STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

MICHAEL F. EASLEY
GOVERNOR

LYNDO TIPPETT
SECRETARY

March 20, 2007

US Army Corps of Engineers
Raleigh Field Office
6508 Falls of Neuse Road, Suite120
Raleigh, NC 27615-6814

ATTENTION: Eric Alsmeyer
NCDOT Coordinator, Division 5

Dear Sir:

Subject: **Application for Regional General Permit 31, Section 401 Water Quality Certification 3404, and Neuse Buffer Authorization** for the replacement of Bridge No. 63 over Middle Creek on US 401, Wake County. Federal Aid Project No. BRSTP-401(13), State Project No. 8.1404501,WBS Element No. 33350.1.1, Division 5, T.I.P. No. B-3916.

Please see the enclosed copies of the Categorical Exclusion (CE) document, permit drawings, half size plan sheets, pre-construction notification (PCN), and Ecosystem Enhancement Program (EEP) compensatory mitigation request letter. The North Carolina Department of Transportation (NCDOT) proposes to replace the 95-foot Bridge No. 63 over Middle Creek with a new 3 span bridge approximately 171-feet in length. The new structure will be a reinforced concrete girder bridge, with 3, 57-foot spans. The project will replace the current bridge on its existing location while using a temporary on-site detour bridge located upstream to maintain traffic during construction. Two temporary work pads will be constructed to provide access for demolition of the old bridge and construction of the new bridge.

IMPACTS TO WATERS OF THE UNITED STATES

The project is located in the Neuse River Basin (sub-basin 03-04-03) in Wake County. This area is part of Hydrologic Cataloging Unit 03020201 of the South Atlantic-Gulf Coast Region. Middle Creek and two unnamed tributaries to Middle Creek (UT1 and UT2) are located within the project area. Middle Creek is a perennial stream and will be bridged by the proposed project. UT1 and UT2 area perennial streams located in the northwest (UT1) and northeast (UT2) portions of the project area. Middle Creek has been assigned a Best Usage Classification of "C-NSW" [NCDWQ Stream Index Number 27-43-15-(4)]. UT1 and UT2 have no separate Best Usage Classification and, therefore, share the Best Usage Classification of Middle Creek.

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. This portion of Middle Creek is not listed on the 2004 List of impaired waters [Section 303(d)] for the Neuse River Basin nor does it drain into any 303(d) waters within 1-mile of the project area

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

TELEPHONE: 919-715-1500
FAX: 919-715-1501
WEBSITE: WWW.NCDOT.ORG

LOCATION:
2728 CAPITAL BLVD.
PARKER LINCOLN BUILDING, SUITE 168
RALEIGH NC 27604

Temporary Impacts
The construction of two temporary workpads and an on-site detour bridge will result in temporary impacts to Middle Creek, UT1, and wetlands. The work pads will be constructed simultaneously, providing access for demolition of the old bridge and construction of the new bridge. The first workpad will be located on the southern bank of Middle Creek, resulting in 0.05 acres (52 linear feet) of temporary surface water impacts (Site 6) and less than 0.01 acre of temporary fill in wetlands (Site 7). The second workpad will be located on the northern bank of Middle Creek, resulting in 0.03 acres (62 linear feet) of temporary surface water impacts (Site 8).

A temporary on-site detour bridge, located west of the existing bridge, will span Middle Creek and result in temporary impacts to UT1 and three wetlands. The construction of the approaches to the detour bridge will require the placement of 0.04 acre (371 linear feet) of temporary roadway fill in UT1 (Site 3). UT1 will be lined with geo-fabric prior to the placement of fill in the channel. Upon completion of the project, the detour fill and geo-fabric will be removed and the pre-existing stream contours will be restored. The construction of the detour bridge end bent will result in less than 0.01 acre (20 linear feet) of temporary fill in UT1 (Site 2).

The on-site detour will also result in temporary fill into three wetlands (Sites 1, 4, and 5). Construction of the southern end bent will result in 0.01 acre of temporary wetland fill (Site 1). The construction of the approaches to the detour bridge will result in 0.06 acre of temporary wetland fill into the wetland located west of UT1 (Site 4). Construction of the detour bridge approaches will result in 0.07 acre of temporary wetland fill into the wetland located adjacent to UT1 (Site 5). Upon completion of the project the fill will be removed and pre-existing elevations and drainage patterns will be restored.

The construction of the outlet of a pipe utilized to conduct stormwater runoff will result in 0.01 acre (228 linear feet) of temporary stream impacts (Site 10). These impacts will result from temporary piping and fill necessary to allow access for construction access to construct the pipe outlet.

Permanent Impacts
The proposed bridge will require the placement of 2 bents in Middle Creek. Each bent will have four 42-inch diameter drilled piers. The resulting permanent surface water impacts to Middle Creek will be 77-square feet (less than 0.01 acre).

The construction of the approaches will result in less than 0.01 acre of permanent wetland fill (Site 9).

The construction of the pipe outlet utilized to conduct stormwater runoff will result in of 50 linear feet (less than 0.01 acre) of permanent impacts to UT2 (Site 10). USACE will not require mitigation for permanent impacts to UT2 due to the lack of aquatic function. NCDWQ will not require mitigation for the permanent impacts to UT2 because impacts are less than 150 linear feet.

Neuse Buffer Impacts
Construction of the new bridge, approaches, and the on-site detour will result in impacts to buffers of Middle Creek and UT1 (Buffer Permit Drawings Sheets 7-10). UT 2 is not located on either the USGS Topographic Map or the NRCS soil survey map for Wake County, therefore it is not subject to Neuse Riparian Buffer Regulations. Impacts to buffers are shown in Table 1 below.

Table 1. Neuse River Buffer Impacts (Square Feet)

	Bridge	Road Crossing*	Impact Other Than Road Crossing	Temporary Road
Zone 1 Impact (sq. ft.)	1,392	121	1971	17,581
Zone 2 Impact (sq. ft.)	277	240	25	8,373
Total Impacts (sq. ft.)	1,669	361	1,996	25,954
Mitigation requirements (exempt, allowable, or allowable with mitigation)	Allowable	Allowable	Allowable with Mitigation	Allowable

*Road crossing impacts total 23 linear feet.

Under the Neuse Buffer Rules, buffer impacts to Middle Creek resulting from the construction of bridges are allowable (Site 4); impacts associated with construction of the approaches, which fall under the category of road crossings, are allowable because impacts will be less than 150 linear feet or one-third of an acre (Site 5). Impacts to the buffers of UT1 resulting from construction of the approaches are considered impacts other than road crossings, and are allowable with mitigation (Site 6).

A temporary bridge located upstream of the existing bridge will be used during construction of the new bridge. The temporary bridge and the approaches will impact the buffers of Middle Creek (Site 1 and Site 2) and UT1 (Site 3). Due to traffic volume and safety concerns it is not practical to detour traffic onto the northbound bridge. Forced sewer and water lines are located east of the northbound bridge; therefore it is not practical to construct a temporary detour in this location due to the interruption of public services and cost of relocating the lines.

Under the Neuse Buffer Rules, temporary roads used for bridge construction or replacement are allowable provided that restoration activities are conducted immediately after construction. All non-maintained riparian buffers impacted by the placement of temporary fill or clearing activities shall be restored to the preconstruction contours and revegetated with native woody species.

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 the Middle Creek are unavoidable. Replacing the existing bridge at its existing location provides the least amount of impacts to riparian buffers.

Utility Impacts
The replacement of Bridge No. 63 will result in impacts to buried telephone lines located on the western portion of the bridge. The telephone lines will be relocated using a directional bore outside of the riparian buffers. There will be impacts to riparian buffers due to the relocation of the telephone lines. The impacts will be within areas which will be impacted by construction of the detour bridge and are, therefore, included in the impacts associated with the temporary detour.

Sanitary sewer lines at the southwestern portion of the project, where an existing storm water drainage ditch is cutting down the existing ground over the sanitary sewer force main, may be impacted by the project. The force main may or may not have to be lowered to provide sufficient cover. Lowering the force main will not result in any impacts to jurisdictional streams, wetlands, or riparian buffers.

Bridge Demolition
Existing Bridge No. 63 was built in 1926. It is a two-span structure that is 95-feet long and 31.4-feet wide. The bridge superstructure consists of reinforced concrete deck on concrete girders. The substructure of the bridge consists of reinforced concrete end bents and concrete caps on concrete piles for interior bents. One reinforced concrete abutment and one pier are in the water. There is the potential for 242.7 cubic yards to be temporarily placed into Waters of the United States, although all guidelines for bridge demolition and removal will be followed in addition to Best Management Practices for the Protection of Surface Waters.

Restoration Plan
Removal and Disposal Plan: The contractor will be required to submit a reclamation plan for the removal and disposal of all material off-site at an upland location. The contractor will use excavation equipment for removal of any earthen material. Heavy-duty trucks, dozers, cranes, and various other pieces of mechanical equipment necessary for construction of roadways and bridges will be used on site. The contractor will have the option of reusing any of the materials that the engineer deems suitable in the construction of the project. After the erosion control devices are no longer needed, all temporary materials will become property of the contractor.

Following construction of the bridge, all temporary fills will be completely removed from wetlands and streams. Restoring natural hydrology and native vegetation will restore wetlands. Stream contours and vegetation will be reestablished upon the removal of the temporary workpads. Class II riprap and filter fabric will be used for bank stabilization.

Schedule: At this time the project is scheduled to let May 15, 2007 with a date of availability of June 26, 2007. It is expected that the contractor will choose to start construction in June.

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 US. The following is a list of the project's jurisdictional stream avoidance/minimization activities proposed or completed by NCDOT:

- Bridge No. 63 will be replaced in place, providing the least amount of impacts to the riparian buffers.
- Traffic will be maintained on a detour bridge that will span Middle Creek.
- Where possible, steeper fill slopes were used to reduce the footprint of the project reducing impacts to riparian buffers and wetlands.
- The roadway grade was maintained close to the existing, minimizing the placement of roadway fill into wetlands and riparian buffers.
- Design Standards in Sensitive Watersheds will be used.
- Temporary construction impacts due to erosion and sedimentation will be minimized through implementation of stringent erosion control schedule and use of Best Management Practices (BMPs).
- A preformed scour hole will be located southwest of the bridge to reduce stormwater impact on Middle Creek.

Compensatory Mitigation:

NCDOT has avoided and minimized impacts to jurisdictional resources to the greatest extent possible as described above. Unavoidable, impacts to 1,996 square feet of riparian buffers will be offset by compensatory mitigation provided by the EEP program. A letter requesting compensatory mitigation from the EEP is attached. No mitigation is proposed for the temporary impacts.

FEDERALLY-PROTECTED SPECIES

Plants and animals with federal classifications of Endangered, Threatened, Proposed Endangered, and Proposed Threatened are protected under provisions of Section 7 and Section 9 of the Endangered Species Act of 1973, as amended. As of January 29, 2007, the United States Fish and Wildlife Service (USFWS) lists four federally protected species for Wake County. Table 2 lists the species, their status and biological conclusion.

Table 2. Federally-Protected Species for Wake County

Common Name	Scientific Name	Federal Status	Biological Conclusion
dwarf wedgemussel	*Alasmidonta heteradon*	E	May affect, Not Likely to Adversely Affect
bald eagle	*Haleaeetus leucephalus*	T	No Effect
red-cockaded woodpecker	*Picoides borealis*	E	No Effect
Michaux's sumac	*Rhus michauxii*	E	No Effect

Biological conclusions of "No Effect" were given in the CE for red-cockaded woodpecker and Michaux's sumac. There is no suitable habitat for the red-cockaded woodpecker. There was suitable habitat for Michaux's sumac within disturbed areas and rights-of-way, however, no plants were observed during surveys performed on April 19, 2004.

A biological conclusion of "May Affect, Not Likely to Adversely Affect" was given in the CE for the bald eagle. Surveys were conducted November 4 and 12, 2003 for bald eagles for this project. Only marginal habitat exists within 1.0 mile of the project site and no bald eagles were seen. A concurrence letter from USFWS dated December 3, 2003 concurs with these biological conclusions for these species. However, due to a change in terminology, the biological conclusion has been changed to "No Effect" for the bald eagle.

A biological conclusion of "May affect, not likely to adversely affect," was given in the CE for the dwarf wedgemussel. Alderman Environmental Services, Inc. conducted surveys for the dwarf wedgemussel on November 4, 2003. No dwarf wedgemussels were found. This particular portion of Middle Creek is located downstream of an impounded lake and does not appear to provide optimal habitat for dwarf wedgemussel; therefore no further surveys were required. A letter from the USFWS dated December 8, 2003, which included in the CE, concurs with the Biological Conclusion of "May Affect-Not Likely to Adversely Affect" for dwarf wedgemussel.

SUMMARY

Section 404 Permit: Application is hereby made for the Department of Army Section 404 Regional General Permit No. 198200031 authorizing for the above-described activities for impacts associated the construction of Bridge No. 63.

Section 401 Permit: The NCDOT will adhere to all General Water Quality Certifications (WQC) 3404. Written concurrence from the NCDWQ is required. We are providing five copies of this application to the North Carolina Department of Environment and Natural Resources, Division of Water Quality, for review.

Buffer Authorization: This project has been designed to comply with the Neuse River Basin Riparian Buffer Rules (15A NCAC 2B.0233). NCDOT requests written authorization for a 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 Erica McLamb at 715-1521.

Sincerely,

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

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

w/o attachment
Mr. Jay Bennett, P.E., Roadway Design
Mr. Majed Alghandour, P. E., Programming and TIP
Mr. Art McMillan, P.E., Highway Design
Mr. Scott McLendon, USACE, Wilmington
Ms. Theresa Ellerby, PDEA
Ms. Beth Harmon, EEP
Mr. Todd Jones, NCDOT External Audit Branch

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

Wetland Impact Site Number (indicate on map)	Type of Impact	Type of Wetland (e.g., forested, marsh, herbaceous, bog, etc.)	Located within 100-year Floodplain (yes/no)	Distance to Nearest Stream (linear feet)	Area of Impact (acres)
1	Temporary Fill	Riverine	Yes	20 feet	0.01
4	Temporary Fill	Riverine	Yes	120 feet	0.06
5	Temporary Fill	Riverine	Yes	7 feet	0.07
7	Temporary Fill	Riverine	Yes	20 feet	<0.01
9	Permanent Fill	Riverine	Yes	100 feet	<0.01
Total Wetland Impact (acres)					0.14

3. List the total acreage (estimated) of all existing wetlands on the property: 1.04 acres

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

Stream Impact Number (indicate on map)	Stream Name	Type of Impact	Perennial or Intermittent?	Average Stream Width Before Impact	Impact Length (linear feet)	Area of Impact (acres)
2	UT1	Temporary Fill	Perennial	10	20	<0.01
3	UT1	Temporary Fill	Perennial	10	371	0.04
6	Middle Creek	Temporary Fill	Perennial	50	52	0.05
8	Middle Creek	Temporary Fill	Perennial	50	62	0.03
10	UT2	Temporary Fill	Perennial	10	228	0.01
10	UT2	Permanent	Perennial	10	50	<0.01
Total Stream Impact (by length and acreage)					783	0.13

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: GP 31

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

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

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

II. Applicant Information

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

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

III. Project Information

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

1. Name of project: Replacement of Bridge No.63 over Middle Creek on US 401

2. T.I.P. Project Number or State Project Number (NCDOT Only): B-3916

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

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

5. Site coordinates (For linear projects, such as a road or utility line, attach a sheet that separately lists the coordinates for each crossing of a distinct waterbody.)
   Decimal Degrees (6 digits minimum): 35.6318 °N 78.7161 °W

6. Property size (acres): N/A

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

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

9. Describe the existing conditions on the site and general land use in the vicinity of the project at the time of this application: The project area is primarily business development and forested land with some residential developement

10. Describe the overall project in detail, including the type of equipment to be used: Bridge No. 63 will be replaced on existing location with an onsite detour. Heavy duty excavation equipment will be used such as trucks, dozers, cranes and other various equipment necessary for roadway construction.

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

IV. Prior Project History

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

V. Future Project Plans

Are any future permit requests anticipated for this project? If so, describe the anticipated work, and provide justification for the exclusion of this work from the current application.
N/A

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

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

1. Provide a written description of the proposed impacts: Please refer to attached cover letter.

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

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

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

Stream Impact (acres):	0.13
Wetland Impact (acres):	0.14
Open Water Impact (acres):	0
Total Impact to Waters of the U.S. (acres)	0.13
Total Stream Impact (linear feet):	783

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

_____

_____

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

VII. Impact Justification (Avoidance and Minimization)

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

VIII. Mitigation

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

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

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

1. Provide a brief description of the proposed mitigation plan. The description should provide as much information as possible, including, but not limited to: site location (attach directions and/or map, if offsite), affected stream and river basin, type and amount (acreage/linear feet) of mitigation proposed (restoration, enhancement, creation, or preservation), a plan view, preservation mechanism (e.g., deed restrictions, conservation easement, etc.), and a description of the current site conditions and proposed method of construction. Please attach a separate sheet if more space is needed.
Mitigation is required for the proposed impacts to riparian buffers categorized as "impacts other than road crossings." Mitigation will be conducted through the NCEEP

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

   Amount of stream mitigation requested (linear feet): 0
   Amount of buffer mitigation requested (square feet): 1,996 sq. ft.
   Amount of Riparian wetland mitigation requested (acres): 0.05 acre
   Amount of Non-riparian wetland mitigation requested (acres): 0
   Amount of Coastal wetland mitigation requested (acres): 0

IX. Environmental Documentation (required by DWQ)

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

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

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

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

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

1. Will the project impact protected riparian buffers identified within 15A NCAC 2B .0233 (Neuse), 15A NCAC 2B .0259 (Tar-Pamlico), 15A NCAC 02B .0243 (Catawba) 15A NCAC 2B .0250 (Randleman Rules and Water Supply Buffer Requirements), or other (please identify Neuse)? 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	1971	3 (2 for Catawba)	5913
2	25	1.5	38
Total	1996		5951

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

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

XI. Stormwater (required by DWQ)

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

XII. Sewage Disposal (required by DWQ)

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

XIII. Violations (required by DWQ)

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

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

XIV. Cumulative Impacts (required by DWQ)

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

XV. Other Circumstances (Optional):

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

Applicant/Agent's Signature **Date** 5/29/07

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

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

MICHAEL F. EASLEY
GOVERNOR

LYNDO TIPPETT
SECRETARY

March 19, 2007

Mr. William D. Gilmore, P.E., Director
Ecosystem Enhancement Program
1652 Mail Service Center
Raleigh, NC 27699-1652

Dear Sir:

Subject: **Request for Neuse Riparian Buffer Mitigation for the replacement of Bridge No. 63 over Middle Creek on US 401, Wake County.** Federal Aid Project No. BRSTP-401(13), WBS No. 33350.1.1, State Project No. 8.1404501, Division 5, T.I.P. No. B-3916.

The purpose of this letter is to request that the North Carolina Ecosystem Enhancement Program (EEP) provide confirmation that you are willing to provide compensatory mitigation for the project in accordance with the Memorandum of Agreement (MOA) signed July 22, 2003 by the US Army Corp of Engineers (USACE), the North Carolina Department of Environment and Natural Resources (NCDENR), and the North Carolina Department of Transportation (NCDOT).

The NCDOT proposes to replace Bridge No. 63 over Middle Creek on US 401, Wake County. There will be impacts to riparian buffers associated with this project which will require compensatory mitigation. We have avoided and minimized the impacts to Waters of the US and riparian buffers to the greatest extent possible as described in the permit application. An application for General Regional Permit 31, General Water Quality Certifications 3404, and Neuse Riparian Buffer Authorization will be submitted upon receipt of acceptance of this mitigation. A copy of the permit application, when submitted, can be found at http://www.ncdot.org/planning/pe/naturalunit/Applications.html.

The project is located in the Piedmont Physiographic Province in Wake County in the Neuse River basin in Hydrological Cataloguing Unit 03020201. Mitigation is required for the following riparian buffer impacts:

- 1971 square feet of impacts to Buffer Zone 1
- 25 square feet of impacts to Buffer Zone 2

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

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

FAX: 919-715-5501

LOCATION:
2728 CAPITAL BLVD. SUITE 240
RALEIGH NC 27604

WEBSITE: WWW.NCDOT.ORG

In order to satisfy regulatory assurances that mitigation will be performed; the NCDWQ requires a formal letter from EEP indicating their willingness and ability to provide the mitigation work requested by NCDOT. The NCDOT requests such a letter of confirmation be addressed to Mr. John Hennessy of NCDWQ, with copies submitted to NCDOT.

Please respond to NCDOT in writing within 10 business days with an EEP acceptance letter for this NCDOT project.

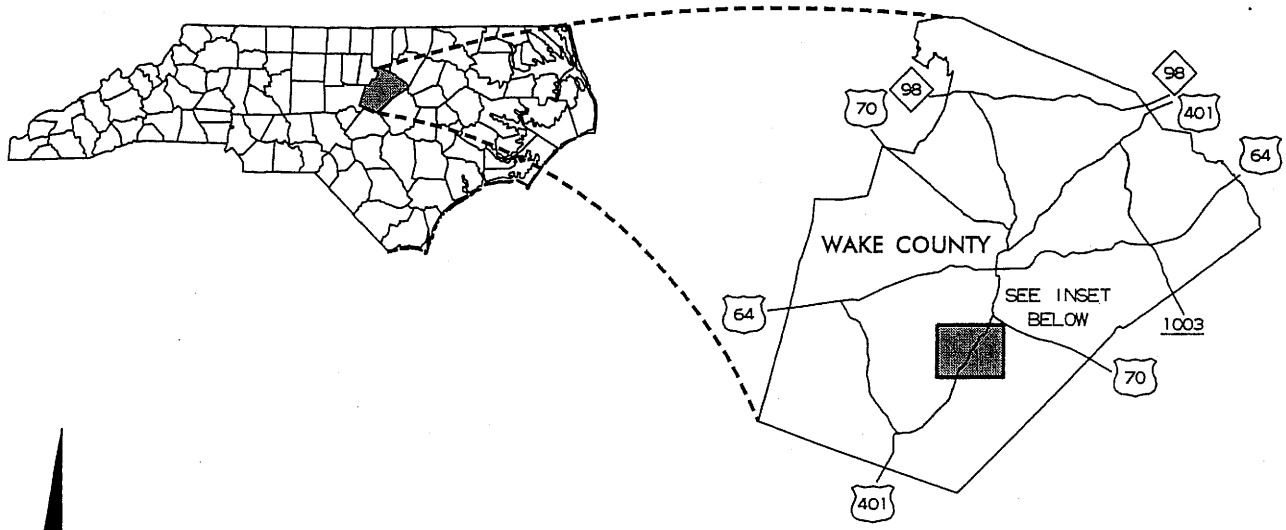
If you have any questions or need additional information please call Erica McLamb at 919-715-1521.

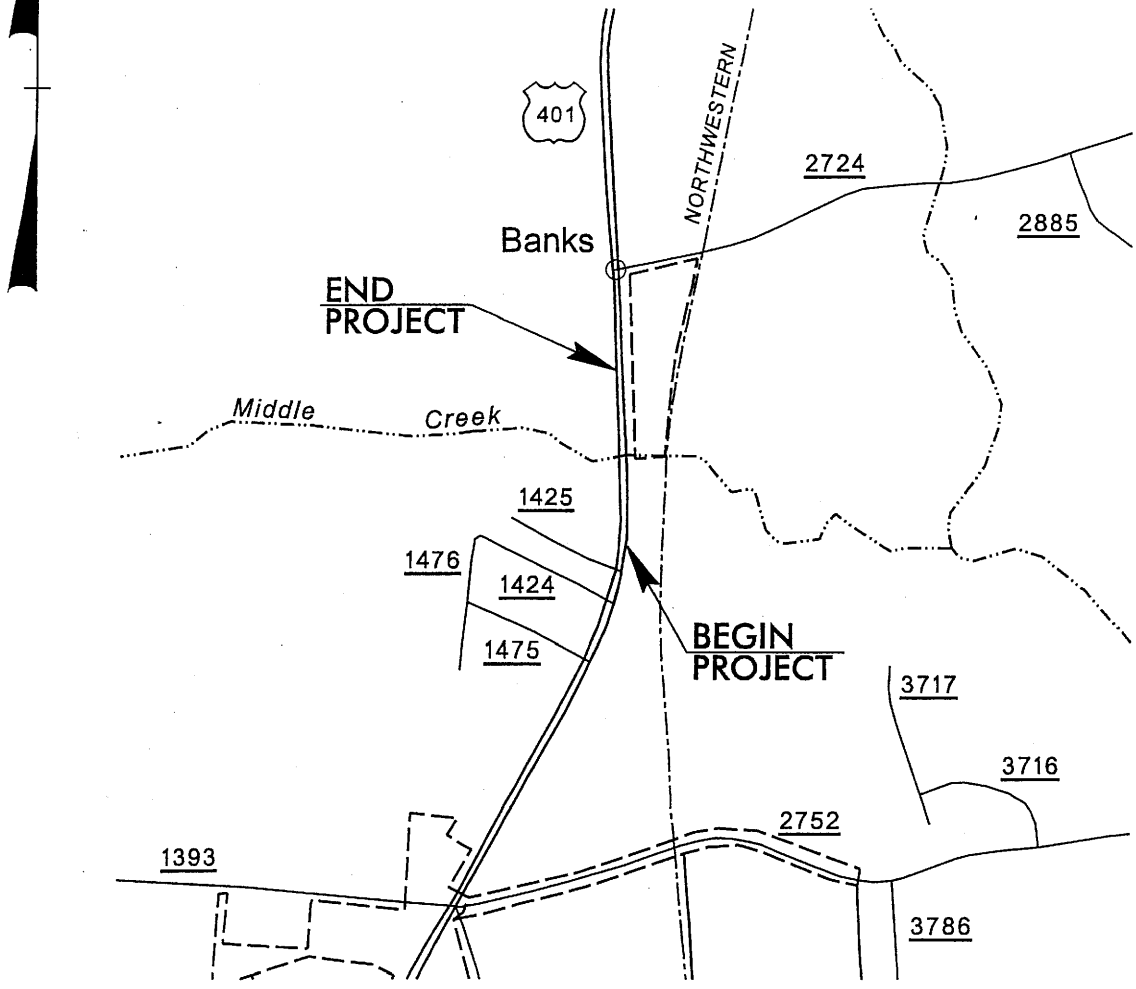
Sincerely,

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

cc:

Mr. John Hennessy, NCDWQ
Mr. Rob Ridings, NCDWQ
Ms. Linda Fitzpatrick, NCDOT Natural Environment Unit
Mr. Majed Alghandour, P. E., NCDOT Project Management/Scheduling Unit
Mr. Todd Jones, NCDOT External Audit Branch
File-B-3916





Wetland and Stream
Permit Drawings

SCALE
1/8 0 1/4 Mile

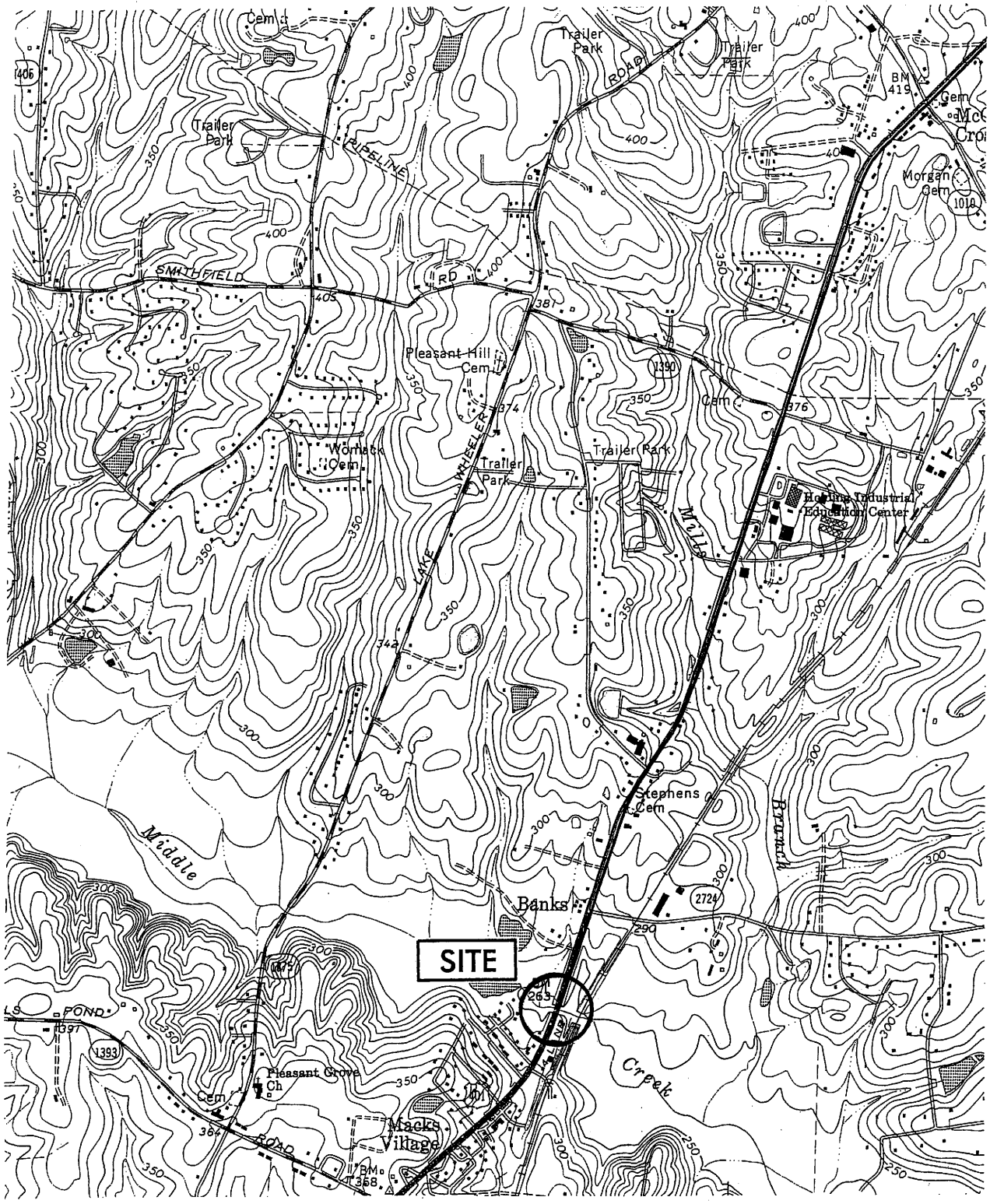
N.C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS

WAKE COUNTY

PROJECT: 33350.1.1 (B-3916)
BRIDGE NO. 63 OVER
MIDDLE CREEK
ON US 401

SHEET 1 OF 15

10/14/05



N.C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS

WAKE COUNTY

PROJECT: 33350.1.1 (B-3916)
BRIDGE NO. 63 OVER
MIDDLE CREEK
ON US 401

SHEET 2 OF 12 10/14/05

Project No. 33350.1.1 (B-3916)

Property Owner List

Parcel Number	Name	Address
2	William L. Carter	3206 Hampton Road Raleigh, NC 27607
3	Carolina Power & Light Company	P.O. Box 1551 Raleigh, NC 27602

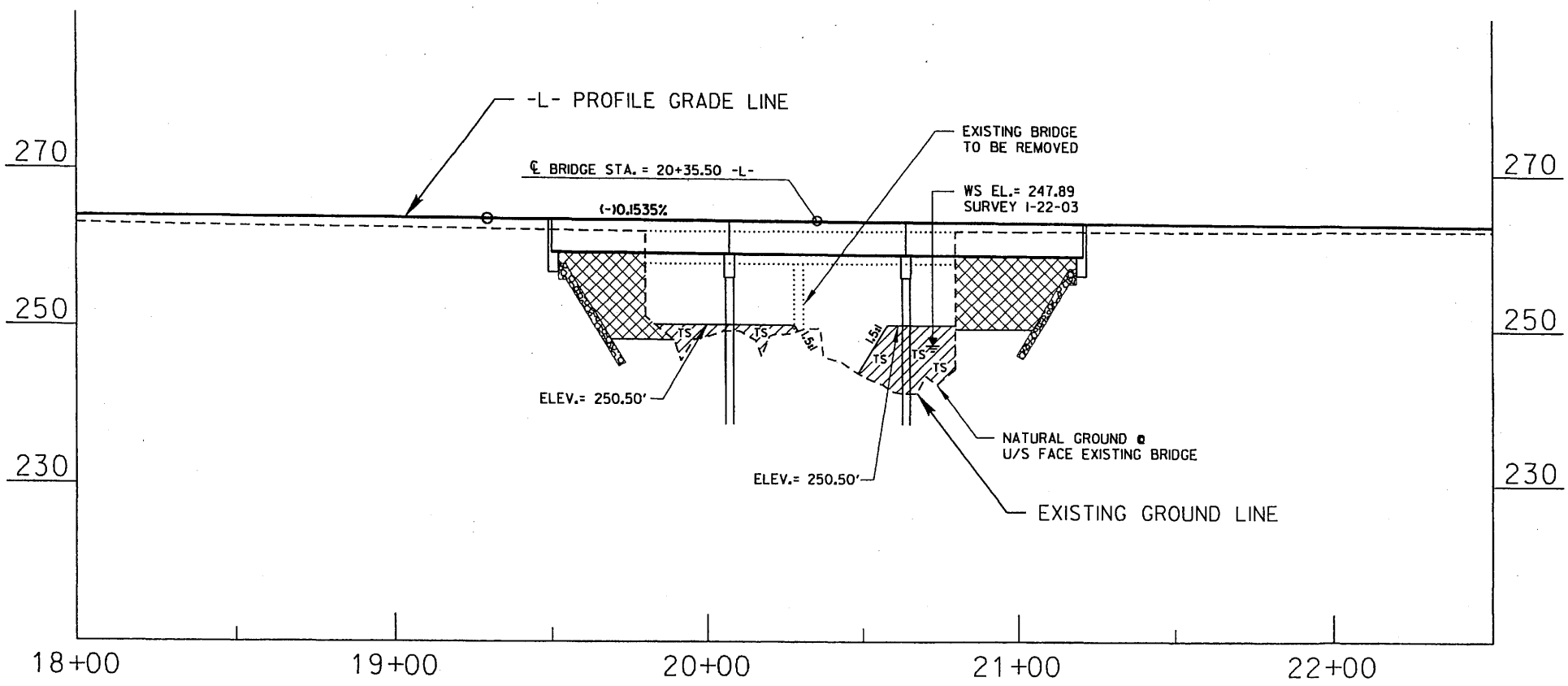
Permit

N.C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS

WAKE COUNTY

PROJECT: 33350.1.1 (B-3916)
BRIDGE NO. 63 OVER
MIDDLE CREEK
ON US 401

SHEET 3 OF 15 10/14/05



SCALE

HORIZONTAL

25 0 50

VERTICAL

10 0 20

EXISTING MATERIAL TO BE REMOVED

DENOTES TEMPORARY FILL IN SURFACE WATERS

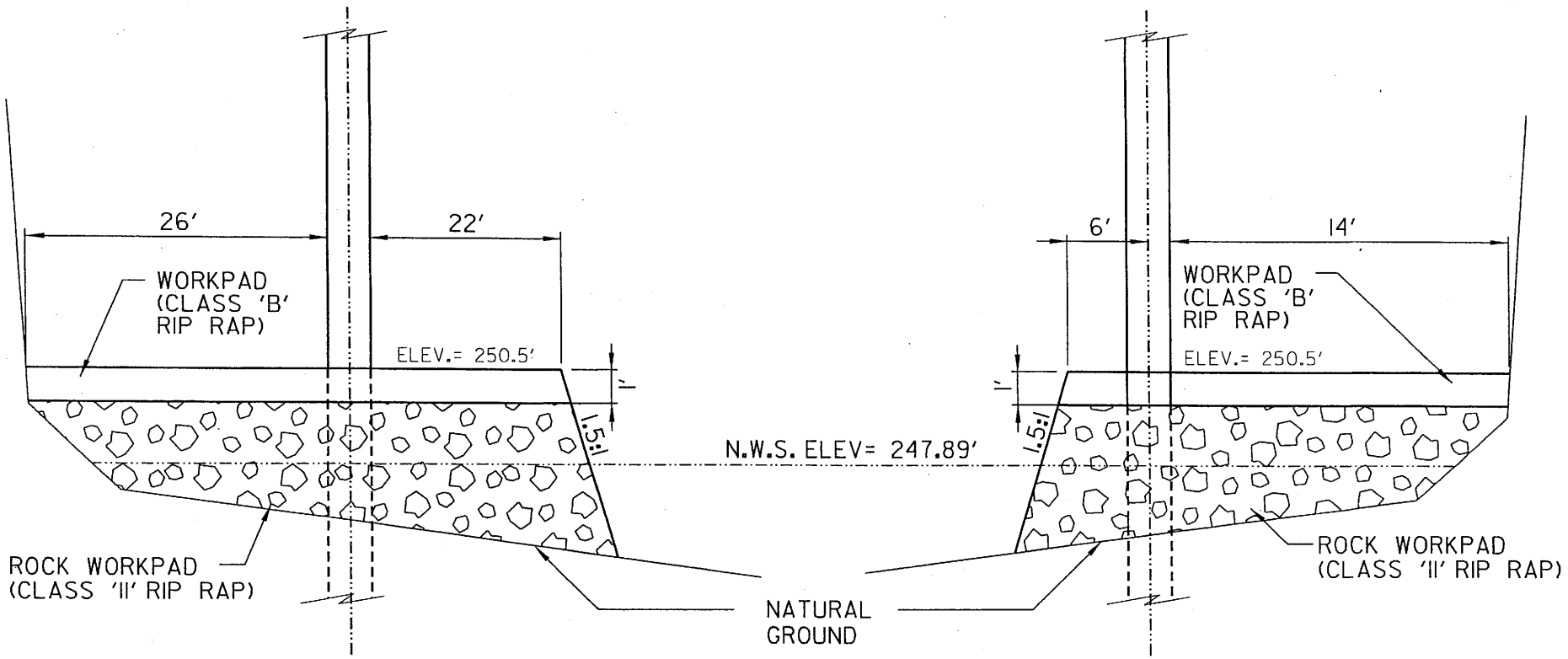
TS TS TS

N.C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS

WAKE COUNTY

PROJECT: 33350.1.1 (B-3916)
BRIDGE NO. 63 OVER
MIDDLE CREEK
ON US 401

SHEET 4 OF 15 **1/23/06**



WORKPAD DETAIL
(NOT TO SCALE)

N.C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS

WAKE COUNTY

PROJECT: 33350.1.1 (B-3916)
BRIDGE NO. 63 OVER
MIDDLE CREEK
- ON US 401

SHEET 5 **OF** 10 **1/23/06**

WETLAND PERMIT IMPACT SUMMARY

Site No.	Station (From / To)	Structure Size / Type	WETLAND IMPACTS					SURFACE WATER IMPACTS				
			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	-DET- 16+00 / 17+60	160' BRIDGE		0.01								
2	-DET- 16+0/17+60	160' BRIDGE							<0.01		20	
3	-DET 17+60 / 21+60	Temporary							0.04		371	
	(impacts to UT)	Roadway Fill										
4	-DET 17+60 / 21+60	Temporary		0.06								
	(impacts to UT)	Roadway Fill										
5	-DET 17+60 / 21+60	Temporary		0.07								
	(impacts to UT)	Roadway Fill										
6	-L- 19+80 / 20+28	Work Pad							0.05		52	
	(impacts to Middle Cr)											
	for Main Bridge											
7	-L- 19+80 / 20+28	Work Pad		<0.01								
	(impacts to Middle Cr)											
	for Main Bridge											
8	-L- 20+58 / 20+78	Work Pad							0.03		62	
	(impacts to Middle Cr)											
	for Main Bridge											
9	-L- 25+32 Lt	Roadway Fill	<0.01									
10	-L- 23+00 / 25+25 Rt	Construction							0.01		228	
		access										
		out of pipe						<0.01		50		
TOTALS:			<0.01	0.15				<0.01	0.13	50	733.00	

There will be less than 0.01 acre (77 sq. ft.) of surface water impacts associated with the placement of two bents in Middle Creek

N.C. DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

WAKE COUNTY

PROJECT 33350.1.1 (B-3916)
BRIDGE #63 OVER MIDDLE CREEK
ON US 401

SHEET 10 of 10 3/15/2007

ATN Revised 3/31/05

Perm

REVISIONS

DENOTES TEMPORARY FILL IN WETLAND

DENOTES TEMPORARY FILL IN SURFACE WATER

PROJECT REFERENCE NO.	SHEET NO.
B-3916	4A
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

Permit Drawing
Sheet 7 of 10

DURWOOD KEMP YOUNG
DB 11653 PG 2297

WILLIAM L. CARTER
DB 3128 PG 47

CAROLINA POWER & LIGHT COMPANY
DB 5610 PG 105
PB 1993 PG 502

ROBERT E. & JACKIE W. NOLES
DB 2984 PG 288
PB 1985 PG 1085

R.M. SMITH, SR. ET AL
% F.L. HOGAN SR.
DB 6276 PG 66
PB 1981 PG 181

DAVID R. COCKMAN, ET AL
DB 3331 PG 334

LINE EXISTING ROADSIDE CHANNEL FROM TB TO TB WITH GEO-FABRIC PRIOR TO PLACEMENT OF DETOUR FILL

SITE 1 SITE 2 SITE 3 SITE 4 SITE 5

CL.II RIP RAP (STRUCTURE PAY ITEM)

TOP OF WORK PAD

BL-2 PINC 15+32.20 = -L- STA. 19+39.36 73.34' RT.

BL-3 PINC 21+94.87 = -L- STA. 26+02.01 77.52' RT.

DETAIL A
SPECIAL CUT BASE DITCH
(Not to Scale)

Min. D = 1.0 Ft
B = 2.0 Ft

-DET- 9+60 to 13+60 LT

DETAIL E
LATERAL BASE DITCH
(Not to Scale)

Min. D = 1.0 Ft
B = 2.0 Ft
b = 5.0 Ft

-DET- 13+60 to 15+25 LT

DETAIL F
VAR. WIDTH LATERAL BASE DITCH
(Not to Scale)

Min. D = 1.0 Ft
B = * Ft
b = 3.0 Ft

* B VARIES FROM 5' TO 10'
-DET- 20+73 to 20+93 LT

DETAIL FSM
FALSE SUMP
(Not to Scale)

S=Ditch Slope ℄ Proposed Ditch

-DET- 19+15 MED

DETAIL G
LATERAL BASE DITCH
(Not to Scale)

Min. D = 1.0 Ft
B = 5.0 Ft
* = vary the base width at the end to 10'

-DET- 21+20 to 21+67 LT
SLOPE = 0.00000%

BEGIN BRIDGE -DET- STA. 16+00.00

END BRIDGE -DET- STA. 17+50.00

TYPE III

SKETCH SHOWING ROADWAY IN RELATION TO STRUCTURE

FOR DET. PROFILE SEE SHEET NO.'S

FOR CROSS SECTIONS SEE SHEET NO.'S

TRANSITE CONSULTING
ENGINEERS, INCORPORATED
1300 Paddock Drive, Suite G-10
Raleigh, N.C. 27609

REVISIONS

PROJECT REFERENCE NO.	SHEET NO.
B-3916	4A
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

Permit Drawing
Sheet 8 of 12

DENOTES TEMPORARY FILL IN WETLAND

DENOTES TEMPORARY FILL IN SURFACE WATER

DURWOOD KEMP YOUNG
DB 11653 PG 2297

WILLIAM L. CARTER
DB 3128 PG 47

CAROLINA POWER & LIGHT COMPANY
DB 5610 PG 105
PB 1993 PG 502

ROBERT E. & JACKIE W. NOLES
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R.M. SMITH SR. ET AL
% F.L. HOGAN SR.
DB 6276 PG 66
PB 1981 PG 181

DAVID R. COCKMAN, ET AL
DB 3331 PG 334

SITE 1

SITE 2

SITE 3

SITE 4

SITE 5

LINE EXISTING ROADSIDE CHANNEL FROM TB TO TB WITH GEO-FABRIC PRIOR TO PLACEMENT OF DETOUR FILL

CL II RIP RAP (STRUCTURE PAY ITEM)

BL-2 PINC 15+32.20 =
-L- STA. 19+39.36
73.34' RT.

BL-3 PINC 21+94.87 =
-L- STA. 26+02.01
77.52' RT.

-DET- 9+60 to 13+60 LT

-DET- 13+60 to 15+25 LT

-DET- 19+15 MED

-DET- 20+73 to 20+93 LT

-DET- 21+20 to 21+67 LT
SLOPE = 0.00000%

* B VARIES FROM 5' TO 10'

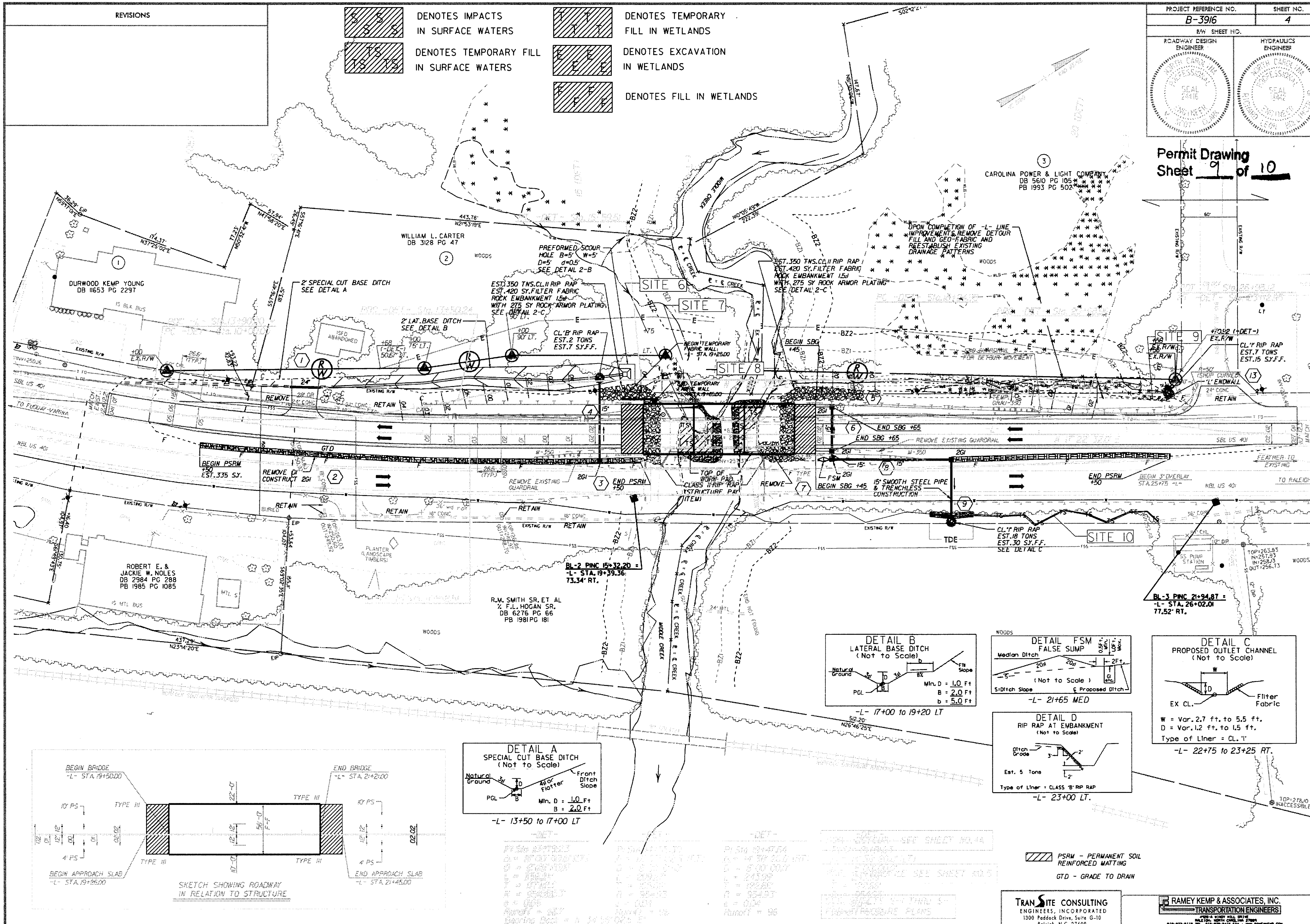
BEGIN BRIDGE -DET- STA. 16+00.00

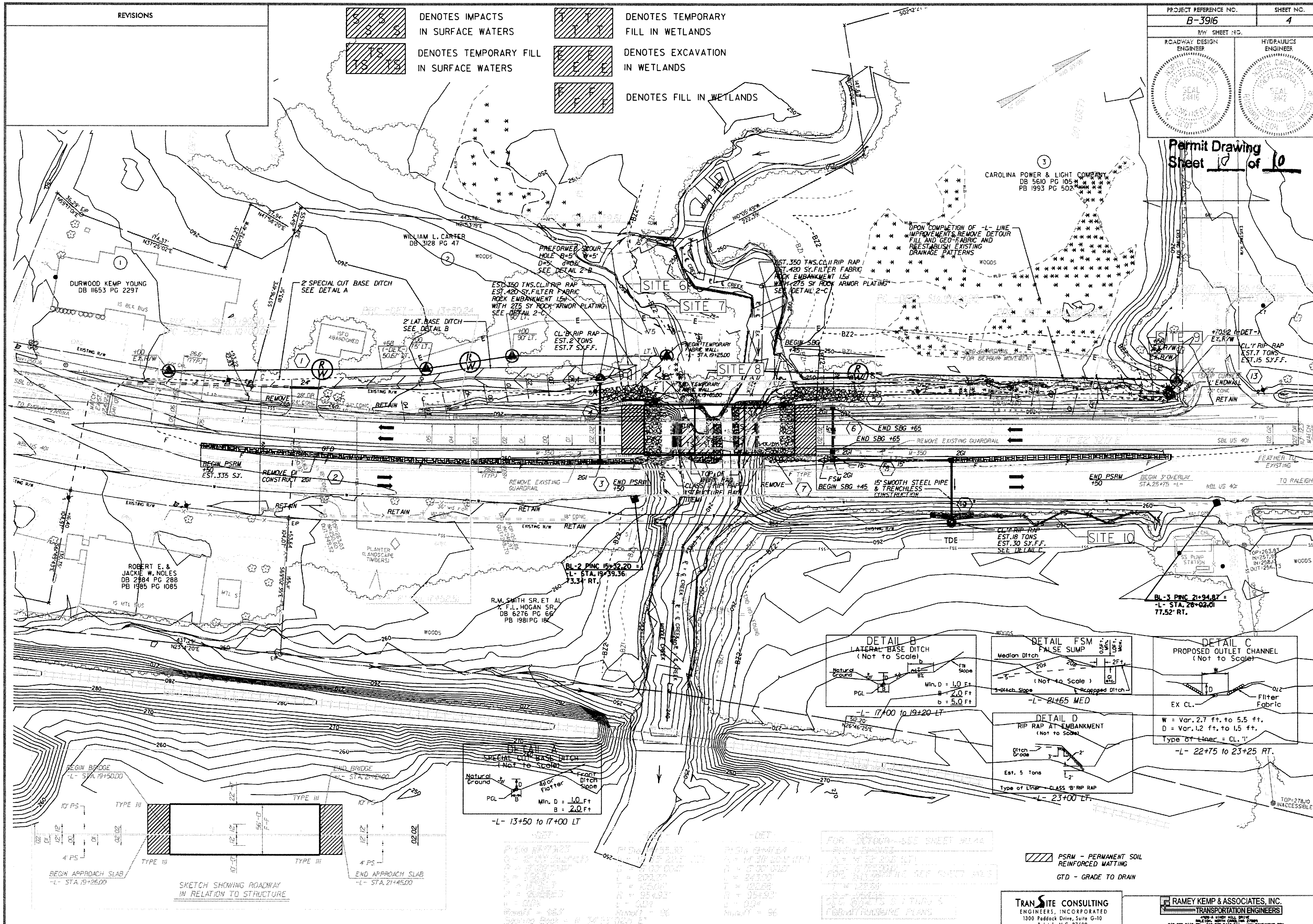
END BRIDGE -DET- STA. 17+50.00

SKETCH SHOWING ROADWAY IN RELATION TO STRUCTURE

FOR DET. PROFILE SEE SHEET 8A

TRANSITE CONSULTING
ENGINEERS, INCORPORATED
1300 Paddock Drive, Suite G-10
Raleigh, N.C. 27609


REVISIONS
DENOTES IMPACTS IN SURFACE WATERS
DENOTES TEMPORARY FILL IN WETLANDS
DENOTES TEMPORARY FILL IN SURFACE WATERS
DENOTES EXCAVATION IN WETLANDS
DENOTES FILL IN WETLANDS
PROJECT REFERENCE NO.
B-3916
SHEET NO.
4
R/W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
Permit Drawing Sheet 9 of 10
CAROLINA POWER & LIGHT COMPANY
DB 5610 PG 105
PB 1993 PG 502
WILLIAM L. CARTER
DB 3128 PG 47
DURWOOD KEMP YOUNG
DB 11653 PG 2297
ROBERT E. & JACKIE W. NOLES
DB 2984 PG 288
PB 1985 PG 1085
R.M. SMITH SR. ET AL
% F.L. HOGAN SR.
DB 6276 PG 66
PB 1981 PG 181
SITE 6
SITE 7
SITE 8
SITE 9
SITE 10
MIDDLE CREEK
SBL US 401
NBL US 401
TO FUQUAY-VARINA
TO RALEIGH
2' SPECIAL CUT BASE DITCH SEE DETAIL A
2' LAT. BASE DITCH SEE DETAIL B
PREFORMED SCOUR HOLE B=5' W=5' D=5' d=0.5' SEE DETAIL 2-B
EST.350 TNS.CL.II RIP RAP EST.420 SY.FILTER FABRIC ROCK EMBANKMENT 1.5:1 WITH 275 SY ROCK ARMOR PLATING SEE DETAIL 2-C
CL.'B' RIP RAP EST.2 TONS EST.7 SY.F.F.
UPON COMPLETION OF -L- LINE IMPROVEMENTS REMOVE DETOUR FILL AND GEO-FABRIC AND REESTABLISH EXISTING DRAINAGE PATTERNS
CL.'I' RIP RAP EST.7 TONS EST.15 SY.F.F.
CL.'I' RIP RAP EST.18 TONS EST.30 SY.F.F. SEE DETAIL C
BEGIN PSRM +50 EST.335 SY.
END PSRM +50
BEGIN SBG +45
END SBG +65
15" SMOOTH STEEL PIPE & TRENCHLESS CONSTRUCTION
BL-2 PINC 15+32.20 = -L- STA. 19+39.36 73.34' RT.
BL-3 PINC 21+94.87 = -L- STA. 26+02.01 77.52' RT.
DETAIL A
SPECIAL CUT BASE DITCH (Not to Scale)
Min. D = 1.0 Ft
B = 2.0 Ft
-L- 13+50 to 17+00 LT
DETAIL B
LATERAL BASE DITCH (Not to Scale)
Min. D = 1.0 Ft
B = 2.0 Ft
b = 5.0 Ft
-L- 17+00 to 19+20 LT
DETAIL FSM
FALSE SUMP
-L- 21+65 MED
DETAIL D
RIP RAP AT EMBANKMENT (Not to Scale)
Est. 5 Tons
Type of Liner = CLASS 'B' RIP RAP
-L- 23+00 LT.
DETAIL C
PROPOSED OUTLET CHANNEL (Not to Scale)
W = Var. 2.7 ft. to 5.5 ft.
D = Var. 1.2 ft. to 1.5 ft.
Type of Liner = CL. 'I'
-L- 22+75 to 23+25 RT.
BEGIN BRIDGE -L- STA. 19+50.00
END BRIDGE -L- STA. 21+21.00
BEGIN APPROACH SLAB -L- STA. 19+35.00
END APPROACH SLAB -L- STA. 21+45.00
SKETCH SHOWING ROADWAY IN RELATION TO STRUCTURE
PSRM - PERMANENT SOIL REINFORCED MATTING
GTD - GRADE TO DRAIN
TRANSITE CONSULTING ENGINEERS, INCORPORATED
1300 Paddock Drive, Suite G-10
Raleigh, N.C. 27609
RAMEY KEMP & ASSOCIATES, INC.
TRANSPORTATION ENGINEERS


REVISIONS
DENOTES IMPACTS IN SURFACE WATERS
DENOTES TEMPORARY FILL IN SURFACE WATERS
DENOTES TEMPORARY FILL IN WETLANDS
DENOTES EXCAVATION IN WETLANDS
DENOTES FILL IN WETLANDS
PROJECT REFERENCE NO.
B-3916
SHEET NO.
4
R/W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
Permit Drawing
Sheet 10 of 10
CAROLINA POWER & LIGHT COMPANY
DB 5610 PG 105
PB 1993 PG 502
UPON COMPLETION OF -L- LINE IMPROVEMENTS, REMOVE DETOUR FILL AND GEO-FABRIC AND REESTABLISH EXISTING DRAINAGE PATTERNS
WILLIAM L. CARTER
DB 3128 PG 47
DURWOOD KEMP YOUNG
DB 11653 PG 2297
2' SPECIAL CUT BASE DITCH
SEE DETAIL A
2' LAT. BASE DITCH
SEE DETAIL B
PREFORMED SCOUR HOLE
SEE DETAIL 2-B
EST. 350 TNS. CL.II RIP RAP
EST. 420 SY. FILTER FABRIC
ROCK EMBANKMENT 1.5d
WITH 275 SY ROCK ARMOR PLATING
SEE DETAIL 2-C
CL.'B' RIP RAP
EST. 2 TONS
EST. 7 SY. F.F.
SITE 6
SITE 7
SITE 8
SITE 9
SITE 10
BEGIN SBG
END SBG +65
REMOVE EXISTING GUARDRAIL
SBL US 401
NBL US 401
TO RALEIGH
BEGIN PSRM
EST. 335 SY.
REMOVE DI
CONSTRUCT 2GI
END PSRM
BEGIN SBG +45
15" SMOOTH STEEL PIPE & TRENCHLESS CONSTRUCTION
CL.'I' RIP RAP
EST. 18 TONS
EST. 30 SY. F.F.
SEE DETAIL C
CL.'I' RIP RAP
EST. 7 TONS
EST. 15 SY. F.F.
RETAIN
ROBERT E. & JACKIE W. NOLES
DB 2984 PG 288
PB 1985 PG 1085
R.M. SMITH SR. ET AL
% F.L. HOGAN SR.
DB 6276 PG 66
PB 1981 PG 18
BL-2 PINC 15+32.20 =
-L- STA. 19+39.36
73.34' RT.
BL-3 PINC 21+94.87 =
-L- STA. 26+02.01
77.52' RT.
WOODS
DETAIL A
SPECIAL CUT BASE DITCH
(Not to Scale)
Min. D = 1.0 Ft
B = 2.0 Ft
-L- 13+50 to 17+00 LT
DETAIL B
LATERAL BASE DITCH
(Not to Scale)
Min. D = 1.0 Ft
B = 2.0 Ft
b = 5.0 Ft
-L- 17+00 to 19+20 LT
DETAIL FSM
FALSE SUMP
(Not to Scale)
-L- 21+65 MED
DETAIL C
PROPOSED OUTLET CHANNEL
(Not to Scale)
Filter Fabric
W = Var. 2.7 ft. to 5.5 ft.
D = Var. 1.2 ft. to 1.5 ft.
Type of Liner = CL. 'I'
-L- 22+75 to 23+25 RT.
DETAIL D
RIP RAP AT EMBANKMENT
(Not to Scale)
Est. 5 Tons
Type of Liner - CLASS 'B' RIP RAP
-L- 23+00 LT.
BEGIN BRIDGE
-L- STA. 19+50.00
END BRIDGE
-L- STA. 21+20.00
BEGIN APPROACH SLAB
-L- STA. 19+26.00
END APPROACH SLAB
-L- STA. 21+45.00
SKETCH SHOWING ROADWAY IN RELATION TO STRUCTURE
PSRM - PERMANENT SOIL REINFORCED MATTING
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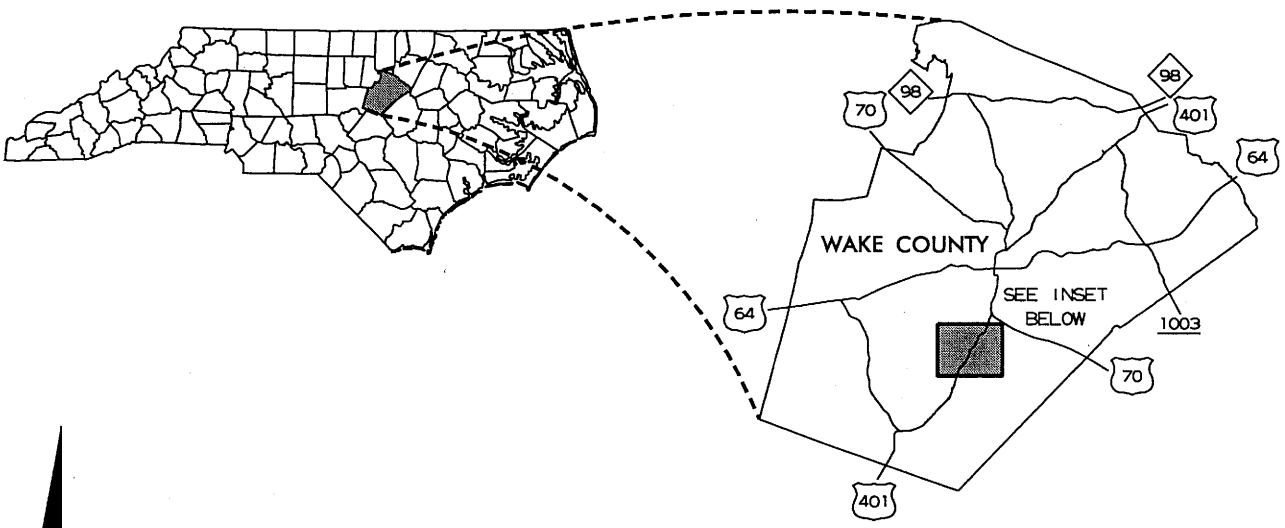
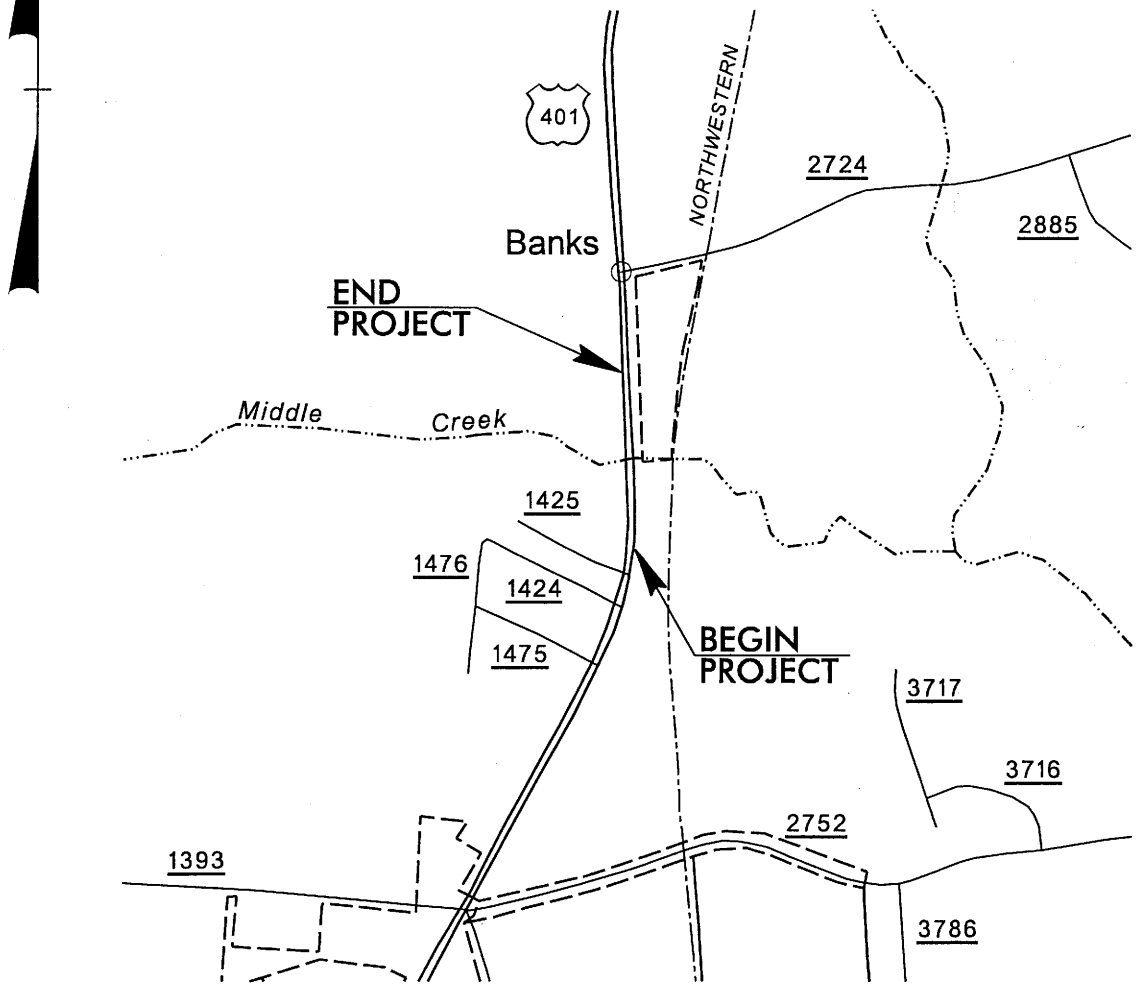




Buffer
Permit Drawings

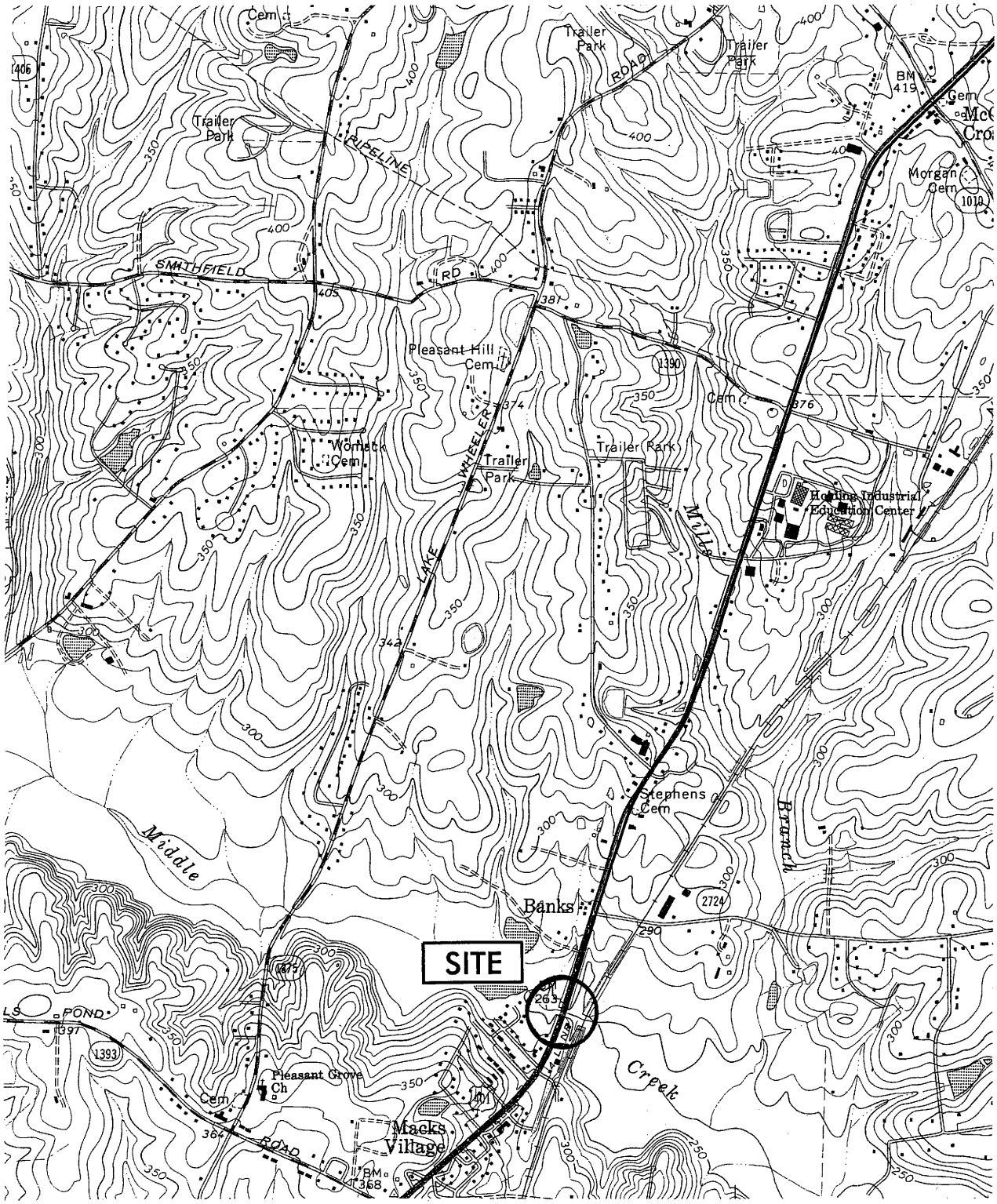
SCALE
1/8 0 1/4 Mile

N.C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS

WAKE COUNTY

PROJECT: 33350.1.1 (B-3916)
BRIDGE NO. 63 OVER
MIDDLE CREEK
ON US 401

SHEET 1 OF 13 10/14/05



N.C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS

WAKE COUNTY

PROJECT: 33350.1.1 (B-3916)
BRIDGE NO. 63 OVER
MIDDLE CREEK
ON US 401

SHEET 2 OF 12 **10/14/05**

Project No. 33350.1.1 (B-3916)

Property Owner List

Parcel Number	Name	Address
2	William L. Carter	3206 Hampton Road Raleigh, NC 27607
3	Carolina Power & Light Company	P.O. Box 1551 Raleigh, NC 27602

N.C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS

WAKE COUNTY

PROJECT: 33350.1.1 (B-3916)
BRIDGE NO. 63 OVER
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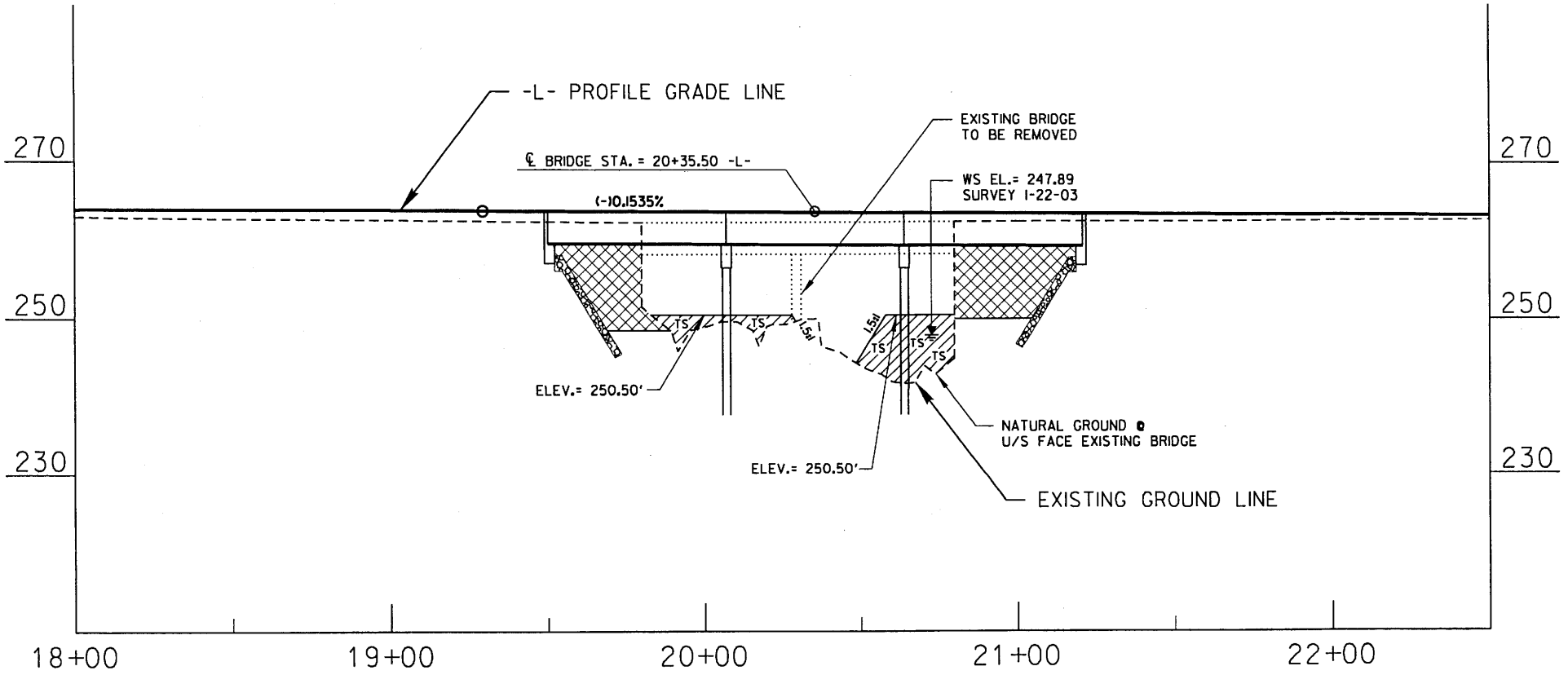
10/14/05



SCALE

HORIZONTAL

25 0 50

VERTICAL

10 0 20

EXISTING MATERIAL TO BE REMOVED

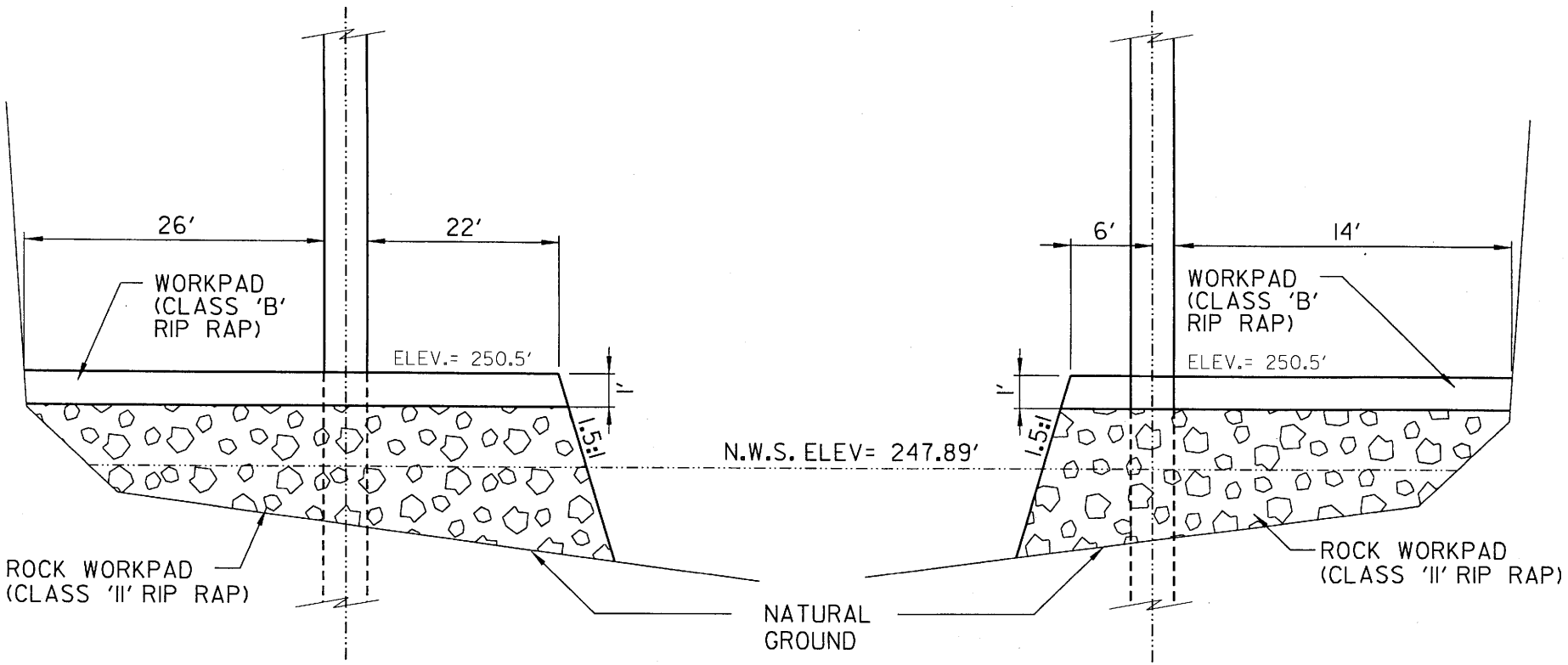
DENOTES TEMPORARY FILL IN SURFACE WATERS

N.C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS

WAKE COUNTY

PROJECT: 33350.1.1 (B-3916)
BRIDGE NO. 63 OVER
MIDDLE CREEK
ON US 401

SHEET 4 OF 10 **1/23/06**



WORKPAD DETAIL
(NOT TO SCALE)

N.C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS

WAKE COUNTY

PROJECT: 33350.1.1 (B-3916)
BRIDGE NO. 63 OVER
MIDDLE CREEK
ON US 401

SHEET 5 **OF** 10 **1/23/06**

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	Detour Bridge, L_T = 160'-0" - Middle Cr	-DET-		X		4723	3703	8426					
2	-DET- Roadway Fill - Middle Cr	-DET-	X			401	58	459					
3	-DET- Roadway Fill - UT	-DET-	X			12457	4612	17069					
	Buffers												
4	Bridge, L_T = 171'-0" - Middle Cr	-L- 19+50 / -L- 21+20		X		1392	277	1669					
5	-L- Roaday Fill - Middle Cr	-L- 21+20 / -L- 21+53	X			121	240	361					
6	=-L- Roadway Permant Fill to UT	-L- 21+53 /-L- 25+48			X				1971	25	1996		
TOTALS:						19094.0	8890.0	27984.0	1971.0	25.0	1996.0		

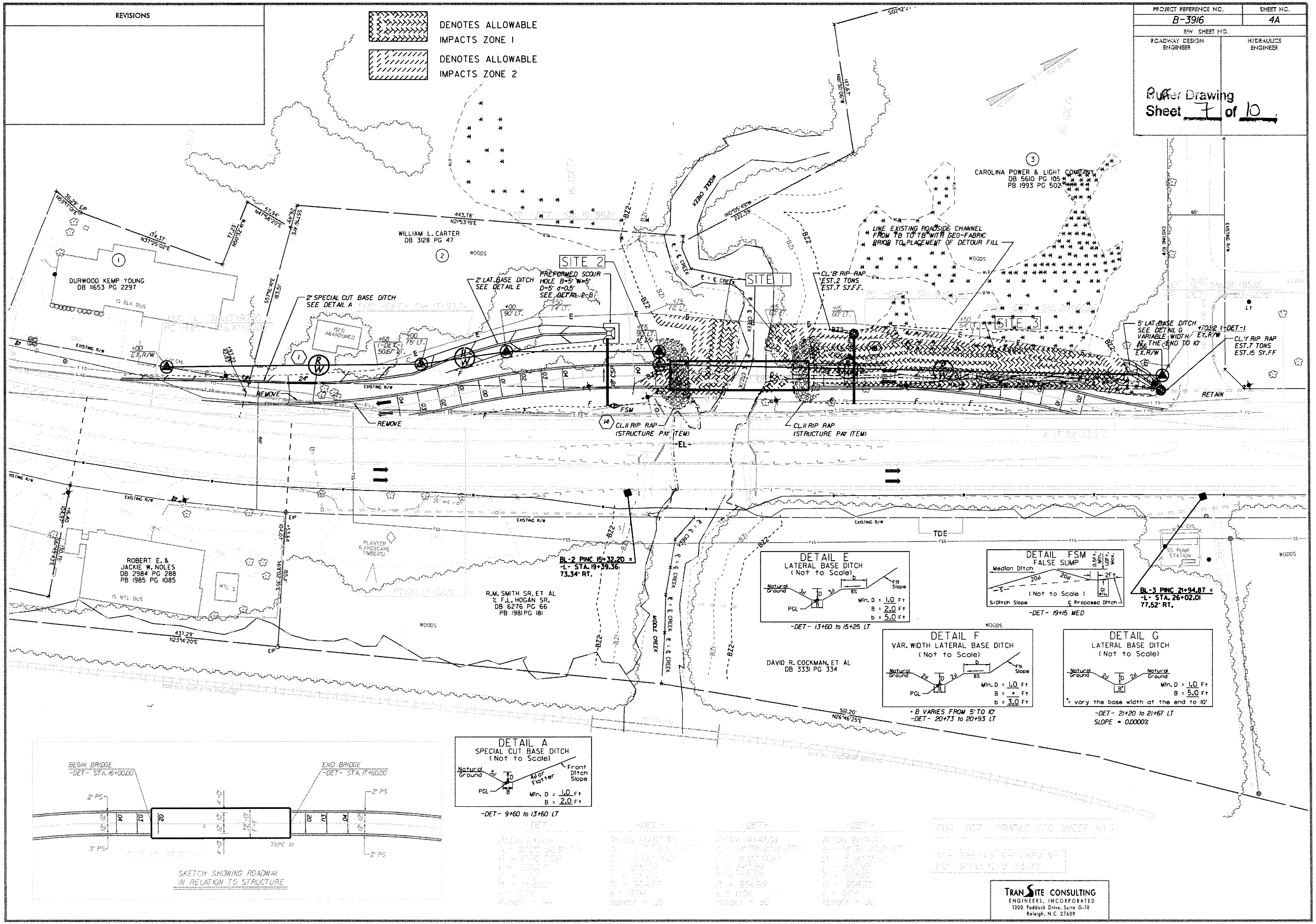
Buffered Stream Length Impacted to Middle Creek =23 feet - widest width of road crossing impacts measure parrellel to stream (-) existing transportation facility

N.C. DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

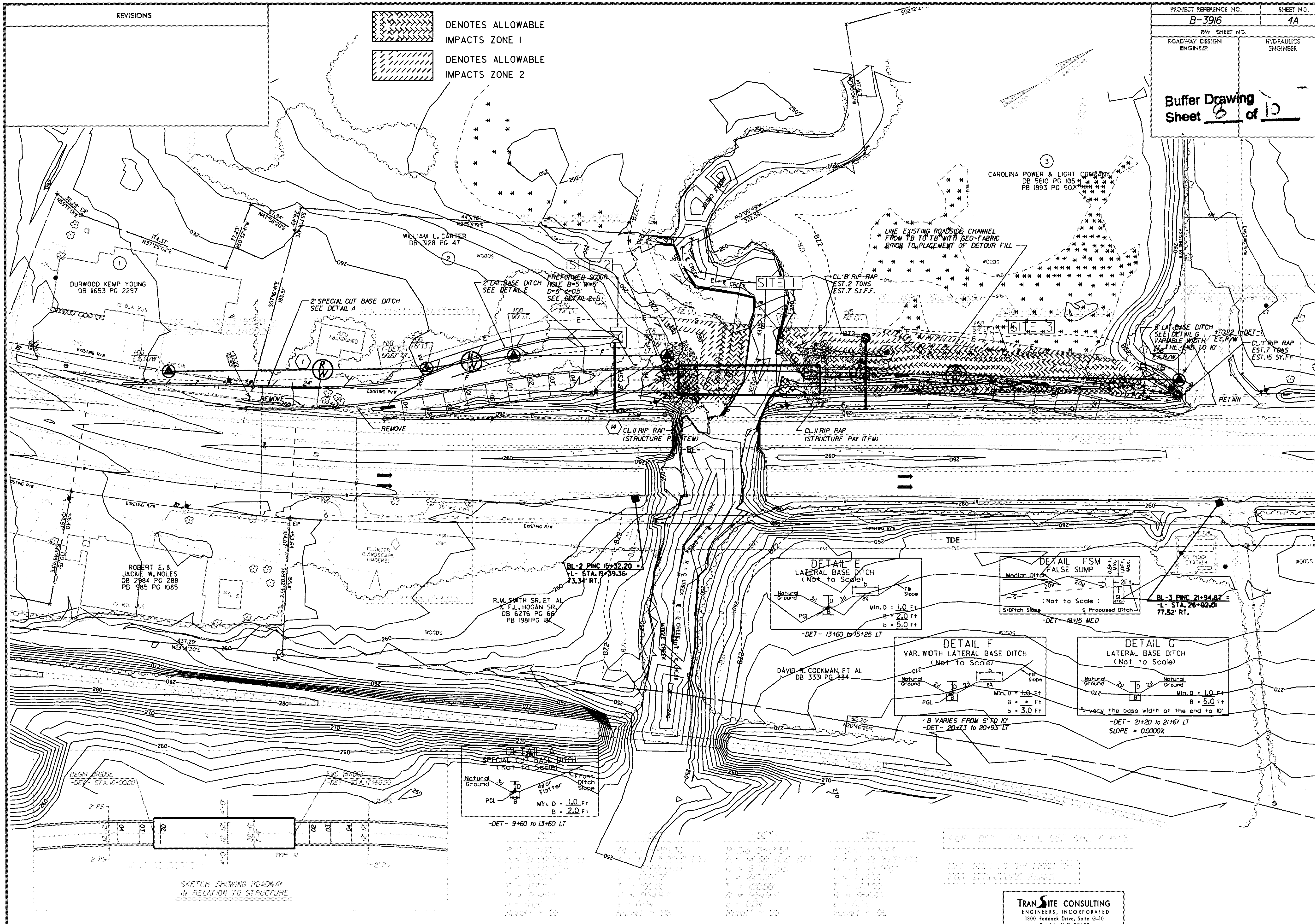
WAKE COUNTY

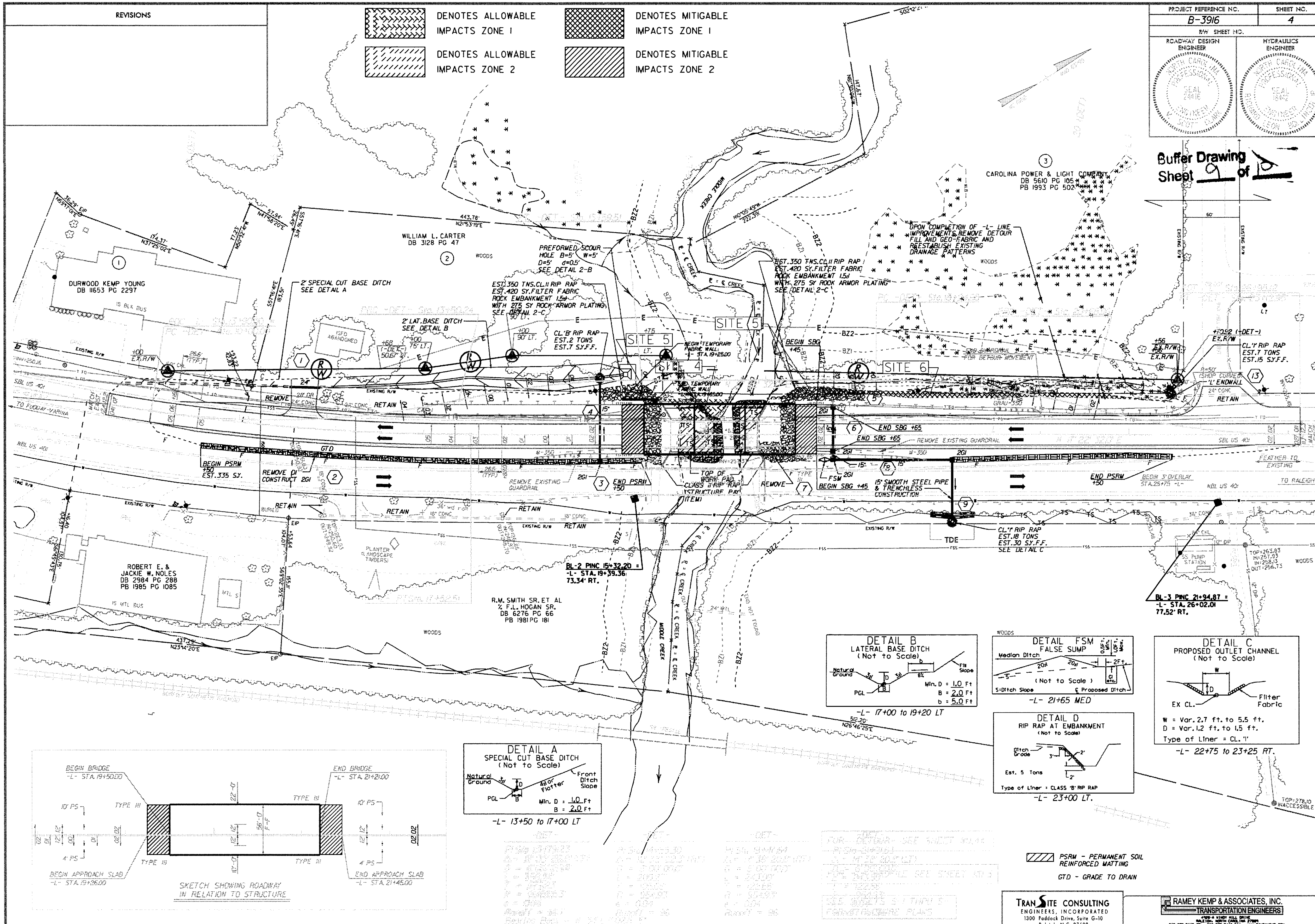
PROJECT 33350.1.1 (B-3916)
BRIDGE #63 OVER MIDDLE CREEK
ON US 401

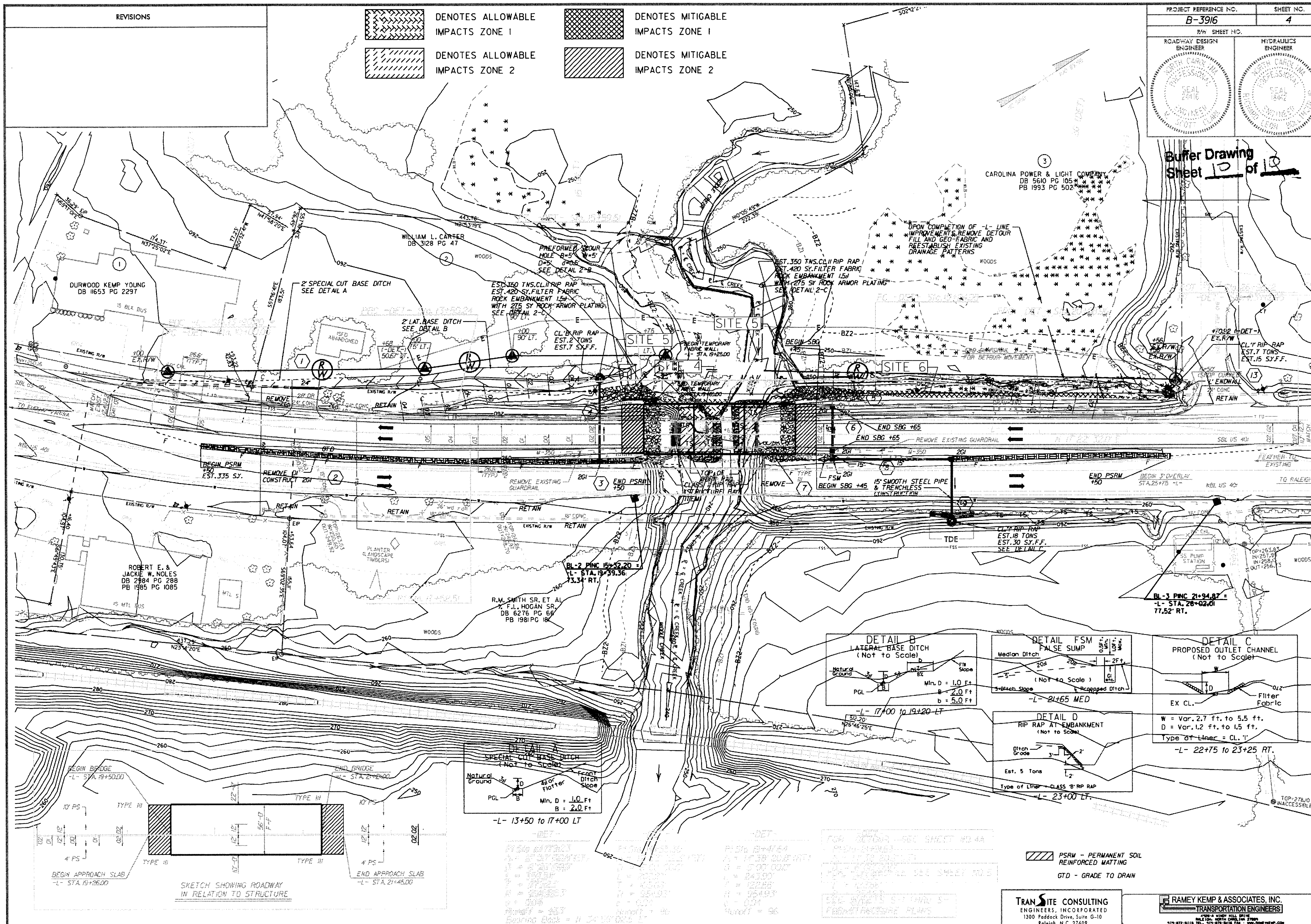
SHEET 6 OF 10 2/9/2007



REVISIONS
DENOTES ALLOWABLE IMPACTS ZONE 1
DENOTES ALLOWABLE IMPACTS ZONE 2
PROJECT REFERENCE NO.
B-3916
SHEET NO.
4A
R/W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
Buffer Drawing
Sheet 7 of 10
CAROLINA POWER & LIGHT COMPANY
DB 5610 PG 105
PB 1993 PG 502
WILLIAM L. CARTER
DB 3128 PG 47
DURWOOD KEMP YOUNG
DB 11653 PG 2297
SITE 2
SITE 1
SITE 3
2' SPECIAL CUT BASE DITCH
SEE DETAIL A
2' LAT. BASE DITCH
SEE DETAIL E
PREFORMED SCOUR HOLE B=5' W=5' D=5' d=0.5'
SEE DETAIL 2-B
LINE EXISTING ROADSIDE CHANNEL FROM TB TO TB WITH GEO-FABRIC PRIOR TO PLACEMENT OF DETOUR FILL
CL.'B' RIP RAP
EST. 2 TONS
EST. 7 SY.F.F.
5' LAT. BASE DITCH
SEE DETAIL G
VARIABLE WIDTH AT THE END TO 10'
CL.'I' RIP RAP
EST. 7 TONS
EST. 15 SY.FF
RETAIN
REMOVE
CL.II RIP RAP
(STRUCTURE PAY ITEM)
ROBERT E. & JACKIE W. NOLES
DB 2984 PG 288
PB 1985 PG 1085
BL-2 PINC 15+32.20 =
-L- STA. 19+39.36
73.34' RT.
R.M. SMITH SR. ET AL
% F.L. HOGAN SR.
DB 6276 PG 66
PB 1981 PG 181
DAVID R. COCKMAN, ET AL
DB 3331 PG 334
BL-3 PINC 21+94.87 =
-L- STA. 26+02.01
77.52' RT.
DETAIL E
LATERAL BASE DITCH
(Not to Scale)
Min. D = 1.0 Ft
B = 2.0 Ft
b = 5.0 Ft
-DET- 13+60 to 15+25 LT
DETAIL FSM
FALSE SUMP
(Not to Scale)
-DET- 19+15 MED
DETAIL F
VAR. WIDTH LATERAL BASE DITCH
(Not to Scale)
Min. D = 1.0 Ft
B = * Ft
b = 3.0 Ft
* B VARIES FROM 5' TO 10'
-DET- 20+73 to 20+93 LT
DETAIL G
LATERAL BASE DITCH
(Not to Scale)
Min. D = 1.0 Ft
B = 5.0 Ft
* vary the base width at the end to 10'
-DET- 21+20 to 21+67 LT
SLOPE = 0.0000%
DETAIL A
SPECIAL CUT BASE DITCH
(Not to Scale)
Min. D = 1.0 Ft
B = 2.0 Ft
-DET- 9+60 to 13+60 LT
BEGIN BRIDGE
-DET- STA. 16+00.00
END BRIDGE
-DET- STA. 17+60.00
SKETCH SHOWING ROADWAY IN RELATION TO STRUCTURE
TRANSITE CONSULTING
ENGINEERS, INCORPORATED
1300 Paddock Drive, Suite G-10
Raleigh, N.C. 27609


REVISIONS
DENOTES ALLOWABLE IMPACTS ZONE 1
DENOTES ALLOWABLE IMPACTS ZONE 2
PROJECT REFERENCE NO.
B-3916
SHEET NO.
4A
R/W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
Buffer Drawing Sheet 8 of 10
CAROLINA POWER & LIGHT COMPANY
DB 5610 PG 105
PB 1993 PG 502
WILLIAM L. CARTER
DB 3128 PG 47
DURWOOD KEMP YOUNG
DB 11653 PG 2297
LINE EXISTING ROADSIDE CHANNEL FROM "B" TO "B" WITH GEO-FABRIC PRIOR TO PLACEMENT OF DETOUR FILL
SITE 1
SITE 2
SITE 3
2' LAT. BASE DITCH SEE DETAIL E
2' SPECIAL CUT BASE DITCH SEE DETAIL A
PREFORMED SCOUR HOLE B=5' W=5' D=5' d=0.5' SEE DETAIL 2-B
CL.'B' RIP RAP EST. 2 TONS EST. 7 SY.F.F.
5' LAT. BASE DITCH SEE DETAIL G VARIABLE WIDTH AT THE END TO 10'
CL.'I' RIP RAP EST. 7 TONS EST. 15 SY.FF
RETAIN
REMOVE
CL.II RIP RAP (STRUCTURE PAY ITEM)
ROBERT E. & JACKIE W. NOLES
DB 2984 PG 288
PB 1985 PG 1085
BL-2 PINC 15+32.20 = -L- STA. 19+39.36 73.34' RT.
R.M. SMITH SR. ET AL & F.L. HOGAN SR.
DB 6276 PG 66
PB 1981 PG 18
DAVID N. COCKMAN, ET AL
DB 3331 PG 334
TDE
WOODS
DETAIL E
LATERAL BASE DITCH
(Not to Scale)
Min. D = 1.0 Ft
B = 2.0 Ft
b = 5.0 Ft
-DET- 13+60 to 15+25 LT
DETAIL FSM
FALSE SUMP
(Not to Scale)
-DET- 19+15 MED
BL-3 PINC 21+94.87 = -L- STA. 26+02.01 77.52' RT.
DETAIL F
VAR. WIDTH LATERAL BASE DITCH
(Not to Scale)
Min. D = 1.0 Ft
B = * Ft
b = 3.0 Ft
* B VARIES FROM 5' TO 10'
-DET- 20+73 to 20+93 LT
DETAIL G
LATERAL BASE DITCH
(Not to Scale)
Min. D = 1.0 Ft
B = 5.0 Ft
* vary the base width at the end to 10'
-DET- 21+20 to 21+67 LT
SLOPE = 0.0000%
DETAIL A
SPECIAL CUT BASE DITCH
(Not to Scale)
Min. D = 1.0 Ft
B = 2.0 Ft
-DET- 9+60 to 13+60 LT
BEGIN BRIDGE -DET- STA. 16+00.00
END BRIDGE -DET- STA. 17+60.00
SKETCH SHOWING ROADWAY IN RELATION TO STRUCTURE
TRANSITE CONSULTING ENGINEERS, INCORPORATED
1300 Paddock Drive, Suite G-10
Raleigh, N.C. 27609


REVISIONS
DENOTES ALLOWABLE IMPACTS ZONE 1
DENOTES MITIGABLE IMPACTS ZONE 1
DENOTES ALLOWABLE IMPACTS ZONE 2
DENOTES MITIGABLE IMPACTS ZONE 2
PROJECT REFERENCE NO. B-3916
SHEET NO. 4
R/W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
Buffer Drawing Sheet 9 of 10
CAROLINA POWER & LIGHT COMPANY
DB 5610 PG 105
PB 1993 PG 502
WILLIAM L. CARTER
DB 3128 PG 47
DURWOOD KEMP YOUNG
DB 11653 PG 2297
PREFORMED SCOUR HOLE B=5' W=5' D=5' d=0.5' SEE DETAIL 2-B
2' SPECIAL CUT BASE DITCH SEE DETAIL A
2' LAT. BASE DITCH SEE DETAIL B
EST. 350 TNS. CL.II RIP RAP
EST. 420 SY. FILTER FABRIC
ROCK EMBANKMENT 1.5:1
WITH 275 SY ROCK ARMOR PLATING
SEE DETAIL 2-C
CL.'B' RIP RAP EST. 2 TONS EST. 7 SY. F.F.
UPON COMPLETION OF -L- LINE IMPROVEMENTS, REMOVE DETOUR FILL AND GEO-FABRIC AND REESTABLISH EXISTING DRAINAGE PATTERNS
SITE 5
SITE 4
SITE 6
BEGIN TEMPORARY FABRIC WALL
BEGIN SBG +45
CL.'I' RIP RAP EST. 7 TONS EST. 15 SY. F.F.
SHOP CURVED 'L' ENDWALL
SBL US 401
NBL US 401
TO FUQUAY-VARINA
TO RALEIGH
BEGIN PSRM EST. 335 SY.
REMOVE DI CONSTRUCT 2GI
END PSRM +50
TOP OF WORK PAD CLASS 'B' RIP RAP (STRUCTURE PAY ITEM)
END SBG +65
REMOVE EXISTING GUARDRAIL
BEGIN SBG +45
15" SMOOTH STEEL PIPE & TRENCHLESS CONSTRUCTION
END PSRM +50
BEGIN 3" OVERLAY STA. 25+75 -L-
FEATHER TO EXISTING
CL.'I' RIP RAP EST. 18 TONS EST. 30 SY. F.F. SEE DETAIL C
BL-2 PINC 15+32.20 = -L- STA. 19+39.36 73.34' RT.
BL-3 PINC 21+94.87 = -L- STA. 26+02.01 77.52' RT.
ROBERT E. & JACKIE W. NOLES
DB 2984 PG 288
PB 1985 PG 1085
R.M. SMITH SR. ET. AL
% F.L. HOGAN SR.
DB 6276 PG 66
PB 1981 PG 181
MIDDLE CREEK
WOODS
DETAIL B
LATERAL BASE DITCH
(Not to Scale)
Min. D = 1.0 Ft
B = 2.0 Ft
b = 5.0 Ft
-L- 17+00 to 19+20 LT
DETAIL FSM
FALSE SUMP
(Not to Scale)
-L- 21+65 MED
DETAIL C
PROPOSED OUTLET CHANNEL
(Not to Scale)
Filter Fabric
W = Var. 2.7 ft. to 5.5 ft.
D = Var. 1.2 ft. to 1.5 ft.
Type of Liner = CL. 'I'
-L- 22+75 to 23+25 RT.
DETAIL D
RIP RAP AT EMBANKMENT
(Not to Scale)
Est. 5 Tons
Type of Liner = CLASS 'B' RIP RAP
-L- 23+00 LT.
DETAIL A
SPECIAL CUT BASE DITCH
(Not to Scale)
Min. D = 1.0 Ft
B = 2.0 Ft
-L- 13+50 to 17+00 LT
BEGIN BRIDGE -L- STA. 19+50.00
END BRIDGE -L- STA. 21+21.00
BEGIN APPROACH SLAB -L- STA. 19+26.00
END APPROACH SLAB -L- STA. 21+45.00
SKETCH SHOWING ROADWAY IN RELATION TO STRUCTURE
PSRM - PERMANENT SOIL REINFORCED MATTING
GTD - GRADE TO DRAIN
TRANSITE CONSULTING ENGINEERS, INCORPORATED
1300 Paddock Drive, Suite G-10
Raleigh, N.C. 27609
RAMEY KEMP & ASSOCIATES, INC.
TRANSPORTATION ENGINEERS



REVISIONS
DENOTES ALLOWABLE IMPACTS ZONE 1
DENOTES MITIGABLE IMPACTS ZONE 1
DENOTES ALLOWABLE IMPACTS ZONE 2
DENOTES MITIGABLE IMPACTS ZONE 2
PROJECT REFERENCE NO.
B-3916
SHEET NO.
4
R/W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
Buffer Drawing Sheet 10 of 10
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PB 1985 PG 1085
R.M. SMITH SR. ET AL
% F.L. HOGAN SR.
DB 6276 PG 66
PB 1981 PG 18
2' SPECIAL CUT BASE DITCH
SEE DETAIL A
2' LAT. BASE DITCH
SEE DETAIL B
SITE 4
SITE 5
SITE 6
UPON COMPLETION OF -L- LINE IMPROVEMENTS REMOVE DETOUR FILL AND GEO-FABRIC AND REESTABLISH EXISTING DRAINAGE PATTERNS
BEGIN PSRM +50 EST. 335 SY.
END PSRM +50
END SBG +65
BEGIN SBG +45
15' SMOOTH STEEL PIPE & TRENCHLESS CONSTRUCTION
TO RALEIGH
NBL US 401
SBL US 401
BL-2 PINC 15+52.20 = -L- STA. 19+39.36 73.34' RT.
BL-3 PINC 21+94.87 = -L- STA. 26+02.01 77.52' RT.
DETAIL B
LATERAL BASE DITCH (Not to Scale)
Min. D = 1.0 Ft
b = 2.0 Ft
B = 5.0 Ft
-L- 17+00 to 19+20 LT
DETAIL FSM
FALSE SUMP
(Not to Scale)
-L- 21+65 MED
DETAIL C
PROPOSED OUTLET CHANNEL (Not to Scale)
Filter Fabric
W = Var. 2.7 ft. to 5.5 ft.
D = Var. 1.2 ft. to 1.5 ft.
Type of Liner = CL. 'I'
-L- 22+75 to 23+25 RT.
DETAIL D
RIP RAP AT EMBANKMENT (Not to Scale)
Est. 5 Tons
Type of Liner = CLASS 'B' RIP RAP
-L- 23+00 LT.
DETAIL A
SPECIAL CUT BASE DITCH (Not to Scale)
Min. D = 1.0 Ft
B = 2.0 Ft
-L- 13+50 to 17+00 LT
BEGIN BRIDGE -L- STA. 19+50.00
END BRIDGE -L- STA. 21+21.00
BEGIN APPROACH SLAB -L- STA. 19+26.00
END APPROACH SLAB -L- STA. 21+45.00
SKETCH SHOWING ROADWAY IN RELATION TO STRUCTURE
PSRM - PERMANENT SOIL REINFORCED MATTING
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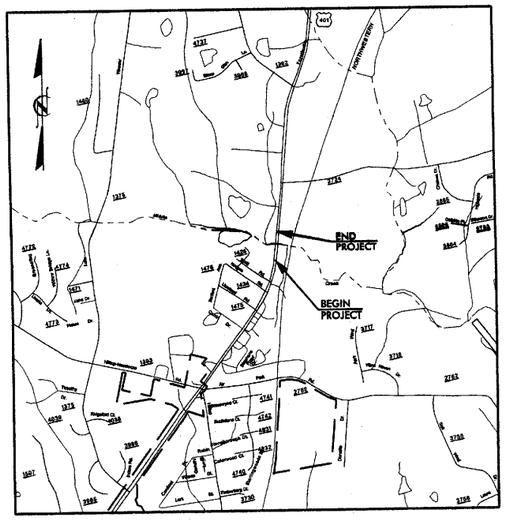
RAMEY KEMP & ASSOCIATES, INC.
TRANSPORTATION ENGINEERS

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-3916	1	

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
33350.1.1	BRSTP-401(13)	P.E.
33350.2.1	BRSTP-401(13)	R/W & UTILITY
33350.3.1	BRSTP-401(154)	CONST.

CONTRACT: C201546 TIP PROJECT: B-3916

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



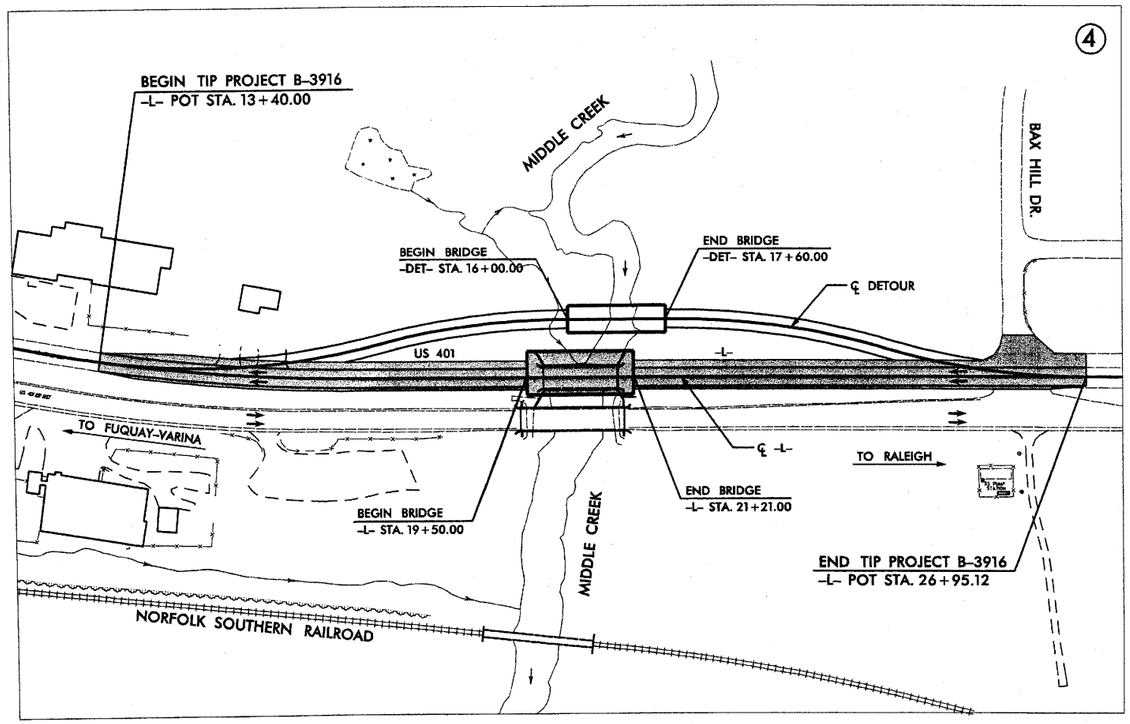
VICINITY MAP

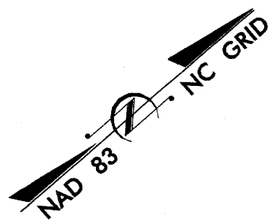
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

WAKE COUNTY

LOCATION: BRIDGE NO. 63 AND APPROACHES ON US SOUTHBOUND 401 OVER MIDDLE CREEK

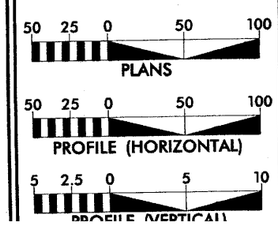
TYPE OF WORK: GRADING, PAVING, DRAINAGE AND STRUCTURE





TRANSITE CONSULTING
ENGINEERS, INCORPORATED
1300 Paddock Drive, Suite G-10
Raleigh, N.C. 27609

GRAPHIC SCALES



DESIGN DATA

ADT 2007	=	31,250
ADT 2027	=	58,750
DHV	=	10 %
D	=	60 %
T	=	8 % *
V	=	60 MPH
V(DET)	=	50 MPH

* TTST 4 % DUAL 4 %

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT B-3916	= 0.225 mi
LENGTH STRUCTURE TIP PROJECT B-3916	= 0.032 mi
TOTAL LENGTH OF TIP PROJECT B-3916	= 0.257 mi

Plans prepared in the office of:
RAMEY KEMP & ASSOCIATES, INC.
TRANSPORTATION ENGINEERS
5808 Faringdon Place
Raleigh, North Carolina 27609
919-872-5115 fax 919-872-2418 Tel - www.rameykemp.com
for the North Carolina Department of Transportation

2006 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
DECEMBER 16, 2005

LETTING DATE:
MAY 15, 2007

N.C.D.O.T. CONTACT:
CATHY HOUSER, P.E.
PROJECT ENGINEER
ROADWAY DESIGN

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 18442 ENGINEER RICHARD LEON BOLLINGER, JR.
RICHARD LEON BOLLINGER, JR. *P.E.*

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 24416 ENGINEER M. SCOTT CLARK
M. SCOTT CLARK *P.E.*

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

STATE DESIGN ENGINEER *P.E.*

DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

APPROVED
DIVISION ADMINISTRATOR *DATE*

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 24416 ENGINEER W. SCOTT CLARK

PROJECT REFERENCE NO.	SHEET NO.
B-3916	1-A

ROADWAY ENGLISH STANDARD DRAWINGS

The following Roadway Standards as appear in "Roadway Standard Drawings" Highway Design Branch - N. C. Department of Transportation - Raleigh, N. C., Dated July 18, 2006 are applicable to this project and by reference hereby are considered a part of these plans:

STD.NO.	TITLE
DIVISION 2 - EARTHWORK	
200.03	Method of Clearing - Method III
225.02	Guide for Grading Subgrade - Secondary and Local
225.04	Method of Obtaining Superelevation - Two Lane Pavement
DIVISION 3 - PIPE CULVERTS	
300.02	Method of Pipe Installation - Method 'B'
310.10	Driveway Pipe Construction
DIVISION 4 - MAJOR STRUCTURES	
422.10	Reinforced Bridge Approach Fills
DIVISION 5 - SUBGRADE, BASES AND SHOULDERS	
560.01	Method of Shoulder Construction - High Side of Superelevated Curve - Method I
DIVISION 6 - ASPHALT BASES AND PAVEMENTS	
654.01	Pavement Repairs
DIVISION 8 - INCIDENTALS	
806.01	Concrete Right-of-Way Marker
806.02	Granite Right-of-Way Marker
815.03	Pipe Underdrain and Blind Drain
838.05	Concrete 'L' Endwall for Single Pipe Culverts - 15" thru 48" Pipe
838.15	Brick 'L' Endwall for Single Pipe Culverts - 15" thru 48" Pipe
838.80	Precast Endwalls - 12" thru 72" Pipe 90 Skew
840.00	Concrete Base Pad for Drainage Structures
840.18	Concrete Grated Drop Inlet Type'B' - 12" thru 36" Pipe
840.24	Frames and Narrow Slot Sag Grates
840.27	Brick Grated Drop Inlet Type 'B' - 12" thru 36" Pipe
840.29	Frames and Narrow Slot Flat Grates
840.35	Traffic Bearing Grated Drop Inlet - for Cast Iron Double Frame and Grates
840.45	Precast Drainage Structure
840.46	Traffic Bearing Drainage Structure
862.01	Guardrail Placement
862.02	Guardrail Installation
862.03	Structure Anchor Units
862.04	Anchoring End of Guardrail B-77 and B-83 Anchor Units
876.02	Guide for Rip Rap at Pipe Outlets

INDEX OF SHEETS

GENERAL NOTES: 2006 SPECIFICATIONS
EFFECTIVE: 7-18-06

GRADING AND SURFACING OR RESURFACING AND WIDENING:

THE GRADE LINES SHOWN DENOTE THE FINISHED ELEVATION OF THE PROPOSED SURFACING AT GRADE POINTS SHOWN ON THE TYPICAL SECTIONS. WHERE NO GRADE LINES ARE SHOWN, THE PROFILES SHOWN DENOTE THE TOP ELEVATION OF THE EXISTING PAVEMENT ALONG THE CENTER LINE OF SURVEY ON WHICH THE PROPOSED RESURFACING WILL BE PLACED. GRADE LINES MAY BE ADJUSTED BY THE ENGINEER IN ORDER TO SECURE A PROPER TIE-IN.

CLEARING:

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

SUPERELEVATION:

ALL CURVES ON THIS PROJECT SHALL BE SUPERELEVATED IN ACCORDANCE WITH STD. NO. 225.04 USING THE RATE OF SUPERELEVATION AND RUNOFF SHOWN ON THE PLANS. SUPERELEVATION IS TO BE REVOLVED ABOUT THE GRADE POINTS SHOWN ON THE TYPICAL SECTIONS.

SHOULDER CONSTRUCTION:

ASPHALT, EARTH, AND CONCRETE SHOULDER CONSTRUCTION ON THE HIGH SIDE OF SUPERELEVATED CURVES SHALL BE IN ACCORDANCE WITH STD. NO. 560.01.

SIDE ROADS:

THE CONTRACTOR WILL BE REQUIRED TO DO ALL NECESSARY WORK TO PROVIDE SUITABLE CONNECTIONS WITH ALL ROADS, STREETS, AND DRIVES ENTERING THIS PROJECT. THIS WORK WILL BE PAID FOR AT THE CONTRACT UNIT PRICE FOR THE PARTICULAR ITEMS INVOLVED.

UNDERDRAINS:

UNDERDRAINS SHALL BE CONSTRUCTED IN ACCORDANCE WITH STD. NO. 815.03 AT LOCATIONS DIRECTED BY THE ENGINEER.

GUARDRAIL:

THE GUARDRAIL LOCATIONS SHOWN ON THE PLANS MAY BE ADJUSTED DURING CONSTRUCTION AS DIRECTED BY THE ENGINEER. THE CONTRACTOR SHOULD CONSULT WITH THE ENGINEER PRIOR TO ORDERING GUARDRAIL MATERIAL.

TEMPORARY SHORING:

SHORING REQUIRED FOR THE MAINTENANCE OF TRAFFIC NOT SHOWN ON THE PLANS WILL BE PAID FOR AT THE CONTRACTOR PRICE FOR "TEMPORARY SHORING" OR "TEMPORARY SHORING-BARRIER SUPPORTED" DEPENDING UPON THE LOCATION OF THE SHORING.

SUBSURFACE PLANS:

NO SUBSURFACE PLANS ARE AVAILABLE ON THIS PROJECT. THE CONTRACTOR SHOULD MAKE HIS OWN INVESTIGATION AS TO THE SUBSURFACE CONDITIONS.

END BENTS:

THE ENGINEER SHALL CHECK THE STRUCTURE END BENT PLANS, DETAILS, AND CROSS-SECTION PRIOR TO SETTING OF THE SLOPE STAKES FOR THE EMBANKMENT OR EXCAVATION APPROACHING A BRIDGE.

UTILITIES:

UTILITY OWNERS ON THIS PROJECT ARE: PROGRESS ENERGY, SOUTHERN BELL, AND TIME WARNER CABLE. ANY RELOCATION OF EXISTING UTILITIES WILL BE ACCOMPLISHED BY OTHERS, EXCEPT AS SHOWN ON THE PLANS.

RIGHT-OF-WAY MARKERS:

ALL RIGHT-OF-WAY MARKERS ON THIS PROJECT SHALL BE PLACED BY CONTRACT.

RAMEY KEMP & ASSOCIATES, INC.
TRANSPORTATION ENGINEERS
5808 Faringdon Place
Raleigh, North Carolina 27609
919-872-5115 tel 919-872-5418 fax — www.ramey-kemp.com

3/15/86

PROJECT REFERENCE NO.	SHEET NO.
B-3916	1-B

Note: Not to Scale

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

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

CONVENTIONAL PLAN SHEET SYMBOLS

BOUNDARIES AND PROPERTY:

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

BUILDINGS AND OTHER CULTURE:

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

HYDROLOGY:

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

RAILROADS:

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

RIGHT OF WAY:

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

ROADS AND RELATED FEATURES:

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

VEGETATION:

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

EXISTING STRUCTURES:

MAJOR:

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

MINOR:

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

UTILITIES:

POWER:

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

TELEPHONE:

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

WATER:

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

TV:

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

GAS:

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

SANITARY SEWER:

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

MISCELLANEOUS:

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

RAMEY KEMP & ASSOCIATES, INC.
TRANSPORTATION ENGINEERS
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Raleigh, North Carolina 27609
919-872-5115 tel 919-870-3416 fax - www.rameykemp.com

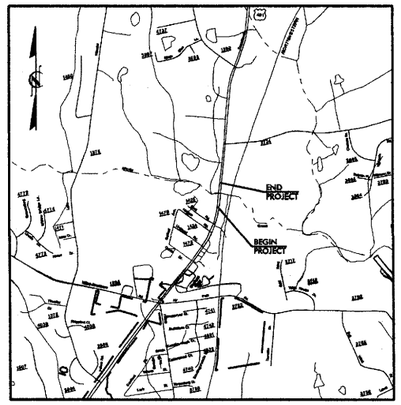
PROJECT REFERENCE NO.	SHEET NO.
B-3916	1-C
Location and Surveys	

B-3916

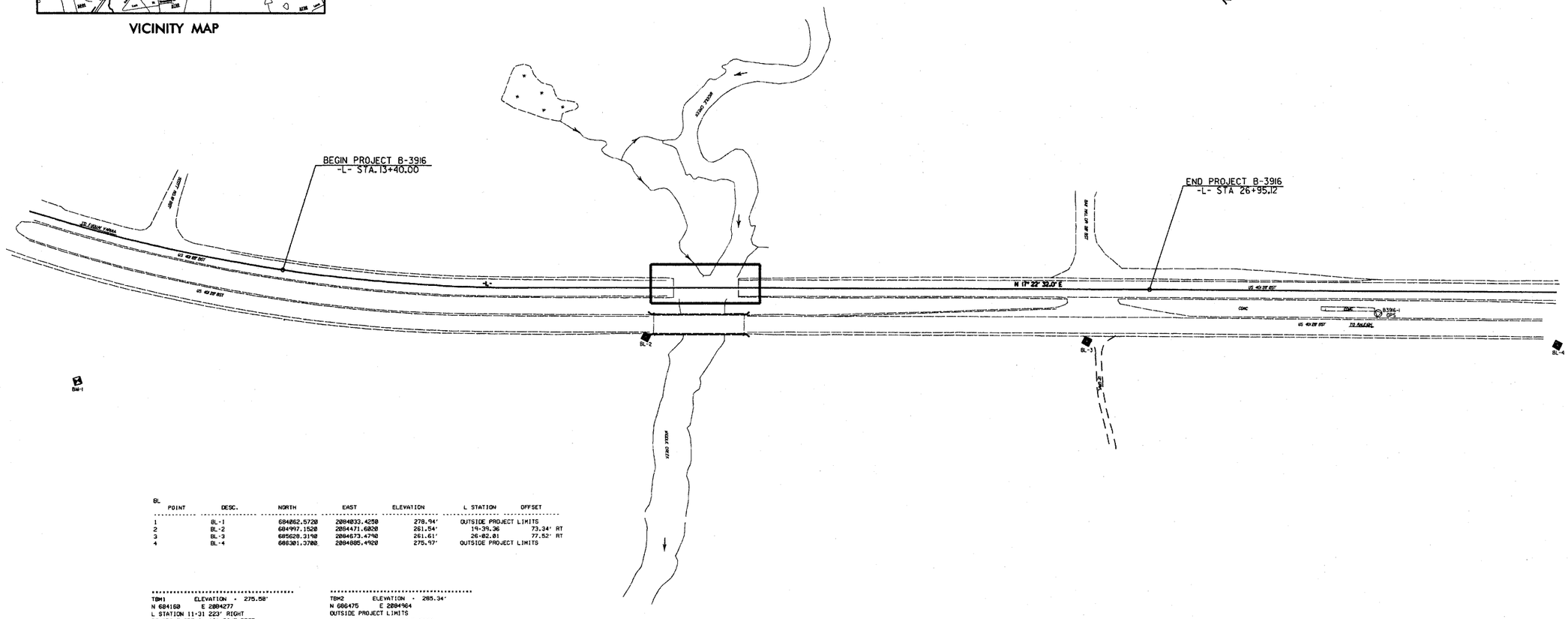
SURVEY CONTROL SHEET B-3916

WAKE COUNTY

LOCATION: BRIDGE NO. 63 ON US 401



VICINITY MAP



BL

POINT	DESC.	NORTH	EAST	ELEVATION	L STATION	OFFSET
1	BL-1	684862.5720	2084033.4250	278.94'	OUTSIDE PROJECT LIMITS	
2	BL-2	684997.1528	2084471.6828	261.54'	19+35.36	73.24' RT
3	BL-3	685628.3198	2084673.4798	261.61'	26+82.81	77.52' RT
4	BL-4	686301.3788	2084885.4928	275.97'	OUTSIDE PROJECT LIMITS	

TBM1 ELEVATION = 275.58'
N 684160 E 2084277
L STATION 11+31 223' RIGHT
RR SPIKE SET IN 12" PINE TREE

TBM2 ELEVATION = 265.34'
N 686475 E 2084964
OUTSIDE PROJECT LIMITS
RR SPIKE SET IN 12" PINE TREE

DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCDOT FOR MONUMENT "B3916-1" WITH NAD 1983/95 STATE PLANE GRID COORDINATES OF NORTHING: 686058.6081(f) EASTING: 2084761.5921(f)
THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.99988633
THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "B3916-1" TO -L- STATION 13+40.00 IS
S 20° 40' 41" E 1968.99'
ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES
VERTICAL DATUM USED IS NAVD 88

NOTES:

THE CONTROL DATA FOR THIS PROJECT CAN BE FOUND ELECTRONICALLY BY SELECTING PROJECT CONTROL DATA AT:

HTTP:\\WWW.NCDOT.ORG/DOH/PRECONSTRUCT/HIGHWAY/LOCATION/PROJECT

THE FILES TO BE FOUND ARE AS FOLLOWS:

b3916_ls_control_050504.txt

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

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

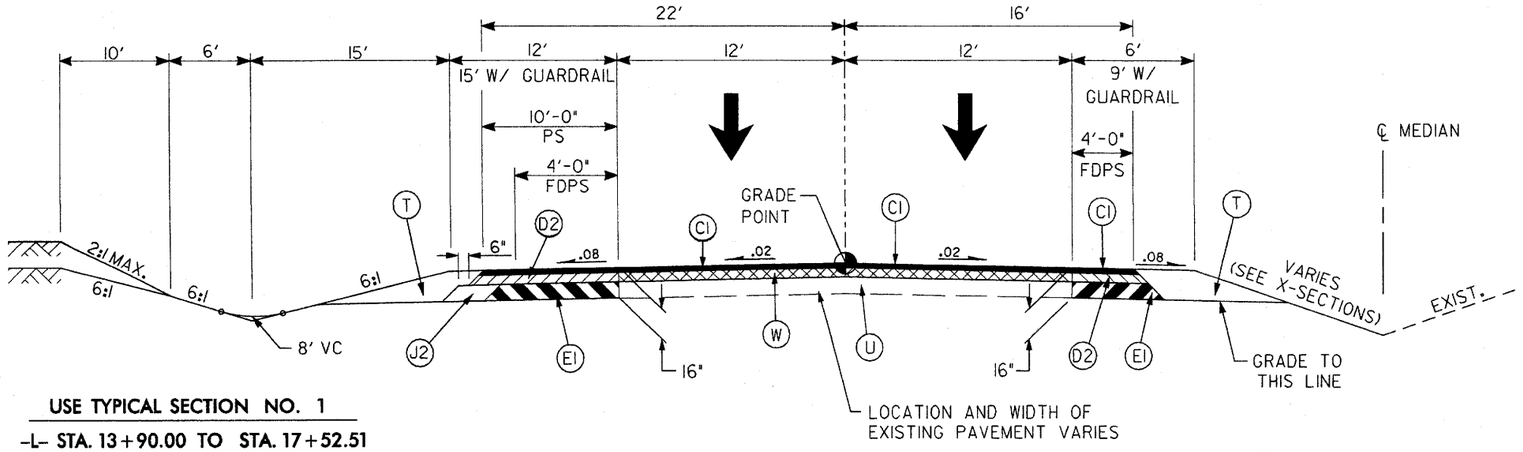
PROJECT CONTROL ESTABLISHED USING GLOBAL POSITIONING SYSTEM.
NETWORK ESTABLISHED FROM NGS ONLINE POSITIONING USER SERVICE (OPUS)

NOTE: DRAWING NOT TO SCALE

PROJECT REFERENCE NO.	SHEET NO.
B-3916	2
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 24416 ENGINEER M. SCOTT CLARK

SBL ℄
–L– (US HWY 401)

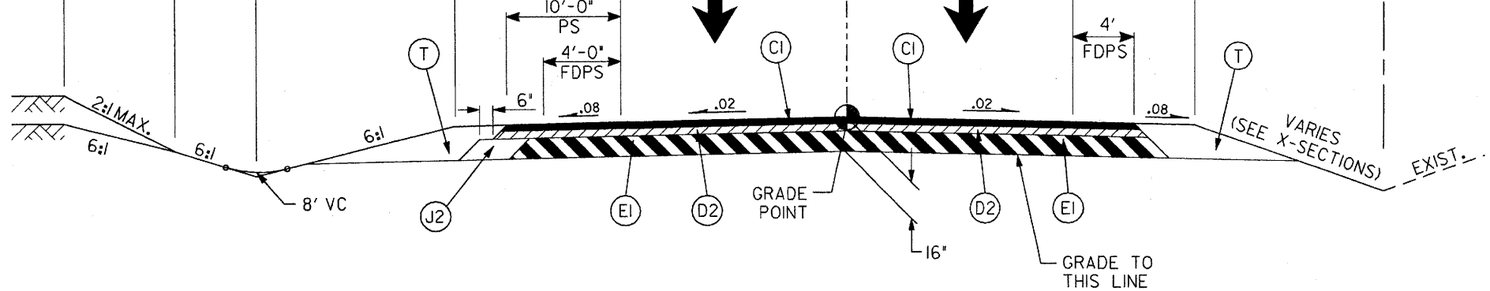


USE TYPICAL SECTION NO. 1

–L– STA. 13+90.00 TO STA. 17+52.51
–L– STA. 23+50.00 TO STA. 25+75.00

TYPICAL SECTION NO. 1

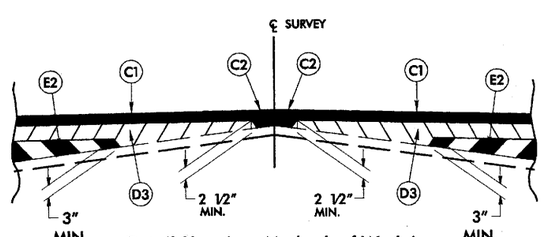
SBL ℄
–L– (US HWY 401)



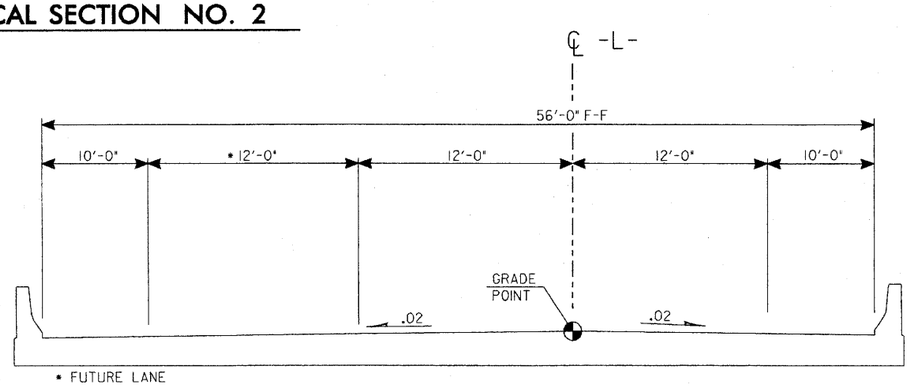
USE TYPICAL SECTION NO. 2

–L– STA. 17+52.51 TO STA. 19+50.00 (BEGIN BRIDGE)
–L– STA. 21+21.00 (END BRIDGE) TO STA. 23+50.00

TYPICAL SECTION NO. 2



Detail Showing Method of Wedging



TYPICAL SECTION ON STRUCTURE
(36" PRESTRESSED CONCRETE GIRDER)

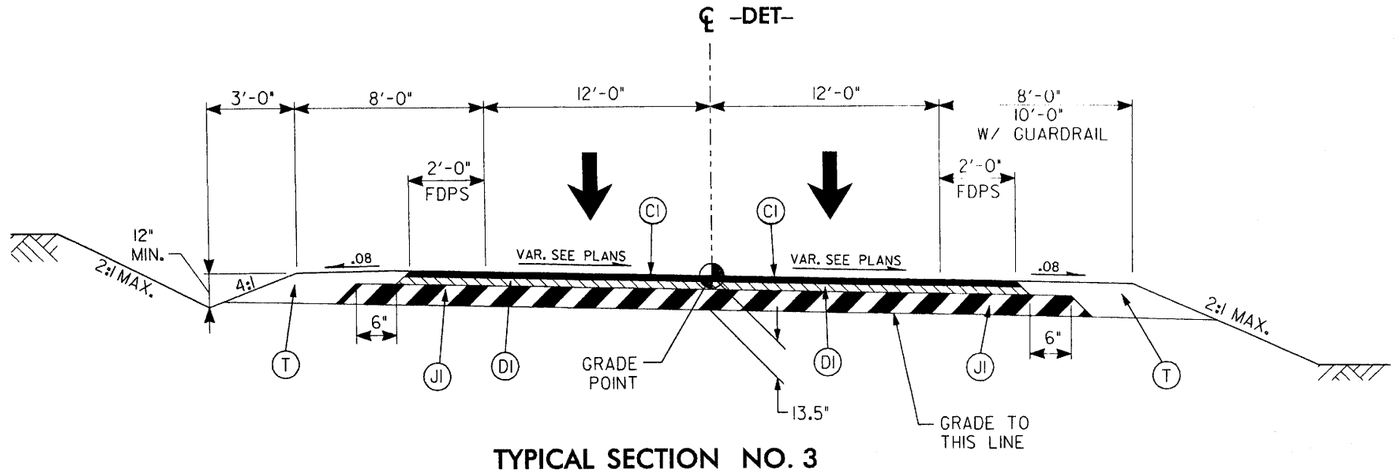
PAVEMENT SCHEDULE	
C1	PROP. APPROX. 3" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5C, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.
C2	PROP. VAR. DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5C, AT AN AVERAGE RATE OF 112 LBS. PER SQ. YD. PER 1" DEPTH TO PLACED IN LAYERS NOT LESS THAN 1 1/2" OR GREATER THAN 2".
D1	PROP. APPROX. 2 1/2" ASPHALT CONCRETE SURFACE COURSE, TYPE I19.0C, AT AN AVERAGE RATE OF 285 LBS. PER SQ. YD.
D2	PROP. APPROX. 4" ASPHALT CONCRETE SURFACE COURSE, TYPE I19.0C, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.
D3	PROP. VAR. DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE I19.0C, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1" DEPTH TO PLACED IN LAYERS NOT LESS THAN 2 1/2" IN DEPTH OR GREATER THAN 4" IN DEPTH.
E1	PROP. APPROX. 9" ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 513 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.
E2	PROP. VAR. DEPTH ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1" DEPTH TO PLACED IN LAYERS NOT LESS THAN 3" IN DEPTH OR GREATER THAN 5 1/2".
J1	PROPOSED 8" AGGREGATE BASE COURSE
J2	PROPOSED VARIABLE DEPTH AGGREGATE BASE COURSE
T	EARTH MATERIAL.
U	EXISTING PAVEMENT
W	VARIABLE DEPTH ASPHALT PAVEMENT (SEE WEDGING DETAIL THIS SHEET)

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

RAMEY KEMP & ASSOCIATES, INC.
TRANSPORTATION ENGINEERS
5808 Faringdon Place
Raleigh, North Carolina 27609
919-872-5115 tel. 919-878-5416 fax – www.rameykemp.com

PROJECT REFERENCE NO.	SHEET NO.
B-3916	2-A
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 24416 ENGINEER M. SCOTT CLARK



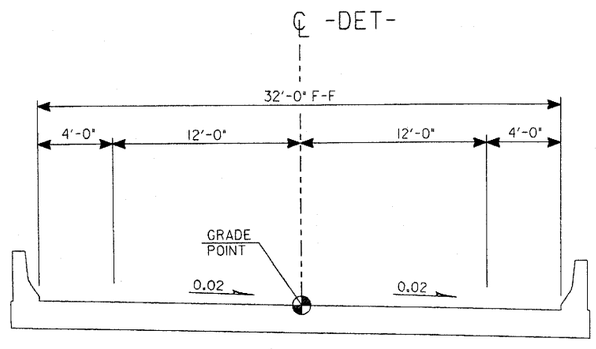
TYPICAL SECTION NO. 3

USE TYPICAL SECTION NO. 3

-DET- STA. 11+89.24 TO STA. 16+00.00 (BEGIN BRIDGE)
-DET- STA. 17+60.00 (END BRIDGE) TO STA. 21+58.54

PAVEMENT SCHEDULE	
C1	PROP. APPROX. 3" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5C, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.
D1	PROP. APPROX. 2 1/2" ASPHALT CONCRETE SURFACE COURSE, TYPE I19.0C, AT AN AVERAGE RATE OF 285 LBS. PER SQ. YD.
J1	PROPOSED 8" AGGREGATE BASE COURSE
T	EARTH MATERIAL.

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



TYPICAL SECTION ON STRUCTURE

RAMEY KEMP & ASSOCIATES, INC.
TRANSPORTATION ENGINEERS
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919-872-5115 tel. 919-878-5418 fax - www.rameykemp.com

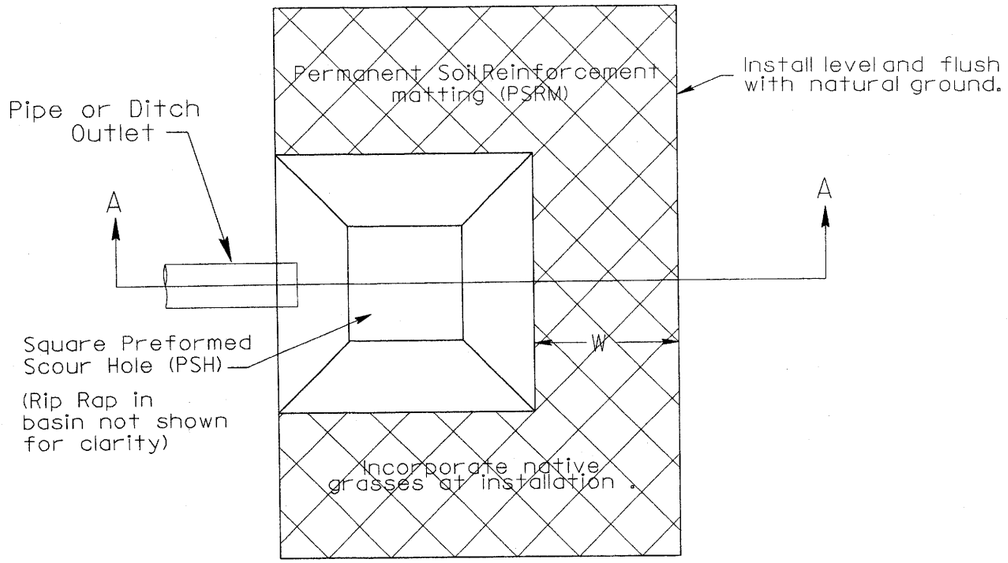
HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 18442 ENGINEER RICHARD LEON BOLLINGER JR.

PROJECT REFERENCE NO.	SHEET NO.
B-3916	2-B

PREFORMED SCOUR HOLE DETAIL

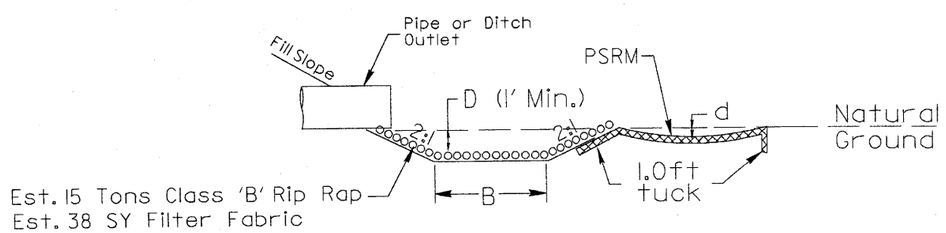
PLAN VIEW



LOCATION (AT OUTLET)
Sta 19+30 -L- (Lt.)
Sta 15+34 -DET- (Lt.)

B	5	ft
D	5	ft
W	5	ft
d	0.5	ft

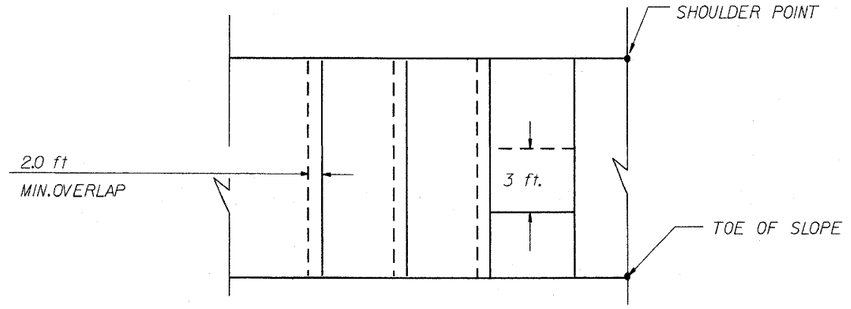
SECTION A-A



TRANSITE CONSULTING ENGINEERS, INCORPORATED
1300 Perimeter Drive, Suite G-10
Raleigh, N.C. 27609

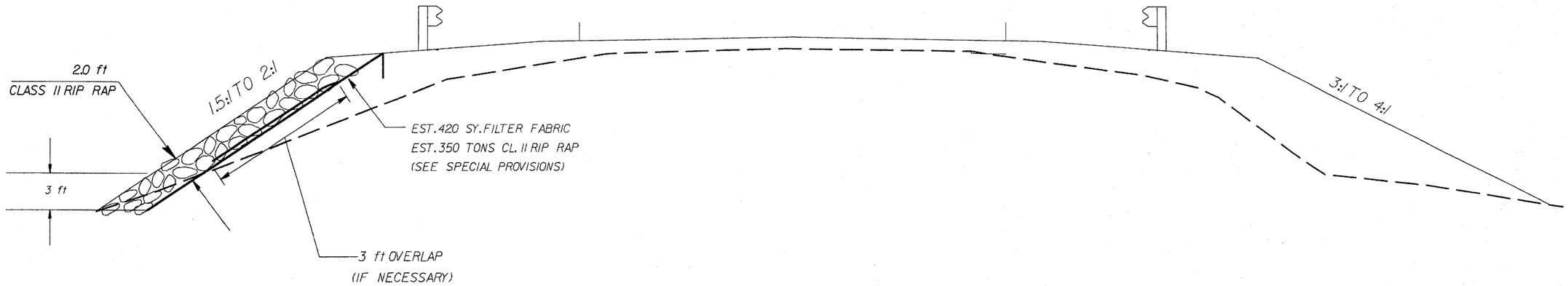
RAMEY KEMP & ASSOCIATES, INC.
TRANSPORTATION ENGINEERS
5808 Faringdon Place
Raleigh, North Carolina 27609
919-872-5115 tel. 919-878-5818 fax - www.rameykemp.com

PROJECT REFERENCE NO.	SHEET NO.
B-3916	2-C



FABRIC OVERLAP DETAIL

N.T.S.



ROCK PLATING DETAIL

N.T.S.

ROCK PLATING LOCATION

STATION 19+00.00 -L- TO STATION 19+50.00 -L- LEFT

STATION 21+21.00 -L- TO STATION 22+00.00 -L- LEFT

DESIGNED BY CAG DATE 12/05
CHECKED BY JRB DATE 12/05

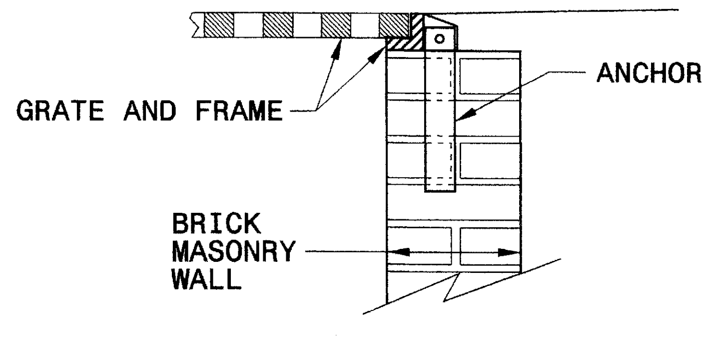
PROJECT B-3916
WAKE **COUNTY**
STATION SEE CHART

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

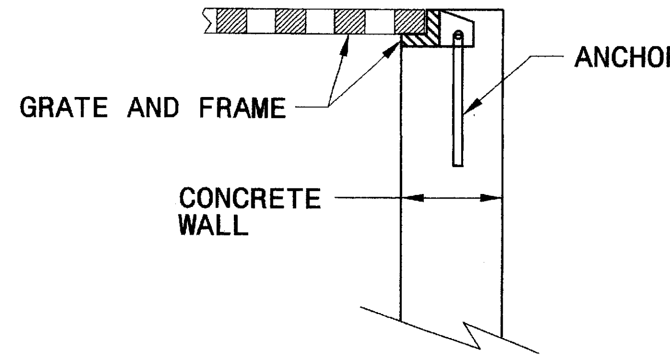
ROCK PLATING DETAIL

STATE OF
NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

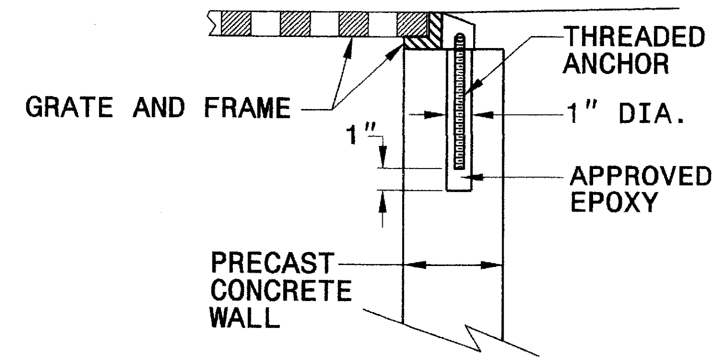
ENGLISH DETAIL DRAWING FOR
ANCHORAGE FOR FRAMES
BRICK/CONCRETE/PRECAST CONCRETE



BRICK MASONRY CONSTRUCTION



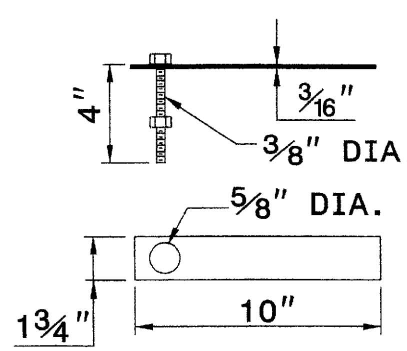
CONCRETE CONSTRUCTION



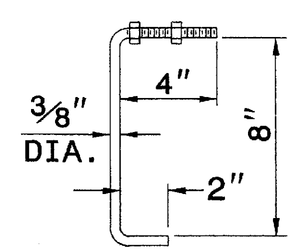
PRECAST CONCRETE CONSTRUCTION

DETAIL SHOWING ANCHORAGE OF FRAME FOR GRATED DROP INLET

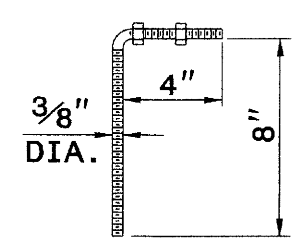
NOTE:
CONSTRUCT GRATED DROP INLET TO COINCIDE WITH NORMAL OR SUPERELEVATED SHOULDER OR PAVEMENT SLOPE.



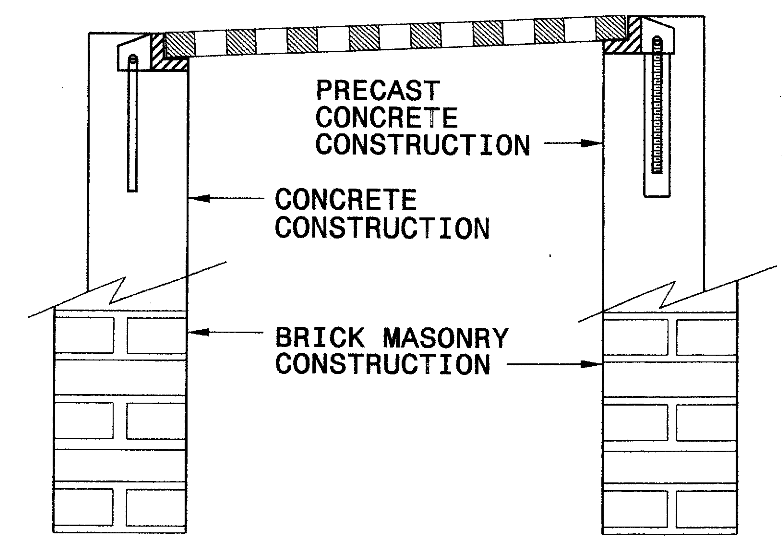
MASONRY ANCHOR
3/8" DIA. BOLT WITH PLATE



CONCRETE ANCHOR
3/8" DIA. BENT BAR



PRECAST CONCRETE ANCHOR
3/8" DIA. BENT BAR



FRAME AND GRATE INSTALLATION FOR NORMAL CROWN AND SUPERELEVATED SECTIONS

SHEET 1 OF 1
840D25

STATE OF
NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

ENGLISH DETAIL DRAWING FOR
ANCHORAGE FOR FRAMES
BRICK/CONCRETE/PRECAST CONCRETE

SHEET 1 OF 1
840D25

PROJECT SERVICES UNIT
STANDARDS AND SPECIAL DESIGN
Office 919-250-4128 FAX 919-250-4119

SEE PLATE FOR TITLE

ORIGINAL BY: 2006 STD 840.25 DATE: 07/18/06
MODIFIED BY: E.E. WARD DATE: 9/25/06
CHECKED BY: [signature] DATE: 9/27/06
FILE SPEC.:

PROJECT REFERENCE NO.	SHEET NO.
B-3916	3

SUMMARY OF QUANTITIES

RAMEY KEMP & ASSOCIATES, INC.
TRANSPORTATION ENGINEERS
5808 Faringdon Place
Raleigh, North Carolina 27609
919-872-5115 tel. 919-870-3418 fax -- www.rameykemp.com

COMPUTED BY: D. PETRY DATE: 01-16-07
CHECKED BY: M. COPPLE DATE: 01-22-07

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

PROJECT REFERENCE NO.	SHEET NO.
B-3916	3-A

ASPHALT PAVEMENT REMOVAL SUMMARY

STATION TO STATION	SQUARE YARDS
-L- STA. 17+52.51 TO -L- STA. 19+80.00	759.50
-L- STA. 20+78.00 TO -L- STA. 23+50.00	893.82
-DET- STA. 10+58.11 TO -L- STA. 16+00.00	1,213.12
-DET- STA. 17+60.00 TO -L- STA. 21+58.54	1,157.67
TOTAL	4,024.11
SAY	4,030

NOTE: APPROXIMATE QUANTITIES ONLY. UNCLASSIFIED EXCAVATION, SHOULDER BORROW, BORROW EXCAVATION, FINE GRADING, CLEARING AND GRUBBING, AND REMOVAL OF EXISTING PAVEMENT WILL BE PAID FOR AT THE CONTRACT LUMP SUM PRICE FOR "GRADING."

SUMMARY OF EARTHWORK

STATION TO STATION	UNCLASIFIED EXCAVATION (cu. yds)	UNDERCUT (cu. yds.)	ROADWAY EMBANKMENT (cu. yds)	BORROW (cu. yds)	TOTAL WASTE (cu. yds)
PHASE 1 (TEMPORARY DETOUR)					
-DET- STA. 10+10.00 -DET- STA. 16+00.00 (BEGIN BRIDGE)	647		2,876	2,229	0
-DET- STA. 17+60.00.00 (END BRIDGE) -DET- STA. 21+58.54	52		7,699	7,647	0
PHASE 2 (PROPOSED ROADWAY TO TEMPORARY SLOPES)					
-L- STA. 13+90.00 -L- STA. 19+50.00 (BEGIN BRIDGE)	159		464	305	
-L- STA. 21+21.00.00 (END BRIDGE) -L- STA. 26+95.12	276		248	0	28
PHASE 3 (DETOUR REMOVAL)					
-L- STA. 13+90.00 -L- STA. 19+50.00 (BEGIN BRIDGE)	1,732		608	0	1,124
-L- STA. 21+21.00.00 (END BRIDGE) -L- STA. 26+95.12	6,269		114	0	6,155
SUBTOTAL (PHASES 1-3)	9,135		12,009	10,181	7,307
EST. 5% FOR REPLACING TOPSOIL	-509			509	
ON BORROW PITS					
SHOULDER BORROW			1,070	1,070	
GRAND TOTAL	8,626		13,079	11,760	
SAY	8,630			11,760	7,310

ESTIMATED UNDERCUT = 500 CY.
ESTIMATED FABRIC FOR SOIL STABILIZATION = 960 SY.
ESTIMATED DRAINAGE DITCH EXCAVATION = 710 CY.
ESTIMATED INCIDENTAL STONE BASE = 75 TNS.
ESTIMATED SELECT GRANULAR MATERIAL = 200 CY.

NOTE:
EARTHWORK QUANTITIES ARE CALCULATED BY THE ROADWAY DESIGN UNIT. THESE EARTHWORK QUANTITIES ARE BASED IN PART ON SUBSURFACE DATA PROVIDED BY THE GEOTECHNICAL ENGINEERING UNIT.

"N" = DISTANCE FROM EDGE OF LANE TO FACE OF GUARDRAIL.
TOTAL SHOULDER WIDTH = DISTANCE FROM EDGE OF TRAVEL LANE TO SHOULDER BREAK POINT.
FLARE LENGTH = DISTANCE FROM LAST SECTION OF PARALLEL GUARDRAIL TO END OF GUARDRAIL.
W = TOTAL WIDTH OF FLARE FROM BEGINNING OF TAPER TO END OF GUARDRAIL.

GUARDRAIL SUMMARY

SURVEY LINE	BEG. STA.	END STA.	LOCATION	LENGTH			WARRANT POINT		"N" DIST. FROM E.O.L.	TOTAL SHOUL. WIDTH	FLARE LENGTH		W		ANCHORS									IMPACT ATTENUATOR TYPE 350		REMOVE EXISTING GUARDRAIL	REMOVE AND STOCKPILE EXISTING GUARDRAIL	REMARKS
				STRAIGHT	SHOP CURVED	DOUBLE FACED	APPROACH END	TRAILING END			APPROACH END	TRAILING END	APPROACH END	TRAILING END	TYPE III	TEMP CAT-1	TEMP GRAU 350	M-350	XIII	CAT-1	AT-1	BIC	B-77					
-L-	18+25.00	19+50.00	RT.	125.00'				19+50.00	10'	15'		37.50'		4.00'				1					1			127'		
-L-	17+00.00	19+50.00	LT.	250.00'				19+50.00	22'	15'	-		-			1				1			1			213'		
-L-	21+21.00	22+71.00	RT.	150.00'			21+21.00		10'	15'	93.75'		6.25'					1					1			173'		
-L-	21+21.00	26+08.50	LT.	425.00'	62.50'		21+21.00		22'	15'	406.25'		8.125'				1				1		1			535'		
SUBTOTAL				950.00'	62.50'		DEDUCTION FOR ANCHOR UNITS:																					
DEDUCTIONS FOR ANCHOR UNITS:				-162.50'			2 M-350 @ 37.50' = 75.00'																					
							1 CAT-1 @ 6.25' = 6.25'																					
TOTAL				787.50'	62.50'		4 B-77 @ 18.75' = 75.00'						... 5 ADDITIONAL GUARDRAIL POSTS															
			SAY	787.50'	62.50'		1 AT-1 @ 6.25' = 6.25'									1	1	2		1	1		4			1,048		
								162.50'																				
TEMPORARY GUARDRAIL																												
-DET-	15+12.50	16+00.00	RT.	87.50'				16+00.00	4'	10'		43.75'		0.875	1		1											TEMPORARY GUARDRAIL
-DET-	15+12.50	16+00.00	LT.	87.50'				16+00.00	4'	10'		43.75'		0.875	1		1											TEMPORARY GUARDRAIL
-DET-	17+60.00	19+72.50	RT.	212.50'			17+60.00		4'	10'	18.75'		.375		1		1											TEMPORARY GUARDRAIL
-DET-	17+60.00	19+72.50	LT.	212.50'			17+60.00		4'	10'	143.75'		2.875		1		1											TEMPORARY GUARDRAIL
							DEDUCTION FOR ANCHOR UNITS:																					
							4 GRAU-350 @ 50.00' = 200.00'																					
SUBTOTAL				600.00'			4 TYPE III @ 18.75' = 75.00'																					
DEDUCTIONS FOR ANCHOR UNITS:				-275.00				275.00'																				
TOTAL				325.00'											4		4											
			SAY	325.00'																								

RAMEY KEMP & ASSOCIATES, INC.
TRANSPORTATION ENGINEERS
5808 Faringdon Place
Raleigh, North Carolina 27609
919-872-5115 tel. 919-878-5416 fax - www.rameykemp.com

COMPUTED BY: D. PETRY DATE: 01-16-07
CHECKED BY: M. COPPLE DATE: 01-22-07

PROJECT REFERENCE NO.	SHEET NO.
B-3916	3-B

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

LIST OF PIPES, ENDWALLS, ETC. (FOR PIPES 48" & UNDER)

STATION	LOCATION (LT, RT, OR CL)	STRUCTURE NO. FROM	STRUCTURE NO. TO	TOP ELEVATION	INVERT ELEVATION	INVERT ELEVATION	SLOPE CRITICAL	CLASS III R.C. PIPE (UNLESS NOTED OTHERWISE) SIZE	CLASS III R.C. PIPE (UNLESS NOTED OTHERWISE) THICKNESS OR GAUGE	BITUMINOUS COATED C.S. PIPE TYPE B (UNLESS NOTED OTHRWISE) SIZE	BITUMINOUS COATED C.S. PIPE TYPE B (UNLESS NOTED OTHRWISE) THICKNESS OR GAUGE	CLASS III R.C. PIPE OR C.S. PIPE, TYPE IR ALUMINIZED OR HDPE PIPE, TYPE S OR D SIZE	15" SIDE DRAIN PIPE	18" SIDE DRAIN PIPE	24" SIDE DRAIN PIPE	ENDWALLS STD. 838.01 OR STD. 838.11 (UNLESS NOTED OTHERWISE) CU. YDS. R.C.P.	ENDWALLS STD. 838.01 OR STD. 838.11 (UNLESS NOTED OTHERWISE) CU. YDS. C.S.P.	QUANTITIES FOR DRAINAGE STRUCTURES * TOTAL L.F. FOR PAY QUANTITY SHALL BE COL. 'A' + (1.3 X COL. 'B') LIN. FT. PER EACH (0' THRU 5.0')	A 5.0' THRU 10.0'	B 10.0' AND ABOVE	C.B. STD. 840.01 OR STD. 840.02	FRAME, GRATES AND HOOD STANDARD 840.03 TYPE OF GRATE E	F	G	M.D.I. TYPE "S" STD. 840.18 OR 840.27	M.D.I. FRAME W/2 N.S. GRATES STD. 840.24	TRAFFIC BEARING DI. STD. 840.35	M.D.I. FRAME WITH TWO N.S. GRATES STD. 840.29	PIPE REMOVAL (LF)	REMARKS
-L- 15+61	LT.	1													36'													36'	
-L- 15+80	RT.	2		261.00															1							1	1				REMOVE EXIST. DI & CONSTRUCT 2GI
-L- 19+00	RT.	3		260.45															1							1	1				2GI
	RT.	3	4		257.70	252.46		18"	88'																					
-L- 21+65	LT.	5		262.36															1							1	1				2GI
	LT.	5	6		259.61	259.15		18"	52'																					
-L- 21+65	RT.	6		262.60															1									1	1		TRAFFIC BEARING DI
	RT.	6	7		259.00	258.60		18"	8'																					
-L- 21+65	RT.	7		261.20															1							1	1				2GI
	RT.	7	8		258.45	256.75		18"	136'																					
-L- 23+00	RT.	8		260.10															1							1	1				2GI
	RT.	8	9		256.60	250.50		18"	76'																					
-L- 25+55	LT.	10																1.5												
-DET- 15+25	℄	11			256.75	254.00				24"	.064																			
-DET- 18+12	℄	12			257.00	250.50				24"	.064																			
TOTAL								18"	360'	24"	.064						36'	1.5		6					5	5	1	1		55'	
																	SAY	2												

ABBREVIATIONS

C.B.	CATCH BASIN
N.D.I.	NARROW DROP INLET
D.I.	DROP INLET
M.D.I.	MEDIAN DROP INLET
M.D.I. (N.S.)	MEDIAN DROP INLET (NARROW SLOT)
J.B.	JUNCTION BOX
M.H.	MANHOLE
T.B.D.I.	TRAFFIC BEARING DROP INLET
T.B.J.B.	TRAFFIC BEARING JUCTION BOX

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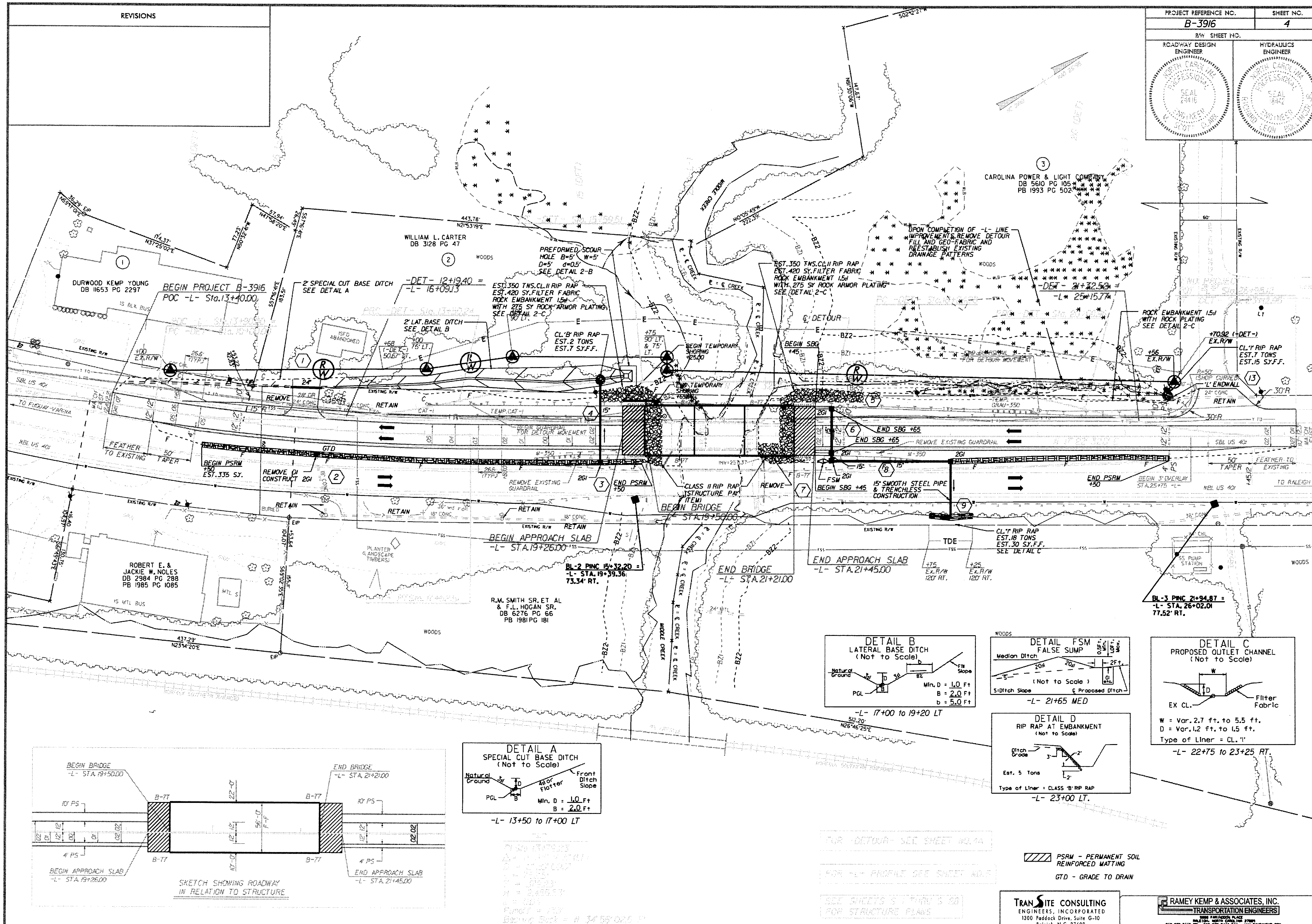
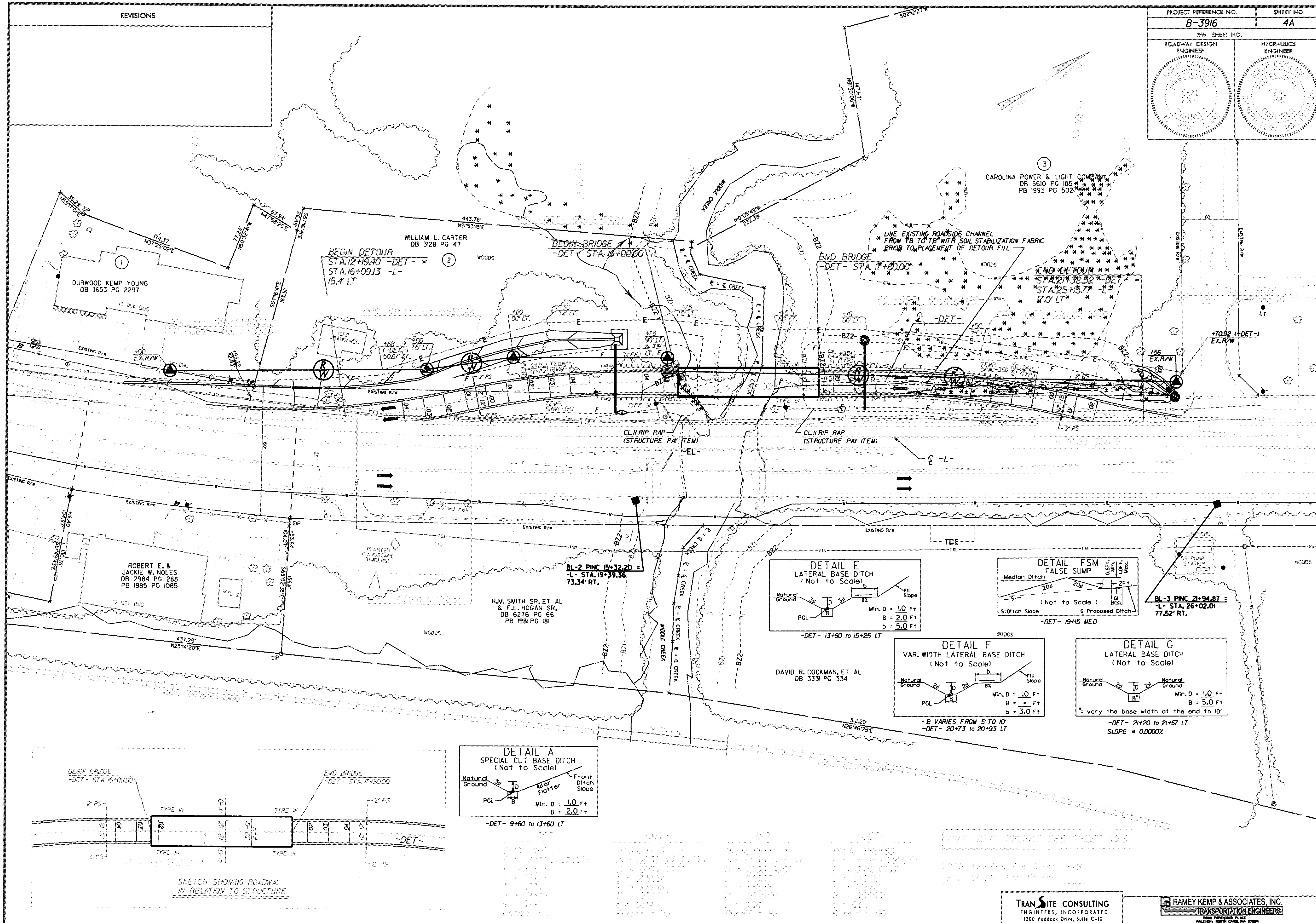

REVISIONS
PROJECT REFERENCE NO.
B-3916
SHEET NO.
4
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
CAROLINA POWER & LIGHT COMPANY
DB 5610 PG 105
PB 1993 PG 502
WILLIAM L. CARTER
DB 3128 PG 47
DURWOOD KEMP YOUNG
DB 11653 PG 2297
BEGIN PROJECT B-3916
POC -L- Sta.13+40.00
2' SPECIAL CUT BASE DITCH
SEE DETAIL A
-DET- 12+19.40 =
-L- 16+09.13
2' LAT. BASE DITCH
SEE DETAIL B
PREFORMED SCOUR HOLE B=5' W=5'
D=5' d=0.5'
SEE DETAIL 2-B
EST. 350 TNS. CL.II RIP RAP
EST. 420 SY. FILTER FABRIC
ROCK EMBANKMENT 1.5d
WITH 275 SY ROCK ARMOR PLATING
SEE DETAIL 2-C
CL.'B' RIP RAP
EST. 2 TONS
EST. 7 SY. F.F.
BEGIN TEMPORARY SHORING
UPON COMPLETION OF -L- LINE IMPROVEMENTS REMOVE DETOUR FILL AND GEO-FABRIC AND REESTABLISH EXISTING DRAINAGE PATTERNS
-DET- 21+32.50 =
-L- 25+15.77
ROCK EMBANKMENT 1.5d
WITH ROCK PLATING
SEE DETAIL 2-C
CL.'I' RIP RAP
EST. 7 TONS
EST. 15 SY. F.F.
'L' ENDWALL
FEATHER TO EXISTING
50' TAPER
BEGIN PSRM
EST. 335 SY.
REMOVE CI
CONSTRUCT 2GI
REMOVE EXISTING GUARDRAIL
END PSRM
CLASS II RIP RAP (STRUCTURE PAY ITEM)
BEGIN BRIDGE
-L- STA.19+50.00
BEGIN APPROACH SLAB
-L- STA.19+26.00
END BRIDGE
-L- STA.21+21.00
END APPROACH SLAB
-L- STA.21+45.00
END SBG +65
BEGIN SBG +45
15' SMOOTH STEEL PIPE & TRENCHLESS CONSTRUCTION
CL.'I' RIP RAP
EST. 18 TONS
EST. 30 SY. F.F.
SEE DETAIL C
BL-2 PINC 15+32.20 =
-L- STA. 19+39.36
73.34' RT.
BL-3 PINC 21+94.87 =
-L- STA. 26+02.01
77.52' RT.
ROBERT E. & JACKIE W. NOLES
DB 2984 PG 288
PB 1985 PG 1085
R.M. SMITH SR. ET AL & F.L. HOGAN SR.
DB 6276 PG 66
PB 1981 PG 181
MIDDLE CREEK
TO FUQUAY-VARINA
TO RALEIGH
WOODS
DETAIL A
SPECIAL CUT BASE DITCH
(Not to Scale)
Min. D = 1.0 Ft
B = 2.0 Ft
-L- 13+50 to 17+00 LT
DETAIL B
LATERAL BASE DITCH
(Not to Scale)
Min. D = 1.0 Ft
B = 2.0 Ft
b = 5.0 Ft
-L- 17+00 to 19+20 LT
DETAIL FSM
FALSE SUMP
(Not to Scale)
-L- 21+65 MED
DETAIL D
RIP RAP AT EMBANKMENT
(Not to Scale)
Est. 5 Tons
Type of Liner = CLASS 'B' RIP RAP
-L- 23+00 LT.
DETAIL C
PROPOSED OUTLET CHANNEL
(Not to Scale)
Filter Fabric
W = Var. 2.7 ft. to 5.5 ft.
D = Var. 1.2 ft. to 1.5 ft.
Type of Liner = CL. 'I'
-L- 22+75 to 23+25 RT.
SKETCH SHOWING ROADWAY IN RELATION TO STRUCTURE
PSRM - PERMANENT SOIL REINFORCED MATTING
GTD - GRADE TO DRAIN
TRANSITE CONSULTING ENGINEERS, INCORPORATED
1300 Paddock Drive, Suite G-10
Raleigh, N.C. 27609
RAMEY KEMP & ASSOCIATES, INC.
TRANSPORTATION ENGINEERS


REVISIONS
PROJECT REFERENCE NO.
B-3916
SHEET NO.
4A
R/W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
DURWOOD KEMP YOUNG
DB 11653 PG 2297
WILLIAM L. CARTER
DB 3128 PG 47
BEGIN DETOUR
STA.12+19.40 -DET- =
STA.16+09.13 -L-
15.4' LT
BEGIN BRIDGE
-DET- STA.16+00.00
END BRIDGE
-DET- STA.17+60.00
CAROLINA POWER & LIGHT COMPANY
DB 5610 PG 105
PB 1993 PG 502
LINE EXISTING ROADSIDE CHANNEL
FROM TB TO TB WITH SOIL STABILIZATION FABRIC
PRIOR TO PLACEMENT OF DETOUR FILL
END DETOUR
STA.21+32.82 -DET- =
STA.25+15.77 -L-
17.0' LT
+70.92 (-DET-)
EX.R/W
CL.II RIP RAP
(STRUCTURE PAY ITEM)
CL.II RIP RAP
(STRUCTURE PAY ITEM)
ROBERT E. &
JACKIE W. NOLES
DB 2984 PG 288
PB 1985 PG 1085
R.M. SMITH SR. ET AL
& F.L. HOGAN SR.
DB 6276 PG 66
PB 1981 PG 181
BL-2 PINC 15+32.20 =
-L- STA. 19+39.36
73.34' RT.
BL-3 PINC 21+94.87 =
-L- STA. 26+02.01
77.52' RT.
DAVID R. COCKMAN, ET AL
DB 3331 PG 334
WOODS
DETAIL E
LATERAL BASE DITCH
(Not to Scale)
Natural Ground
PGL
Fill Slope
Min. D = 1.0 Ft
B = 2.0 Ft
b = 5.0 Ft
-DET- 13+60 to 15+25 LT
DETAIL FSM
FALSE SUMP
Median Ditch
(Not to Scale)
S=Ditch Slope
℄ Proposed Ditch
-DET- 19+15 MED
DETAIL F
VAR. WIDTH LATERAL BASE DITCH
(Not to Scale)
Natural Ground
PGL
Fill Slope
Min. D = 1.0 Ft
B = * Ft
b = 3.0 Ft
* B VARIES FROM 5' TO 10'
-DET- 20+73 to 20+93 LT
DETAIL G
LATERAL BASE DITCH
(Not to Scale)
Natural Ground
Natural Ground
Min. D = 1.0 Ft
B = 5.0 Ft
* = vary the base width at the end to 10'
-DET- 21+20 to 21+67 LT
SLOPE = 0.0000%
DETAIL A
SPECIAL CUT BASE DITCH
(Not to Scale)
Natural Ground
PGL
4:1 or Flatter
Front Ditch Slope
Min. D = 1.0 Ft
B = 2.0 Ft
-DET- 9+60 to 13+60 LT
BEGIN BRIDGE
-DET- STA. 16+00.00
END BRIDGE
-DET- STA. 17+60.00
TYPE III
2' PS
-DET-
SKETCH SHOWING ROADWAY
IN RELATION TO STRUCTURE
TRANSITE CONSULTING
ENGINEERS, INCORPORATED
1300 Paddock Drive, Suite G-10
Raleigh, N.C. 27609
RAMEY KEMP & ASSOCIATES, INC.
TRANSPORTATION ENGINEERS

PROJECT REFERENCE NO.	SHEET NO.
B-3916	5

ROADWAY DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 24416 ENGINEER M. SCOTT CLARK

HYDRAULICS ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 18442 ENGINEER RICHARD LEON BOLLINGER, JR.

STRUCTURE HYDRAULIC DATA

DESIGN DISCHARGE	= 6,100 CFS
DESIGN FREQUENCY	= 50 YRS
DESIGN HW ELEVATION	= 258.8 FT.
BASE DISCHARGE	= 7,500 CFS
BASE FREQUENCY	= 100 YRS
BASE HW ELEVATION	= 259.8 FT
OVERTOPPING DISCHARGE	= 12,000 CFS
OVERTOPPING FREQUENCY	= 200 +/- YR.
OVERTOPPING ELEVATION	= 262.14 FT

-L-
(FOR PLAN, SEE SHEET NO. 4)

BEGIN PROJECT -L- STA. 13+40.00

BEGIN GRADE -L- STA. 13+90.00
ELEV. = 264.36 (INCLUDES 3" RESURFACING)

PI = 15+00.00
EL = 263.24'
K = 160
VC = 210'

FEATHER TO EXISTING

-11.015%

(+)0.2979%

(-)0.1535%

PI = 17+80.00
EL = 264.07'
K = 662
VC = 299'

-1.11%

-2.212%

BEGIN 2' SPEC. CUT BASE DITCH STA. 13+50 LT. ELEV. = 260.0

END 2' SPEC. CUT BASE DITCH
BEGIN 2' LATERAL BASE DITCH
STA. 17+00 LT.
ELEV. = 257.00

END 2' LATERAL BASE DITCH
STA. 18+80 LT.
ELEV. = 252.00

B.M. # 1 ELEV. = 275.58'
RR SPIKE IN 12" PINE
-BL- 6+91.33 180' RT. =
-L- 11+31.25 223.40' RT.

BEGIN BRIDGE -L- STA. 19+50.00
ELEV. = 263.81

36" PRESTRESSED GIRDER
(3 - 57' SPANS = 171')

END BRIDGE -L- STA. 21+21.00
ELEV. = 263.55

ROCK EMBANKMENT 1.5:1 WITH ARMOR PLATING (STRUCTURE PAY ITEM)

MATERIAL TO BE REMOVED (TYP.)

1 1/2:1 SLOPE (TYP.)

ROCK EMBANKMENT 1.5:1 WITH ARMOR PLATING (STRUCTURE PAY ITEM)

WS ELEV. = 247.89
SURVEY 1-22-03

(-)0.1535%

(+)0.1020%

PI = 24+00.00
EL = 263.12'
K = 783
VC = 200'

MATCH LINE STA. 25+50

BEGIN 2' BASE DITCH
STA. 25+00 LT.
ELEV. = 251.50

+3.600%

END 2' BASE DITCH
STA. 25+50 LT.
ELEV. = 253.30

END GRADE -L- STA. 25+75.00
ELEV. = 263.30 (INCLUDES 3" RESURFACING)

FEATHER TO EXISTING

END PROJECT
-L- STA. 26+95.12

MATCH LINE STA. 25+50

BEGIN GRADE
STA. 12+19.40 -DET-
STA. 16+09.13 -L-, 15.4' LT.
EL = 262.04'

PI = 13+00.00
EL = 261.46'
K = 96
VC = 160'

-1.478%

(-)0.7896%

(+)0.9395%

PI STA. 12+40 LT.
ELEV. = 258.11

-1.326%

-1.392%

BEGIN 2' SPEC. CUT BASE DITCH STA. 9+60 LT. ELEV. = 261.0

END 2' SPEC. CUT BASE DITCH
STA. 13+60 LT.
ELEV. = 256.68
BEGIN 2' LATERAL BASE DITCH

END 2' LAT. BASE DITCH
STA. 15+25 LT.
ELEV. = 254.00

BEGIN BRIDGE -DET- STA. 16+00.00
ELEV. = 263.39

PI = 15+30.00
EL = 263.62'
K = 145
VC = 180'

(+)0.9395%

(-)0.3000%

1 1/2:1 SLOPE (TYP.)

END BRIDGE -DET- STA. 17+60.00
ELEV. = 262.93

WS EL = 247.89
SURVEY 1-22-03

END GRADE
STA. 21+32.52 -DET-
STA. 25+15.77 -L-, 17.0' LT.
EL = 262.48'

PI = 20+70.00
EL = 262.00'
K = 102
VC = 110'

(-)0.3000%

(+)0.7487%

BEGIN VAR. WIDTH LAT. BASE DITCH "BEGINS OUTSIDE OF BUFFER ZONE" STA. 21+20 DET LT. ELEV. = 253.3

0.000%

END 5' LAT. BASE DITCH
STA. 21+67 DET LT.
ELEV. = 253.3

END VAR. WIDTH LAT. BASE DITCH
STA. 21+34 DET LT.
ELEV. = 253.3
BEGIN 5' LAT. BASE DITCH

LEGEND
--- DITCH PROFILE LEFT

-DET-
(FOR PLAN, SEE SHEET NO. 4A)

STRUCTURE HYDRAULIC DATA

DESIGN DISCHARGE	= 3,200 CFS
DESIGN FREQUENCY	= 10 YRS
DESIGN HW ELEVATION	= 255.4 FT.
BASE DISCHARGE	= 7,500 CFS
BASE FREQUENCY	= 100 YRS
BASE HW ELEVATION	= 260.0 FT
OVERTOPPING DISCHARGE	= N/A CFS
OVERTOPPING FREQUENCY	= N/A YR.
OVERTOPPING ELEVATION	= 260.77 FT

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5808 Farrington Road
Raleigh, North Carolina 27609
919-872-5115 tel. 919-872-2555 fax - www.rameykemp.com

PROJ. REFERENCE NO.	SHEET NO.
B-3916	X-1

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

NOTE: EMBANKMENT COLUMN INCLUDES BACKFILL FOR UNDERCUT

CROSS-SECTION SUMMARY

Phase 1			Phase 2			Phase 3		
Station	Uncl. Exc. (cu. yd.)	Embt (cu. yd.)	Station	Uncl. Exc. (cu. yd.)	Embt (cu. yd.)	Station	Uncl. Exc. (cu. yd.)	Embt (cu. yd.)
-DET-			-L-			DETOUR REMOVAL		
10+10.00	0	0						
12+10.23	388	0	13+90.00	0	0	13+90.00	0	0
12+60.44	127	3	14+00.00	4	2	14+00.00	0	0
13+09.02	91	29	14+50.00	37	15	14+50.00	0	0
13+58.15	38	113	15+00.00	39	17	15+00.00	0	0
14+09.74	3	232	15+50.00	27	13	15+50.00	0	14
14+60.92	0	333	16+00.00	8	9	16+00.00	1	27
15+11.82	0	529	16+50.00	4	13	16+50.00	15	33
15+62.54	0	809	17+00.00	4	21	17+00.00	30	69
16+00.00 (BEG. BRIDGE)	0	349	17+50.00	5	30	17+50.00	54	83
			18+00.00	11	35	18+00.00	136	90
17+60.00 (END BRIDGE)	0	0	18+50.00	12	61	18+50.00	270	100
17+62.54	0	32	19+00.00	5	107	19+00.00	443	67
18+12.54	0	1250	19+50.00 (BEG. BRIDGE)	3	64	19+50.00 (BEG. BRIDGE)	783	24
18+63.11	0	1194						
19+13.97	0	1095	21+21.00 (END BRIDGE)	0	0	21+21.00 (END BRIDGE)	0	0
20+05.54	0	986	21+50.00	7	27	21+50.00	318	0
20+16.61	9	821	22+00.00	29	73	22+00.00	1128	0
20+67.57	14	573	22+50.00	42	46	22+50.00	1124	0
21+16.45	11	343	23+00.00	55	34	23+00.00	1029	0
21+58.54	18	122	23+50.00	65	19	23+50.00	915	0
			24+00.00	40	5	24+00.00	743	5
			24+50.00	12	1	24+50.00	528	7
			25+00.00	11	1	25+00.00	340	24
			25+50.00	15	1	25+50.00	144	59
			26+00.00	0	0	26+00.00	0	0
			26+50.00	0	0	26+50.00	0	0
			26+95.12	0	0	26+95.12	0	0
TOTAL	699	8813	TOTAL	435	594	TOTAL	8001	602

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

RAMEY KEMP & ASSOCIATES, INC.
TRANSPORTATION ENGINEERS
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PROJ. REFERENCE NO.	SHEET NO.
B-3916	X-2

0 10

150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150

270
260

263.48
0.050
0.050
263.10
EP NBL
4:1
3:1
VAR.
2:1
4:1
258.75 (-L-)
261.063
10+10.00 -DET-
15+50.00

263.58
0.050
0.050
263.30
EP NBL
5:1
6:1
3:1
259.33 (-L- & -DET-)
261.43
15+00.00

263.84
0.050
0.050
263.59
EP NBL
6:1
6:1
3:1
259.92 (-L-)
262.016
14+50.00

264.26
0.044
0.044
264.00
EP NBL
6:1
6:1
3:1
260.50 (-L-)
263.313
14+00.00

BEGIN GRADE
STA. 13+90.00 -L-
EL = 264.36

EXIST.
EXIST.
264.62
13+50.00

LEGEND
——— -L- DITCH
– – – -DET- DITCH

BEGIN PROJECT
STA. 13+40.00 -L-

-L-

PROJ. REFERENCE NO.	SHEET NO.
B-3916	X-3

0 10

150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150

270
260
280

Temp. Slope
262.03 -DET-
263.88
EP NBL
0.010
0.010
0.0340
0.0340
263.05
260.88'
256.18' (-DET-)
255.86' (-L-)
13+58.15 -DET-
17+50.00

Temp. Slope
-DET
261.89
263.80
EP NBL
0.030
0.050
0.050
263.03
261.17'
256.85' (-DET-)
257.00' (-L-)
13+09.02 -DET-
17+00.00

-DET-
261.83
263.68
EP NBL
0.040
0.0500
0.0500
263.00
261.33'
257.51' (-DET-)
257.58' (-L-)
12+60.44 -DET-
16+50.00

BEGIN DETOUR GRADE
STA. 12+19.40 -DET-
EL = 262.04

CL -DET-
263.54
EP NBL
0.040
0.0500
0.0500
263.00
261.15'
VAR.
258.17' (-DET- & -L-)
12+10.23 -DET-
16+00.00

LEGEND
———— -L- DITCH
– – – -DET- DITCH

-L-

PROJ. REFERENCE NO.	SHEET NO.
B-3916	X-4

0 10

150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150

270 260 250 280

263.41 -DET-
0.0400 0.0400
TEMPORARY SHORING (40' LT)
15+62.54DET-

263.81
0.0200 0.0200
262.44
EP NBL
19+50.00

BEGIN BRIDGE
STA.19+50.00 -L-
EL = 263.81

263.27 -DET-
0.0400 0.0400
254.20
252.46 (-L-)
15+11.82 -DET-

263.38
0.0200 0.0200
262.63
EP NBL
260.485
19+00.00

262.95 -DET-
0.033 0.033
254.86 (-DET-)
253.59 (-L-)
14+60.92 -DET-

263.92
0.0200 0.033
262.78
EP NBL
260.419
18+50.00

Temp. Slope
262.49 -DET-
0.071 0.071
255.52 (-DET-)
254.73 (-L-)
14+09.74 -DET-

263.92
0.0200 0.0154
263.01
EP NBL
260.642
18+00.00

-L-

LEGEND
——— -L- DITCH
– – – -DET- DITCH

PROJ. REFERENCE NO.	SHEET NO.
B-3916	X-5

0 10

150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150

280 270 260 250

262.92 -DET-

0.020 0.020

2:1 1.5:1 2:1

17+62.54 -DET-

END BRIDGE
STA. 17+60.00 -DET-
EL = 262.93

263.35

0.0200 0.0200

EP NBL

262.55

4:1

261.20

21+50.00

END BRIDGE
STA. 21+21.00 -L-
EL = 263.55

263.07 -DET-

0.0200 0.0200

17+12.54 -DET-

263.58

0.0200 0.0200

EP NBL

21+00.00

263.22 -DET-

0.0200 0.0200

16+62.54 -DET-

263.66

0.0200 0.0200

246.35

20+50.00

BEGIN BRIDGE
STA. 16+00.00 -DET-
EL = 263.39

263.37 -DET-

0.023 0.023

16+12.54 -DET-

263.74

0.0200 0.0200

245.44

20+00.00

-L-

PROJ. REFERENCE NO.	SHEET NO.
B-3916	X-6

0 10

150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150

270
260
250

262.31 -DET-
263.21
0.027
0.027
0.0200
0.0200
EP NBL
2:1
3:1
4:1
260.399
19+65.09 -DET-
23+50.00

262.41 -DET-
263.28
0.0400
0.0400
0.0200
0.0200
EP NBL
260.13
19+13.97 -DET-
23+00.00

280
270
260
250

262.62 -DET-
263.35
0.0400
0.0400
0.0200
0.0200
EP NBL
261.260
18+63.11 -DET-
22+50.00

262.77 -DET-
263.43
0.0370
0.0370
0.0200
0.0200
EP NBL
261.294
18+12.54 -DET-
22+00.00

150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150

PROJ. REFERENCE NO.	SHEET NO.
B-3916	X-7

END GRADE
BEGIN OVERLAY
STA. 25+75.00 -L-
EL = 263.30

CL -DET-

263.27

EP NBL

0.040 0.0200 0.0200

263.03

4H

261.75

2H 1.5H 2H 2H 1.5H 2H 4H

253.30 (-DET-) 253.30 (-L-)

21+58.54 -DET-

25+50.00

END DETOUR GRADE
STA. 21+32.52 -DET-
EL = 262.48

262.36 -DET-

263.22

EP NBL

0.020 0.0200 0.0200

262.99

4H

261.302

2H 2H 1.5H 2H 2H 4H

253.30 (-DET-) 251.50 (-L-)

21+16.45 -DET-

25+00.00

262.14 -DET-

263.19

EP NBL

0.014 0.005 0.0200 0.0200

262.96

4H

261.017

2H 1.5H 2H

20+67.57 -DET-

24+50.00

262.16 -DET-

263.19

EP NBL

0.005 0.005 0.0200 0.0200

262.93

4H

260.821

2H 2H 0.5H

20+16.61 -DET-

24+00.00

LEGEND
-L- DITCH
-DET- DITCH

PROJ. REFERENCE NO.	SHEET NO.
B-3916	X-8

0 10

270
260
270
260
270

EP NBL

263.03

27+00.00

END PROJECT
STA. 26+95.12 -L-

EP NBL

263.27

262.98

26+50.00

BAY HILL DRIVE 0.0200 263.20 0.0200 MED. OPENING

263.02

26+00.00

-L-

US 401
BRIDGE NO. 63 OVER MIDDLE CREEK
WAKE COUNTY

FEDERAL-AID PROJECT NO. BRSTP-401(13)
STATE PROJECT NO. 8.1404501
T.I.P. NO. B-3916

CATEGORICAL EXCLUSION

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
AND
N.C. DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

APPROVED:

05/27/04
DATE

for Gregory J. Thorpe, Ph.D.
Environmental Management Director
Project Development & Environmental Analysis Branch
North Carolina Department of Transportation

05/27/04
DATE

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

US 401
BRIDGE NO. 63 OVER MIDDLE CREEK
WAKE COUNTY

FEDERAL-AID PROJECT NO. BRSTP-401(13)
STATE PROJECT NO. 8.1404501
T.I.P. NO. B-3916

CATEGORICAL EXCLUSION

May 2004

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5/26/14
Date

For the North Carolina Department of Transportation
Project Development and Environmental Analysis Branch

Theresa Ellerby, Project Manager
Project Development and Environmental Analysis Branch

PROJECT COMMITMENTS

US 401
BRIDGE NO. 63 OVER MIDDLE CREEK
WAKE COUNTY

FEDERAL-AID PROJECT NO. BRSTP-401(13)
STATE PROJECT NO. 8.1404501
TIP NO. B-3916

In addition to the standard Nationwide Permit #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, Design Standards for Sensitive Watersheds, NCDOT's Guidelines for Best Management Practices for Bridge Demolition and Removal, General Certification Conditions, and Section 401 Conditions of Certification, the following special commitments have been agreed to by NCDOT:

NCDOT Division 5, Roadway Design and Hydraulic Unit

1.) The Neuse River Riparian Buffer Rule will be implemented during design, construction and maintenance of the project.

US 401
BRIDGE NO. 63 OVER MIDDLE CREEK
WAKE COUNTY

FEDERAL-AID PROJECT NO. BRSTP-401(13)
STATE PROJECT NO. 8.1404501
T.I.P. NO. B-3916

INTRODUCTION

The replacement of Bridge No. 63 located on US 401 over Middle Creek in southern Wake County is included in the North Carolina Department of Transportation (NCDOT) 2004-2010 Transportation Improvement Program (TIP) and in the Federal-Aid Bridge Replacement Program (BRSTP-401(13)). 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

The NCDOT Bridge Maintenance Unit records indicate Bridge No. 63 had a sufficiency rating of 42.4 out of a possible 100 for a new structure in 1995. Needed repairs to the structure were completed between 1995 and 1997 which improved the bridge a sufficiency rating to 52.4 out of a possible 100 for a new structure. The bridge is considered structurally deficient and functionally obsolete. The replacement of this inadequate structure will result in safer and more efficient traffic operations.

II. EXISTING CONDITIONS

Bridge No. 63 is located on the southbound lanes of US 401 approximately 1.3 miles south of Wake Technical Community College and 0.3 mile south of the junction of SR 2724. Refer to Figure 1 and 7 for the project location and Figures 2 and 3 for photos of the existing project study area.

Bridge No. 63 was constructed in 1926 and reconstructed in 1953 and has a sufficiency rating of 52.4 out of a possible 100. The bridge is currently not posted to restrict weight limits.

The overall length of the two-span structure is 95.0 ft. It has a clear roadway width of 28.1 ft that includes two travel lanes over the bridge. The deck width out-to-out is 31.4 ft. The superstructure consists of reinforced concrete deck girders. The substructure consists of reinforced concrete full height abutments and reinforced concrete solid web piers. The height from crown to streambed is 19 ft.

US 401 is classified as a rural minor arterial in the Statewide Functional Classification System. The 2004 average daily traffic volume (ADT) on southbound US 401 over Bridge No. 63 is estimated to be 27,100 vehicles

per day (vpd). The percentages of truck traffic are 4 percent TTST vehicles and 4 percent dual-tired vehicles. The projected 2030 ADT is 62,900 vpd.

The southbound two-lane facility measures approximately 24 ft in clear roadway width with 2-ft paved shoulders and guardrail approximately 4 ft from the edge of pavement along both sides of the roadway. The horizontal alignment of US 401 is tangent and the vertical alignment is approximately flat in the vicinity of Bridge No. 63. The speed limit in the immediate vicinity of the bridge is posted at 55 miles hour (mph). Existing right-of-way is approximately 125 ft in width.

Overhead power lines are located along the west side of US 401. An underground telephone cable is located between the existing bridge and the overhead power lines. The telephone cable crosses Middle Creek on poles. Markers indicate an underground fiber optic cable along the west shoulder of US 401. A small conduit (2.5 – 3.0 inches) is attached underneath the west side of the bridge. Utility impacts are expected to be high.

US 401 is not part of a designated bicycle route nor is it listed in the Transportation Improvement Program as needing incidental bicycle accommodations. There is no indication that an unusual number of bicyclists use this roadway.

Land use within the project study area is a mixture of residential and commercial/light industrial. A Progress Energy (CP&L) maintenance facility is just north and west of the immediate project study area. Wake Technical Community College is approximately 1.3 miles north of the project study area. The area immediately south of the project study area is mostly residential on the west side and commercial/wooded on the east side.

School buses cross Bridge No. 63 thirty (30) times per day.

There have been four crashes reported on US 401 South within 500 feet of Bridge No. 63 between September 1, 2000 and August 31, 2003. These accidents involved vehicles crossing the median, rear end collisions and animal collisions that resulted in property damage only.

III. ALTERNATIVES

A. Project Description

Based upon a preliminary hydraulics analysis, the proposed replacement structure will be approximately 140 ft long with a 56 ft clear roadway width. The bridge will be designed to accommodate future traffic when US 401 is widened to six lanes. At the time of construction the bridge will be striped to include two 12 ft travel lanes with 10 ft of lateral clearance on each side of the bridge.

The length and opening size of the proposed structure may increase or decrease as necessary to accommodate peak flows, as determined by a more detailed hydraulic analysis to be performed during the final design phase of the project.

The roadway approaches will provide two 12 ft travel lanes with a 12 ft shoulder (10 ft paved) on the outside and 6 ft (4 ft paved) shoulders on the median side. The roadway approach and bridge grades will approximately match existing bridge and roadway elevations. The design speed is 60 mph.

B. Build Alternatives

Two build alternatives studied for replacing the bridge are described below:

Alternative A

Alternative A consists of replacing the bridge in-place with a new bridge. During construction traffic will be maintained using the northbound bridge as a detour to maintain traffic during construction. Improvements to the approach roadways will be required for a distance of approximately 200 ft west and 200 ft east of the structure. Traffic will be detoured to the northbound lanes during construction. This detour will provide one lane in each direction across the existing two-lane northbound bridge during the construction period. Refer to Figure 4 for illustration of this alternative.

Alternative A was not selected because the existing northbound bridge is not wide enough to provide the required positive protection between opposing traffic and would possibly require a truck detour. US 401 north is also an emergency evacuation route for the Shearon Harris Nuclear power plant.

Alternative B (Preferred)

Alternative B consists of replacing the bridge in-place using a temporary on-site detour upstream of the existing bridge to maintain traffic during construction. Improvements to the approach roadways will be required for a distance of approximately 200 ft west and 200 ft east of the structure. Traffic will be detoured along a two-lane temporary on-site detour immediately west of the existing structure. The edge of the temporary detour bridge will be located approximately 12 ft west of the edge of the proposed bridge. The temporary detour bridge will have a clear roadway width of 32 ft with 2 travel lanes each 12 ft wide and 4 ft shoulders on each side of the travel lanes. The design speed for the temporary detour bridge is 50 mph. The length of the temporary detour is approximately 1600 ft. Refer to Figures 5A and 5B for illustration of this alternative.

C. Alternatives Eliminated From Further Consideration

The "Do-Nothing" alternative would eventually necessitate closure of the bridge due to its poor condition. This is not desirable due to the traffic service provided by US 401.

Investigation of the existing structure by the NCDOT Bridge Maintenance Unit indicates that rehabilitation of the old bridge is not feasible due to its deteriorated condition.

D. Preferred Alternative (Alternative B)

Alternative B consists of replacing the bridge in-place using a temporary on-site detour upstream (west) of the existing bridge to maintain traffic during construction. This alternative was selected as the preferred because it maintains an acceptable level of service on both the northbound and southbound lanes during construction.

The Division 5 Engineer concurs with Alternative B as the preferred alternative.

IV. ESTIMATED COSTS

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

TABLE 1
Estimated Project Costs

	Alternative A	Alternative B (Preferred)
Structure Removal (Existing)	$ 21,280	$ 21,280
Structure Proposed	$ 270,750	$ 588,000
Roadway Approaches	$ 99,260	$ 117,970
Temporary Structures	$ 0	$ 174,720
Detour Approaches	$ 8,880	$ 259,842
Miscellaneous and Mobilization[1]	$ 179,830	$ 522,816
Engineering and Contingencies[1]	$ 95,000	$ 252,694
Right-of-Way/Easement and Utilities	$ 39,375	$ 115,125
Total Project Cost	**$ 714,375**	**$ 2,052,447**

The estimated cost of the project, as shown in the 2004-2010 NCDOT Transportation Improvement Program is $1,180,000 including $300,000 spent in prior years, $80,000 for right of way and $800,000 for construction.

V. NATURAL RESOURCES

Natural resources within the project study area were evaluated to provide: 1) an assessment of existing vegetation, wildlife, protected species, streams, wetlands, and water quality; 2) an evaluation of probable impacts resulting from construction; and 3) a preliminary determination of permit needs.

A. Methodology

Materials and research data in support of this investigation have been derived from a number of sources. The U.S. Geological Survey (USGS) 7.5-minute quadrangle topographic map of Lake Wheeler, NC (USGS 1993) was consulted to determine physiographic relief and to assess landscape characteristics. U.S. Fish and Wildlife Service (USFWS) National Wetlands Inventory mapping was also consulted to determine what potential wetland types may be encountered in the field. Detailed soils information was obtained from the *Soil Survey of Wake County, North Carolina* (USDA 1970).

Aerial photograph served as the basis for mapping plant communities and wetlands. Plant community patterns were identified from available mapping sources and then verified in May 2001. Plant community descriptions are based on a classification system utilized by the NC Natural Heritage Program (NHP) (Schafale and Weakley

1990). When appropriate, community classifications were modified to better reflect field observations. Vascular plant names typically follow nomenclature found in Radford *et al.* (1968).

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

Water resource information for Middle Creek was derived from the most recent version of the *Neuse River Basinwide Water Quality Plan* (DWQ 1998) and several NC Division of Water Quality (DWQ) internet resources. Quantitative sampling was not undertaken to support existing data.

At the time of the field investigation, the most current USFWS list of federal protected species listed for Wake County was dated February 26, 2001, and this list was reviewed prior to the field investigation. Currently, the most recent USFWS list is dated February 25, 2003. No additional species have been listed for Wake County. In addition, NHP records documenting occurrences of federal or state-listed species were consulted before commencing the field investigation. An updated NHP records search was performed on December 20, 2001, November 25, 2003 and March 10, 2004.

Direct observations of terrestrial and aquatic wildlife were documented, and expected population distributions were determined through observations of available habitat and review of supportive documentation found in Martof *et al.* (1980), Webster *et al.* (1985), Menhinick (1991), Hamel (1992), Rohde *et al.* (1994), and Palmer and Braswell (1995).

B. Physiography and Soils

The project study area is located in the Piedmont physiographic province of North Carolina. The topography in the project study area is generally characterized as nearly level to moderately sloping. Elevations in the project study area range from 240 to 250 feet above mean sea level (MSL) (USGS 1993). The project study area consists of existing forested areas and maintained/disturbed land resulting from commercial development.

The project study area crosses seven soil mapping units (USDA 1970). Hydric soil units mapped as occurring within the project study area include the Wehadkee (Typic Haplaquents) and Bibb (Fluventic Haplaquepts) series, which are poorly drained. Non-hydric soil units that may contain hydric inclusions that are mapped as occurring in the project study area include the Altavista (Aquic Hapludults) series, which often has hydric inclusions of the Roanoke (Typic Ochraquults) series. Non-hydric soils mapped as occurring within the project study area include two phases of the Appling (Typic Hapludults) series, the Herndon (Typic Hapludults) series, and Made land. Made land is defined as areas that have been altered by man to the extent that the profile of the original soil can not be recognized (USDA 1970).

The Appling series is derived from granite, gneiss, schist, and other acidic rocks (USDA 1970). This soil series is conducive to providing potential habitat for the federally protected Michaux's sumac (*Rhus michauxii*), assuming that the vegetative communities are appropriate. This is further discussed in Section F.1.

C. Water Resources

C.1. Waters Impacted

The project study area is located within sub-basin 030403 of the Neuse River Basin (DWQ 1998) and is part of USGS hydrologic unit 03020201 (USGS 1974). Middle Creek originates north of US 1 in the Town of Apex, in Wake County, North Carolina and flows south to its confluence with Swift Creek south of the project study area. This stream has been assigned Stream Index Number (SIN) 27-43-15-(4) by the DWQ from its source to Swift Creek (DEM 1993, DENR 2001a).

C.2. Water Resource Characteristics

Middle Creek is a perennial stream with moderate flow over substrate consisting of sand and silt. Water clarity at the time of the initial site inspection was moderate with some slight turbidity. The channel ranges in width from 20 feet upstream of the bridge to as wide as 50 feet downstream of both the north and southbound bridges. The average depth of Middle Creek is approximately 6.1 ft.

There are three additional stream channels within the project study area that flow into Middle Creek. The first channel is located on the north side of the bridge, west of US 401. This channel is intermittent for much of its length but grades into a perennial channel near the confluence with Middle Creek. The second stream channel is located north of the bridge, and east of US 401. This feature is not mapped on either the USGS or soil survey maps and appears to be a roadside drainage feature that has down-cut and formed morphological features consistent with a natural stream channel. Approximately the lower 150 feet of this feature is perennial since it has down-cut to the perennial water table matching the elevation of Middle Creek. Approximately 290 feet of intermittent channel occur above the perennial reach. The third stream channel is located south of the bridge, east of US 401. This channel is intermittent and is adjacent to the existing railroad tracks.

Middle Creek has been assigned a best usage classification of **C NSW** (DEM 1993, DENR 2001a). The **C** designation indicates waters that support aquatic life propagation and survival, fishing, wildlife, secondary recreation, and agriculture. The **NSW** supplemental classification indicates Nutrient Sensitive Waters, which require limitations on nutrient inputs. The three tributary channels have no separate Best Usage Classification and so share the Best Usage Classification of their receiving water.

No Outstanding Resource Waters **(ORW)**, High Quality Waters **(HQW)**, **WS-I**, or **WS-II** Waters occur within 1.0 mile upstream or downstream of the project study area (DEM 1993, DENR 2001a). Middle Creek is not designated as a North Carolina Natural and Scenic River, or as a national Wild and Scenic River. The NHP has designated Aquatic Habitat along Middle Creek approximately 0.75 mile upstream from the project study area. The Middle Creek Aquatic Habitat begins at SR 1375 and extends upstream. The proposed bridge replacement will not affect any portion of the Middle Creek Aquatic Habitat.

One method used by DWQ to monitor water quality is through long-term monitoring of macroinvertebrates. In 1995, benthic macroinvertebrate samples were collected approximately 0.75 mile (1.2 km) upstream of the project study area on SR 1375 over Middle Creek. The sampling location received a bio-classification of Good-Fair (DWQ 1998).

Another measure of water quality being used by the DWQ is the North Carolina Index of Biotic Integrity (NCIBI), which assesses biological integrity using the structure and health of the fish community. An NCIBI sample location was established in 1995 approximately 1.6 miles upstream of the project study area on SR 1404 over Middle Creek. This site received an NCIBI rating of Excellent (DWQ 1998)

Discharges that enter surface waters through a pipe, ditch or other well-defined point of discharge are broadly referred to as "point sources". There are six (6) permitted dischargers located upstream of the project study area (DWQ 1998, DENR 2001b).

C.3. Anticipated Impacts to Water Resources

Short-term impacts to water quality, such as sedimentation and turbidity, may result from construction-related activities. Temporary construction impacts due to erosion and sedimentation will be minimized through implementation of a stringent erosion control schedule and the use of BMP's. These measures include: the use of dikes, berms, silt basins, and other containment measures to control runoff and elimination of construction staging areas in floodplains and adjacent waterways. Disturbed sites will be revegetated.

Other impacts to water quality can be anticipated as a result of this project. There may be changes in water temperature as a result of increased exposure to sunlight due to the removal of stream-side vegetation or decreased exposure to sunlight due to the construction of the bridges. The stormwater flows may change due to changes in the amount of impervious surface adjacent to the stream channels. However, due to the limited amount of overall change in the surrounding areas, impacts are expected to be temporary in nature.

No adverse long-term impacts to water resources are expected to result from the proposed project. The proposed bridge replacement will allow for continuation of present stream flow within the existing channel, thereby protecting stream integrity.

C.4. Impacts Related to Bridge Demolition and Removal

In order to protect the water quality and aquatic life in the area affected by this project, the NCDOT and all potential contractors will follow appropriate guidelines for bridge demolition and removal. These guidelines are presented in three NCDOT documents entitled *Pre-Construction Guidelines for Bridge Demolition and Removal, Policy: Bridge Demolition and Removal in Waters of the United States*, and *Best Management Practices for Bridge Demolition and Removal.*

The superstructure of Bridge No. 63 consists of a reinforced concrete deck on concrete girders. The substructure of the bridge consists of reinforced concrete end bents and concrete caps on concrete piles for interior bents. The bridge has two spans and totals 95 feet in length.

There is the potential for the concrete deck and parts of the interior end bents to be dropped into Waters of the United States during demolition and removal. The maximum potential temporary fill associated with the removal of the bridge is approximately 242.7 cubic yards.

D. BIOTIC RESOURCES

D.1. Plant Communities

Distribution and composition of plant communities throughout the project study area reflect landscape-level variations in topography, soils, hydrology, and past and present land use practices. When appropriate, the plant community names have been adopted and modified from the NHP classification system (Schafale and Weakley 1990) and the descriptions written to reflect local variations within the project study area. Four plant communities were identified within the project study area: Piedmont alluvial forest, mixed hardwood forest, mixed pine/hardwood forest, and maintain/disturbed areas.

Piedmont Alluvial Forest - This specific community is found within the Middle Creek floodplain. The Piedmont alluvial forest community is located in river and stream floodplains in which separate fluvial landforms and associated vegetation zones are too small to distinguish (Schafale and Weakley 1990). This community is characterized by its location in a floodplain and the presence of alluvial species such as green ash (*Fraxinus pennsylvanica*), sweetgum (*Liquidambar styraciflua*), slippery elm (*Ulmus rubra*), river birch (*Betula nigra*), and ironwood (*Carpinus caroliniana*). Groundcover species consist primarily of sedges (*Carex* spp.), Japanese honeysuckle (*Lonicera japonica*), and scattered lizards tail (*Saururus cernuus*).

Mixed Hardwood Forest - The mixed hardwood forest located within the project study area is located at higher elevations than the Piedmont alluvial forest. This plant community has been disturbed in the past by selective logging. Dominant tree species consist sweetgum, water oak (*Quercus nigra*), red maple (*Acer rubrum*), and tulip poplar *(Liriodendron tulipifera)*. Groundcover species consist of greenbriar *(Smilax rotundifolia)* and poison ivy *(Toxicodendron radicans).*

Mixed Pine/Hardwood Forest – Dominant species include loblolly pine (*Pinus taeda*), eastern red cedar (*Juniperus virginiana*), persimmon (*Diospyros virginiana*), red maple, sweetgum, water oak, and tulip poplar. Groundcover consists of blackberry (*Rubus* sp.), trumpet creeper (*Campsis radicans*), poison ivy, and Japanese honeysuckle.

Maintained/Disturbed Areas – The maintained/disturbed areas located within the project study area include maintained rights-of-way, commercial and/or residential areas, and other areas where human related activities dominate. Mowing and/or herbicides typically maintain these roadsides. Dominant vegetation within the maintained roadsides consists of grasses such as fescue (*Festuca* sp.) and rye grass (*Lolium* sp.), as well as blackberry and Japanese honeysuckle.

A small wetland occurs at the headwaters of the intermittent channel located on the north side of Middle Creek west of US 401. This small wetland has formed in the roadside ditch and is surrounded by maintained/disturbed land. This wetland still exhibits characteristics resulting from past maintenance and disturbance and is included as a maintained/disturbed area. Vegetation includes black willow (*Salix nigra*), red maple, and sedges.

D.2. Wildlife

The project study area was visually surveyed for signs of terrestrial and aquatic wildlife; however, little evidence of wildlife was observed during the field effort. US 401 bisects the project study area. Surrounding land use is comprised primarily of commercial establishments. The Piedmont alluvial forest along streams such as Middle Creek provides limited cover and food due to the surrounding land use and its fragmented nature.

A relatively diverse bird population was observed within or adjacent to the project study area. Bird species observed include mourning dove (*Zenaida macroura*), barn swallow (*Hirundo rustica*), blue jay (*Cyanocitta cristata*), American crow (*Corvus brachyrhynchos*), Carolina chickadee (*Poecile carolinensis*), northern cardinal (*Cardinalis cardinalis*), Eastern towhee (*Pipilo erythrophthalmus),* song sparrow (*Melospiza melodia*), white-throated sparrow (*Zonotrichia albocollis*), and American goldfinch (*Cardeulis tristis*). Other species that commonly occur in regional alluvial forests include pileated woodpecker (*Dryocopus pileatus*) and barred owl (*Strix varia).*

White-tailed deer (*Odocoileus virginianus*) and raccoon (*Procyon lotor*) tracks were found within the project study area. No other mammals were observed within the project study area. Other species expected to be found in and around roadside and urban settings include Virginia opossum (*Didelphis virginiana*), gray fox (*Urocyon cinereoargenteus*), red fox (*Vulpes vulpes*), gray squirrel (*Sciurus carolinensis*), muskrat (*Ondatra zibethicus*), and eastern cottontail (*Sylvilagus floridanus*).

No terrestrial reptiles were observed within the project study area. Species expected to occur within the project study area include, but are not limited to, eastern box turtle (*Terrapene carolina*), eastern garter snake (*Thamnophis sirtalis*), ringneck snake (*Diadophis punctatus*), and black rat snake (*Elaphe obsoleta*).

No terrestrial amphibians were observed within the project study area. Species expected to occur within the project study area include, but are not limited to, American toad (*Bufo americanus*), spring peeper (*Pseudacris crucifer*), and northern cricket frog (*Acris crepitans*).

D.3. Aquatic Communities

The aquatic habitat located within the project study area includes Middle Creek and the two small intermittent tributaries. Limited kick-netting, seining, dip-netting, electro-shocking and visual observation of stream banks and channel within the project study area were conducted in Middle Creek to document the resident aquatic wildlife populations. The water depth of Middle Creek limited the use of the electro-shocker.

Fish species documented in the segment of Middle Creek within the project study area include bluegill (*Lepomis macrochirus*), redbreast sunfish (*Lepomis auritus*), and eastern mosquitofish (*Gambusia holbrooki*). Additional species expected to utilize Middle Creek include pumpkinseed (*Lepomis gibbosus*), Johnny darter (*Etheostoma nigrum*), pirate perch (*Aphredoderus sayanus*), and margined madtom (*Noturus insignis*).

No aquatic reptiles were observed within the project study area. Species expected to occur within the project study area include, but are not limited to, northern water snake (*Nerodia sipedon*), painted turtle (*Chrysemys picta*), and common snapping turtle (*Chelydra serpentina*).

No aquatic amphibians were observed within the project study area. Species expected to occur within the project study area include, but are not limited to red-spotted newt (*Notophthalmus viridescens*), bullfrog (*Rana catesbeiana*), and pickerel frog (*Rana palustris*).

Aquatic invertebrate surveys included kick-net surveys, limited bottom sampling, and walking all streambanks in the project study area to locate freshwater mussel middens. Visual observation of the streambanks along Middle Creek revealed evidence of the Asiatic clam (*Corbicula fluminea*).

Benthic macroinvertebrate organisms collected within Middle Creek were identified to at least Order and Family if possible and include dragonflies (Odonota), crane flies (Diptera: Tipulidae), midges (Diptera: Chironomidae), mosquitoes (Diptera: Culicidae), water scorpion (Hemiptera: Nepidae), back swimmers (Hemiptera: Notonectidae), trout-stream beetles (Coleoptera: Amphizoidae), marsh beetles (Coleoptera: Helodidae), leech (Gastropoda: Hirundinea), primitive minnow mayflies (Ephemeroptera: Siphlonuridae), and flathead mayflies (Ephemeroptera: Heptageniidae). Identifications are based on McCafferty (1998).

D.4 Anticipated Impacts to Biotic Communities

D.4.a. Terrestrial Communities Impacts

Potential impacts to plant communities are estimated based on the approximate area of each plant community present within both the proposed right-of-way and the temporary construction limits of the on-site detour or easement that falls outside the estimated permanent right-of-way. A summary of potential plant community impacts is presented in Table 2. All plant community impacts are based on aerial photograph base mapping. Impervious surface and open water areas are not included in this analysis.

TABLE 2
Potential Impacts to Plant Communities

PLANT COMMUNITY	POTENTIAL IMPACTS acres		
	ALT A	ALT B (Preferred)	
	Impacts	Impacts	Temp. Detour Impacts
Piedmont Alluvial Forest	0.04	0.04	0.43
Mixed Hardwood Forest	0.0	0.0	0.0
Mixed Pine/Hardwoods	0.0	0.0	0.03
Maintained/Disturbed	0.10	0.10	1.24
Total	0.14	0.14	1.70
TOTAL FOR ALT	**0.14**	**1.84**	

Permanent impacts due to bridge replacement will result from expansion of the existing right-of-way and are generally limited to narrow strips adjacent to the existing bridge structure and roadway approach segments. The proposed right-of-way will be expanded from 125 feet to 165 feet resulting in clearing and maintenance within the new right-of-way.

Permanent impacts to natural plant communities associated with Alternative A and Alternative B are the same (0.14 acre); however, the temporary impacts associated with Alternative B account for 1.70 acres of additional impact. Temporary impacts typically consist of on-site detour routes, temporary fill, and/or staging areas.

D.4.b. Aquatic Communities Impacts

The proposed bridge replacement will not result in substantial loss or displacement of known aquatic wildlife population. Potential down-stream impacts to aquatic habitat will be avoided by bridging Middle Creek to maintain regular flow and stream integrity. In addition, temporary impacts to downstream habitat from increased

sediment during construction are expected to be reduced by limiting in-stream work to an absolute minimum, except for the removal of the portion of the sub-structure below the water. BMP-BDRs will be followed to minimize impacts due to anticipated bridge demolition.

E. SPECIAL TOPICS

E.1. "Waters of the United States":

Surface waters and wetlands associated with Middle Creek are subject to jurisdictional consideration under Section 404 of the Clean Water Act as "waters of the United States" (33 CFR 328.3). Wetlands subject to review under Section 404 of the Clean Water Act (33 U.S.C. 1344) are defined by the presence of three primary criteria: hydric soils, hydrophytic vegetation, and evidence of hydrology at or near the surface for a portion (12.5 percent) of the growing season (DOA 1987). USACE has issued a formal jurisdictional determination for this project and a copy is provided in the Appendix.

The jurisdictional wetlands associated with the Middle Creek floodplain are characteristic of palustrine forested, broad-leaved deciduous, seasonally flooded wetlands (PFO1C) based on the USACE methodology of characterizing wetlands pursuant to Cowardin *et al.* (1979). These wetlands appear to be riverine influenced (*i.e.*, riparian) in that they obtain wetland hydrology from overbank flooding. A small wetland area located along the upper reach of one of the small tributaries (northwest of the bridge) is characteristic of a palustrine shrub-scrub, broad-leaved deciduous, seasonally flooded wetland (PSS1C). This wetland appears to be non-riverine (non-riparian) in that it obtains hydrology primarily from groundwater, overland flow, and/or upland runoff.

E.2. Anticipated Impacts to Waters of the United States

Potential temporary and permanent impacts to surface waters and wetlands are estimated based on the amount of each jurisdictional area within the project limits. Temporary impacts include those impacts that will result from temporary construction activities outside of permanent right-of-way and/or those associated with temporary on-site detours. Temporary impact areas will be restored to their original condition after the project has been completed. Permanent impacts are those areas that will be in the construction limits and/or the proposed right-of-way of the new structure and approaches. Portions of those areas that are considered temporary impact areas often end up being within the proposed right-of-way. Potential wetland and surface water impacts are included in Table 3. Permanent impacts to surface waters and wetlands associated with Alternative A and Alternative B are the same; however, the temporary impacts associated with Alternative B are greater than the temporary impacts associated with Alternative A.

TABLE 3
POTENTIAL IMPACTS TO JURISDICTIONAL WETLANDS AND SURFACE WATERS

JURISDICTIONAL AREAS	POTENTIAL IMPACTS WITHIN EACH ALTERNATIVE			
	ALT A		ALT B (Preferred)	
	Impacts	Temporary Impacts	Impacts	Temporary Impacts
PFO1 wetland acres	0.01	0.0	0.01	0.05
PSS1 wetland acres	0.0	0.0	0.0	0.06
R2 surface water acres	0.01	0.05	0.01	0.14
Perennial Channel feet	0.0	30	0.0	295
R4 surface water acres	0.0	0.0	0.0	0.01
Intermittent Channel feet	0.0	0.0	0.0	150

PFO1 - palustrine forested, broad-leaved deciduous
PSS1 - palustrine shrub-scrub, broad-leaved deciduous
R2 - riverine, lower perennial
R4 – riverine, intermittent

Note: Permanent impacts are approximate and include the proposed right-of-way and the temporary construction easement associated with the approximate slope-stake limits as provided by the project engineer. Temporary impacts are approximate and are based on the area potentially affected by bridge demolition and/or temporary detours.

E.3. Permits

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

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

Section 401 Water Quality Certification - A 401 Water Quality Certification, administered through the DWQ, will also be required. This certification is issued for any activity which may result in a discharge into waters for which a federal permit is required. According to the DWQ, one condition of the permit is that the appropriate sediment and erosion control practices must be utilized to prevent exceedences of the appropriate turbidity water quality standard.

E.4. Neuse River Riparian Buffer Rule

Because the project study area is within the Neuse River Drainage Basin, surface waters may be subject to the Neuse River Riparian Buffer Rules. The Buffer Rules apply to a 50-foot wide riparian buffer directly adjacent to all surface waters in the Neuse River Drainage Basin. This includes intermittent streams, perennial streams, lakes, ponds, and estuaries that are depicted as surface waters on either the most current versions of either USGS maps or county soil survey maps, but does not include jurisdictional wetlands (non-surface waters) regulated under Section 404 of the Clean Water Act. Middle Creek is mapped on the USGS map and the Wake County soils map and is subject to the Buffer Rules. There are three tributaries in the vicinity of the proposed bridge. The first tributary stream channel is located on the east side of US 401 south of Middle Creek (near the railroad tracks) and is mapped on the USGS map and is subject to the Buffer Rules. The second tributary is located on the west side of US 401 north of Middle Creek and appears to have possibly been relocated from its original location during construction of the existing Carolina Power and Light facility. There is a mapped tributary depicted on the USGS map in the northwest quadrant but not in the exact location of the delineated roadside feature; however the USGS map was produced prior to construction of the Carolina Power and Light facility. This second tributary is subject to the Buffer Rules. The third tributary is located on the east side of US 401 north of Middle Creek and is not mapped on either the USGS map or the soil survey map and is likely not subject to the Buffer Rules.

Portions of the riparian buffer zone along Middle Creek may be impacted by this project. Alternative A expands the existing right-of-way (in the vicinity of the bridge) from 125 feet to 165 feet, resulting in 40 feet of impact to riparian buffer through clearing of forested vegetation in Zones 1 and 2 associated with Middle Creek. The expanded right-of-way will extend into the buffer associated with the roadside tributary in the northwest quadrant. This buffer is already disturbed and appears to be periodically maintained. Buffer impacts resulting from Alternative A should be "Exempt."

Alternative B results in an additional 75 feet of clearing of existing perennial stream buffer along Middle Creek resulting from the temporary on-site detour and temporary construction easement. The tributary stream located in the northwest quadrant of the project study area does not have a full 50 feet separating it from US 401. This tributary stream has approximately 25 to 30 feet of buffer on its east side and the normal 50 feet on its west side. An additional 250 feet of this tributary stream buffer outside of the Middle Creek buffer limits may be affected. Buffer impacts resulting from Alternative B should be "Allowable with Mitigation" as long as the affected buffers associated with the temporary detour are restored to pre-construction condition.

Since portions of the project study area are within the 50-foot riparian buffer zone, measures should be taken prior to initiating any activities on the site in order to keep any stockpiled material a minimum of 50 feet from any stream channel. Silt fences should also be erected around any stockpiled material in order to minimize the chance of erosion or run-off from affecting the stream channel.

E.5. Mitigation Evaluation

Avoidance – Each alternative contains jurisdictional open water areas, which will be subject to impact. However, open water will be bridged from high ground to high ground such that no fill will be placed in the Waters of the United States for any of the alternatives. Each alternative also contains riparian buffers, which will be subject to unavoidable impact resulting from clearing activities for the expanded right-of-way.

Minimization – Impacts will be minimized by limiting the amount of clearing of riparian buffers within the new right-of-ways and immediately replanting the riparian buffer that has to be cleared.

Mitigation – Compensatory mitigation is not proposed for this project due to the limited nature of project impacts. However, BMPs will be used in an effort to minimize impacts, including avoiding placing staging areas within wetlands. Temporary impacts associated with the construction activities will be mitigated by replanting disturbed areas with native species and removal of any temporary fill material within the floodplain upon project completion.

A final determination regarding mitigation requirements rests with the USACE.

F. Rare and Protected Species

F.1. Federal Protected Species

Species with the federal classification of Endangered (E) or Threatened (T), Proposed Endangered (PE), and Proposed Threatened (PT) are protected under provisions of Section 7 and Section 9 of the Endangered Species Act (ESA) of 1973, as amended (16 U.S.C. 1531 et seq.). Table 4 lists the federal protected species for Wake County (USFWS list dated February 25, 2003).

TABLE 4
Federally Protected Species Listed for Wake County

Common Name	Scientific Name	Status	Biological Conclusion
Bald eagle	*Haliaeetus leucocephalus*	T	May Effect-Not Likely to Adversely Effect
Red-cockaded woodpecker	*Picoides borealis*	E	No Effect
Dwarf wedgemussel	*Alasmidonta heterodon*	E	May Effect-Not Likely to Adversely Effect
Michaux's sumac	*Rhus michauxii*	E	No Effect

Endangered (E) – any native or once-native species in danger of extinction throughout all or a significant portion of its range.
Threatened (T) - any native or once-native species which is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range.

Bald eagle - Bald eagles typically nest in tall, living trees in a conspicuous location near water and forage over large bodies of water with adjacent trees available for perching (Hamel 1992). Preventing disturbance activities within a primary zone, which may extend a minimum of 750 to a maximum of 1500 feet outward from a nest tree depending on critical elements within the particular nesting area, is considered critical for maintaining acceptable conditions for eagles (USFWS 1987). USFWS recommends avoiding any disturbance activities, including

construction and tree-cutting, within this primary zone. Within a secondary zone extending from the primary zone boundary out an additional distance of 750 feet to 1.0 mile depending on site specific circumstances, construction and land-clearing activities typically associated with bridge replacements should be restricted to the non-nesting period. USFWS also recommends avoiding alteration of natural shorelines where bald eagles forage, and avoiding significant land-clearing activities within 1500 feet of roosting sites.

BIOLOGICAL CONCLUSION: May Effect-Not Likely to Adversely Effect

NCDOT biologists visited the project site on November 4 and 12, 2003. A 1.0 mile radius from the project site was surveyed for bald eagle nests. No nests were seen and no bald eagles were seen flying around the area. Only marginal habitat exists within 1.0 mile of the project site and the nearest large body of water for the bald eagle to forage in is located approximately 3.6 miles from the project site. The North Carolina Natural Heritage Project lists a record of a bald eagle nest approximately 6.2 miles from the project site, but this nest has not been active since 1989 and the closest known active nest is located approximately 15 miles away. USFWS concurred with this conclusion in a letter dated December 3, 2003.

Red-cockaded woodpecker (RCW) – This small woodpecker is 7 to 8.5 inches long, has a black head, prominent white cheek patch, and black-and-white barred back. Males often have red markings (cockades) behind the eye, but the cockades may be absent or difficult to see (Potter et al. 1980). Primary habitat consists of mature to over-mature southern pine forests dominated by loblolly, long-leaf (Pinus palustris), slash (P. elliotii), and pond (P. serotina) pines (Henry 1989). Primary nest sites for RCWs include open pine stands greater than 60 years of age with little or no mid-story development. Nest cavity trees tend to occur in clusters, which are referred to as colonies (USFWS 1985). Foraging habitat is comprised of open pine or pine/mixed hardwood stands 30 years of age or older. Pine flatwoods or pine-dominated savannas, which have been maintained by frequent natural fire, serve as ideal nesting and foraging sites for this species. Development of a thick understory may result in abandonment of cavity trees. The woodpecker drills holes into the bark around the cavity entrance, resulting in a shiny, resinous buildup around the entrance that allows for easy detection of active nest trees (Henry 1989).

BIOLOGICAL CONCLUSION: No Effect

No suitable habitat for the RCW was observed within the project study area. Past human disturbance and development have also greatly fragmented the landscape. An updated NHP search conducted on December 20, 2001 and on March 10, 2004 did not indicate that any RCW's have been documented within 1.0 mile of the project study area. Project construction will not impact the RCW.

Dwarf wedgemussel – The dwarf wedgemussel rarely exceeds 1.5 inches in length. The outer shell is brown or yellowish brown with faint green rays, and the nacre is bluish or silvery white. The shells of the females are somewhat wider that those of males. This mussel species typically inhabits streams with moderate flow velocities and substrates varying in texture from gravel and coarse sand to mud with little silt deposition (USFWS 1993). It is generally found in association with other mussels but is never very numerous. As with other mussel species, the dwarf wedgemussel has suffered from excess siltation in streams and rivers and from the toxic effects of various pollutants entering waterways.

BIOLOGICAL CONCLUSION: May Effect-Not Likely to Adversely Effect

Middle Creek has perennial flow, and sand to silt substrate within the project study area. A fine covering of silt was observed on the leaf litter and woody debris located in the stream. This particular reach of Middle Creek is located downstream from an impounded lake and does not appear to provide optimal dwarf wedgemussel habitat. A survey for the presence of dwarf wedgemussel was conducted on November 4, 2003 during which no species were found.

Michaux's sumac – Michaux's sumac is a dioecious, densely pubescent rhizomatous shrub, generally 2 to 3 feet in height, which produces fruits and seeds in late summer. In the Piedmont, Michaux's sumac appears to prefer clay soil derived from mafic rocks or sandy soil derived from granite. Michaux's sumac typically grows in disturbed areas where competition is reduced by periodic fire or other disturbances, and may grow along roadside margins or utility rights-of-way (Weakley 1993).

Two phases of the Appling series are mapped as occurring within the project study area. This soil series is derived from granite and other acidic rocks (USDA 1970). The disturbed areas and rights-of-way located within the project study area, in conjunction with the Appling series may represent potential habitat for Michaux's sumac.

BIOLOGICAL CONCLUSION: No Effect

Potential habitat for Michaux's sumac may be present within the project study area. A species-specific survey for Michaux's sumac was performed on May 9, 2001 and April 19, 2004. Prior to the field effort, a known reference population of Michaux's sumac located in eastern Wake County was inspected to determine its vegetative state. No Michaux's sumac was located within the project study area. NHP records do not document any Michaux's sumac within 1.0 mile of the project study area as of March 10, 2004. Project construction will not impact Michaux's sumac. USFWS concurred with this conclusion in a letter dated December 8, 2004.

F.2. Federal Species of Concern

Federal Species of Concern (FSC) are not afforded federal protection under the Endangered Species Act and are not subject to any of the provisions included in Section 7 until they are formally proposed or listed as Threatened or Endangered. In addition to the federal program, organisms that are listed as Endangered (E), Threatened (T), or Special Concern (SC) by the North Carolina Natural Heritage Program (NCNHP) on its list of Rare Plant and Animal Species are afforded state protection under the N.C. State Endangered Species Act and the N.C. Plant Protection and Conservation Act of 1979. Table 5 lists the Federal Species of Concern for Wake County, the state status of these species, and the potential for suitable habitat in the project study area. The NCNHP database shows no occurrences of FSC within 1 mile of the project study area as of March 2004.

TABLE 5
Federal Species of Concern (FSC) Listed for Wake County

Common Name	Scientific Name	Potential Habitat	State Status
Bachman's sparrow	*Aimophila aestivalis*	N	SC
Southern hognose snake	*Heterodon simus*	N	SC
Carolina darter	*Etheostoma collis lepidinion*	Y	SC
Pinewoods shiner	*Lythrurus matutinus*	N	SR
Southeastern myotis	*Myotis austroriparius*	N	SC
Yellow lance	*Elliptio lanceolata*	Y	E
Atlantic pigtoe	*Fusconaia masoni*	Y	E
Green floater	*Lasmigona subviridis*	Y	E
Diana fritillary butterfly	*Speyeria diana*	N	SR
Flatrock panic grass	*Panicum lithophilum*	N	SR-T
"Neuse" madtom	*Noturus furiosus*	Y	SC-PT
Sweet pinesap	*Monotropsis odorata*	N	SR-T
Bog spicebush	*Lindera subcoriacea*	N	E
Carolina least trillium	*Trillium pusillum var. pusillum*	N	E

Endangered (E) – any native or once-native species in danger of extinction throughout all or a significant portion of its range.
Threatened (T) - any native or once-native species which is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range.
Special Concern (SC) – any species which requires monitoring but which may be collected and sold under specific regulations.
Significantly Rare(SR) – species which are very rare, generally with 1-20 populations in the state, and generally reduced in numbers by habitat destruction.

F.3. State Protected Species

Plant and animal species which are on the North Carolina state list as Endangered (E), Threatened (T), or Special Concern (SC), receive limited protection under the North Carolina Endangered Species Act (G.S. 113-331 et seq.) and the North Carolina Plant Protection Act of 1979 (G.S. 106-202 et seq.).

NHP records document the presence of three (3) state-protected species within 1.0 mile of the project study area. These three species include the squawfoot (Strophitus undulatus) (T), eastern lampmussel (Lampsilis radiata) (SC), and the triangle floater (Alasmidonta undulata) (T). These three freshwater mussels have been documented from the Middle Creek Aquatic Habitat that begins approximately 0.75 mile upstream of the project study area at SR 1375. No state protected species were identified during the course of field investigations for this project.

VI. CULTURAL RESOURCES

A. Compliance Guidelines

This project is subject to compliance with Section 106 of the National Historic Preservation Act of 1966, as amended, implemented by the Advisory Council on Historic Preservation's Regulations for Compliance with Section 106, codified at 36 CFR Part 800. Section 106 requires Federal agencies to take into account the effect of their undertakings (federally funded, licensed, or permitted) on properties included in or eligible for inclusion in

the National Register of Historic Places and to afford the Advisory Council on Historic Preservation a reasonable opportunity to comment on such undertakings. This project has been coordinated with the North Carolina State Historic Preservation Office (HPO) in accordance with the Advisory Council's regulations and FHWA procedures.

B. Historic Architecture

In their August 6, 2001 memorandum, the HPO stated "We are aware of no historic properties in the area of potential effect, except the bridge itself. Built in 1926, the bridge's eligibility for listing in the National Register of Historic Places should be evaluated". This memorandum is included in the appendix. On August 30, 2001, a concurrence form was signed by NCDOT Architectural Historians, HPO staff and FHWA stating that Bridge No. 63 was not eligible for the National Register. This form is included in the appendix. Based on this finding, compliance with Section 106 is complete.

C. Archaeology

In their August 6, 2001 memorandum (included in the appendix), the HPO stated "There are no known archaeological sites within the proposed project area... We therefore recommend that no archaeological investigation be conducted in connection with this project".

VII. ENVIRONMENTAL EFFECTS

The project is expected to have an overall positive impact. Replacement of inadequate bridges will result in safer traffic operations.

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

Replacement of Bridge No. 63 will not have an adverse effect on the quality of the human or natural environment with the use of the current North Carolina Department of Transportation standards and specifications.

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

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

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

In compliance with Executive Order 12898 (Federal Actions to Address Environmental Justice in Minority Populations and Low Income Populations) the project would not disproportionately impact any minority or low-income populations.

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

This project has been coordinated with the United States Department of Agriculture, Natural Resources Conservation Service. The Farmland Protection Policy Act requires all federal agencies or their representatives to consider the potential impact to prime farmland for all land acquisition and construction projects. The project area is within an urbanized area of Wake County. Therefore, the project will not involve the direct conversion of farmland acreage within these classifications. No impacts to prime or locally important farm land are anticipated. No publicly owned parks or recreational facilities, wildlife and waterfowl refuges, or historic sites of national, state or local significance in the immediate vicinity of the project will be impacted.

The proposed project will not require right-of-way acquisition or easement from any land protected under Section 4(f) of the Department of Transportation Act of 1966.

The project is located in Wake County, which is within the Raleigh-Durham nonattainment area for ozone (O_3) and carbon monoxide (CO) as defined by the EPA. The 1990 Clean Air Act Amendments (CAAA) designated these areas as "moderate" nonattainment area for O_3 and CO. However, due to improved monitoring data, these areas were redesignated as "maintenance" for O_3 on June 17, 1994 and "maintenance" for CO on September 18, 1995. 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 2025 Long Range Transportation Plan (LRTP) and the 2004-2010 Metropolitan Transportation Improvement Program (MTIP) has been determined to conform to the intent of the SIP. The USDOT air quality conformity approval of the LRTP was August 20, 2002 and the USDOT air quality conformity approval for the MTIP was October 1, 2003. The current conformity determination is consistent with the final conformity rule found in 40 CFR Parts 51 and 93. There have been no substantial changes in the project's design concept or scope, as used in the conformity analyses. This evaluation completes the assessment requirements for air quality impacts. No additional reports are required.

Ambient noise levels may increase during the construction of this project; however this increase will be only temporary and usually confined to daylight hours. There should be no notable change in traffic volumes after this project is complete. Therefore, this project will have no adverse effect on existing noise levels. Noise receptors in the project area will not be impacted by this project. This evaluation completes the assessment requirements for highway noise set forth in 23 CFR Part 772. No additional reports are required.

During the site visit, observation revealed no evidence of underground storage tanks or hazardous waste sites in the project area.

Wake County is a participant in the National Flood Insurance Regular Program. The bridge is located in a Detailed Study Area. The replacement structure is proposed as an in-kind replacement. It is anticipated that this project will not have any adverse effect or impact on the existing floodplain or the adjacent properties and existing structures. The approximate 100-year floodplain in the project study area is shown in Figure 6.

Geotechnical borings for the bridge foundation will be necessary.

Based on the above discussion, it is concluded that no substantial adverse environmental impacts will result from the replacement of Bridge No. 63.

VIII. PUBLIC INVOLVEMENT

No formal public involvement program was initiated. Efforts were undertaken early in the planning process to contact local officials to involve them in the project development with a scoping letter.

IX. AGENCY COORDINATION

Agency comments are summarized below. Letters from the commenting agencies are included in the appendix.

North Carolina Wildlife Resources Commission (NCWRC): There are also records of state listed mussels upstream of the project. Therefore, due to the potential for impacts to listed species we request that NCDOT perform a mussel survey prior to the construction of this bridge.

> **Response:** A survey for the presence of dwarf wedgemussel was conducted on November 4, 2003 during which no species were found.

X. REFERENCES

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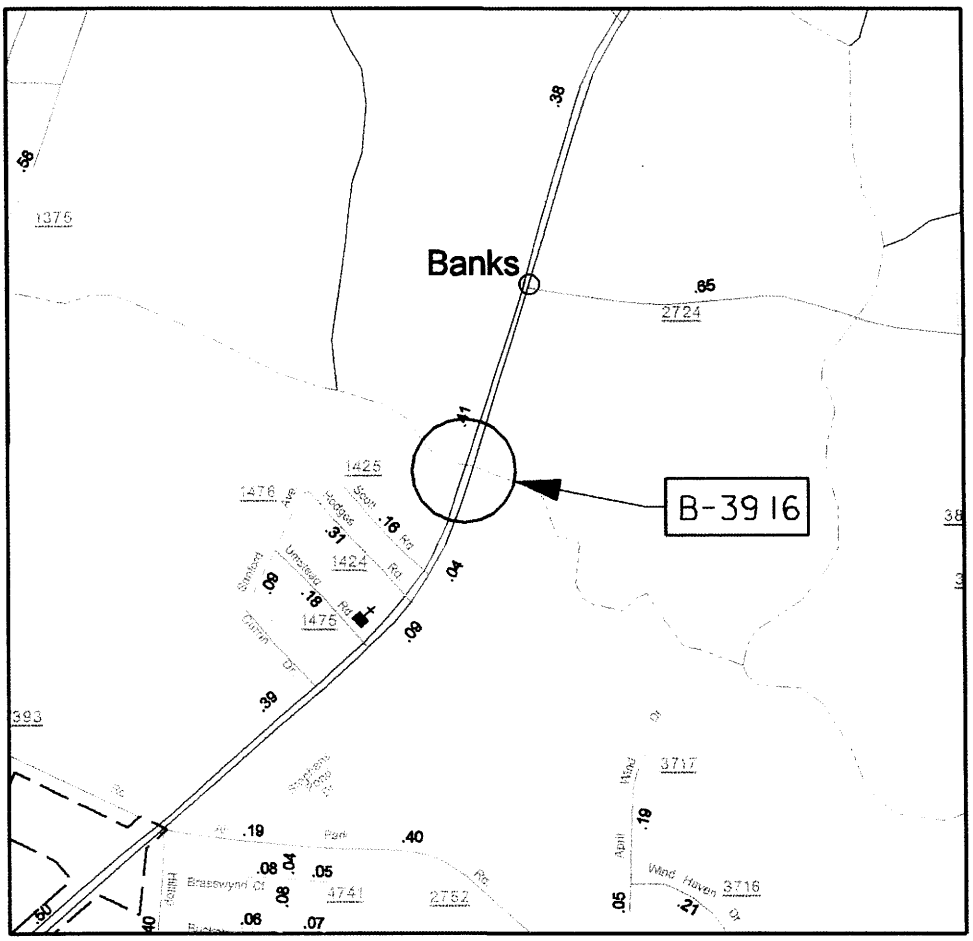
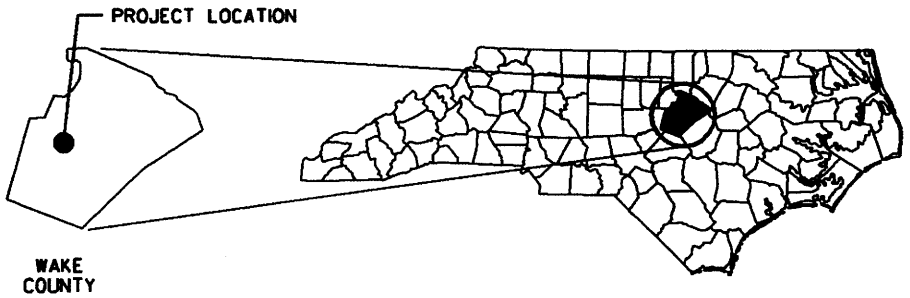
FIGURES



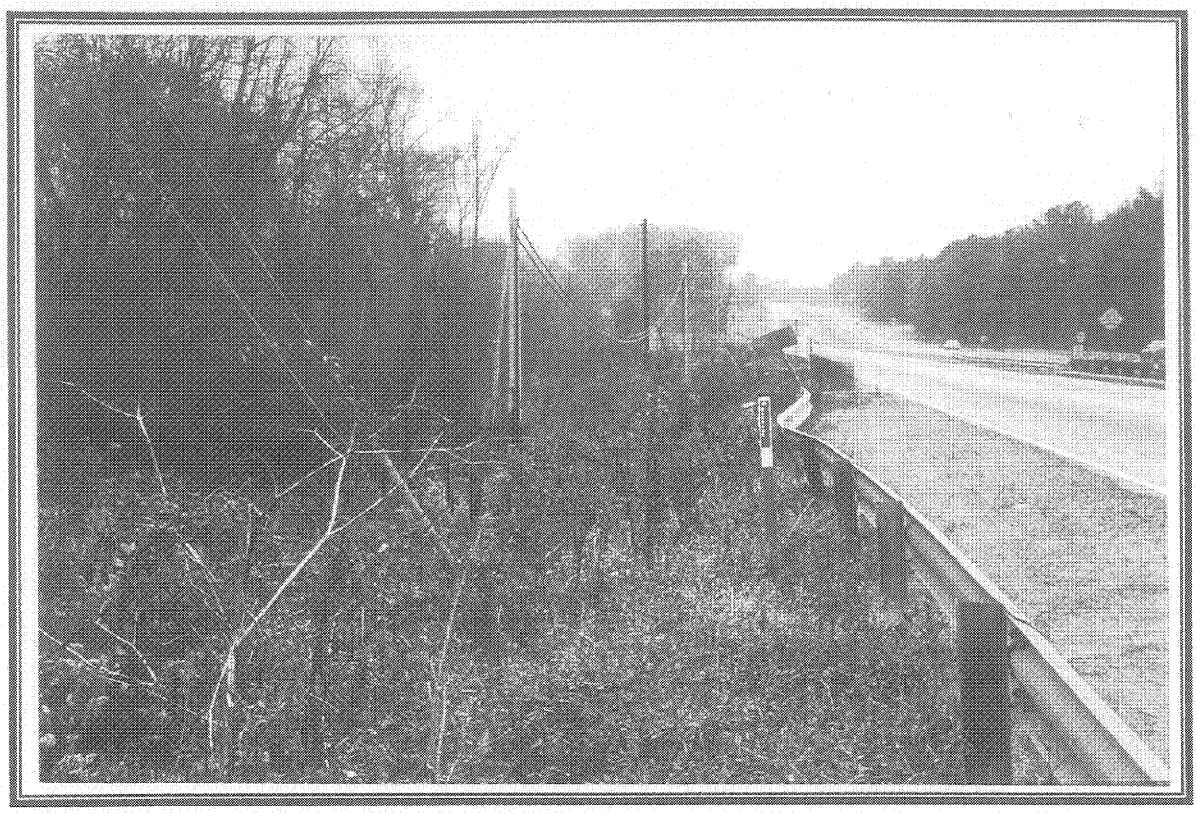


SCALE IN MILES

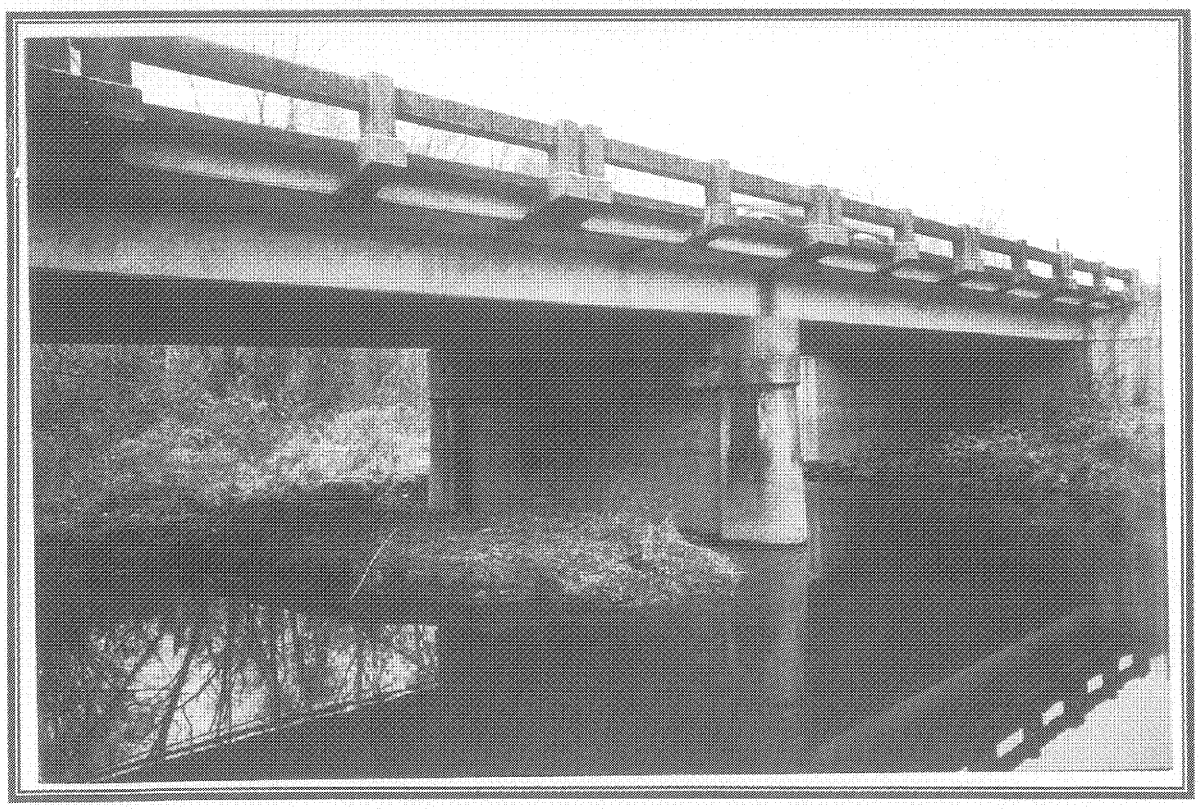
1 0 1

North Carolina Department of Transportation
Division of Highways
Project Development & Environmental Analysis Branch

FIGURE 1
AREA LOCATION MAP
BRIDGE NO. 63
ON US 401
OVER MIDDLE CREEK
WAKE COUNTY, NORTH CAROLINA
TIP PROJECT B-3916



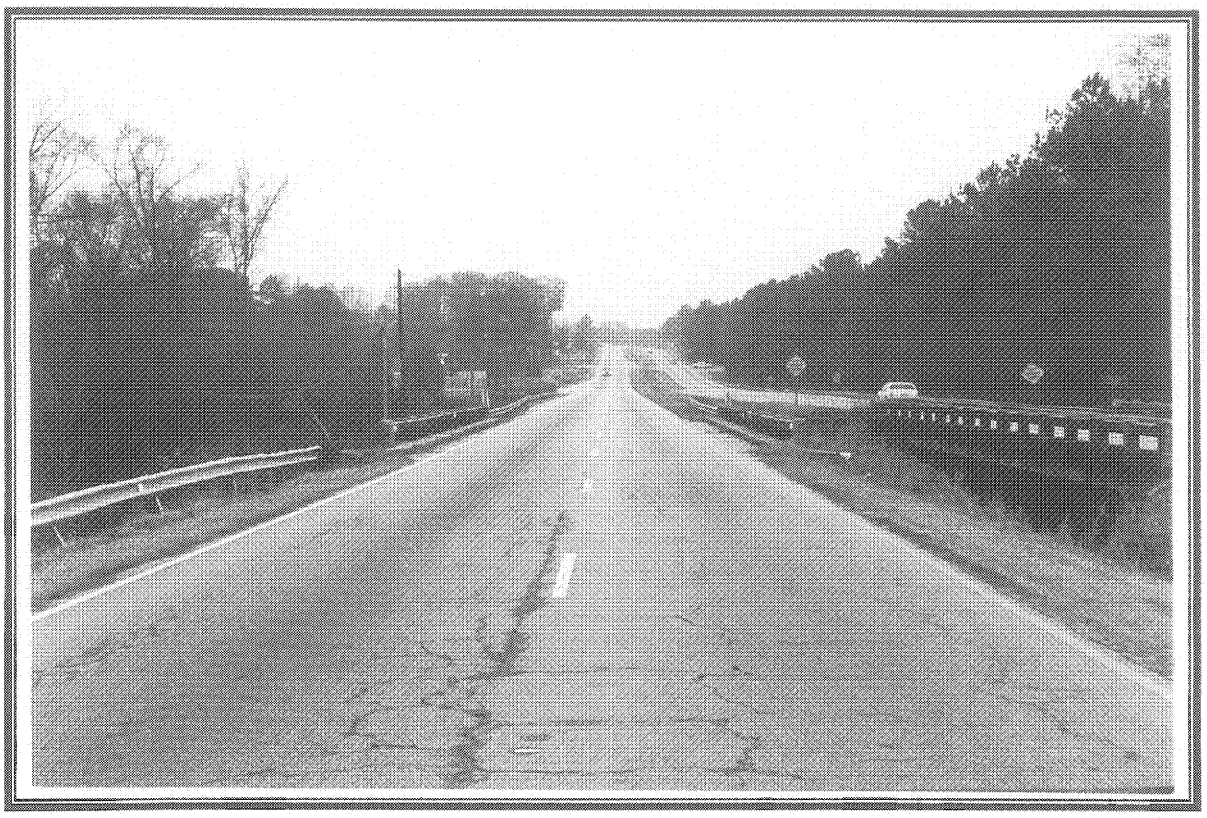
LOOKING NORTH ALONG THE WEST SIDE OF BRIDGE NO. 63



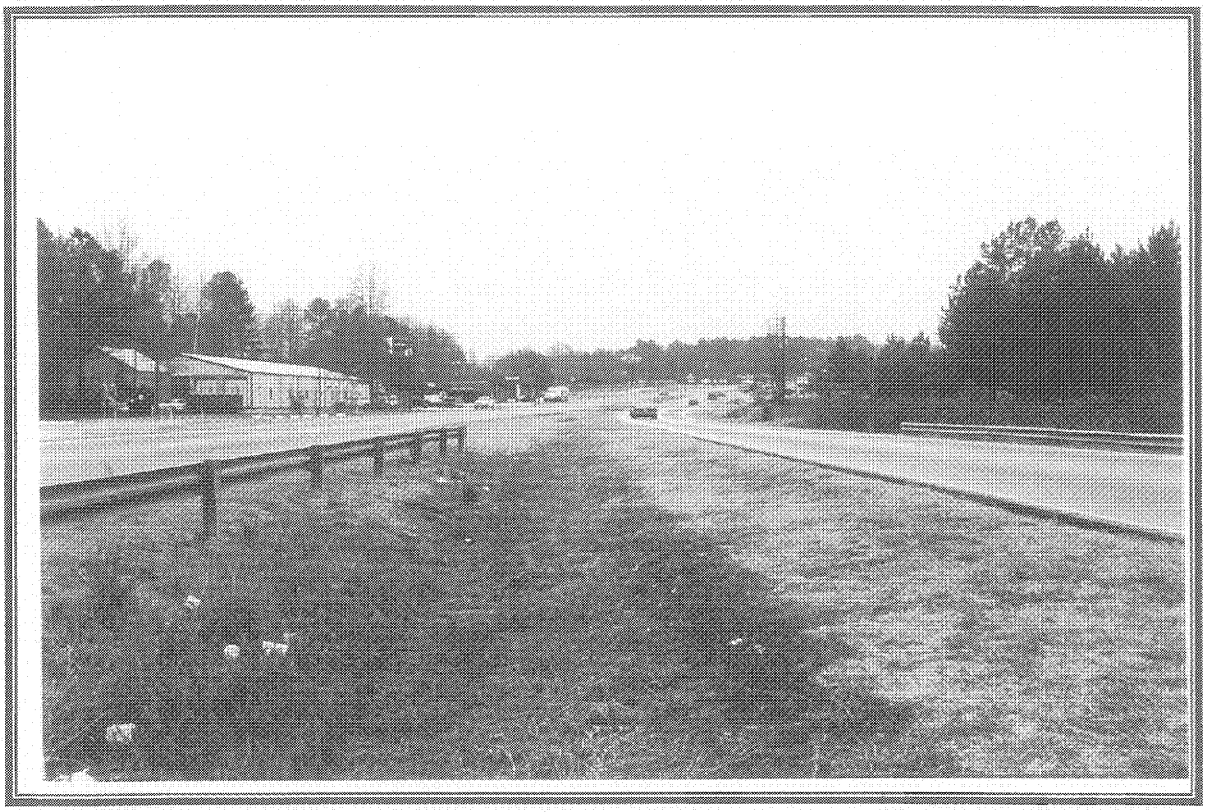
LOOKING AT EAST SIDE OF BRIDGE NO. 63

B-3916 WAKE COUNTY
REPLACE BRIDGE NO. 63 ON US 401 S OVER MIDDLE CREEK

FIGURE 2
PROJECT PHOTOGRAPHS



LOOKING NORTH ACROSS BRIDGE NO. 63



LOOKING SOUTH FROM MEDIAN ON THE EAST SIDE OF BRIDGE NO. 63

B-3916 WAKE COUNTY
REPLACE BRIDGE NO. 63 ON US 401 S OVER MIDDLE CREEK

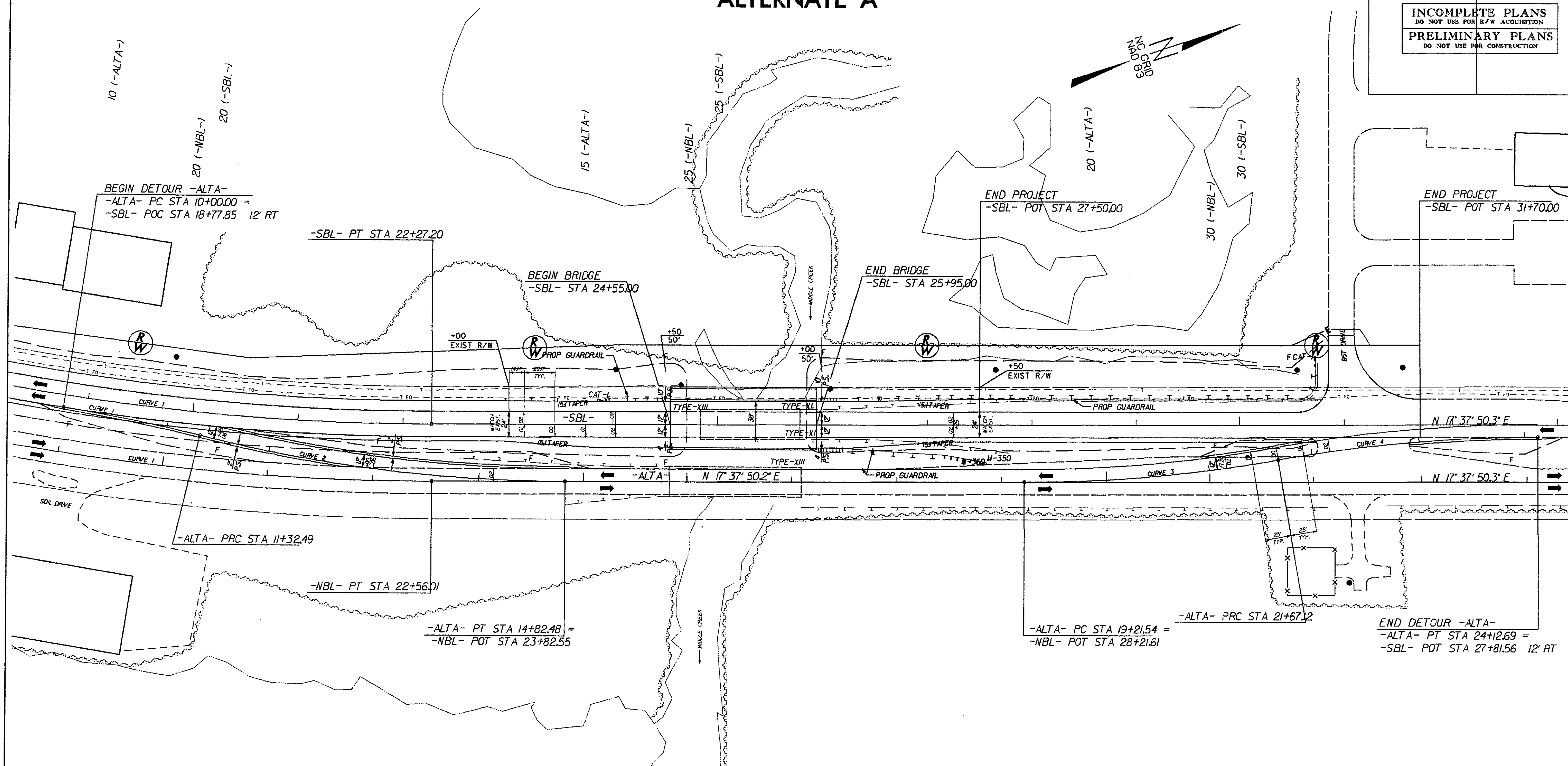
FIGURE 3
PROJECT PHOTOGRAPHS

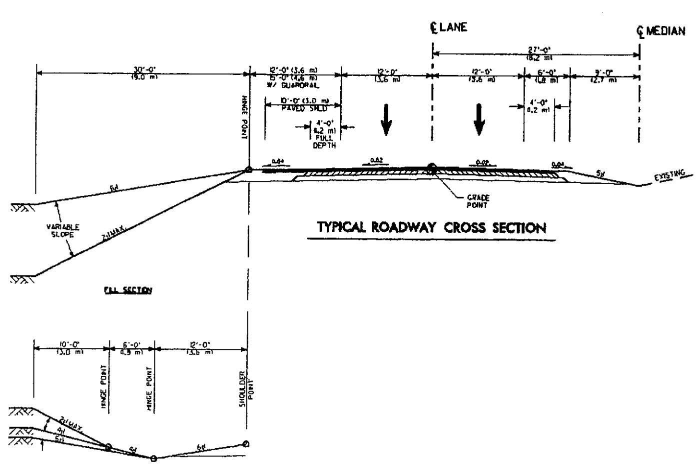
(REPLACE IN-PLACE WITH ON-SITE DETOUR)
ALTERNATE A

PROJECT REFERENCE NO.	SHEET NO.
B-3916	
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

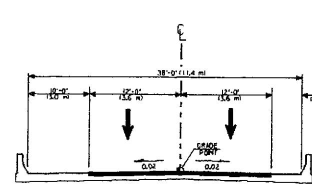
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION

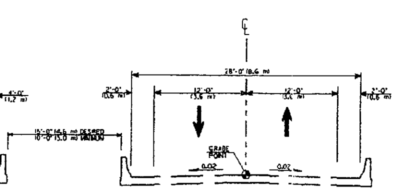
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION

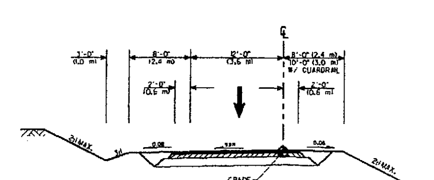




-SBL- CURVE 1	-NBL- CURVE 1	-ALTA- CURVE 1	-ALTA- CURVE 2	-ALTA- CURVE 3	-ALTA- CURVE 4
PI Sta 16+28.58	PI Sta 16+43.33	PI STA 10+66.29	PI STA 13+08.36	PI STA 20+44.63	PI STA 22+90.21
Δ = 30° 33' 44.4" (LT)	Δ = 30° 33' 44.4" (LT)	Δ = 5° 17' 58.2" (RT)	Δ = 13° 59' 58.9" (LT)	Δ = 9° 49' 23.1" (LT)	Δ = 9° 49' 23.1" (RT)
D = 2° 29' 25.5"	D = 2° 25' 59.9"	D = 4° 00' 00.0"	D = 4° 00' 00.0"	D = 4° 00' 00.0"	D = 4° 00' 00.0"
L = 1,227.2014'	L = 1,256.0057'	L = 132.49'	L = 349.99	L = 245.58'	L = 245.58'
T = 628.5759'	T = 643.3295'	T = 66.29'	T = 175.87'	T = 123.09'	T = 123.09'
R = 2,300.6574'	R = 2,354.6574'	R = 1,432.39'	R = 1,432.39'	R = 1,432.39'	R = 1,432.39'







DESIGN CRITERIA

DESIGN SPEED	60 mph (100 km/h)
POSTED SPEED	Not Posted - 55 mph
CURRENT YEAR ADT (2001)	23,000 vpd
DESIGN YEAR ADT (2025)	56,000 vpd
% TTST , % DUALS	4% ,4%
FUNCTIONAL CLASSIFICATION	Rural Minor Arterial
TERRAIN	Rolling
MAX RADIUS	1206 ft (368 m)
MAXIMUM GRADE	4%
SUPERELEVATION RATE	Se = 0.08

DETOUR DESIGN CRITERIA

DESIGN SPEED	50 mph (80 km/h)
MAX RADIUS	849 ft (259 m)
MAX GRADE	8%
SUPERELEVATION RATE	Se = 0.06

SCALE

50 0 50 100

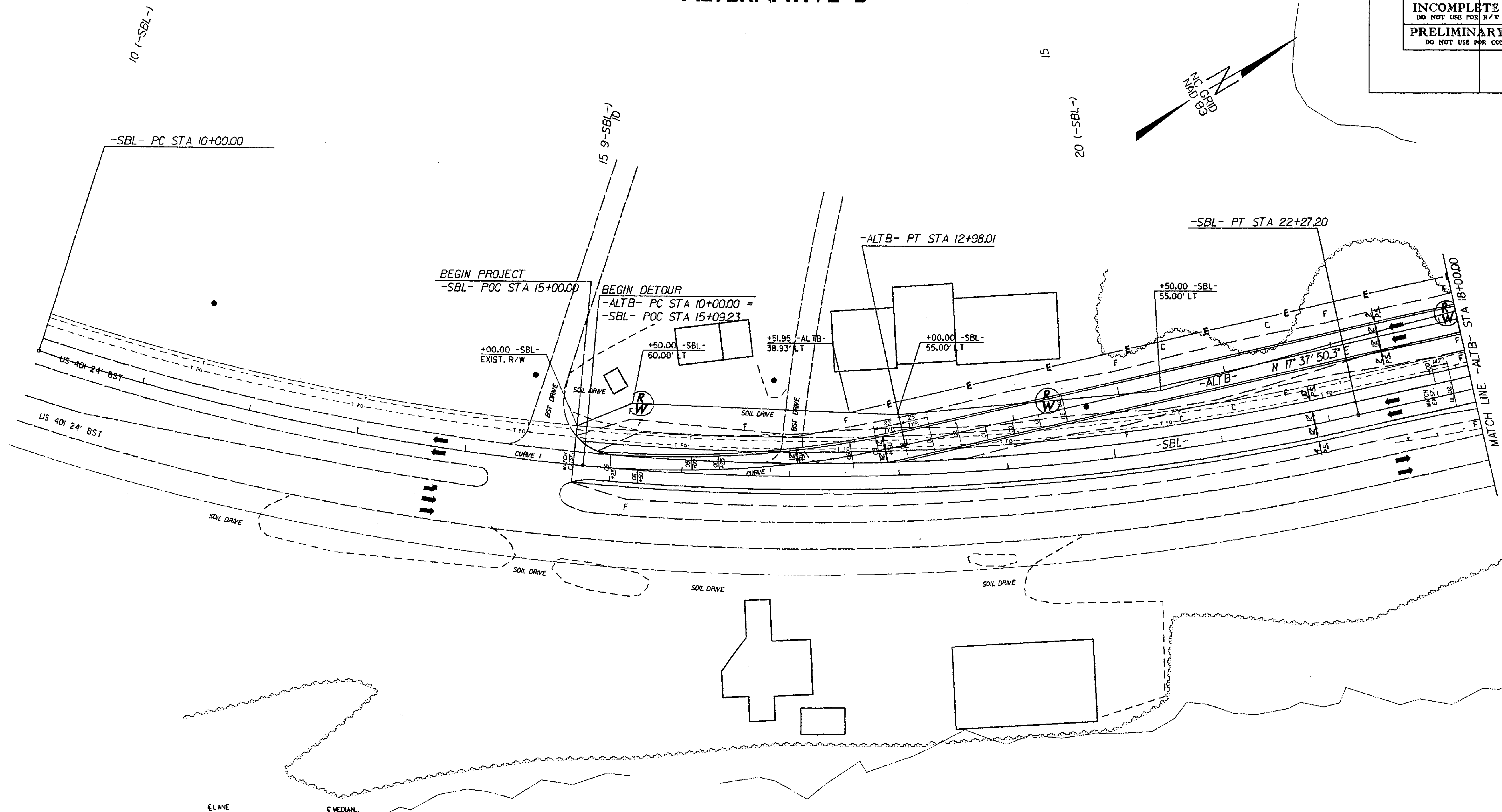
FIGURE 4

PROJECT REFERENCE NO.	SHEET NO.
B-3916	
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

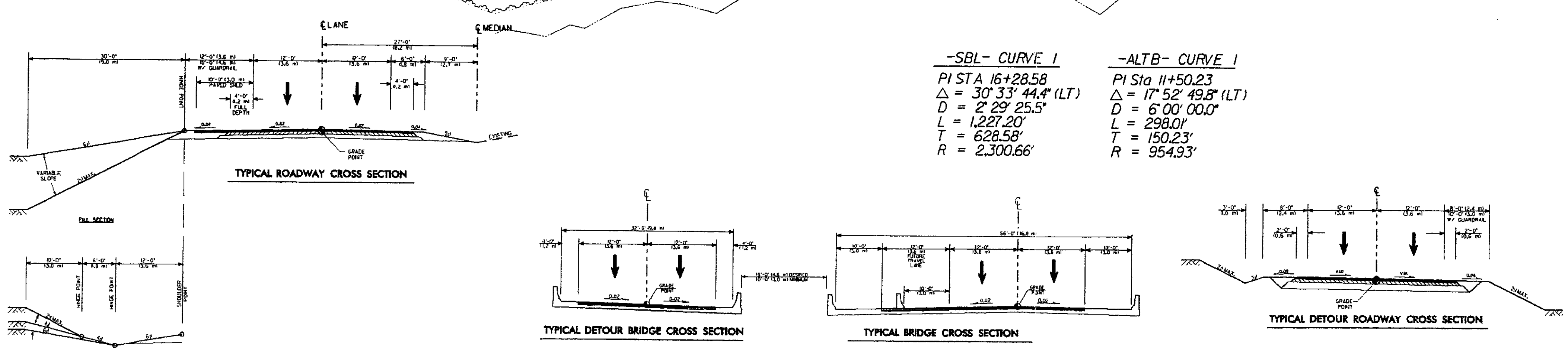
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

(REPLACE IN-PLACE WITH ON-SITE DETOUR)
ALTERNATIVE B



-SBL- CURVE 1	-ALTB- CURVE 1
PI STA 16+28.58	PI Sta 11+50.23
Δ = 30° 33' 44.4" (LT)	Δ = 17° 52' 49.8" (LT)
D = 2° 29' 25.5"	D = 6° 00' 00.0"
L = 1,227.20'	L = 298.01'
T = 628.58'	T = 150.23'
R = 2,300.66'	R = 954.93'



DESIGN CRITERIA

DESIGN SPEED	60 mph (100 km/h)
POSTED SPEED	Not Posted - 55 mph
CURRENT YEAR ADT (2001)	23,000 vpd
DESIGN YEAR ADT (2025)	56,000 vpd
% TTST ,% DUALS	4% ,4%
FUNCTIONAL CLASSIFICATION	Rural Minor Arterial
TERRAIN	Rolling
MAX RADIUS	1206 ft (368 m)
MAXIMUM GRADE	4%
SUPERELEVATION RATE	Se = 0.08

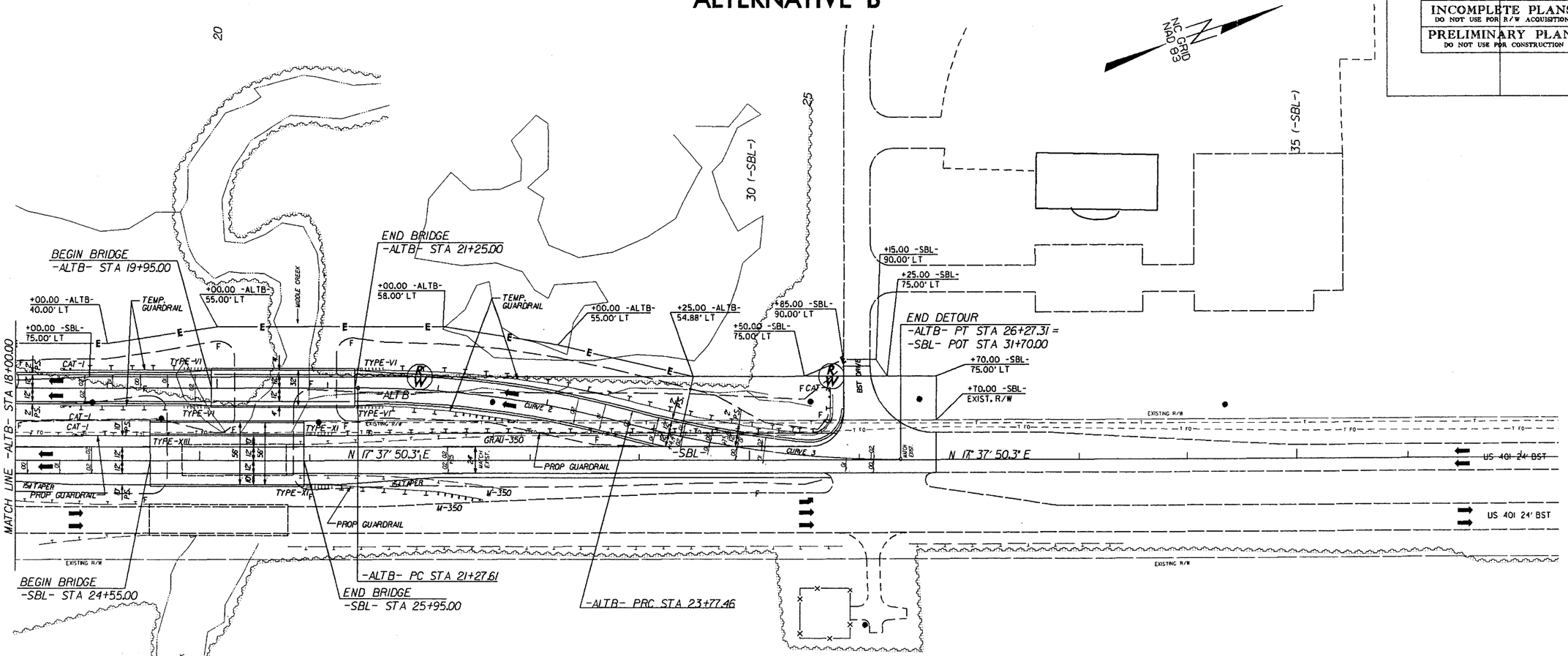
DETOUR DESIGN CRITERIA

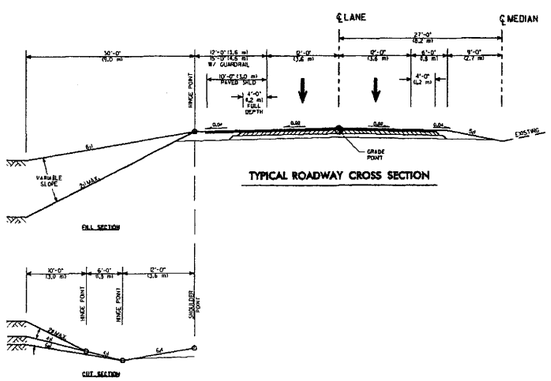
DESIGN SPEED	50 mph (80 km/h)
MAX RADIUS	849 ft (259 m)
MAX GRADE	8%
SUPERELEVATION RATE	Se = 0.06

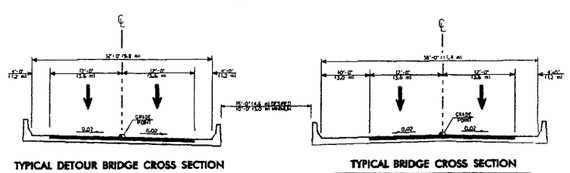
SCALE

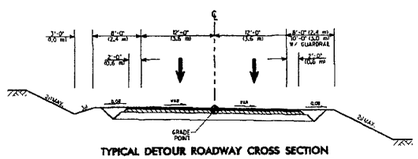
50 0 50 100

FIGURE 5A









(REPLACE IN-PLACE WITH ON-SITE DETOUR)
ALTERNATIVE B

PROJECT REFERENCE NO.	SHEET NO.
B-3916	
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

-ALTB- CURVE 2
PI Sta 22+53.26
Δ = 14° 59' 27.9" (RT)
D = 6° 00' 00.0"
L = 249.85'
T = 125.64'
R = 954.93'

-ALTB- CURVE 3
PI Sta 25+03.11
Δ = 14° 59' 27.9" (LT)
D = 6° 00' 00.0"
L = 249.85'
T = 125.64'
R = 954.93'

TYPICAL ROADWAY CROSS SECTION

TYPICAL DETOUR BRIDGE CROSS SECTION

TYPICAL BRIDGE CROSS SECTION

TYPICAL DETOUR ROADWAY CROSS SECTION

DESIGN CRITERIA

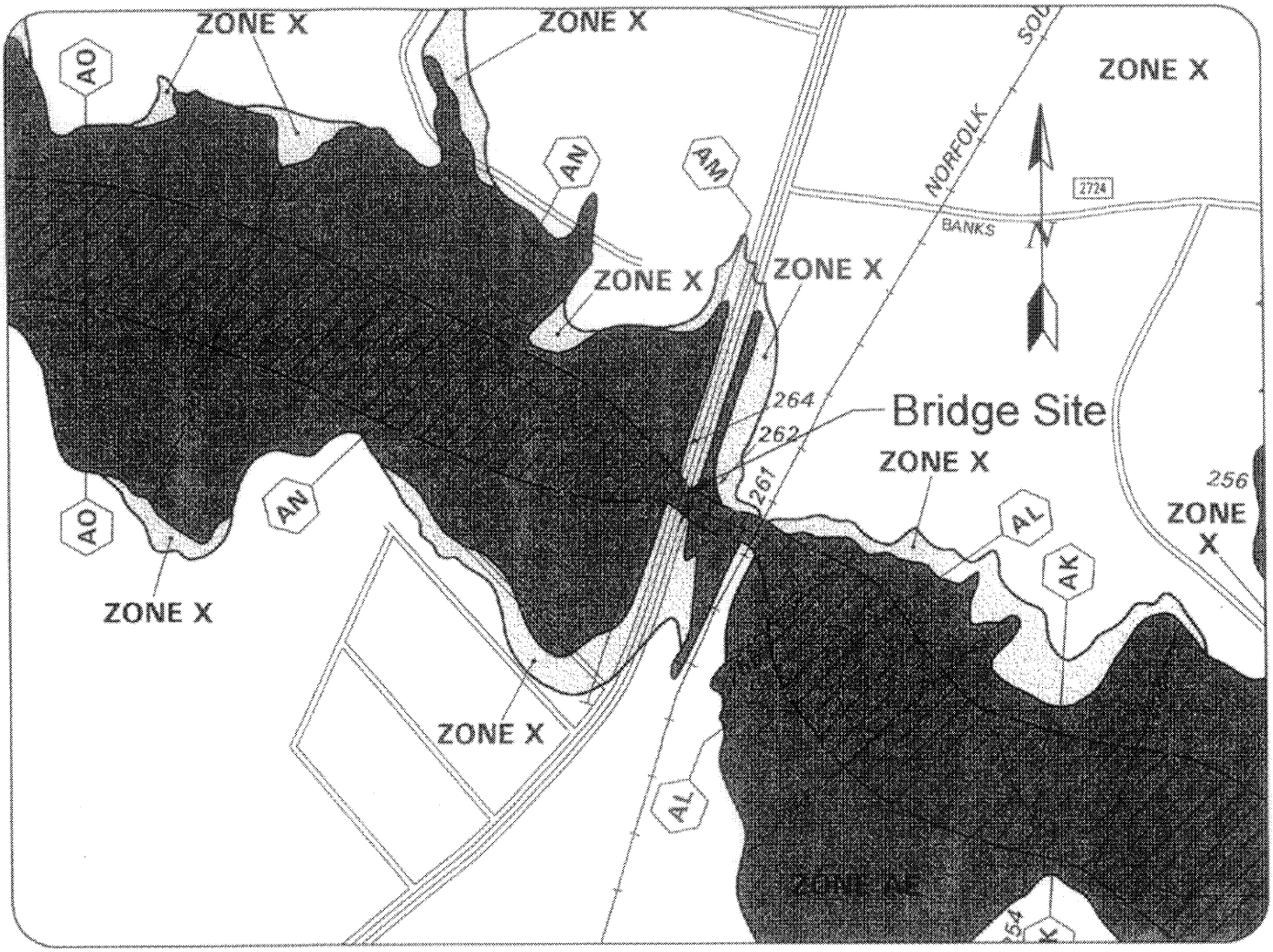
DESIGN SPEED	60 mph (100 km/h)
POSTED SPEED	Not Posted - 55 mph
CURRENT YEAR ADT (2001)	23,000 vpd
DESIGN YEAR ADT (2025)	56,000 vpd
% TTST ,% DUALS	4% ,4%
FUNCTIONAL CLASSIFICATION	Rural Minor Arterial
TERRAIN	Rolling
MAX RADIUS	1206 ft (368 m)
MAXIMUM GRADE	4%
SUPERELEVATION RATE	Se = 0.08

DETOUR DESIGN CRITERIA

DESIGN SPEED	50 mph (80 km/h)
MAX RADIUS	849 ft (259 m)
MAX GRADE	8%
SUPERELEVATION RATE	Se = 0.06

SCALE
50 0 50 100

FIGURE 5B



FLOOD INSURANCE RATE MAP

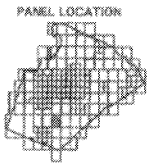
WAKE COUNTY,
NORTH CAROLINA AND
INCORPORATED AREAS

PANEL 685 OF 810
(SEE MAP INDEX FOR PANELS NOT PRINTED)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
UNINCORPORATED AREAS	370368	0685	E

PANEL LOCATION



MAP NUMBER:
37183C0685 E
EFFECTIVE DATE:
MARCH 3, 1992

Federal Emergency Management Agency

NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

US 401
Replace Bridge No. 63 over
Middle Creek
Wake County, North Carolina

TIP NO. B-3916
FEMA 100-YEAR FLOOD PLAIN MAP

Not to Scale

FIGURE 6

US 401
Replace Bridge No. 17 over
Middle Creek
Wake County, North Carolina

Figure 7
Project Vicinity
TIP NO. B-3916

APPENDIX

Theresa Ellerby

North Carolina Department of Cultural Resources

State Historic Preservation Office

David L. S. Brook, Administrator

Michael F. Easley, Governor
Lisbeth C. Evans, Secretary

Division of Archives and History
Jeffrey J. Crow, Director

August 6, 2001

MEMORANDUM

To: William D. Gilmore, P.E., Manager
NCDOT, Project Development & Environmental Analysis Branch

From: David Brook
Deputy State Historic Preservation Officer

Re: Replace Bridge No. 63 on US 401 over Middle Creek, B-3916,
Wake County, ER 01-10081

Thank you for your memorandum of June 21, 2001, concerning the above project.

We are aware of no historic properties in the area of potential effect, except the bridge itself. Built in 1926, the bridge's eligibility for listing in the National Register of Historic Places should be evaluated.

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

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

Thank you for your cooperation and consideration. If you have questions concerning the above comment, contact Renee Gledhill-Earley, Environmental Review Coordinator, at 919/733-4763.

DB:kgc

cc: Mary Pope Furr, NCDOT

	Location	Mailing Address	Telephone/Fax
Administration	507 N. Blount St, Raleigh, NC	4617 Mail Service Center, Raleigh 27699-4617	(919) 733-4763 •733-8653
Restoration	515 N. Blount St, Raleigh , NC	4613 Mail Service Center, Raleigh 27699-4613	(919) 733-6547 •715-4801
Survey & Planning	515 N. Blount St, Raleigh, NC	4618 Mail Service Center, Raleigh 27699-4618	(919) 733-4763 •715-4801

Federal Aid # **BRSTP 401(3)** *TIP #* **B-3916** *County*: **Wake**

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

Project Description: Replace Bridge No. 63 on US 401 over Middle Creek

On 8/30/01, representatives of the

- [x] North Carolina Department of Transportation (NCDOT)
- [ ] 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.
- [x] There are properties over fifty years old within the project's Area of Potential Effects (APE), but based on the historical information available and the photographs of each property, the properties identified as _____ Bridge No. 63 (1953) are considered not eligible for the National Register and no further evaluation of them 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.
- [ ] There are no historic properties affected by this project. (*Attach any notes or documents as needed*)

Signed:

Representative, NCDOT — Date: 8/30/01

FHWA, for the Division Administrator, or other Federal Agency — Date: 9/7/01

Representative, HPO — Date: 8/30/01

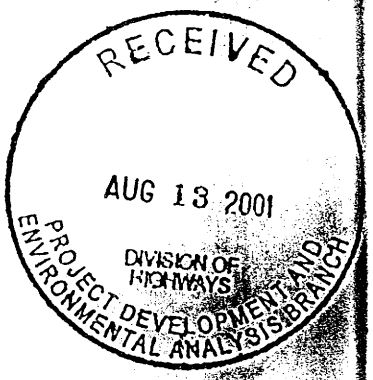
State Historic Preservation Officer — Date: 8/30/01

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

Theresa Ellerbe

United States Department of the Interior

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



August 10, 2001

Mr. William D. Gilmore, P.E., Manager
NCDOT
Project Development and Environmental Analysis Branch
1548 Mail Service Center
Raleigh, NC 27699-1548

Dear Mr. Gilmore:

Thank you for your June 21, 2001, request for information from the U.S. Fish and Wildlife Service (Service) on the potential environmental impacts of proposed bridge replacements in Franklin and Wake Counties, North Carolina. This report provides scoping information and is provided in accordance with provisions of the Fish and Wildlife Coordination Act (FWCA) (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). This report also serves as initial scoping comments to federal and state resource agencies for use in their permitting and/or certification processes for this project.

The North Carolina Department of Transportation (NCDOT) proposes to replace the following bridge structures:

1. B-4515 Bridge No. 40 on SR 1235 over Bear Swamp Creek;

2. B-3916 Bridge No. 63 on US 401 over Middle Creek; and,

3. B-4299 Bridge No. 255 on SR 1006 over unnamed creek.

The following recommendations are provided to assist you in your planning process and to facilitate a thorough and timely review of the project.

Generally, the Service recommends that wetland impacts be avoided and minimized to the maximum extent practical as outlined in Section 404 (b)(1) of the Clean Water Act Amendments of 1977. In regard to avoidance and minimization of impacts, we recommend that proposed highway projects be aligned along or adjacent to existing roadways, utility corridors, or previously developed areas in order to minimize habitat fragmentation and encroachment. Areas exhibiting high biodiversity or ecological value important to the watershed and region should be avoided. Crossings of streams and associated wetland systems should use existing crossings and/or occur on a structure wherever feasible. Where bridging is not feasible, culvert structures that maintain natural water flows and hydraulic regimes without scouring, or impeding fish and wildlife passage, should be employed. Highway shoulder and

median widths should be reduced through wetland areas. Roadway embankments and fill areas should be stabilized by using appropriate erosion control devices and techniques. Wherever appropriate, construction in sensitive areas should occur outside fish spawning and migratory bird nesting seasons.

The National Wetlands Inventory (NWI) maps of the Ingleside and Lake Wheeler 7.5 Minute Quadrangles show wetland resources in the specific work areas. However, while the NWI maps are useful for providing an overview of a given area, they should not be relied upon in lieu of a detailed wetland delineation by trained personnel using an acceptable wetland classification methodology. Therefore, in addition to the above guidance, we recommend that the environmental documentation for this project include the following in sufficient detail to facilitate a thorough review of the action.

1. 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. Wetland boundaries should be determined by using the 1987 Corps of Wetlands Delineation Manual and verified by the U.S. Army Corps of Engineers (Corps).

2. If unavoidable wetland impacts are proposed, we recommend that every effort 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, preferably via conservation easement, should be explored at the outset.

The document presents a number of scenarios for replacing each bridge, ranging from in-place to relocation, with on-site and off-site detours. The Service recommends that each bridge be replaced on the existing alignment with an off-site detour.

The enclosed list identifies the federally-listed endangered and threatened species, and Federal Species of Concern (FSC) that are known to occur in Franklin and Wake Counties. The Service recommends that habitat requirements for the listed species be compared with the available habitats at the respective project sites. If suitable habitat is present within the action area of the project, biological surveys for the listed species should be performed. Environmental documentation that includes survey methodologies, results, and NCDOT's recommendations based on those results, should be provided to this office for review and comment.

FSC's are those plant and animal species for which the Service remains concerned, but further biological research and field study are needed to resolve the conservation status of these taxa. Although FSC's receive no statutory protection under the ESA, we would encourage the NCDOT to be alert to their potential presence, and to make every reasonable effort to conserve them if found. The North Carolina Natural Heritage Program should be contacted for information on species under state protection.

The Service appreciates the opportunity to comment on this project. Please continue to advise us during the progression of the planning process, including your official determination of the impacts of the project. If you have any questions regarding these comments, please contact Tom McCartney at 919-856-4520, Ext. 32.

Sincerely,

for Dr. Garland B. Pardue
Ecological Services Supervisor

Enclosures

cc: COE, Raleigh, NC (Eric Alsmeyer)
NCDWQ, Raleigh, NC (John Hennessey)
NCDNR, Creedmoor, NC (David Cox)

FWS/R4:TMcCartney:TM:08/10/01:919/856-4520 extension 32:\bdgfran.wak

COMMON NAME	SCIENTIFIC NAME	STATUS
WAKE COUNTY		
Vertebrates		
Bachman's sparrow	*Aimophila aestivalis*	FSC
Bald eagle	*Haliaeetus leucocephalus*	Threatened
Southern hognose snake	*Heterodon simus*	FSC*
Southeastern myotis	*Myotis austroriparius*	FSC
Red-cockaded woodpecker	*Picoides borealis*	Endangered
Invertebrates		
Dwarf wedge mussel	*Alasmidonta heterodon*	Endangered
Yellow lance	*Elliptio lanceolata*	FSC
Atlantic pigtoe	*Fusconaia masoni*	FSC
Green floater	*Lasmigona subviridus*	FSC
Diana fritillary butterfly	*Speyeria diana*	FSC*
Vascular Plants		
Sweet pinesap	*Monotropsis odorata*	FSC
Michaux's sumac	*Rhus michauxii*	Endangered
Carolina least trillium	*Trillium pusillum* var. *pusillum*	FSC
WARREN COUNTY		
Vertebrates		
Bachman's sparrow	*Aimophila aestivalis*	FSC
Invertebrates		
Dwarf wedge mussel	*Alasmidonta heterodon*	Endangered
Yellow lance	*Elliptio lanceolata*	FSC
Tar spinymussel	*Elliptio steinstansana*	Endangered
Atlantic pigtoe	*Fusconaia masoni*	FSC
Vascular Plants		
Heller's trefoil	*Lotus helleri*	FSC
WASHINGTON COUNTY		
Vertebrates		
Red wolf	*Canis rufus*	EXP
Rafinesque's big-eared bat	*Corynorhinus (=Plecotus) rafinesquii*	FSC
Waccamaw killifish	*Fundulus waccamawensis*	FSC
Bald eagle	*Haliaeetus leucocephalus*	Threatened

U.S. ARMY CORPS OF ENGINEERS
Wilmington District

COPY

Action ID: 200220001 TIP: B-3916 County: Wake

NOTIFICATION OF JURISDICTIONAL DETERMINATION

Project Proponent:	NCDOT	**Agent:**	Environmental Services Inc.
Address:	Division of Highways William D. Gilmore, P.E., Manager PDEA Branch 1548 Mail Service Center Raleigh, NC 27699-1548		ATTN: Mr. Jeff Harbour, PWS 524 New Hope Road Raleigh, North Carolina 27610
Telephone No.:	(919) 733-7844		(919) 212-1760

Location of Property (waterbody, Highway name/number, town, etc.): Existing Bridge No. 63 on US 401 over Middle Creek.

Basis for Determination: The site contains wetlands, as indicated on the data forms submitted on August 22, 2001, and stream channels with indicators of ordinary high water marks. The wetlands are located adjacent to Middle Creek, a tributary to the Neuse River.

Indicate Which of the Following Apply:

____ There are waters of the U.S., to include wetlands, on the above described property which we strongly suggest should be delineated and surveyed. The surveyed wetland lines must be verified by our staff before the Corps will make a final jurisdictional determination on your property.

____ Because of the size of your property and our present workload, our identification and delineation of your wetlands cannot be accomplished in a timely manner. You may wish to obtain a consultant to obtain a more timely delineation of the wetlands. Once the consultant has flagged a wetland line on the property, Corps staff will review it, and, if it is accurate, we strongly recommend that you have the line surveyed for final approval by the Corps. The Corps will not make a final jurisdictional determination on your property without an approved survey.

X The waters of the U.S., to include wetlands, within the project limits, have been delineated, as shown in the August 7, 2002 submittal, and a desktop verification of Corps jurisdiction has been completed on this date. 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. **Note: This verification replaces the verification for this site dated October 4, 2001.**

____ There are no waters of the U.S., to include wetlands, present on the above described property 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.

Placement of dredged or fill material in wetlands on this property without a Department of the Army Permit is in most cases a violation of Section 301 of the Clean Water Act (33 USC 1311). A permit is not required for work on the property restricted entirely to existing high ground. If you have any questions regarding the Corps of Engineers regulatory program, please contact Eric Alsmeyer **at telephone number** (919) 876 - 8441 extension 23.

Project Manager Signature Eric Alsmeyer

Date August 27, 2002 **Expiration Date** August 27, 2006

SURVEY PLAT OR FIELD SKETCH OF THE DESCRIBED PROPERTY AND THE WETLAND DELINEATION FORM MUST BE ATTACHED TO THE FILE COPY OF THIS FORM.

NOTIFICATION OF ADMINISTRATIVE APPEAL OPTIONS AND PROCESS AND REQUEST FOR APPEAL

Applicant: NCDOT/TIP B-3916	File Number: 200220001	Date: August 27, 2002
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
X	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: Mr. Eric C. Alsmeyer, Regulatory Project Manager U.S. Army Corps of Engineers, Wilmington District Raleigh Regulatory Field Office 6508 Falls of Neuse Road, Suite 120 Raleigh, North Carolina 27615-6814	If you only have questions regarding the appeal process you may also contact: Mr. Arthur Middleton, 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

U.S. ARMY CORPS OF ENGINEERS
Wilmington District

COPY

Action ID: 200220001 **TIP**: B-3916 County: Wake

NOTIFICATION OF JURISDICTIONAL DETERMINATION

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Telephone No.:	(919) 733-7844		(919) 212-1760

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Indicate Which of the Following Apply:

____ There are waters of the U.S., to include wetlands, on the above described property which we strongly suggest should be delineated and surveyed. The surveyed wetland lines must be verified by our staff before the Corps will make a final jurisdictional determination on your property.

____ Because of the size of your property and our present workload, our identification and delineation of your wetlands cannot be accomplished in a timely manner. You may wish to obtain a consultant to obtain a more timely delineation of the wetlands. Once the consultant has flagged a wetland line on the property, Corps staff will review it, and, if it is accurate, we strongly recommend that you have the line surveyed for final approval by the Corps. The Corps will not make a final jurisdictional determination on your property without an approved survey.

__X__ The waters of the U.S., to include wetlands, within the project limits, have been delineated, as shown in the August 7, 2002 submittal, and a desktop verification of Corps jurisdiction has been completed on this date. 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. **Note: This verification replaces the verification for this site dated October 4, 2001.**

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Project Manager Signature Eric Alsmeyer

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_____ 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

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quadrant

SBB
(INT)

NCDWQ Stream Classification Form

Project Name: B-3916 River Basin: Neuse County: Wake Evaluator: SSF
DWQ Project No.: Nearest Named Stream: Middle Creek Latitude: Signature:
Date: 5-3-01 USGS Quad: Lake Wheeler Longitude: Location/Direction:

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

PRIMARY FIELD INDICATORS: (Circle One Number Per Line)

I. Geomorphology	Absent	Weak	Moderate	Strong
1) Is there a Riffle-Pool Sequence?	0	(1)	2	3
2) Is the USDA Texture in Streambed Different From Surrounding Terrain?	0	(1)	2	3
3) Are Natural Levees Present?	0	(1)	2	3
4) Is the Channel Sinuous?	0	1	(2)	3
5) Is There Active (or Relic)) Floodplain Present?	(0)	1	2	3
6) Is The Channel Braided?	(0)	1	2	3
7) Are Recent Alluvial Deposits Present?	0	(1)	2	3
8) Is There a Bankfull Bench?	0	(1)	2	3
9) Is A Continuous Bed & Bank Present?	0	1	(2)	3
	Note: If Bed & Bank Caused By Ditching And W/O Sinuosity Then Score =0			
10) Is A 2nd Order or Greater Channel (As Indicated on USGS and/or In Field) Present?	Yes=3			No=(0)

PRIMARY GEOMORPHOLOGY INDICATOR POINTS: 9

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

PRIMARY HYDROLOGY INDICATOR POINTS: 0

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

PRIMARY BIOLOGICAL INDICATOR POINTS: 4

TOTAL PRIMARY INDICATOR POINTS: 13

Secondary Field Indicators: (Circle One Number Per Line)

I. Geomorphology	Absent	Weak	Moderate	Strong
1) Is There A Head Cut Present In Channel?	0	0.5	(1)	1.5
2) Is There A Grade Control Point in Channel?	0	0.5	(1)	1.5
3) Does Topography Indicate A Natural Drainage Way?	0	0.5	(1)	1.5

SECONDARY GEOMORPHOLOGICAL INDICATOR POINTS: 3

II. Hydrology	Absent	Weak	Moderate	Strong
1) Is This Year's (or Last's) Leaflitter Present Inn Channel?	(1.5)	1	0.5	0
2) Is Sediment On Plants (or Debris) Present?	0	(0.5)	1	1.5
3) Are Wrack Lines Present?	(0)	0.5	1	1.5
4) Is Water In Channel And >48 hrs Since Last Known Rain?	(0)	0.5	1	1.5
Note: If Ditch Indicated in #9 Above Skip This Step And #5 Below				
5) Is There Water In Channel During Dry Conditions (or In Growing Season)?	(0)	0.5	1	1.5
6) Are Hydric Soils Present In Sides of Channel or Headcut?	Yes=1.5			No=(0)

SECONDARY HYDROLOGICAL INDICATOR POINTS: 2.0

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

8) Are Wetland Plants in Sreambed?	SAV	Mostly OBL	Mostly FACW	Mostly FAC	Mostly UPL
Note: If Total Absence of All Plants in Streambed As noted above skip this step UNLESS SAV Present	2	1	.75	(.5)	0

SECONDARY BIOLOGICAL INDICATOR PINTS: 1.5

TOTAL SECONDARY INDICATOR POINTS: 6.5

TOTAL POINTS (Primary + Secondary)= 19.5

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

(Int)

NCDWQ Stream Classification Form

Project Name: B-3916 River Basin: Neuse County: Wake Evaluator: ESI
DWQ Project No.: Nearest Named Stream: Middle Creek Latitude: Signature:
Date: 5-3-01 USGS Quad: Lake Wheeler Longitude: Location/Direction:

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

PRIMARY FIELD INDICATORS: (Circle One Number Per Line)

I. Geomorphology	Absent	Weak	Moderate	Strong
1) Is there a Riffle-Pool Sequence?	(0)	1	2	3
2) Is the USDA Texture in Streambed Different From Surrounding Terrain?	0	(1)	2	3
3) Are Natural Levees Present?	(0)	1	2	3
4) Is the Channel Sinuous?	0	1	(2)	3
5) Is There Active (or Relic)) Floodplain Present?	0	(1)	2	3
6) Is The Channel Braided?	(0)	1	2	3
7) Are Recent Alluvial Deposits Present?	0	(1)	2	3
8) Is There a Bankfull Bench?	0	(1)	2	3
9) Is A Continuous Bed & Bank Present?	0	(1)	2	3
	Note: If Bed & Bank Caused By Ditching And W/O Sinuosity Then Score =0			
10) Is A 2nd Order or Greater Channel (As Indicated on USGS and/or In Field) Present?	Yes=3		No=(0)	

PRIMARY GEOMORPHOLOGY INDICATOR POINTS: 7

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

PRIMARY HYDROLOGY INDICATOR POINTS: 1

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

PRIMARY BIOLOGICAL INDICATOR POINTS: 5

TOTAL PRIMARY INDICATOR POINTS: 13

Secondary Field Indicators: (Circle One Number Per Line)

I. Geomorphology	Absent	Weak	Moderate	Strong
1) Is There A Head Cut Present In Channel?	0	(0.5)	1	1.5
2) Is There A Grade Control Point in Channel?	0	0.5	(1)	1.5
3) Does Topography Indicate A Natural Drainage Way?	0	0.5	(1)	1.5

SECONDARY GEOMORPHOLOGICAL INDICATOR POINTS: 2.5

II. Hydrology	Absent	Weak	Moderate	Strong
1) Is This Year's (or Last's) Leaflitter Present Inn Channel?	(1.5)	1	0.5	0
2) Is Sediment On Plants (or Debris) Present?	0	(0.5)	1	1.5
3) Are Wrack Lines Present?	0	(0.5)	1	1.5
4) Is Water In Channel And >48 hrs Since Last Known Rain?	0	(0.5)	1	1.5
Note: If Ditch Indicated in #9 Above Skip This Step And #5 Below				
5) Is There Water In Channel During Dry Conditions (or In Growing Season)?	0	(0.5)	1	1.5
6) Are Hydric Soils Present In Sides of Channel or Headcut?		Yes=1.5		No=0

SECONDARY HYDROLOGICAL INDICATOR POINTS: 5

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

8) Are Wetland Plants in Sreambed?	SAV	Mostly OBL	Mostly FACW	Mostly FAC	Mostly UPL
Note: If Total Absence of All Plants in Streambed As noted above skip this step UNLESS SAV Present	2	1	(.75)	.5	0

SECONDARY BIOLOGICAL INDICATOR PINTS: 9.25

TOTAL SECONDARY INDICATOR POINTS: 16.75

TOTAL POINTS (Primary + Secondary)= 24.75

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

NE UT quadrant

S2A (Int)

NCDWQ Stream Classification Form

Project Name: B-3716 | River Basin: Neuse | County: Wake | Evaluator: EST
DWQ Project No.: | Nearest Named Stream: Middle Creek | Latitude: | Signature: CK
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I. Geomorphology	Absent	Weak	Moderate	Strong
1) Is there a Riffle-Pool Sequence?	0	(1)	2	3
2) Is the USDA Texture in Streambed Different From Surrounding Terrain?	0	(1)	2	3
3) Are Natural Levees Present?	(0)	1	2	3
4) Is the Channel Sinuous?	0	1	(2)	3
5) Is There Active (or Relic)) Floodplain Present?	(0)	1	2	3
6) Is The Channel Braided?	(0)	1	2	3
7) Are Recent Alluvial Deposits Present?	0	(1)	2	3
8) Is There a Bankfull Bench?	0	(1)	2	3
9) Is A Continuous Bed & Bank Present?	0	1	2	(3)
	Note: If Bed & Bank Caused By Ditching And W/O Sinuosity Then Score =0			
10) Is A 2nd Order or Greater Channel (As Indicated on USGS and/or In Field) Present?	Yes=3		No=(0)	

PRIMARY GEOMORPHOLOGY INDICATOR POINTS: 9

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

PRIMARY HYDROLOGY INDICATOR POINTS: 0

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

PRIMARY BIOLOGICAL INDICATOR POINTS: 4

TOTAL PRIMARY INDICATOR POINTS: 13

Secondary Field Indicators: (Circle One Number Per Line)

I. Geomorphology	Absent	Weak	Moderate	Strong
1) Is There A Head Cut Present In Channel?	0	(0.5)	1	1.5
2) Is There A Grade Control Point in Channel?	0	(0.5)	1	1.5
3) Does Topography Indicate A Natural Drainage Way?	0	(0.5)	1	1.5

SECONDARY GEOMORPHOLOGICAL INDICATOR POINTS: 1.5

II. Hydrology	Absent	Weak	Moderate	Strong
1) Is This Year's (or Last's) Leaflitter Present Inn Channel?	(1.5)	1	0.5	0
2) Is Sediment On Plants (or Debris) Present?	0	(0.5)	1	1.5
3) Are Wrack Lines Present?	0	0.5	1	(1.5)
4) Is Water In Channel And >48 hrs Since Last Known Rain?	0	0.5	(1)	1.5
Note: If Ditch Indicated in #9 Above Skip This Step And #5 Below				
5) Is There Water In Channel During Dry Conditions (or In Growing Season)?	0	(0.5)	1	1.5
6) Are Hydric Soils Present In Sides of Channel or Headcut?	Yes=1.5			No=(0)

SECONDARY HYDROLOGICAL INDICATOR POINTS: 5

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

8) Are Wetland Plants in Sreambed? *Note: If Total Absence of All Plants in Streambed As noted above skip this step UNLESS SAV Present*	SAV	Mostly OBL	Mostly FACW	Mostly FAC	Mostly UPL
	2	1	.75	(.5)	0

SECONDARY BIOLOGICAL INDICATOR PINTS: 1.5

TOTAL SECONDARY INDICATOR POINTS: 8

TOTAL POINTS (Primary + Secondary)= 21

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

NE UT quadrant

S2A Per

NCDWQ Stream Classification Form

Project Name: B-3916 | River Basin: Neuse | County: WAKE | Evaluator: ESI
DWQ Project No.: | Nearest Named Stream: Middle Cr. | Latitude: | Signature: CK
Date: 7-30-02 | USGS Quad: Lake Wheeler | Longitude: | Location/Direction:

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

PRIMARY FIELD INDICATORS: (Circle One Number Per Line)

I. Geomorphology	Absent	Weak	Moderate	Strong
1) Is there a Riffle-Pool Sequence?	0	(1)	2	3
2) Is the USDA Texture in Streambed Different From Surrounding Terrain?	0	1	(2)	3
3) Are Natural Levees Present?	(0)	1	2	3
4) Is the Channel Sinuous?	0	1	(2)	3
5) Is There Active (or Relic)) Floodplain Present?	(0)	1	2	3
6) Is The Channel Braided?	(0)	1	2	3
7) Are Recent Alluvial Deposits Present?	0	1	(2)	3
8) Is There a Bankfull Bench?	0	(1)	2	3
9) Is A Continuous Bed & Bank Present?	0	1	2	(3)
	Note: If Bed & Bank Caused By Ditching And W/O Sinuosity Then Score =0			
10) Is A 2nd Order or Greater Channel (As Indicated on USGS and/or In Field) Present?	Yes=3		No=(0)	

PRIMARY GEOMORPHOLOGY INDICATOR POINTS: 11

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

PRIMARY HYDROLOGY INDICATOR POINTS: 0

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

PRIMARY BIOLOGICAL INDICATOR POINTS: 6

TOTAL PRIMARY INDICATOR POINTS: 17

Secondary Field Indicators: (Circle One Number Per Line)

I. Geomorphology	Absent	Weak	Moderate	Strong
1) Is There A Head Cut Present In Channel?	0	(0.5)	1	1.5
2) Is There A Grade Control Point in Channel?	0	(0.5)	1	1.5
3) Does Topography Indicate A Natural Drainage Way?	0	0.5	(1)	1.5

SECONDARY GEOMORPHOLOGICAL INDICATOR POINTS: 2

II. Hydrology	Absent	Weak	Moderate	Strong
1) Is This Year's (or Last's) Leaflitter Present Inn Channel?	(1.5)	1	0.5	0
2) Is Sediment On Plants (or Debris) Present?	0	0.5	(1)	1.5
3) Are Wrack Lines Present?	0	(0.5)	1	1.5
4) Is Water In Channel And >48 hrs Since Last Known Rain?	0	0.5	1	(1.5)
Note: If Ditch Indicated in #9 Above Skip This Step And #5 Below				
5) Is There Water In Channel During Dry Conditions (or In Growing Season)?	0	(0.5)	1	1.5
6) Are Hydric Soils Present In Sides of Channel or Headcut?	Yes=1.5			No=(0)

SECONDARY HYDROLOGICAL INDICATOR POINTS: 5

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

8) Are Wetland Plants in Sreambed?	SAV	Mostly OBL	Mostly FACW	Mostly FAC	Mostly UPL
Note: If Total Absence of All Plants in Streambed As noted above skip this step UNLESS SAV Present	2	1	.75	.5	0

SECONDARY BIOLOGICAL INDICATOR PINTS: 1.5

TOTAL SECONDARY INDICATOR POINTS: 8.5

TOTAL POINTS (Primary + Secondary)= 25.5
(If Greater Than or Equal To 19 Points The Stream Is At Least Intermittent)

E quadrant

Ditch

NCDWQ Stream Classification Form

Project Name: B-3916 River Basin: Neuse County: Wake Evaluator: EST
DWQ Project No.: Nearest Named Stream: Middle Creek Latitude: Signature: CK
Date: 7-30-02 USGS Quad: Lake Wheeler Longitude: Location/Direction:

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

PRIMARY FIELD INDICATORS: (Circle One Number Per Line)

I. Geomorphology	Absent	Weak	Moderate	Strong
1) Is there a Riffle-Pool Sequence?	(0)	1	2	3
2) Is the USDA Texture in Streambed Different From Surrounding Terrain?	(0)	1	(2)	3
3) Are Natural Levees Present?	(0)	1	2	3
4) Is the Channel Sinuous?	(0)	1	2	3
5) Is There Active (or Relic)) Floodplain Present?	(0)	1	2	3
6) Is The Channel Braided?	(0)	1	2	3
7) Are Recent Alluvial Deposits Present?	(0)	1	2	3
8) Is There a Bankfull Bench?	(0)	1	2	3
9) Is A Continuous Bed & Bank Present?	(0)	1	2	3
	Note: If Bed & Bank Caused By Ditching And W/O Sinuosity Then Score =0			
10) Is A 2nd Order or Greater Channel (As Indicated on USGS and/or In Field) Present?	Yes=3			(No=0)

PRIMARY GEOMORPHOLOGY INDICATOR POINTS: 2

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

PRIMARY HYDROLOGY INDICATOR POINTS: 0

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

PRIMARY BIOLOGICAL INDICATOR POINTS: 5

TOTAL PRIMARY INDICATOR POINTS: 7

Secondary Field Indicators: (Circle One Number Per Line)

I. Geomorphology	Absent	Weak	Moderate	Strong
1) Is There A Head Cut Present In Channel?	(0)	0.5	1	1.5
2) Is There A Grade Control Point in Channel?	(0)	0.5	1	1.5
3) Does Topography Indicate A Natural Drainage Way?	(0)	0.5	1	1.5

SECONDARY GEOMORPHOLOGICAL INDICATOR POINTS: 0

II. Hydrology	Absent	Weak	Moderate	Strong
1) Is This Year's (or Last's) Leaflitter Present Inn Channel?	1.5	(1)	0.5	0
2) Is Sediment On Plants (or Debris) Present?	0	(0.5)	1	1.5
3) Are Wrack Lines Present?	0	(0.5)	1	1.5
4) Is Water In Channel And >48 hrs Since Last Known Rain?	0	0.5	1	(1.5)
Note: If Ditch Indicated in #9 Above Skip This Step And #5 Below				
5) Is There Water In Channel During Dry Conditions (or In Growing Season)?	0	0.5	(1)	1.5
6) Are Hydric Soils Present In Sides of Channel or Headcut?	Yes=1.5			No=(0)

SECONDARY HYDROLOGICAL INDICATOR POINTS: 4.5

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

8) Are Wetland Plants in Sreambed?	SAV	Mostly OBL	Mostly FACW	Mostly FAC	Mostly UPL
Note: If Total Absence of All Plants in Streambed As noted above skip this step UNLESS SAV Present	2	1	.75	(.5)	0

SECONDARY BIOLOGICAL INDICATOR PINTS: 1

TOTAL SECONDARY INDICATOR POINTS: 5.5

TOTAL POINTS (Primary + Secondary)= 12.5

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

PA wet

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

Project/Site: Middle Creek Bridge	Date: 12-4-01
Applicant/Owner: NCDOT	County: Wake
Investigator: ESI	State: NC
Do Normal Circumstances exist on the site? Yes No	Community ID: scrub/shrub
Is the site significantly disturbed (Atypical Situation)? Yes No	Transect ID: PA 3
Is the area a potential Problem Area? Yes No	Plot ID: wet
(If needed, explain on reverse	

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Liquidambar styraciflua	S+H	FAC+	9.		
2. Acer rubrum	S+H	FAC	10.		
3. Rubus betulifolius	H	FAC	11.		
4. Boehmeria cylindrica	H	FACW+	12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-) 4/4

Remarks:
Individual Black willow shrubs present

HYDROLOGY

__Recorded Data (Describe in Remarks):
- __Stream, Lake or Tide Gauge
- __Aerial Photographs
- __Other

X No Recorded Data Available

Field Observations:
- Depth of Surface Water: — (in.)
- Depth to Free Water in Pit: >18 (in.)
- Depth to Saturated Soil: 0 (in.)

Wetland Hydrology Indicators:
Primary Indicators:
- __Inundated
- X Saturated in Upper 12 Inches
- __Water Marks
- __Drift Lines
- __Sediment Deposits
- X Drainage Patterns in Wetlands

Secondary Indicators (2 or more required):
- __Oxidized Root Channels in Upper 12 Inches
- __Water-Stained Leaves
- __Local Soil Survey Data
- __FAC-Neutral Test
- __Other (Explain in Remarks)

Remarks:

SOILS

Map Unit Name (Series and Phase): Wehadkee silt loam

Drainage Class: poorly drained

Taxonomy (Subgroup): Fluvaquentic Haplaquepts

Field Observations Confirm Mapped Type: Yes (No)

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-3		10YR 3/2			silt loam
3-10		10YR 4/1	10YR 4/6	common/distinct	silt loam
10+		10YR 5/1	10YR 4/6	common/distinct	silty clay loam

Hydric Soil Indicators:

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

Remarks:

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	(Yes)	No (Circle)		(Circle)
Wetland Hydrology Present?	(Yes)	No	Is this Sampling Point Within a Wetland?	(Yes) No
Hydric Soils Present?	(Yes)	No		

Remarks:

Approved by HQUSACE 2/92

HJL
8/93

PA up

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

Project/Site: Middle Creek Bridge	Date: 12-4-01
Applicant/Owner: NCDOT	County: Wake
Investigator: ESI	State: N.C.
Do Normal Circumstances exist on the site? (Yes) No	Community ID: scrub/shrub
Is the site significantly disturbed (Atypical Situation)? Yes (No)	Transect ID: PA 3
Is the area a potential Problem Area? Yes (No)	Plot ID: up
(If needed, explain on reverse	

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Liquidambar styraciflua	S+H	FAC+	9.		
2. Acer rubrum	H	FAC	10.		
3. Rubus betulifolius	H	FAC	11.		
4. Lonicera japonica	H	FAC-	12.		
5. Solidago spp.	H	—	13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-): 3/4

Remarks:

HYDROLOGY

__Recorded Data (Describe in Remarks):
- __Stream, Lake or Tide Gauge
- __Aerial Photographs
- __Other

X No Recorded Data Available

Field Observations:
- Depth of Surface Water: — (in.)
- Depth to Free Water in Pit: >18 (in.)
- Depth to Saturated Soil: 14 (in.)

Wetland Hydrology Indicators:

Primary Indicators:
- __Inundated
- __Saturated in Upper 12 Inches
- __Water Marks
- __Drift Lines
- __Sediment Deposits
- __Drainage Patterns in Wetlands

Secondary Indicators (2 or more required):
- __Oxidized Root Channels in Upper 12 Inches
- __Water-Stained Leaves
- __Local Soil Survey Data
- __FAC-Neutral Test
- __Other (Explain in Remarks)

Remarks:

SOILS

Map Unit Name (Series and Phase): Wehadkee silt loam

Drainage Class: poorly drained

Taxonomy (Subgroup): Fluventic Haplaquepts

Field Observations
Confirm Mapped Type: Yes (No)

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-5		7.5YR 4/4			fine sandy loam
5-18+		7.5YR 5/8			sandy clay loam

Hydric Soil Indicators:

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

Remarks:

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	(Yes)	No (Circle)	(Circle)
Wetland Hydrology Present?	Yes	(No)	
Hydric Soils Present?	Yes	(No)	Is this Sampling Point Within a Wetland? Yes (No)

Remarks:

Approved by HQUSACE 2/92

HJL
8/93

BB 1-14

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

Project/Site: Bridge No. 3916 Middle Creek	Date: 5/8/01
Applicant/Owner: NCDOT	County: Wake
Investigator: ESI	State: NC
Do Normal Circumstances exist on the site? (Yes) No	Community ID: Floodplain
Is the site significantly disturbed (Atypical Situation)? Yes (No)	Transect ID: BB 1-7
Is the area a potential Problem Area? Yes (No)	Plot ID: Wetland
(If needed, explain on reverse	

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Fraxinus pennsylvanica	T	FACW	9.		
2. Betula nigra	T	FACW	10.		
3. Acer rubrum	T	FAC	11.		
4.			12.		
5. Impatiens capensis	H	FACW	13.		
6. Saururus cernuus	H	OBL	14.		
7. Peltandra virginica	H	OBL	15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-) 6/6

Remarks:

Area is floodplain of Middle Creek

HYDROLOGY

__Recorded Data (Describe in Remarks):
- __Stream, Lake or Tide Gauge
- __Aerial Photographs
- __Other

X No Recorded Data Available

Field Observations:

Depth of Surface Water:	0	(in.)
Depth to Free Water in Pit:	10	(in.)
Depth to Saturated Soil:	10	(in.)

Wetland Hydrology Indicators:

Primary Indicators:
- __Inundated
- X Saturated in Upper 12 Inches
- X Water Marks
- X Drift Lines
- __Sediment Deposits
- __Drainage Patterns in Wetlands

Secondary Indicators (2 or more required):
- __Oxidized Root Channels in Upper 12 Inches
- X Water-Stained Leaves
- __Local Soil Survey Data
- __FAC-Neutral Test
- __Other (Explain in Remarks)

Remarks:

Indicators met

SOILS

Map Unit Name (Series and Phase): Wehadkee and Bibb Soils Drainage Class: Poorly

Taxonomy (Subgroup): Fluvaquentic Haplaquepts/Typic Haplaquepts Field Observations Confirm Mapped Type: Yes (No)

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-2		10YR 3/2	—	—	Loam
2-13		10YR 4/2	5YR 4/6	common, distinct	Clay loam
13-18+		7.5YR 5/8	10YR 5/1	common, distinct	Clay

Hydric Soil Indicators:

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

Remarks:

Floodplain soils

WETLAND DETERMINATION

Hydrophytic Vegetation Present? (Yes) No (Circle)
Wetland Hydrology Present? (Yes) No
Hydric Soils Present? (Yes) No

Is this Sampling Point Within a Wetland? (Circle) (Yes) No

Remarks:

Approved by HQUSACE 2/92

HJL
8/93

BB1-14

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

Project/Site: Bridge No. 396 Middle Creek	Date: 5/8/01
Applicant/Owner: NCDOT	County: Wake
Investigator: ESI	State: NC
Do Normal Circumstances exist on the site? (Yes) No	Community ID: Successional
Is the site significantly disturbed (Atypical Situation)? Yes (No)	Transect ID: BB-7
Is the area a potential Problem Area? Yes (No)	Plot ID: Upland
(If needed, explain on reverse	

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Acer rubrum	T	FAC	9. Rubus argutus	H	FACU+
2.			10.		
3. Ligustrum Sinense	S	FAC	11.		
4.			12.		
5. Toxicodendron radicans	V	FAC	13.		
6. Smilax rotundifolia	V	FAC	14.		
7. Lonicera japonica	V	FAC-	15.		
8. Vitus rotundifolia	V	FAC	16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-) 5/7

Remarks:
Successional area previously disturbed

HYDROLOGY

___Recorded Data (Describe in Remarks):
___Stream, Lake or Tide Gauge
___Aerial Photographs
___Other
X No Recorded Data Available

Field Observations:
Depth of Surface Water: 0 (in.)
Depth to Free Water in Pit: >18 (in.)
Depth to Saturated Soil: >18 (in.)

Wetland Hydrology Indicators:
Primary Indicators:
___Inundated
___Saturated in Upper 12 Inches
___Water Marks
___Drift Lines
___Sediment Deposits
___Drainage Patterns in Wetlands
Secondary Indicators (2 or more required):
___Oxidized Root Channels in Upper 12 Inches
___Water-Stained Leaves
___Local Soil Survey Data
___FAC-Neutral Test
___Other (Explain in Remarks)

Remarks:
No indicators met

SOILS

Map Unit Name (Series and Phase): Wehadkee and Bibb Soils Drainage Class: Poorly

Taxonomy (Subgroup): Fluventic Haplaquepts/Typic Haplaquepts Field Observations Confirm Mapped Type: Yes (No)

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-2		10YR 3/2	—	—	Loam
2-14		7.5YR 4/4	—	—	Clay loam
14-18+		10YR 4/3	—	—	Clay loam

Hydric Soil Indicators:

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

Remarks:

Non-hydric soils present

WETLAND DETERMINATION

Hydrophytic Vegetation Present? (Yes) No (Circle)

Wetland Hydrology Present? Yes (No)

Hydric Soils Present? Yes (No)

Is this Sampling Point Within a Wetland? (Circle) Yes (No)

Remarks:

Approved by HQUSACE 2/92

HJL
8/93

WA 1-55
WB 1-13

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

Project/Site: Bridge No. 3916 - Middle Creek	Date: 5/3/01
Applicant/Owner: NCDOT	County: Wake
Investigator: ESI	State: NC
Do Normal Circumstances exist on the site? (Yes) No	Community ID: Hardwood
Is the site significantly disturbed (Atypical Situation)? Yes (No)	Transect ID: WA-1/WB-1
Is the area a potential Problem Area? Yes (No)	Plot ID: Wet
(If needed, explain on reverse	

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Fraxinus pennsylvanica	T	FACW	9. Toxicodendron radicans	V	FAC
2.			10.		
3. Fraxinus pennsylvanica	S	FACW	11.		
4. Ulmus rubra	S	FAC	12.		
5. Ligustrum sinense	S	FAC	13.		
6. Saururus cernuus	H	OBL	14.		
7. Carex spp.	H	—	15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-) 6/6

Remarks:
Hardwood floodplain of Middle Creek

HYDROLOGY

___Recorded Data (Describe in Remarks):
- ___Stream, Lake or Tide Gauge
- ___Aerial Photographs
- ___Other

X No Recorded Data Available

Field Observations:
- Depth of Surface Water: 0 (in.)
- Depth to Free Water in Pit: 18+ (in.)
- Depth to Saturated Soil: 12 (in.)

Wetland Hydrology Indicators:
Primary Indicators:
- ___Inundated
- ___Saturated in Upper 12 Inches
- ___Water Marks
- ___Drift Lines
- X Sediment Deposits
- ___Drainage Patterns in Wetlands

Secondary Indicators (2 or more required):
- ___Oxidized Root Channels in Upper 12 Inches
- X Water-Stained Leaves
- ___Local Soil Survey Data
- ___FAC-Neutral Test
- ___Other (Explain in Remarks)

Remarks:
Hydrology indicators met

SOILS

Map Unit Name (Series and Phase): Wehadkee and Bibb Soils Drainage Class: Poorly

Taxonomy (Subgroup): Fluvaquentic Haplaquepts/Typic Haplaquepts Field Observations Confirm Mapped Type: Yes (No)

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-7		10YR 4/2	7.5YR 5/6	Common, distinct	Clay loam
7-18+		10YR 5/1	5YR 4/6	Common, distinct	Clay

Hydric Soil Indicators:

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

Remarks:

Hydric soils present

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	(Yes) No (Circle)	(Circle)
Wetland Hydrology Present?	(Yes) No	
Hydric Soils Present?	(Yes) No	Is this Sampling Point Within a Wetland? (Yes) No

Remarks:

Approved by HQUSACE 2/92

HJL
8/93

WA 1-55
WB 1-13

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

Project/Site: B-3916 Middle Creek	Date: 5/3/01
Applicant/Owner: NCDOT	County: Wake
Investigator: EST	State: NC
Do Normal Circumstances exist on the site? (Yes) No	Community ID: Hardwood
Is the site significantly disturbed (Atypical Situation)? Yes (No)	Transect ID: WA-1/WB-1
Is the area a potential Problem Area? Yes (No)	Plot ID: upland
(If needed, explain on reverse	

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Liquidambar styraciflua	S	FAC+	9.		
2. Liriodendron tulipifera	S	FAC	10.		
3.			11.		
4. Rubus argutus	H	FACU+	12.		
5.			13.		
6. Campsis radicans	V	FAC	14.		
7. Toxicodendron radicans	V	FAC	15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-) 4/5

Remarks:
Successional area

HYDROLOGY

__Recorded Data (Describe in Remarks):
- __Stream, Lake or Tide Gauge
- __Aerial Photographs
- __Other

X No Recorded Data Available

Field Observations:
- Depth of Surface Water: 0 (in.)
- Depth to Free Water in Pit: >18 (in.)
- Depth to Saturated Soil: >18 (in.)

Wetland Hydrology Indicators:
Primary Indicators:
- __Inundated
- __Saturated in Upper 12 Inches
- __Water Marks
- __Drift Lines
- __Sediment Deposits
- __Drainage Patterns in Wetlands

Secondary Indicators (2 or more required):
- __Oxidized Root Channels in Upper 12 Inches
- __Water-Stained Leaves
- __Local Soil Survey Data
- __FAC-Neutral Test
- __Other (Explain in Remarks)

Remarks:
No indicators met

SOILS

Map Unit Name (Series and Phase): Wehadkee and Bibb Soils Drainage Class: Poorly

Field Observations

Taxonomy (Subgroup): Fluventic Haplaquepts / Typic Haplaquepts Confirm Mapped Type: Yes (No)

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-5		10YR 5/6	—	—	Clay loam
5-14		2.5Y 5/3	5YR 5/8	common, distinct	Clay
14-18+		10YR 5/1	5YR 4/6	common, distinct	Clay

Hydric Soil Indicators:

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

Remarks:

Non-hydric soils present

WETLAND DETERMINATION

Hydrophytic Vegetation Present? (Yes) No (Circle)

Wetland Hydrology Present? Yes (No)

Hydric Soils Present? Yes (No)

Is this Sampling Point Within a Wetland? (Circle) Yes (No)

Remarks:

Approved by HQUSACE 2/92

HJL
8/93

WAKE COUNTY PUBLIC SCHOOL SYSTEM

Bill McNeal
Superintendent

September 4, 2001

Mr. Gerald H. Knott
Department of Public Instruction
Section Chief, School Planning
301 North Wilmington Street
Raleigh, North Carolina 27601 - 2825

Dear Mr. Knott:

Impact to school sites and school bus routes by bridge replacement, B-3916 would be minimal provided a temporary structure is used to maintain four lanes of travel. As for bridge replacement, B-4299, school bus routes would be impacted by adding five minutes in each direction if an off-site detour is used.

Thank you for soliciting our input.

Sincerely,

William R. McNeal, Jr.

1/15/02 Telephone Call—
Wake County Schools
Transportation
Vern Hatley
B-3916 20 busses each way.
B-4299 10X2 = 20 busses per day.
(Old Stage)

3600 Wake Forest Road • P.O. Box 28011 • Raleigh, North Carolina 27611-8011 • Telephone (919) 850-1606 • Fax (919) 850-8952

Elderly

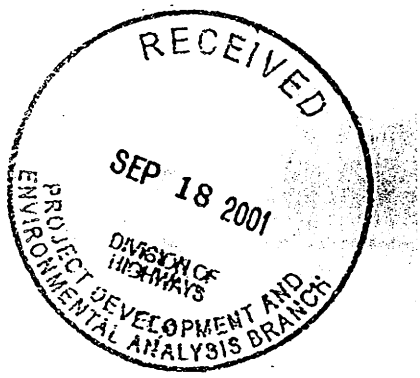
Public Schools of North Carolina

State Board of Education
Phillip J. Kirk, Jr., Chairman

www.ncpublicschools.org

Department of Public Instruction
Michael E. Ward, State Superintendent

SEP 18 2001



September 17, 2001

B- 3916
B-4299

MEMORANDUM

TO: William D. Gilmore, P.E., Manager

FROM: Gerald H. Knott, Section Chief, School Planning GHK

SUBJECT: Replace Bridge No. 63 on US 401 over Middle Creek
Replace Bridge No. 255 on SR 1006 over Creek

Enclosed is the response from Wake County Schools to our impact inquiry.

/ed
Enclosure

301 N. Wilmington Street, Raleigh, North Carolina 27601-2825
Telephone (919) 807-3300

North Carolina Wildlife Resources Commission

Charles R. Fullwood, Executive Director

TO: Theresa Ellerby
Project Development Engineer, NCDOT

FROM: David Cox, Highway Project Coordinator
Habitat Conservation Program

DATE: October 8, 2001

SUBJECT: NCDOT Bridge Replacements in Franklin and Wake counties of North Carolina. TIP Nos. B-4515, B-3916, and B-4299.

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).

On bridge replacement projects of this scope our standard recommendations 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

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

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. Tim Savidge 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.

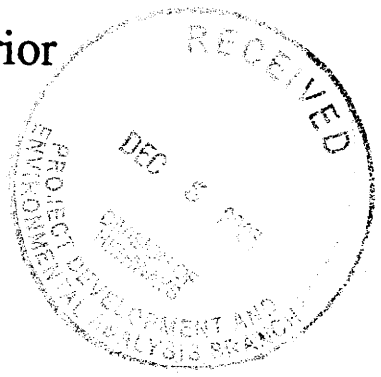
16. During subsurface investigations, equipment should be inspected daily and maintained to prevent contamination of surface waters from leaking fuels, lubricants, hydraulic fluids, or other toxic materials.

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

1. The culvert must be designed to allow for fish passage. Generally, this means that the culvert or pipe invert is buried at least 1 foot below the natural stream bed. If multiple cells are required the second and/or third cells should be placed so that their bottoms are at stream bankful stage (similar to Lyonsfield design). This could be

United States Department of the Interior

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



December 3, 2003

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

Dear Dr. Thorpe:

This letter is in response to your letter of November 20, 2003 which provided the U.S. Fish and Wildlife Service (Service) with the biological conclusion of the North Carolina Department of Transportation (NCDOT) that the replacement of Bridge No. 63 over Middle Creek in Wake County (TIP No. B-3916) may affect, but is not likely to adversely affect the federally-threatened bald eagle (*Haliaeetus leucocephalus*). These comments are provided in accordance with section 7 of the Endangered Species Act (ESA) of 1973, as amended (16 U.S.C. 1531-1543).

According to the information you submitted, surveys were conducted for bald eagle nests within a 1.0 mile radius of the project site on November 4 and 12, 2003. No nests or bald eagles were observed. Based on the negative survey results, the Service concurs with your conclusion that the proposed bridge replacement may affect, but is not likely to adversely affect the bald eagle. We believe that the requirements of section 7 (a)(2) of the ESA have been satisfied for this species. We remind you that obligations under section 7 consultation must be reconsidered if: (1) new information reveals impacts of this identified action that may affect listed species or critical habitat in a manner not previously considered in this review; (2) this action is subsequently modified in a manner that was not considered in this review; or (3) a new species is listed or critical habitat determined that may be affected by this identified action.

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

Sincerely,

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

cc: Eric Alsymeyer, USACE, Raleigh, NC
David Franklin, USACE, Wilmington, NC
John Hennessy, NCDWQ, Raleigh, NC
Travis Wilson, NCWRC, Creedmoor, NC
Chris Militscher, USEPA, Raleigh, NC

accomplished by constructing a low sill on the upstream end of the other cells that will divert low flows to another cell. This will allow sufficient water depth in the culvert or pipe during normal flows to accommodate fish movements. If culverts are long, notched baffles should be placed in reinforced concrete box culverts at 15 foot intervals to allow for the collection of sediments in the culvert, to reduce flow velocities, and to provide resting places for fish and other aquatic organisms moving through the structure.

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 so that no channel realignment or widening is required. Widening of the stream channel at the inlet or outlet of structures usually causes a decrease in water velocity causing sediment deposition that will require future maintenance.

4. Riprap should not be placed on the stream bed.

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 that is reclaimed was previously wetlands, NCDOT should restore the area to wetlands. If successful, the site may be used as wetland mitigation for the subject project or other projects in the watershed.

Project specific comments:

1. B-4515 – Franklin County – Bridge No. 40 over Bear Swamp Creek. There are records of state and federally listed mussels in the project vicinity. Therefore, due to the potential for impacts to listed species we request that NCDOT perform a mussel survey prior to the construction of this bridge. Standard comments apply.

2. B-3916 – Wake County – Bridge No. 63 over Middle Creek. There are also records of state listed mussels upstream of the project. Therefore, due to the potential for impacts to listed species we request that NCDOT perform a mussel survey prior to the construction of this bridge. Standard comments apply.

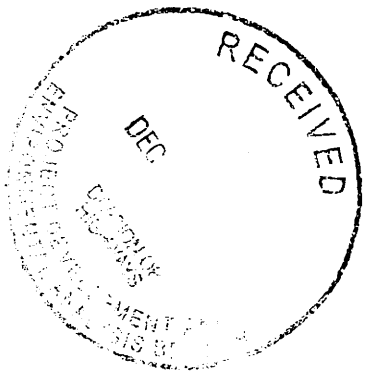
3. B-4299 – Wake County – Bridge No. 255 over unnamed Creek. Standard comments apply. We are not aware of any threatened of endangered species in the project vicinity.

We request that NCDOT routinely minimize adverse impacts to fish and wildlife resources in the vicinity of bridge replacements. The 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, reducing habitat fragmentation and vehicle related mortality at highway crossings.

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.

United States Department of the Interior

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



December 8, 2003

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

Dear Dr. Thorpe:

This letter is in response to your letter of December 3, 2003 which provided the U.S. Fish and Wildlife Service (Service) with the biological conclusion of the North Carolina Department of Transportation (NCDOT) that the proposed replacement of Bridge No. 63 on US 401 over Middle Creek in Wake County (TIP No. B-3916) may affect, but is not likely to adversely affect the federally-endangered dwarf wedgemussel (*Alasmidonta heterodon*). These comments are provided in accordance with section 7 of the Endangered Species Act (ESA) of 1973, as amended (16 U.S.C. 1531-1543).

According to the information you submitted, a mussel survey was conducted on November 4, 2003. The survey extended 400 meters downstream of the US 401 crossing. No dwarf wedgemussels were observed. It is understood that this stretch of stream has been heavily impacted by human activity upstream, as evidenced by the strong effluent odor reported in the survey report. Based on the negative survey results, the Service concurs with your conclusion that the proposed bridge replacement may affect, but is not likely to adversely affect the dwarf wedgemussel. We believe that the requirements of section 7 (a)(2) of the ESA have been satisfied for this species. We remind you that obligations under section 7 consultation must be reconsidered if: (1) new information reveals impacts of this identified action that may affect listed species or critical habitat in a manner not previously considered in this review; (2) this action is subsequently modified in a manner that was not considered in this review; or (3) a new species is listed or critical habitat determined that may be affected by this identified action.

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

Sincerely,

for Tom Hoggard

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

cc: Eric Alsymeyer, USACE, Raleigh, NC
David Franklin, USACE, Wilmington, NC
John Hennessy, NCDWQ, Raleigh, NC
Travis Wilson, NCWRC, Creedmoor, NC
Chris Militscher, USEPA, Raleigh, NC