**Channel sinuosity** (extensive channelization = 0; natural meander = max points)	0 – 5	0 – 4	0 – 3	1
	10	**Sediment input** (extensive deposition = 0; little or no sediment = max points)	0 – 5	0 – 4	0 – 4	1
	11	**Size & diversity of channel bed substrate** (fine, homogenous = 0; large, diverse sizes = max points)	NA*	0 – 4	0 – 5	2
STABILITY	12	**Evidence of channel incision or widening** (deeply incised = 0; stable bed & banks = max points)	0 – 5	0 – 4	0 – 5	0
	13	**Presence of major bank failures** (severe erosion = 0; no erosion, stable banks = max points)	0 – 5	0 – 5	0 – 5	1
	14	**Root depth and density on banks** (no visible roots = 0; dense roots throughout = max points)	0 – 3	0 – 4	0 – 5	2
	15	**Impact by agriculture, livestock, or timber production** (substantial impact = 0; no evidence = max points)	0 – 5	0 – 4	0 – 5	3
HABITAT	16	**Presence of riffle-pool/ripple-pool complexes** (no riffles/ripples or pools = 0; well-developed = max points)	0 – 3	0 – 5	0 – 6	2
	17	**Habitat complexity** (little or no habitat = 0; frequent, varied habitats = max points)	0 – 6	0 – 6	0 – 6	3
	18	**Canopy coverage over streambed** (no shading vegetation = 0; continuous canopy = max points)	0 – 5	0 – 5	0 – 5	5
	19	**Substrate embeddedness** (deeply embedded = 0; loose structure = max)	NA*	0 – 4	0 – 4	2
BIOLOGY	20	**Presence of stream invertebrates** (see page 4) (no evidence = 0; common, numerous types = max points)	0 – 4	0 – 5	0 – 5	0
	21	**Presence of amphibians** (no evidence = 0; common, numerous types = max points)	0 – 4	0 – 4	0 – 4	0
	22	**Presence of fish** (no evidence = 0; common, numerous types = max points)	0 – 4	0 – 4	0 – 4	0
	23	**Evidence of wildlife use** (no evidence = 0; abundant evidence = max points)	0 – 6	0 – 5	0 – 5	4
		Total Points Possible	100	100	100	
		TOTAL SCORE (also enter on first page)				51

* These characteristics are not assessed in coastal streams.

USACE AID#_____ DWQ #_____ Site #____ (indicate on attached map)

STREAM QUALITY ASSESSMENT WORKSHEET

Provide the following information for the stream reach under assessment:

1. Applicant's name: NCDOT
2. Evaluator's name: CINDY CARR, MULKEY
3. Date of evaluation: 1/14/04
4. Time of evaluation: 1.30 pm
5. Name of stream: MUD CREEK
6. River basin: CAPE FEAR
7. Approximate drainage area: 5.3 mi²
8. Stream order: 3RD +
9. Length of reach evaluated: 300 FT
10. County: DURHAM
11. Site coordinates (if known): prefer in decimal degrees.
12. Subdivision name (if any):_____

Latitude (ex. 34.872312): _____ Longitude (ex. -77.556611):_____

Method location determined (circle): GPS Topo Sheet Ortho (Aerial) Photo/GIS Other GIS Other_____

13. Location of reach under evaluation (note nearby roads and landmarks and attach map identifying stream(s) location):
BRIDGE NO. 120 ON SR1303 (PICKETT RD) NEAR PINEVIEW CIRCLE

14. Proposed channel work (if any):_____

15. Recent weather conditions: LOW - MID 40's, NO RAIN W/IN ~48 hours

16. Site conditions at time of visit: CLEAR, SUNNY ~40°F

17. Identify any special waterway classifications known: ___Section 10 ___Tidal Waters ___Essential Fisheries Habitat ___Trout Waters ___Outstanding Resource Waters ___Nutrient Sensitive Waters ___Water Supply Watershed ____(I-IV)

18. Is there a pond or lake located upstream of the evaluation point? YES (NO) If yes, estimate the water surface area:_____

19. Does channel appear on USGS quad map? (YES) NO

20. Does channel appear on USDA Soil Survey? (YES) NO

21. Estimated watershed land use: 20 % Residential 15 % Commercial 10 % Industrial ___% Agricultural 50 % Forested 5 % Cleared / Logged ___% Other (_____)

22. Bankfull width: 8 to 12 FT

23. Bank height (from bed to top of bank): 5 to 7 FT

24. Channel slope down center of stream: ✓ Flat (0 to 2%) ___Gentle (2 to 4%) ___Moderate (4 to 10%) ___Steep (>10%)

25. Channel sinuosity: ✓ Straight ___Occasional bends ___Frequent meander ___Very sinuous ___Braided channel

Instructions for completion of worksheet (located on page 2): Begin by determining the most appropriate ecoregion based on location, terrain, vegetation, stream classification, etc. Every characteristic must be scored using the same ecoregion. Assign points to each characteristic within the range shown for the ecoregion. Page 3 provides a brief description of how to review the characteristics identified in the worksheet. Scores should reflect an overall assessment of the stream reach under evaluation. If a characteristic cannot be evaluated due to site or weather conditions, enter 0 in the scoring box and provide an explanation in the comment section. Where there are obvious changes in the character of a stream under review (e.g., the stream flows from a pasture into a forest), the stream may be divided into smaller reaches that display more continuity, and a separate form used to evaluate each reach. The total score assigned to a stream reach must range between 0 and 100, with a score of 100 representing a stream of the highest quality.

Total Score (from reverse): 51 **Comments:** STREAM MAY BE SUBJECT TO (LOW) FLOW CONDITIONS BECAUSE IT IS IN TRIASSIC BASIN. HEAVY SEDIMENT DEPOSITION WAS EVIDENT AT TIME OF SITE VISIT.

Evaluator's Signature Cindy Carr **Date** 1-14-04

This channel evaluation form is intended to be used only as a guide to assist landowners and environmental professionals in gathering the data required by the United States Army Corps of Engineers to make a preliminary assessment of stream quality. The total score resulting from the completion of this form is subject to USACE approval and does not imply a particular mitigation ratio or requirement. Form subject to change – version 06/03. To Comment, please call 919-876-8441 x 26.

SOILS

Map Unit Name
(Series and Phase): Chewacla and Wehadkee Soils **Drainage Class:** Poorly Drained

Taxonomy (Subgroup): Fluvaquentic Dystrochrepts/ Typic Fluvaquents **Confirm Mapped Type? Yes____ No___**

Profile Description:

Depth (inches)	Horizon	Matrix Colors (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/ Contrast	Texture, Concretions, Structure, etc.
0 – 14	B1	7.5 YR 4/3	n/a	n/a	Clay
14 – 20	B2	10 YR 5/3	n/a	n/a	Sandy Loam

Hydric Soil Indicators:

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

Remarks: Wehadkee soils are listed as hydric "A" and Chewacla soils are listed as hydric "B" on the NC hydric soils list.

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	**Yes** _X_	**No** ___	**Is the Sampling Point**
Wetland Hydrology Present?	**Yes** ___	**No** _X_	**Within a Wetland?** **Yes**___ **No**_X_
Hydric Soils Present?	**Yes** ___	**No** _X_	

Remarks: Sample plot was taken approx. 15 feet downhill of wetland flag WB 5.

NCDWQ Stream Classification Form

Project Name: B-4109	River Basin: Cape Fear	County: Durham	Evaluators: Cindy Carr
DWQ Project Number:	Nearest Named Stream: MUD CREEK	Latitude:	Signature: Cindy Carr
Date: 1/14/04	USGS QUAD: SW DURHAM	Longitude:	Location/Directions: PICKETT RD NEAR PINEVIEW CIRCLE

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: 16

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: 6

SOILS

Map Unit Name
(Series and Phase): Chewacla and Wehadkee Soils **Drainage Class:** Poorly Drained

Taxonomy (Subgroup): Fluvaquentic Dystrochrepts/ Typic Fluvaquents **Confirm Mapped Type? Yes____ No___**

Profile Description:

Depth (inches)	Horizon	Matrix Colors (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/ Contrast	Texture, Concretions, Structure, etc.
0 – 2	A	7.5 YR 2.5/1	n/a	n/a	Clay Loam, many fine roots
2 – 17	B	10 YR 6/1	7.5 YR 5/8	Common, Distinct, Medium	Firm Clay, thin layer of organic material streaking

Hydric Soil Indicators:

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

Remarks: Wehadkee soils are listed as hydric "A" and Chewacla soils are listed as hydric "B" on the NC hydric soils list.

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	**Yes** _X_	**No** ___	**Is the Sampling Point**
Wetland Hydrology Present?	**Yes** _X_	**No** ___	**Within a Wetland?** **Yes** _X_ **No** ___
Hydric Soils Present?	**Yes** _X_	**No** ___	

Remarks: Wetland B is classified as a wetland based upon the criteria set forth in the 1987 Army Corps of Engineers Wetlands Delineation Manual. Sample plot was taken approx. 15 feet downhill of wetland flag WB 5.

WETLAND A
0.26 ac

NCDWQ WETLAND RATING WORKSHEET (4th VERSION)

Project Name:	B-4109	County:	DURHAM
Nearest Road:	PICKETT RD	Date:	11/14/04
Wetland Area (ac):	~ 1/4 ac	Wetland Width (ft):	~50 FT
Name of Evaluator(s):	CINDY CARR, MULKEY ENGINEERS		

WETLAND LOCATION:

- ____ on sound or estusuary, pond or lake
- ____ on perennial steam
- ____ on intermittent stream
- ✓ within interstream divide
- ____ other ____

ADJACENT LAND USE:

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

- ✓ forested/natural vegetation — 70 %
- ✓ agricultural/ urbanized — 25 %
- ✓ impervious surface — 5 %

Adjacent Special Natural Areas

SOILS:

Soil Series: Chewacla/Creedmoor

- ____ predominantly organic (humus, muck or peat)
- ✓ predominantly mineral (non-sandy)
- ____ predominantly sandy

DOMINANT VEGETATION:

1. Liriodendron tulipifera
2. Liquidambar styraciflua
3. Acer rubrum
4. Dulichium arundinacium

HYDRAULIC FACTORS:

- ✓ freshwater
- ____ brackish
- ____ steep topography
- ____ ditched or channelized
- ____ total wetland width >= 100 feet

FLOODING AND WETNESS:

- ____ semipermanently to permenently flooded or inundated
- ✓ seasonally flooded or inundated
- ____ intermittently flooded or temporary surface water
- ____ no evidence of flooding or surface water

WETLAND TYPE: (select one)*

- ✓ Bottomland Hardwood Forest
- ____ Swamp Forest
- ____ Carolina Bay
- ____ Pocosin
- ____ Pine Savannah
- ____ Freshwater Marsh
- ____ Bog/Fen
- ____ Headwater Forest
- ____ Bog Forest
- ____ Ephemeral Wetland
- ____ Other: ____

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

DEM RATING

1. WATER STORAGE	1	X 4.00 =	4
2. BANK, SHORELINE STABILIZATION	1	X 4.00 =	4
3. POLLUTANT REMOVAL	1 *	X 5.00 =	5
4. WILDLIFE HABITAT	2	X 2.00 =	4
5. AQUATIC LIFE HABITAT	4	X 4.00 =	16
6. RECREATION/EDUCATION	0	X 1.00 =	0
		TOTAL WETLAND SCORE =	33

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

SOILS

Map Unit Name
(Series and Phase): Chewacla and Wehadkee soils **Drainage Class:** Poorly Drained

Taxonomy (Subgroup): Fluvaquentic Dystrochrepts/ Typic Fluvaquents **Confirm Mapped Type? Yes_____ No____**

Profile Description:

Depth (inches)	Horizon	Matrix Colors (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/ Contrast	Texture, Concretions, Structure, etc
0 – 3	A	7.5 YR 4/4	n/a	n/a	Loamy Clay
3 – 14	B1	10 YR 5/4	n/a	n/a	Firm Clay
14 – 19	B2	10 YR 5/4	7.5 YR ¾	Common, Distinct, Coarse	Sandy Clay Loam, Fe Concretions

Hydric Soil Indicators:

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

Remarks: Wehadkee soils are listed as hydric "A" and Chewacla soils are listed as hydric "B" on the state hydric soils list.

WETLAND DETERMINATION

Hydrophytic Vegetation Present? Yes _X_ No ____
Wetland Hydrology Present? Yes ____ No _X_
Hydric Soils Present? Yes ____ No _X_

Is the Sampling Point Within a Wetland? Yes____ No_X_

Remarks: Data point taken approximately 20 feet uphill of wetland flag WA3.

WETLAND B
0.06 ac

NCDWQ WETLAND RATING WORKSHEET (4th VERSION)

Project Name:	B-4109	County:	DURHAM
Nearest Road:	PICKETT RD	Date:	1/14/04
Wetland Area (ac):	<0.1	Wetland Width (ft):	~10 FT
Name of Evaluator(s):	CINDY CARR, MULKEY ENGINEERS		

WETLAND LOCATION:

_____ on sound or estusuary, pond or lake
_____ on perennial steam
_____ on intermittent stream
✓ within interstream divide
_____ other _____

ADJACENT LAND USE:

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

✓ forested/natural vegetation 70 %
✓ agricultural/ urbanized 25 %
✓ impervious surface 5 %

Adjacent Special Natural Areas

SOILS:

Soil Series: Chewacla / Creedmoor

_____ predominantly organic (humus, muck or peat)
✓ predominantly mineral (non-sandy)
_____ predominantly sandy

DOMINANT VEGETATION:

1 Acer rubrum
2 ROSA multiflora
3 Carex sp.
4 Typha latifolia

HYDRAULIC FACTORS:

✓ freshwater
_____ brackish
_____ steep topography
_____ ditched or channelized
_____ total wetland width >= 100 feet

FLOODING AND WETNESS:

_____ semipermanently to permenently flooded or inundated
_____ seasonally flooded or inundated
✓ intermittently flooded or temporary surface water
_____ no evidence of flooding or surface water

WETLAND TYPE: (select one)*

_____ Bottomland Hardwood Forest
_____ Swamp Forest
_____ Carolina Bay
_____ Pocosin
_____ Pine Savannah
✓ Freshwater Marsh
_____ Bog/Fen
_____ Headwater Forest
_____ Bog Forest
_____ Ephemeral Wetland
_____ Other: _____

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

DEM RATING

1. WATER STORAGE	1	X 4.00 =	4
2. BANK, SHORELINE STABILIZATION	1	X 4.00 =	4
3. POLLUTANT REMOVAL	1 *	X 5.00 =	5
4. WILDLIFE HABITAT	1	X 2.00 =	2
5. AQUATIC LIFE HABITAT	4	X 4.00 =	16
6. RECREATION/EDUCATION	0	X 1.00 =	0
		TOTAL WETLAND SCORE =	31

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

SOILS

Map Unit Name
(Series and Phase): Chewacla and Wehadkee soils **Drainage Class:** Poorly Drained

Taxonomy (Subgroup): Fluvaquentic Dystrochrepts/ Typic Fluvaquents **Confirm Mapped Type? Yes____ No___**

Profile Description:

Depth (inches)	Horizon	Matrix Colors (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/ Contrast	Texture, Concretions, Structure, etc.
0 – 1	A	2.5 Y 3/2	n/a	n/a	Silty Clay Loam, many fine roots
2 – 12	Bg	2.5 Y 5/1	10 YR 5/6	Many, Distinct, Medium	Very Firm Clay, Fe concretions,
12 – 16	B	10 YR 5/3	7.5 YR 5/8	Few, Faint, Fine	Sandy Clay Loam, Fe concretions

Hydric Soil Indicators:

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

Remarks: Wehadkee soils are listed as hydric "A" and Chewacla soils are listed as hydric "B" on the state hydric soils list.

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	**Yes** _X_ **No** ___	**Is the Sampling Point**	
Wetland Hydrology Present?	**Yes** _X_ **No** ___	**Within a Wetland?**	**Yes** _X_ **No** ___
Hydric Soils Present?	**Yes** _X_ **No** ___		

Remarks: Wetland A is classified as a wetland based upon the criteria set forth in the 1987 Army Corps of Engineers Wetlands Delineation Manual.

Informational Newsletter

NCDOT Proposes Replacement of Bridge No. 120 on SR 1303 (Pickett Road) over Mud Creek, Durham County, NC TIP No. B-4109

February 2005

Ms. Theresa Ellerby
North Carolina Department of Transportation
Project Development and Environmental Analysis Branch
1548 Mail Service Center
Raleigh, North Carolina 27699-1548

Contact Information

If you have questions or comments regarding anything in this newsletter, you may call, write, or e-mail one of the contacts provided below.

Theresa Ellerby
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1548 Mail Service Center
Raleigh, NC 27699-1548
919-733-7844 ext. 266
tellerby@dot.state.nc.us

Pam Williams
Mulkey Engineers & Consultants
PO Box 33127
Raleigh, NC 27636-3127
919-858-1908
pwilliams@mulkeyinc.com

We're on the Web!

www.ncdot.org

Project Introduction

The North Carolina Department of Transportation (NCDOT) is planning to replace Bridge No. 120 on SR 1303 (Pickett Road) over Mud Creek. The new bridge will provide safer, more efficient traffic operations.

Data has been collected on the existing human and natural environments, alternatives have been developed, and the impacts of each alternative have been analyzed. NCDOT realizes that citizens and business owners in the vicinity of the bridge want to be informed of the potential impacts that this project may have on their homes and businesses. This newsletter is part of the public involvement process to provide this information.

Proposed Replacement Structure and Preferred Alternative

NCDOT recommends replacing Bridge No. 120 on the existing alignment with a new bridge approximately 100 feet in length. Two alternatives were studied for the bridge replacement.

Alternative A replaces the bridge in place. During construction, traffic will be maintained with an off-site detour. **Alternative B** replaces the bridge in place. During construction, traffic will be maintained by an on-site detour north of the existing bridge.

Alternative A was selected as the **preferred alternative** because it minimizes impacts to area residents and wetlands and has a shorter construction period. Construction will be scheduled around the summer months.

Additional Information

Public involvement is an important part of the planning process. The NCDOT encourages citizen involvement on transportation projects, and will consider your suggestions and address all concerns. Please send your comments to one of the contacts listed in this newsletter. Your opinions are important to us!

If you have transportation questions on other projects, call our Customer Service Center toll free at 1-877-DOT-4YOU, or visit the NCDOT website at www.ncdot.org.

Project Development Process

Step 1

Data Collection

Step 2

Alternative Development

Step 3

Environmental Analysis

Step 4

Selection of Preferred Alternative

Step 5 ← **We are here.**

Citizens Informational Newsletter

Step 6

Complete Environmental Document

Construction & Right-of-Way Cost

Preliminary Cost Estimate

$685,000

Schedule

Right-of-way in fiscal year 2006
Construction in fiscal year 2007

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION