STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

MICHAEL F. EASLEY
GOVERNOR

LYNDO TIPPETT
SECRETARY

April 25, 2008

US Army Corps of Engineers
Regional Field Office
3331 Heritage Trade Drive, Suite 105
Wake Forest, NC 27587

ATTENTION: Eric Alsmeyer
NCDOT Coordinator, Division 5

Dear Sir:

Subject: **Application for Section 404 Nationwide Permits 23, 33, and 13, Section 401 Water Quality Certification, and Neuse Riparian Buffer Authorization** for the replacement of Bridge No. 102 over Lower Bartons Creek on SR 1844 (Mount Vernon Church Road), Wake County. Federal Aid Project Number BRZ-1844(1), WBS No. 33640.1.1, State Project No. 8.2409401, Division 5, T.I.P No. B-4303.

$240.00 Debit from WBS Element 33640.1.1.

The North Carolina Department of Transportation (NCDOT) proposes to replace Bridge No. 102 over Lower Bartons Creek. The existing bridge is currently in poor condition (bridge sufficiency rating of 7.0 out of a possible 100) 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 bridge will be approximately 115 feet in length with three spans at 35 feet, 45 feet, and 35 feet each. Two interior bents will be placed in the streambed near water edge. The superstructure will be composed of pre-stressed 21-inch (depth) cored slab units on concrete caps and drilled piers. The proposed bridge has 36.4 feet of clear roadway and will provide two travel lanes. The travel lanes will be 10.5 feet wide each with approximately 7.7-foot shoulders. The project will replace the current bridge on its existing location and traffic will be maintained through off-site detour during construction.

The project also involves replacing the existing 118-inch by 79-inch corrugated metal pipe (CMP) with a triple barrel 8-foot by 7-foot reinforced concrete box culvert (RCBC). The project involves constructing the RCBC on the existing alignment, while maintaining traffic through off-site detour. Please see the enclosed copies of the Pre-Construction Notification (PCN), permit drawings, and design plans for the above-referenced project. The CE was completed for this project in April 2007 and was distributed shortly thereafter. Additional copies of the CE are available upon request.

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

IMPACTS TO WATERS OF THE UNITED STATES

The project is located in the Neuse River Basin (subbasin 03-04-01) and USGS hydrologic unit 03020201. Two jurisdictional perennial streams, Lower Bartons Creek and an unnamed tributary (UT) to Lower Bartons Creek, are located in the project study area. They are currently classified by the NC Division of Water Quality (DWQ) as WS-IV NSW waters. Both are given a DWQ stream index number of 27-16-(1). 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. No portion of Lower Bartons Creek or its tributary, or other surface waters within 1.0 mile of the project are listed on the North Carolina Division of Water Quality's (NCDWQ) 2006 Final 303(d) List of Impaired Waters. A jurisdictional determination letter for all water resources within the study area was issued by the US Army Corps of Engineers on January 31, 2005.

Permanent Impacts

There will be 60 feet of surface water impacts (bank stabilization) to Lower Bartons Creek from bridge construction (Site 1). The bank stabilization reach of Lower Bartons Creek also encompasses the area where minimal surface water fill from bridge bent placement will occur. There will also be 85 feet of surface water impacts to the UT to Lower Bartons Creek from the RCBC construction (Site 2) Approximately 25 feet of those impacts is due to filling in a scour hole (3 feet deep) downstream of the existing culvert.

Temporary Impacts

There will be 40 feet (0.03 acre) of temporary impacts to Lower Bartons Creek due to the construction of the temporary causeway for bridge construction (Site 1). These temporary impacts occur within the same reach of stream as the permanent impacts. There will also be 55 feet (0.01 acre) of temporary impacts to the UT to Lower Bartons Creek due to the RCBC construction upstream of the RCBC and permanent drainage easement access downstream of the RCBC (Site 2).

Utility Impacts

No utility impacts are anticipated from project construction.

Bridge Demolition

The existing bridge was constructed in 1967 and is 90 feet in length. It consists of three spans 30 feet each. The superstructure consists of pre-cast concrete channels with a 4.5-inch asphalt overlay. The existing substructure consists of pre-stressed concrete caps on timber piles. The existing bridge will be removed without dropping components into Lower Bartons Creek. Best Management Practices for Bridge Demolition and Removal will be implemented during the demolition of this bridge.

IMPACTS TO NEUSE RIPARIAN BUFFER

This project is located within the Neuse River Basin and is therefore subject to Neuse River riparian buffer rules (15A NCAC 2B .0233). Bridge and RCBC construction will impact buffers along Lower Bartons Creek and its UT, respectively. The buffer impacts from bridge construction (Site 1) are allowable. The buffer impacts resulting from road crossings (Site 1 and Site 2) are also allowable because less than 150 linear feet of stream buffers per road crossing are being impacted (Table 1).

Table 1. Neuse River Buffer Impacts

	Bridge Construction	Road Crossing (Bridge at Site 1)	Road Crossing (Culvert at Site 2)
Zone 1 Impact (sq. ft)	5,432	248	7,208
Zone 2 Impact (sq. ft)	509	1951	1,064
Mitigation requirements (exempt, allowable, or allowable with mitigation)	Allowable	Allowable	Allowable

Practical Alternatives Analysis

This bridge has been determined to be structurally deficient and functionally obsolete. The replacement of this inadequate structure will result in safer and more efficient traffic operations. Because this bridge needs to be replaced, impacts to the riparian buffers of Lower Bartons Creek and its UT are unavoidable.

Utility Impacts to Riparian Buffers

No utility impacts are anticipated from project construction.

RESTORATION PLAN

Following construction of the bridge and culvert, all material used in the construction of the structure will be removed. The impact area associated with the culvert 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.

Following construction of the bridge and culvert, all material used in the construction of the structure will be removed. 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, bridges, and culverts 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.

FEDERALLY PROTECTED SPECIES

Plants and animals with federal classifications of Endangered, Threatened, Proposed Endangered, and Proposed Threatened are protected under the provisions of the Endangered Species Act of 1973, as amended. As of January 31, 2008, the US Fish and Wildlife Service (USFWS) lists three federally protected species for Wake County (Table 2). One species (bald eagle) was officially delisted on August 8, 2007 (CFR 50 Part 17). The biological conclusion for bald eagle in the CE was "No Effect" with no habitat available in the project area. The bald eagle still remains protected under the Bald and Golden Eagle Protection Act.

Table 2. Federally Protected Species in Wake County, NC

Common Name	Scientific Name	Federal Status	Biological Conclusion	Habitat Present
Bald eagle	*Haliaeetus leucocephalus*	Delisted	Not Required	No
Red-cockaded woodpecker	*Picoides borealis*	Endangered	No Effect	No
Dwarf wedgemussel	*Alasmidonta heterodon*	Endangered	No Effect	Yes
Michaux's sumac	*Rhus michauxii*	Endangered	No Effect	Yes

The biological conclusion of "No Effect" rendered for the remaining three species in the CE still remains valid. While only marginal habitat is present for the dwarf wedgemussel, no specimens have been found from past surveys (November 14, 2004 being most recent). It was determined that additional surveys were not warranted. Suitable habitat for Michaux's sumac does occur in the project study area. The most recent survey for Michaux's sumac, conducted on June 25, 2007 by NCDOT biologists Greg Price, Jim Mason, and James Pflaum, revealed no specimens. This survey remains valid for two years. A review of the Natural Heritage Program database in April 2008 revealed no occurrences of these species within 1.0 mile of the project study area.

MITIGATION OPTIONS

Avoidance and 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 U.S. The following is a list of the project's jurisdictional stream, wetland, and Neuse Buffer avoidance/minimization activities proposed or completed by NCDOT:

Avoidance/Minimization

- Best Management Practices for Protection of Surface Waters will be implemented.
- The culvert will be buried one foot below the streambed in order to maintain aquatic habitat and flow regime.
- An off-site detour will be used instead of on-site detour for traffic control during construction.
- Bridge and culvert will be replaced on existing alignment.
- A preformed scour hole will be implemented.

Compensatory Mitigation

No compensatory mitigation for permanent stream impacts is proposed due to the impacts being minimal. All permanent impacts to Lower Bartons Creek (60 feet) and approximately 40 feet of the 85 feet of total permanent impacts to the UT to Lower Bartons Creek are for bank stabilization and do not constitute loss of waters of the U.S. No compensatory mitigation is required for the buffer impacts.

SCHEDULE

The project calls for a letting of December 16, 2008 (review date of October 28, 2008) with a date of availability of February 3, 2009. It is expected that the contractor will choose to start construction in February 2009.

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 work associated with temporary impacts and a Nationwide Permit 13 for bank stabilization (100 feet).

Section 401 Certification: We anticipate 401 General Certification numbers 3701, 3688, and 3689 will apply to this project. This project will impact greater than 40 linear feet of stream and impact Neuse Riparian Buffers, requiring written concurrence. In accordance with 15A NCAC 2H, Section .0500(a) and 15A NCAC 2B.0200 we are providing five copies of this application to the North Carolina Department of Environment and Natural Resources, Division of Water Quality, for their review. In compliance with Section 143-215.3D(e) of the NCAC we will provide $240.00 to act as payment for processing the Section 401 permit application.

Buffer Authorization: This project has been designed to comply with the Neuse Riparian Buffer Regulations (15A NCAC 2B.0242). NCDOT requests a Neuse Riparian Buffer Authorization from the Division of Water Quality.

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

w/o attachment (see permits website for attachments)
- 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, PE., Division Engineer
- Mr. Chris Murray, DEO
- 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
- Ms. Theresa Ellerby, PDEA Project 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: NW 23, 33, & 13

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

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

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

II. Applicant Information

1. Owner/Applicant Information
   Name: North Carolina Department of Transportation
   Mailing Address: Gregory J. Thorpe, Ph.D., Manager
   Project Development and Environmental Analysis Branch
   1598 Mail Service Center
   Raleigh, NC 27699-1598
   Telephone Number: 919-733-3141 Fax Number: 919-733-9794
   E-mail Address: gthorpe@dot.state.nc.us

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

III. Project Information

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

1. Name of project: Replace Bridge No. 102 over Lower Bartons Creek on SR 1844.

2. T.I.P. Project Number or State Project Number (NCDOT Only): B-4303

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

4. Location
   County: Wake Nearest Town: Raleigh
   Subdivision name (include phase/lot number): N/A
   Directions to site (include road numbers/names, landmarks, etc.): Site is located on SR 1884 (Mount Vernon Church Road).

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): 78.665191 °N 35.933529 °W

6. Property size (acres): Please refer to attached drawings.

7. Name of nearest receiving body of water: Lower Bartons Creek and its UT

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

9. Describe the existing conditions on the site and general land use in the vicinity of the project at the time of this application: The local area surrounding the proposed project consists of gently rolling hills and land use is best described as residential development and natural forest vegetation.

10. Describe the overall project in detail, including the type of equipment to be used: NCDOT proposes to replace Bridge No. 102 over Lower Bartons Creek and replace existing corregated metal pipe (CMP) with reinforced concrete box-culvert (RCBC) on UT to Lower Bartons Creek on SR 1844. Heavy construction equipment such as cranes, excavators and dump trucks will be utilized during construction.

11. Explain the purpose of the proposed work: The existing bridge was constructed in 1967 and received a sufficiency rating of 7.0 out of a possible 100 for a new structure during the last bridge inspection. Based on this rating, the bridge is considered functionally obsolete and structurally deficient. The project proposes to replace the existing bridge and replace existing CMP with a RCBC, resulting in safer transportation.

IV. Prior Project History

If jurisdictional determinations and/or permits have been requested and/or obtained for this project (including all prior phases of the same subdivision) in the past, please explain. Include the USACE Action ID Number, DWQ Project Number, application date, and date permits and certifications were issued or withdrawn. Provide photocopies of previously issued permits, certifications or other useful information. Describe previously approved wetland, stream and buffer impacts, along with associated mitigation (where applicable). If this is a NCDOT project, list and describe permits issued for prior segments of the same T.I.P. project, along with construction schedules. A jurisdictional determination letter was issued for streams and wetlands on this project by the USACE on January 31, 2005.

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: Approximately 60 linear feet and 85 linear feet of warm perennial streams will be impacted resulting from bridge and box culvert construction, respectively. Another 40 and 55 linear feet for Lower Bartons Creek and UT to Lower Bartons Creek, repectively, will be temporarily impacted.

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)
Total Wetland Impact (acres)					

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

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 (Perm)	Lower Bartons Creek	Bridge Construction	Perennial	40 feet	60	0.01
Site 1 (Temp)	Lower Bartons Creek	Temp Causeway for Bridge Construction	Perennial	40 feet	40**	0.03**
Site 2 (Perm)	UT to Lower Bartons Creek	Box Culvert	Perennial	25 feet	85	0.03
Site 2 (Temp)	UT to Lower Bartons Creek	Box Culvert	Perennial	25 feet	55	0.01
Total Stream Impact (by length and acreage)					200	0.08

* Impacts do not cover entire width of channel.

** These temporary impacts are in same reach of stream as permanent impacts and therefore not calculated in total length and area.

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

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

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

Stream Impact (acres):	0.14
Wetland Impact (acres):	NA
Open Water Impact (acres):	NA
Total Impact to Waters of the U.S. (acres)	0.14
Total Stream Impact (linear feet):	200

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.
N/A

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

VII. Impact Justification (Avoidance and Minimization)

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

See 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.
   Compensatory mitigation for permanent stream impacts is not proposed (see cover letter).

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	12,888	3	
2	3,524	1.5	
Total	16,412		

* 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.

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

XI. Stormwater (required by DWQ)

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

XII. Sewage Disposal (required by DWQ)

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

XIII. Violations (required by DWQ)

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

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

XIV. Cumulative Impacts (required by DWQ)

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

XV. Other Circumstances (Optional):

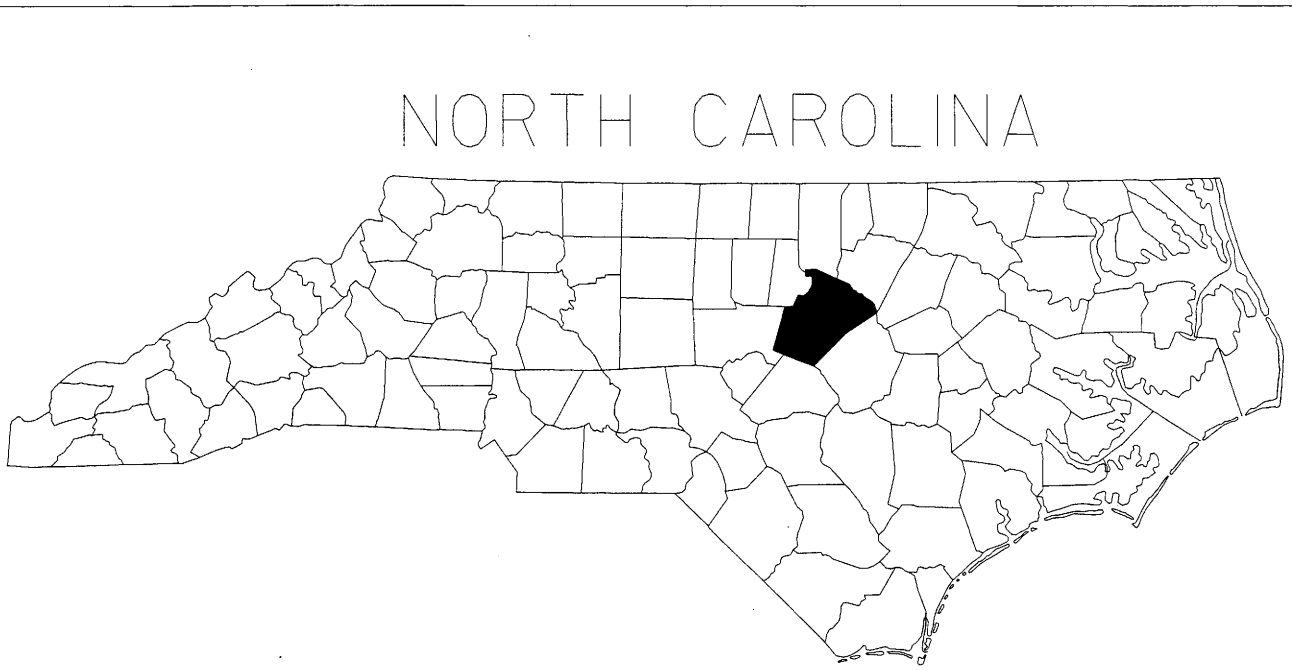
It is the applicant's responsibility to submit the application sufficiently in advance of desired construction dates to allow processing time for these permits. However, an applicant may choose to list constraints associated with construction or sequencing that may impose limits on work schedules (e.g.,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

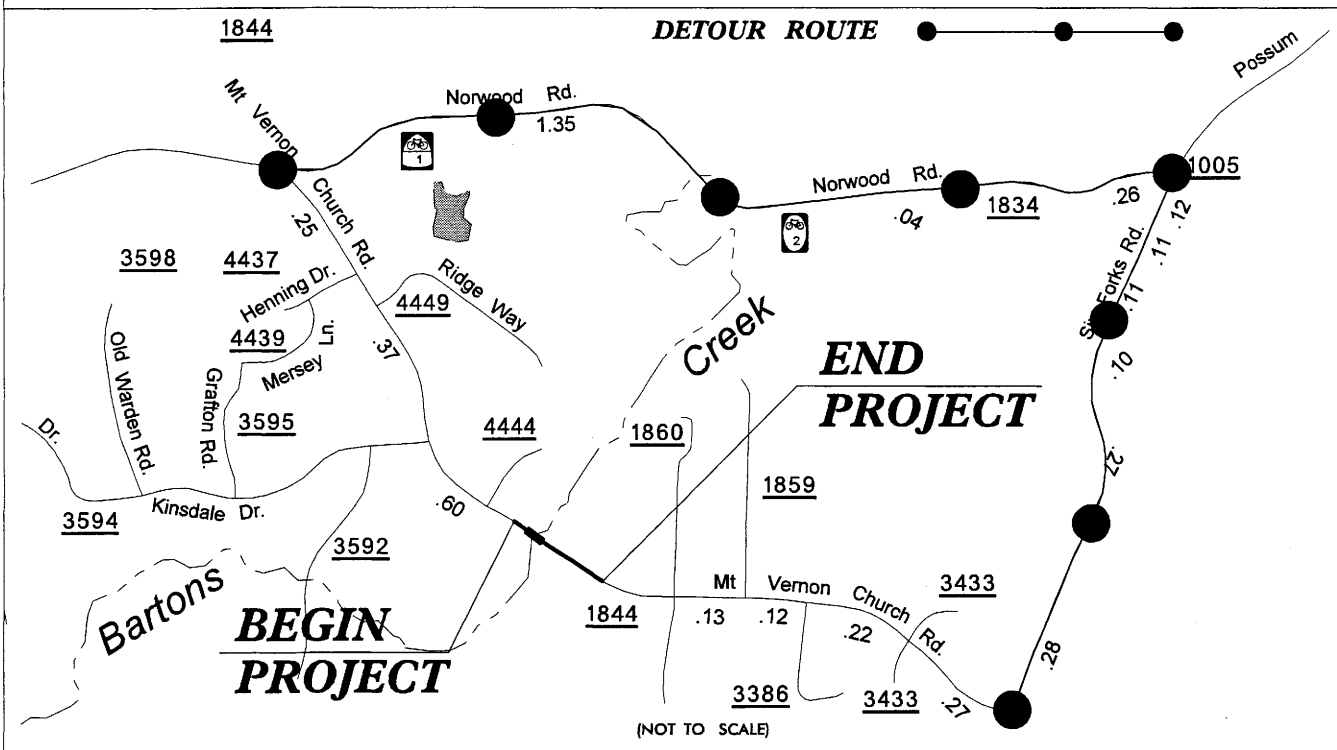
N/A

E. L. Lusk 4-24-08

Applicant/Agent's Signature **Date**

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





VICINITY MAPS

NCDOT

DIVISION OF HIGHWAYS
WAKE COUNTY
PROJECT: B-4303 (BRIDGE #102)
BRIDGE NO. 102 OVER
LOWER BARTONS CREEK
ON SR 1844
(MOUNT VERNON CHURCH ROAD)

SHEET 1 OF 8 02/22/2008

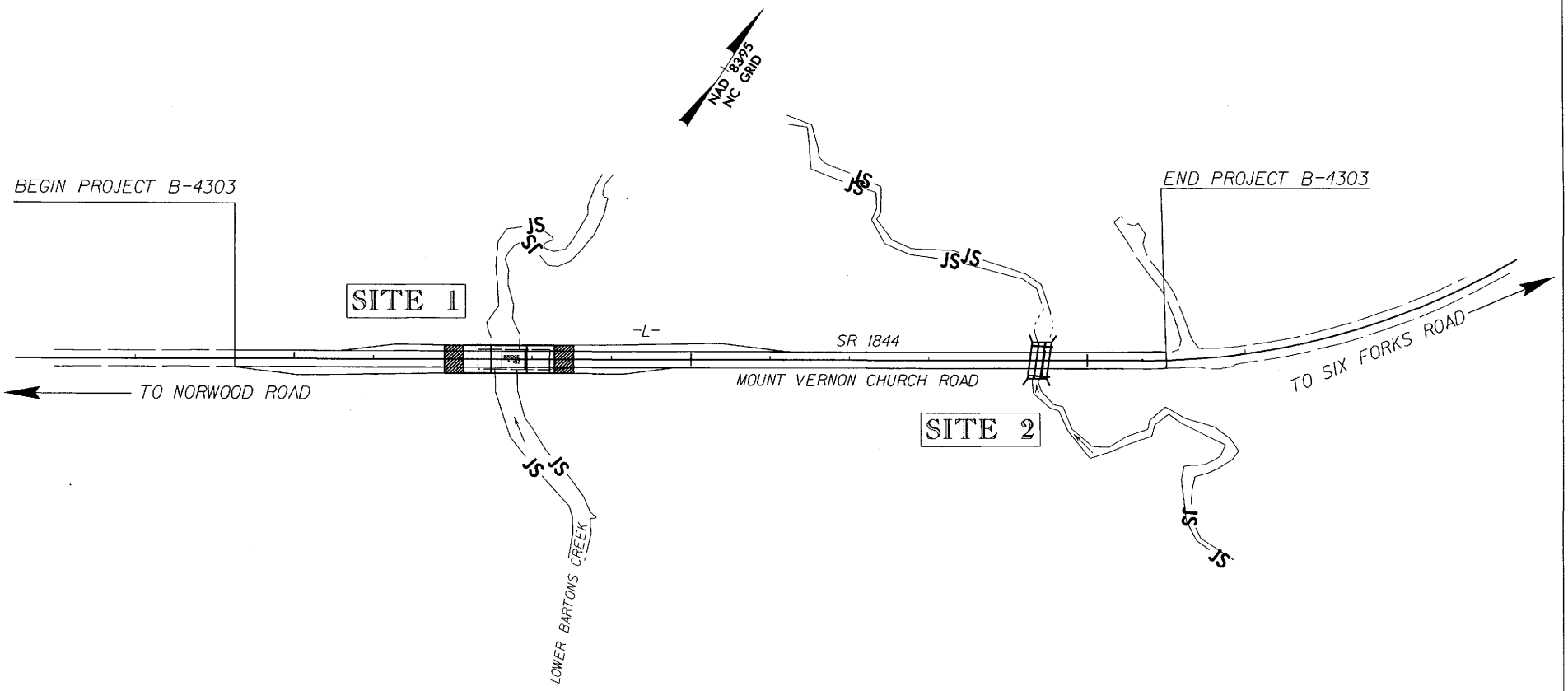
TOPO MAP

SCALE: 1" : 1500'

NCDOT

DIVISION OF HIGHWAYS
WAKE COUNTY
PROJECT: B-4303 (BRIDGE #102)
BRIDGE NO. 102 OVER
LOWER BARTONS CREEK
ON SR 1844
(MOUNT VERNON CHURCH ROAD)

SHEET 2 OF 8 02/22/2008



SITE MAP

NOT TO SCALE

NCDOT

DIVISION OF HIGHWAYS
WAKE COUNTY
PROJECT: B-4303 (BRIDGE #102)
BRIDGE NO. 102 OVER
LOWER BARTONS CREEK
ON SR 1844
(MOUNT VERNON CHURCH ROAD)

SHEET 3 OF 8 02/22/2008

PROPERTY OWNERS

NAMES AND ADDRESSES

	NAMES	ADDRESSES
1	Nicholas & Carrie Smith	10600 Tredwood Dr. Raleigh, NC 27614
2	Michael & Virginia Hall	10516 Tredwood Dr. Raleigh, NC 27615
3	Karl & Gale Bowman	920 Mt Vernon Church Rd. Raleigh, NC 27614
4	Bosworth Beckwith	817 Mt Vernon Church Rd Raleigh, NC 27614

NCDOT

DIVISION OF HIGHWAYS
WAKE COUNTY
PROJECT: B-4303 (BRIDGE #102)
BRIDGE NO. 102 OVER
LOWER BARTONS CREEK
ON SR 1844
(MOUNT VERNON CHURCH ROAD)

SHEET 4 OF 8 02/22/2008

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	17+13.5 to 18+28.5 CL	Bridge						0.01	0.03	60.00	40.00	
2	24+40 Rt./Lt.	Culvert						0.03	0.01	85.00	55.00	
TOTALS:								0.04	0.04	145.00	95.00	

NC DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

WAKE COUNTY
WBS - 33640.1.1 (B-4303)

SHEET 5 of 8 2/22/2008

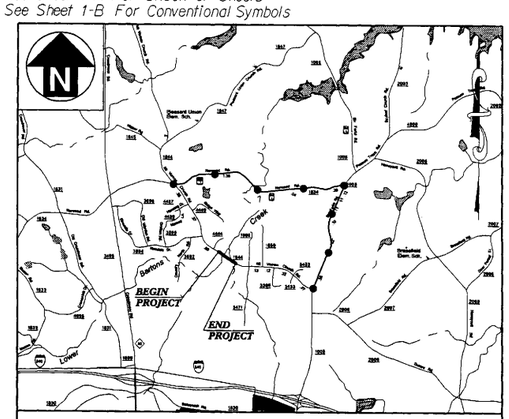
ATN Revised 3/31/05

09/08/99

TIP PROJECT: B-4303

CONTRACT:

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



VICINITY MAP — DETOUR ROUTE

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

WAKE COUNTY

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-4303	1	

W.B.S. ELEMENT	F. A. PROJ. NO.	DESCRIPTION
33640.1.1	BRZ-1844(1)	PE
33640.2.1	BRZ-1844(1)	R/W, UTL

LOCATION: BRIDGE NO. 102 OVER LOWER BARTONS CREEK ON SR 1844

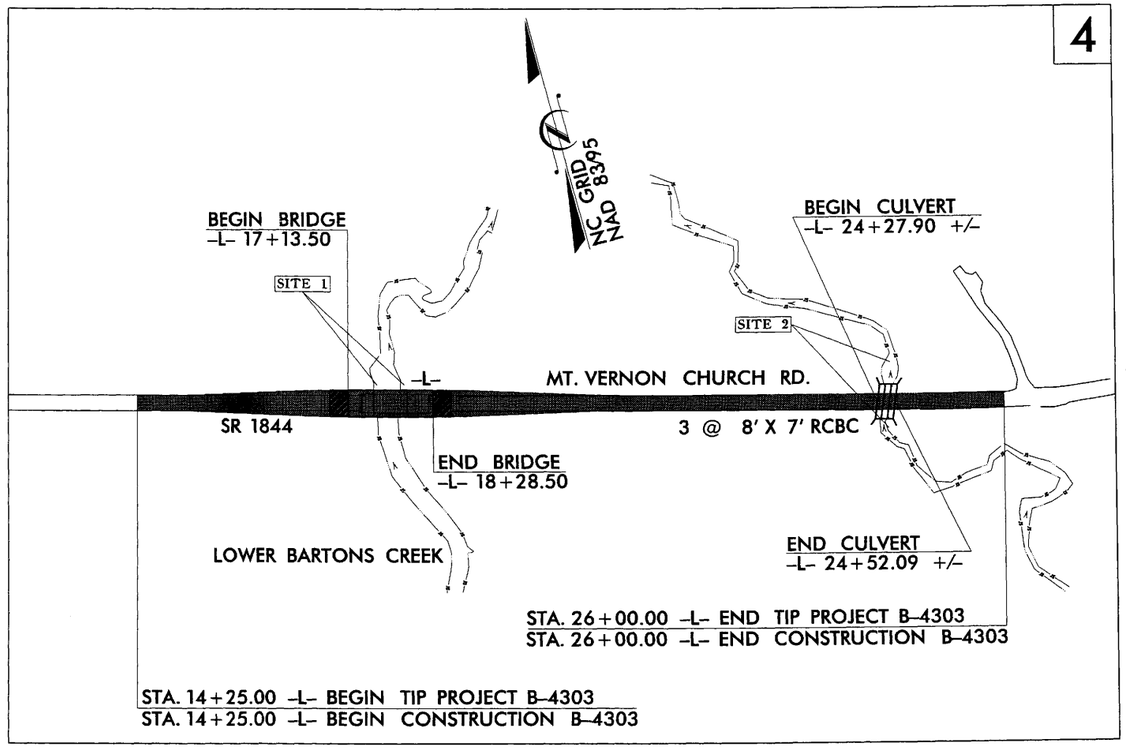
TYPE OF WORK: PAVING, GRADING, DRAINAGE, STRUCTURE AND CULVERT

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

Permit Drawing
Sheet 6 of 8

STREAM & WETLAND IMPACTS

4



MULKEY
ENGINEERS & CONSULTANTS
PO Box 33127
RALEIGH, N.C. 27636
(919) 851-1912
(919) 851-1918 (FAX)
WWW.MULKEYINC.COM

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

GRAPHIC SCALES

PLANS: 50 25 0 50 100
PROFILE (HORIZONTAL): 50 25 0 50 100
PROFILE (VERTICAL): 10 5 0 10 20

DESIGN DATA

ADT 2008 = 6,800
ADT 2030 = 11,800
DHV = 12 %
D = 55 %
T = 3 %*
V = 50 MPH

* TTST 1% DUAL 2%
** Design Exception – Lane Width
Func. Classification – Rural Local

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT B-4303	=	.197 MILES
LENGTH STRUCTURE TIP PROJECT B-4303	=	.026 MILES
TOTAL LENGTH TIP PROJECT B-4303	=	.223 MILES

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

2006 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
DECEMBER 21, 2007

LETTING DATE:
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ROADWAY PROJECT ENGINEER

JEFF RECK, PE
HYDRAULIC PROJECT ENGINEER

DOUG TAYLOR, PE
NCDOT ROADWAY DESIGN PROJECT ENGINEER

HYDRAULICS ENGINEER

P.E.
SIGNATURE:

ROADWAY DESIGN ENGINEER

P.E.
SIGNATURE:

DIVISION OF HIGHWAYS STATE OF NORTH CAROLINA

P.E.
STATE HIGHWAY DESIGN ENGINEER

4/8/2008
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10:06 PM

MULKEY
ENGINEERS & CONSULTANTS
PO BOX 33137
RALEIGH, NC 27636
(919) 851-1912
(919) 851-1513 (FAX)
WWW.MULKEYINC.COM

PROJECT REFERENCE NO.	SHEET NO.
B-4303	4
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

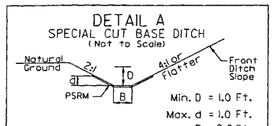
FOR -L- PROFILE SEE SHEET 5

Permit Drawing
Sheet 7 of 8

REVISIONS

8/17/

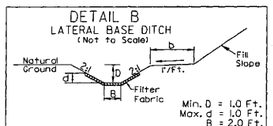
DETAIL A
SPECIAL CUT BASE DITCH
(Not to Scale)



Type of Liner = PSRM

-L- STA. 14+25 TO 15+25 LT

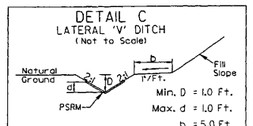
DETAIL B
LATERAL BASE DITCH
(Not to Scale)



Type of Liner = CLASS B RIP RAP

-L- STA. 15+25 TO 16+00 LT

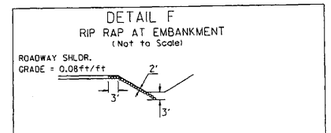
DETAIL C
LATERAL 'V' DITCH
(Not to Scale)



Type of Liner = PSRM

-L- STA. 14+25 TO 16+50 RT

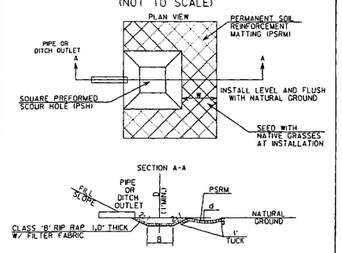
DETAIL F
RIP RAP AT EMBANKMENT
(Not to Scale)



Type of Liner = Class B Rip-Rap

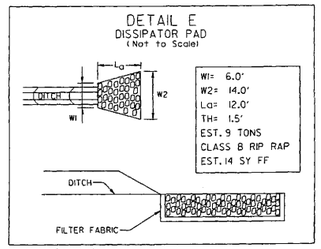
-L- STA. 24+50 TO 25+25 RT
-L- STA. 24+20 TO 24+30 RT

DETAIL D
PREFORMED SCOUR HOLE
(NOT TO SCALE)



STATION	B FT.	D FT.	W FT.	d FT.	CLASS B RIP RAP TONS	DDE FT³	FILTER FABRIC FT²	PSRM FT²
18+69 RT	3.75	1	4	0.5	4	90	65	215

DETAIL E
DISSIPATOR PAD
(Not to Scale)



W1= 6.0'
W2= 14.0'
Lo= 12.0'
TH= 1.5'
EST. 9 TONS
CLASS B RIP RAP
EST. 14 SY FF

-L- STA. 16+00 LT
-L- STA. 16+50 RT

NAD 83/95
NC GRID

STREAM & WETLAND IMPACTS

DENOTES IMPACTS IN SURFACE WATER

DENOTES TEMPORARY IMPACTS IN SURFACE WATER

15+00

20+00

25+00

(1) NICHOLAS J. SMITH
CARRIE J. SMITH

(2) MICHAEL L. HALL
VIRGINIA W. HALL

(3) KARL F. BOWMAN
GALE G. BOWMAN

(4) BOSWORTH CLIFTON BECKWITH

JACK R. CARROLL
NANCY T. CARROLL

ELIZABETH BECKWITH REYNOLDS

SITE 1

SITE 2

LATERAL BASE DITCH
SEE DETAIL B
EST. 15 CY DDE
EST. 35 TONS RIP RAP
EST. 100 SY FIL FAB

SPECIAL BASE DITCH
SEE DETAIL A

DISSIPATOR PAD
SEE DETAIL E
EST. 9 TONS RIP RAP
EST. 14 SY FIL FAB

EXISTING BRIDGE

PROPOSED BRIDGE

SHOULDER BERM GUTTER
-L- STA. 18+52.50 TO 18+69

LATERAL V DITCH
SEE DETAIL C
EST. 65 CY DDE

DISSIPATOR PAD
SEE DETAIL E
EST. 9 TONS RIP RAP
EST. 14 SY FIL FAB

BM 51
-BL- STA 16+08.54
38.50' RIGHT
ELEV. = 284.36

CLASS II RIP RAP
STRUCTURE PAY ITEM

HAUL ROAD

EXCAVATION
STRUCTURE PAY ITEM

CLASS I RIP RAP
STRUCTURE PAY ITEM

PREFORMED SCOUR HOLE
SEE DETAIL D

CLASS I RIP RAP

TIE TO WINGWALL

CLASS B RIP RAP
SEE DETAIL F
EST. 110 TONS
EST. 125 SY FIL FAB

CLASS B RIP RAP
SEE DETAIL F
EST. 16 TONS
EST. 20 SY FIL FAB

BM 52
-BL- STA 24+03.96
27.88' RIGHT
ELEV. = 289.00

POISON IVY PLACE
PRIVATE ROAD 13 EST

MOUNT VERNON CHURCH ROAD
(SR 1844) 2' EST

S 59° 03' 50.9" E

S 57° 25' 25.7" E

-L-
PI Sta 28+23.48
Δ = 30° 47' 33.2" (LT)
D = 6° 12' 43.6"
L = 495.69'
T = 253.99'
R = 922.32'

BRIDGE #102

SKETCH SHOWING RELATIONSHIP OF BRIDGE TO PAVEMENT AND SHOULDERS

INLET TYPICAL
NOT TO SCALE
EST DDE = 100 CY
TYP. 0' TO 50' UPSTREAM

CLASS 'I' RIP RAP W/ FILTER FABRIC

OUTLET TYPICAL
NOT TO SCALE
EST DDE = 65 CY
EST 86 TONS CLASS 'I' RIP RAP
EST 120 SY F.F.
TYP 25' TO 70' DOWNSTREAM

NOTE: SILL PLACEMENT AT UPSTREAM & DOWNSTREAM FACE

CLASS 'I' RIP RAP W/ FILTER FABRIC

OUTLET TYPICAL
NOT TO SCALE
EST DDE = 35 CY
EST 115 TONS CLASS 'I' RIP RAP
EST 140 SY F.F.
TYP 0' TO 25' DOWNSTREAM

why rip rap in ditch when rip rap is in

2/22/2008
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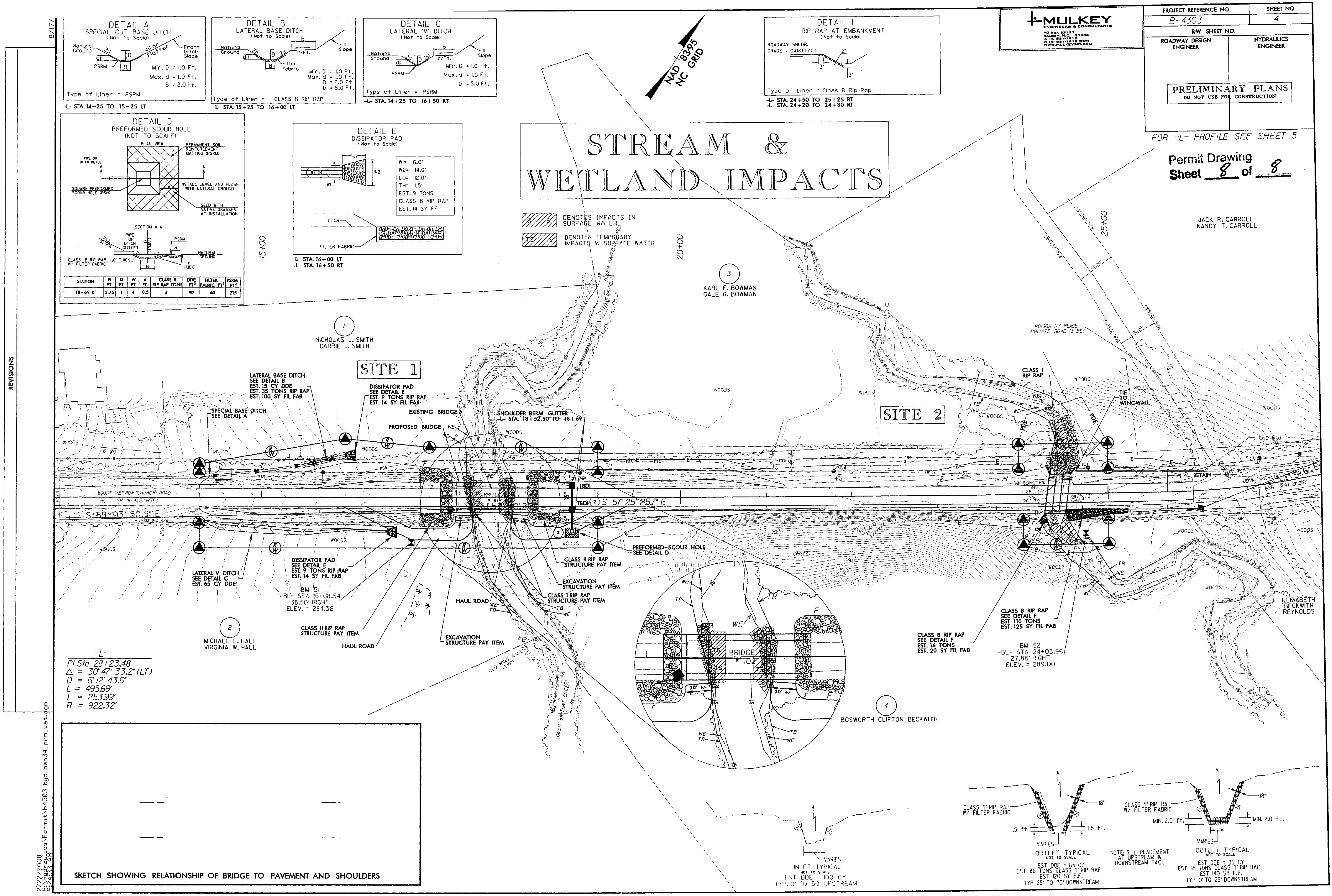

PROJECT REFERENCE NO. B-4303
SHEET NO. 4
R/W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
MULKEY ENGINEERS & CONSULTANTS
FOR -L- PROFILE SEE SHEET 5
Permit Drawing
Sheet 8 of 8
STREAM & WETLAND IMPACTS
DENOTES IMPACTS IN SURFACE WATER
DENOTES TEMPORARY IMPACTS IN SURFACE WATER
NAD 83/95 NC GRID
DETAIL A
SPECIAL CUT BASE DITCH
(Not to Scale)
Min. D = 1.0 Ft.
Max. d = 1.0 Ft.
B = 2.0 Ft.
Type of Liner = PSRM
-L- STA. 14+25 TO 15+25 LT
DETAIL B
LATERAL BASE DITCH
(Not to Scale)
Min. D = 1.0 Ft.
Max. d = 1.0 Ft.
B = 2.0 Ft.
b = 5.0 Ft.
Type of Liner = CLASS B RIP RAP
-L- STA. 15+25 TO 16+00 LT
DETAIL C
LATERAL 'V' DITCH
(Not to Scale)
Min. D = 1.0 Ft.
Max. d = 1.0 Ft.
b = 5.0 Ft.
Type of Liner = PSRM
-L- STA. 14+25 TO 16+50 RT
DETAIL F
RIP RAP AT EMBANKMENT
(Not to Scale)
ROADWAY SHLDR. GRADE = 0.08ft/ft
Type of Liner = Class B Rip-Rap
-L- STA. 24+50 TO 25+25 RT
-L- STA. 24+20 TO 24+30 RT
DETAIL D
PREFORMED SCOUR HOLE
(NOT TO SCALE)
STATION 18+69 RT; B FT. 3.75; D FT. 1; W FT. 4; d FT. 0.5; CLASS B RIP RAP TONS 4; DDE FT³ 90; FILTER FABRIC FT² 65; PSRM FT² 215
DETAIL E
DISSIPATOR PAD
(Not to Scale)
W1= 6.0'
W2= 14.0'
La= 12.0'
TH= 1.5'
EST. 9 TONS
CLASS B RIP RAP
EST. 14 SY FF
-L- STA. 16+00 LT
-L- STA. 16+50 RT
SITE 1
SITE 2
NICHOLAS J. SMITH
CARRIE J. SMITH
MICHAEL L. HALL
VIRGINIA W. HALL
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GALE C. BOWMAN
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ELIZABETH BECKWITH REYNOLDS
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S 57° 25' 25.7" E
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PI Sta 28+23.48
Δ = 30° 47' 33.2" (LT)
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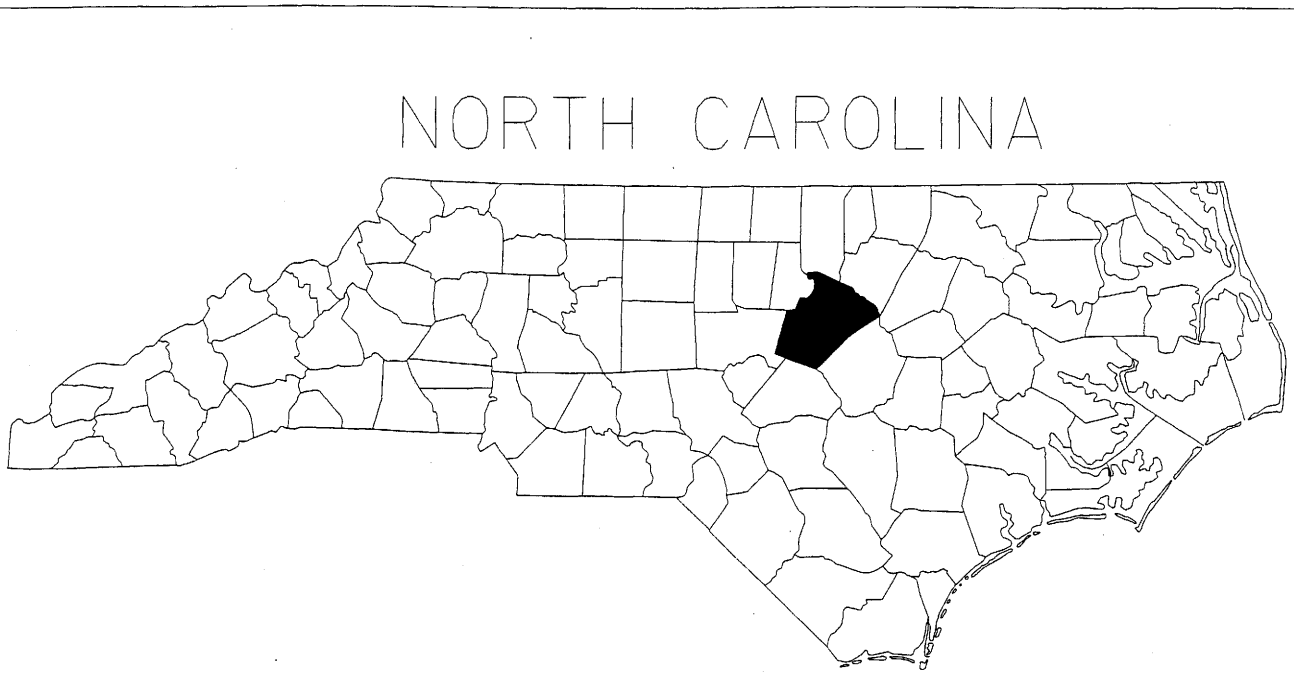
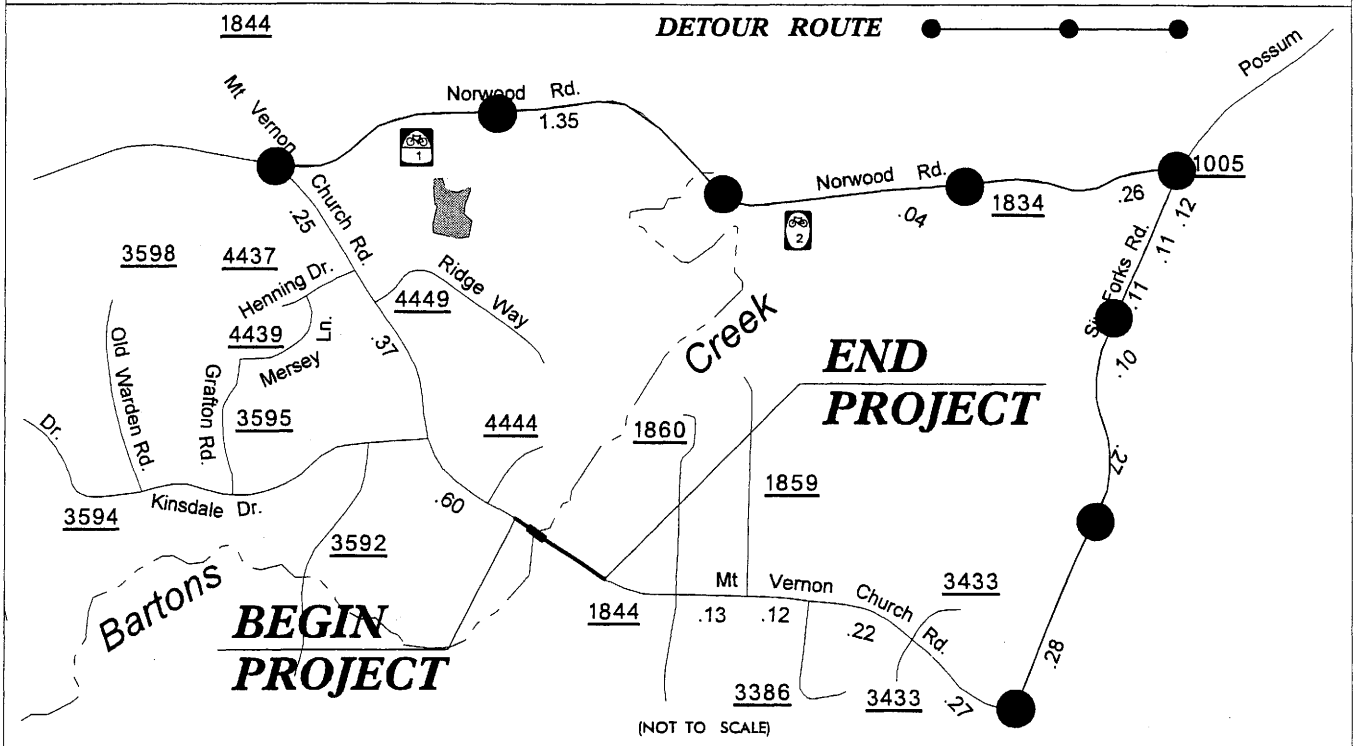
SKETCH SHOWING RELATIONSHIP OF BRIDGE TO PAVEMENT AND SHOULDERS
INLET TYPICAL
OUTLET TYPICAL
REVISIONS





BUFFER IMPACTS

VICINITY MAPS

NCDOT

DIVISION OF HIGHWAYS
WAKE COUNTY
PROJECT: B-4303 (BRIDGE #102)
BRIDGE NO. 102 OVER
LOWER BARTONS CREEK
ON SR 1844
(MOUNT VERNON CHURCH ROAD)

SHEET 1 OF 8 02/22/2008

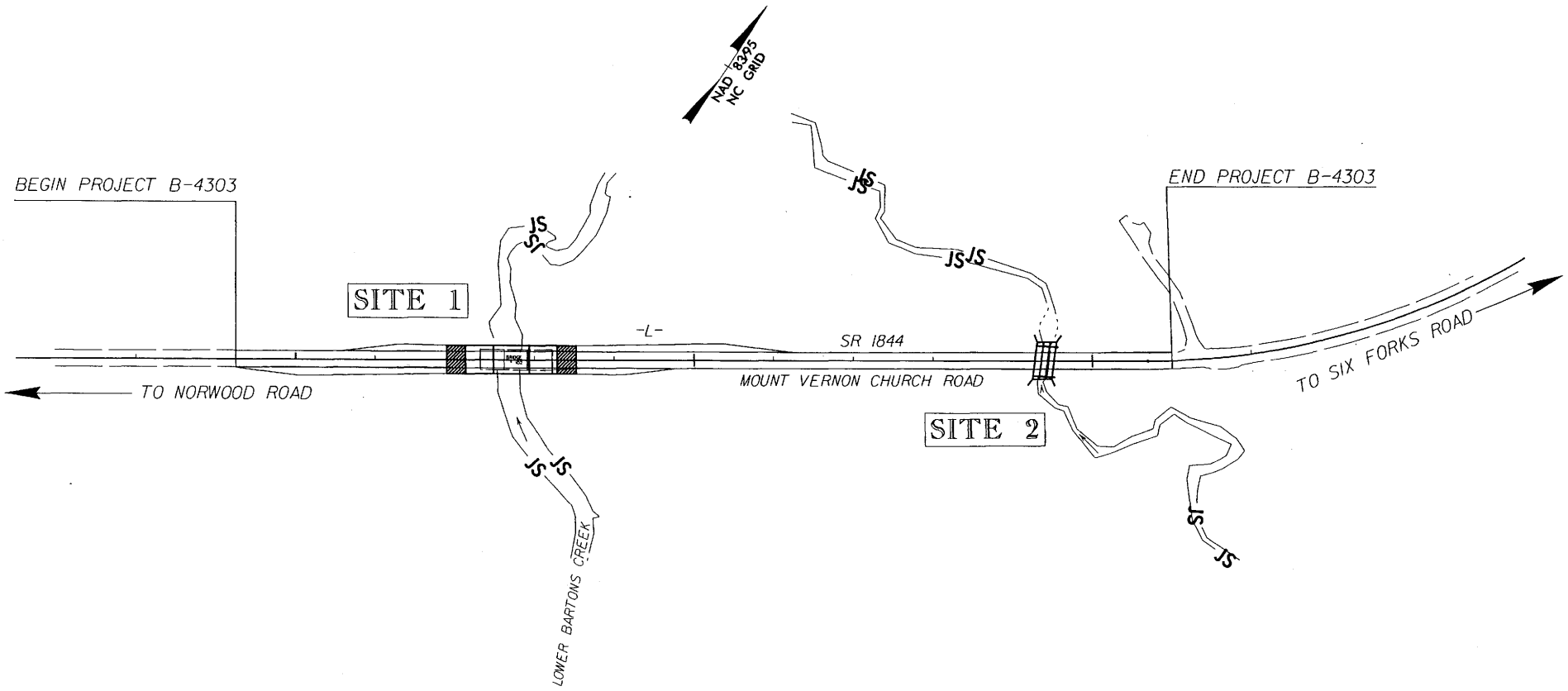
TOPO MAP

SCALE: 1" : 1500'

NCDOT

DIVISION OF HIGHWAYS
WAKE COUNTY
PROJECT: B-4303 (BRIDGE #102)
BRIDGE NO. 102 OVER
LOWER BARTONS CREEK
ON SR 1844
(MOUNT VERNON CHURCH ROAD)

SHEET 2 OF 8 02/22/2008



SITE MAP

NOT TO SCALE

NCDOT

DIVISION OF HIGHWAYS
WAKE COUNTY
PROJECT: B-4303 (BRIDGE #102)
BRIDGE NO. 102 OVER
LOWER BARTONS CREEK
ON SR 1844
(MOUNT VERNON CHURCH ROAD)

SHEET 3 OF 8 02 / 22 / 2008

PROPERTY OWNERS

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NCDOT

DIVISION OF HIGHWAYS
WAKE COUNTY
PROJECT: B-4303 (BRIDGE #102)
BRIDGE NO. 102 OVER
LOWER BARTONS CREEK
ON SR 1844
(MOUNT VERNON CHURCH ROAD)

SHEET 4 OF 8 02/22/2008

BUFFER IMPACTS SUMMARY

SITE NO.	STRUCTURE SIZE / TYPE	STATION (FROM/TO)	IMPACT									BUFFER REPLACEMENT	
			TYPE			ALLOWABLE			MITIGABLE				
			ROAD CROSSING	BRIDGE	PARALLEL IMPACT	ZONE 1 (ft^2)	ZONE 2 (ft^2)	TOTAL (ft^2)	ZONE 1 (ft^2)	ZONE 2 (ft^2)	TOTAL (ft^2)	ZONE 1 (ft^2)	ZONE 2 (ft^2)
1	Bridge (1@35',1@45',1@35')	17+13.50 to 18+28.50		X		5432	509	5941					
	Roadway Fill	16+83 to 18+50	X			248	1951	2199					
2	Culvert (3@ 8'x7')	23+95 to 25+00	X			7208	1064	8272					
TOTAL:						12888	3524	16412	0	0	0		

N.C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS

WAKE COUNTY
PROJECT: B-4303
REPLACEMENT OF BRIDGE NO. 102
OVER LOWER BARTONS CREEK ON SR 1844
2/22/2008
SHEET 5 OF 8

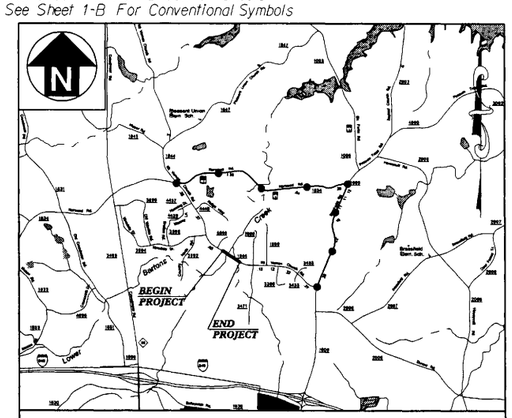
Rev. May 2006

09/08/99

TIP PROJECT: B-4303

CONTRACT:

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



VICINITY MAP DETOUR ROUTE

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

WAKE COUNTY

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-4303	1	

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33640.2.1	BRZ-1844(1)	R/W, UTL

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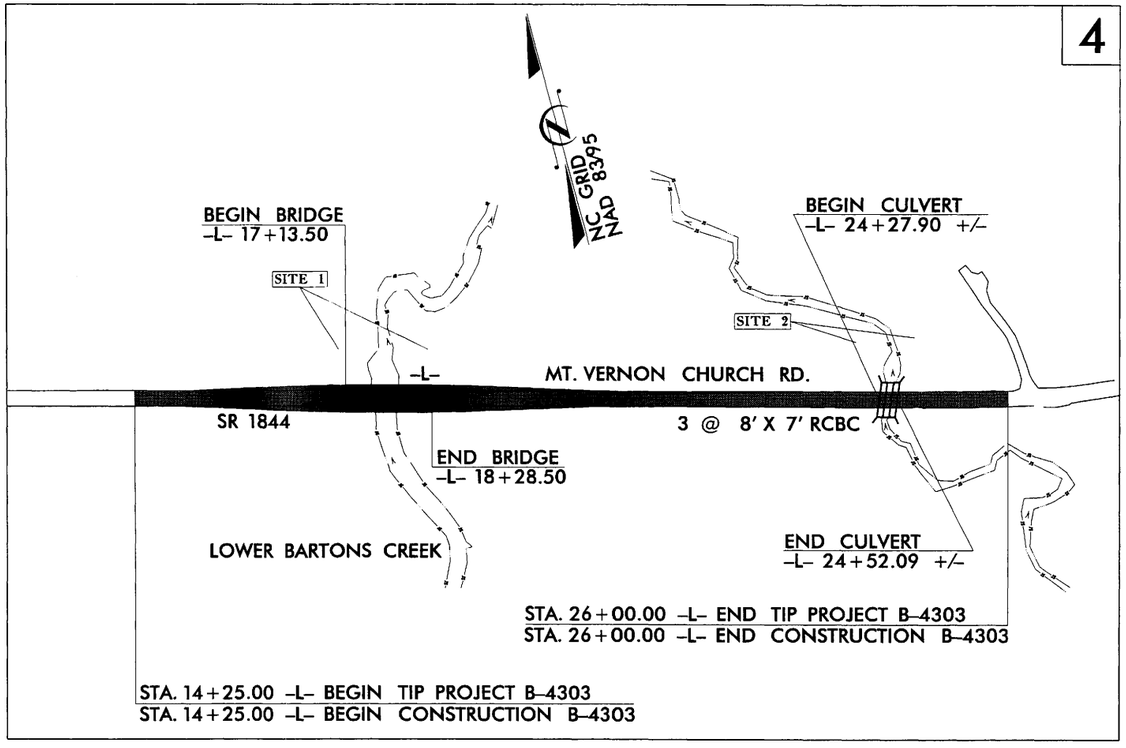
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

Buffer Drawing Sheet 6 of 8

BUFFER IMPACTS

4



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50 25 0 50 100
PLANS

50 25 0 50 100
PROFILE (HORIZONTAL)

10 5 0 10 20
PROFILE (VERTICAL)

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NCDOT ROADWAY DESIGN PROJECT ENGINEER

HYDRAULICS ENGINEER

SIGNATURE: *P.E.*

ROADWAY DESIGN ENGINEER

SIGNATURE: *P.E.*

DIVISION OF HIGHWAYS STATE OF NORTH CAROLINA

STATE HIGHWAY DESIGN ENGINEER *P.E.*

4/8/2008
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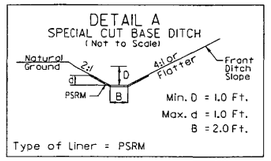
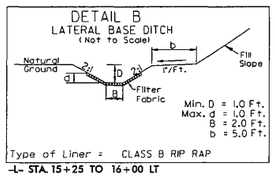
8/17/99

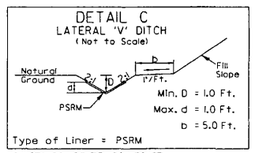
REVISIONS



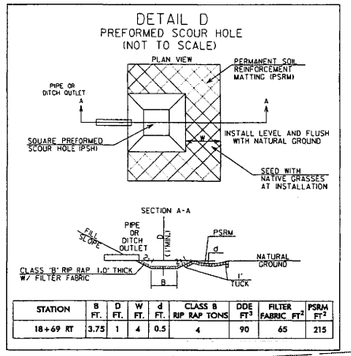
-L- STA. 14+25 TO 15+25 LT



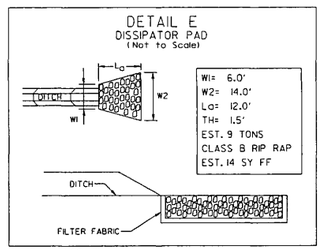
-L- STA. 15+25 TO 16+00 LT



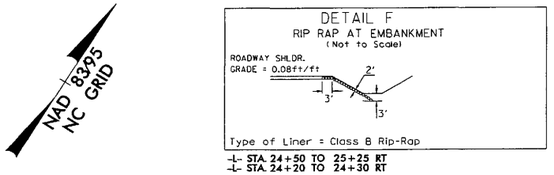
-L- STA. 14+25 TO 16+50 RT



STATION	B FT.	D FT.	W FT.	d FT.	CLASS B RIP RAP TONS	DDE FT³	FILTER FABRIC FT²	PSRM FT²
18+69 RT	3.75	1	4	0.5	4	90	65	215



-L- STA. 16+00 LT
-L- STA. 16+50 RT



-L- STA. 24+50 TO 25+25 RT
-L- STA. 24+20 TO 24+30 RT

NAD 83/95
NC GRID

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

PROJECT REFERENCE NO.	SHEET NO
B-4303	4
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

FOR -L- PROFILE SEE SHEET 5

Buffer Drawing
Sheet 7 of 8

BUFFER IMPACTS

ALLOWABLE IMPACTS ZONE 1

ALLOWABLE IMPACTS ZONE 2

JACK R. CARROLL
NANCY T. CARROLL

3
KARL F. BOWMAN
GALE G. BOWMAN

1
NICHOLAS J. SMITH
CARRIE J. SMITH

SITE 1

SITE 2

LATERAL BASE DITCH
SEE DETAIL B
EST. 15 CY DDE
EST. 35 TONS RIP RAP
EST. 100 SY FIL FAB

SPECIAL BASE DITCH
SEE DETAIL A

DISSIPATOR PAD
SEE DETAIL E
EST. 9 TONS RIP RAP
EST. 14 SY FIL FAB

EXISTING BRIDGE

PROPOSED BRIDGE

SHOULDER BERM GUTTER
-L- STA. 18+52.50 TO 18+69

TBD1
TBD2
S 57° 25' 25.7" E

PREFORMED SCOUR HOLE
SEE DETAIL D

CLASS II RIP RAP
STRUCTURE PAY ITEM

EXCAVATION
STRUCTURE PAY ITEM

CLASS I RIP RAP
STRUCTURE PAY ITEM

LATERAL V DITCH
SEE DETAIL C
EST. 65 CY DDE

DISSIPATOR PAD
SEE DETAIL E
EST. 9 TONS RIP RAP
EST. 14 SY FIL FAB

BM 51
-BL- STA 16+08.54
38.50' RIGHT
ELEV. = 284.36

CLASS II RIP RAP
STRUCTURE PAY ITEM

EXCAVATION
STRUCTURE PAY ITEM

2
MICHAEL L. HALL
VIRGINIA W. HALL

CLASS I RIP RAP
SEE DETAIL F
EST. 110 TONS
EST. 125 SY FIL FAB

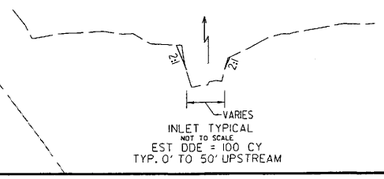
CLASS B RIP RAP
SEE DETAIL F
EST. 16 TONS
EST. 20 SY FIL FAB

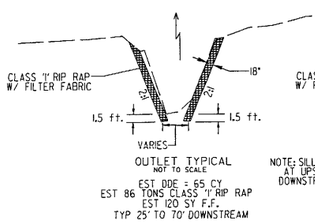
BM 52
-BL- STA 24+03.96
27.88' RIGHT
ELEV. = 289.00

4
BOSWORTH CLIFTON BECKWITH

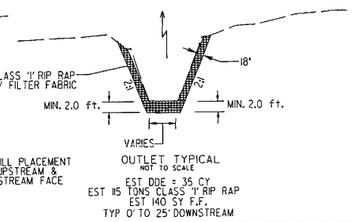
ELIZABETH BECKWITH REYNOLDS

SKETCH SHOWING RELATIONSHIP OF BRIDGE TO PAVEMENT AND SHOULDERS





NOTE: SILL PLACEMENT AT UPSTREAM & DOWNSTREAM FACE



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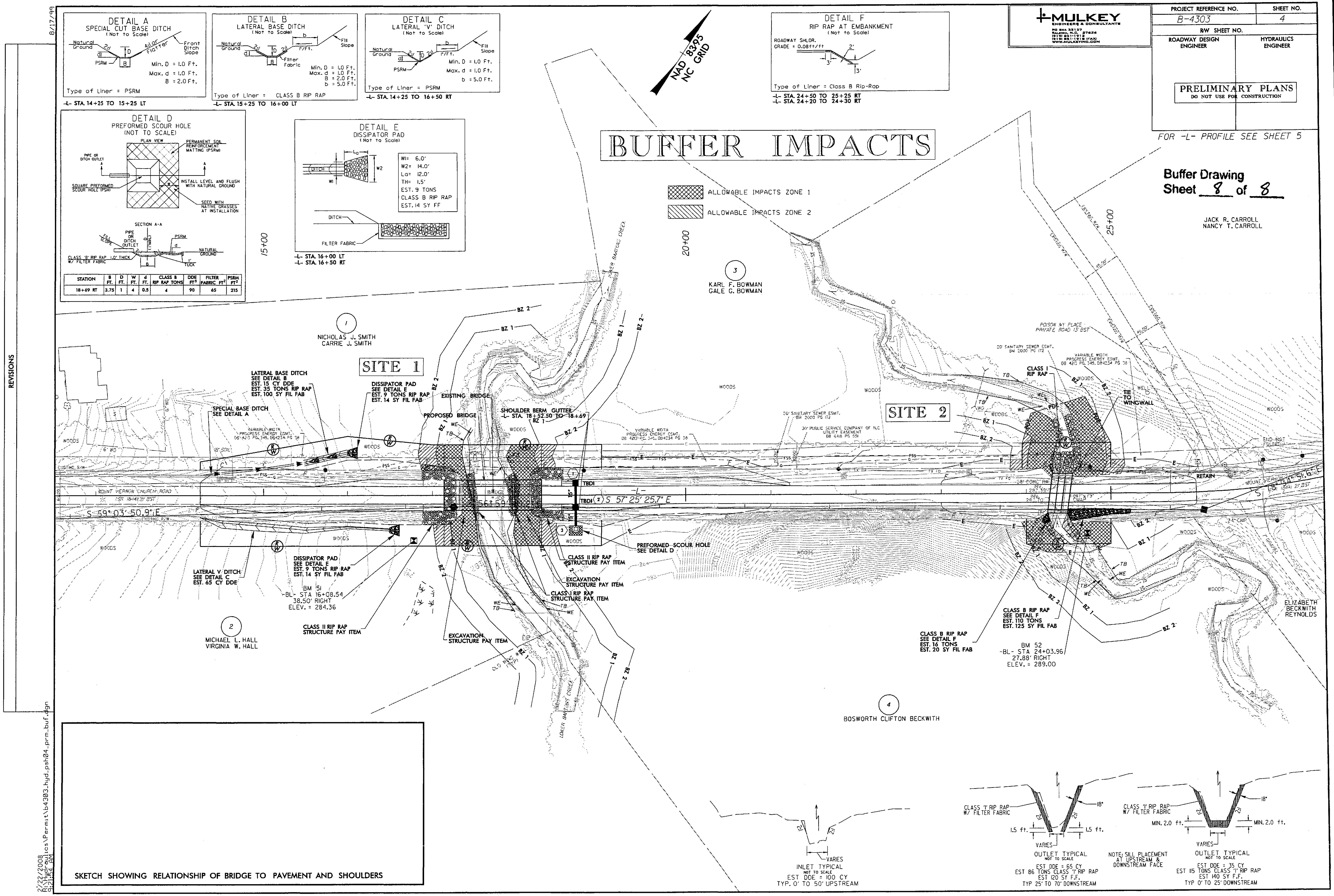


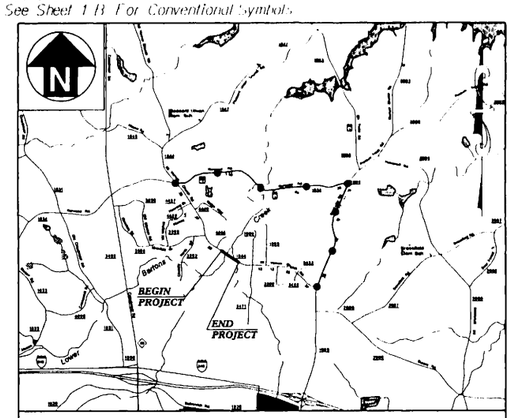
8/17/99
PROJECT REFERENCE NO.
SHEET NO.
B-4303
4
RW SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
MULKEY ENGINEERS & CONSULTANTS
FOR -L- PROFILE SEE SHEET 5
BUFFER IMPACTS
Buffer Drawing
Sheet 8 of 8
ALLOWABLE IMPACTS ZONE 1
ALLOWABLE IMPACTS ZONE 2
NAD 83/95 NC GRID
DETAIL A
SPECIAL CUT BASE DITCH
(Not to Scale)
Min. D = 1.0 Ft.
Max. d = 1.0 Ft.
B = 2.0 Ft.
Type of Liner = PSRM
-L- STA. 14+25 TO 15+25 LT
DETAIL B
LATERAL BASE DITCH
(Not to Scale)
Min. D = 1.0 Ft.
Max. d = 1.0 Ft.
B = 2.0 Ft.
b = 5.0 Ft.
Type of Liner = CLASS B RIP RAP
-L- STA. 15+25 TO 16+00 LT
DETAIL C
LATERAL 'V' DITCH
(Not to Scale)
Min. D = 1.0 Ft.
Max. d = 1.0 Ft.
b = 5.0 Ft.
Type of Liner = PSRM
-L- STA. 14+25 TO 16+50 RT
DETAIL D
PREFORMED SCOUR HOLE
(NOT TO SCALE)
SECTION A-A
STATION | B FT. | D FT. | W FT. | d FT. | CLASS B RIP RAP TONS | DDE FT³ | FILTER FABRIC FT² | PSRM FT²
18+69 RT | 3.75 | 1 | 4 | 0.5 | 4 | 90 | 65 | 215
DETAIL E
DISSIPATOR PAD
(Not to Scale)
W1= 6.0'
W2= 14.0'
La= 12.0'
TH= 1.5'
EST. 9 TONS
CLASS B RIP RAP
EST. 14 SY FF
-L- STA. 16+00 LT
-L- STA. 16+50 RT
DETAIL F
RIP RAP AT EMBANKMENT
(Not to Scale)
ROADWAY SHLDR. GRADE = 0.08ft/ft
Type of Liner = Class B Rip-Rap
-L- STA. 24+50 TO 25+25 RT
-L- STA. 24+20 TO 24+30 RT
SITE 1
SITE 2
1 NICHOLAS J. SMITH CARRIE J. SMITH
2 MICHAEL L. HALL VIRGINIA W. HALL
3 KARL F. BOWMAN GALE G. BOWMAN
4 BOSWORTH CLIFTON BECKWITH
JACK R. CARROLL NANCY T. CARROLL
ELIZABETH BECKWITH REYNOLDS
LATERAL BASE DITCH SEE DETAIL B EST. 15 CY DDE EST. 35 TONS RIP RAP EST. 100 SY FIL FAB
DISSIPATOR PAD SEE DETAIL E EST. 9 TONS RIP RAP EST. 14 SY FIL FAB
SPECIAL BASE DITCH SEE DETAIL A
EXISTING BRIDGE
PROPOSED BRIDGE
SHOULDER BERM GUTTER -L- STA. 18+52.50 TO 18+69
LATERAL V DITCH SEE DETAIL C EST. 65 CY DDE
BM 51 -BL- STA 16+08.54 38.50' RIGHT ELEV. = 284.36
CLASS II RIP RAP STRUCTURE PAY ITEM
EXCAVATION STRUCTURE PAY ITEM
CLASS I RIP RAP STRUCTURE PAY ITEM
PREFORMED SCOUR HOLE SEE DETAIL D
S 59° 03' 50.9" E
S 57° 25' 25.7" E
CLASS I RIP RAP
TIE TO WINGWALL
CLASS B RIP RAP SEE DETAIL F EST. 110 TONS EST. 125 SY FIL FAB
CLASS B RIP RAP SEE DETAIL F EST. 16 TONS EST. 20 SY FIL FAB
BM 52 -BL- STA 24+03.96 27.88' RIGHT ELEV. = 289.00
15+00
20+00
25+00
WOODS
REVISIONS
SKETCH SHOWING RELATIONSHIP OF BRIDGE TO PAVEMENT AND SHOULDERS
INLET TYPICAL NOT TO SCALE EST DDE = 100 CY TYP. 0' TO 50' UPSTREAM
CLASS 'I' RIP RAP W/ FILTER FABRIC
OUTLET TYPICAL NOT TO SCALE EST DDE = 65 CY EST 86 TONS CLASS 'I' RIP RAP EST 120 SY F.F. TYP 25' TO 70' DOWNSTREAM
NOTE: SILL PLACEMENT AT UPSTREAM & DOWNSTREAM FACE
OUTLET TYPICAL NOT TO SCALE EST DDE = 35 CY EST 115 TONS CLASS 'I' RIP RAP EST 140 SY F.F. TYP 0' TO 25' DOWNSTREAM
2/22/2008

09/08/99

TIP PROJECT: B-4303

CONTRACT:

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



VICINITY MAP DETOUR ROUTE

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

WAKE COUNTY

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-4303	1	

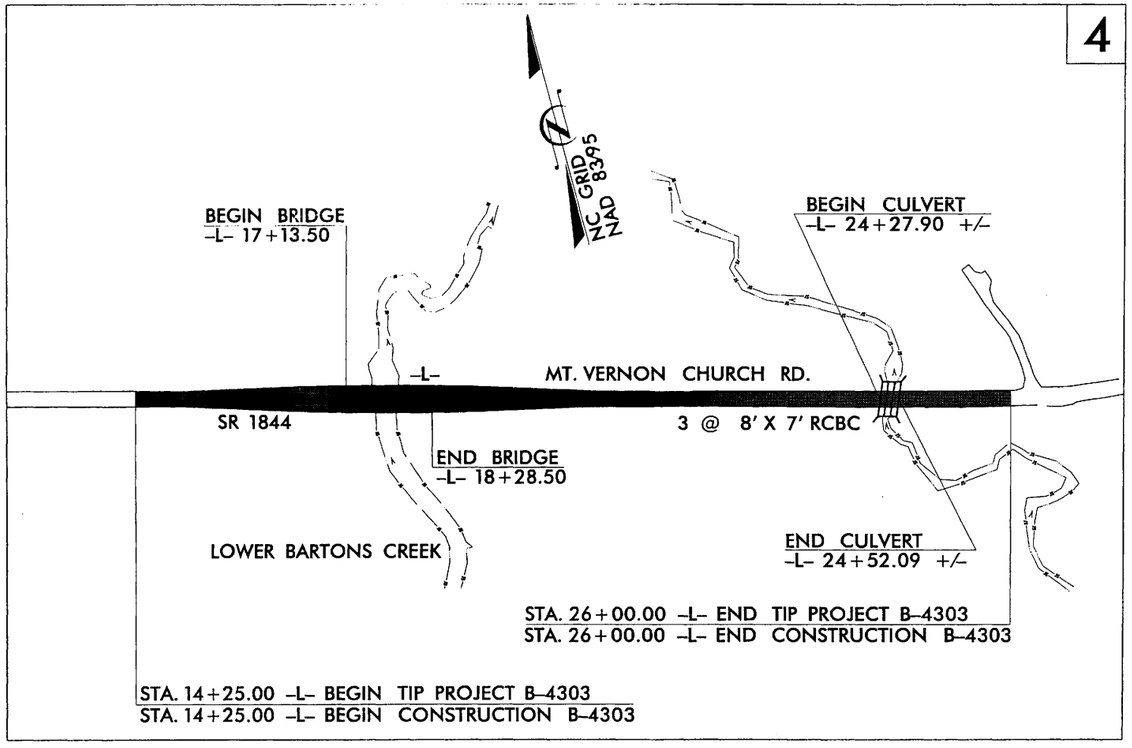
W.B.S. ELEMENT	F. A. PROJ. NO.	DESCRIPTION
33640.1.1	BRZ-1844(1)	PE
33640.2.1	BRZ-1844(1)	RW, UTL

LOCATION: BRIDGE NO. 102 OVER LOWER BARTONS CREEK ON SR 1844

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

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

4



MULKEY
ENGINEERS & CONSULTANTS
PO Box 33127
RALEIGH, N.C. 27636
(919) 851-1912
(919) 851-1918 (FAX)
WWW.MULKEYINC.COM

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

GRAPHIC SCALES

PLANS: 50 25 0 50 100
PROFILE (HORIZONTAL): 50 25 0 50 100
PROFILE (VERTICAL): 10 5 0 10 20

DESIGN DATA

ADT 2008 = 6,800
ADT 2030 = 11,800
DHV = 12 %
D ≐ 55 %
T = 3 %*
V = 50 MPH

* TTST 1% DUAL 2%
** Design Exception – Lane Width
Func. Classification – Rural Local

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT B-4303	=	.197 MILES
LENGTH STRUCTURE TIP PROJECT B-4303	=	.026 MILES
TOTAL LENGTH TIP PROJECT B-4303	=	.223 MILES

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

2006 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE: DECEMBER 21, 2007

LETTING DATE: DECEMBER 16, 2008

TIM JORDAN, PE
ROADWAY PROJECT ENGINEER

JEFF RECK, PE
HYDRAULIC PROJECT ENGINEER

DOUG TAYLOR, PE
NCDOT ROADWAY DESIGN PROJECT ENGINEER

HYDRAULICS ENGINEER

P.E.
SIGNATURE:

ROADWAY DESIGN ENGINEER

P.E.
SIGNATURE:

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

STATE HIGHWAY DESIGN ENGINEER P.E.

2/22/2008
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5/14/99

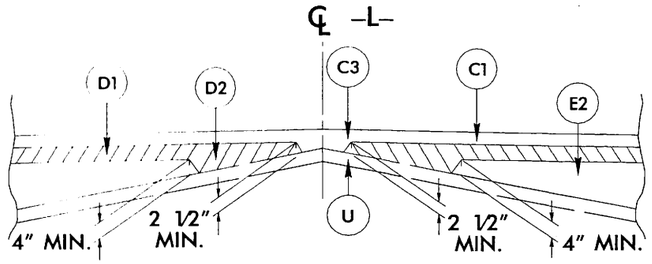
PROJECT REFERENCE NO.	SHEET NO.
B-4303	2
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

PAVEMENT SCHEDULE
(FINAL PAVEMENT DESIGN)

A	CONCRETE WEARING SURFACE (STRUCTURE PAY ITEM)
C1	PROP. APPROX. 1½" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD.
C2	PROP. APPROX. 3" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.
C3	PROP. VAR. DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 112 LBS. PER SQ. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NOT LESS THAN 1½" IN DEPTH OR GREATER THAN 2" IN DEPTH.
D1	PROP. APPROX. 2½" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0B, AT AN AVERAGE RATE OF 285 LBS. PER SQ. YD.
D2	PROP. VAR. DEPTH ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0B, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NOT LESS THAN 2½" IN DEPTH OR GREATER THAN 4" IN DEPTH.
E1	PROP. APPROX. 4½" ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 513 LBS. PER SQ. YD.
E2	PROP. VAR. DEPTH ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NOT LESS THAN 4" IN DEPTH OR GREATER THAN 5½" IN DEPTH.
T	EARTH MATERIAL.
U	EXISTING PAVEMENT.
W	VARIABLE DEPTH ASPHALT PAVEMENT (SEE STANDARD WEDGING DETAIL)

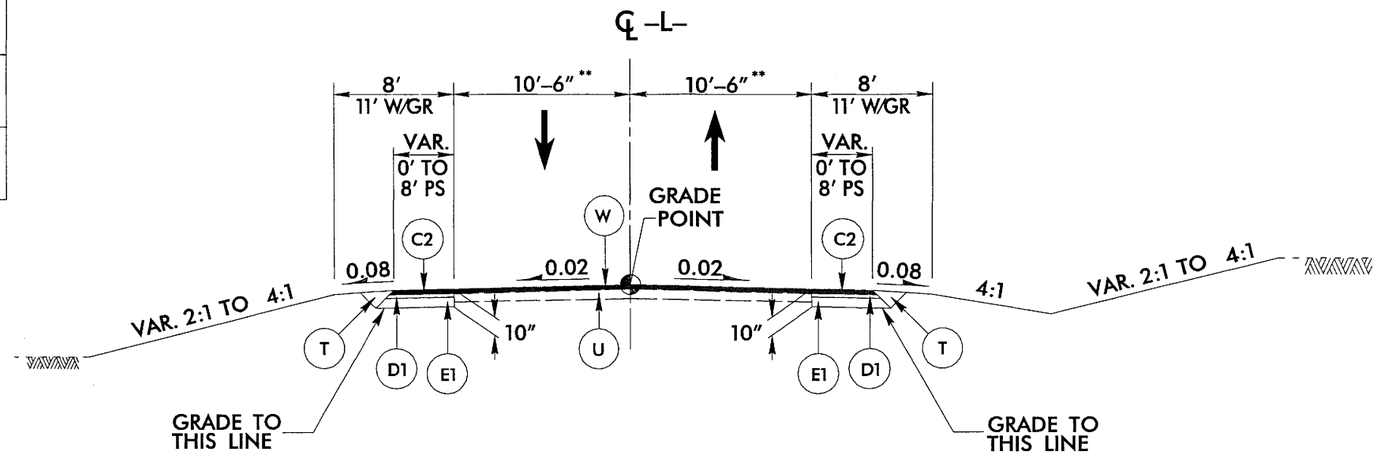
NOTE: PAVEMENT EDGE SLOPES ARE 1:1 UNLESS SHOWN OTHERWISE.



DETAIL SHOWING METHOD OF WEDGING

USE IN CONJUNCTION WITH TYPICAL SECTION NO. 1

** DESIGN EXCEPTION



TYPICAL SECTION NO. 1

USE TYPICAL SECTION NO. 1
AT THE FOLLOWING LOCATIONS

TRANSITION FROM EXISTING TO T.S. NO. 1 FROM
–L– STA. 14+25.00 TO STA. 14+75.00

–L– STA. 14+75.00 TO STA. 17+13.50 (BEGIN BRIDGE)
–L– STA. 18+28.50 (END BRIDGE) TO STA. 21+00.00
–L– STA. 23+50.00 TO STA. 24+05.00
–L– STA. 24+75.00 TO STA. 25+50.00

TRANSITION FROM T.S. NO. 1 TO EXISTING
–L– STA. 25+50.00 TO STA. 26+00.00

OVERLAY WITH C1 FROM
–L– STA. 21+00.00 TO STA. 23+50.00

2/22/2008
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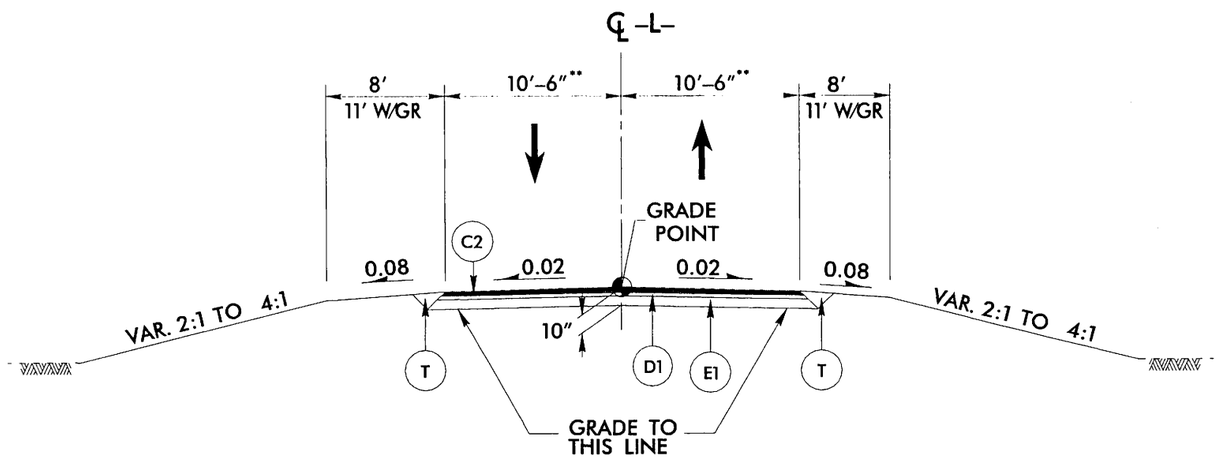
5/14/99

PROJECT REFERENCE NO.	SHEET NO.
B-4303	2-A
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

** DESIGN EXCEPTION

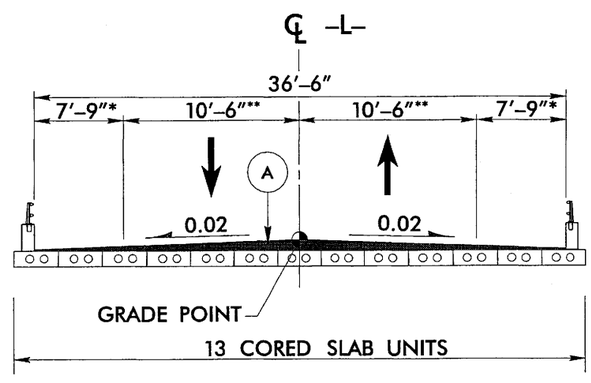


TYPICAL SECTION NO. 2

USE TYPICAL SECTION NO. 2
AT THE FOLLOWING LOCATIONS

-L- STA. 24+05.00 TO STA. 24+75.00

NOTE: SAW CUT AT -L- STA. 24+05.00 AND -L- STA. 24+75.00 FOR PAVEMENT REMOVAL



DETAIL OF BRIDGE

-L- STA 17+13.50 TO STA 18+28.50

SEE STRUCTURE PLANS FOR CONCRETE OVERLAY

* BRIDGE WIDENED FOR HYDRAULIC SPREAD & FUTURE 12' LANES

PAVEMENT SCHEDULE (FINAL PAVEMENT DESIGN)	
A	CONC. WEAR SURF.
C2	3" S9.5B
C3	VAR. S9.5B
D1	2½" I19.0B
E1	4½" B25.0B
T	EARTH MATERIAL

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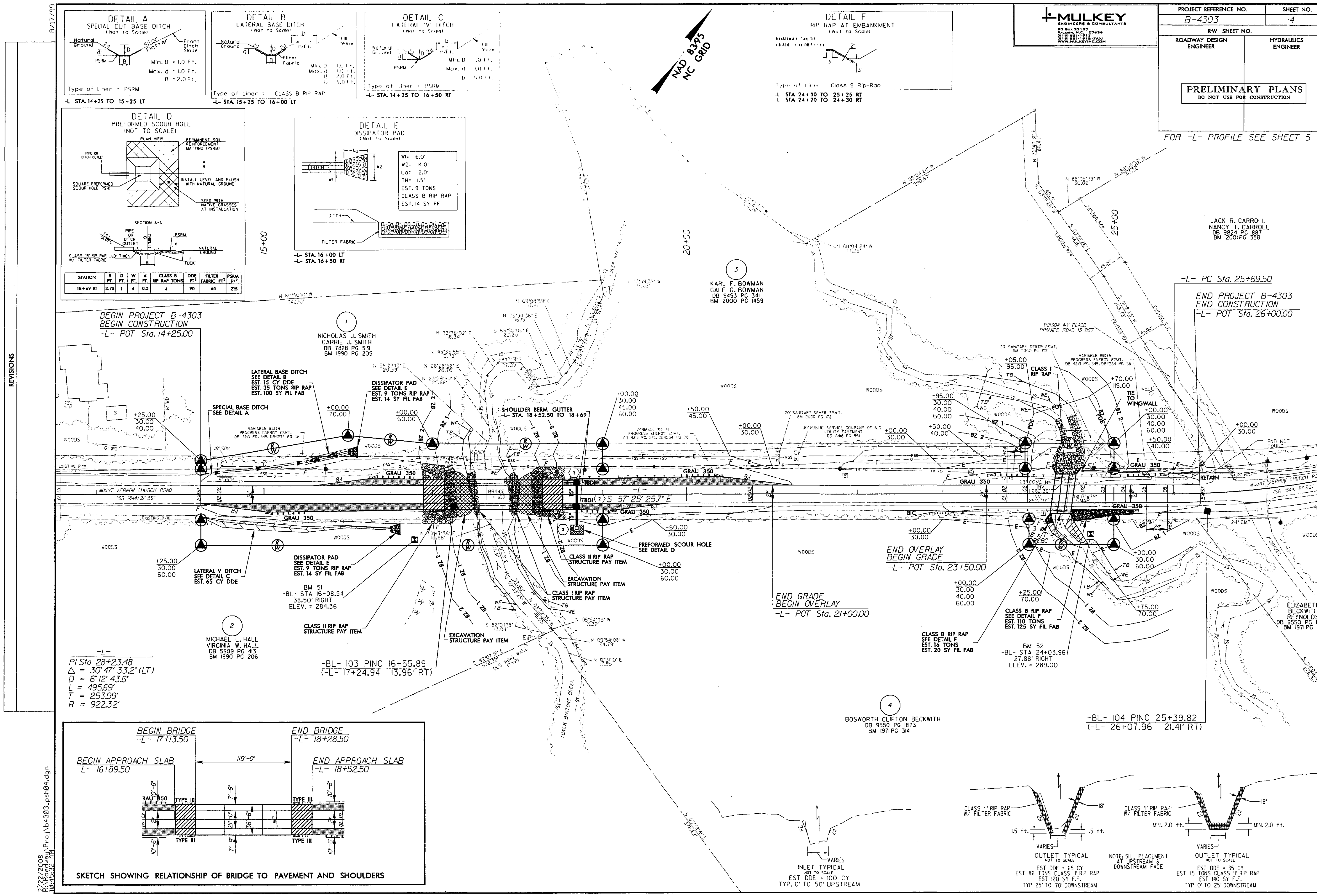
PROJECT REFERENCE NO. B-4303
SHEET NO. 4
R/W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
MULKEY ENGINEERS & CONSULTANTS
FOR -L- PROFILE SEE SHEET 5
NAD 83/95 NC GRID
DETAIL A
SPECIAL CUT BASE DITCH
(Not to Scale)
Min. D = 1.0 Ft.
Max. d = 1.0 Ft.
B = 2.0 Ft.
Type of Liner = PSRM
-L- STA. 14+25 TO 15+25 LT
DETAIL B
LATERAL BASE DITCH
(Not to Scale)
Type of Liner = CLASS B RIP RAP
-L- STA. 15+25 TO 16+00 LT
DETAIL C
LATERAL 'V' DITCH
(Not to Scale)
Type of Liner = PSRM
-L- STA. 14+25 TO 16+50 RT
DETAIL D
PREFORMED SCOUR HOLE
(NOT TO SCALE)
DETAIL E
DISSIPATOR PAD
(Not to Scale)
W1= 6.0'
W2= 14.0'
Lo= 12.0'
TH= 1.5'
EST. 9 TONS
CLASS B RIP RAP
EST. 14 SY FF
-L- STA. 16+00 LT
-L- STA. 16+50 RT
DETAIL F
RIP RAP AT EMBANKMENT
(Not to Scale)
Type of Liner = Class B Rip-Rap
-L- STA 24+50 TO 25+25 RT
-L- STA 24+70 TO 24+30 RT
BEGIN PROJECT B-4303
BEGIN CONSTRUCTION
-L- POT Sta. 14+25.00
END PROJECT B-4303
END CONSTRUCTION
-L- POT Sta. 26+00.00
-L- PC Sta. 25+69.50
END GRADE
BEGIN OVERLAY
-L- POT Sta. 21+00.00
END OVERLAY
BEGIN GRADE
-L- POT Sta. 23+50.00
NICHOLAS J. SMITH
CARRIE J. SMITH
DB 7828 PG 519
BM 1990 PG 205
MICHAEL L. HALL
VIRGINIA W. HALL
DB 5909 PG 413
BM 1990 PG 206
KARL F. BOWMAN
GALE C. BOWMAN
DB 9453 PG 341
BM 2000 PG 1459
BOSWORTH CLIFTON BECKWITH
DB 9550 PG 1873
BM 1971 PG 314
JACK R. CARROLL
NANCY T. CARROLL
DB 9824 PG 887
BM 2001 PG 358
ELIZABETH BECKWITH REYNOLDS
DB 9550 PG 1878
BM 1971 PG 316
MOUNT VERNON CHURCH ROAD
S 57° 25' 25.7" E
-L-
PI Sta 28+23.48
Δ = 30° 47' 33.2" (LT)
D = 6° 12' 43.6"
L = 495.69'
T = 253.99'
R = 922.32'
-BL- 103 PINC 16+55.89
(-L- 17+24.94 13.96' RT)
-BL- 104 PINC 25+39.82
(-L- 26+07.96 21.41' RT)
BM 51
-BL- STA 16+08.54
38.50' RIGHT
ELEV. = 284.36
BM 52
-BL- STA 24+03.96
27.88' RIGHT
ELEV. = 289.00
SHOULDER BERM GUTTER
-L- STA. 18+52.50 TO 18+69
PREFORMED SCOUR HOLE
SEE DETAIL D
CLASS II RIP RAP
STRUCTURE PAY ITEM
EXCAVATION
STRUCTURE PAY ITEM
CLASS I RIP RAP
STRUCTURE PAY ITEM
LATERAL BASE DITCH
SEE DETAIL B
EST. 15 CY DDE
EST. 35 TONS RIP RAP
EST. 100 SY FIL FAB
DISSIPATOR PAD
SEE DETAIL E
EST. 9 TONS RIP RAP
EST. 14 SY FIL FAB
SPECIAL BASE DITCH
SEE DETAIL A
LATERAL V DITCH
SEE DETAIL C
EST. 65 CY DDE
CLASS B RIP RAP
SEE DETAIL F
EST. 110 TONS
EST. 125 SY FIL FAB
CLASS B RIP RAP
SEE DETAIL F
EST. 16 TONS
EST. 20 SY FIL FAB
SKETCH SHOWING RELATIONSHIP OF BRIDGE TO PAVEMENT AND SHOULDERS
BEGIN BRIDGE
-L- 17+13.50
END BRIDGE
-L- 18+28.50
BEGIN APPROACH SLAB
-L- 16+89.50
END APPROACH SLAB
-L- 18+52.50
115'-0"
INLET TYPICAL
NOT TO SCALE
EST DDE = 100 CY
TYP. 0' TO 50' UPSTREAM
OUTLET TYPICAL
NOT TO SCALE
EST DDE = 65 CY
EST 86 TONS CLASS 'I' RIP RAP
EST 120 SY F.F.
TYP 25' TO 70' DOWNSTREAM
NOTE: SILL PLACEMENT AT UPSTREAM & DOWNSTREAM FACE
OUTLET TYPICAL
EST DDE = 35 CY
EST 115 TONS CLASS 'I' RIP RAP
EST 140 SY F.F.
TYP 0' TO 25' DOWNSTREAM
REVISIONS
8/17/99
2/22/2008
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5/28/99

BM-51
RAILROAD SPIKE IN 11" TWIN SWEET GUM
-BL- STA 16+09 38' RIGHT
EL = 284.36'
-L- STA 16+78.72 53.80' RIGHT

BM-52
RAILROAD SPIKE IN 18" POPLAR
-BL- STA 24+04 28' RIGHT
EL = 289.00'
-L- STA 24+72.78 47.45' RIGHT

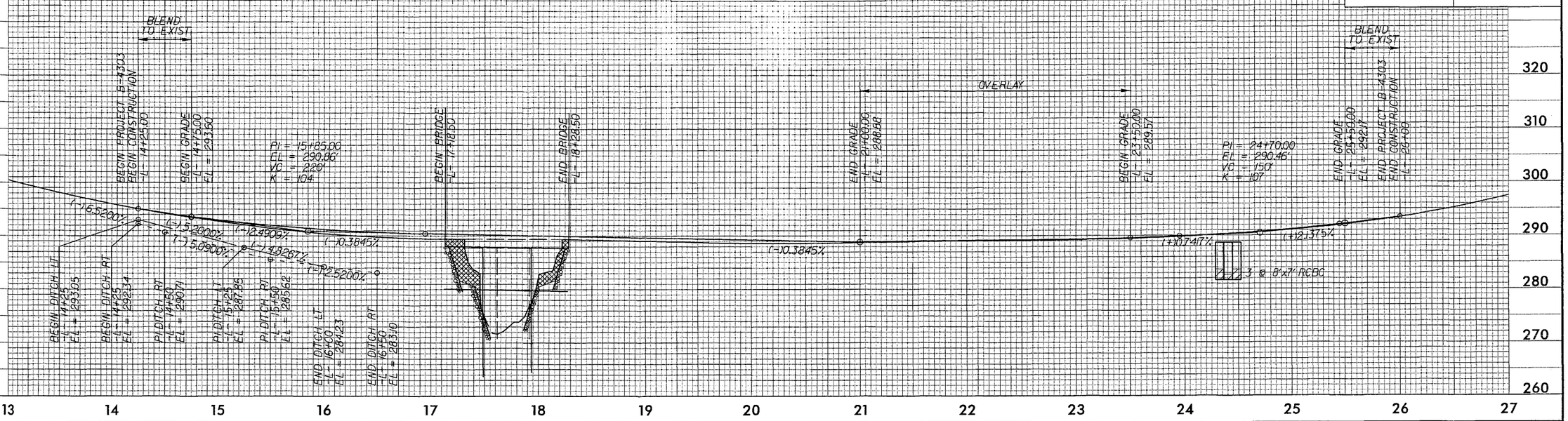
-L-

FOR -L- PLAN VIEW SEE SHEET 4

MULKEY
ENGINEERS & CONSULTANTS
PO BOX 32137
RALEIGH, N.C. 27626
(919) 851-1912
(919) 851-1918 (FAX)
WWW.MULKEYINC.COM

PROJECT REFERENCE NO.	SHEET NO.
B-4303	5
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



BRIDGE HYDRAULIC DATA

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DESIGN FREQUENCY	= 25	YRS
DESIGN HW ELEVATION	= 287.9	FT
BASE DISCHARGE	= 3300	CFS
BASE FREQUENCY	= 100	YRS
BASE HW ELEVATION	= 288.6	FT
OVERTOPPING DISCHARGE	= 3700	CFS
OVERTOPPING FREQUENCY	= 100+	YRS
OVERTOPPING ELEVATION	= 288.9	FT
DATE OF SURVEY	= 6-21-06	
W.S. ELEVATION AT DATE OF SURVEY	= 279.0	FT

CULVERT HYDRAULIC DATA

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DESIGN FREQUENCY	= 25	YRS
DESIGN HW ELEVATION	= 289.0	FT
BASE DISCHARGE	= 1200	CFS
BASE FREQUENCY	= 100	YRS
BASE HW ELEVATION	= 290.2	FT
OVERTOPPING DISCHARGE	= 1125	CFS
OVERTOPPING FREQUENCY	= 50 +/-	YRS
OVERTOPPING ELEVATION	= 290.0	FT

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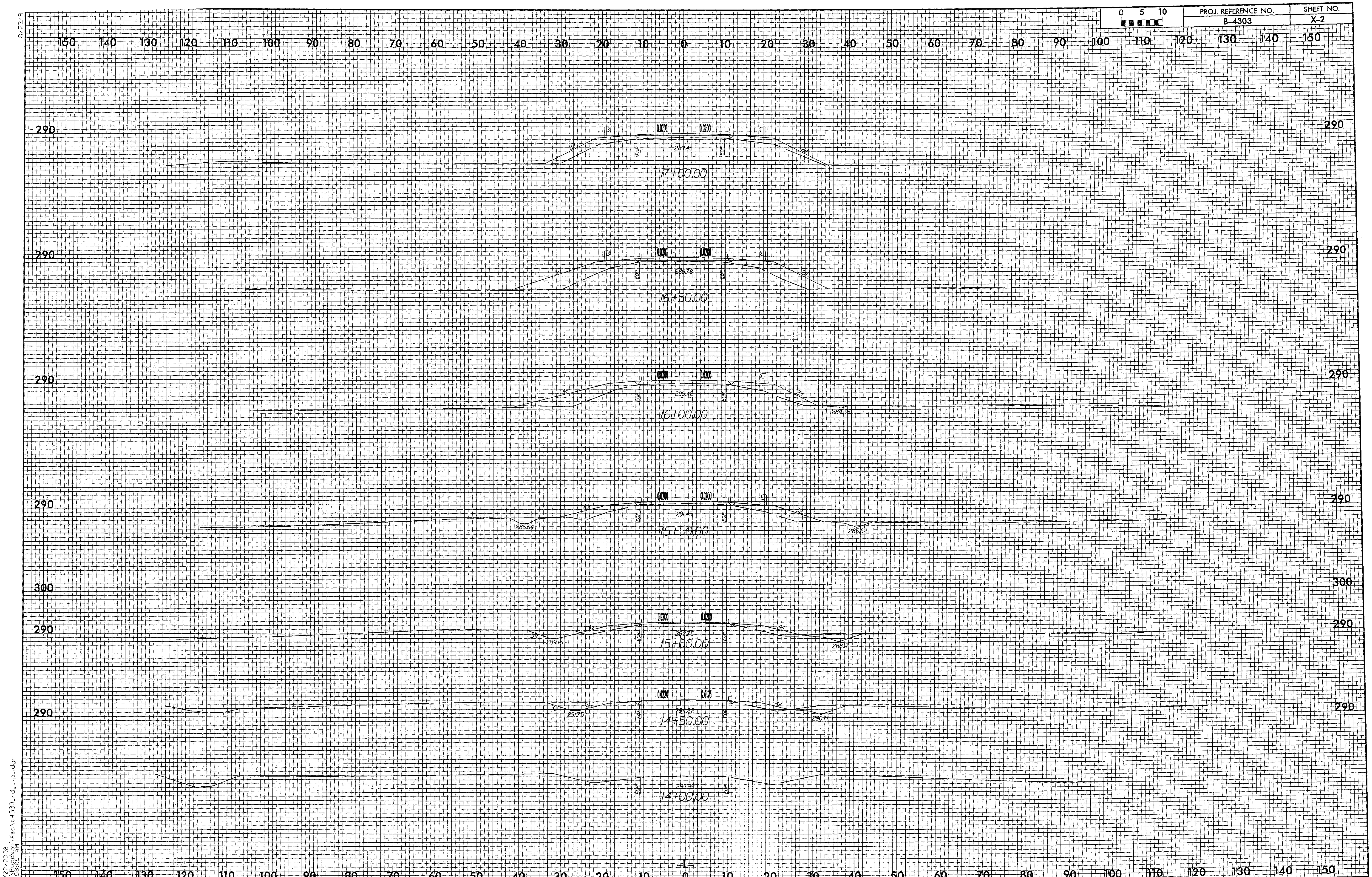
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B-4303
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-L-

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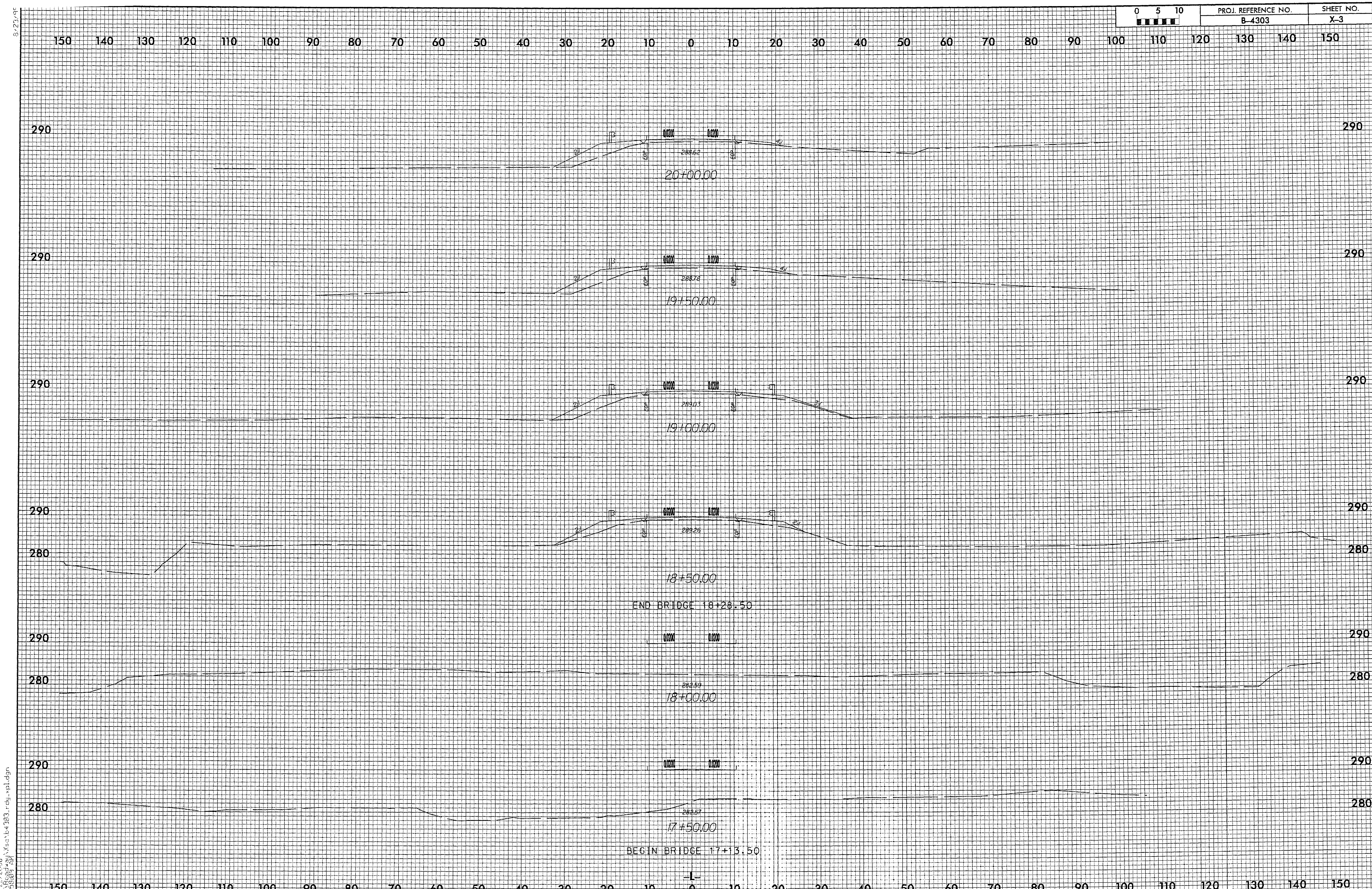

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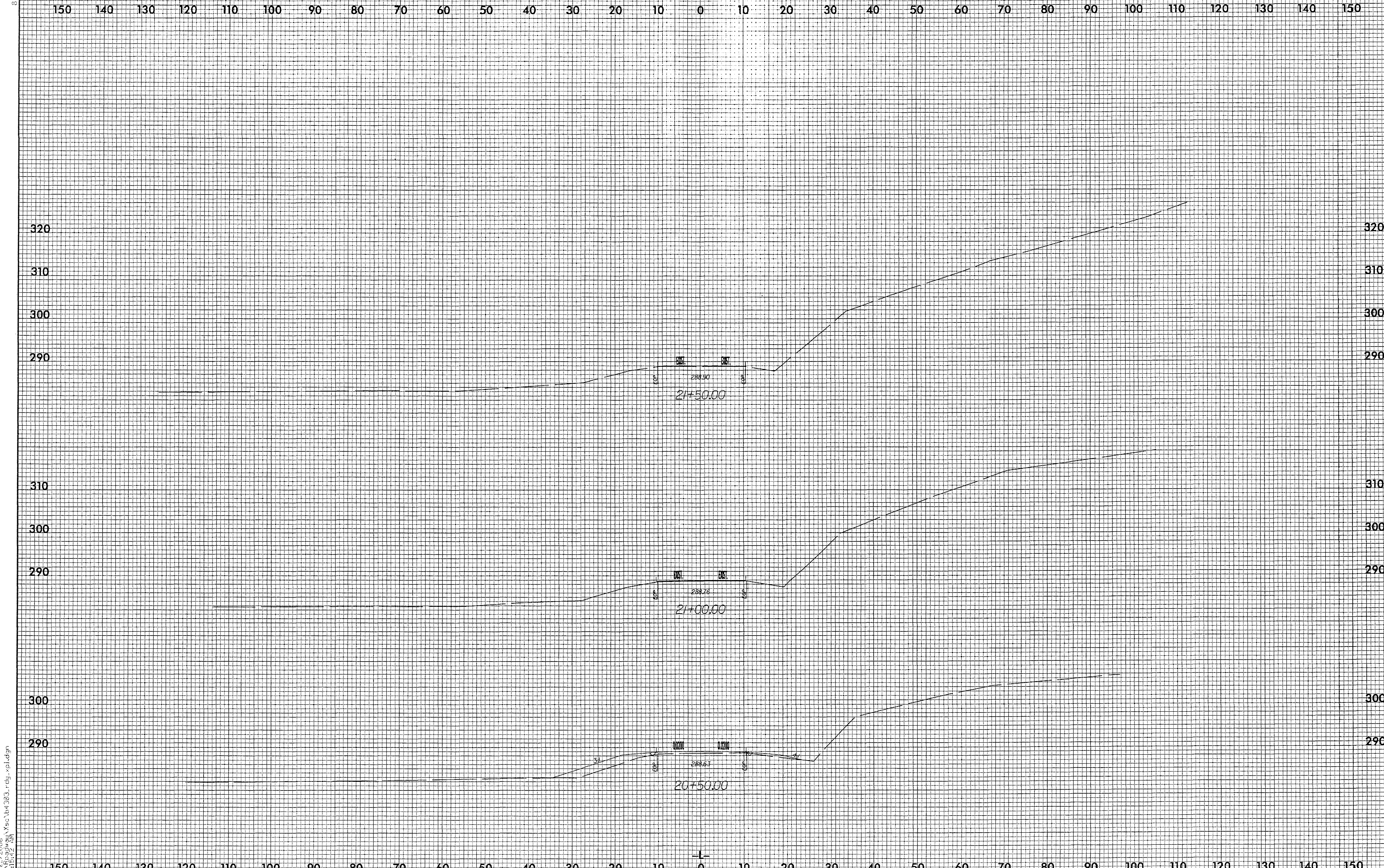

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DIST DIST
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DIST DIST
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DIST DIST
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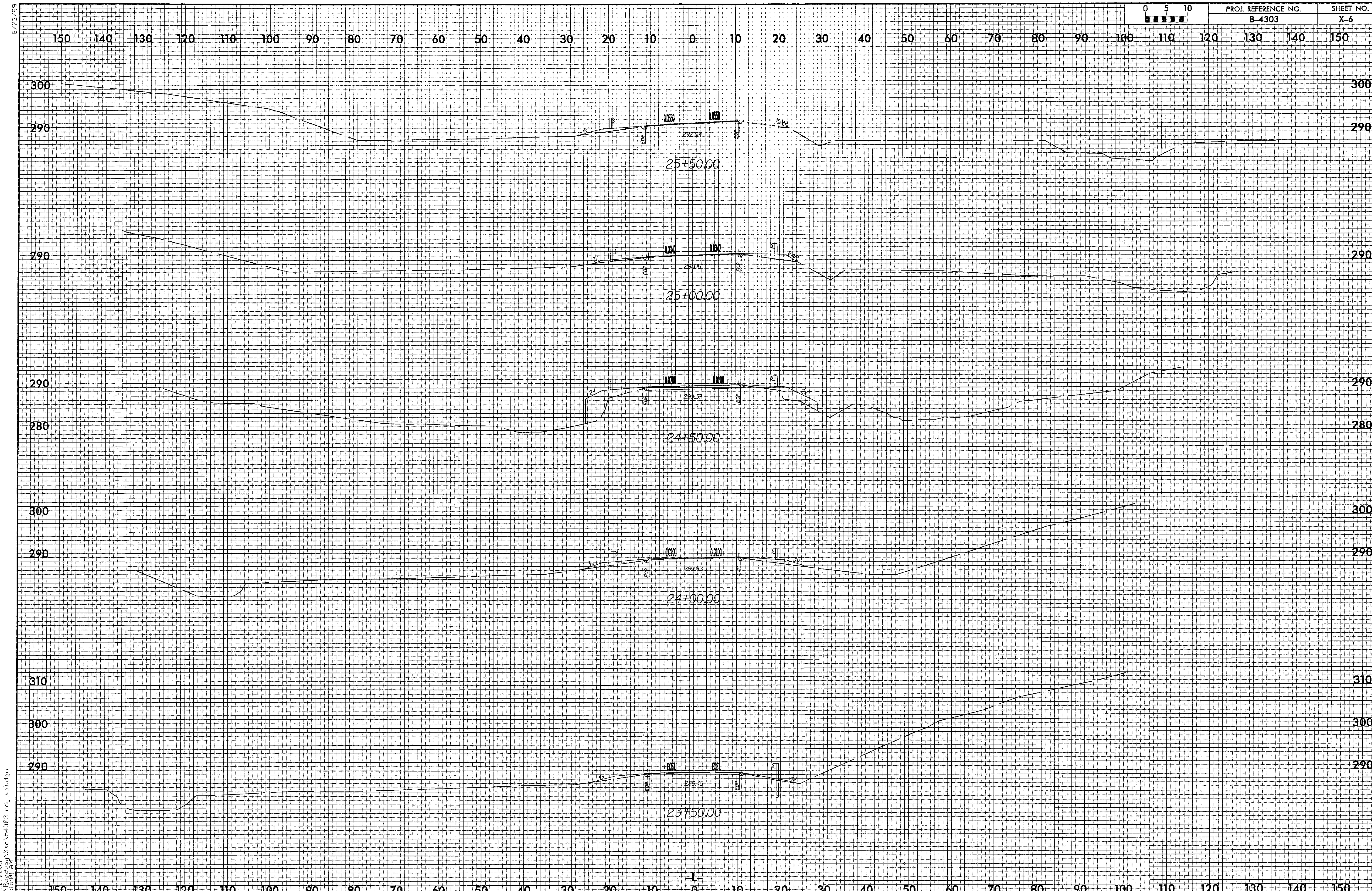

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-L-

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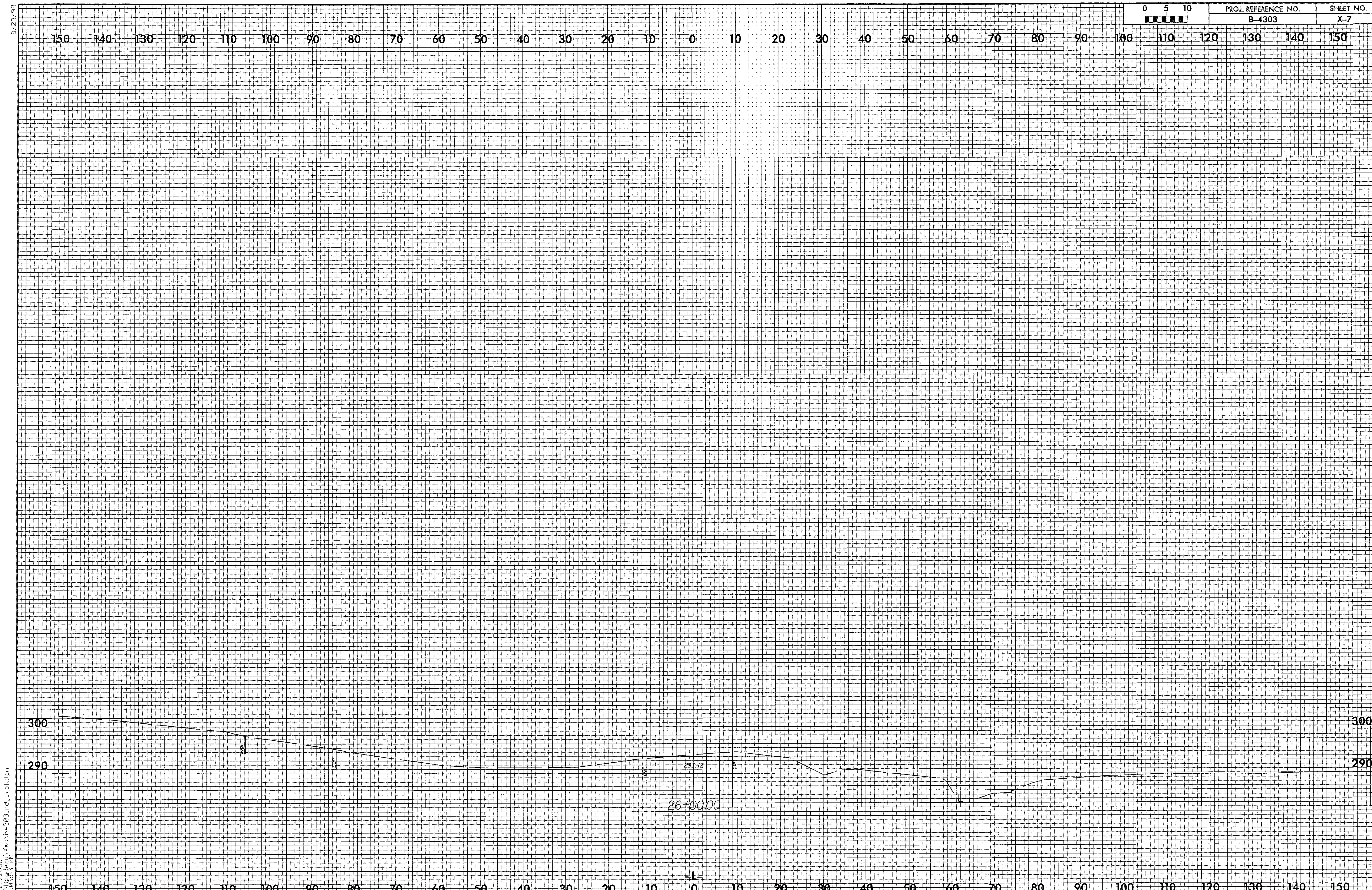

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WAKE COUNTY
BRIDGE NO. 102 ON SR 1844 (MT. VERNON CHURCH ROAD)
OVER LOWER BARTONS CREEK
FEDERAL-AID PROJECT NO. BRZ-1844(1)
STATE PROJECT NO. 8.2409401
WBS NO. 33640.1.1
T.I.P. NO. B-4303

CATEGORICAL EXCLUSION

UNITED STATES DEPARTMENT OF TRANSPORTATION

FEDERAL HIGHWAY ADMINISTRATION

AND

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

DIVISION OF HIGHWAYS

APPROVED:

4-16-07
Date

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

4/17/07
Date

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

WAKE COUNTY
BRIDGE NO. 102 ON SR 1844 (MT. VERNON CHURCH ROAD)
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STATE PROJECT NO. B.2409401
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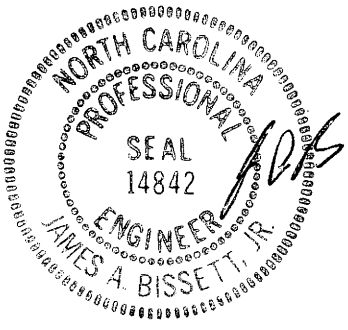
CATEGORICAL EXCLUSION

APRIL 2007

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

3-30-07
Date

J. A. Bissett, Jr., P.E.
Raleigh Branch Manager



3-30-07
Date

Nicole H. Bennett, AICP
Project Manager

FOR THE NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

4/10/07
Date

Theresa Ellerby
Project Manager
Consultant Engineering Group, Western Region

PROJECT COMMITMENTS

WAKE COUNTY
BRIDGE NO. 102 ON SR 1844 (MT. VERNON CHURCH ROAD)
OVER LOWER BARTONS CREEK
FEDERAL-AID PROJECT NO. BRZ-1844(1)
STATE PROJECT NO. 8.2409401
WBS NO. 33640.1.1
T.I.P. NO. B-4303

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:

PROGRAMMING AND TIP BRANCH, PROJECT DEVELOPMENT AND ENVIRONMENTAL ANALYSIS BRANCH

A municipal agreement will be necessary with the City of Raleigh to determine a cost-sharing agreement for expenses associated with the accommodation of the proposed greenway. During preparation of the agreement, these two branches should confer regarding the use of the Bridge Replacement funds for the entire project. The portion of the bridge required to accommodate a two-lane roadway will be funded with Bridge Replacement funds. Funding for the additional length will be determined at a future date.

STRUCTURES

Bicycle safe bridge railing will be provided.

WAKE COUNTY
BRIDGE NO. 102 ON SR 1844 (MT. VERNON CHURCH ROAD)
OVER LOWER BARTONS CREEK
FEDERAL-AID PROJECT NO. BRZ-1844(1)
STATE PROJECT NO. 8.2409401
WBS NO. 33640.1.1
T.I.P. NO. B-4303

INTRODUCTION: The replacement of Bridge No. 102 is included in the 2007-2013 North Carolina Department of Transportation (NCDOT) Transportation Improvement Program (TIP) 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

Bridge Maintenance Unit records indicate that Bridge No. 102 has a sufficiency rating of 7.0 out of a possible 100 for a new structure and is considered functionally obsolete and structurally deficient. The replacement of this inadequate structure will result in safer, more efficient traffic operations.

II. EXISTING CONDITIONS

Bridge No. 102 is located on SR 1844 (Mt. Vernon Church Road) over Lower Bartons Creek in Wake County, just south of Falls Lake near the Bayleaf community. SR 1844 is classified as Rural Local by the statewide functional classification system. It connects to NC 50 approximately 3.5 miles northwest of Bridge No. 102. Lower Bartons Creek is included in the *Capital Area Greenway Master Plan* (Figure 7).

Land use in the project area is primarily residential housing and forest.

The 2008 estimated average daily traffic (ADT) volume is 6,800 vehicles per day (vpd). The projected 2030 ADT is 11,800 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 1844 is 45 miles per hour (mph).

Bridge No. 102 was built in 1967. It is a tangent two-lane facility with a clear roadway width of 24 feet. The bridge has three spans and totals 90 feet in length. The deck is composed of prestressed concrete channels with asphalt overlay and the railings are steel. The substructure consists of precast prestressed concrete caps on timber piles, and reinforced concrete jacket piles. Height from roadway crown to streambed is 12 feet. Bridge No. 102 is posted at 22 tons for single vehicle and 22 tons for TTSTs.

There is a 118 inch by 79 inch corrugated metal pipe (CMP) on an unnamed tributary (UT) to Lower Bartons Creek approximately 600 feet east of Bridge No. 102. The pipe is in poor condition. No driveways are located between Bridge No. 102 and the CMP.

SR 1844 has two nine-foot travel lanes and six-foot grassed shoulders. The approaches to Bridge No. 102 are tangent. A horizontal curve with a radius of approximately 890 feet is located east of the CMP.

Overhead utility lines are located along the north side of SR 1844. Southern Bell and MCI underground utility markers indicate utilities on the south side of SR 1844. The underground utilities cross Lower Bartons Creek on poles. Utility impacts are anticipated to be low.

There are approximately 16 school bus crossings on Bridge No. 102 each day.

Two accidents were reported in the project area during the period from January 2004 through December 2006. There were no fatalities and neither accident involved injuries.

This section of SR 1844 is located on a route that is heavily used by bicycle traffic.

III. ALTERNATIVES

A. PROJECT DESCRIPTION

The recommended replacement structure is a bridge approximately 140 feet in length. The length may increase or decrease as necessary to accommodate peak flows as determined by further hydrologic studies. The bridge will provide two 10.5-foot travel lanes and 7.7-foot shoulders, for a total width of 36.4 feet (Figure 3A). The 7.7-foot shoulders anticipated are based on preliminary hydraulic design for deck drainage and future widening. A minimum 0.3 percent grade is recommended to facilitate deck drainage. Bicycle safe bridge railing 54 inches in height with two bar metal rails and concrete parapet will be provided.

Based on preliminary hydraulic analysis, the CMP is proposed to be replaced with a triple barrel 8-foot by 7-foot reinforced concrete box culvert.

The approach roadway in the project area will provide two 10.5-foot wide travel lanes with 8-foot grass shoulders (Figure 3A). The design speed will be 50 mph.

Lower Bartons Creek is part of the Capital Area Greenway Master Plan. Accommodating the greenway under the bridge increases the bridge length from 115 feet to the proposed 140 feet. This accommodation is contingent upon a municipal agreement with the City of Raleigh to determine a cost-sharing agreement for expenses associated with the increased bridge length.

A design exception will be needed for the lane width.

B. BUILD ALTERNATIVES

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

Alternative A (preferred) replaces the bridge and CMP at the existing locations (Figure 4A). During construction, traffic will be maintained with an off-site detour approximately five miles in length. The detour route will travel along SR 1834 (Norwood Road) and SR 1005 (Six Forks Road).

Alternative B replaces the bridge and CMP at the existing locations (Figure 4B). During construction, traffic will be maintained with an on-site detour north of the existing bridge. The detour bridge will be approximately 85 feet in length and provide two 10.5-foot travel lanes with 2-foot shoulders (Figure 3A). Three 54-inch pipes will be located at the crossing of the UT east of the bridge. The detour approach roadway will provide two 10.5-foot travel lanes with 8 foot grass shoulders and a design speed of 40 mph. Alternative B is not recommend because of greater impacts to the UT and residential property than Alternative A.

Alternative C replaces the bridge and CMP at the existing locations (Figure 4C). During construction, traffic will be maintained with an on-site detour south of the existing bridge. The detour bridge will be approximately 85 feet in length and provide two 10.5-foot travel lanes with 2-foot shoulders (Figure 3B). Three 54-inch pipes will be located at the crossing of the UT east of Bridge No. 102. The detour approach roadway will provide two 10.5-foot travel lanes with 8-foot grass shoulders and a design speed of 40 mph. Alternative C is not recommended because of greater impacts to the UT and forest than Alternatives A and B.

C. Alternatives Eliminated From Further Study

The "do-nothing" alternative will eventually necessitate closure of the bridge. This is not desirable because of the traffic service provided by SR 1844 and Bridge No. 102.

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

D. Preferred Alternative

Alternative A, replacing the bridge and CMP at existing locations while using an off-site detour for traffic, is the preferred alternative. Alternative A was selected because it minimizes impacts to residential property, forest and stream, is more economical, and has a shorter construction time than other alternatives considered.

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	Alternative C
Existing Structure Removal	$ 27,700	$ 27,700	$ 27,700
Existing Concrete Pipe Removal	1,100	1,100	1,100
Proposed Structure	573,300	573,300	573,300
Proposed Box Culvert	91,200	91,200	91,200
Roadway Approaches	233,900	424,000	550,000
Temporary Detour Bridge	0	116,900	116,900
Temporary Pipes	0	18,000	22,800
Detour Approaches	0	205,400	213,600
Miscellaneous and Mobilization	247,800	412,400	478,400
Engineering Contingencies	175,000	280,000	325,000
ROW/Const. Easements/Utilities	178,500	220,000	210,450
TOTAL	$1,528,500	$2,370,000	$2,610,450

The estimated cost of the project as shown in the 2007-2013 Transportation Improvement Program (TIP) is $1,762,000 including $200,000 in prior years, $200,000 for right-of-way, $12,000 for mitigation, and $1,350,000 for construction.

V. NATURAL RESOURCES

A. METHODOLOGY

Field investigations within the project area were conducted by qualified biologists on January 22, 2004. 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 topographical quadrangle maps (Bayleaf, North Carolina), U.S. Fish and Wildlife Service (USFWS) National Wetlands Inventory (NWI) maps, USGS aerial photomosaics of the project area, and Natural Resources Conservation Service (NRCS) soil survey maps of Wake County. Water resources information was obtained from publications of the North

Carolina Division of Water Quality (NCDWQ). Information concerning the occurrence of federal and state protected species within the project area and vicinity was gathered from the USFWS list of protected species and the 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). 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, as well as the U. S. Army Corps of Engineers' (USACE) Stream Quality Assessment Worksheet.

B. PHYSIOGRAPHY AND SOILS

The project study area is located in Wake County, approximately 13 miles south of the Town of Creedmoor and seven miles north of the City of Raleigh. Wake County is situated in the central part of the state in the Piedmont physiographic province. The geography of this county consists predominantly of rolling hills, with steep areas following major streams. Narrow, nearly level floodplains exist along most of the streams.

Elevations in the project area range from approximately 290 feet above mean sea level (msl) along Lower Bartons Creek to approximately 340 feet above msl at the far western end of the project.

The geology underlying the project area consists of two separate and distinct formations. The central portion of the study area consists of meta-ultramafic rock of the Raleigh Belt, while the remainder of the project area is mapped as a formation of biotite gneiss and schist of the Raleigh Belt. The meta-ultramafic rock formation is comprised primarily of intrusive metamorphosed dunite and peridotite, with serpentite and soapstone present in locales. This outcropping is found as a small isolated area associated with Lower Bartons Creek. The biotite geniss and schist formation is primarily comprised of the nominal minerals, with garnet, mica schist, amphibolite, and phyllite also present locally. This formation is mapped as a long, thin area stretching from Sanford to Grissom.

Four soil series are represented within the project area: Madison, Chewacla, Wilkes, and Lloyd. Soil mapping units within the study corridor include Chewacla soils (*Fluvaquentic Dystrocrepts*), Madison sandy loam (*Typic Hapludults*), Wilkes soils and Wilkes stony soils (*Typic Hapludalfs*), and Lloyd loam (*Typic Hapludults*).

Chewacla soils are nearly level, somewhat poorly drained soils with moderate to moderately-rapid permeability. The surface layer is brown sandy loam to silt loam, and the subsoil is brown sandy loam to clay. Surface runoff is slow and the hazard of flooding is severe. These soils typically occur in floodplains of streams and are mapped adjacent to Lower Bartons Creek.

Madison sandy loam soils are gently sloping to moderately steep, well drained, strongly acid soils with moderate permeability. The surface layer is brown sandy loam, and the subsoil is red clay to clay loam. Madison soils occupy the uplands on the western end of the project area, where they have slopes ranging from two to 15 percent. The hazard of erosion is very severe in the steeper areas.

Wilkes soils are moderately steep, well drained soils with moderate permeability and low available water capacity. The surface layer is yellowish brown to dark brown sandy loam to silt loam, and the subsoil is brown to gray sandy loam to clay loam. Wilkes soils are depicted within the study area as a thin strip along the UT to Lower Bartons Creek, and as a large area of stony soils in the south-central portion of the study area. The slopes of the Wilkes soils within the study area range from 15 to 45 percent. The hazard of erosion is severe due to the very rapid surface runoff and steep slopes.

Lloyd loam soils are gently sloping well drained soils with moderate permeability. The surface layer is reddish brown loam, and the subsoil is red clay loam to clay. Lloyd soils are located on uplands in the eastern end of the study area, where the slope ranges from two to 10 percent. Due to this soil's high agricultural potential many of these areas are significantly eroded.

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 Wake County soil survey, one Hydric B soil map unit occurs in the project area: Chewacla soils. According to NRCS, Chewacla soils are known to contain inclusions of Wehadkee soils. One area mapped as Chewacla located approximately 100 feet west of Lower Bartons Creek and approximately 100 feet south of Mount Vernon Church Road has been found to contain hydric inclusions. This area was determined to be a jurisdictional wetland, and is discussed later in this report.

C. WATER RESOURCES

1. Waters Impacted

All streams within the project vicinity are completely within the Neuse River Basin. The confluence of the Eno River and Flat River, which occurs immediately above the Falls Lake Reservoir dam, forms the Neuse River, near the Wake and Durham County boundaries. Lower Bartons Creek is a perennial stream that generally flows in a northerly direction toward Falls Lake with a drainage area of 7.8 square miles. Lower Bartons Creek is located within Neuse River Subbasin 03-04-01. The NCDWQ stream index number is 27-16-(1) and the USGS 8-digit hydrologic unit is 03020201.

2. Water Resource Characteristics

The NCDWQ classifies surface waters of the state based on their intended best uses. Lower Bartons Creek and the UT to Lower Bartons Creek are classified as "WS-IV NSW" waters. The "WS-IV" (drinking water supply) designation denotes that these waters lie within a water supply watershed, and are protected for uses such as aquatic life propagation and survival, fishing, wildlife, primary recreation, and agriculture. WS-IV waters are generally in moderately to highly developed watersheds or Protected Areas, and involve no categorical restrictions on discharges. Lower Bartons Creek is also considered Nutrient Sensitive Waters (NSW). This is a supplemental surface water classification assigned to waters needing additional nutrient management due to their susceptibility to excessive growth of microscopic or macroscopic vegetation. **No Outstanding Resource Waters (ORW), High Quality Waters (HQW), or Sensitive Water Supply Watershed (WS-I or WS-II) Waters occur within a three-mile radius of the project study area.**

Section 303(d) of the federal 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 waterbodies in the state. No 303(d) waters are located within one mile of the project study area.

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 eight AMS monitoring stations in this subbasin; however, there are no stations, within this subbasin, downstream of the project area. Lower Bartons Creek is not rated for use support within the project area.

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. A monitoring site is located along Upper Bartons Creek approximately two miles northwest of the project area. Data collected in 1995 indicated this site had a "Good" rating. The 2000 data gave this site a "Good-Fair" rating. This poorer rating is somewhat expected due to the increasing development within the Upper Bartons Creek watershed.

Bioclassification criteria have been developed that are based on the number and type of benthic macroinvertebrates (primarily Orders: Ephemeroptera, Plecoptera, and Tricoptera) present in streams and rivers because they are very sensitive to the effects of water pollution. Streams and river reaches are then given a bioclassification rating that ranges from Excellent to Poor based on benthic

macroinvertebrate collection data. A benthic macroinvertebrate sampling site is located on Upper Bartons Creek at NC Highway 50 approximately two miles northwest of the project study area. This site was sampled in 1995 and 2000 and was given a bioclassification rating of "Good-Fair" at both sampling events.

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 September 26, 2001 list of active NPDES permits issued by NCDWQ, there are 20 permitted dischargers within the 03-04-01 subbasin. There is one permitted discharger along Lower Bartons Creek: Wildwood Green WWTP, owned by Heater Utilities, Inc. This minor domestic waste discharger is located approximately 1.5 miles southwest and upstream of the project area, and is permitted to release 0.1 million gallons a day (MGD). No violations have been reported.

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 made during the site visit, both Lower Bartons Creek and the UT to Lower Bartons Creek appear to be C4 type channels at the bridge site. Lower Bartons Creek and the UT to Lower Bartons Creek have a moderate flow over a substrate of silt, sand, gravel, and cobble. Table 2 provides further details of stream characteristics within the project study area. Stream rating forms are included in the Appendix.

Table 2. Approximate Stream Dimensions for Surface Waters

Stream	Bankfull Width	Channel Width	Bank Height	Water Depth	
				Riffle	Pool
Lower Bartons Creek	20 feet	25 feet	4 feet	6 to 12 inches	2 to 4 feet
UT to Lower Bartons Creek	10 feet	15 feet	3 feet	3 to 6 inches	1 to 2 feet

3. Anticipated Impact to Water Resources

a. General Impacts

Short-term impacts to water quality from construction-related activities include increased sedimentation and turbidity. Long-term construction related impacts to water resources include substrate destabilization, bank erosion, increased turbidity, altered flow rates, and possible temperature fluctuations within the channel due to removal of streamside vegetation.

No adverse long-term impacts to water resources are expected to result from the alternative being studied. The proposed project calls for replacing the bridge and CMP at the existing locations. This will allow for continuation of present stream flow within the existing channels.

4. Impacts Related to Bridge Demolition and Removal

The deck is composed of prestressed concrete channels and the railings are steel. The substructure consists of precast prestressed concrete caps on timber piles, and reinforced concrete jacket piles. The rails will be removed without dropping them into Waters of the U. S. There is potential for components of the concrete deck and concrete caps to be dropped into Waters of the U. S. during construction. The resulting potential temporary fill associated with the concrete deck and concrete substructure components is approximately 31 cubic yards. Best Management Practices for Construction and Maintenance Activities will be adhered to.

D. BIOTIC RESOURCES

1. Plant Communities

The field survey team observed three plant communities in the project study area: Piedmont alluvial forest, mixed pine-hardwood forest, and urban/disturbed community. These communities are described below.

a. Piedmont Alluvial Forest

The Piedmont alluvial forest community occurs along river and stream floodplains in the Piedmont with small, indistinguishable fluvial landforms and vegetation zones. It is best classified as a variation of Schafale and Weakley's Piedmont Alluvial Forest type. This vegetative community is situated immediately adjacent to Lower Bartons Creek in the study area and has witnessed past disturbance due to agriculture and the presence of an old road. The canopy and understory are somewhat open throughout.

Dominant tree species observed in the canopy and understory layers include river birch (*Betula nigra*), sycamore (*Platanus occidentalis*), red maple (*Acer rubrum*), umbrella magnolia (*Magnolia tripetala*), slippery elm (*Ulmus rubra*), musclewood (*Carpinus caroliniana*), and yellow poplar (*Liriodendron tulipifera*). Shrubs and vines include American holly (*Ilex opaca*), silky dogwood (*Cornus amomum*), greenbriar (*Smilax rotundifolia*), Japanese honeysuckle (*Lonicera japonica*), and poison ivy (*Toxicodendron radicans*). The herbaceous community is diverse, with dominant species including giant cane (*Arundinaria gigantea*), goldenrod (*Solidago* spp.), Christmas fern (*Polystichum acrostichoides*), rushes (*Juncus coriaceus* and *J. effusus*), velvet grass (*Dichanthelium scoparium*), and creeping grass (*Microstegium vimineum*).

b. Mixed Pine-Hardwood Forest

The mixed pine-hardwood forest community is located immediately upslope of the alluvial forest and dominates the project area. This community appears to be a variation of the Mesic Mixed Hardwood Forest (Piedmont Subtype) identified by Schafale and Weakley, with increased amounts of pine. This community type occurs on acidic soils in lower slopes, steep north-facing slopes, ravines, and occasionally well-drained small stream bottoms. Under natural conditions these communities are uneven-aged, with old trees present. Reproduction occurs mainly in canopy gaps, with disturbed areas having increased amounts of pines and weedy hardwoods such as yellow poplar and sweetgum (*Liquidambar styraciflua*).

In the project area, dominant canopy and subcanopy species include red maple, loblolly pine (*Pinus taeda*), pignut hickory (*Carya glabra*), yellow poplar, northern red oak (*Quercus rubra*), white oak (*Q. alba*), black oak (*Q. velutina*), American beech (*Fagus grandifolia*), sourwood (*Oxydendrum arboreum*), and sweetgum. Small trees and shrubs include tag alder (*Alnus serrulata*), eastern red cedar (*Juniperus virginiana*), willow oak (*Quercus phellos*), flowering dogwood (*Cornus florida*), winterberry (*Ilex verticillata*), possum haw (*I. decidua*), and highbush blueberry (*Vaccinium corymbosum*). Vines present within the study area include crossvine (*Bignonia capreolata*), poison ivy, greenbriar, muscadine grape (*Vitis rotundifolia*), and Japanese honeysuckle. The herbaceous vegetation consists primarily of giant cane, partridge berry (*Mitchella repens*), and mock strawberry (*Duchesnea indica*).

A variation of the mixed pine/hardwood forest is located in the south-central portion of the study area. This community contains most of the same species as mentioned above; however, it is dominated by American beech and no loblolly pine is present. In addition, plants such as wild ginger (*Hexastylis* spp.) and large-whorled pogonia (*Isotria verticillata*) are present along the steep, rocky, and ultramafic slopes of this somewhat unique area.

c. Urban/Disturbed Community

The urban/disturbed community consists of areas that are periodically maintained by human influences, such as roadside and power line rights-of-way, regularly mowed lawns, and open areas. Within the project area, residences are present on the western and eastern ends and a maintained roadside is present through the center and at the western and eastern ends. Characteristic species include microstegium, goatsbeard (*Aruncus dioicus*), dog fennel (*Eupatorium capillifolium*), English plantain (*Plantago lanceolata*), broomsedge (*Andropogon virginicus*), lespedeza (*Lespedeza* spp.), panic grass (*Panicum* spp.), fescue (*Festuca* spp.), paspalum (*Paspalum* spp.), and horse nettle (*Solanum carolinense*). A disturbed area located immediately west of the UT to Lower Bartons Creek and north of Mt. Vernon Church Road contains rushes (*Juncus* spp.), sedges (*Carex* spp.), flatsedge (*Cyperus* spp.), ironweed (*Vernonia* spp.), smartweed (*Polygonum* spp.), and bishop-weed (*Ptilimnium capillaceum*).

2. Wildlife

The project area was visually surveyed for signs of terrestrial and aquatic wildlife. The forested and urban/disturbed communities offer moderate diversity of foraging, nesting, and cover habitat for many species of amphibians, reptiles, birds, and mammals. 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*). These animals inhabit fields, woodlands, river bottoms, and stream edges of the upper Coastal Plain and Piedmont of North Carolina.

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*), blue jay (*Cyanocitta cristata*), Carolina chickadee (*Parus carolinensis*), tufted titmouse* (*P. bicolor*), white-breasted nuthatch (*Sitta carolinensis*), American robin* (*Turdus migratorius*), northern cardinal* (*Cardinalis cardinalis*), northern mockingbird* (*Mimus polyglottos*), 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*), beaver (*Castor canadensis*), muskrat (*Ondatra zibethicus*), and white-tailed deer (*Odocoileus virginianus*) are species most 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

A visual survey of streams in the project area found many mayflies (Order: Ephemeroptera) and caddisflies (Order: Trichoptera), and a few stoneflies (Order: Plecoptera).

The project area likely has a limited amphibian population, which may include salamanders and frogs. Potential species include the two-lined salamander (*Eurycea cirrigera*), spring peeper (*Pseudacris crucifer*), pickerel frog (*Rana palustris*), northern cricket frog (*Acris crepitans*), and upland chorus frog (*Pseudacris triseriata*).

Reptiles that spend the vast majority of their lives in aquatic communities and are somewhat common throughout this portion of North Carolina include the snapping turtle (*Chelydra serpentina*), eastern musk turtle (*Sternotherus odoratus*), yellowbelly slider (*Chrysemys scripta*), and northern water snake (*Nerodia sipedon*).

Fish that are likely to utilize Lower Bartons Creek include yellow bullhead (*Ameiurus natalis*), largemouth bass (*Micropterus salmoides*), American eel (*Anguilla rostrata*), rosyside dace (*Clinostomus funduloides*), and creek chub (*Semotilus atromaculatus*). These fish thrive in habitats like the moderate flowing, mixed substrate waters present within Lower Bartons Creek.

4. Anticipated Impacts to Biotic Communities

a. Terrestrial Communities

The study area consists of approximately 5.4 acres of Piedmont alluvial forest, 8.8 acres of mixed pine/hardwood forest, and 2.2 acres of urban/disturbed land. Table 3 depicts anticipated permanent and temporary impacts to terrestrial biotic communities based upon the approximate construction limits of the three alternatives.

Table 3. Estimated Impacts for Proposed Alternatives

Vegetative Community	Alternative A (preferred)	Alternative B		Alternative C	
	Permanent	Permanent	Detour	Permanent	Detour
Piedmont Alluvial Forest	0.72 acre	0.72 acre	0.91 acre	0.72 acre	1.19 acres
Mixed Pine/Hardwood Forest	0.05 acre	0.05 acre	0.58 acre	0.05 acre	1.26 acres
Urban/Disturbed Land	0.04 acre	0.04 acre	0.39 acre	0.04 acre	none

For Alternatives B and C, all anticipated impacts greater than those for Alternative A may be considered temporary because they involve the construction of temporary on-site detours. The on-site detour routes would be removed and impacted areas replanted after the completion of construction.

b. Wetland Communities

One area of jurisdictional wetlands, occupying approximately 0.03 acre, is located approximately 100 feet south of Mt. Vernon Church Road and approximately 100 feet west of Lower Bartons Creek within the project study area. The jurisdictional wetland is found at the lowest point in the project area between the back of the natural stream levee and the toe of the upland slope. There are no permanent or temporary wetland impacts associated with this project.

c. Aquatic Communities

Aquatic organisms are very sensitive to the discharges and inputs resulting from construction activities. Appropriate measures must be taken to avoid spills and control runoff. Such measures will include an erosion and sedimentation control plan, provisions for disposal and handling of waste materials and storage, stormwater management measures, and appropriate road maintenance measures. Long-term impacts to water resources may include permanent changes to the stream banks and temperature increases caused by the removal of stream-side vegetation.

The removal of stream-side vegetation and placement of fill material during construction contributes to erosion and possible sedimentation. Quick revegetation of these areas helps to reduce the impacts by supporting the underlying soils. Erosion and sedimentation may carry soils, toxic compounds, trash, and other materials into the aquatic communities at the construction site.

Impacts usually associated with in-stream construction include increased channelization and scouring of the streambed. In-stream construction alters the substrate and impacts adjacent stream-side 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.

E. SPECIAL TOPICS

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

Section 404 of the Clean Water Act (CWA) requires regulation of discharges into "Waters of the United States." The U.S. Environmental Protection Agency (USEPA) is the principal administrative agency of the Clean Water Act; however, the USACE has the responsibility for implementation, permitting, and enforcement of the provisions of the Act. The USACE regulatory program is defined in 33 CFR 320-330.

Section 401 of the Clean Water Act 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 NCAC 15A, the NCDWQ has the responsibility for implementation, permitting, and enforcement of the provisions of the CWA.

Wetlands, defined in 33 CFR 328.3, are those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. One area of jurisdictional wetlands, occupying approximately 0.03 acre, is located approximately 100 feet south of Mt. Vernon Church Road and approximately 100 feet west of Lower Bartons Creek within the project study area. The jurisdictional wetland is found at the lowest point in the project area between the back of the natural stream levee and the toe of the upland slope. The wetland is classified by the USFWS as a Palustrine-Forested Seasonally Saturated wetland system (PFO1E). Detailed hydric soils, wetland hydrology, and hydrophytic vegetation information associated with this jurisdictional wetland (verified by the USACE January 31, 2005) is in the USACE data forms included in the Appendix.

Stream impacts are estimated as follows: Alternative A (preferred), 18.5 linear feet; Alternative B, 62 linear feet, and Alternative C, 453 linear feet. The impacts are greater for Alternatives B and C because those alternatives involve on-site detours and potential channel work. There are no permanent or temporary wetland impacts associated with this project.

2. Permits

Permits may be required for roadway encroachment into jurisdictional wetlands and surface waters. The USACE issues Section 404 Nationwide 23 permits for activities that are categorically excluded from environmental documentation because it is included within a category of actions that do not have a significant effect on the environment.

The USACE issues Nationwide Permit 33 when construction activities necessitate the use of temporary structures such as cofferdams, placement of access fill material, or dewatering of the construction site.

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. If written concurrence is required, the NCDWQ must issue the 401 Certification before the USACE will issue the 404 permit.

The bridge demolition activities associated with this replacement will strictly follow NCDOT's *Best Management Practices for Construction and Maintenance Activities.* All methods of demolition shall be considered and implemented where practical, other than dropping the bridge in the water. The steel bridge rails can be removed without being dropped into Waters of the U.S.; however, there is potential for components of the concrete deck and concrete substructure to be dropped into Waters of the U.S. Permitting will be coordinated such that any permit needed for bridge construction will address issues related to bridge demolition. If there is a practical alternative to dropping bridge components into the water, that alternative shall be followed.

3. Buffer Rules

The Neuse River Riparian Buffer Rules apply to 50-foot wide riparian buffers directly adjacent to perennial and intermittent surface waters in the Neuse River Basin. The Neuse River Buffer rules do not apply to portions of the riparian buffer where a use is existing and ongoing. Any change in land use within the riparian buffer is characterized as an impact. The Nutrient Sensitive Waters Management Strategy for the Protection and Maintenance of Riparian Buffers (15 A NCAC 2B .0233) provides a designation for uses that cause impacts to riparian buffers within the Neuse Basin.

Simple perpendicular bridge crossings are designated **Allowable** within the riparian buffer, assuming project impacts are below 150 linear feet of buffer (measured parallel to the stream) and/or 0.33 acre. The **Allowable** designation means that the intended uses may proceed within the riparian buffer provided that there are no practical alternates, and that written authorization from the Division of Water Quality is obtained prior to project development. **Allowable with Mitigation** buffer impacts for bridge replacement projects are addressed when parallel impacts to jurisdictional waters occur, and when a bridge or culvert is replaced with a culvert. **Allowable** and **Allowable with Mitigation** buffer impacts require written authorization from the Division of Water Quality prior to project development. Table 4 describes the anticipated Neuse River Buffer impacts for this bridge replacement project.

Table 4. Estimated Neuse River Buffer Impacts

Proposed Alternatives	Alternative A (preferred)	Alternative B		Alternative C	
	Permanent	Permanent	Detour	Permanent	Detour
Buffer Impacts Allowable	< 0.01 acre	<0.01 acre	0.08 acre	<0.01 acre	0.07 acre
Buffer Impacts Allowable with Mitigation	0.07 acre	0.07 acre	0.14 acre	<0.07 acre	0.32 acre
Total Neuse River Impacts	<0.08 acre	<0.08 acre	0.22 acre	<0.08 acre	0.39 acre

4. Mitigation

Mitigation of wetland impacts has been defined by the Council on Environmental Quality to include avoidance, minimization, and compensation. These activities must 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 for this roadway to completely avoid Lower Bartons Creek and UT to Lower Bartons Creek and still meet the purpose and need of the project.

Minimization includes the examination of appropriate and practicable steps to reduce adverse impacts to Waters of the U.S. All of the alternatives are minimizing the amount of in-stream impacts to Lower Bartons Creek by replacing the existing bridge with another bridge and not a culvert or pipe. All of the alternatives propose bridges that are longer than the existing bridge, minimizing floodplain impacts. All of the alternatives will maintain cut/fill slopes no shallower than 2:1. By replacing the bridge in-place and having an off-site detour, Alternative A further minimizes the impacts to the streams and floodplain associated with Lower Bartons Creek and the UT to Lower Bartons Creek.

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 one acre of wetlands or more than 150 linear feet of perennial or intermittent streams. No compensatory wetland mitigation is anticipated.

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 action likely to adversely affect a species classified as federally-protected be subject to review by the USFWS. Species may receive additional protection under separate federal or state laws.

1. Federally Protected Species

Species which are listed, or are proposed for listing, as endangered or threatened are recorded in Section 4 of the ESA. As of the latest list updated March 9, 2006, and reviewed February 2007, the USFWS identified three Endangered (E) species and one Threatened (T) species known to occur in Wake County.

NCNHP maps were reviewed on February 19, 2007 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 study area. Table 5 provides federal protected species in Wake County. Species descriptions follow.

Table 5. Threatened & Endangered Species Listed for Wake County, North Carolina

Common Name	Scientific Name	Federal Listing	State Listing
Bald eagle	*Haliaeetus leucocephalus*	Threatened (Proposed for delisting)	Threatened
Red-cockaded woodpecker	*Picoides borealis*	Endangered	Endangered
Dwarf wedge mussel	*Alasmidonta heterodon*	Endangered	Endangered
Michaux's sumac	*Rhus michauxii*	Endangered	Endangered-Special concern

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

The bald eagle is a very large bird of prey that ranges in size from 32 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 water (usually within one-half mile) with a clear flight path to the water. Nests are often 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.

Biological Conclusion: *No Effect*

As of July 6, 1999, this species is currently 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. Bald eagles are a year-round and transient species in North Carolina.

Suitable habitat for bald eagles, consisting of areas of open water, does not exist in the project study area nor within a one-mile radius of Bridge No. 102. Proposed project construction will have **No Effect** on this species.

Red-cockaded woodpecker (*Picoides borealis*)
Federal 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 pine dominated, foraging habitat. The foraging range of the RCW may extend 500 acres and must be contiguous (separated by no more than 330 linear feet) 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. Cavities are located from 12 to 100 feet above ground level and below live branches. These trees can be identified by the presence of large white encrustations of running sap that surrounds the tree, often referred to as "candlesticks." 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 the RCW consisting of open, mature stands of southern pines does not exist within the project area. The pines that are present in the project area are present in hardwood dominated forests, are young (<30 years old), and the forests contain a thick understory. NCNHP maps were reviewed on February 18, 2004 and in March 2005 to determine if any protected species have been identified at or near the project area. This map review confirmed that no RCWs are known to occur within a one-mile radius of the project study area. Based upon the absence of suitable habitat this project will have **No Effect** on the RCW.

Dwarf wedge mussel (*Alasmidonta heterodon*)
Federal 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: the tessellated darter, Johnny darter, and mottled sculpin. These fish species are found in Atlantic coast drainages of North Carolina.

Biological Conclusion: ***No Effect***

Suitable habitat for the dwarf wedge mussel consisting of nearly silt-free streams, with slow to moderate currents is marginally present within the project study area. The most recent freshwater mussel survey at the bridge site on November 4, 2004 found no freshwater mussels. The only mollusks present were individuals of the introduced Asiatic clam (*Corbicula fulminea*). Past surveys conducted by the North Carolina Wildlife Resources Commission in 1991 and by qualified biologists in March 2004 found no dwarf wedge mussel individuals in Lower Bartons Creek near the bridge site. A letter regarding the project site is included in the Appendix.

NCNHP maps were reviewed on February 18, 2004 and in March 2005. The map reviews confirmed that no populations of dwarf wedge mussel are known to occur within a one-mile radius of the project study area. Based on finding no dwarf wedge mussel individuals within Lower Bartons Creek, the replacement of Bridge No. 102 will have **No Effect** on the dwarf wedge mussel.

Michaux's sumac (*Rhus michauxii*)
Federal Status: Endangered

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 consisting of sandy or rocky open woods is not present in the project study area; however, roadside habitats do exist within the project study area. Soils in the upland portions of the project study area are clayey textured, vegetated areas characterized by dense undergrowth. The open roadside areas provide marginal habitat for Michaux's sumac and are characterized by narrow and steep grassy areas. A plant by plant survey for Michaux's sumac was conducted within the project study area on November 8, 2004.

NCNHP maps were reviewed on February 18, 2004 and in March 2005 to determine if any protected species have been identified at or near the project study area. This map review confirmed that no populations of Michaux's sumac are known to occur within a one-mile radius of the project site. Based on finding no Michaux sumac individuals within the project study area, the replacement of Bridge No. 102 will have **No Effect** on Michaux's sumac.

2. Federal Species of Concern

The USFWS lists 14 Federal Species of Concern (FSC) that are known to occur in Wake County (Table 6). Federal Species of Concern 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, that 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.

One State Threatened (T) species, one State Concern (SC) species, and three Significantly Rare (SR) species have been identified within three miles of the project study area. The State Threatened plant, bog spicebush (*Lindera subcoriacea*), is mapped approximately 2.5 miles southwest of the project area. According to the NCNHP, this population was destroyed during the construction of I-540. Populations of the State Concern amphibian, four-toed salamander (*Hemidactylium scutatum*), are depicted approximately two miles northeast and north of the project area, along the fringes of Falls Lake. Populations of the State Rare crustacean, Carolina ladle crayfish (*Cambarus davidi*), are located approximately 1,500 feet northeast and approximately two miles north of the study area. A population of the State Rare and Federal fish, pinewoods shiner (*Lythrurus matutinus*), has been observed approximately two miles northwest of the study area. Lastly, a population of the State Rare plant, western rough goldenrod (*Solidago radula*), is mapped approximately 2.5 miles southwest of the study area.

In addition, one locale denoted as an "Identified Priority Area" is located within and adjacent to the project area. This area, referred to as the Lower Bartons Creek Ultramafic Slopes by NCNHP, is located in the south-central portion of the study area. This region of the study area contains steep slopes and is dominated by American beech. This Identified Priority Area comprises approximately 15 acres and continues from the project area southwest along the eastern banks of Lower Bartons Creek.

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

Common Name	Scientific Name	State Status	Potential Habitat
Southeastern myotis	*Myotis austroriparius*	SC	Yes
American eel	*Anguilla rostrada*	none	Yes
Roanoke bass	*Ambloplites cavifrons*	SR	No
Bachman's sparrow	*Aimophila aestivalis*	SC	No
Southern hognose snake*	*Heterodon simus*	SC	No
Carolina darter	*Etheostoma collis lepidinion*	SC	No
Neuse madtom	*Noturus furiosus*	SC(PT)	No
Pinewoods shiner	*Lythrurus matutinus*	SR	Yes
Diana fritillary*	*Speyeria diana*	SR	No
Atlantic pigtoe	*Fusconaia masoni*	E	Yes
Green floater	*Lasmigona subviridis*	E	Yes
Yellow lance	*Elliptio lanceolata*	E	Yes
Bog spicebush	*Lindera subcoriacea*	E	Yes
Virginia least trillium	*Trillium pusillum* var. *virginianum*	E	No
Grassleaf arrowhead	*Sagittaria weatherbiana*	SR-T	Yes
Sweet pinesap	*Monotropsis odorata*	SR-T	Yes

Notes:
SC-Special Concern, PT-Proposed Threatened, SR-Significantly Rare, E-Endangered, -T-Throughout,
*-Historic Record

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 with 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 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 functionally obsolete and structurally deficient bridge will result in safer traffic operations.

The project is a Federal "Categorical Exclusion" because of 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 preferred 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 Wake County, which is within the Raleigh-Durham-Chapel Hill nonattainment area for ozone (O_3) and the Raleigh-Durham nonattainment area for carbon monoxide (CO) as defined by the EPA. The 1990 Clean Air Act Amendments (CAAA) designated these areas as moderate nonattainment areas for CO. However, due to improved monitoring data, these areas were redesignated as maintenance areas for O_3 on September 18, 1995. The area was designated nonattainment 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 Wake County. The *Capital Area Metropolitan Planning Organization 2030 Long Range Transportation Plan* (LRTP) and the FY 2004-2010 Metropolitan Transportation Improvement Program (MTIP) conform to the intent of the SIP. The USDOT made a conformity determination on the LRTP on June 15, 2005 and the MTIP on November 14, 2005. The current conformity determination is consistent with the final conformity rule found in 40 CFR Parts 51 and 93. There are no significant changes in the project's design concept or scope, as used in the conformity analyses.

The purpose of this project is to replace Bridge 102 by constructing a new structure. This project will not result in any meaningful changes in traffic volumes, vehicle mix, location of the existing facility, or any other factor that would cause an increase in emissions impacts relative to the No-Build Alternative. As such, FHWA has determined that this project will generate minimal air quality impacts for Clean Air Act criteria pollutants and has not been linked with any special Mobile Source Air Toxics (MSAT) concerns. Consequently, this effort is exempt from analysis for MSATs.

EPA regulations for vehicle engines and fuels will cause overall MSATs to decline significantly over the next 20 years. FHWA predicts MSATs will decline in the range of 57 percent to 87 percent, from 2000 to 2020, based on regulations now in effect, even with a projected 64 percent increase in vehicle miles traveled (VMT). Therefore, both the background level of MSATs and the possibility of even minor MSAT emissions from this project will be reduced.

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. Based on field reconnaissance and records search, 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 Lower Bartons Creek at the proposed crossings is 7.8 square miles. Wake County is currently participating in the National Flood Insurance Program. This crossing of Lower

Bartons Creek is located in a FEMA Special Flood Hazard Zone, Zone AE. This reach of stream is in a detailed study with a published floodway. Attached is a flood insurance rate map (Figure 5). The published 100-year base flood appears to overtop the existing roadway. Proposed encroachments in the floodplain and floodway could result in a Floodway Modification if a "No Impact" certification can not be obtained. Further detailed analysis during final design will be required to adequately address all the impacts associated with the floodplain.

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 (February 5, 2004) were also sent to various agencies.

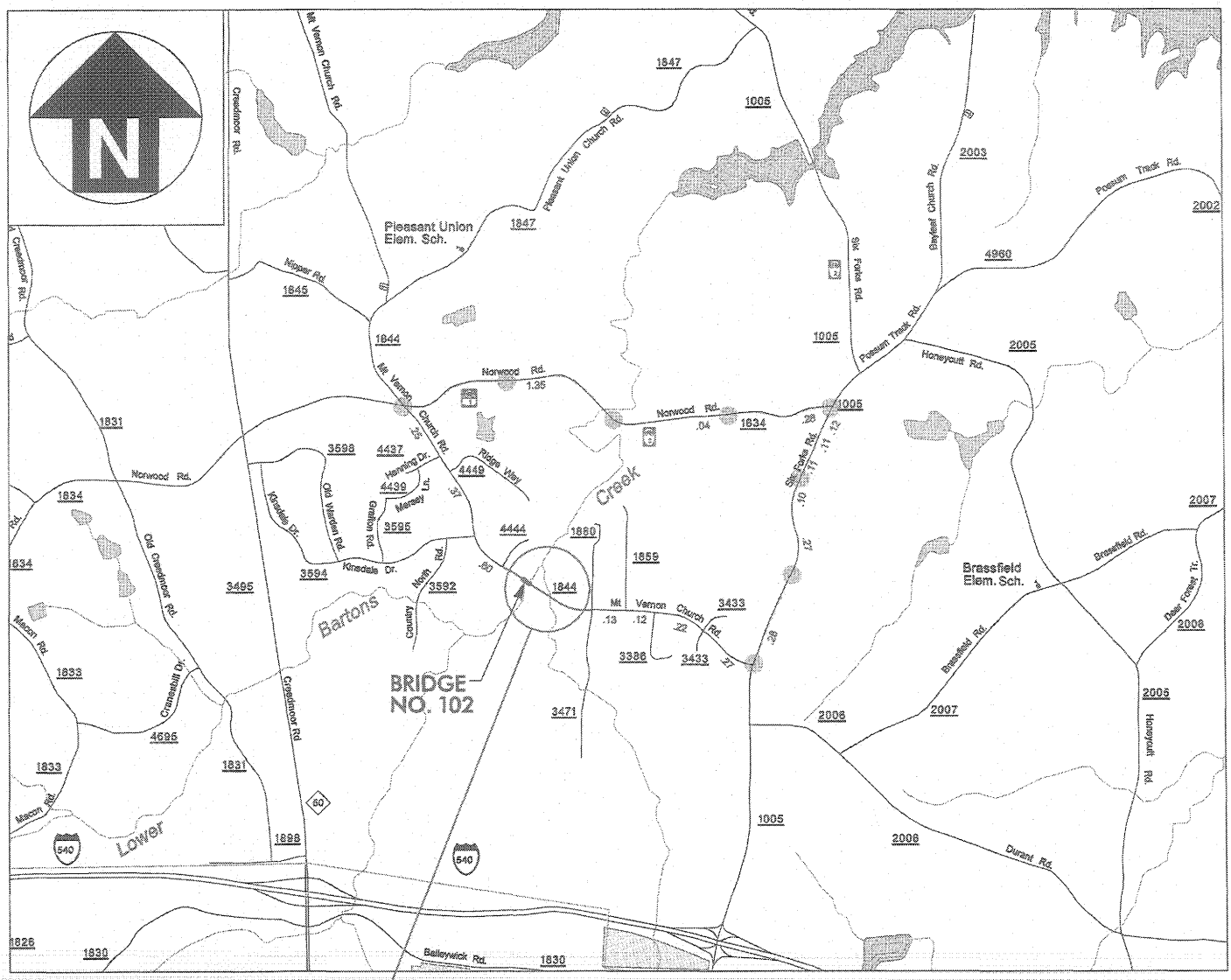
A Citizens Informational Workshop was held on August 9, 2004 in the media center of Pleasant Union Elementary School. This workshop was an open-house format where citizens dropped in to ask questions and voice their concerns. A display of Alternatives A, B, and C and other project related handouts were available for viewing. Two citizens attended the workshop. Comments included preference for closing the road during construction (Alternative A) because:

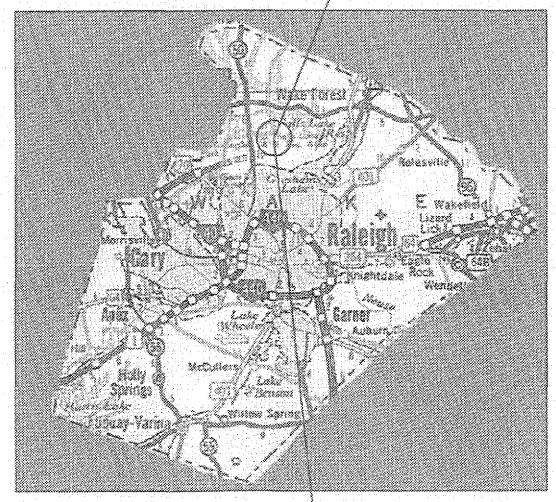
1. No encroachment/destruction of wild/native land on either side of the existing road.
2. Alternative A is more economical to construct.
3. Overall construction time is less than Alternatives B & C.
4. Less disruption to landowner's property.

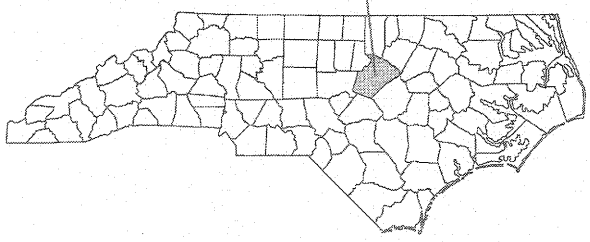
An informational newsletter was mailed to area residents and appropriate officials in January 2006 identifying Alternative A as the preferred. No comments were received in response to the newsletter.

IX. Agency Comments

All agency comments have been addressed within the document. Letters from commenting agencies are included in the Appendix.



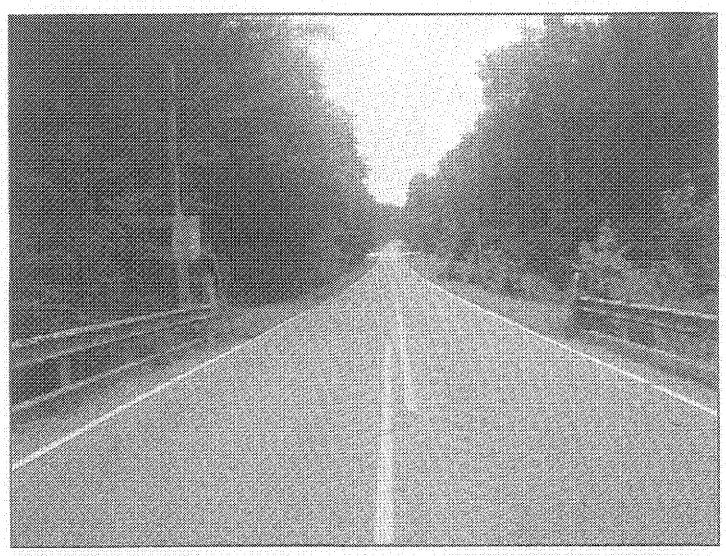




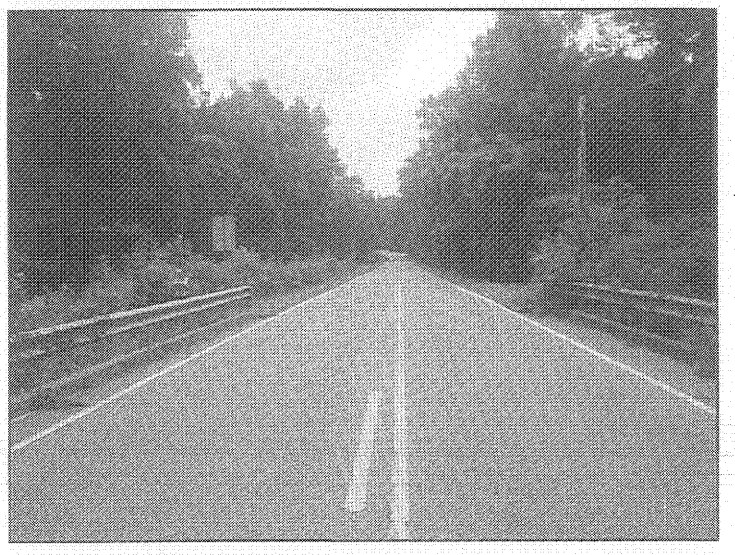
North Carolina Department of Transportation
Project Development & Environmental Analysis

WAKE COUNTY
BRIDGE NO. 102 ON SR 1844
OVER LOWER BARTONS CREEK
B-4303

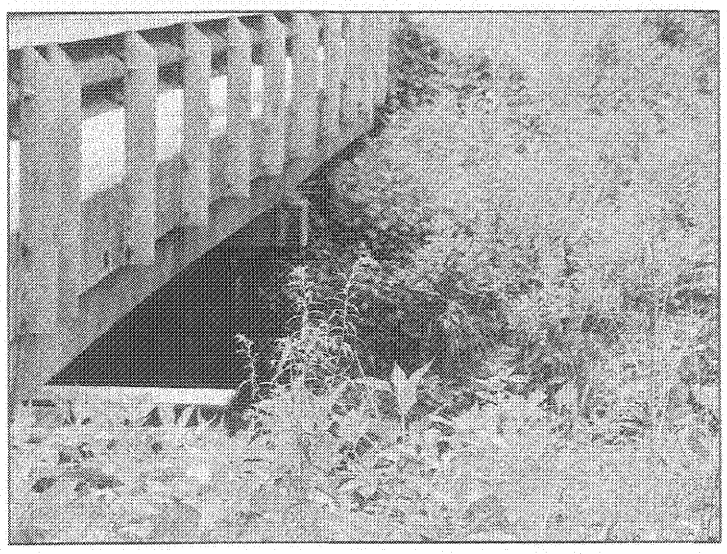
FIGURE 1



View of north approach from Bridge No. 102.



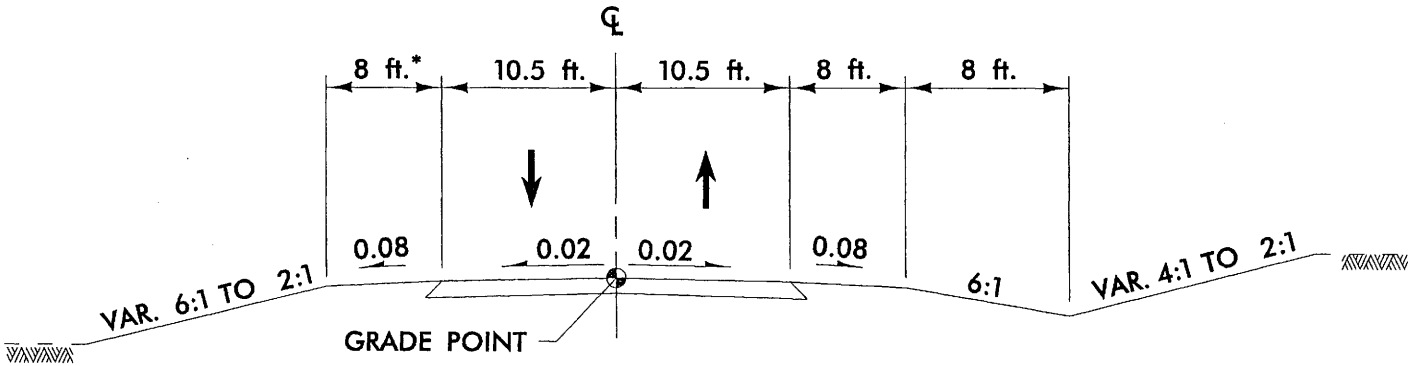
View of south approach from Bridge No. 102.



Bridge No. 102 side view.

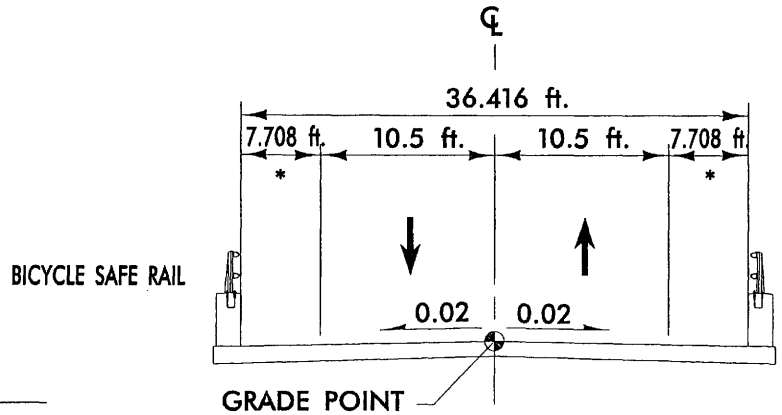
Figure 2

B-4303 Bridge No. 102 on SR 1844 over Lower Bartons Creek



TYPICAL APPROACH SECTION
(PROPOSED)

* 11 ft. WITH GUARDRAIL IS WARRANTED



TYPICAL BRIDGE SECTION
(PROPOSED)

* BRIDGE WIDENED FOR HYDRAULIC SPREAD AND FUTURE 12 FT. LANES

TRAFFIC DATA

(CONST. YR.) 2008 ADT = 6,800
(DESIGN YR.) 2030 ADT = 11,800
DUAL 2%
TTST 1%

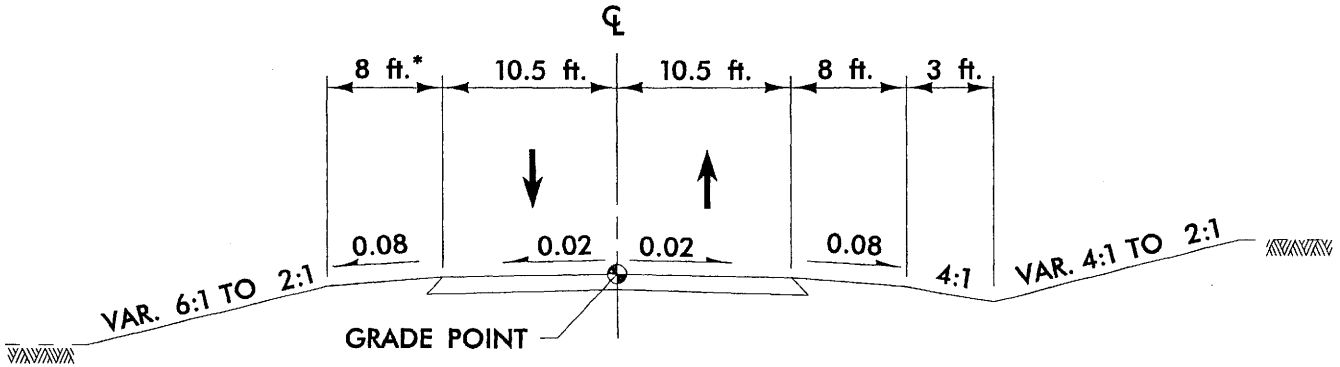
EXISTING BRIDGE LENGTH = 90 ft.

FUNCTIONAL CLASSIFICATION :
LOCAL – RURAL

North Carolina Department Of Transportation
Project Development & Environmental Analysis

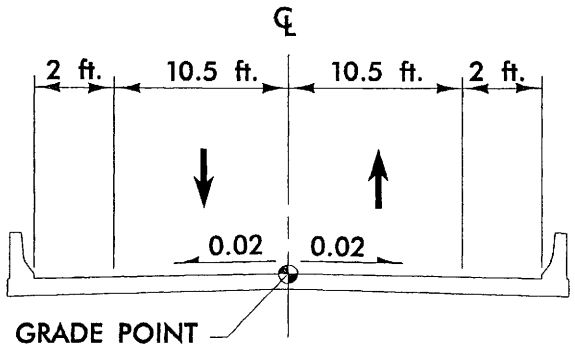
WAKE COUNTY
BRIDGE NO. 102 ON SR 1844
(MT. VERNON CHURCH RD)
OVER LOWER BARTONS CREEK
TIP NO: B–4303

FIGURE 3



TYPICAL APPROACH SECTION
(DETOUR)

* 10 ft. WITH GUARDRAIL IS WARRANTED



TYPICAL BRIDGE SECTION
(DETOUR)

TRAFFIC DATA

(CONST. YR.) 2008 ADT = 6,800
(DESIGN YR.) 2030 ADT = 11,800
DUAL 2%
TTST 1%

FUNCTIONAL CLASSIFICATION :
LOCAL – RURAL

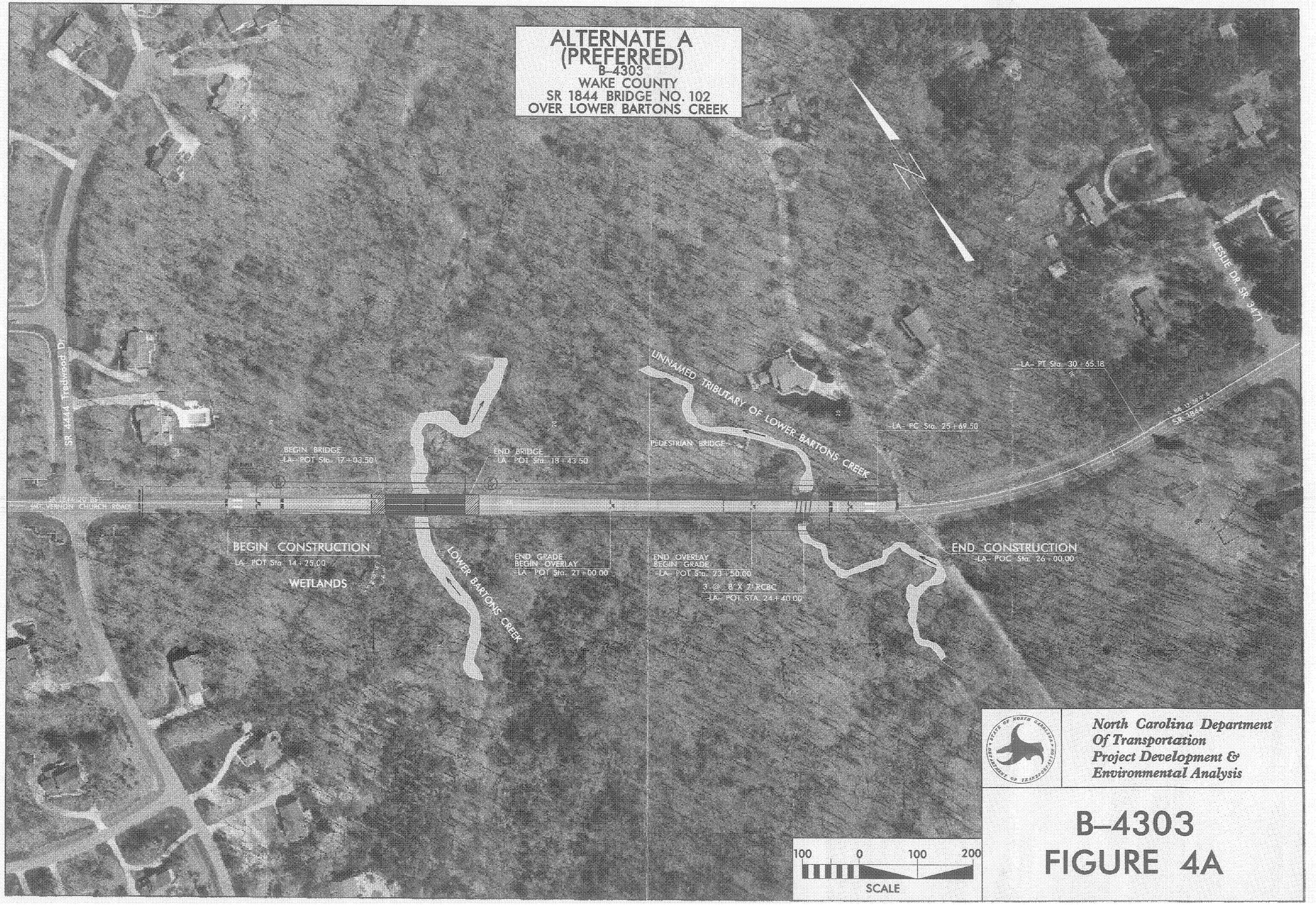
North Carolina Department Of Transportation
Project Development & Environmental Analysis

WAKE COUNTY
BRIDGE NO. 102 ON SR 1844
(MT. VERNON CHURCH RD)
OVER LOWER BARTONS CREEK
TIP NO: B–4303

FIGURE 3A

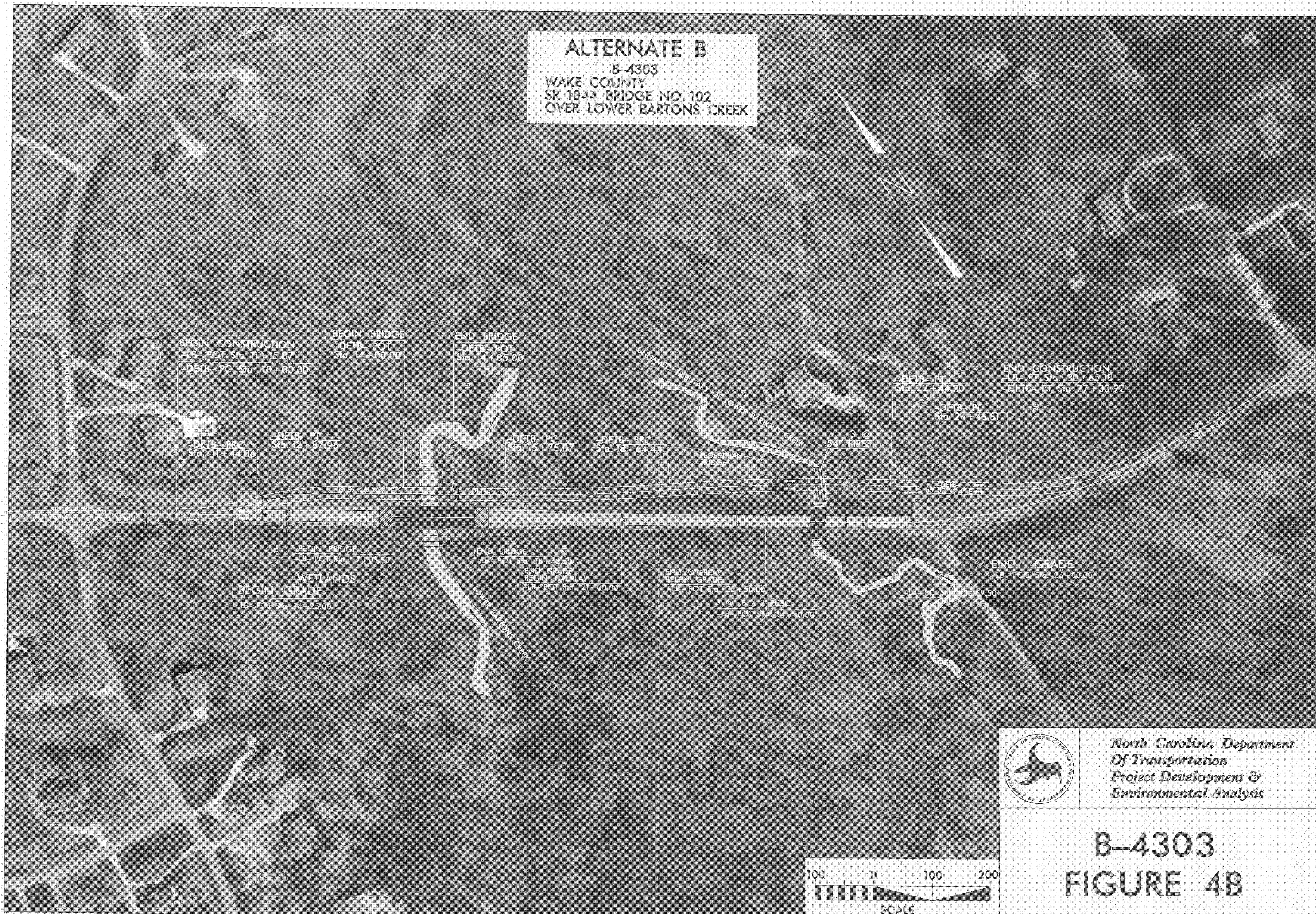
ALTERNATE A
(PREFERRED)

B-4303
WAKE COUNTY
SR 1844 BRIDGE NO. 102
OVER LOWER BARTONS CREEK



North Carolina Department Of Transportation
Project Development & Environmental Analysis

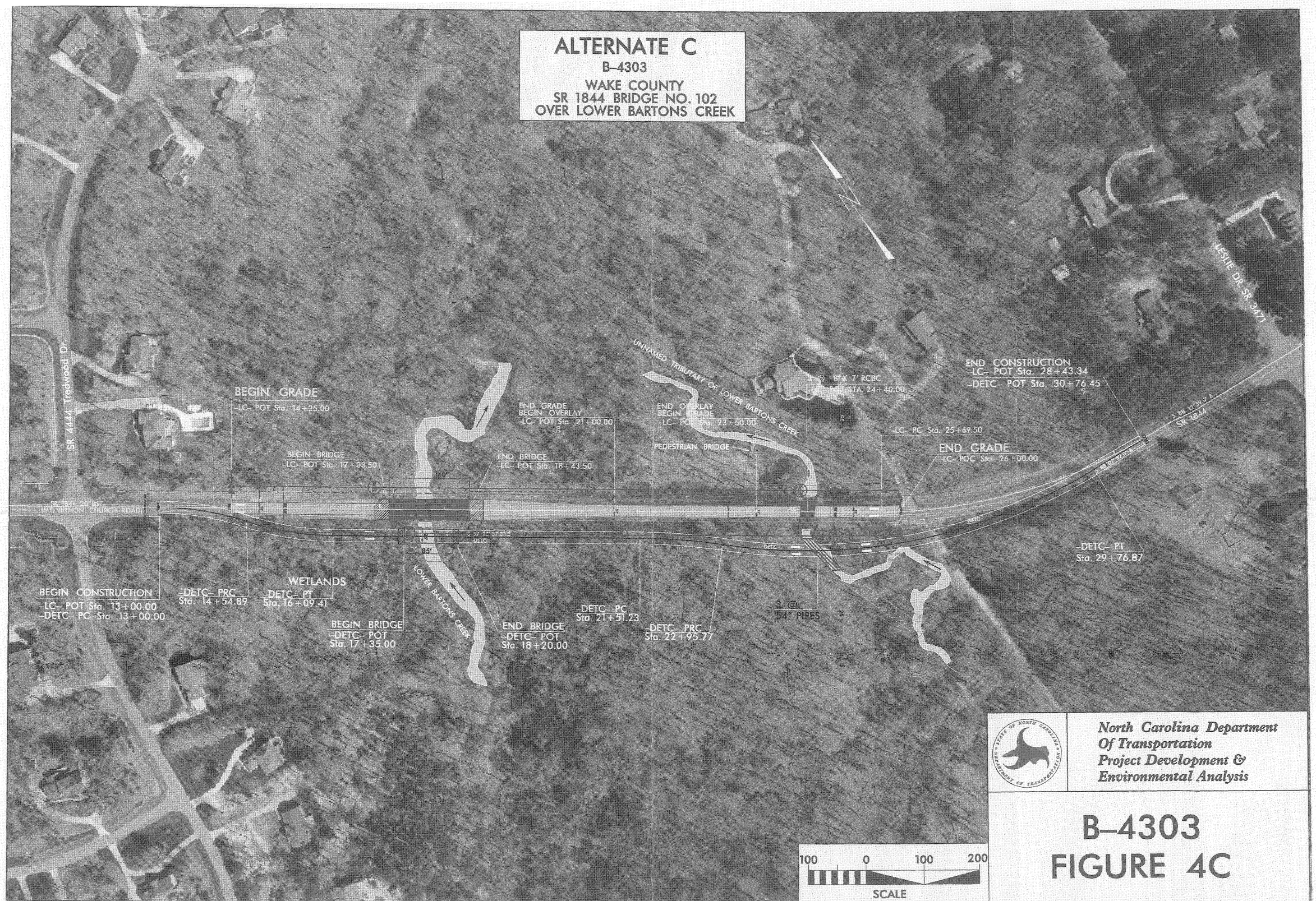
B-4303
FIGURE 4A


ALTERNATE B
B–4303
WAKE COUNTY
SR 1844 BRIDGE NO. 102
OVER LOWER BARTONS CREEK
BEGIN CONSTRUCTION
-LB- POT Sta. 11+15.87
-DETB- PC Sta. 10+00.00
BEGIN BRIDGE
-DETB- POT
Sta. 14+00.00
END BRIDGE
-DETB- POT
Sta. 14+85.00
-DETB- PRC
Sta. 11+44.06
-DETB- PT
Sta. 12+87.96
-DETB- PC
Sta. 15+75.07
-DETB- PRC
Sta. 18+64.44
UNNAMED TRIBUTARY OF LOWER BARTONS CREEK
PEDESTRIAN BRIDGE
3 @ 54" PIPES
-DETB- PT
Sta. 22+44.20
-DETB- PC
Sta. 24+46.81
END CONSTRUCTION
-LB- PT Sta. 30+65.18
-DETB- PT Sta. 27+33.92
LESLIE DR. SR 3471
SR 1844
SR 4444 Tredwood Dr.
(MT. VERNON CHURCH ROAD)
BEGIN BRIDGE
-LB- POT Sta. 17+03.50
END BRIDGE
-LB- POT Sta. 18+43.50
END GRADE
BEGIN OVERLAY
-LB- POT Sta. 21+00.00
WETLANDS
BEGIN GRADE
-LB- POT Sta. 14+25.00
LOWER BARTONS CREEK
END OVERLAY
BEGIN GRADE
-LB- POT Sta. 23+50.00
3 @ 8' X 7' RCBC
-LB- POT STA 24+40.00
END GRADE
-LB- POC Sta. 26+00.00
North Carolina Department
Of Transportation
Project Development &
Environmental Analysis
100 0 100 200
SCALE
B–4303
FIGURE 4B

ALTERNATE C

B–4303

WAKE COUNTY
SR 1844 BRIDGE NO. 102
OVER LOWER BARTONS CREEK



North Carolina Department Of Transportation
Project Development & Environmental Analysis

B–4303
FIGURE 4C

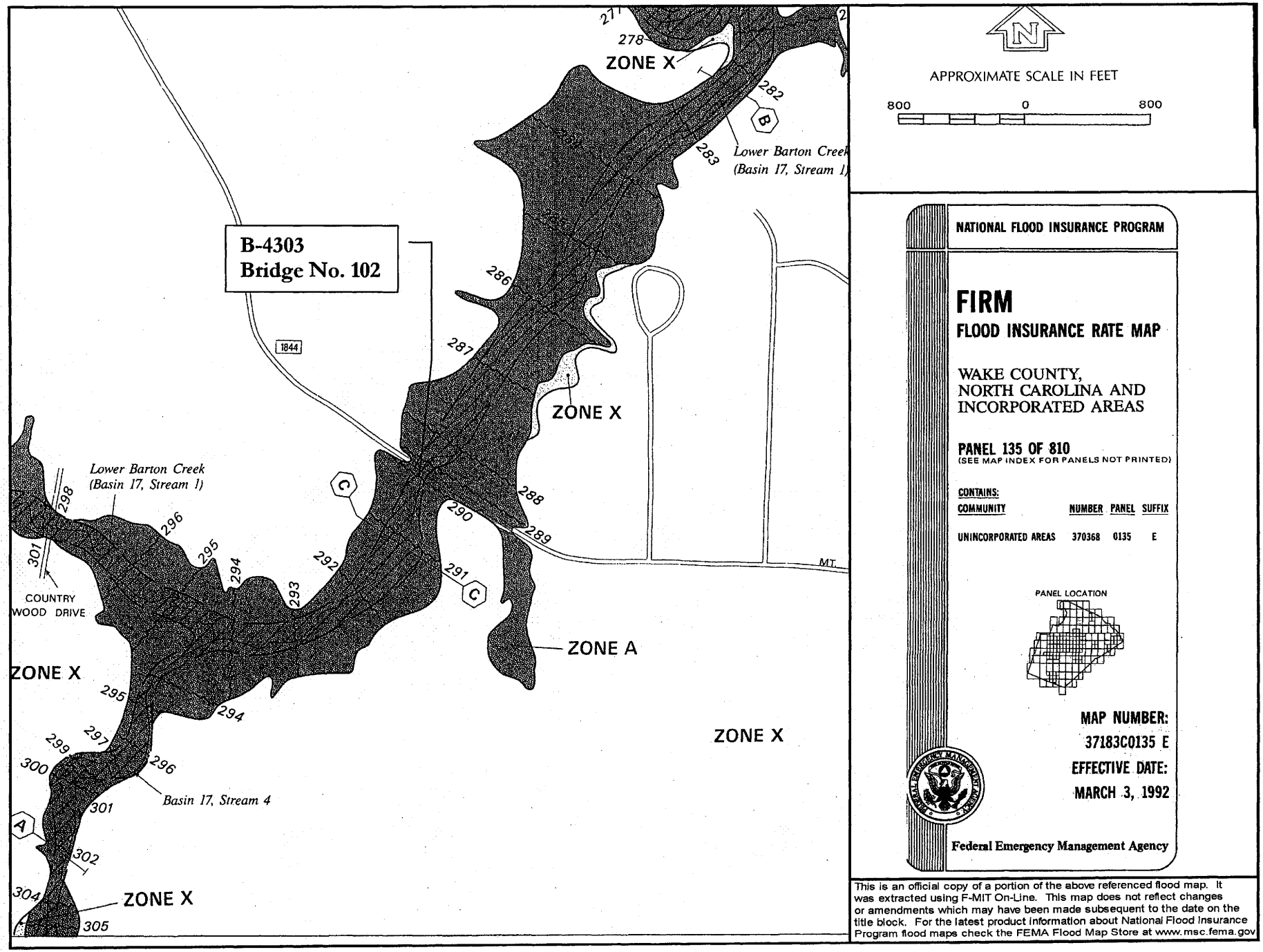

B-4303
Bridge No. 102
1844
ZONE X
ZONE X
ZONE A
ZONE X
ZONE X
Lower Barton Creek
(Basin 17, Stream 1)
Lower Barton Creek
(Basin 17, Stream 1)
Basin 17, Stream 4
COUNTRY
WOOD DRIVE
MT.
278
282
283
286
287
288
289
290
291
292
293
294
295
296
297
298
299
300
301
302
304
305
A
B
C
C
APPROXIMATE SCALE IN FEET
800
0
800
NATIONAL FLOOD INSURANCE PROGRAM
FIRM
FLOOD INSURANCE RATE MAP
WAKE COUNTY,
NORTH CAROLINA AND
INCORPORATED AREAS
PANEL 135 OF 810
(SEE MAP INDEX FOR PANELS NOT PRINTED)
CONTAINS:
COMMUNITY NUMBER PANEL SUFFIX
UNINCORPORATED AREAS 370368 0135 E
PANEL LOCATION
MAP NUMBER:
37183C0135 E
EFFECTIVE DATE:
MARCH 3, 1992
Federal Emergency Management Agency
This is an official copy of a portion of the above referenced flood map. It was extracted using F-MIT On-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at www.msc.fema.gov

Figure 5

APPENDIX

U.S. ARMY CORPS OF ENGINEERS
WILMINGTON DISTRICT

COPY

Action ID. 200420708 County: Wake U.S.G.S. Quad: Bayleaf

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

RECEIVED
FEB 03 2005

Property description:
Size (acres) n/a Nearest Town Bayleaf
Nearest Waterway Lower Barton Creek River Basin Neuse
USGS HUC 03020201 Coordinates N 35.933529 W 78.665191
Location description Study area for bridge replacement (TIP B-4303) as shown in drawings submitted on 3/29/04.

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. **200420708**

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 stream channels of Lower Bartons Creek and an unnamed tributary, tributaries of the Neuse River, with indicators of ordinary high water marks, and wetlands adjacent to Lower Bartons Creek.**

Remarks: ____

Corps Regulatory Official: Eric C. Alsmeyer

Date **01/31/2005** Expiration Date **01/31/2010**

Corps Regulatory Official (Initial): ECA

FOR OFFICE USE ONLY:

- A plat or sketch of the property and the wetland data form must be attached to the file copy of this form.
- A copy of the "Notification Of Administrative Appeal Options And Process And Request For Appeal" form must be transmitted with the property owner/agent copy of this form.
- If the property contains isolated wetlands/waters, please indicate in "Remarks" section and attach the "Isolated Determination Information Sheet" to the file copy of this form.

Copy furnished (with drawings): Julie Gibson
Mulkey Engineers
PO Box 33127
Raleigh, NC 27636

NOTIFICATION OF ADMINISTRATIVE APPEAL OPTIONS AND PROCESS AND REQUEST FOR APPEAL

Applicant: NCDOT (**TIP B-4303**)	File Number: **200420708**	Date: **01/31/2005**
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.

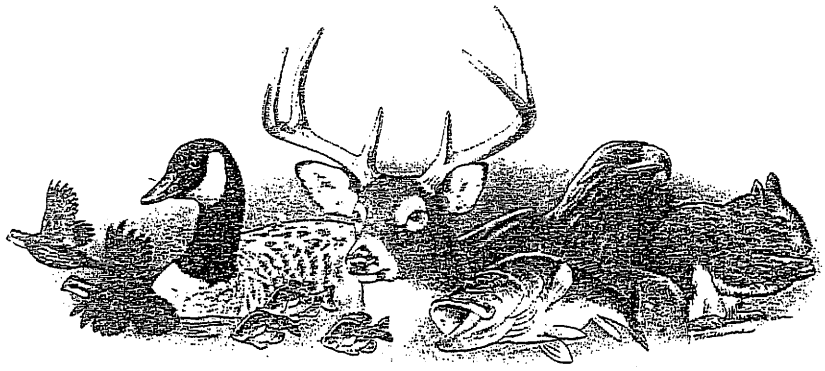
The Service appreciates the opportunity to comment on these projects. Please continue to advise us during the progression of the planning process, including your official determination of the impacts of this project. If you have any questions regarding our response, please contact Mr. Gary Jordan at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



North Carolina Wildlife Resources Commission

Richard B. Hamilton, 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.

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 15. 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 15. 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

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

Federal Aid # BRZ-1844(1) *TIP* # B-4303 *County*: Wake

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

Project Description: Replace Bridge No. 102 on SR 1844 over Lower Branch Bartons 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

- [x] 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.
- [ ] 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 _____ 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 H — 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.

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 321
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
Stokes County Replace Bridge No. 60 on NC 8-89 over the Dan River B-4281 PEF	Impacts to SNHA: National significance, rare mussels and fish
Wake County Replace Bridge No. 102 on SR 1844 over Lower Bartons Creek B-4303 Goodwin PEF	Impacts to SNHA: Local significance
Wake County Replace Bridge No. 143 on SR 2217 over Beaver Dam Creek B-4304 Goodwin PEF	Impacts to rare mussel
Warren County Replace Bridge No. 4 on US 401 over Shocco Creek B-4307 Goodwin EA?	Impacts to rare sedge

Pam Williams

From: Lebsock, Victor [Victor.Lebsock@ci.raleigh.nc.us]
Sent: Wednesday, April 07, 2004 1:05 PM
To: Lamb, Eric; Pam Williams
Subject: RE: Bridge Replacement projects in Wake County

You have picked up most of the greenway issues, but must note that the Southeast Raleigh Urban Service area extends to the east and encompasses Poplar Creek. Poplar Creek is on the Capital Area Greenway Master Plan and accommodations in replacing the Poole Road Bridge over the creek should take into account the future greenway trail. For further information you can contact me.

Victor (Vic) Lebsock
Park and Greenway Planner
P. O. Box 590
Raleigh, NC 27602
Telephone (919) 890-3293
email victor.lebsock@ci.raleigh.nc.us

-----Original Message-----
From: Lamb, Eric
Sent: Tuesday, March 30, 2004 8:35 AM
To: 'Pam Williams'
Cc: Lebsock, Victor
Subject: RE: Bridge Replacement projects in Wake County

Pam:

Sorry it's taken me so long to get back to you. I hope this information helps – please let me know if you have any questions. Thanks once again for seeking our input and coordinating with us on these NCDOT projects.

B-4300
Although this is slightly outside of my jurisdiction, there are a few elements of concern that I have.

1) Poole Road is an arterial thoroughfare in the City of Raleigh's plan and will likely be widened to a multilane facility at some point. The design of the bridge should accommodate this future widening.
2) The Eastern Wake Expressway (I-540) will be coming through this immediate area in the future. You should extrapolate an approximate corridor based on the location of the interchange with US 64 Bypass.
3) US 64 Bypass is severing your detour route. In fact, you may want to consider building the project with a full closure and use the bypass as your detour route.

Also, please coordinate this project with the Town of Knightdale.

B-4301, B-4302
Both are way outside of my jurisdiction, and you'll be dealing with Knightdale and Fuquay-Varina respectively.

B-4303
This is just outside the City of Raleigh, but I know the area. I think your detour route looks fine. There will need to be a greenway accommodations beneath the bridge as Lower Barton's Creek is part of our greenway master plan. Please contact Vic Lebsock at 890-3293 for more information. You also need to contact Tim Clark at Wake County Planning at 856-6320 for additional input.

B-4304
Old Milburnie Road is classified as a major thoroughfare, whose ultimate section will be a five-lane roadway with sidewalks on both sides. Any bridge design should accommodate for this ultimate section. There are also significant impacts to Old Milburnie Road in association with the construction of I-540 (R-2000G). This project is also identified as a greenway corridor on the City's greenway master plan, and will also require accommodations

as part of the project.

With respect to the detour route, I-540 will also be an issue. You may wish to check the construction schedule for this project and familiarize yourself with the interchange locations.

Thanks again,

Eric

Eric J. Lamb, PE
Manager, Transportation Services Division
City of Raleigh Public Works Department
P.O. Box 590, Raleigh, NC 27602

eric.lamb@ci.raleigh.nc.us
http://www.raleigh-nc.org
(919) 890-3430
fax(919) 890-3786

WAKE COUNTY
PUBLIC SCHOOL SYSTEM

TRANSPORTATION DEPARTMENT
1551 ROCK QUARRY ROAD
RALEIGH, NORTH CAROLINA 27610
PHONE: 919.856.8050
FAX: 919.856.7773

March 3, 2004

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

Dear Mr. Thorpe:

Outlined below are school bus bridge crossings and projected impact Bridge Replacement Projects will have on our ability to transport children to required destinations.

B-4300 to replace Bridge#29: 46 daily school bus crossings which will severely impact school bus routing.

B- 4301 to replace Bridge#229: 46 daily school bus crossings which will severely impact school bus routing.

B-4302 to replace Bridge #336: 52 daily school bus crossings which will severely impact school bus routing.

B-4303 to replace Bridge #102: 16 daily school bus crossing which will moderately impact school bus routing.

B-3528 to replace Bridge #429: 6 daily school bus crossings which will minimally impact school bus routing.

Thanks you for soliciting our input.

Sincerely,

Vernon W. Hatley

VWH/as

Subject: Comments Bridge Replacement Projects
Date: Wed, 25 Feb 2004 12:46:40 -0500 (GMT-05:00)
From: bayleafchief@mindspring.com
To: tellerby@dot.state.nc.us

Dear Ms. Ellerby:

We received a memo regarding request for comments on Bridge Replacement Projects. I have a comment/request regarding two Bridge Projects that we are now aware of:

Project B-4303; SR 1844, Bridge #102 (Mt. Vernon Church Road), future project and current Project B-3704; SR 1834, Bridge #108 (Norwood Road)

Both of these Bridges provide critical access to densely populated areas of our Fire District. As such we need the Bridge Load capability to handle our largest vehicle. Our largest vehicle is a 105 foot aerial ladder truck, with a GVWR of 73,500 lbs. Our request is to confirm that both of these Bridge Replacement projects provide adequate load capability to accept travel by our apparatus.

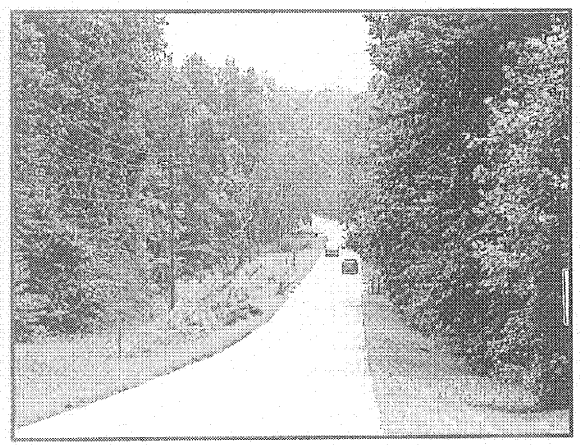
Thank you for your consideration in this matter. If there are any questions please contact me.
Ron Roof

Ron Roof, Chief
Bay Leaf Volunteer Fire Dept.
Office 919- 847-3858
Fax 919- 847-3892
bayleafchief@mindspring.com

Informational Newsletter

NCDOT Proposes Replacement of Bridge No. 102 on SR 1844 (Mt. Vernon Church Road) over Lower Bartons Creek, Wake County, NC TIP No. B-4303

February 2006



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 this newsletter or this project, you may call, write, or e-mail one of the contacts provided below.

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

or

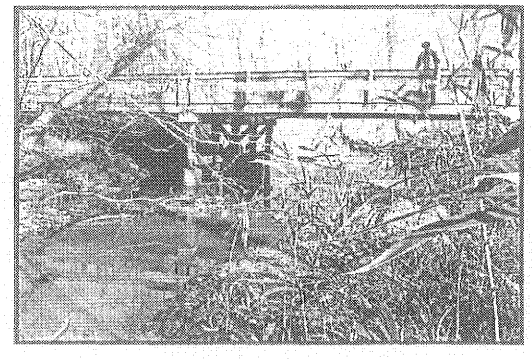
Pam Williams
Mulkey Engineers & Consultants
PO Box 33127
Raleigh, NC 27636-3127
919-858-1908
pwilliams@mulkeyinc.com

We're on the Web!

www.ncdot.org

Project Introduction

The North Carolina Department of Transportation (NCDOT) is proposing to replace Bridge No. 102 over Lower Bartons Creek and the corrugated metal pipe culvert approximately 600 feet south of the bridge on SR 1844 (Mt. Vernon Church Road) in Wake County. The new bridge and culvert will provide safer, more efficient traffic operations.



A Citizens Informational Workshop was held for this project on August 9, 2004 at Pleasant Union Elementary School. The purpose of the workshop was to introduce citizens to the project, provide information on proposed alternatives, and solicit comments. Three alternatives were presented: A, B, and C. The preferred alternative has now been selected.

Proposed Replacement Structure and Preferred Alternative

The preferred Alternative A replaces Bridge No. 102 with a new bridge approximately 125 feet in length and replaces the corrugated metal pipe culvert with a double barrel 8-foot by 6-foot reinforced concrete box culvert.

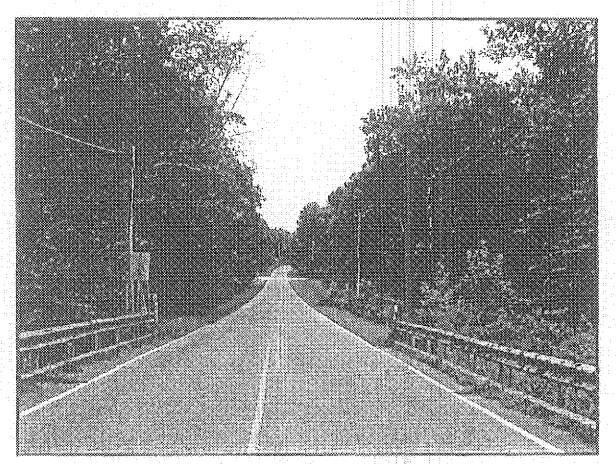
During construction, traffic will be maintained by an off-site detour approximately five miles in length. The detour traffic will be routed along SR 1834 (Norwood Road) and SR 1005 (Six Forks Road).

Alternative A is the preferred alternative because it minimizes impacts to residential properties, woods and streams, is more economical, and has a shorter construction time than other alternatives considered.

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 any concerns that you may have. 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 and Citizens Information Workshop

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

$1,528,500

Schedule

Right-of-way in fiscal year 2007
Construction in fiscal year 2008

Citizens Informational Workshop

North Carolina
Department of Transportation

NCDOT

Replacement of Bridge No. 102 and pipe culvert on SR 1844 (Mt. Vernon Church Road) over Lower Bartons Creek in Wake County
T.I.P. No. B-4303

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

You are invited to attend a
Citizens Informational Workshop

Date:

August 9, 2004

Time:

4:30 p.m. to 6:30 p.m.

Location:

Pleasant Union Elementary School Cafeteria
1900 Pleasant Union Church Road
Raleigh, NC

Contact Information

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or

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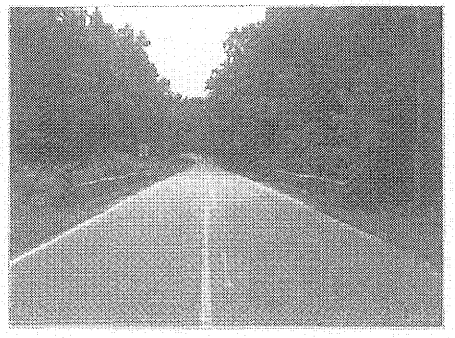
Project Introduction

The North Carolina Department of Transportation (NCDOT) is planning to replace Bridge No. 102 over Lower Bartons Creek on SR 1844 in Wake County. The proposed project includes the replacement of the pipe culvert approximately 600 feet east of Bridge No. 102. The proposed bridge and culvert replacement will provide safer, more efficient traffic operations. The NCDOT is conducting studies of the proposed project including wetland and protected species surveys. These studies aid in the development of the alternatives and an environmental document evaluating the proposed projects impacts.



Project Description

The project is located on SR 1844 (Mt. Vernon Church Road) just south of Falls Lake near the Bayleaf community. There are three alternatives under consideration for replacing the bridge and the pipe culvert.

Alternative A will replace the bridge and pipe culvert on the existing alignment with a new bridge and double barrel reinforce concrete box culvert. During construction, traffic will be maintained with an off-site detour approximately 2.6 miles in length along SR 1834 (Norwood Road) and SR 1005 (Six Forks Road).

Alternative B will replace the bridge and pipe culvert on the existing alignment with a new bridge and double barrel reinforce concrete box culvert. During construction, traffic will be maintained with an on-site detour **north** of the existing bridge and culvert.

Alternative C will replace the bridge and pipe culvert on the existing alignment with a new bridge and double barrel reinforce concrete box culvert. During construction, traffic will be maintained with an on-site detour **south** of the existing bridge and culvert.

Citizens Informational Workshop

NCDOT realizes that citizens and business owners in the vicinity of the bridge are concerned about the potential impacts that this project may have on their homes and businesses. NCDOT personnel will be available to answer questions at the informational workshop. Drop by any time between 4:30 pm and 6:30 pm for an opportunity to gather more information, voice your concerns, and ask questions.

About Our Organization

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 your concerns. 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.

Auxiliary aids and services will be provided for disabled persons who wish to attend this workshop. Contact Ms. Ellerby as soon as possible so that arrangements can be made.

NCDOT

Project Development Process

Step 1
Data Collection

Step 2
Alternative Development

Step 3
Environmental Analysis

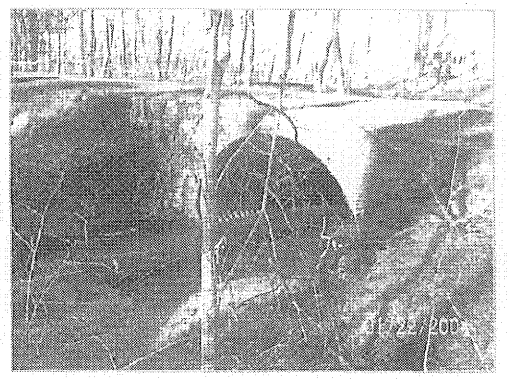
Step 4
Citizens Informational Workshop

Step 5
Selection of Preferred Alternative

Step 6
Complete Environmental Document

Schedule

Right-of-Way Acquisition in 2006
Begin Construction in 2007



We're on the Web!
www.ncdot.org