



STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION

MICHAEL F. EASLEY  
GOVERNOR

LYNDO TIPPETT  
SECRETARY

October 26, 2007

U. S. Army Corps of Engineers  
Regulatory Field Office  
6508 Falls of the Neuse Road  
Suite 120  
Raleigh, NC 27615

ATTN: Mr. John Thomas  
NCDOT Coordinator

Subject: **Nationwide Permit 23 and 33 Application** for the proposed replacement of Bridge No. 60 over the Dan River on NC 8 / 89 in Stokes County, Federal Aid Project No. BRSTP-008 (4), State Project No. 8.1641201, WBS Element: 33621.1.1, Division 9, TIP B-4281.

Dear Sir:

The North Carolina Department of Transportation (NCDOT) proposes to replace Bridge No. 60 over the Dan River on NC 8 / 89. It is proposed that the current bridge be replaced with a three span, 54-inch continuous steel plate girder bridge with 9-foot, 6-inch centers, 400-feet in length, there will be no bents in the water. The new bridge will have 12-foot travel lanes in both directions and will have 4-foot shoulders on each side. During construction traffic will be maintained on the existing bridge. Please find enclosed the pre-construction notification, permit drawings, and design plan sheets. A Categorical Exclusion (CE) was completed for this project in July 2005 and distributed shortly thereafter. Additional copies are available upon request.

**IMPACTS TO WATERS OF THE UNITED STATES**

General Description: The project is located in the Roanoke River Basin, subbasin 03-02-01 with a Hydrologic Unit Code of 03010103. The Dan River has a Division of Water Quality (DWQ) stream index number of 21-(8). A best usage classification of WS-V has been assigned to the Dan River. This reach of the Dan River has not been assigned the supplemental classification for Trout Waters (Tr). Buck Island Creek has a stream index of 22-14 and a best usage classification of Class C. There is one UT located on the south side of bridge. This UT has the same DWQ stream index and classification as the Dan River. There are no wetlands in the project area.

A Jurisdictional Determination (JD) field visit was conducted on May 1, 2007. It was determined in the field by the United States Army Corp of Engineers (USACE) that the Dan River would require mitigation at a 2:1 ratio, UT1 was intermittent, but contained stone flies and other perennial indicators and would require mitigation at 1:1 ratio, Buck Island Creek would require mitigation at a 2:1 ratio. This field visit was confirmed in a Jurisdictional Information Sheet dated May 3, 2007, Action Id. SAW20071592285.

No designated High Quality Waters (HQW), Outstanding Resource Waters (ORW), WS-I or WS-II waters occur within one-mile of the project area. The Dan River is not listed on the 2006 List of impaired waters [Section 303(d)] for the Roanoke River Basin nor does it drain into any 303(d) waters within 1-mile of the project area.

Permanent Impacts: Construction of the new bridge will require the use of Class II Rip Rap for bank stabilization along the banks of the Dan River. Construction of the new bridge will result in a total of 33-feet (0.02 acre) of permanent surface water impacts to the Dan River.

Temporary Impacts: There will be temporary impacts associated with the construction of Bridge No. 60. There will be 0.02 acres of temporary fill in the Dan River associated with the bents of two temporary work bridges. One temporary work bridge will be constructed to remove the existing bridge and one temporary work bridge will be constructed to set the girders for the new bridge. There will also be 0.02 acre of temporary impacts due to the use of two temporary negative pressure rings. The negative pressure rings will be used during the removal of the two existing bridge bents. The total temporary impacts will be 0.04 acre (70-linear feet).

Utility Impacts: The following utilities have been identified as being in conflict with the project.

Power line - Duke Energy has a three phase power line which runs parallel for the length of the project. The power line is supported by five poles that are located within the project limits. The power line will be removed by Duke Power and replaced at a later date. This action will not impact any jurisdictional areas.

Telephone – The existing aerial telephone cables which parallel NC 8 on the west side of the existing roadway will be raised on the existing Duke Energy poles. A buried fiber optic cable located on the south side of NC 89 will be lowered beneath the existing ditch line within existing right of way. This work will have no impact on jurisdictional areas.

Bridge Demolition: Bridge No. 60 has a superstructure composed of reinforced concrete deck on reinforced concrete girders. The substructure consists of reinforced concrete abutments and interior bents. The existing bridge has an overall length of 315-feet and is 20-feet wide. Two temporary negative pressure rings will be used during to removal of the two existing bridge bents that are located in the Dan River. North Carolina Department of Transportation's Guidelines for Best Management Practices for the Protection of Surface Waters, Design Standards for Sensitive Watersheds, Erosion and Sediment Control Guidelines for Contract Construction, and Best Management Practices for Bridge Demolition and Removal will be followed. The bridge will be removed without dropping any components into waters of the United States. NCDOT's Best Management Practices for Bridge Demolition and Removal will be followed.

## RESTORATION PLAN

Following construction, all material used in the construction of the new bridge as well as the detour bridge will be removed. The impacted areas associated with the bridge are expected to recover naturally, since the natural streambed and plant material will not be effected. Pre-project elevations will be restored. NCDOT will replant the area along the stream bank of Buck Island Creek with appropriate vegetation. All disturbed areas will be brought back to their pre-project contours.

## REMOVAL AND DISPOSAL PLAN

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

## FEDERALLY PROTECTED SPECIES

Plants and animals with federal classifications of Endangered, Threatened, Proposed Endangered and Proposed Threatened are protected under provisions of Section 7 and Section 9 of the Endangered Species Act of 1973, as amended. As of May 10, 2007, the United States Fish and Wildlife Service (USFWS) lists three federally protected species for Stokes County. Table 1 lists the species, their status and biological conclusion.

**Table 1. Federally-Protected Species for Stokes County, NC**

<b>Common Name</b>	<b>Scientific Name</b>	<b>Federal Status</b>	<b>Habitat Present</b>	<b>Biological Conclusion</b>
James spiny mussel	<i>Pleurobema collina</i>	E	Yes	May Affect - Not Likely to Adversely Affect
Schweinitz's sunflower	<i>Helianthus schweinitzii</i>	E	Yes	No Effect
Small-anthered bittercress	<i>Cardamine micranthera</i>	E	Yes	May Affect - Not Likely to Adversely Affect

Descriptions and biological conclusions for each of these species were presented in the CE. A biological conclusion of "No Effect" was rendered for Schweinitz's sunflower and small-anthered bittercress. A biological conclusion of "May Affect" was rendered for James spiny mussel (JSM) since it is known to be present in the project area.

Small-anthered bittercress (*Cardamine micranthera*) has a status of Federally Endangered. The North Carolina Natural Heritage database of rare species and unique habitats was

reviewed on October 22, 2007. There is documentation of rare species found within 2 miles of the project study area (small-anthered bittercress and the James spinymussel).

A survey was conducted for Schweinitz's sunflower (September 13, 2007). No Schweinitz's sunflower was found during the September 2007 survey.

A survey was conducted for small-anthered bittercress (May 24, 2006) since the CE document stated that potentially suitable habitat exists within the project study. Two locations of small-anthered bittercress were found in Buck Island Creek during the field visit on May 24, 2006. The locations are approximately 425 feet and 265 feet from the confluence of Buck Island Creek and the Dan River. Buck Island creek flows into the Dan River approximately 200 feet downstream from the current bridge.

A formal Section 7 meeting was held at the project site with NCDOT, USFWS and WRC personnel on Monday October 2, 2006 to discuss the James spinymussel and the small-anthered bittercress. At that time it was determined that the biological conclusion for small-anthered bittercress be changed from "No Effect" to "May Affect-Not Likely to Adversely Affect".

JSM individuals were observed in the vicinity of the proposed bridge replacement and both upstream and downstream of the project area in 2001, 2006 and 2007. The NCDOT Biosurveys Group will conduct a pre-construction survey and relocation of mussels in the project footprint will reduce the possibility of direct mortality of JSM. Measures will be incorporated by NCDOT to avoid/minimize effects to the Dan River and potential habitat for the JSM. A complete list of these measures can be found in the Biological Assessment (BA). Strict implementation of these measures will ensure that the effects will be minimal and temporary wherever possible.

The unavoidable effects of bridge construction are expected to adversely affect existing JSM in the Dan River immediately downstream of the project area, but these effects are anticipated to be temporary and sublethal. Effects caused by bridge construction are not likely to prevent the re-colonization of JSM into the action area in the future. Therefore, the biological conclusion for the James spinymussel should be changed from "May Affect" to "May Affect-Not Likely to Adversely Affect".

A Final BA and Biological Opinion (BO) will be submitted to the USACE when completed.

## **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:



### Avoidance/Minimization:

- Bridge No. 60 will span the Dan River.
- In-stream activity will be limited only to the areas shown on the plan sheets.
- Removal of the existing bents will take place when water flow level is at a minimum point allowable within the project schedule and will be done in such a manner to minimize disturbance to the streambed.
- Deck drains will not be allowed to discharge directly into stream.
- A preformed scour hole is to be located on the northwest side of the Dan River.
- The use of temporary work bridges in lieu of causeways to construct proposed bridge.
- Temporary construction impacts due to erosion and sedimentation will be minimized through implementation of stringent erosion control methods and use of Best Management Practices (BMPs).
- Design Standards for Sensitive Watersheds will be used.
- The existing bridge will serve as an on-site detour during construction of the new bridge.
- The area along the bank of Buck Island Creek will be protected during construction and no access will be allowed in this area.
- The Contractor may perform clearing operations, but not grubbing operations until immediately prior to beginning grading operations.
- Stilling basins will be used to hold water impacted by bridge construction activities. The stilling basins will be located upgradient and on the southwest side of the project area.

Compensatory Mitigation: No compensatory mitigation is proposed for the 33-feet of stream impacts because the impacts are for bank stabilization and there will be no loss of aquatic use to the Dan River.

### **MORATORIUM**

In an email dated October 20, 2006, the North Carolina Wildlife Resource Commission (NCWRC) requested a moratorium for the Dan River from February 1 to June 30 to protect the spawning periods for sensitive non-game fish species that are present. Also, in the Section 7 Consultation field meeting on August 1, 2007, and in a follow up email the NCWRC recommended an in-water work moratorium to protect smallmouth bass, sunfish, and other listed species in the project area. However, these species are not afforded federal or state protection in Waters of the U.S in NC. Additionally, the in-water construction phase of the proposed project will not significantly affect the above mentioned fish species. In fact, imposing a moratorium for these species will result an increase of \$327,000 in construction costs and at least a 6 month delay of the project completion, resulting in a longer sustained effect on the environment. Therefore, the NCDOT does not believe this moratorium is warranted and does not propose to adhere to it.

### **SCHEDULE**

The project calls for a letting of April 15, 2008 with a date of availability of May 27, 2008. Permits are needed by the review date of February 26, 2008. It is expected that the contractor will choose to start construction as soon as possible.

## REGULATORY APPROVALS

Section 404 Permit: The project is being processed by the Federal Highway Administration as a "Categorical Exclusion" in accordance with 23 CFR 771.115(b). The NCDOT requests that these activities be authorized by a Nationwide Permit 23 (Federal Register Vol. 72, No. 47 Pages 11092-11198, March 12, 2007). It is anticipated that the temporary impacts will be authorized under Section 404 Nationwide Permit 33 for the temporary work bridges and negative pressure rings. We are therefore also requesting the issuance of a Nationwide Permit 33.

Section 401 Permit: We anticipate General Certification numbers 3632 and 3334 will apply to this project. All general conditions of the Water quality Certifications will be met. Therefore, in accordance with 15A NCAC 2H, Section .0500(a) and 15A NCAC 2B.0200 we are providing two copies of this application to the North Carolina Department of Environmental and Natural Resources, Division of Water Quality, for their notification.

Comments from the North Carolina Wildlife Resources Commission (NCWRC) will be required prior to authorization by the Corps of Engineers. By copy of this letter and attachment, NCDOT hereby requests NCWRC review. NCDOT requests that NCWRC forward their comments to the Corps of Engineers and the NCDOT within 30 calendar days of receipt of this application.

Thank you for your time and assistance with this project. Please contact Sara Easterly at (919) 715-5499 if you have any questions or need any additional information.

Sincerely,



Gregory J. Thorpe, Ph.D.

Environmental Management Director, PDEA

### w/attachment

Mr. John Hennessy, NCDWQ (2 copies)  
Ms. Marla Chambers, NCWRC  
Mr. Mark Staley, Roadside Environmental  
Mr. Victor Barbour, P.E., Project Services Unit  
Mr. Kent Boyer, DEO

Ms. Marella Buncick, USFWS  
Dr. David Chang, P.E., Hydraulics  
Mr. Greg Perfetti, P.E, Structure Design  
Mr. S. P. Ivey, P.E., Division Engineer

### w/o attachment

Mr. Scott McLendon, USACE, Wilmington  
Mr. Jay Bennett, P.E., Roadway Design  
Mr. Majed Alghandour, P.E., Programming and TIP  
Mr. Art McMillan, P.E., Highway Design

Mr. Wade Kirby, PDEA Engineer

Office Use Only:

Form Version March 05

USACE Action ID No. \_\_\_\_\_

DWQ No. \_\_\_\_\_

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

## I. Processing

1. Check all of the approval(s) requested for this project:

☒ Section 404 Permit

☐

Riparian or Watershed Buffer Rules

☐ Section 10 Permit

☐

Isolated Wetland Permit from DWQ

☐ 401 Water Quality Certification

☐

Express 401 Water Quality Certification

2. Nationwide, Regional or General Permit Number(s) Requested: \_\_\_\_\_ NW 23 & NW 33 \_\_\_\_\_

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

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

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

## II. Applicant Information

1. Owner/Applicant Information

Name: \_\_\_\_\_ Gregory J. Thorpe, Ph.D., Environmental Management Director \_\_\_\_\_

Mailing Address: \_\_\_\_\_ North Carolina Department of Transportation (NCDOT) \_\_\_\_\_

\_\_\_\_\_ Project Development and Environmental Analysis \_\_\_\_\_

\_\_\_\_\_ 1598 Mail Service Center \_\_\_\_\_

\_\_\_\_\_ Raleigh, NC 27699-1598 \_\_\_\_\_

Telephone Number: \_\_\_\_\_ 919-733-3141 \_\_\_\_\_

Fax Number: \_\_\_\_\_ 919-733-9794 \_\_\_\_\_

E-mail Address: \_\_\_\_\_ gthorpe@dot.state.nc.us \_\_\_\_\_

2. Agent/Consultant Information (A signed and dated copy of the Agent Authorization letter must be attached if the Agent has signatory authority for the owner/applicant.)

Name: \_\_\_\_\_

Company Affiliation: \_\_\_\_\_

Mailing Address: \_\_\_\_\_

Telephone Number: \_\_\_\_\_

Fax Number: \_\_\_\_\_

E-mail Address: \_\_\_\_\_

## III. Project Information

Attach a **vicinity map** clearly showing the location of the property with respect to local landmarks such as towns, rivers, and roads. Also provide a detailed **site plan** showing property boundaries and development plans in relation to surrounding properties. Both the vicinity map and site plan must include a scale and

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

1. Name of project: Replacement of Bridge No. 60 on NC 8 / 89 over the Dan River
2. T.I.P. Project Number or State Project Number (NCDOT Only): B-4281
3. Property Identification Number (Tax PIN): \_\_\_\_\_
4. Location  
County: Stokes Nearest Town: Danbury  
Subdivision name (include phase/lot number): NA  
Directions to site (include road numbers/names, landmarks, etc.): Highway 40 West to Exit 210, Highway 68 to Highway 65 to Highway 311 to Highway 8 / 89.
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): 36° 25' 59" °N 80° 14' 33" °W
6. Property size (acres): Total project length is 0.275 miles
7. Name of nearest receiving body of water: Dan River
8. River Basin: Roanoke  
(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: Project area is located in a rural community with the surrounding area being comprised mainly of agricultural land.
10. Describe the overall project in detail, including the type of equipment to be used: Bridge No. 60 will be replaced north of the existing bridge with the existing bridge acting as an on-site detour during construction of the new bridge. Heavy 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: Bridge No. 60 has a sufficiency rating of 42.6 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 more efficient traffic operations.

#### IV. Prior Project History

If jurisdictional determinations and/or permits have been requested and/or obtained for this project (including all prior phases of the same subdivision) in the past, please explain. Include the USACE Action ID Number, DWQ Project Number, application date, and date permits and certifications were issued or

withdrawn. Provide photocopies of previously issued permits, certifications or other useful information. Describe previously approved wetland, stream and buffer impacts, along with associated mitigation (where applicable). If this is a NCDOT project, list and describe permits issued for prior segments of the same T.I.P. project, along with construction schedules. A Jurisdictional Determination Field Visit was conducted on May 1, 2007 with the U.S. Army Corps of Engineers. Only a verbal agreement was given at that time.

## 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.

There are no future permit requests anticipated for this project.

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

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

1. Provide a written description of the proposed impacts: See cover letter

3. 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)
NA					
NA					
NA					
NA					
Total Wetland Impact (acres)					NA

4. List the total acreage (estimated) of all existing wetlands on the property: NA

5. 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 and then divide by 43,560.

Stream Impact Number (indicate on map)	Stream Name	Type of Impact	Perennial or Intermittent?	Average Stream Width Before Impact	Impact Length (linear feet)	Area of Impact (acres)
Site 1	Dan River	Temporary Work Bridge	Perennial	130	20	0.01
Site 2	Dan River	Permanent Bank Stabilization	Perennial	130	33	0.02
Site 3	Dan River	Temporary Negative Pressure Ring	Perennial	130	30	0.02
Site 4	Dan River	Temporary Work Bridge	Perennial	130	20	0.01
Total Stream Impact (by length and acreage)					103	0.06

6. 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)
NA	NA	NA	NA	0.00
NA	NA	NA	NA	0.00
NA	NA	NA	NA	0.00
Total Open Water Impact (acres)				NA

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

Stream Impact (acres):	0.06
Wetland Impact (acres):	0.00
Open Water Impact (acres):	0.00
Total Impact to Waters of the U.S. (acres)	0.06
Total Stream Impact (linear feet):	103.00

8. 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.

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9. 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. See cover letter.

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**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/newetlands/strmgide.html>.

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

No proposed mitigation.

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

Amount of stream mitigation requested (linear feet): \_\_\_\_\_

Amount of buffer mitigation requested (square feet): \_\_\_\_\_

Amount of Riparian wetland mitigation requested (acres): \_\_\_\_\_

Amount of Non-riparian wetland mitigation requested (acres): \_\_\_\_\_

Amount of Coastal wetland mitigation requested (acres): \_\_\_\_\_

#### **IX. Environmental Documentation (required by DWQ)**

1. Does the project involve an expenditure of public (federal/state/local) funds or the use of public (federal/state) land? Yes ☒ No ☐
2. If yes, does the project require preparation of an environmental document pursuant to the requirements of the National or North Carolina Environmental Policy Act (NEPA/SEPA)? Note: If you are not sure whether a NEPA/SEPA document is required, call the SEPA coordinator at (919) 733-5083 to review current thresholds for environmental documentation.  
Yes ☒ No ☐
3. If yes, has the document review been finalized by the State Clearinghouse? If so, please attach a copy of the NEPA or SEPA final approval letter. Yes ☒ No ☐

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

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

1. Will the project impact protected riparian buffers identified within 15A NCAC 2B .0233 (Neuse), 15A NCAC 2B .0259 (Tar-Pamlico), 15A NCAC 02B .0243 (Catawba) 15A NCAC 2B .0250 (Randleman Rules and Water Supply Buffer Requirements), or other (please identify \_\_\_\_\_)? Yes ☐ No ☒
2. If "yes", identify the square feet and acreage of impact to each zone of the riparian buffers. If buffer mitigation is required calculate the required amount of mitigation by applying the buffer multipliers.



Zone*	Impact (square feet)	Multiplier	Required Mitigation
1	NA		
2	NA		
Total	NA		

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

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

#### **XI. Stormwater (required by DWQ)**

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

#### **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. \_\_\_\_\_

#### **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)**

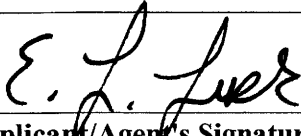
Will this project (based on past and reasonably anticipated future impacts) result in additional development, which could impact nearby downstream water quality? Yes ☐ No ☒

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).

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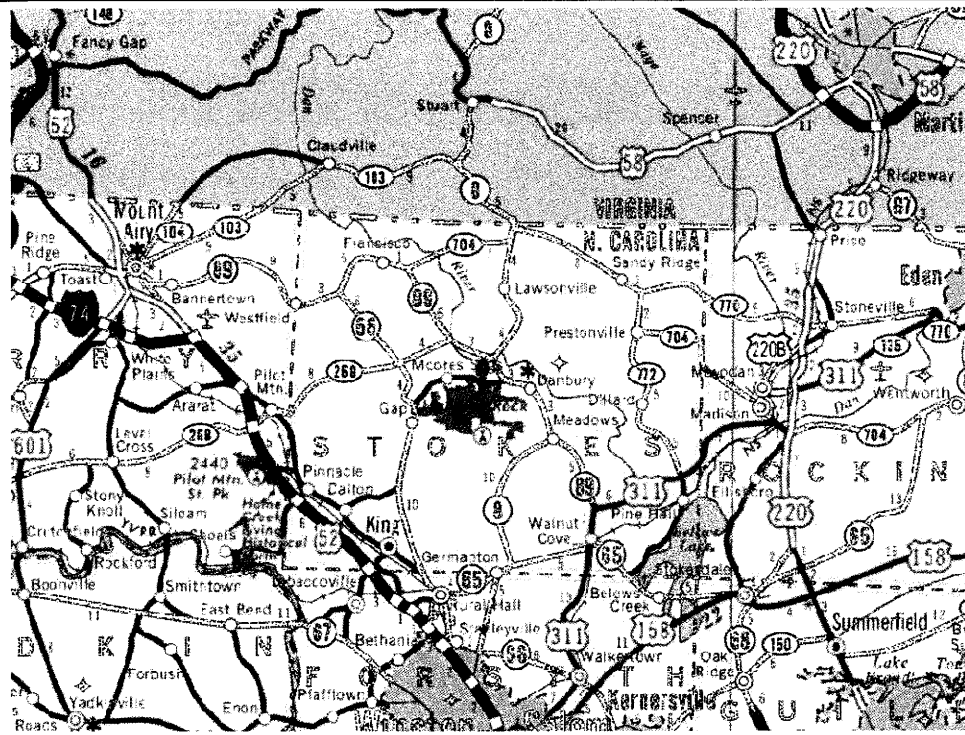
10.26.07

**Applicant/Agent's Signature**

**Date**

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

## A map of North Carolina showing its county boundaries. Wayne County, located in the western part of the state, is highlighted in black. A north arrow is positioned in the top left corner of the map.

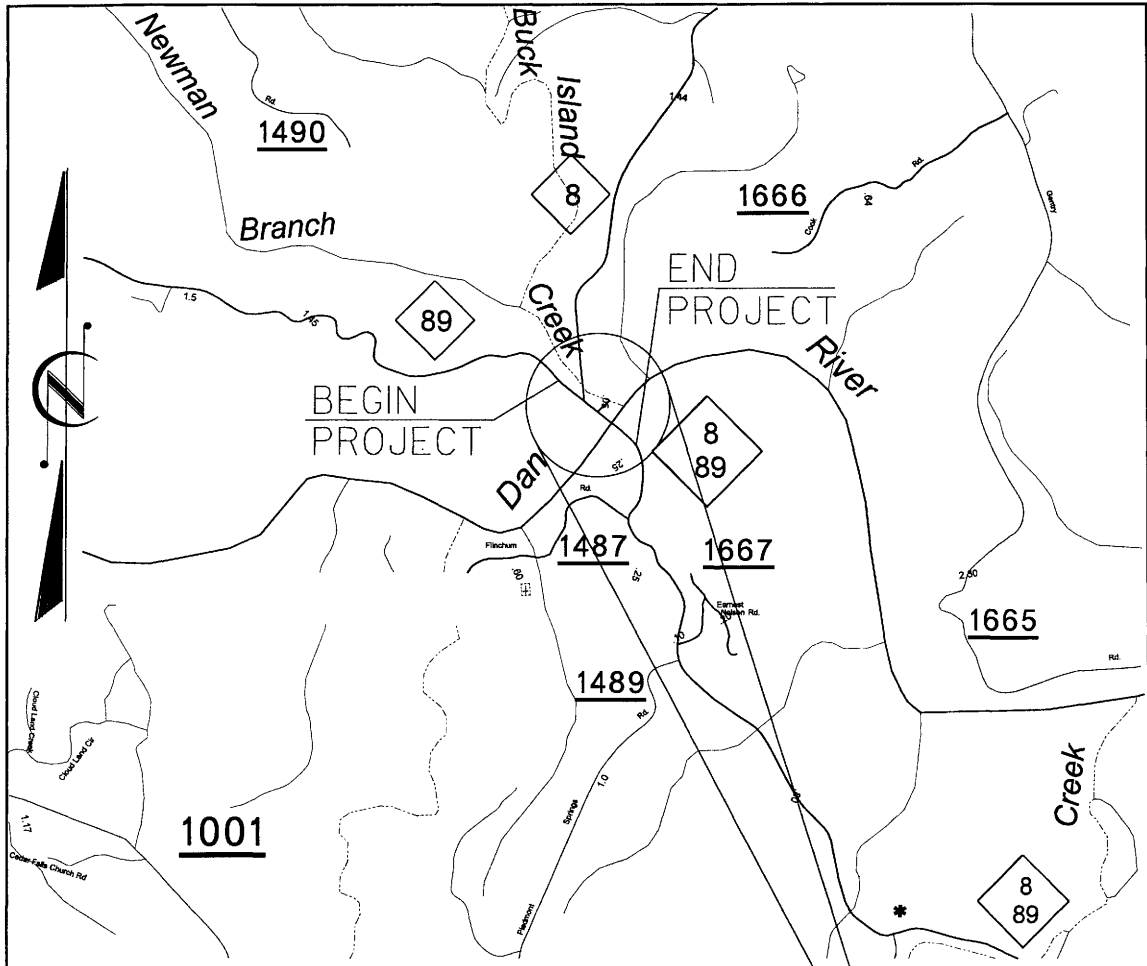


**NCDOT**  
**DIVISION OF HIGHWAYS**  
**STOKES COUNTY**  
**PROJECT: 33621.1.1 (B-4281)**  
**BRIDGE NO. 60 OVER**  
**DAN RIVER ON**  
**NC 8/89**

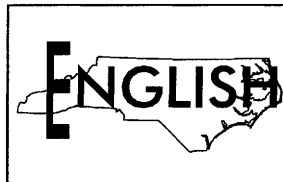
OF 9

2 / 13 / 07

# SITE MAP



SITE



**NCDOT**  
**DIVISION OF HIGHWAYS**  
**STOKES COUNTY**  
**PROJECT: 33621.1.1 (B-4281)**  
**BRIDGE NO. 60 OVER**  
**DAN RIVER ON**  
**NC 8 / 89**

## SUMMARY OF AFFECTED PROPERTY OWNERS

[illegible]

**NCDOT**  
**DIVISION OF HIGHWAYS**  
**STOKES COUNTY**  
**PROJECT: 33621.1.1 (B-4281)**  
**BRIDGE NO. 60 OVER**  
**DAN RIVER ON**  
**NC 8/89**





8 // 06 // 07

**PREFORMED SCOUR HOLE**

**DETAIL B**

**PLAN VIEW**

Plan view of the scour hole showing a square hole with a cross-hatched pattern. Labels include: "Pipe or Orific Outlet" with an arrow pointing to the hole, "Square Formed Scour Hole (PSH)" with an arrow pointing to the hole, "Rip Rap in bottom not shown (for clarity)", "Setback level and flush with natural ground" with an arrow pointing to the top right corner, and "PSH" with an arrow pointing to the hole.

**SECTION A-A**


Section view of the scour hole showing a cross-section. Labels include: "Pipe or Orific Outlet" with an arrow pointing to the hole, "PSH" with an arrow pointing to the hole, "Setback" with an arrow pointing to the distance from the hole to the right edge, "Rip" with an arrow pointing to the rip rap material, "tuck" with an arrow pointing to the tuck-in of the rip rap, and "Natural Ground" with an arrow pointing to the ground surface.


**Dimensions:**

- B = 4 Ft.
- D = 1 Ft.
- W = 4 Ft.
- d = 0.5 Ft.

**Notes:**

- Line B B: Rip Rap 1' thick with Filter Fabric

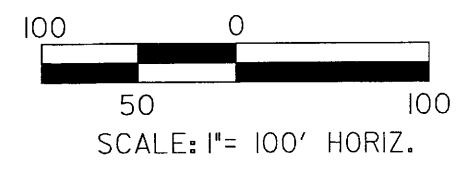
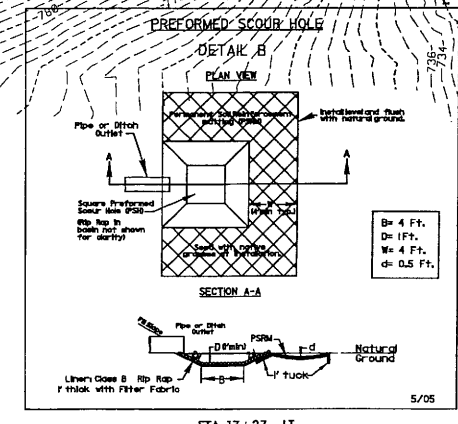
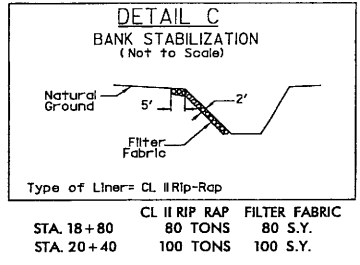
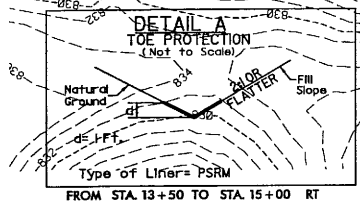
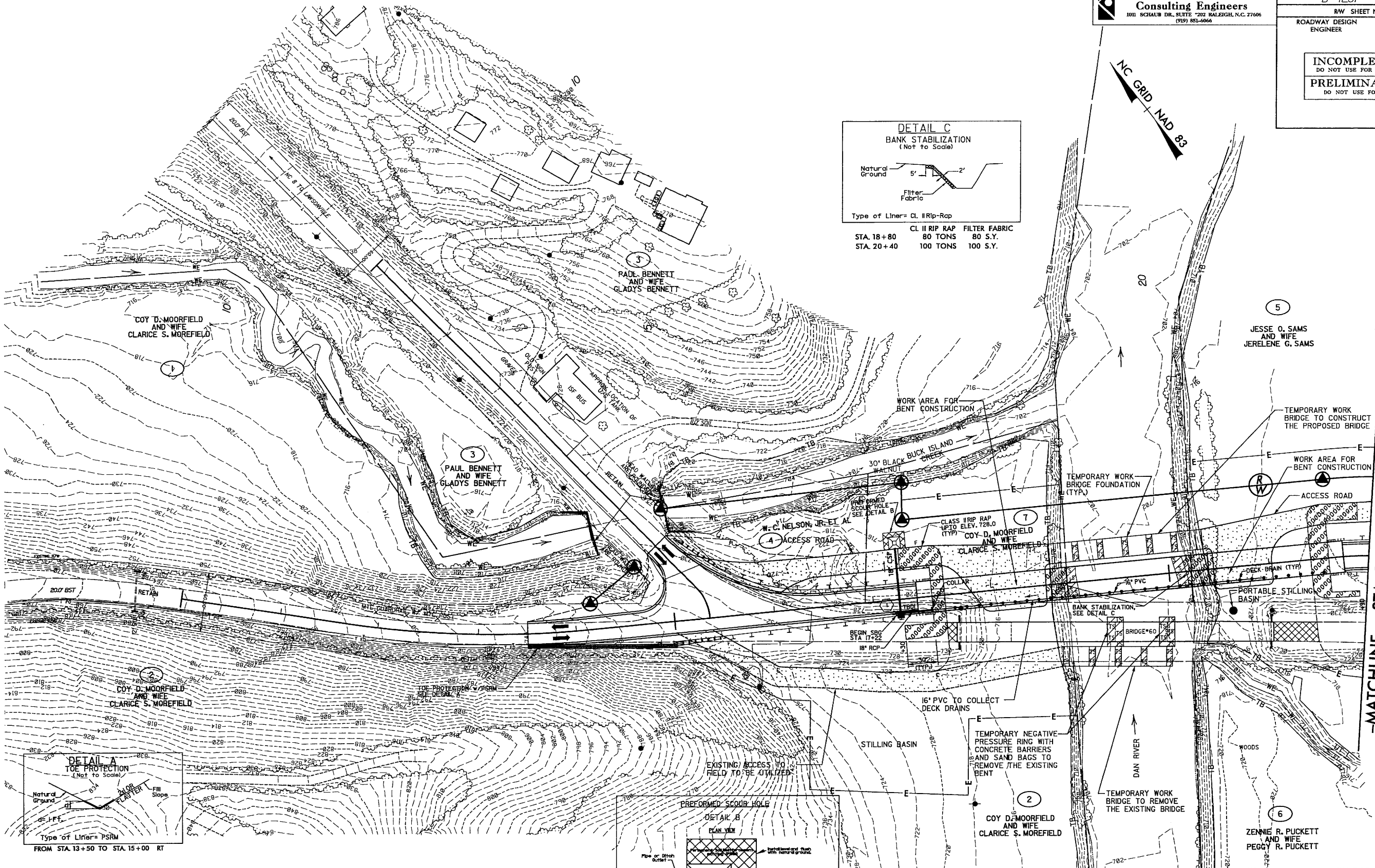
 DENOTES PERMANENT SURFACE WATER IMPACTS

 DENOTES TEMPORARY SURFACE WATER IMPACTS

5/14/99  
8/9/2007  
equics.dgn  
B4281 hyd.prm.wet.04.dgn

**KO & ASSOCIATES, P.C.**  
Consulting Engineers  
101 SCHUB DR., SUITE 202 RALEIGH, N.C. 27606  
(919) 851-6666

PROJECT REFERENCE NO. B-4281		SHEET NO. 4
RW SHEET NO.		
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER	
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION		
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION		



PLAN VIEW

LEGEND

- 5 5 DENOTES PERMANENT SURFACE WATER IMPACTS
- 15 15 DENOTES TEMPORARY SURFACE WATER IMPACTS

-MATCHLINE- STA. 22+00  
SEE SHEET NO. 5

**NCDOT**  
DIVISION OF HIGHWAYS  
STOKES COUNTY  
PROJECT: 33621.11 (B-4281)  
BRIDGE NO. 60 OVER  
DAN RIVER ON  
NC 8/89  
SHEET 6 OF 9 8/06/07





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

Natural Ground

Filter Fabric

Fill Slope

b

d

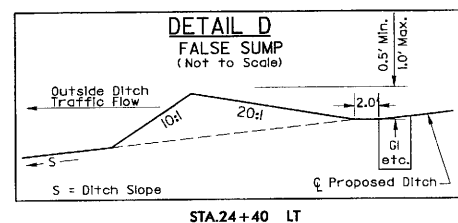
D

P/F.T.

Min. D= 1ft.  
 Max. d= 1ft.  
 b= 5 Ft.

Type of Liner= Class 'B' Rip-Rap

FROM STA. 22+70 TO STA. 23+80 LT



SCALE: 1"= 100' HORIZ.

SHEET 7 OF 9 5/23/07

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

Natural Ground

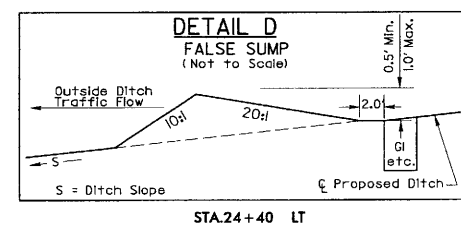
Filter Fabric

Min. D = 1 ft.  
 Max. d = 1 ft.  
 b = 5 ft.

Fill Slope

Type of Liner = Class 'B' Rip-Rap

FROM STA. 22+70 TO STA. 23+80 LT



100 0

50 100

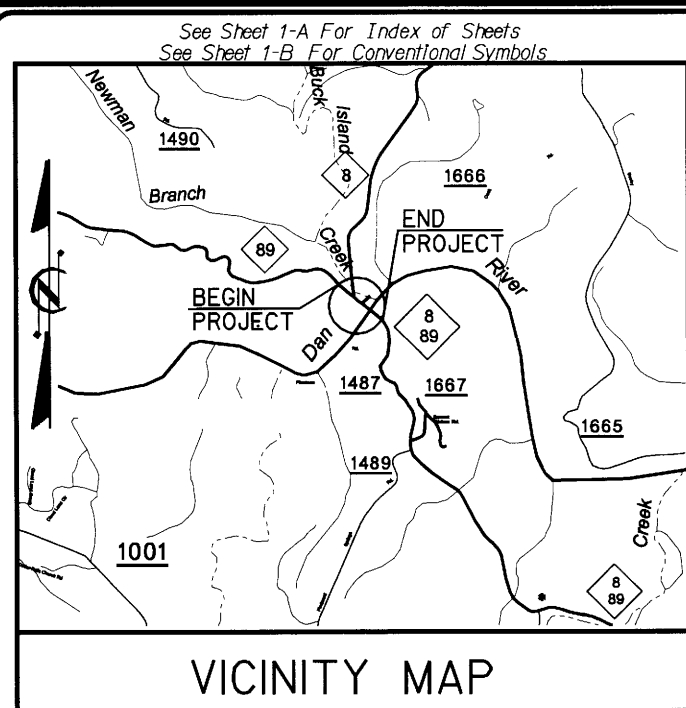
SCALE: 1"= 100' HORIZ.

SHEET 8 OF 9 5/23/07

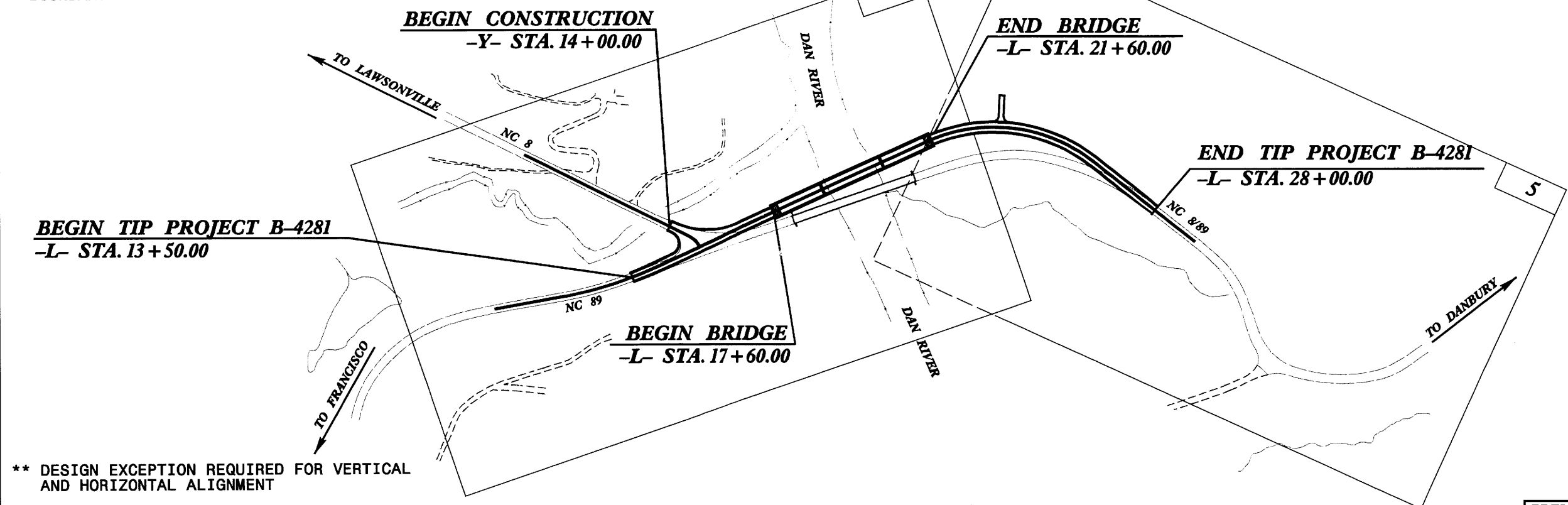


5/23/2007 R:\Roadway\Proj\B4281\_Rdy-1.sh.dgn KO & Associates, P.C.

CONTRACT: TIP PROJECT: B-4281



THIS PROJECT IS NOT WITHIN ANY MUNICIPAL BOUNDARY

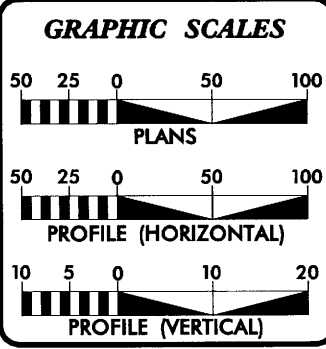
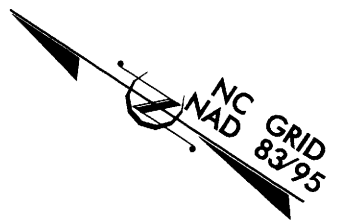


\*\* DESIGN EXCEPTION REQUIRED FOR VERTICAL AND HORIZONTAL ALIGNMENT

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

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

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-4281	1	
VEN. PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
33621.1.1	BRSTP-008(4)	P.E.	
33621.2.1	BRSTP-008(4)	R/W	



DESIGN DATA	
ADT 2008 =	3300
ADT 2028 =	5100
DHV =	10 %
D =	65 %
T =	3 % *
** V =	60 MPH
* TTST 1%	DUAL 2%

PROJECT LENGTH	
LENGTH ROADWAY TIP PROJECT B-4281	= 0.199 MI.
LENGTH STRUCTURE TIP PROJECT B-4281	= 0.076 MI.
TOTAL LENGTH OF TIP PROJECT B-4281	= 0.275 MI.

Prepared In the Office of:

**KO & ASSOCIATES, P.C.**  
Consulting Engineers  
1011 Schaub Dr., Suite 202, Raleigh NC 27606  
(919) 851-6066

2006 STANDARD SPECIFICATIONS

**RIGHT OF WAY DATE:**  
APRIL 20, 2007

**LETTING DATE:**  
APRIL 15, 2008

**STEPHEN R. WHITLEY, PE**  
PROJECT ENGINEER

**DAVID C. WALLER, PE**  
PROJECT DESIGN ENGINEER

**HYDRAULICS ENGINEER**

SIGNATURE: \_\_\_\_\_ P.E.

**ROADWAY DESIGN ENGINEER**

SIGNATURE: \_\_\_\_\_ P.E.

**DIVISION OF HIGHWAYS  
STATE OF NORTH CAROLINA**

SIGNATURE: \_\_\_\_\_ P.E.

**STATE DESIGN ENGINEER**

**DEPARTMENT OF TRANSPORTATION  
FEDERAL HIGHWAY ADMINISTRATION**

APPROVED DIVISION ADMINISTRATOR DATE

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	IP
Property Corner	
Property Monument	ECM
Parcel/Sequence Number	23
Existing Fence Line	X-X-X
Proposed Woven Wire Fence	○
Proposed Chain Link Fence	□
Proposed Barbed Wire Fence	◇
Existing Wetland Boundary	W.B.
Proposed Wetland Boundary	W.B.
Existing Endangered Animal Boundary	E.A.B.
Existing Endangered Plant Boundary	E.P.B.

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	
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	⊗
Proposed Right of Way Line with Iron Pin and Cap Marker	⊗ ▲
Proposed Right of Way Line with Concrete or Granite Marker	⊗
Existing Control of Access	⊗
Proposed Control of Access	⊗
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
Curb Cut for Future Wheel Chair Ramp	CCFR
Existing Metal Guardrail	T T T T
Proposed Guardrail	T T T T
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	⊗
Storm Sewer	S

UTILITIES:

POWER:	
Existing Power Pole	●
Proposed Power Pole	○
Existing Joint Use Pole	●
Proposed Joint Use Pole	○
Power Manhole	⊗
Power Line Tower	⊗
Power Transformer	⊗
U/G Power Cable Hand Hole	PH
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	⊗
Telephone Booth	⊗
Telephone Pedestal	⊗
Telephone Cell Tower	⊗
U/G Telephone Cable Hand Hole	PH
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	⊗
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	⊗
TV Tower	⊗
U/G TV Cable Hand Hole	PH
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:

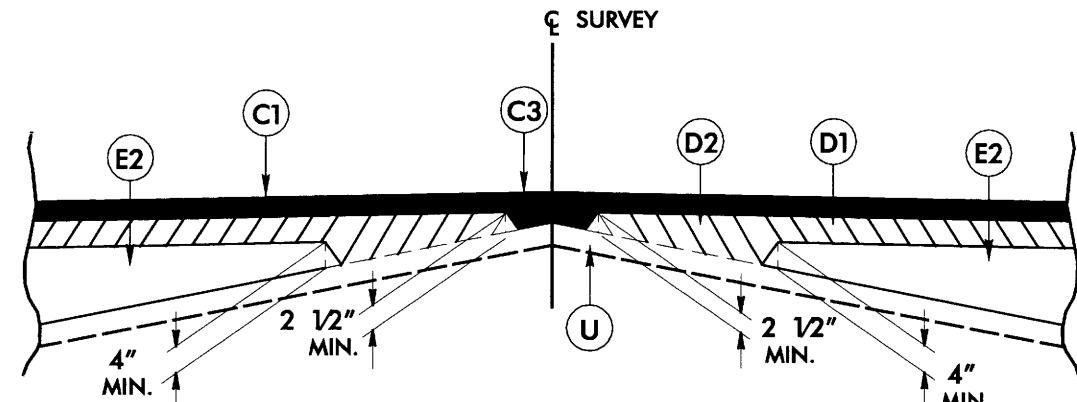
Sanitary Sewer Manhole	⊗
Sanitary Sewer Cleanout	⊗
U/G Sanitary Sewer Line	SS
Above Ground Sanitary Sewer	A/G Sanitary Sewer
Recorded SS Forced Main Line	FSS
Designated SS Forced Main Line (S.U.E.*)	FSS

MISCELLANEOUS:

Utility Pole	●
Utility Pole with Base	⊗
Utility Located Object	⊗
Utility Traffic Signal Box	⊗
Utility Unknown U/G Line	UTIL
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.

PAVEMENT SCHEDULE	
C1	PROP. APPROX. 1 1/4" ASPHALT CONCRETE SURFACE COURSE, TYPE SF9.5A, AT AN AVERAGE RATE OF 138 LBS. PER SQ. YD.
C2	PROP. APPROX. 2 1/2" ASPHALT CONCRETE SURFACE COURSE, TYPE SF9.5A, AT AN AVERAGE RATE OF 138 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.
C3	PROP. VAR. DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE SF9.5A, AT AN AVERAGE RATE OF 110 LBS. PER SQ. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NOT TO EXCEED 1 1/2" IN DEPTH.
D1	PROP. APPROX. 2 1/2" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0B, AT AN AVERAGE RATE OF 285 LBS. PER SQ. YD.
D2	PROP. VAR. DEPTH ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0B, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1" DEPTH, TO BE PLACED IN LAYERS NOT LESS THAN 2 1/2" IN DEPTH OR GREATER THAN 4" IN DEPTH.
E1	PROP. APPROX. 4" ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.
E2	PROP. VAR. DEPTH ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NOT LESS THAN 3" IN DEPTH OR GREATER THAN 5 1/2" IN DEPTH.
U	EXISTING PAVEMENT.
T	EARTH MATERIAL.
W	VARIABLE DEPTH ASPHALT PAVEMENT

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



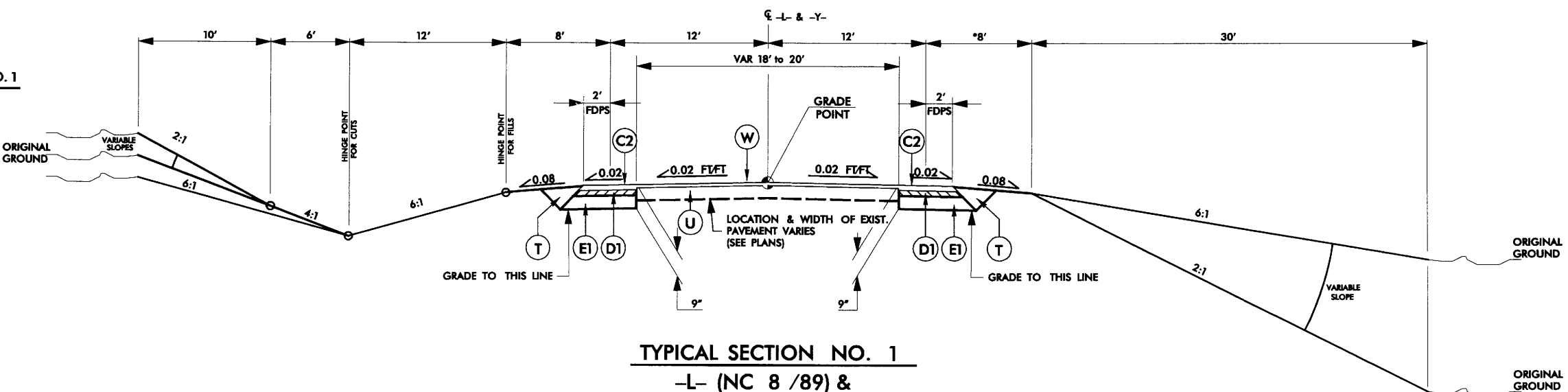
Detail Showing Method of Wedging

**TRANSITION FROM EXISTING TO TYPICAL NO. 1**

-L- STA. 13+50.00 TO 14+00.00

**USE TYPICAL SECTION NO. 1**

-L- STA. 14+00.00 TO 16+00.00  
 -L- STA. 26+50.00 TO 27+50.00  
 -Y- STA. 14+00.00 TO 14+81.19.00

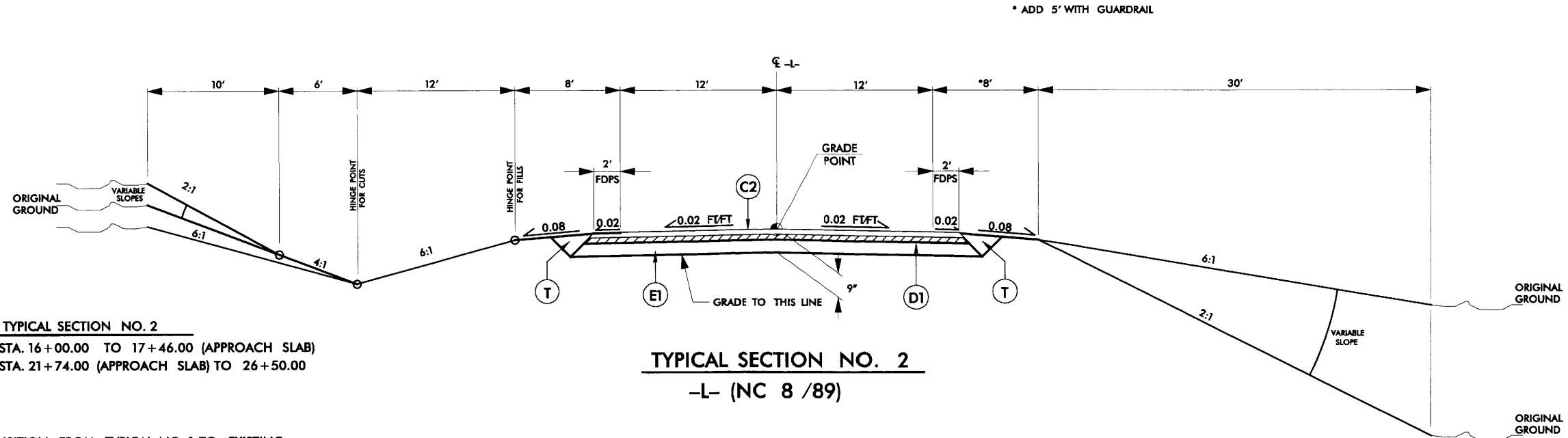


**TYPICAL SECTION NO. 1**

-L- (NC 8 /89) &  
 -Y- (NC 8)

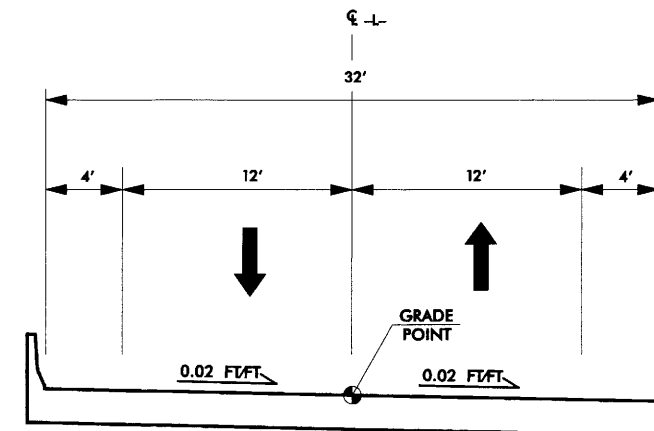
6/2/99

6/2/99

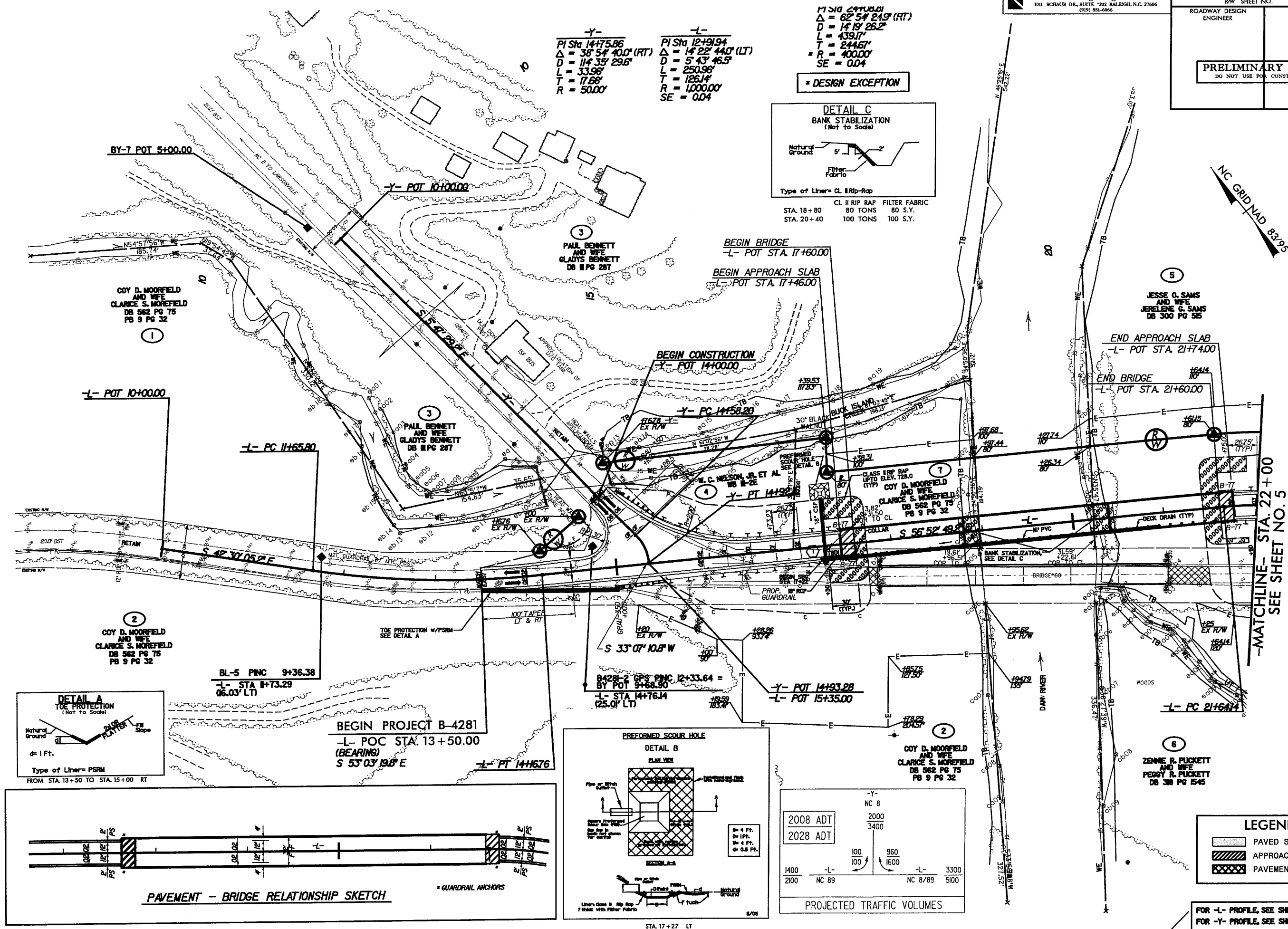


PAVEMENT SCHEDULE	
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C3	PROP. VAR. DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE SF9.5A, AT AN AVERAGE RATE OF 110 LBS. PER SQ. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NOT TO EXCEED 1 1/2" IN DEPTH.
D1	PROP. APPROX. 2 1/2" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0B, AT AN AVERAGE RATE OF 285 LBS. PER SQ. YD.
D2	PROP. VAR. DEPTH ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0B, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1" DEPTH, TO BE PLACED IN LAYERS NOT LESS THAN 2 1/2" IN DEPTH OR GREATER THAN 4" IN DEPTH.
E1	PROP. APPROX. 4" ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.
E2	PROP. VAR. DEPTH ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NOT LESS THAN 3" IN DEPTH OR GREATER THAN 5 1/2" IN DEPTH.
U	EXISTING PAVEMENT.
T	EARTH MATERIAL.
W	VARIABLE DEPTH ASPHALT PAVEMENT

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



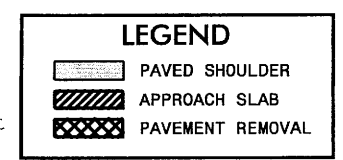
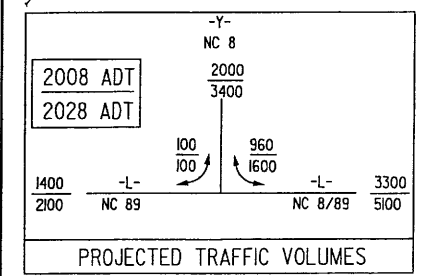
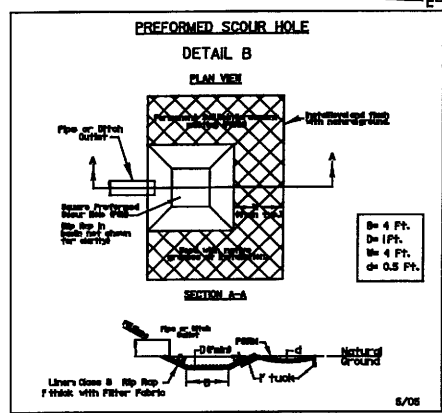
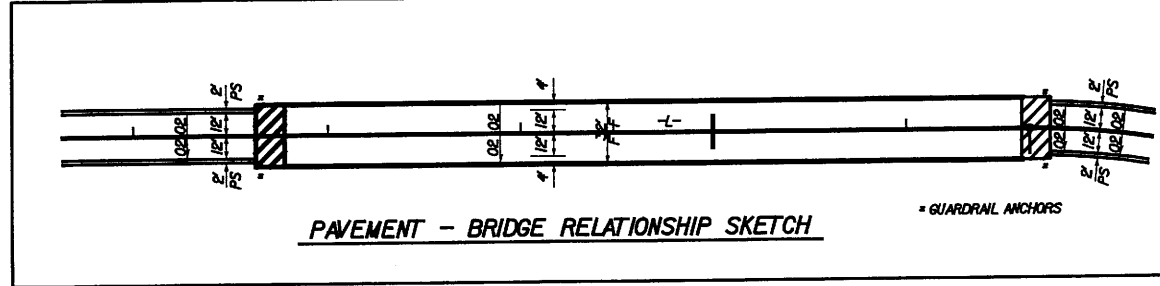
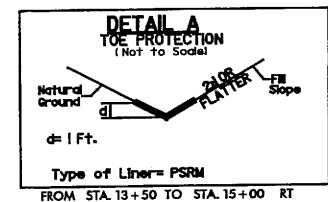
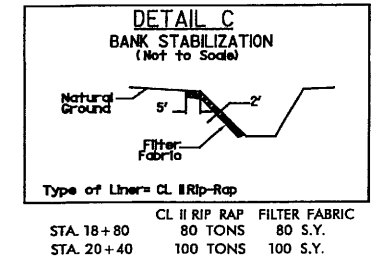
5/14/99  
8/9/2007  
\\RAV\proj\p01\B4281\B4281\_Rdy\_psh\_04.dgn



-Y-	-L-
PI Sta 14+75.86	PI Sta 12+19.94
$\Delta = 38^\circ 54' 40.0''$ (RT)	$\Delta = 14^\circ 22' 44.0''$ (LT)
D = 114' 35" 29.6'	D = 5' 43' 46.5'
L = 33.96'	L = 250.96'
T = 17.66'	T = 126.14'
R = 50.00'	R = 1,000.00'
	SE = 0.04

MSD 2410000  
 $\Delta = 62^\circ 54' 24.9''$  (RT)  
D = 14' 19" 26.2'  
L = 439.17'  
T = 244.61'  
R = 400.00'  
SE = 0.04

• DESIGN EXCEPTION

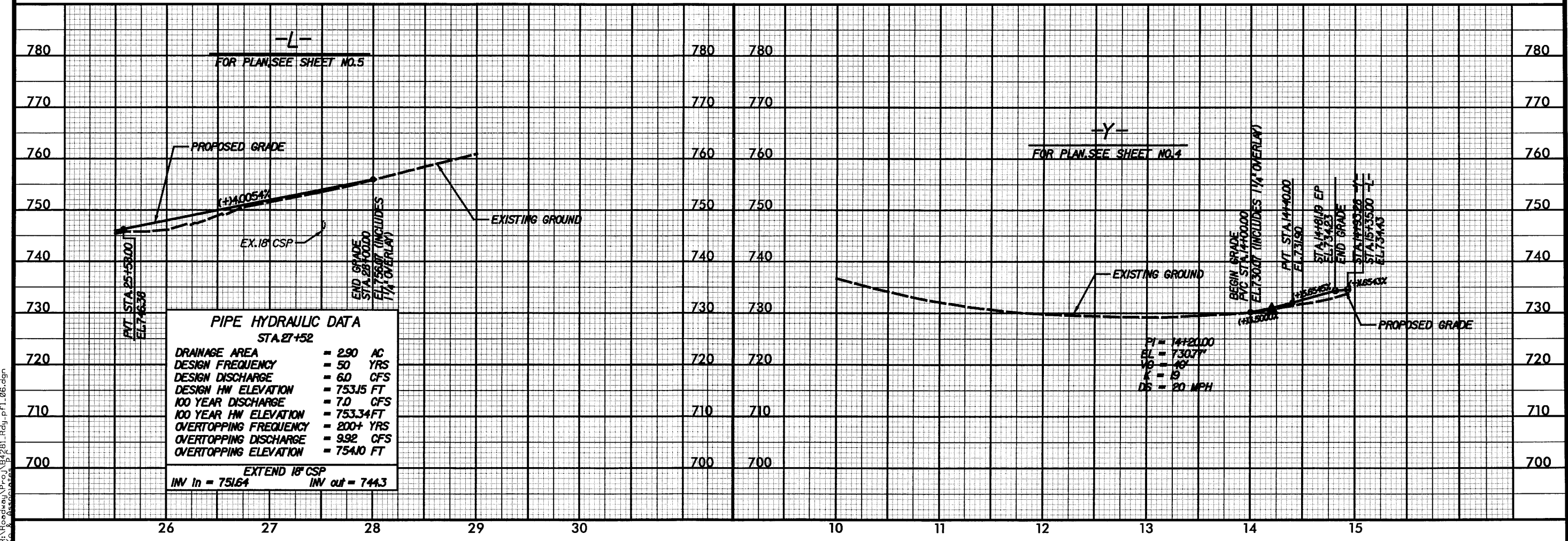
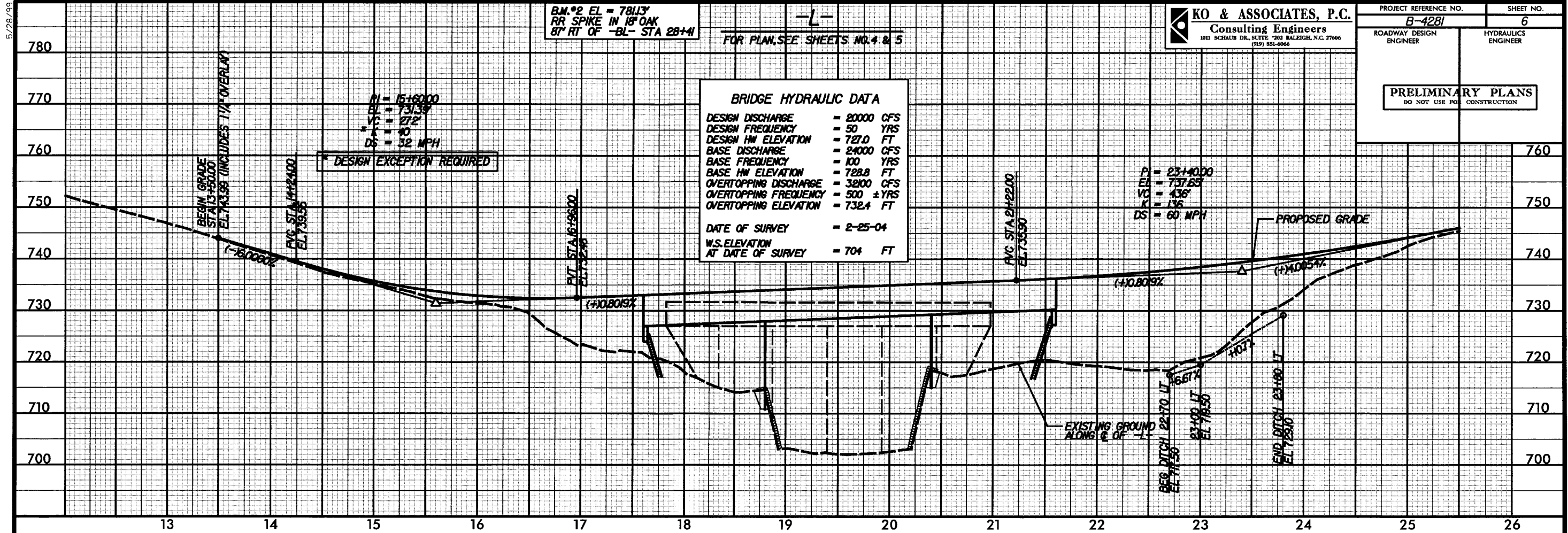


FOR -L- PROFILE, SEE SHEET NO. 6  
FOR -Y- PROFILE, SEE SHEET NO. 6





5/28/99



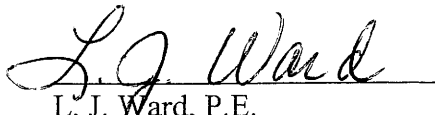
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Stokes County  
NC 8 / 89  
Bridge No. 60 over Dan River  
Federal-Aid Project No. BRSTP-008(4)  
State Project No. WBS 33621.1.1  
T.I.P. No. B-4281

CATEGORICAL EXCLUSION

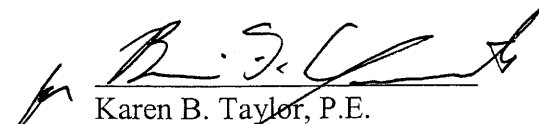
July 2005

Documentation Prepared By Ko & Associates, P.C.

  
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For North Carolina Department of Transportation

  
Karen B. Taylor, P.E.  
Project Development Engineer

## PROJECT COMMITMENTS

Stokes County  
NC 8 / 89  
Bridge No. 60 over Dan River  
Federal-Aid Project No. BRSTP-008(4)  
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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 Protection of Surface Waters, NCDOT's Guidelines for Best Management Practices for Construction and Maintenance Activities, General Certifications, and Section 401 Conditions of Certification, this project will require formal consultation with the US Fish and Wildlife Service (USFWS) to address impacts to the Endangered James spiny mussel (*Pleurobema collina*). Additional special commitments will follow the consultation. The following are special commitments known and agreed to by NCDOT at this phase of the project development.

### **Project Development & Environmental Analysis Branch (PD&EA):**

A formal Consultation with the USFWS in compliance with Section (7a) of the Endangered Species Act of 1973 will follow this CE document in order to more closely identify the specific course of action necessary to minimize impacts to the endangered James spiny mussel species.

### **PD&EA and Construction Office, Division 9:**

The Dan River in the project area is classified as WS-V waters and is in the Roanoke River Basin. NC Wildlife Resources Commission (NCWRC) commented that the Dan River supports a fishery, which includes smallmouth bass, sunfish, and several federal and state listed species. NCWRC recommends an in-stream moratorium from May 1 to July 15 to protect the egg and fry stage of the smallmouth bass, sunfish, and many of the listed species.

### **Structure Design Unit, Construction Office, Division 9:**

During final design all practical considerations will be given to avoid placing a bent in the water of the Dan River by spanning the entire river. Should a bent be necessary, construction will be accomplished so wet concrete does not contact water entering or flowing in the river.

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### **Structure Design Unit, Hydraulic Unit:**

The deck and roadbed drainage will flow through a vegetated buffer prior to reaching the Dan River.

### **Roadway Design Branch, Division 9:**

The Stokes County Board of Commissioners has requested a canoe access area be provided with this project. The County would like NCDOT to retain the existing right of way and make it available so the canoe access area could be developed by the County when funding is available. The canoe access area typically includes a 12-foot gravel drive and gravel parking area for 4-5 vehicles. The final design should insure that access to the existing right of way can be obtained for the future canoe access area. The NCWRC also requested a canoe access area at this location. During final design NCDOT will coordinate with Stokes County (336-593-2496) and NCWRC regarding the canoe access area.

### **Construction Office Division 9, Hydraulics Unit, Structure Design Unit:**

In addition to NCDOT Best Management Practices, all attempts will be made to keep existing bridge debris from entering the Dan River. A containment system will be needed during portions of the demolition process; however, the containment system will only be used to catch debris that inadvertently falls into the river. If debris does enter the river, the contractor will be required to submit a proposed removal method for review and approval prior to conducting this work. The method will be coordinated with the resource agencies.

Categorical Exclusion

July 2005

Green Sheet

Sheet 2 of 4

## **PROJECT COMMITMENTS**

Stokes County  
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### **Roadway Design Unit, PD&EA, Roadside Environmental Unit, Construction Office Division 9, Structure Design Unit:**

Upon completion of the project the existing approach fill will be removed to natural grade and the area will be planted with native grasses and/or tree species.

Activities in the floodplain will be limited to those needed to construct the proposed bridge and remove the existing bridge. Areas used for borrow or construction by-products will not be located in floodplains. Any material that is deposited in the floodplain as a result from this project will be removed and the floodplain will be restored after the project is completed.

Every effort will be made to minimize work pads in the floodplain.

During and after bridge demolition neither bridge debris, asphalt or dirt fill will be allowed to enter Waters of the United States. Silt fences, silt bags or other suitable sedimentation control measures may be used at the approval of the Division Engineer.

The PD&EA Branch, the USFWS, the USACE, the NCDWQ, and the NCWRC will be invited to the pre-construction conference to discuss with the contractor the provisions of the Endangered Species Act of 1973 and penalties for violation of the Act.

### **Roadway Design Unit, PD&EA, Roadside Environmental Unit, Construction Office Division 9, Structure Design Unit:**

Stringent erosion control measures included in the Division of Water Quality's High Quality Waters Erosion Control Guidelines will be implemented during all construction activities.

## PROJECT COMMITMENTS

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### Roadway Design Unit, PD&EA, Roadside Environmental Unit, Construction Office Division 9, Structure Design Unit (continued):

Riparian vegetation will be maintained wherever possible, especially large trees.

If riparian areas are disturbed, they will be revegetated with native species as soon as possible after construction.

Prior to construction the contractor will be required to give notification of the construction initiation date to the USFWS and the NCWRC.

Stokes County  
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**INTRODUCTION:** The replacement of Bridge No. 60 is included in the North Carolina Department of Transportation 2006-2012 Transportation Improvement Program and in the Federal-Aid Bridge Replacement Program. The location is shown in Figures 1A and 1B. With the special commitments incorporated into the project to protect the Endangered James spiny mussel, no substantial environmental impacts are anticipated. The project is classified as a Federal "Categorical Exclusion."

## **I. PURPOSE AND NEED STATEMENT**

Bridge Maintenance Unit records indicated the bridge has a sufficiency rating of 42.6 out of a possible 100 for a new structure. The bridge is considered functionally obsolete and structurally deficient. The replacement of this inadequate structure will result in safer and more efficient traffic operations.

## **II. EXISTING CONDITIONS**

NC 8 / 89 crosses over the Dan River in Stokes County approximately 300 feet southeast of the junction of NC 8 and NC 89. NC 8 and NC 89 are primary travel routes across the heart of Stokes County. NC 8 is a north-south travel route while NC 89 is generally considered an east-west route. Land in the proximity of the bridge is hilly and heavily wooded except for the flood plain surrounding the Dan River. Land use is agricultural and very low-density residential. A residence and an old abandoned gas station/store are located in the vicinity of the project. The residence is a farmhouse with barns located approximately 200 feet east of NC 8, approximately 300 feet from the junction of NC 8 and NC 89. The storefront is located just off the roadway (NC 8) slightly south of the farmhouse. Buck Island Creek crosses under NC 8 through a culvert approximately 100 feet from the junction of NC 8 and NC 89. Buck Island Creek merges into Dan River approximately 200 feet downstream from the bridge. The land surrounding this reach of the Dan River is a Significant Natural Heritage Area and is a Land Trust Priority Area of Piedmont Land Conservancy. NC 8 / 89 is classified as a Rural Minor Arterial in the Statewide Functional Classification System.



NC 8 / 89 has a current pavement width of 18 feet with 6-foot grass shoulders in the area of the bridge. The roadway approaches slope down toward the bridge but are relatively flat near the bridge. From the bridge, the south approach curves to the west and restricts sight distance.

The estimated 2005 traffic volumes on NC 8 / 89 at the Dan River are 3000 vehicles per day (vpd) and the estimated traffic volumes for the design year 2025 are 4800 vpd. The volumes include an estimated 1 percent truck-tractor semi-trailer (TTST) and 2 percent dual-tired (DT) vehicles. The posted speed limit is 55 mph in the vicinity of the bridge.

Bridge No. 60, as shown in Figures 2A and 2B, has an overall length of 315 feet and a clear deck width of 20 feet. The existing two-lane bridge has a reinforced concrete deck on reinforced concrete bents. The structure was constructed in 1932. The current posted weight limit is 30 tons for single unit vehicles and 33 tons for truck-tractor semi-trailer vehicles. Bridge No. 60 has a bed-to-crown distance of approximately 31 feet.

Three accidents were reported in the vicinity of the bridge during the period from May 1, 1999 to April 30, 2002. The accident rate for the period is 536.71 accidents per 100 million vehicle miles (MVM) of travel as compared to the statewide average of 182.95 accidents per 100 MVM for rural NC routes (two lanes undivided) for the three-year period 2000–2002.

Overhead power and fiber-optic/telephone lines parallel the northern side of the bridge but cross over to the southern side of both the east and west roadway approaches. No utilities are attached to the bridge.

There are 16 school bus crossings daily over the bridge.

### **III. ALTERNATIVES**

#### **A. Project Description**

NCDOT proposes to replace Bridge No. 60 with a new bridge approximately 335 feet long with a clear roadway width of 32 feet. New approaches to the bridge will provide 12-foot travel lanes in each direction with 8-foot shoulders (2-foot paved). The proposed cross sections are shown in Figure 3. A design speed exception will be required for the horizontal and vertical alignments. [During final design all practical considerations will be given to avoid placing a bent in the water of the Dan River by spanning the entire river.]

## **B. Build Alternatives**

The studied alternatives were: (1) Replace Bridge No. 60 on the northern side maintaining traffic on the existing structure as an on-site detour; and (2) Replace Bridge No. 60 on the southern side maintaining traffic on the existing structure as on-site detour. These alternatives are shown in Figures 4 and 5.

The alternative to replace the bridge at its existing location by maintaining traffic with an off-site detour is not considered acceptable. The off-site detour is approximately 16 miles in length. A 10-mile detour would be possible except that it would cross a 19-ton-posted bridge, which would be considerably more restrictive to trucks that use Bridge No. 60 on NC 8 / 89. [Bridge No. 60 has a posted weight limit of 30 tons for single unit vehicles and 33 tons for truck-tractor semi-trailer vehicles.] Utilizing an off-site detour would create timing problems for school bus pick-ups and incur an additional cost of approximately \$200 per day for the county schools.

## **C. Alternatives Eliminated from Further Study**

The No-Build or "do-nothing" alternative was also considered, but this alternative would eventually necessitate closure of the bridge. This is not a desirable alternative due to the traffic service provided by NC 8 / 89.

Investigation of the existing structure by the NCDOT Bridge Maintenance Unit indicates rehabilitation of Bridge No. 60 is not feasible due to its age and deteriorated condition. The existing bridge is classified as structurally deficient.

## **D. Preferred Alternative**

Alternate 1, replacing the existing bridge on new alignment on the northern side and generally parallel to the existing bridge is the preferred alternative. Alternate 1 is preferred because it is estimated to cost \$ 593,750 less than Alternate 2 and has less impacts to relatively undisturbed Dry-Mesic Oak-Hickory Forest and Piedmont/Mountain Alluvial Forests. Since Alternate 1 results in the least amount of disturbed area, the potential for erosion and sedimentation impacts to the Dan River should be minimized. During final design all practical considerations will be given to avoid placing a bent in the water of the Dan River by spanning the entire river.

The new structure will be approximately 335 feet long with a clear roadway width of 32 feet. The length of the bridge will be determined during final design. New approaches to the bridge will provide 12-foot travel lanes with 8-foot shoulders including 2-foot paved shoulders. Approximately 1500 feet of new approaches will be required. A design speed exception will be

required for the horizontal and vertical alignments. The estimated cost for the recommended proposed improvement is \$2,288,750. The current estimated cost of the project, as shown in the NCDOT 2006-2012 Transportation Improvement Program, is \$60,000 for right-of-way and \$2,400,000 for construction.

The Division Office concurs with the recommended improvements.

#### **IV. ESTIMATED COST**

The estimated costs of the alternatives studied, based on 2005 prices, are shown in the following table:

	Alternate 1 On-site Detour New Location Northern Side (Preferred)	Alternate 2 On-site Detour New Location Southern Side
Structure Removal	\$ 65,560	\$ 65,560
Structure	\$ 996,625	\$1,175,125
Roadway Approaches	\$ 487,690	\$ 708,655
Mobilization and Miscellaneous	\$ 378,125	\$ 505,660
Engineering and Contingencies	\$ 297,000	\$ 370,000
SUBTOTAL	\$2,225,000	\$2,825,000
Right-of-Way/Const. Ease./Util.	\$ 63,750	\$ 57,500
TOTAL	\$2,288,750	\$2,882,500

The above estimates are based on functional design plans; therefore, 45 percent is included for miscellaneous items and contractor mobilization, and 15 percent for engineering and contingencies.

## V. NATURAL RESOURCES

### A. Methodology

Materials and literature supporting this investigation have been derived from a number of sources including U.S. Geological Survey (USGS) topographic mapping (Danbury, NC 7.5 minute quadrangle), U.S. Fish and Wildlife Service (FWS) National Wetlands Inventory (NWI) mapping (Danbury, NC 7.5 minute quadrangle), Natural Resources Conservation Service (NRCS; formerly the Soils Conservation Service) soils mapping (SCS 1991), N.C. Wildlife Resources Commission (WRC) proposed Significant Aquatic Endangered Species Habitats, and recent aerial photography furnished by NCDOT.

Plant community descriptions are based on a classification system utilized by the N.C. Natural Heritage Program (NHP) (Schafale and Weakley 1990). When appropriate, community classifications were modified to better reflect field observations. Vascular plant names follow nomenclature found in Radford *et al.* (1968) with adjustments for updated nomenclature (Kartesz 1998). Jurisdictional areas were evaluated using the three-parameter approach following U.S. Army Corps of Engineers (COE) delineation guidelines (Department of the Army [DOA] 1987). Jurisdictional areas were characterized according to a classification scheme established by Cowardin *et al.* (1979) and/or the N.C. Division of Environmental Management (DEM) *Field Guide to North Carolina Wetlands* (1996). Aquatic and terrestrial wildlife habitat requirements and distributions were determined by supportive literature (Martof *et al.* 1980, Potter *et al.* 1980, Webster *et al.* 1985, Menhinick 1991, Palmer and Braswell 1995, and Rohde *et al.* 1994). Water quality information for area streams and tributaries was derived from available sources (NC Division of Water Quality [DWQ] 2002, DWQ 2001). Quantitative sampling was not undertaken to support existing data.

The most current FWS listing of federally protected species with ranges extending into Stokes County (February 25, 2003 FWS list) is considered in this report. In addition, NHP records documenting the presence of federally or state listed species were consulted before commencing field investigations. Significant Aquatic Endangered Species Habitats proposed by the WRC (December 11, 1998 listing) were consulted to determine the presence of Proposed Critical Habitats for aquatic species.

The fieldwork for the natural resource investigations was conducted on April 7, 2004 by biologists from EcoScience Corporation. The project area was walked and visually surveyed for significant features. For purposes of this evaluation, the project area is approximately 300 feet

wide, centered on NC 8 / 89, and approximately 1800 feet long. The project area encompasses approximately 12.8 acres. Special concerns evaluated in the field include: 1) potential protected species habitat, and 2) wetlands and water quality protection of the Dan River.

## **B. Physiography and Soils**

The project area is located within the Northern Inner Piedmont (Level III) ecoregion of North Carolina. This ecoregion is rolling and hilly and includes rugged topography with monadnocks and mountains. It has colder temperatures, more snowfall, and a shorter growing season than in other areas of the encompassing Piedmont (Level IV) ecoregion, as well as moister and cooler soils.

Elevations within the project area range from a high of approximately 800 feet National Geodetic Vertical Datum (NGVD) to a low of approximately 710 feet NGVD within the stream channel. Land uses within the project vicinity consist of woodlands, agriculture, residential lots, roadside shoulders, and a maintained yard containing power transformers.

Based on soil mapping for Stokes County (SCS 1991), the project area is underlain by six soil series including Pacolet-Wilkes complex (*Typic Kanhapludults*, *Typic Hapludalfs*), Rion fine sandy loam (*Typic Hapludults*), Pacolet sandy clay loam (*Typic Kanhapludults*), Wateree fine sandy loam (*Typic Dystrochrepts*), Riverview fine sandy loam (*Fluventic Dystrochrepts*), and Toccoa fine sandy loam (*Typic Udifluvents*). Within the project area, Toccoa and Riverview soils occur along the stream and adjacent alluvial forests, Rion, Pacolet, Wateree, and Pacolet-Wilkes complex soils are found on slopes. None of the series are considered hydric in Stokes County by the NRCS (1997).

The Pacolet series consists of well drained, moderately permeable soils on uplands. These soils formed in material weathered from felsic metamorphic and igneous rock, such as quartz-mica gneiss and granite. Slopes range from 2 to 60 percent. The depth to the seasonal water table is greater than 6 feet. The depth to bedrock is more than 60 inches.

The Pacolet-Wilkes complex consists mainly of a very deep, well drained Pacolet soil and a shallow, well drained Wilkes soil. Slopes range from 15 to 25 percent. The depth to the seasonal water table is greater than 6 feet. The depth to bedrock is more than 60 inches.

The Rion series consists of well drained, moderately permeable soils on uplands. These soils formed in residuum of felsic metamorphic and igneous rock, in the form of gneiss, schist or granite. Slopes range from 2 to 60 percent. The depth to the seasonal water table is greater than 6 feet. The depth to bedrock is more than 60 inches.

The Riverview series consists of well drained, moderately permeable soils on floodplains. These soils formed in recent alluvium. Slopes range from 0 to 4 percent. The depth to the seasonal water table is 3 to 5 feet. The depth to bedrock is more than 60 inches.

The Toccoa series consists of well drained and moderately well drained, moderately rapidly permeable soils on floodplains. These soils formed in recent alluvium. Slopes range from 0 to 4 percent. The depth to the seasonal water table is 3 to 5 feet. The depth to bedrock is more than 60 inches.

The Wateree series consists of well drained, moderately rapidly permeable soils on steep side slopes in the uplands. These soils formed in material weathered from felsic metamorphic and igneous rock, in the form of gneiss and schist or granite. Slopes range from 2 to 60 percent. The depth to the seasonal water table is greater than 6 feet. The depth to bedrock is more than 60 inches.

## **C. Water Resources**

### **1. Water Impacted**

The project area is located within sub-basin 03-02-01 of the Roanoke River Basin (DWQ 2001). This area is part of USGS Hydrologic Unit 03010103 of the South Atlantic/Gulf Region. The structure targeted for replacement spans the Dan River and the adjacent floodplain. The portion of the Dan River that lies within the project area has been assigned Stream Index Number 21-(8) by DWQ (2002). Also included within the project area are Buck Island Creek and UT1 to the Dan River.

### **2. Water Resource Characteristics**

The Dan River enters the project area from the southwest as a well-defined, fourth-order, perennial stream with moderate flow over a cobble, boulder, gravel, and sand substrate (Figure 6). At Bridge No. 60, the Dan River is approximately 130 feet wide. The banks of the Dan River are approximately 10 feet high and steeply sloping. During field investigations, the water level was approximately 1-3 feet deep. Water clarity was very good, with visibility to the substrate, and flow velocity was moderate. No persistent emergent aquatic vegetation was observed within the river. The Dan River may provide good aquatic habitat for mussels and benthic macroinvertebrates due to the observation of little to no siltation within the stream and the channel substrate composition. Opportunities for habitat within the Dan River include overhanging trees, undercut banks, fallen logs, and leaf packs.

Buck Island Creek enters the project area from the northwest as a well-defined, second-order, perennial stream with moderate flow over a cobble, gravel, and sand substrate (Figure 6). Buck Island Creek is approximately 20 feet wide. The banks of Buck Island Creek are approximately 20 feet high and steeply sloping. During field investigations, the water level was approximately 1-2 feet deep. Water clarity was good, with visibility to the substrate, and flow velocity was moderate. No persistent emergent aquatic vegetation was observed within the stream. Buck Island Creek may provide good aquatic habitat for mussels and benthic macroinvertebrates due to the observation of little to no siltation within the stream and the channel substrate composition. Opportunities for habitat within Buck Island Creek include overhanging trees, undercut banks, fallen logs, and leaf packs.

UT1 to Dan River begins in the south quadrant of the project area as a well-defined, first-order, intermittent stream with no flow (as observed on April 7, 2004) over a gravel and sand substrate (Figure 6). UT1 to Dan River is approximately 3 feet wide. The banks of UT1 to Dan River are approximately 1 foot high. During field investigations, the soil was saturated to the surface but there was no observed flow. No persistent emergent aquatic vegetation was observed within the stream.

The DWQ has assembled a list of impaired waterbodies according to the Clean Water Act Section 303(d) and 40 CFR 130.7, hereafter referred to as the N.C. 2002 Section 303(d) list. The list is a comprehensive public accounting of all impaired waterbodies. An impaired waterbody is one that does not meet water quality standards including designated uses, numeric and narrative criteria, and anti-degradation requirements defined in 40 CFR 131. The standards violation may be due to an individual pollutant, multiple pollutants, pollution, or an unknown cause of impairment. The impairment could be from point sources, nonpoint sources, and/or atmospheric deposition. Some sources of impairment exist across state lines. North Carolina's methodology is strongly based on the aquatic life use support guidelines available in the Section 305(b) guidelines (EPA-841-B-97-002A and -002B). Those streams attaining only Partially Supporting (PS) or Not Supporting (NS) status are listed on the N.C. 2002 Section 303(d) list. Streams are further categorized into one of six parts within the N.C. 2002 Section 303(d) list, according to source of impairment and degree of rehabilitation required for the stream to adequately support aquatic life. Within Parts 1, 4, 5, and 6 of the list, North Carolina has developed a priority ranking scheme (low, medium, high) that reflects the relative value and benefits those waterbodies provide to the State. The Dan River, Buck Island Creek, and UT1 to Dan River are not listed on any section of the N.C. 2002 Section 303(d) list.

Classifications are assigned to waters of the State of North Carolina based on the existing or contemplated best usage of various streams or segments of streams in the basin. A Best Usage Classification of WS-V has been assigned to the Dan River within the project area. Class WS-V waters are waters protected for water supply which are generally upstream and draining to class WS-IV, or waters previously used for drinking water supply purposes, or waters used by industry to supply their employees, but not municipalities or counties, with a raw water drinking supply source. WS-V waters are also suited for all Class C uses, which include aquatic life propagation and protection, agriculture, and secondary recreation. Secondary recreation includes wading, boating, and other uses not involving human body contact with waters on an organized or frequent basis. No designated Outstanding Resource Waters (ORW), High Quality Waters (HQW), Water Supply I (WS-I), Water Supply II (WS-II) or watershed Critical Area (CA) occur within 1.0 mile of the project area (DWQ 2002). This reach of the Dan River has not been assigned the supplemental classification for Trout Waters (Tr). The nearest reach of the Dan River with the supplemental classification of Tr occurs approximately 6 miles upstream. Buck Island Creek and UT1 to Dan River have not been assigned an individual water quality classification and are therefore considered to have the same classification as this reach of the Dan River.

The Division of Water Quality (DWQ) has initiated a whole-basin approach to water quality management for the 17 river basins within the state. Water quality for the proposed project area is summarized in the Roanoke River Basinwide Water Quality Plan (DWQ 2001). The Dan River is currently designated by DWQ as Supporting its designated uses. No benthic macroinvertebrate monitoring stations occur within 1.0 mile of the project area (DWQ 2001).

Sub-basin 03-02-01 of the Roanoke River Basin supports 23 permitted, point source discharges with a total discharge of 1.3 million gallons per day. Major non-point sources of pollution within the Roanoke River Basin include runoff from construction activities, agriculture, timber harvesting, hydrologic modification, failing septic systems, straight pipes, roads, parking lots, and roof tops. Sedimentation and nutrient inputs are major problems associated with non-point source discharges (DWQ 2001).

The NCWRC has developed a Significant Aquatic Endangered Species Habitat database to enhance planning and impact analysis in areas proposed by WRC as being critical due to the presence of Endangered or Threatened aquatic species. The open waters within the project area are designated by the WRC as Significant Aquatic Endangered Species Habitat.



### 3. Anticipated Impacts to Water Resources

Temporary construction impacts due to erosion and sedimentation will be minimized through implementation of a stringent erosion control schedule and the use of Best Management Practices (BMPs). The contractor will follow contract specifications pertaining to erosion control measures as outlined in 23 CFR 650 Subpart B and Article 107-13 entitled *Control of Erosion, Siltation, and Pollution* (NCDOT, Specifications for Roads and Structures). These measures include the use of dikes, berms, silt basins, and other containment measures to control runoff; elimination of construction staging areas in floodplains and adjacent to waterways; re-seeding of herbaceous cover on disturbed sites; management of chemicals (herbicides, pesticides, de-icing compounds) with potential negative impacts on water quality; and avoidance of direct discharges into streams by catch basins and roadside vegetation.

The proposed bridge replacement will allow for continuation of pre-project stream flows in the Dan River, thereby protecting the integrity of this waterway. Long-term impacts resulting from construction are expected to be negligible. In order to minimize impacts to water resources, NCDOT *Best Management Practices for the Protection of Surface Waters* will be strictly enforced during the entire life of the project. In addition the DWQ High Quality Waters Erosion Control Guidelines will be implemented in all construction activities.

NCDOT will coordinate with various resource agencies during project planning to ensure that all concerns regarding bridge demolition are resolved. For the replacement of Bridge No. 60 in water work is limited to an absolute minimum due to the documented presence of a federally Endangered species, James spinymussel (*Pleurobema collina*). Consequently, there may be special restrictions beyond those outlined in *Best Management Practices for Protection of Surface Waters*.

Impacts to water resources in the project area may result from activities associated with project construction. Activities that would result in impacts are clearing and grubbing on streambanks, riparian canopy removal, in-stream construction, fertilizers and pesticides used in revegetation, and pavement/culvert installation. The following impacts to surface water resources could result from the construction activities mentioned above.

- Increased sedimentation and siltation downstream of the crossing and increased erosion in the project area.
- Alteration of stream discharge due to silt loading and changes in surface and groundwater drainage patterns.

- Changes in light incidence and water clarity due to increased sedimentation and vegetation removal.
- Changes in and destabilization of water temperature due to vegetation removal.
- Alteration of water levels and flows due to interruptions and/or additions to surface and ground water flow from construction.
- Increased nutrient loading during construction via runoff from exposed areas.
- Increased concentrations of toxic compounds in roadway runoff.
- Increased potential for release of toxic compounds such as fuel and oil from construction equipment and other vehicles.

In order to minimize potential impacts to water resources in the project area, DOT's *Best Management Practices for the Protection of Surface Waters* should be strictly enforced during the construction phase of the project.

## **D. BIOTIC RESOURCES**

### **1. Plant Communities**

Three distinct plant communities were identified within the project area: Dry-Mesic Oak-Hickory Forest, disturbed/maintained land, and Piedmont/Low Mountain Alluvial Forest (Figure 6). Plant community descriptions are based on a classification system utilized by the NHP (Schafale and Weakley 1990), where applicable. Plant communities are listed in order of their predominance within the project area.

#### **a) Disturbed/maintained land**

Disturbed/maintained land includes roadside shoulders, agricultural fields, and the yard containing the power transformers. This community predominantly supports an herb/grass assemblage. Most of this area is maintained by mowing or agricultural activities. Groundcover includes seeded and native grasses and weedy forbs including fescue (*Festuca* sp.), dog-fennel (*Eupatorium capillifolium*), goldenrod (*Solidago* sp.), pokeweed (*Phytolacca americana*), wild onion (*Allium canadense*), vetch (*Vicia* sp.), and henbit (*Lamium amplexicaule*). This community occupies approximately 4.5 acres of the project area.

#### **b) Dry-Mesic Oak-Hickory Forest**

This community is described by Schafale and Weakley (1990) as occurring on mid slopes, low ridges, upland flats, and other dry-mesic upland areas on acidic soils. Under natural conditions

these forests are uneven-aged, with a component of mature trees. Within the project area, this community was well-developed with a closed canopy consisting of many large, mature trees. The Dry-Mesic Oak Hickory Forest occurs on moderate to steep slopes outside of the project area floodplains. This community supports a canopy vegetated by white oak (*Quercus alba*), tulip poplar (*Liriodendron tulipifera*), sourwood (*Oxydendrum arboreum*), ironwood (*Carpinus caroliniana*), American holly (*Ilex opaca*), and black cherry (*Prunus serotina*). In addition, a few sparse white pine (*Pinus strobus*) and Virginia pine (*Pinus virginiana*) occur within the canopy layer. A small section of the community within the southeastern most portion of the project area exhibits an early-successional dominance by Virginia pine. The sapling layer includes those species within the canopy layer as well as red maple (*Acer rubrum*), southern red oak (*Quercus falcata*), hickory, and northern red oak (*Quercus rubra* var. *borealis*). Shrubs and vines within this community include greenbrier (*Smilax* sp.), American beech (*Fagus grandifolia*), red maple, American holly, and Chinese privet (*Ligustrum sinense*). The herbaceous layer within this community is sparsely vegetated by Japanese honeysuckle (*Lonicera japonica*), Christmas fern (*Polystichum acrostichoides*), and wild onion. This community occupies approximately 3.4 acres of the project area.

#### **c) Piedmont/Low Mountain Alluvial Forest**

This community is described by Schafale and Weakley (1990) as occurring within river and stream floodplains in which separate fluvial landforms and associated vegetation zones are too small to distinguish. Flood-carried sediment provides nutrient input to this community and serves as a natural disturbance factor. Within the project area, the Piedmont/Low Mountain Alluvial Forest consists of floodplain areas adjacent to the Dan River, the UT1 to the Dan River, and Buck Island Creek. This community was well-developed with a closed canopy consisting of large, mature trees. This community supports a canopy vegetated by river birch (*Betula nigra*), sycamore (*Platanus occidentalis*), tulip poplar, ironwood, and black cherry. The sapling and shrub layers include those species within the canopy layer as well as red maple, blackberry (*Rubus* sp.), Chinese privet, and American beech. Vines within this community include Japanese honeysuckle and greenbrier. This community occupies approximately 3.2 acres of the project area.

## **2. Wildlife**

#### **a) Disturbed/maintained land**

Terrestrial mammal species adapted to maintained/disturbed sections of the project area include Virginia opossum (*Didelphis virginiana*), least shrew (*Cryptotis parva*), eastern mole (*Scalopus aquaticus*), hispid cotton rat (*Sigmodon hispidus*), house mouse (*Mus musculus*), and red fox

(*Vulpes vulpes*). Birds observed within open and/or disturbed areas include American crow (*Corvus brachyrhynchos*), turkey vulture (*Cathartes aura*), northern cardinal (*Cardinalis cardinalis*), and mourning dove (*Zenaida macroura*). Other avian species which might frequent this community include red-tailed hawk (*Buteo jamaicensis*), eastern kingbird (*Tyrannus tyrannus*), blue jay (*Cyanocitta cristata*), common grackle (*Quiscalus quiscula*), house finch (*Carpodacus mexicanus*), and European starling (*Sturnus vulgaris*). No terrestrial reptile or amphibian species were observed during the site visit. Terrestrial reptile and amphibian species that might find habitat in disturbed parts of the project area include eastern fence lizard (*Sceloporus undulatus*), five-lined skink (*Eumeces fasciatus*), worm snake (*Carphophis amoenus*), brown snake (*Storeria dekayi*), redbelly snake (*Storeria occipitomaculata*), and American toad (*Bufo americanus*).

#### **b) Dry-Mesic Oak-Hickory Forest**

No terrestrial mammals were observed during the site visit. Some mammal species which may inhabit upland forests within the project region include gray squirrel (*Sciurus carolinensis*), red bat (*Lasiurus borealis*), eastern cottontail (*Sylvilagus floridanus*), eastern chipmunk (*Tamias striatus*), woodchuck (*Marmota monax*), white-footed mouse (*Peromyscus leucopus*), woodland vole (*Microtus pinetorum*), silver-haired bat (*Lasionycteris noctivagans*), long-tailed weasel (*Mustela frenata*), striped skunk (*Mephitis mephitis*), and bobcat (*Felis rufus*). Observed bird species in these forested areas include Carolina wren (*Thryothorus ludovicianus*) and red bellied woodpecker (*Melanerpes carolinus*). Upland forest-dwelling birds of the project region include eastern towhee (*Pipilo erythrophthalmus*), Cooper's hawk (*Accipiter cooperii*), red-bellied woodpecker (*Melanerpes carolinus*), great crested flycatcher (*Myiarchus crinitus*), Carolina chickadee (*Poecile carolinensis*), brown thrasher (*Toxostoma rufum*), ruby-crowned kinglet (*Regulus calendula*), and pine warbler (*Dendroica pinus*). Terrestrial reptiles and amphibians within this forested community might include eastern garter snake (*Thamnophis sirtalis*), spring peeper (*Pseudacris crucifer*), broadhead skink (*Eumeces laticeps*), ground skink (*Scincella lateralis*), black racer (*Coluber constrictor*), and rat snake (*Elaphe obsoleta*).

#### **c) Piedmont/Low Mountain Alluvial Forest**

Tracks of white-tailed deer (*Odocoileus virginianus*) and raccoon (*Procyon lotor*) were observed within the project area along Buck Island Creek and UT1 to the Dan River. South of the bridge on the east side of the Dan River were numerous saplings cut down by beaver (*Castor canadensis*). Other mammal species expected to occur within this community include southeastern shrew (*Sorex longirostris*), red bat (*Lasiurus borealis*), evening bat (*Nycticeius humeralis*), golden mouse (*Ochrotomys nuttalli*), and gray fox (*Urocyon cinereoargenteus*).

Birds observed within the alluvial forest corridor include red-shouldered hawk (*Buteo lineatus*), white-throated sparrow (*Zonotrichia albicollis*), blue-gray gnatcatcher (*Polioptila caerulea*), and eastern phoebe (*Sayornis phoebe*). The alluvial forest in the project area may also provide suitable habitat for American woodcock (*Scolopax minor*), white-eyed vireo (*Vireo griseus*), and yellow-throated warbler (*Dendroica dominica*). Terrestrial reptiles and amphibians, like other species groups, are expected to exhibit particular species richness in this moist habitat. Species expected to occur within alluvial forests within the project area are northern dusky salamander (*Desmognathus fuscus*), two-lined salamander (*Eurycea bislineata*), redback salamander (*Plethodon cinereus*), slimy salamander (*Plethodon glutinosus*), red salamander (*Pseudotriton ruber*), Fowler's toad (*Bufo woodhousei*), gray treefrog (*Hyla versicolor*), northern cricket frog (*Acris crepitans*), eastern box turtle (*Terrapene carolina*), ringneck snake (*Diadophis punctatus*), rough green snake (*Opheodrys aestivus*), and queen snake (*Regina septemvittata*).

Many of these wildlife species are very adaptable and can eat a wide variety of plant and animal material when the preferred food is absent. Many of these species can be found within disturbed areas, brushy edges of the forest, within heavy underbrush, or amongst shrubby plants. Migration between communities of the project area may be frequent based on the needs of each species for food, cover, protection from predators, and nesting.

### **3. Aquatic Communities**

Limited investigations resulted in no observations of aquatic or semi-aquatic species. Species expected to occur within the project area vicinity include mink (*Mustela vison*), belted kingfisher (*Megaceryle alcyon*), green frog (*Rana clamitans*), pickerel frog (*Rana palustris*), snapping turtle (*Chelydra serpentina*), eastern musk turtle (*Sternotherus odoratus*), painted turtle (*Chrysemys picta*), northern water snake (*Nerodia sipedon*), and eastern ribbon snake (*Thamnophis sauritus*).

No sampling was undertaken in the Dan River to determine fishery potential and no fish species were observed during the field survey. Fish species that may be present in this reach of the Dan River and UT1 to the Dan River include rosyside dace (*Clinostomus funduloides*), satinfish shiner (*Cyprinella analostana*), bluehead chub (*Nocomis leptcephalus*), mountain redbelly dace (*Phoxinus oreas*), creek chub (*Semotilus atromaculatus*), white sucker (*Catostomus commersoni*), Roanoke hog sucker (*Hypentelium roanokense*), blue catfish (*Ictalurus furcatus*), redbreast sunfish (*Lepomis auritus*), Roanoke darter (*Percina roanoka*), fantail darter (*Etheostoma flabellare*), margined madtom (*Noturus insignis*), and walleye (*Stizostedion vitreum*). The proposed project will not occur within WRC trout waters. The nearest designated trout waters occur approximately 6 miles upstream.

Aquatic surveys conducted at Bridge No. 60 have documented the presence of the federally Endangered James spinymussel. Subsequently, the NHP has designated this reach of the Dan River as an Aquatic Significant Natural Heritage Area. This designation refers to nationally significant natural areas, which contain examples of natural communities, rare plant or animal populations, or geological features that are among the highest quality or best of their kind in the nation, or clusters of such elements that are among the best in the nation.

#### **4. Anticipated Impacts to Plant Communities**

Plant communities were delineated to determine the approximate area and location of each within the project area (Figure 6). Plant community impacts are based on cut-and-fill areas for each alternative. A summary of permanent plant community impacts are presented in Table 1.

Table 1: Plant Community Impacts for Each Alternative

Plant Community	Alternate 1*	Alternate 2*
Dry-Mesic Oak-Hickory Forest	0.04	1.70
Disturbed/Maintained Land	1.60	1.30
Piedmont/Mountain Alluvial Forest	0.70	0.50
<b>TOTAL</b>	<b>2.34</b>	<b>3.50</b>

\*Areas are given in acres.

The majority of impacts associated with both alternatives will occur within disturbed/maintained land. Alternate 2 will impact approximately three times the area of relatively undisturbed community. Most of this difference will occur within Dry-Mesic Oak-Hickory Forest. No significant habitat fragmentation is expected as a result of project activities. Losses to plant communities may be offset by the rehabilitation of the old roadway once construction of the new road and bridge is complete. Construction noise and associated disturbances are anticipated to have short-term impacts on avifauna and migratory wildlife movement patterns.

#### **E. SPECIAL TOPICS**

##### **1. “Waters of the United States”: Jurisdictional Issues**

Surface waters within the embankments of the Dan River, Buck Island Creek, and UT1 to the Dan River are subject to jurisdictional consideration under Section 404 of the Clean Water Act as waters of the United States (33 CFR Section 328.3). The Dan River exhibits characteristics of a well-defined, fourth-order, perennial stream with moderate flow over a cobble, gravel, and

sand substrate containing some boulders. The Dan River and Buck Island Creek can both be classified as riverine, upper perennial with an unconsolidated bottom composed primarily of cobble and gravel (R3UB1) (Figure 6). UT1 to the Dan River can be classified as riverine, intermittent with an unconsolidated bottom composed primarily of sand (R4UB2) (Figure 6).

Vegetated wetlands 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). No vegetated wetlands occur in the project area.

The existing bridge has 125 feet of its superstructure located over the Dan River and two reinforced concrete bents located within the river. The jurisdictional impacts expected from project construction are possible placement of bents in the river and removal of the existing bents. NCDOT will coordinate with various resource agencies during project development to ensure that all concerns regarding bridge demolition are resolved. The replacement of Bridge No. 60 will be accomplished according to the regulations defined by NCDOT Best Management Practices for Bridge Demolition and Removal, which states that “in water” work is restricted to an absolute minimum due to the presence of Outstanding Resource Waters and/or Threatened and/or Endangered Species. For Bridge No. 60, in water work is limited to an absolute minimum due to the presence within the project area within the last 20 years of the James spinymussel, a federally Endangered species; therefore, all work potentially affecting the resource must be carefully coordinated with the jurisdictional agency.

## **2. Permits**

Impacts to jurisdictional areas, resulting from bridge bent construction or removal within the Dan River, may be anticipated from the proposed project. As a result, construction activities will require permits and certifications from various regulatory agencies in charge of protecting the water quality of public water resources.

For construction activities, access fills, or dewatering of the site for bridge bent construction, NWP 3 (67 FR 2020, 2078, January 15, 2002) and 33 (67 FR 2020, 2087; January 15, 2002) and the associated General 401 Water Quality Certifications (GC 3376 and GC 3366) will be required. In the event that Nationwide Permits (NWPs) 3 and 33 will not suffice, impacts attributed to bridge replacement and associated approach improvements may qualify under General Bridge Permit (GP) 031 issued by the Wilmington COE District. DWQ has made available a General 401 Water Quality Certification for GP 031 (GC 3404). Notification to the Wilmington COE District and DWQ is required for use of these permits.

### **3. Mitigation**

The COE has adopted through the Council on Environmental Quality (CEQ) a wetland mitigation policy which embraces the concept of “no net loss of wetlands” and sequencing. The purpose of this policy is to restore and maintain the chemical, biological, and physical integrity of waters of the United States, and specifically wetlands. Mitigation of wetland impacts has been defined by the CEQ to include: avoiding impacts (to wetlands), minimizing impacts, rectifying impacts, reducing impacts over time and compensating for impacts (40 CFR 1508.20). Each of these three aspects (avoidance, minimization, and compensatory mitigation) must be considered sequentially.

Avoidance mitigation examines all appropriate and practicable possibilities of averting impacts to waters of the United States. According to a 1990 Memorandum of Agreement (MOA) between the Environmental Protection Agency (EPA) and the COE, in determining “appropriate and practicable” measures to offset unavoidable impacts, such measures should be appropriate to the scope and degree of those impacts and practicable in terms of cost, existing technology and logistics in light of overall project purposes. Given the purpose and scope of the proposed project, complete avoidance of jurisdictional impacts is not possible.

Minimization includes the examination of appropriate and practicable steps to reduce the adverse impacts to waters of the United States. Implementation of these steps will be required through project modifications and permit conditions. Minimization typically focuses on decreasing the footprint of the proposed project through the reduction of median widths, right-of-way widths, fill slopes, and/or road shoulder widths. All efforts will be made to decrease impacts to surface waters. Minimization for the proposed project may include decreasing the amount of fill to be deposited into the Dan River, decreasing the footprint of any bents to be constructed in the stream bed, and designing and placing bents to obstruct stream flow as little as possible.

Compensatory mitigation is not normally considered until anticipated impacts to waters of the United States have been avoided and minimized to the maximum extent possible. It is recognized that “no net loss of wetlands” functions and values may not be achieved in each and every permit action. In accordance with 15A NCAC 2H .0506(h), DWQ may require compensatory mitigation for projects with greater than or equal to 1.0 acre of impacts to jurisdictional wetlands or greater than or equal to 150.0 linear feet of total perennial stream impacts. Furthermore, in accordance with 67 FR 2020 and 2092, since January 15, 2002, the COE requires compensatory mitigation when necessary to ensure that adverse effects to the aquatic environment are minimal. The size and type of the proposed project impact and the function and value of the impacted aquatic resource are factors considered in determining



acceptability of appropriate and practicable compensatory mitigation. Appropriate and practicable compensatory mitigation is required for unavoidable adverse impacts, which remain after all appropriate and practicable minimization has been required. Compensatory actions often include restoration, preservation and enhancement, and creation of waters of the United States. Such actions should be undertaken first in areas adjacent to or contiguous to the discharge site.

Mitigation for Section 404 jurisdictional areas may need to be proposed for this project due to the potential for project impacts. Utilization of BMPs is recommended in an effort to minimize impacts. On-site mitigation opportunities might include replacement of the culvert on NC 8 with a bridge to completely span the Buck Island Creek. After bridge construction, complete removal of the existing bents in the Dan River and restoration of the stream bed to preconstruction contours should be considered. Temporary impacts to floodplains associated with construction activities may be mitigated by replanting disturbed areas with native riparian species and removal of temporary fill material upon project completion. A final determination regarding mitigation rests with the COE and DWQ.

## **F. Protected Species**

### **1. Federally Protected Species**

Species with the federal classification of Endangered, Threatened, or officially Proposed for such listing are protected under the Endangered Species Act (ESA) of 1973, as amended (16 U.S.C. 1531 *et seq.*). The term “Endangered Species” is defined as “any species which is in danger of extinction throughout all or a significant portion of its range,” and the term “Threatened Species” is defined as “any species which is likely to become an Endangered species within the foreseeable future throughout all or a significant portion of its range” (16 U.S.C. 1532).

Three federally protected species are listed for Stokes County (February 25, 2003 FWS list): James spiny mussel, Schweinitz’s sunflower (*Helianthus schweinitzii*), and Small-anthered bittercress (*Cardamine micranthera*). All three species are federally listed as Endangered.

#### ***Pleurobema collina* (James spiny mussel)**

##### **Endangered**

##### **Family: Unionidae**

##### **Date Listed: July 22, 1988**

The James spiny mussel is a small, subrhomboidal mussel, with an obliquely subtruncated posterior, that grows to approximately 1.5 inches in length. The external shells of juveniles

usually bear one to three short spines on each valve. The adult shells usually lack spines. The shell is smooth, straw-colored to brownish-black, with widely spaced concentric striations. Preferred habitat of the spiny mussel includes relatively fast-flowing, well-oxygenated, circumneutral water over a silt-free, noncompacted, gravel/coarse sand substrate. As of printing of the FWS species recovery plan (FWS 1990), this spiny mussel was only known from 10 streams within the James River basin in Virginia and West Virginia. In October 2000, an unidentified spiny mussel was found in the Dan River in Stokes County, North Carolina during a survey conducted by personnel of NCDOT, WRC, and the N.C. Division of Marine Fisheries (DMF). Subsequent surveys found several more individuals of spiny mussel (personal communication, Tim Savidge, April 4, 2001). Spiny mussels had not previously been identified within the Dan River basin. The mussels found in the Dan River have characteristics similar to the James spiny mussel and the Tar spiny mussel (*Elliptio steinstansanna*). Specimens of the recently found spiny mussel are currently (as of April 2001) undergoing genetic analysis. The finding of this unidentified spiny mussel has resulted in the FWS listing James spiny mussel in North Carolina counties that include tributaries of the Dan River basin (as of the February 25, 2003 list).

**James spiny mussel**

**Biological Conclusion:**

**MAY AFFECT**

The NHP documents the occurrence of James spiny mussel within the project area. No surveys for James spiny mussel were undertaken during the field visit to the project area, and no bivalve shells were observed. A Consultation in compliance with Section (7a) of the Endangered Species Act of 1973 will follow this CE document to minimize impacts to the endangered James spiny mussel.

***Helianthus schweinitzii* (Schweinitz's sunflower)**

**Endangered**

**Family: Asteraceae**

**Date Listed: May 7, 1991**

Schweinitz's sunflower is an erect, unbranched, rhizomatous, perennial herb that grows to approximately 6 feet in height. The stem may be purple, usually pubescent, but sometimes nearly smooth. Leaves are sessile, opposite on the lower stem but alternate above; in shape they are lanceolate and average 5 to 10 times as long as wide. The leaves are rather thick and stiff, with a few small serrations. The upper leaf surface is rough and the lower surface is usually pubescent with soft white hairs. Schweinitz's sunflower blooms from September to frost; the yellow flower heads are about 0.6 inch in diameter. The current range of this species is within 60 miles of Charlotte, North Carolina, occurring on upland interstream flats or gentle slopes, in

soils that are thin or clay in texture. The species needs open areas protected from shade or excessive competition, reminiscent of Piedmont prairies. Disturbances such as fire maintenance or regular mowing help sustain preferred habitat (FWS 1994).

**Schweinitz's sunflower**

**Biological Conclusion: NO EFFECT**

Suitable habitat for Schweinitz's sunflower occurs within project area disturbed/maintained land. A survey during the blooming/fruiting season (August-frost) was conducted on August 18, 2004 and no plants were identified. NHP has no record of Schweinitz's sunflower within a 2.0-mile radius of the project area. Based on the recent survey results and available information from NHP, the proposed project will have no effect on Schweinitz's sunflower.

***Cardamine micranthera* (Small-anthered bittercress)**

**Endangered**

**Family: Brassicaceae**

**Date Listed: September 21, 1989**

Small-anthered bittercress is a low, erect, biennial or perennial herb with simple, slender stems. The plant has crenate, lobed basal leaves 0.3 to 0.7 inch in length, and unlobed, crenate stem leaves that are slightly shorter. The small flowers have white petals to 0.1 inch long and bloom in the late spring. This species is only known from Forsyth and Stokes Counties. Typical habitat is stream banks and low, moist woods (Murdock and Weakley 1991).

**Small-anthered bittercress**

**Biological Conclusion: NO EFFECT**

Suitable habitat for small-anthered bittercress occurs within the project area along stream banks and some wet rock crevices found along the south side of NC 89 just north of where NC 89/8 splits to become NC 89 and NC 8. A survey during the blooming/fruiting season (April-May) was conducted on May 15, 2004 and no plants were identified. NHP has no record of anthered bittercress within a 2.0-mile radius of the project area. Based on the recent survey results and available information from NHP, the proposed project will have no effect on small-anthered bittercress.

## **2. Federal Species of Concern**

The February 3, 2003 FWS list also includes a category of species designated as "Federal species of concern" (FSC). A species with this designation is one that may or may not be listed in the future (formerly C2 candidate species or species under consideration for listing for which there is

insufficient information to support listing). The FSC designation provides no federal protection under the ESA for the species listed. FSC species listed for Stokes County are presented in Table 2.

Table 2: Federal Species of Concern

Common Name	Scientific Name	Potential Habitat	State Status**
Orangefin madtom	Noturus gilberti	Yes	E
Rustyside sucker	Thoburnia hamiltoni	Yes	E
Diana fritillary	Speyeria diana	Yes	SR*
Green floater	Lasmigonia subviridis	Yes	E
Butternut	Juglans cinerea	Yes	SR-T
Sweet pinesap	Monotropis odorata	No	SR

\*Historic record--the species was last observed in the county more than 50 years ago

\*\*State Status: E = Endangered; T = Threatened; SR = Significantly Rare; SR-T = Significantly Rare Throughout their ranges (fewer than 100 populations total) (Amoroso 2002; LeGrand and Hall 2001).

NHP files list documentation for orangefin madtom (*Noturus gilberti*) within 2.0 miles of the project area. Neither orangefin madtom nor any other FSC species were observed during field investigations.

## VI. CULTURAL RESOURCES

### A. Compliance Guidelines

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

### B. Historic Architecture

A field survey of the Area of Potential Effects (APE) was conducted on February 25, 2004. All structures within the APE were photographed, and later reviewed by the State Historic Preservation Office (HPO). In a memorandum dated March 10, 2004, the State Historic Preservation Office (HPO) determined that the project would not affect any historic structures. A copy of this memorandum is included in the Appendix.

### **C. Archaeology**

The State Historic Preservation Office (HPO), in a March 10, 2004 memorandum, stated: "Archaeological site 31SK48 is located in the northeast quadrant of the road and river intersection and archaeological site 31SK50 is located west of the bridge. Neither of these two prehistoric sites may be affected, depending upon the replacement alternative selected and the length of any necessary approach work connected with the proposed bridge replacement. Please forward information regarding the specific location of ground disturbing activities associated with this project as soon as it is available in order that we may complete our review."

Environmental Services, Inc. conducted an intensive archaeological survey of the APE. No evidence of previously recorded archaeological site 31SK221 was encountered during the survey. Two new isolated archaeological finds (ESI-1 & ESI-2, site numbers to be assigned) were recorded during this investigation. Each site consisted of a single piece of lithic debitage. Neither isolated find has the potential to yield significant data pertaining to prehistory. They are both recommended not eligible for listing in the National Register.

In a memorandum dated January 3, 2005, the HPO concurred that the two referred sites, subsequently numbered 31SK221 and 31SK222, were not eligible for listing in the National Register of Historic Places under criterion D, and since no evidence of archaeological site 31SK48 was encountered during the survey; concurred that the site has either been destroyed or is located outside the APE for the project. A copy of the HPO memorandums are included in the Appendix.

### **VII. ENVIRONMENTAL EFFECTS**

Replacement of Bridge No. 60 will not have an adverse effect on the quality of the human or natural environment if current NCDOT standards and specifications are implemented. A Section 7 consultation will be required concerning the endangered James spiny mussel following completion of this document.

The project is expected to have an overall positive impact by replacing a potentially unsafe bridge.

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

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

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

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.

No residential or business relocatees are anticipated as a result of the proposed project.

No adverse impacts on families or communities are anticipated.

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

Neither of the alternatives studied impacts any Prime and Unique Farmland or Farmland of Importance. Alternate 1 (preferred) has a “Farmland Conversion Impact Rating” score of 48 and will impact 2.34 acres while Alternate 2 has a score of 43 and will impact 3.50 acres. Both alternatives affect some cultivated fields. The Natural Resources Conservation Service (USDA) memo and Farmland Conversion Impact Rating Form are included in the Appendix. The preferred (Alternate 1) does impact more acres of cultivated farmland, which accounts for its higher impact rating. Both alternatives would meet the requirements of the Farmland Protection Policy Act (7 CFR Part 658).

This reach of the Dan River is part of the “Significant Natural Heritage Area Program” (SNHA) and is a Land Trust priority area of the Piedmont Land Conservancy. The Piedmont Land Conservancy owns land southeast of the bridge and has a canoe access located 1568 feet northeast of the bridge (not open to the public). [Neither the land owned by the Piedmont Land Conservancy nor the canoe access will be affected by the project.] Both Stokes County and the NC Wildlife Resources Commission requested that the NCDOT incorporate a small parking and canoe access area into the construction plans for this project. Stokes County requested this site to be in the southwest quadrant. Since the new bridge will span the river and the existing bridge abutments will be removed from the Dan River, this project should generally enhance river activities sponsored by the SNHA Program. There are not any resources protected by Section 4(f) of the 1966 DOT Act in the project study area.

The project is an air quality “neutral” project, so it is not required to be included in the regional emissions analysis and a project level CO analysis is not required. 40 CFR Part 51 is not applicable because the proposed project is located in an attainment area. If vegetation or wood debris is disposed of by open burning, it shall be done in accordance with applicable local laws and regulations of the North Carolina State Implementation Plan (SIP) for air quality in

compliance with 15 NCAC 2D.0520 and 1990 Clean Air Act Amendments and the National Environmental Policy Act. Replacement of the existing bridge will not increase traffic volumes. The noise levels will increase during the construction period, but will only be temporary. This evaluation completes the assessment requirements for highway traffic noise of Title 23, Code of Federal Regulations (CFR), Part 772 and for air quality (1990 Clean Air Act Amendments and the National Environmental Policy Act) and no additional reports are required.

The results from a pre-scoping geotechnical and geoenvironmental investigation performed by the NCDOT Geotechnical Engineering Unit showed that no hazardous waste sites or apparent landfills were identified within the project limits. There is one potential underground storage tank identified near the project limits, an abandoned old gas station. This property is outside the project limits of this bridge. The geotechnical pre-scoping report is included in the Appendix.

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

## **VIII. PUBLIC INVOLVEMENT**

A “start of study” letter was distributed to local officials and agencies requesting information and concerns relative to the proposed study alternates. Their responses are included in the Appendix.

Due to the isolated nature of this bridge replacement project, no formal public involvement program was initiated.

## **IX. AGENCY COORDINATION**

Letters requesting comments and environmental input were sent to the following agencies:

- US Army Corps of Engineers- Wilmington District
- \*US Fish and Wildlife Service
- \*US Department of Agriculture
  - Federal Highway Administration
  - State Clearinghouse
- \*NC Department of Cultural Resources
- \*NC Wildlife Resources Commission
- \*NC Division of Water Quality
- \*NCDENR, Division of Parks and Recreation
- \*County Manager, Stokes County
  - Chairman, Stokes County Commissioners

\*Superintendent, Stokes County Public Schools  
\*Stokes County Medical Service Emergency Management  
\*Sheriff, Stokes County  
\*Stokes County Fire Marshall  
\*Stokes County Emergency Communications

Asterisks (\*) indicate agencies from which written/oral comments were received. Copies of the comments received are in the Appendix. Comments requiring a response are addressed below:

**1. NCDWQ:**

**Comment:** “Dan River is classified as C Trout and is in the Roanoke River Basin. A moratorium prohibiting in-stream work and land disturbance within the 25-foot trout buffer is recommended from October 15 to April 15 to protect the egg and fry stages of trout.”

**Response:** This reach of the Dan River is classified WS-V based on the information from DWQ’s Basinwide Information Management System and does not require a moratorium for trout; however, a moratorium between May 1 and July 15 will be required for other fish species.

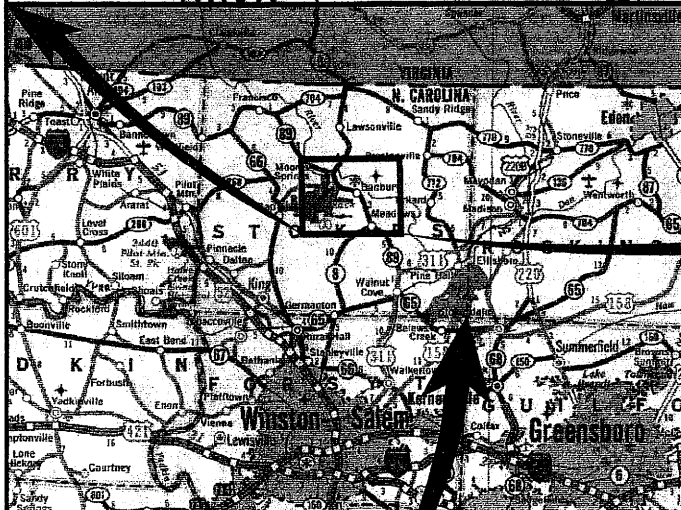
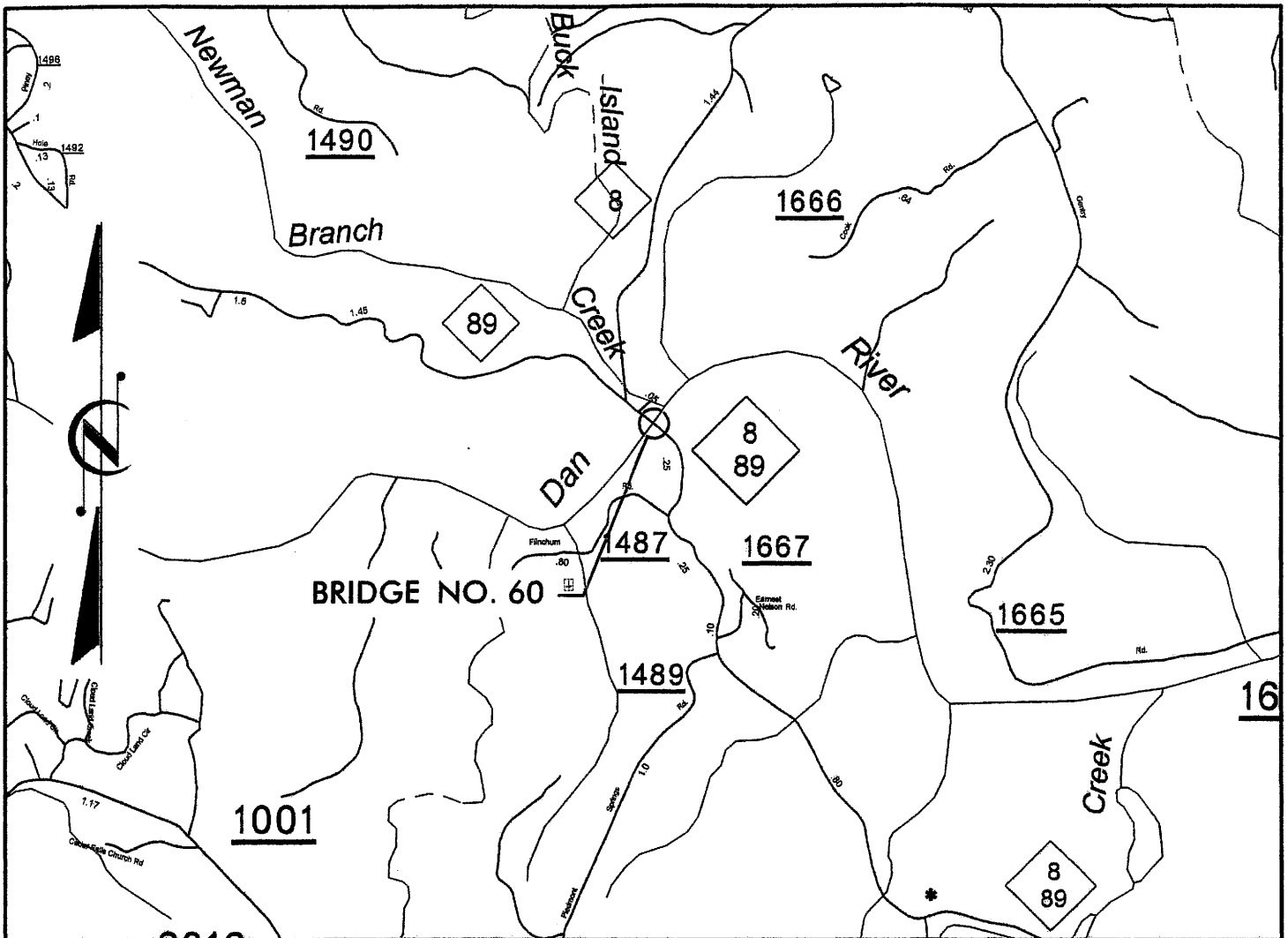


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## FIGURES



GRAPHIC SCALE (MILES)

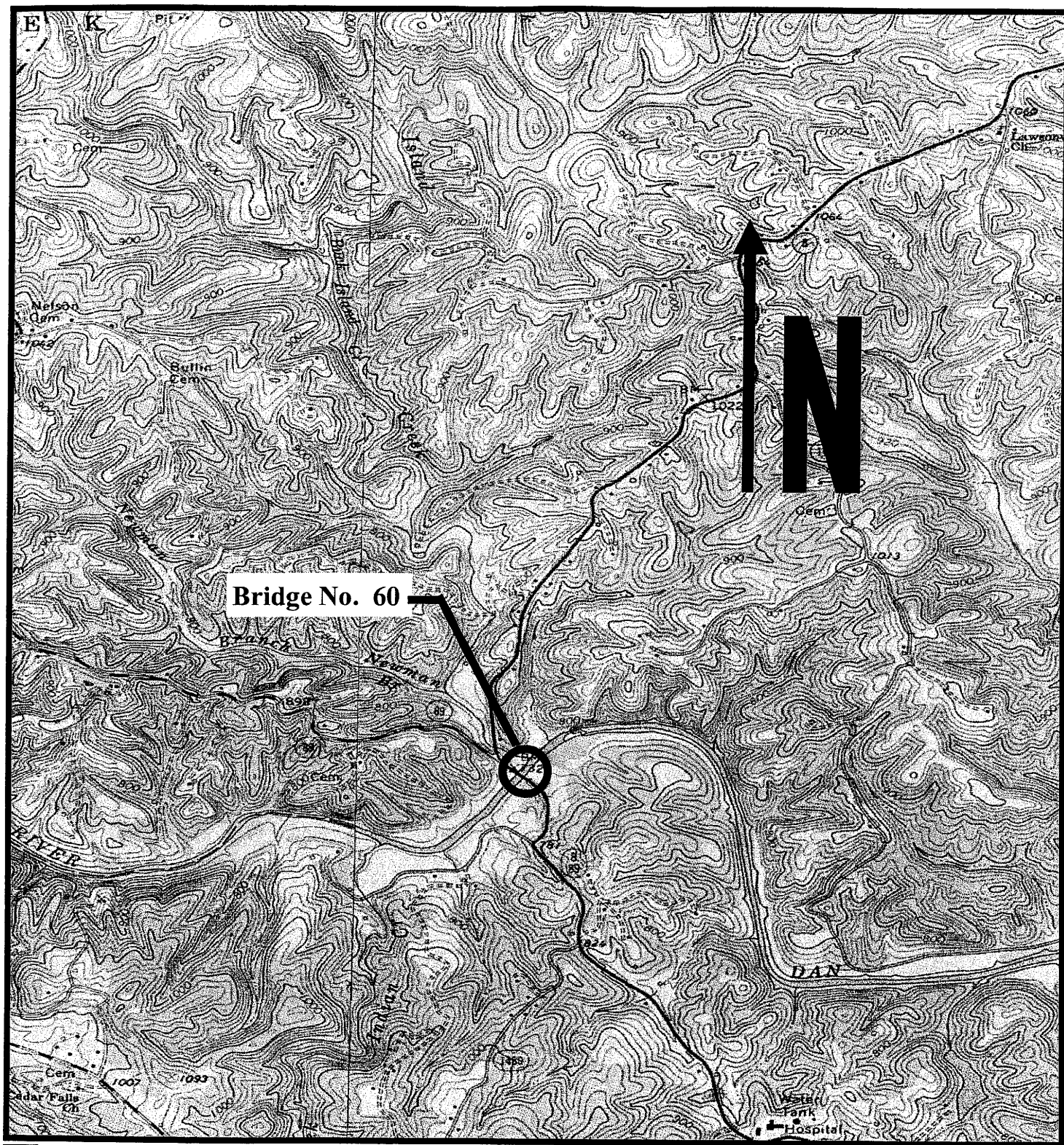


**NORTH CAROLINA DEPARTMENT OF TRANSPORTATION**  
*Project Development and Environmental Analysis Branch*

BRIDGE NO. 60  
 NC 8 / 89 OVER DAN RIVER  
 STOKES COUNTY  
 B-4281

VICINITY MAP

FIGURE 1A



**North Carolina Department of Transportation**  
***Project Development and Environmental Analysis Branch***

**T.I.P. B-4281**  
**Bridge No. 60 Over Dan River**  
**On NC 8 / 89 - Stokes County, N.C.**

Quad.Map: Danbury

**Figure 1B**



**LOOKING EAST ACROSS BRIDGE**



**LOOKING WEST ACROSS BRIDGE**



**NORTH CAROLINA DEPARTMENT OF  
TRANSPORTATION**

**PROJECT DEVELOPMENT AND  
ENVIRONMENTAL ANALYSIS BRANCH**

**BRIDGE NO. 60  
ON NC 8 / 89 OVER DAN RIVER  
STOKES COUNTY  
B-4281**

**FIGURE 2A**



**STRUCTURE PROFILE, LOOKING NORTH & DOWNSTREAM**



**STRUCTURE PROFILE, LOOKING SOUTH & UPSTREAM**



**NORTH CAROLINA DEPARTMENT OF  
TRANSPORTATION**

**PROJECT DEVELOPMENT AND  
ENVIRONMENTAL ANALYSIS BRANCH**

**BRIDGE NO. 60  
ON NC 8 / 89 OVER DAN RIVER  
STOKES COUNTY  
B-4281**

**FIGURE 2B**



# PROPOSED DESIGN CRITERIA

## REPLACE BRIDGE NO. 60 ON NC 8 / 89 OVER DAN RIVER STOKES COUNTY B-428I

FIGURE 3

FUNCTIONAL CLASSIFICATION: RURAL MINOR ARTERIAL

POSTED SPEED: 55 MPH

ESTIMATED ADT:	2005 ADT	=	3,000
	2025 ADT	=	4,800
	TTST	=	1%
	DUAL	=	2%
	DHV	=	10%
	DIR	=	65%

DESIGN SPEED: 60 MPH

MAXIMUM RATE OF SUPERELEVATION: 0.06 ft/ft

MAXIMUM DEGREE OF CURVE: 4°15'

MAXIMUM GRADE: 4%

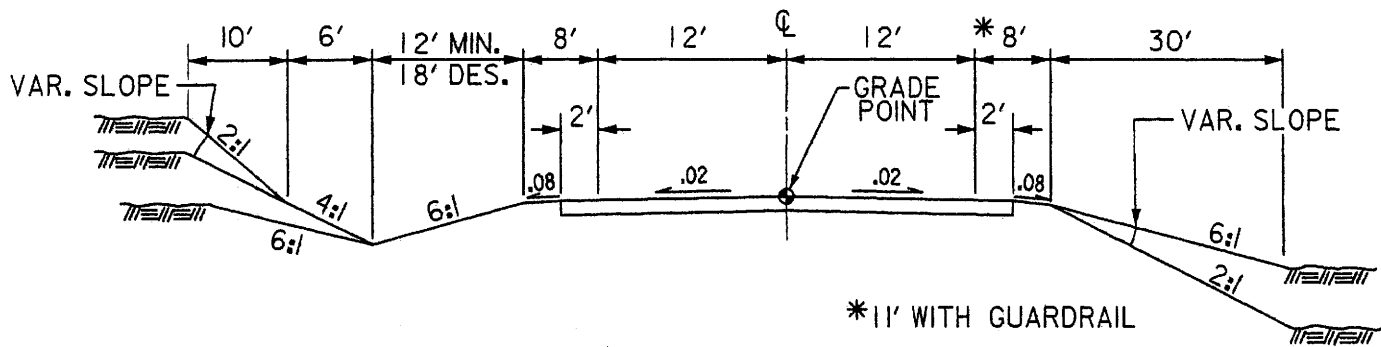
MINIMUM DESIRABLE K FACTORS:  $K_{sag} = 136$   $K_{crest} = 151$

SHOULDER WIDTH & TYPE : 2.0 ft FDPS 8.0 ft TOTAL (11.0ft WITH GUARDRAIL)

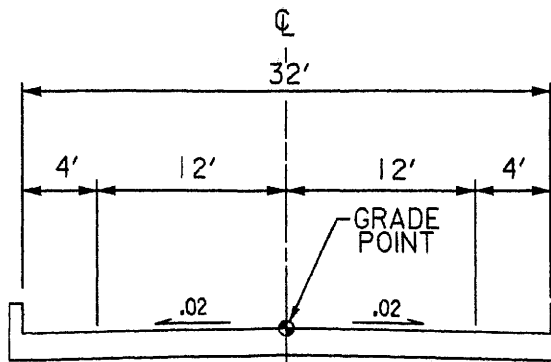
LANE WIDTHS: 12.0 ft

BRIDGE DECK WIDTH: 32.0 ft CLEAR

BRIDGE LENGTH: 395.0 ft or 335.0 ft



APPROACH ROADWAY TYPICAL SECTION



BRIDGE TYPICAL SECTION

NOTE:  
HORIZONTAL & VERTICAL DESIGN  
EXCEPTIONS MAY BE REQUIRED.

PREPARED BY: KO & ASSOC. DATE: 02-04-04  
APPROVED BY: \_\_\_\_\_ DATE: \_\_\_\_\_





$-L-$

---

PI Sta. 12+87.15  
 $\Delta = 14^{\circ} 28' 04.0''$  (LT)  
 $D = 5^{\circ} 43' 46.5''$   
 $T = 126.93'$   
 $L = 252.51'$   
 $R = 1,000.00'$   
 $S.E. = 0.08$   
 $DS = 55 \text{ mph}$

PLANS PREPARED FOR N.C.D.O.T. IN THE OFFICE OF:



NORTH CAROLINA DEPARTMENT OF TRANSPORTATION  
PROJECT DEVELOPMENT AND ENVIRONMENTAL ANALYSIS BRANCH

## FUNCTIONAL PLANS DESIGN ALTERNATIVES

DO NOT USE FOR CONSTRUCTION  
DO NOT USE FOR R/W ACQUISITION

FEBRUARY 2004

0 50 100 150  
(FEET)

BRIDGE NO. 60  
NC 8 /89 OVER DAN RIVER  
STOKES COUNTY  
B-4281

**FIGURE 4**



25+00

SHEET 2 OF 2





-L-


PI Sta. 16+17.93  
 $\Delta = 8^{\circ} 56' 40.7''$  (LT)  
 $D = 4' 46'' 28.7''$   
 $T = 93.86'$   
 $L = 187.34'$   
 $R = 1,200.00'$   
 $S.E. = 0.08$   
 $DS = 60 \text{ mph}$

PLANS PREPARED FOR N.C.D.O.T. IN THE OFFICE OF:

**KO & ASSOCIATES, P.C.**  
 CONSULTING ENGINEERS  
 RALEIGH, NORTH CAROLINA

**FUNCTIONAL PLANS**  
**DESIGN ALTERNATIVES**  
 DO NOT USE FOR CONSTRUCTION  
 DO NOT USE FOR R/W ACQUISITION  
 FEBRUARY 2004

0 50 100 150  
 FEET

 NORTH CAROLINA DEPARTMENT OF TRANSPORTATION  
 PROJECT DEVELOPMENT AND ENVIRONMENTAL ANALYSIS BRANCH

**BRIDGE NO. 60**  
**NC 8/89 OVER DAN RIVER**  
**STOKES COUNTY**  
**B-4281**

**FIGURE 5** SHEET 1 OF 2

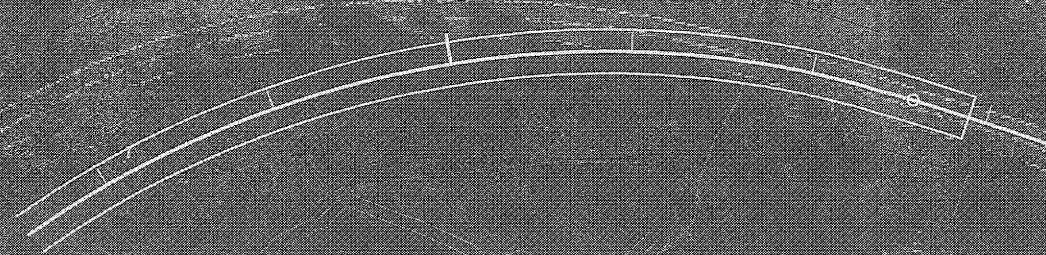
S:\Projects\Bridges\B-4281\Drawings\B-4281-01.dwg 8/17/2005



-L-

PI Sta. 25+08.75  
 $\Delta = 57^{\circ} 25' 40.8''$  (RT)  
 $D = 10' 25' 02.7''$   
 $T = 301.29'$   
 $L = 551.27'$   
 $R = 550.00'$   
 $S.E. = 0.08$   
 $DS = 43 \text{ mph}$

25+00



PLANS PREPARED FOR N.C.D.O.T. IN THE OFFICE OF:

**KO & ASSOCIATES, P.C.**  
 CONSULTING ENGINEERS  
 RALEIGH, NORTH CAROLINA



NORTH CAROLINA DEPARTMENT OF TRANSPORTATION  
 PROJECT DEVELOPMENT AND ENVIRONMENTAL ANALYSIS BRANCH

**FUNCTIONAL PLANS**  
**DESIGN ALTERNATIVES**

DO NOT USE FOR CONSTRUCTION  
 DO NOT USE FOR R/W ACQUISITION

FEBRUARY 2004

0 50 100 150  
 (FEET)

**BRIDGE NO. 60**  
**NC 8/89 OVER DAN RIVER**  
**STOKES COUNTY**  
**B-4281**

**FIGURE 5**

**SHEET 2 OF 2**





1001 Western Blvd., Suite 101  
Raleigh, North Carolina 27604  
Ph: 919 559 5488  
Fax: 919 559 5970

## Figure 6 B-4281 Stokes County

Replacement of  
Bridge No. 60  
NC 8/89 over  
Dan River

State Project No.  
WRS 33621.1.1  
Federal Aid No.  
BRSTP-008 (4)

Prepared for:  
The North Carolina  
Department of  
Transportation

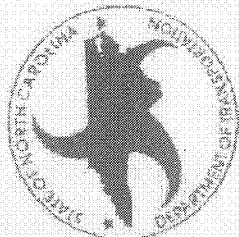
Client: Ko & Assoc.

Project: 04-185

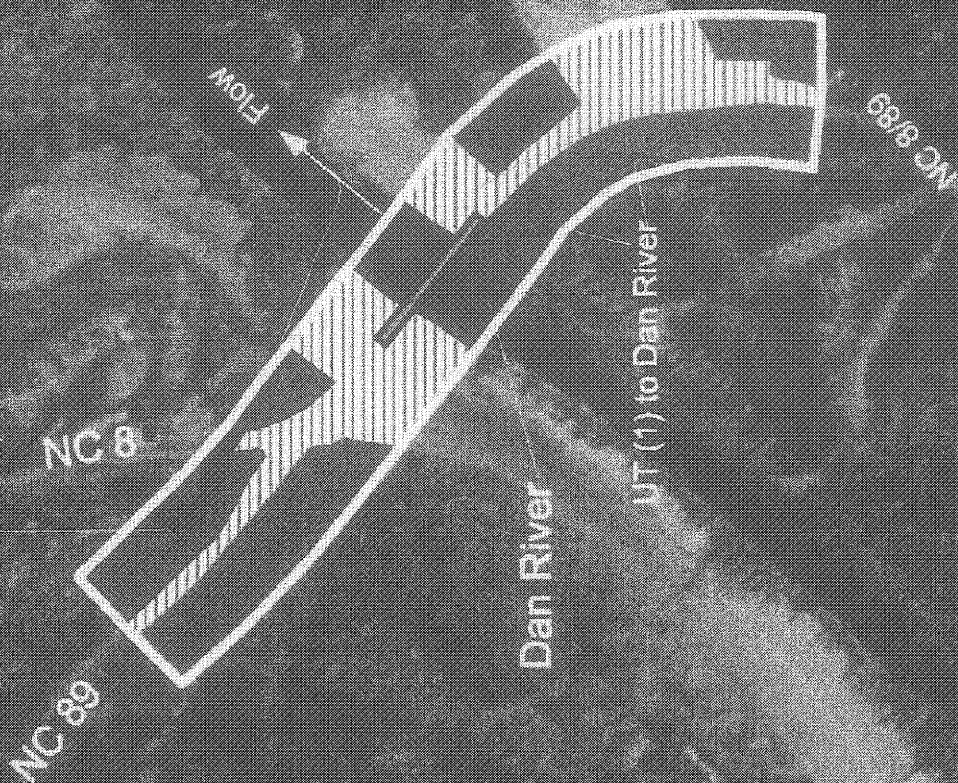
Date: April 2004

Drawn By: CBT

Checked By: APS

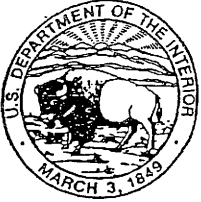


Buck Island Creek



- Project Area
- Bridge No. 60
- Streams
- Dry-Mesic Oak-Hickory
- Disturbed/Maintained Land
- Piedmont/Low Mountain Alluvial

## APPENDIX

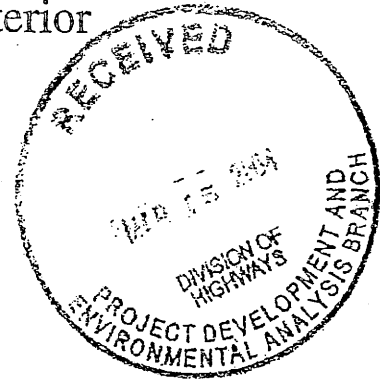


# United States Department of the Interior

## FISH AND WILDLIFE SERVICE

Asheville Field Office  
160 Zillicoa Street  
Asheville, North Carolina 28801

March 9, 2004



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

Dear Mr. Thorpe:

Subject: Scoping Comments for Five Bridge Replacement Proposals, Stokes, Davidson, Forsyth, and Davie Counties, North Carolina

We have reviewed the subject bridge replacement proposals and provide the following comments in accordance with the Fish and Wildlife Coordination Act, as amended (16 U.S.C. 661-667e), and section 7 of the Endangered Species Act of 1973, as amended (16 U.S.C. 1531-1543) (Act). Given the early stages of development for these projects, our comments are limited primarily to the known locations of listed species and federal species of concern. When the categorical exclusions are prepared and more information is available regarding environmental effects, we can offer more substantive comments.

Enclosed is a species list for the four counties included in this package. This list provides the names of species on the *Federal List of Endangered and Threatened Wildlife and Plants* as well as federal species of concern. Federal species of concern are not legally protected under the Act and are not subject to any of its provisions, including section 7, unless they are formally proposed or listed as endangered or threatened. We are including these species in our response to give you advance notification and to request your assistance in protecting them if any are found in the vicinity of your projects. Our records indicate the following:

**Stokes County** – B-4281, Bridge No. 60 on NC 8 and 89 over the Dan River (our Log No. 4-2-04-122) - Our records for Stokes County indicate known locations of the federally endangered James spiny mussel (*Pleurobema collina*) in the project area. It is likely that James spiny mussel individuals would be affected by this project; if that is the case, formal consultation will be required. In addition, there are occurrences of the federally endangered small-anthered bittercress (*Cardamine micranthera*) near the project area.

**Davidson County** - B-4100, Bridge No. 142 on SR 1741, and B-4101, Bridge No. 141 over Abbotts Creek (our Log Nos. 4-2-04-123, 4-2-04-124).

**Forsyth County** - B-4112, Bridge No. 30 on SR 1631 over Muddy Creek (our Log No. 4-2-04-125).

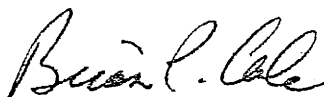
**Davie County** - B-4104, Bridge No. 21 on NC 801 over Carter Creek (our Log No. 4-2-04-128).

Our records for these counties and project areas indicate no known locations of listed species in the project areas. However, we recommend conducting habitat assessments and surveying any suitable habitat in the project areas for these species prior to any further planning or on-the-ground activities to ensure that no adverse impacts occur.

We are interested in the types of structures that will replace the existing bridges and would recommend spanning structures, preferably bridges, in all cases. In addition, off-site detours, which would reduce stream-bank disturbance, are preferable to temporary on-site crossings. We look forward to reviewing the completed categorical exclusion documents.

If you have questions about these comments, please contact Ms. Marella Buncick of our staff at 828/258-3939, Ext. 237. In any future correspondence concerning these projects, please reference the log numbers assigned with our comments for each project as shown above

Sincerely,



Brian P. Cole  
Field Supervisor

Enclosure

cc:

Mr. Eric Alsmeyer, U.S. Army Corps of Engineers, Raleigh Regulatory Field Office, 6508 Falls of the Neuse Road, Suite 120, Raleigh, NC 27615

Ms. Marla J. Chambers, Highway Projects Coordinator, North Carolina Wildlife Resources Commission, 12275 Swift Road, Oakboro, NC 28129

Ms. Cynthia Van Der Wiele, North Carolina Department of Environment and Natural Resources, Division of Water Quality, Wetlands Section, 1621 Mail Service Center, Raleigh, NC 27699-1621



# ENDANGERED, THREATENED, AND CANDIDATE SPECIES AND FEDERAL SPECIES OF CONCERN, DAVIDSON, DAVIE, FORSYTH, AND STOKES COUNTIES, NORTH CAROLINA

This list was adapted from the North Carolina Natural Heritage Program's County Species List. It is a listing, for Davidson, Davie, Forsyth, and Stokes Counties, of North Carolina's federally listed and proposed endangered, threatened, and candidate species and Federal species of concern (for a complete list of rare species in the state, please contact the North Carolina Natural Heritage Program). The information in this list is compiled from a variety of sources, including field surveys, museums and herbaria, literature, and personal communications. The North Carolina Natural Heritage Program's database is dynamic, with new records being added and old records being revised as new information is received. Please note that this list cannot be considered a definitive record of listed species and Federal species of concern, and it should not be considered a substitute for field surveys.

**Critical habitat:** Critical habitat is noted, with a description, for the counties where it is designated or proposed.

**Aquatic species:** Fishes and aquatic invertebrates are noted for counties where they are known to occur. However, projects may have effects on downstream aquatic systems in adjacent counties.

COMMON NAME	SCIENTIFIC NAME	STATUS
<b>DAVIDSON COUNTY</b>		
<b>Vertebrates</b>		
Bog turtle	<i>Clemmys muhlenbergii</i>	T(S/A) <sup>1</sup>
Carolina darter	<i>Etheostoma collis collis</i>	FSC
Bald eagle	<i>Haliaeetus leucocephalus</i>	Threatened (proposed for delisting)
<b>Vascular Plants</b>		
Georgia aster	<i>Aster georgianus</i>	C1
Schweinitz's sunflower	<i>Helianthus schweinitzii</i>	Endangered
Heller's trefoil	<i>Lotus helleri</i>	FSC
<b>DAVIE COUNTY</b>		
<b>Vertebrates</b>		
Robust redbreast	<i>Moxostoma robustum</i>	FSC
<b>Vascular Plants</b>		
Creamy tick-trefoil	<i>Desmodium ochroleucum</i>	FSC*
Heller's trefoil	<i>Lotus helleri</i>	FSC*
Michaux's sumac	<i>Rhus michauxii</i>	Endangered
<b>FORSYTH COUNTY</b>		
<b>Vertebrates</b>		
Bog turtle	<i>Clemmys muhlenbergii</i>	T(S/A) <sup>1</sup>
Red-cockaded woodpecker	<i>Picoides borealis</i>	Endangered****

COMMON NAME	SCIENTIFIC NAME	STATUS
<b>Invertebrates</b>		
Brook floater	<i>Alasmidonta varicosa</i>	FSC
<b>Vascular Plants</b>		
Small-anthered bittercress	<i>Cardamine micranthera</i>	Endangered
<b>STOKES COUNTY</b>		
<b>Vertebrates</b>		
Orangefin madtom	<i>Noturus gilberti</i>	FSC
Rustyside sucker	<i>Thoburnia hamiltoni</i>	FSC
<b>Invertebrates</b>		
Green floater	<i>Lasmigona subviridis</i>	FSC
James spinymussel	<i>Pleurobema collina</i>	Endangered
Diana fritillary butterfly	<i>Speyeria diana</i>	FSC*
<b>Vascular Plants</b>		
Small-anthered bittercress	<i>Cardamine micranthera</i>	Endangered
Schweinitz's sunflower	<i>Helianthus schweinitzii</i>	Endangered
Butternut	<i>Juglans cinerea</i>	FSC
Sweet pinesap	<i>Monotropsis odorata</i>	FSC

#### KEY:

Status	Definition
Endangered	A taxon "in danger of extinction throughout all or a significant portion of its range."
Threatened	A taxon "likely to become endangered within the foreseeable future throughout all or a significant portion of its range."
C1	A taxon under consideration for official listing for which there is sufficient information to support listing.
FSC	A Federal species of concern—a species that may or may not be listed in the future (formerly C2 candidate species or species under consideration for listing for which there is insufficient information to support listing).
T(S/A)	Threatened due to similarity of appearance (e.g., American alligator)—a species that is threatened due to similarity of appearance with other rare species and is listed for its protection. These species are not biologically endangered or threatened and are not subject to Section 7 consultation.

Species with 1, 2, 3, or 4 asterisks behind them indicate historic, obscure, or incidental records.

\*Historic record - the species was last observed in the county more than 50 years ago.

\*\*Obscure record - the date and/or location of observation is uncertain.

\*\*\*Incidental/migrant record - the species was observed outside of its normal range or habitat.

\*\*\*\*Historic record - obscure and incidental record.

<sup>1</sup>In the November 4, 1997, *Federal Register* (55822-55825), the northern population of the bog turtle (from New York south to Maryland) was listed as T (threatened), and the southern population (from Virginia south to Georgia) was listed as T(S/A) (threatened due to similarity of appearance). The T(S/A) designation bans the collection and interstate and international commercial trade of bog turtles from the southern population. The T(S/A) designation has no effect on land-management activities by private landowners in North Carolina, part of the southern population of the species. In addition to its official status as T(S/A), the U.S. Fish and Wildlife Service considers the southern population of the bog turtle as a Federal species of concern due to habitat loss.

U.S. Fish & Wildlife Service  
Asheville Field Office  
160 Zillicoa Street  
Asheville, North Carolina 28801

MEMO FOR: Karen Taylor  
DATE: March 23, 2005  
FROM: Denise Moldenhauer

SUBJECT: Comments on the Categorical Exclusion (CE) and project commitments for replacement of Bridge No. 60 on NC 8/89 over the Dan River, Stokes County, TIP Project No. B-4281

Karen,

We have reviewed the CE and project commitments for B-4281 and provide the following comments:

1. On page 3 of the document, Project Commitments, we recommend adding a sentence to the end of the first paragraph stating that this project will require formal consultation with the USFWS to address impacts to the James spinymussel (*Pleurobema collina*) and that additional commitment measures other than those listed below likely will be required to ensure that effects to the James spinymussel are minimized to the greatest extent possible.
2. The project commitments were not grouped together logically and therefore the document was difficult to follow. We believe that the commitments could be grouped in a more logical manner and recommend the following categories for grouping the commitments; "commitments associated with bridge demolition", "commitments associated with bridge design", and "commitments associated with bridge construction." The "commitments associated with bridge demolition" could include how the material from demolition will be contained and kept out of the river, the "commitments associated with bridge design" could include how deck drainage will be handled and considerations given for spanning or minimizing bents within the river, and "commitments associated with bridge construction" could include erosion control measures and how and where equipment will be operated to minimize impacts to the river and floodplain.
3. Page 3 of the document states that the NCWRC has requested a canoe access area be provided for this project. We are in support of an area for canoe access but if this action is taken it will need to be evaluated within the Biological Assessment for this project to ensure the action does not adversely affect the James spinymussel.
4. Statements within pages 4 and 5, Project Commitments, conflict with one another. Page 4 states that because some bridge debris will enter the river the contractor will submit a demolition plan that details the amount of bridge that can be removed with only minimal portions of material falling into the river and ways the contractor plans on retrieving and disposing of components of the bridge that do fall into the water. Where as page 5 states that during and after the bridge demolition that no bridge debris, asphalt, or dirt fill will be allowed to enter the river. We recommend stating in one place within the document (again we recommend a section entitled "commitments associated with bridge demolition") that "All attempts will be made to keep existing bridge debris from entering

the Dan River. A containment system may be needed during portions of the demolition process; however, the containment system will only be used to catch debris that inadvertently falls into the river. If debris does enter the river, the contractor will be required to submit a proposed removal method for review and approval prior to conducting this work.”

5. Page 4 states that every effort will be made to minimize deck drainage. This should be changed to “the deck and roadbed drainage will flow through a vegetated buffer prior to reaching the Dan River.”
6. Page 4 states that activities in the floodplain will be limited to those needed to construct and remove the bridge. We recommend adding an additional statement that any material that is deposited in the floodplain as a result from this project will be removed and the floodplain will be restored after the project is completed.
7. Page 5 states that “All James spinymussel species must be removed prior to construction. Bridge construction may be subject to a moratorium.” Page 6 states that “Pre-let surveys will be performed at the bridge of occurrence of James spinymussel.” We recommend removing these sentences because the terms of a moratorium, survey work, and the relocation of mussels will need to be worked out through the formal consultation process.
8. Page 5 states that NCDOT PDEA and the USFWS will be invited to the pre-construction meeting. We recommend also inviting the Corps, NCDWQ, and the NCWRC to this meeting.
9. Neither the project commitments nor the CE discuss the applicability of spanning the river. We recommend analyzing this in the CE under the Alternatives section and stating if this is a consideration in the commitments document.
10. Finally, the Preferred Alternatives section of the CE needs to be expanded. Given that NCDOT has decided to issue a CE before formal consultation is finalized we need to make sure that the preferred alternative minimizes impacts to the aquatic environment and the James spinymussel. For the BO we will need to evaluate the alternatives of the project and all measures that have been taken to minimize impacts; therefore, the alternative that is deemed the preferred alternative should illustrate that it was chosen because it minimized impacts to the James spinymussel. Currently the preferred alternative discussion does not discuss how the chosen alternative will minimize impacts to the James spinymussel. Page 9 of the CE document states that the reasons for choosing alternative 1 as the preferred alternative were that this alternative was cheaper and will cause fewer impacts to the dry-mesic oak-hickory forest. Again, the discussion of the preferred alternative should demonstrate that it minimizes impacts to the James spinymussel. Some examples of ways an alternative could minimize impacts are by causing fewer construction impacts and by spanning the river.

If you have questions about these comments, please contact Denise Moldenhauer at 828/258-3939, Ext. 226. In any future correspondence concerning this project, please reference our Log Number 4-2-04-122.

## FARMLAND CONVERSION IMPACT RATING

## PART I (To be completed by Federal Agency)

Date Of Land Evaluation Request

6-24-04

Name Of Project

B - 4281

Federal Agency Involved

Federal Highway Administration

Proposed Land Use

Bridge Replacement

County And State

Stokes Co., N.C.

## PART II (To be completed by NRCS)

Date Request Received By NRCS

6-29-04

Does the site contain prime, unique, statewide or local important farmland?  
(If no, the FPPA does not apply - do not complete additional parts of this form)

Yes

No

☐☒

Acres Irrigated

0

Average Farm Size

77 ac

Major Crop(s)

CORN

Farmable Land In Govt. Jurisdiction

Acres

149.749

% 51.3

Amount Of Farmland As Defined In FPPA

Acres

141831

% 48.6

Name Of Land Evaluation System Used

STOKES LE

Name Of Local Site Assessment System

NONE

Date Land Evaluation Returned By NRCS

7-21-04

## PART III (To be completed by Federal Agency)

Alternative Site Rating

Site A #1

Site B #2

Site C

Site D

A. Total Acres To Be Converted Directly

2.34

3.50

B. Total Acres To Be Converted Indirectly

-

-

C. Total Acres In Site

0.0 2.34

0.0 3.50

0.0

0.0

## PART IV (To be completed by NRCS) Land Evaluation Information

A. Total Acres Prime And Unique Farmland

8

8

B. Total Acres Statewide And Local Important Farmland

8

8

C. Percentage Of Farmland In County Or Local Govt. Unit To Be Converted

8

8

D. Percentage Of Farmland In Govt. Jurisdiction With Same Or Higher Relative Value

100

100

## PART V (To be completed by NRCS) Land Evaluation Criterion

Relative Value Of Farmland To Be Converted (Scale of 0 to 100 Points)

0 0

0 0

0

0

## PART VI (To be completed by Federal Agency)

Site Assessment Criteria (These criteria are explained in 7 CFR 658.5(b))

Maximum Points

1. Area In Nonurban Use

15

15

15

2. Perimeter In Nonurban Use

10

10

10

3. Percent Of Site Being Farmed

20

8

3

4. Protection Provided By State And Local Government

20

0

0

5. Distance From Urban Builtup Area

0

0

0

6. Distance To Urban Support Services

0

0

0

7. Size Of Present Farm Unit Compared To Average

10

10

10

8. Creation Of Nonfarmable Farmland

25

0

0

9. Availability Of Farm Support Services

5

5

5

10. On-Farm Investments

20

0

0

11. Effects Of Conversion On Farm Support Services

25

0

0

12. Compatibility With Existing Agricultural Use

10

0

0

TOTAL SITE ASSESSMENT POINTS

160

0 48

0 43

0

0

## PART VII (To be completed by Federal Agency)

Relative Value Of Farmland (From Part V)

100

0 0

0 0

0

0

Total Site Assessment (From Part VI above or a local site assessment)

160

0 48

0 43

0

0

TOTAL POINTS (Total of above 2 lines)

260

0 0

0 0

0

0

Site Selected:

Date Of Selection

Was A Local Site Assessment Used?

Yes ☐No ☐

Reason For Selection:



North Carolina Department of Cultural Resources  
State Historic Preservation Office

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

RECEIVED  
MAR 16 2004  
DIVISION OF HISTORICAL RESOURCES  
PROJECT DEVELOPMENT AND ENVIRONMENTAL ANALYSIS BRANCH  
David L. S. [Signature]

March 10, 2004

MEMORANDUM

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

FROM: David Brook *for David Brook*  
Deputy State Historic Preservation Officer

SUBJECT: Bridge No. 60 on NC 8 and 89 over Dan River, B-4281, Stokes County,  
ER04-0479

Thank you for your letter of February 10, 2004, concerning the above project.

Archaeological site 31SK48 is located in the northeast quadrant of the road and river intersection and archaeological site 31SK50 is located west of the bridge. Neither of these two prehistoric sites may be affected, depending upon the replacement alternative selected and the length of any necessary approach work connected with the proposed bridge replacement. Please forward information regarding the specific location of ground disturbing activities associated with this project as soon as it is available in order that we may complete our review.

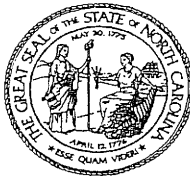
We have determined that the project as proposed will not affect any historic structures.

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

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

cc: Mary Pope Furr  
Matt Wilkerson

[www.hpo.dcr.state.nc.us](http://www.hpo.dcr.state.nc.us)



CITIZENS PARTICIPATION  
RECEIVED

JAN 05 2005

North Carolina Department of Cultural Resources  
State Historic Preservation Office

Peter B. Sandbeck, Administrator

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

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

January 3, 2005

MEMORANDUM

TO: Matt Wilkerson, Archaeology Supervisor  
Office of Human Environment  
NCDOT Division of Highways

FROM: Peter Sandbeck *PSS for Peter Sandbeck*

SUBJECT: Archaeological Survey and Evaluation of Proposed Improvements to Bridge 60 on NC 8/89 over the Dan River, TIP B-4281; Federal Aid Project No. BRSTP-008(1); State Project No. 8.1641201, Stokes County, ER 04-0479

Thank you for your letter of November 29, 2004, transmitting the survey report by Environmental Services, Inc. for the above project.

For purposes of compliance with Section 106 of the National Historic Preservation Act, we concur that the following properties are not eligible for listing in the National Register of Historic Places under criterion D:  
31SK221 and 31SK222

These prehistoric isolated finds do not retain sufficient integrity to yield important information. No evidence of previously recorded archaeological site 31SK48 was encountered during the survey. The report concludes that the site has either been destroyed or is located outside the area of potential effect (APE) for the project.

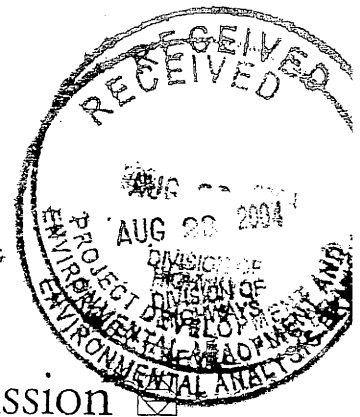
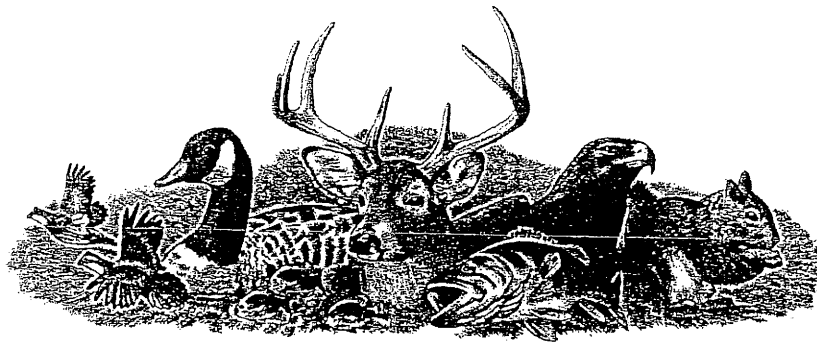
We concur with the author's recommendation that no additional archaeological investigation is warranted for this project as currently proposed. The report meets our office's guidelines and those of the Secretary of the Interior.

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

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

cc: Scott Seibel  
Environmental Services, Inc.

ADMINISTRATION	Location	Mailing Address	Telephone/Fax
RESTORATION	507 N. Blount Street, Raleigh NC	4617 Mail Service Center, Raleigh NC 27699-4617	(919) 733-4763/733-8653
SURVEY & PLANNING	515 N. Blount Street, Raleigh NC	4617 Mail Service Center, Raleigh NC 27699-4617	(919) 733-6547/715-4801
	515 N. Blount Street, Raleigh, NC	4617 Mail Service Center, Raleigh NC 27699-4617	(919) 733-6545/715-4801



## North Carolina Wildlife Resources Commission

Charles R. Fullwood, Executive Director

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

FROM: Marla Chambers, Highway Projects Coordinator *Marla Chambers*  
Habitat Conservation Program, NCWRC

DATE: August 10, 2004

SUBJECT: Scoping review of NCDOT's proposed replacement of Bridge No. 60 on NC 8 and 89 over the Dan River, Stokes County. TIP No. B-4281.

North Carolina Department of Transportation (NCDOT) is requesting comments from the North Carolina Wildlife Resources Commission (NCWRC) regarding impacts to fish and wildlife resources resulting from the subject project. Staff biologists have reviewed the information provided and visited the site on February 25, 2004. We have the following preliminary comments. These comments are provided in accordance with the provisions of the National Environmental Policy Act (42 U.S.C. 4332(2)(c)) and the Fish and Wildlife Coordination Act (48 Stat. 401, as amended; 16 U.S.C. 661-667d).

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

1. We generally prefer spanning structures. Spanning structures usually do not require work within the stream and do not require stream channel realignment. The horizontal and vertical clearances provided by bridges allows for human and wildlife passage beneath the structure, does not block fish passage, and does not block navigation by canoeists and boaters.
2. Bridge deck drains should not discharge directly into the stream.
3. Live concrete should not be allowed to contact the water in or entering into the stream.
4. If possible, bridge supports (bents) should not be placed in the stream.



5. If temporary access roads or detours are constructed, they should be removed back to original ground elevations immediately upon the completion of the project. Disturbed areas should be seeded or mulched to stabilize the soil and native tree species should be planted with a spacing of not more than 10'x10'. If possible, when using temporary structures the area should be cleared but not grubbed. Clearing the area with chain saws, mowers, bush-hogs, or other mechanized equipment and leaving the stumps and root mat intact, allows the area to revegetate naturally and minimizes disturbed soil.
6. A clear bank (riprap free) area of at least 10 feet should remain on each side of the stream 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, Mr. Logan Williams with the NCDOT - ONE 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.
17. If culvert installation is being considered, conduct subsurface investigations prior to structure design to determine design options and constraints and to ensure that wildlife passage issues are addressed.

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

1. The culvert must be designed to allow for aquatic life and fish passage. Generally, the culvert or pipe invert should be buried at least 1 foot below the natural streambed (measured from the natural thalweg depth). If multiple barrels are required, barrels other than the base flow barrel(s) should be placed on or near stream bankfull or floodplain bench elevation (similar to Lyonsfield design). These should be reconnected to floodplain benches as appropriate. This may be accomplished by utilizing sills on the upstream end to restrict or divert flow to the base flow barrel(s). Silled barrels should be filled with sediment so as not to cause noxious or mosquito breeding conditions. Sufficient water depth should be provided in the base flow barrel during low flows to accommodate fish movement. If culverts are longer than 40-50 linear feet, alternating or notched baffles should be installed in a manner that mimics existing stream pattern. This should enhance aquatic life passage: 1) by depositing sediments in the barrel, 2) by maintaining channel depth and flow regimes, and 3) by providing resting places for fish and other aquatic organisms. In essence, the base flow barrel(s) should provide a continuum of water depth and channel width without substantial modifications of velocity.
2. If multiple pipes or cells are used, at least one pipe or box should be designed to remain dry during normal flows to allow for wildlife passage.
3. Culverts or pipes should be situated along the existing channel alignment whenever possible to avoid channel realignment. Widening the stream channel must be avoided. Stream channel widening at the inlet or outlet end of structures typically decreases water velocity causing sediment deposition that requires increased maintenance and disrupts aquatic life passage.
4. Riprap should not be placed in the active thalweg channel or placed in the streambed in a manner that precludes aquatic life passage. Bioengineering boulders or structures should be professionally designed, sized, and installed.

In most cases, we prefer the replacement of the existing structure at the same location with road closure. If road closure is not feasible, a temporary detour should be designed and located to avoid wetland impacts, minimize the need for clearing and to avoid destabilizing stream banks. If the structure will be on a new alignment, the old structure should be removed and the approach fills removed from the 100-year floodplain. Approach fills should be removed

down to the natural ground elevation. The area should be stabilized with grass and planted with native tree species. Tall fescue should not be used in riparian areas. 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-4281, Stokes Co., Bridge No. 60 over Dan River on NC 8 and 89. The Dan River is Class C Tr waters and supports a fishery which includes smallmouth bass (*Micropterus dolomieu*), redbreast sunfish (*Lepomis auritus*), bluegill (*L. macrochirus*) and pumpkinseed (*L. gibbosus*). Several federal and state listed species exist in the project area or vicinity including two mussel species, the James spineymussel (*Pleurobema collina*), federal and state Endangered (E), and notched rainbow (*Villosa constricta*), state Special Concern (SC). Listed fish species in the Dan River include: orangefin madtom (*Noturus gilberti*), Federal Species of Concern and state E; cutlips minnow (*Exoglossum maxillingua*), state E; rustyside sucker (*Thoburnia hamiltoni*), state E; riverweed darter (*Etheostoma podostemone*), state SC; bigeye jumprock (*Scartomyzon ariommum*), state Threatened; Roanoke hogsucker (*Hypentelium roanokenese*), state Significantly Rare (SR); and Blue Ridge sculpin (*Cottus caeruleomentum*), state SR. An in-stream work moratorium is recommended from May 1 to July 15 to protect the egg and fry stage of smallmouth bass, sunfish, and many of the listed species. A thorough mussel survey should be conducted in the project area and immediately downstream.

A similar project (B-3045) on the Dan River was under construction earlier this year not far upstream of this project. NCDOT should continue to work with resource agencies, including NCWRC, regarding protection of listed species in the area. A concern of the B-3045 project involved acidic soils with a very severe hazard of erosion. If similar soils exist for this project, steps must be taken to ensure that the pH of stormwater runoff does not negatively impact surface waters. It is extremely important to implement and maintain strong erosion and sedimentation control measures and properly manage stormwater in the project area. At a minimum, sediment and erosion control measures should adhere to the design standards for sensitive watersheds. Stormwater designs should incorporate treatment of the water by measures such as a preformed scour holes, grassed swales, or grass-lined ditches.

Canoe access was requested more than once for the B-3045 project, but to no avail. Access to our State's water-related recreational resources is often limited to the public right-of-ways maintained by NCDOT. We request that NCDOT incorporate a small parking and canoe access area into their construction plans for this project, B-4281, to provide the public permanent and safe access to this valuable resource.

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.

B-4281, Bridge No. 60, NC 8 & 89  
Dan River, Stokes Co.

5

August 10, 2004

Spanning structures allow wildlife passage along streambanks, reducing habitat fragmentation and vehicle related mortality at highway crossings.

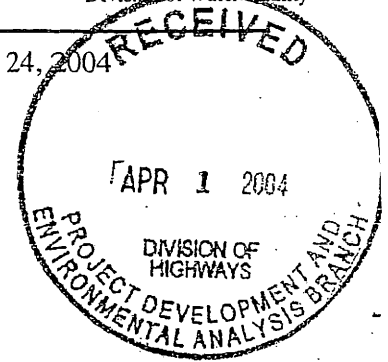
If you need further assistance or information on NCWRC concerns regarding bridge replacements, please contact me at (704) 485-2384. Thank you for the opportunity to review and comment on this project.

cc: Marella Buncick, USFWS  
Brian Wrenn, NCDWQ  
Sarah McRae, NCNHP



Alan W. Klimek, P.E., Director  
Division of Water Quality  
Coleen H. Sullins, Deputy Director  
Division of Water Quality

March 24, 2004



MEMORANDUM

TO: Gregory J. Thorpe, PhD, Director  
NCDOT Project Development and Environmental Analysis Branch

FROM: Robert Ridings, Env. Tech., DWQ 401 Unit *Red Ridings*

THROUGH: John Hennessy, Supervisor, DWQ 401 Transportation Unit *JH*

SUBJECT: Scoping Review of NCDOT's proposed bridge replacement projects: B-4281, B-4112, B-4252, B-4254, B-4100, B-4101, B-4243, B-4244, B-4246, B-4104, B-4129, B-4130, B-4131.  
*ENC* *K (Curl's new*

In reply to your correspondence dated February 10, 2004 (received February 18, 2004) to Cynthia Van der Wiele, in which you requested comments for the referenced projects, the NC Division of Water Quality has the following comments:

I. General Comments Regarding Bridge Replacement Projects

1. If corrugated metal pipe arches, reinforced concrete pipes, or concrete box culverts are used to replace the bridge, then DWQ recommends the use of Nationwide Permit No. 14 rather than Nationwide Permit 23.
2. Bridge demolition should be performed using Best Management Practices developed by NCDOT.
3. DWQ prefers 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.
4. Bridge deck drains should not discharge directly into the stream; stormwater should be directed across the bridge and pre-treated through site-appropriate means (grassed swales, pre-formed scour holes, vegetated buffers, etc.) before entering the stream. Please refer to NCDOT Best Management Practices for the Protection of Surface Waters
5. Live concrete should not be allowed to contact the water in or entering into the stream. Concrete is mostly made up of lime (calcium carbonate) and when in a dry or wet state (not hardened) calcium carbonate is very soluble in water and has a pH of approximately 12. In an unhardened state concrete or cement will change the pH of fresh water to very basic and will cause fish and other macroinvertebrate kills.
6. If possible, bridge supports (bents) should not be placed in the stream.
7. 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' x 10'. If possible, when using temporary structures the area should be cleared but not grubbed. Clearing the area with chain saws, mowers, bush-hogs, or other mechanized equipment and leaving the stumps and root mat intact, allows the area to re-vegetate naturally and minimizes disturbed soil.



8. A clear bank (rip rap-free) area of at least 10 feet should remain on each side of the stream underneath the bridge.
9. Sedimentation and erosion control measures sufficient to protect water resources must be implemented prior to any ground disturbing activities. Structures should be *maintained regularly*, especially following rainfall events.
10. Bare soil should be stabilized through vegetation or other means as quickly as feasible to prevent sedimentation of water resources.
11. 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.
12. 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. This equipment should be inspected daily and maintained to prevent contamination of surface waters from leaking fuels, lubricants, hydraulic fluids, or other toxic materials.

## II. General Comments if Replacing the Bridge with a Culvert

1. The culvert must be designed to allow for aquatic life and fish passage. Generally, the culvert or pipe invert should be buried at least 1 foot below the natural streambed (measured from the natural thalweg depth). If multiple barrels are required, barrels other than the base flow barrel(s) should be placed on or near stream bankfull or floodplain bench elevation (similar to Lyonsfield design). These should be reconnected to floodplain benches as appropriate. This may be accomplished by utilizing sills on the upstream end to restrict or divert flow to the base flow barrel(s). Silled barrels should be filled with sediment so as not to cause noxious or mosquito breeding conditions. Sufficient water depth should be provided in the base flow barrel during low flows to accommodate fish movement. If culverts are longer than 40-50 linear feet, alternating or notched baffles should be installed in a manner that mimics existing stream pattern. This should enhance aquatic life passage: 1) by depositing sediments in the barrel, 2) by maintaining channel depth and flow regimes, and 3) by providing resting places for fish and other aquatic organisms. In essence, the base flow barrel(s) should provide a continuum of water depth and channel width without substantial modifications of velocity.
2. If multiple pipes or cells are used, at least one pipe or box should be designed to remain dry during normal flows to allow for wildlife passage.
3. Culverts or pipes should be situated along the existing channel alignment whenever possible to avoid channel realignment. Widening the stream channel must be avoided. Stream channel widening at the inlet or outlet end of structures typically decreases water velocity causing sediment deposition that requires increased maintenance and disrupts aquatic life passage.
4. Riprap should not be placed in the active thalweg channel or placed in the streambed in a manner that precludes aquatic life passage. Bioengineering boulders or structures should be professionally designed, sized, and installed.

In most cases, we prefer the replacement of the existing structure at the same location with road closure. If road closure is not feasible, a temporary detour should be designed and located to avoid wetland impacts, minimize the need for clearing and to avoid destabilizing stream banks. If the structure will be on a new alignment, the old structure should be removed and the approach fills removed from the 100-year floodplain. Approach fills should be removed down to the natural ground elevation. The area should be stabilized with grass and planted with native tree species. Tall fescue should not be used in riparian areas. 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.

### III. Project-Specific Comments

#### B-4281, Bridge 60, Dan River, Stokes County

Dan River is classified as C Trout and is in the Roanoke River Basin. A moratorium prohibiting in-stream work and land disturbance within the 25-foot trout buffer is recommended from October 15 to April 15 to protect the egg and fry stages of trout. DWQ would prefer this bridge to be replaced with a bridge and the use of BMPs (particularly for sediment and erosion control) to be maximized.

#### B-4112, Bridge 30, Muddy Creek, Forsyth County

Muddy Creek is classified as C and is in the Yadkin River Basin. DWQ has no special concerns with this project. Please refer to general recommendations listed above.

#### B-4252, Bridges 67 and 95, Little Beaver and Big Beaver Creeks, Rockingham County

Little Beaver and Big Beaver Creeks are both classified as C and are in the Roanoke River Basin. DWQ has no special concerns with this project.

#### B-4254, Bridge 89, Little Troublesome Creek, Rockingham County

Little Troublesome Creek is listed as C NSW and is in the Cape Fear River Basin. It is a 303(d) listed water. NCDOT shall maximize the use of Best Management Practices for all work crossing or draining to the Critical Area of the Water Supply Watershed and 303(d)-listed waters. In addition, NCDOT shall strictly adhere to "Design Standards in Sensitive Watersheds" (15A NCAC 04B .0124).

#### B-4100 and B-4101, Bridges 142 and 141, Abbotts Creek, Davidson County

Abbotts Creek is listed as WS-III water supply stream and is in the Yadkin River Basin. There are 30-foot vegetated buffer requirements in WS waters in addition to the requirements to minimize storm water runoff and maximize use of BMPs. Refer to 15A NCAC 2B .0216(3)(b)(i)(F) and (G).

#### B-4243, Bridge 71, Hasketts Creek, Randolph County

Hasketts Creek is listed as C and is in the Cape Fear River Basin. It is a 303(d) listed water. NCDOT shall maximize the use of Best Management Practices for all work crossing or draining to the Critical Area of the Water Supply Watershed and 303(d)-listed waters. In addition, NCDOT shall strictly adhere to "Design Standards in Sensitive Watersheds" (15A NCAC 04B .0124).

#### B-4244, Bridge 140, Gabriels Creek, Randolph County

Gabriels Creek is listed as C and is in the Cape Fear River Basin. DWQ has no special concerns for this project.

#### B-4246, Bridge 228, Richland Creek, Randolph County

Richland Creek is listed as C and is in the Cape Fear River Basin. It is a 303(d) listed water. NCDOT shall maximize the use of Best Management Practices for all work crossing or draining to the Critical Area of the Water Supply Watershed and 303(d)-listed waters. In addition, NCDOT shall strictly adhere to "Design Standards in Sensitive Watersheds" (15A NCAC 04B .0124).

#### B-4104, Bridge 21, Carter Creek, Davie County

Carter Creek is listed as WS-IV and is in the Yadkin River Basin. There are 30-foot vegetated buffer requirements in WS waters in addition to the requirements to minimize storm water runoff and maximize use of BMPs. Refer to 15A NCAC 2B .0216(3)(b)(i)(F) and (G).

**B-4129, Bridge 226, Little Alamance Creek, Guilford County**

Little Alamance Creek is listed as WS-IV NSW CA and is in the Cape Fear River Basin. There are 30-foot vegetated buffer requirements in WS waters in addition to the requirements to minimize storm water runoff and maximize use of BMPs. Refer to 15A NCAC 2B .0216(3)(b)(i)(F) and (G). Since the project is located within the Critical Area of a water supply watershed, hazardous spill catch basins may be required for this project based on traffic count, percent truck traffic or proximity to industries transporting hazardous materials. The project shall incorporate the requirements for WS-IV Waters within the critical area as specified in 15A NCAC 2B .0215 (i.e., stormwater management, sedimentation and erosion control, and buffers).

**B-4130, Bridge 228, Alamance Creek, Guilford County**

Alamance Creek is listed as WS-IV NSW CA and is in the Cape Fear River Basin. There are 30-foot vegetated buffer requirements in WS waters in addition to the requirements to minimize storm water runoff and maximize use of BMPs. Refer to 15A NCAC 2B .0216(3)(b)(i)(F) and (G). Since the project is located within the Critical Area of a water supply watershed, hazardous spill catch basins may be required for this project based on traffic count, percent truck traffic or proximity to industries transporting hazardous materials. The project shall incorporate the requirements for WS-IV Waters within the critical area as specified in 15A NCAC 2B .0215 (i.e., stormwater management, sedimentation and erosion control, and buffers).

**B-4131, Bridge 11, Little Alamance Creek, Guilford County**

Little Alamance Creek is listed as WS-IV NSW CA and is in the Cape Fear River Basin. There are 30-foot vegetated buffer requirements in WS waters in addition to the requirements to minimize storm water runoff and maximize use of BMPs. Refer to 15A NCAC 2B .0216(3)(b)(i)(F) and (G). Since the project is located within the Critical Area of a water supply watershed, hazardous spill catch basins may be required for this project based on traffic count, percent truck traffic or proximity to industries transporting hazardous materials. The project shall incorporate the requirements for WS-IV Waters within the critical area as specified in 15A NCAC 2B .0215 (i.e., stormwater management, sedimentation and erosion control, and buffers).

Thank you for requesting our input at this time. The DOT is reminded that issuance of a 401 Water Quality Certification requires that appropriate measures be instituted to ensure that water quality standards are met and designated uses are not degraded or lost. If you have any questions or require additional information, please contact Robert Ridings at (919) 733-9817 or Cynthia Van der Wiele at (919) 733-5715.

cc: USACE Raleigh Field Office  
File Copy





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

Michael F. Easley, Governor

William G. Ross, Jr., Secretary

Philip K. McKnelly, Director

MEMORANDUM

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

FROM: Brian Strong, Environmental Review Coordinator 1324  
DENR, Division of Parks and Recreation

DATE: September 6, 2002

SUBJECT: Review of Department of Transportation Bridge Replacement Projects

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

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

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

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

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



## STOKES COUNTY

### Administration

Richard Morris  
County  
Manager

Darlene Bullins  
Administration  
P.O. Box 20  
Danbury, NC  
27016  
Office:  
(336) 593-2448  
Fax:  
(336) 593-2346  
Email:  
[bullins@co.stokes.nc.us](mailto:bullins@co.stokes.nc.us)

April 15, 2004

Mr. Gregory J. Thorpe PHD  
Environmental Management Director  
NC Department of Transportation  
1548 Mail Service Center  
Raleigh, NC 27699-1548

Re: Bridge No. 60 on NC 8 and 89 over Dan River -- B-4281

Dear Mr. Thorpe:

My assistant, Darlene Bullins, had spoken with Ms. Karen Taylor in your office and was approved for an extension for the Board's return comments.

This letter references your letter dated February 10<sup>th</sup> requesting scoping comments from the Stokes County Board of Commissioners concerning your plans for improvement or replacement of Bridge No. 60 on NC 8 and 89 over Dan River.

At the April 12, 2004 regular meeting of the Stokes County Board of Commissioners, the bridge topic was discussed along with comments from several of the county department heads. The department head's input and recommendations are enclosed as attachments to this letter. The consensus of the Board of Commissioners was to endorse and include in this letter all of the comments from the department heads. The Commissioners also selected one of the alternatives that you plan to study as their preferred solution, that being "replace on the southwest side maintaining traffic on the existing structure as an on-site detour".

The Board strongly feels that this bridge **must remain open at all times to support the county's emergency services operations**. The Board is also interested in pursuing the possibility of **creating a new river access site** in conjunction with the bridge construction.

If I can be of further assistance or provide additional information concerning this project please contact me at (336)593-2448.

Sincerely yours,

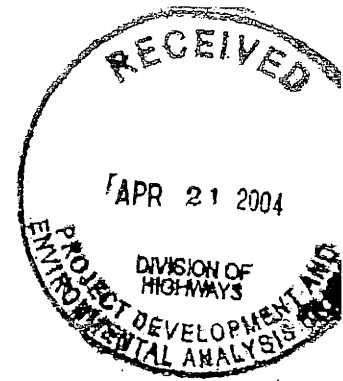
A handwritten signature in cursive script that reads "Richard D. Morris".

Richard D. Morris  
County Manager

Attachments

cc: Stokes County Board of Commissioners  
Sheriff Mike Joyce  
EMS Director Monty Stevens  
Fire Marshall Bradley Cheek  
Emergency Communications Del Hall  
Economic Director Ron Morgan  
File

Faxed: 919-733-9794 (4-16-04)



B-4281

**FAX**

To

Gregory Thorpe

919-733-9794

**Confidential**

**FROM**

**Darlene Bullins for Rick Morris  
Stokes County**

Date: April 16, 2004  
fax: 336-593-2346  
phone: 336-593-2448  
email: dbullins@co.stokes.nc.us

Pages (11) Includes Cover Sheet  
Original will be mailed today 4-16-04

**Subject: Replacement of Bridge No. 60 over the Dan River**

**Date:** Wed, 26 Mar 2003 15:03:09 -0500

**From:** "Mandy Bullins" <mbullins@stokes.k12.nc.us>

**To:** <dmoore@dot.state.nc.us>

Mr. Moore,

Stokes County Schools currently has (7) buses that travel over the Dan River. We also have (1) bus that uses the intersection of Lynchburg Road and NC 89 as a turnaround.

The total number of trips per day is 16. Closing HWY 89 at the bridge would result in additional miles being added to our existing routes. These miles would incur additional costs for bus driver salaries and fuel for the buses. The total cost is estimated at \$200.00 per day.

Also, the time at the bus stop would have to be earlier in order to arrive to school on time and in some cases there are students who would have to get on the bus before 6:00 a.m.

If you need additional information please let me know.

Thank you.

Mandy Bullins  
Stokes County Schools  
Transportation

MIKE JOYCE, Sheriff



Area Code: 336 Phone: 593-8787

Stokes County Sheriff's Department  
P.O. BOX 118 DANBURY, NC 27016

March 30, 2004

Stokes County Board of Commissioners  
P. O. Box 20  
Danbury, N. C. 27016

**RE: BRIDGE NO. 60 ON HWY 8/89**

Dear Commissioners:

This is to inform you the Stokes County Sheriff's Department has no particular alternative to the bridge project as long as the bridge remains open to traffic.

The bridge provides a vital link between Danbury and the Northwest side of the county. If the bridge were not open there would be a considerable difference in response time to calls from that side of the county.

Thank you for allowing us this input and we hope it will be helpful in whatever decision you make.

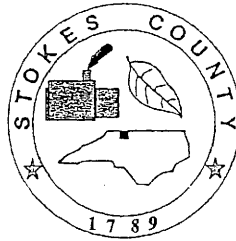
Sincerely,

  
Mike Joyce  
Sheriff

MJ:mb

# COUNTY OF STOKES

Bradley Cheek  
Fire Marshal  
bcheek@co.stokes.nc.us



Robert Snyder  
Deputy Fire Marshal  
rsnyder@co.stokes.nc.us

Phone (336) 593-2410

Stokes County Fire Marshal's Office

Fax (336) 593-2346

Post Office Box 20 • 1012 Main Street • Government Center • Danbury, NC 27016

Fire Investigations - Inspections - Fire & Rescue Support- Emergency Management - Fire & Life Safety Education

3-31-04

Stokes County  
Board of County Commissioners  
P.O. Box 20  
Danbury, N.C. 27052  
Mrs. Sandy McHugh, Chairman

This Office received a request from Darlene Bullins to evaluate how the Fire Service would be impacted by a bridge replacement project at N.C. 8 & 89 over Dan River. Due to the location of this bridge it was obvious a replacement will greatly affect emergency response. After reviewing the fire districts involved in this area of the County it was determined that Danbury Fire District, Lawsonville Fire District, and Francisco Fire District will receive a major impact from this project. Building fires and other manpower intensive emergencies require mutual aid responses between these three departments on a daily basis. The bridge at N.C. 8 & 89 is the only route available to provide emergency assistance between these departments. The discontinued use of the bridge even for a short period of time would create an extreme hazard.

After discussing this assignment with the involved fire departments at the March meeting of the Stokes County Fire & Rescue Association, all departments were in agreement that the lack of a bridge would cause a server hindrance to emergency response. At the meeting I also advised the departments of the four options N.C. D.O.T. was considering concerning this project. Members present at the meeting had no preference about the position of the new bridge, but instead were focused on stressing the importance of the onsite detour.

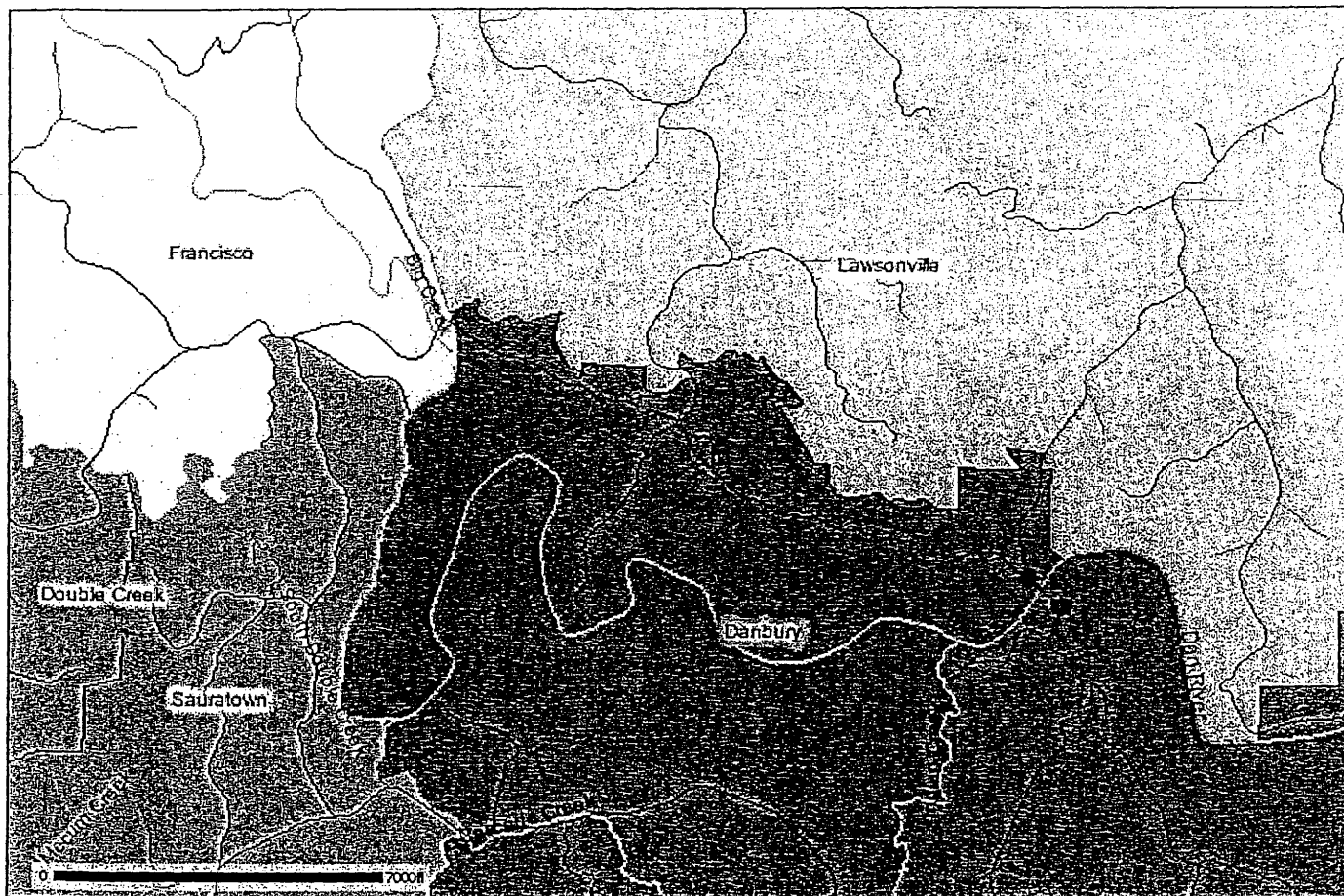
After reviewing fire districts, evaluating emergency response needs, and discussing this issue with all fire departments in Stokes County I would like to recommend the Board strongly consider replacing the bridge while maintaining traffic on the existing bridge. This scenario will accomplish the needed bridge replacement while maintaining proper fire department emergency response times.

Sincerely,

Bradley Cheek  
Stokes County Fire Marshal



# Stokes Co., NC



## Measure

Length: 913 feet

**DISCLAIMER:** This map was prepared from information furnished by government and private industry sources. This map is not a "survey" and may not be used to prepare "legal descriptions". The County of Stokes specifically disclaims any and all responsibility for errors which may be disclosed by a survey of the property shown herein. In no event shall the County of Stokes be liable for any damages, direct or consequential, from the use of this map or the information contained therein. Any errors should be reported to the Stokes County Mapping/GIS Department.

## Stokes Co., NC



**DISCLAIMER:** This map was prepared from information furnished by government and private industry sources. This map is not a "survey" and may not be used to prepare "legal descriptions". The County of Stokes specifically disclaims any and all responsibility for errors which may be disclosed by a survey of the property shown herein. In no event shall the County of Stokes be liable for any damages, direct or consequential, from the use of this map or the information contained therein. Any errors should be reported to the Stokes County Mapping/GIS Department.



**9-1-1**  
**COMMUNICATIONS**

P.O. Box 20 - Danbury, North Carolina 27016 - (336) 593-2494.

Del Hall, Director

TO: Stokes County Board of County Commissioner's  
FROM: Del Hall, Emergency Communications Director  
DATE: April 5, 2004  
Re: Bridge No. 60 on NC 8 & NC 89 over Dan River

Dear: Board of County Commissioner's,

In response to your request pertaining to proposed improvements to bridge number 60 at NC 8 and NC 89 over Dan River, I feel these improvements are crucial to the public safety agencies and more importantly to the citizens of Stokes County. The existing improvements that are taking place at this time are dangerous to the Citizens and Public Service agencies due to causing traffic problems, response times increasing i.e., public safety agency responding to an emergency call has to wait at the bridge and/or detours will make there response times longer. If the responding agencies response time is longer this will be a factor in whether life is saved or a structure is lost.

If nothing is done will the existing structure be strong enough for all passing vehicles to cross over without causing any damage or life injuries? Preserving life is the most important part of all the public safety agency(s) functions. We do not want the bridge to become a factor in whether a citizen lives or dies. Response times would make a difference on emergency calls i.e., armed robbery in progress, house fire, heart attack, etc. Every second counts when dealing with life and death emergencies.

The Emergency Communications Department would be affected on any of the alternatives i.e., Telecommunicator receives a 911 call from the surrounding area of the bridge he/she would have to make sure the closet public safety agency(s) are sent to the location of the emergency which could mean a longer dispatch time for the call. The Computer Aided Dispatch (CAD) System in place now has the pre-determined agencies to be sent but if the agency(s) need to cross the bridge there response time would increase so, the Telecommunicator would need to make a decision if another agency(s) would be dispatched due to the type of emergency call and response times of the field units.

Thanks for your time and consideration in this very important matter.

Sincerely,

Del Hall, Director *Del Hall*  
Stokes County Emergency Communications

# Stokes County

Economic Development

Stokes County  
Economic Development  
1000 E. Main Street  
Danbury, NC 27006  
(336) 785-1000

Currently, there are four Dan River Public Access Sites in Stokes County. The Hart, Hanging Rock, Moratock, and Hemlock Access Areas. Float and Canoe distances and times between each is as follows:

River Access Point	River Landing Point	Distance	Time (Canoe/Float)
Hart's Access	Whitt Access	6.9 miles	3:15 / 6:30
Whitt Access	Hanging Rock Access	5.5 miles	2:20 / 4:40
Hart's Access	Hanging Rock Access	12.4 miles	5:35 / 11:10
Hanging Rock Access	Moratock Access	5.9 miles	2:40 / 5:20
Moratock Access	Hemlock Access	8.6 miles	4:00 / 8:00

With the exceptions of the Hanging Rock and Moratock Access Points, all Access Points are leased from private property owners. Several of the leases are nearing expiration. The Whitt Access site has changed ownership, and is no longer accessible to the public.

The North Carolina Department of Transportation in the 2004-2010 Transportation Improvement Plan identifies four bridge replacements in the near vicinity of, or on the Dan River. Those bridge replacement projects are:

Location	ID No.	Description	Est. Cost	Work Type	Schedule
NC 8-89	B-4281	Bridge #60	\$2,600,000	ROW	2004
NC 89	B-3045	Bridge #17	\$2,305,000	Const.	2003
SR 1668	B-2639	Bridge #133	\$2,260,000	Const.	2003
SR 1697	B-4819	Bridge #105	\$1,320,000	ROW	2008

- Bridge #60 is located just south of where Highways 8 and 89 split, north of Danbury.
- Bridge #17 is located adjacent the current Whitt Access Point.
- Bridge #133 is the Seven Island Bridge.
- Bridge #105 is located on Pitzer Road, over Snow Hill Creek, where Snow Hill Creek enters the Dan River.

These bridge replacements may present an opportunity to incorporate new Public Access Sites on the Dan River. A sketch of a possible incorporation of a new river access site and associated cost estimate is attached.

The Stokes County Tourism Council will be incorporating into their overall Stokes County Tourism Plan, a recommendation to provide public river access sites at the Bridge #17 and Bridge #133 locations.



Conceptual Sketch  
Proposed River Access Site  
NCDOT Bridge # 60

Stokes County, North Carolina



# Stokes County

EMERGENCY MEDICAL SERVICE  
EMERGENCY MANAGEMENT

## MEMO

**TO:** Board Of County Commissioners

**FROM:** Monty Stevens, <sup>MS</sup> Emergency Services Director

**SUBJECT:** Bridge No. 60 on NC 8 and 89 over Dan River (B-4281)

**DATE:** April 2, 2004

In regards to the proposed improvements to the subject bridge replacement project, in my opinion, there are only two viable options. Those options are to replace the bridge either on the northeast or southwest side while maintaining traffic on the existing structure.

To rehabilitate the existing structure would most likely result in a closure for an extended period of time and this would create a significant burden on the Emergency Medical Services. First, for ambulances transporting patients from the northern and northwestern part of the county to Stokes-Reynolds Memorial Hospital would require detours either to the Moore's Spring Road area or the Jewel Road area which will increase transport times for the EMS and increase mileage charges for the patients. Also for ambulances responding from the Walnut Cove area to the area north of NC 8 and 89 again would require detours to the Moore's Spring Road area or Sheppard Mill Road area resulting in significantly increased response times for these calls.

I trust this information has been helpful. If you should require additional comments or have questions, please feel free to contact me.





STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION

Michael F. Easley  
GOVERNOR

Lyndo Tippet  
SECRETARY

September 9, 2004

MEMORANDUM TO: Mr. Gregory J. Thorpe, Ph.D., Director  
Project Development and Environmental Analysis Branch

ATTENTION: Karen Taylor, P.E.  
Project Development Engineer

FROM: Njoroge W. Wainaina, PE *Njoroge Wainaina*  
State Geotechnical Engineer

TIP NO. B-4281  
WBS 33621.1.1  
FEDERAL PROJECT: BRSTP-008 (4)  
COUNTY: Stokes  
DESCRIPTION: Bridge No. 60 on over the Dan River on NC 8 and NC 89

SUBJECT: Geotechnical Pre-Scoping Report

The Geotechnical Engineering Unit performed a limited pre-scoping investigation of the above reference project to provide an early identification of any Geotechnical and GeoEnvironmental issues that might impact the project's planning, design or construction. The following information summarizes our findings.

MAILING ADDRESS:  
NC DEPARTMENT OF TRANSPORTATION  
GEOTECHNICAL ENGINEERING UNIT  
1589 MAIL SERVICE CENTER  
RALEIGH NC 27699-1589

TELEPHONE: 919-250-4088  
FAX: 919-250-4237  
WEBSITE: [WWW.DOH.DOT.STATE.NC.US](http://WWW.DOH.DOT.STATE.NC.US)

LOCATION:  
CENTURY CENTER COMPLEX  
ENTRANCE B-2  
1020 BIRCH RIDGE DRIVE  
RALEIGH NC

## **GEOENVIRONMENTAL ISSUES**

### **Purpose**

This report presents the results of a GeoEnvironmental Impact Evaluation conducted along the above referenced project. The main purpose of this investigation is to identify properties within the project study area that are or may be contaminated and therefore result in increased project costs and future liability if acquired by the Department. GeoEnvironmental impacts may include, but are not limited to, active and abandoned underground storage tank (UST) sites, hazardous waste sites, regulated landfills and unregulated dumpsites.

### **Techniques/Methodologies Used**

The Geographical Information System (GIS) was consulted to identify known environmentally impacting sites in relation to the project corridor. GeoEnvironmental Section personnel conducted a field reconnaissance survey along the project corridor on April 26, 2004.

### **Findings**

#### **Underground Storage Tank (UST) Facilities**

Based on our study, there is one potential UST site identified within the project limits.

#### **Hazardous Waste Sites**

No Hazardous Waste Sites were identified within the project limits.

#### **Land Fills**

No apparent landfills were identified within the project limits.

#### **Other GeoEnvironmental Concerns**

There were no other GeoEnvironmental concerns identified within the project limits.



### **Anticipated Impacts**

We anticipate monetary and scheduling impacts resulting from these sites to be low to moderate.

The GeoEnvironmental Section observed no additional contaminated properties during the field reconnaissance and regulatory agencies' records search. The GeoEnvironmental Section will provide soil and groundwater assessments on each of the above properties after identification of the selected alternative and before right of way acquisition. Please note that discovery of additional sites not recorded by regulatory agencies and not reasonably discernable during the project reconnaissance may occur. The GeoEnvironmental Section should be notified immediately after discovery of such sites so their potential impact(s) may be assessed.

If there are any questions regarding these or other GeoEnvironmental issues on the project, please contact Cyrus Parker, L.G. at (919)-250-4088.

### **GEOTECHNICAL ISSUES**

#### **Techniques and Methodologies**

The geotechnical investigation consisted of a reconnaissance and one Standard Penetration Test boring conducted in May and June of 2004. The boring was performed in the floodplain, north of the river and west of the existing roadway, adjacent to the first interior bent of the existing bridge.

#### **Findings**

Rock outcrop can be observed in the existing cut slope on NC 89 (left side) just north of the bridge and the juncture with NC 8. A small tributary stream is present in the southwest quadrant. A significant tributary stream (Newman Branch?) is present in the northeast quadrant.

The test boring found about 10 feet of very soft alluvial sandy clay with gravel over weathered/hard rock. It was collared about 10 feet above the river elevation.

Mr. Gregory J. Thorpe, Ph.D.  
B-4281 Geotechnical Pre-Scoping Comments  
09/09/04  
Page 4

### **Anticipated Impacts**

Replacement to the southwest may require cut in rock as noted above. The rock appears weathered and fractured on the surface and there do not appear to be any structures nearby that could be damaged by blasting vibration.

Replacement to the northeast may impact the larger tributary stream, or the abandoned service station as noted in the GeoEnvironmental Issues section of this report.

The most likely structure foundation type is drilled shafts due to lack of embedment for piles and potential scour of footings.

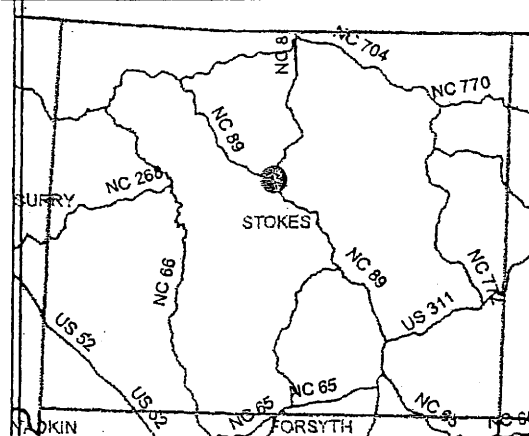
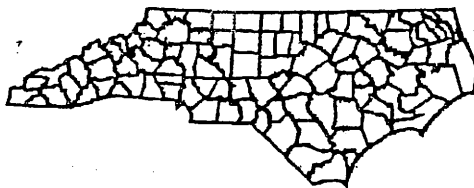
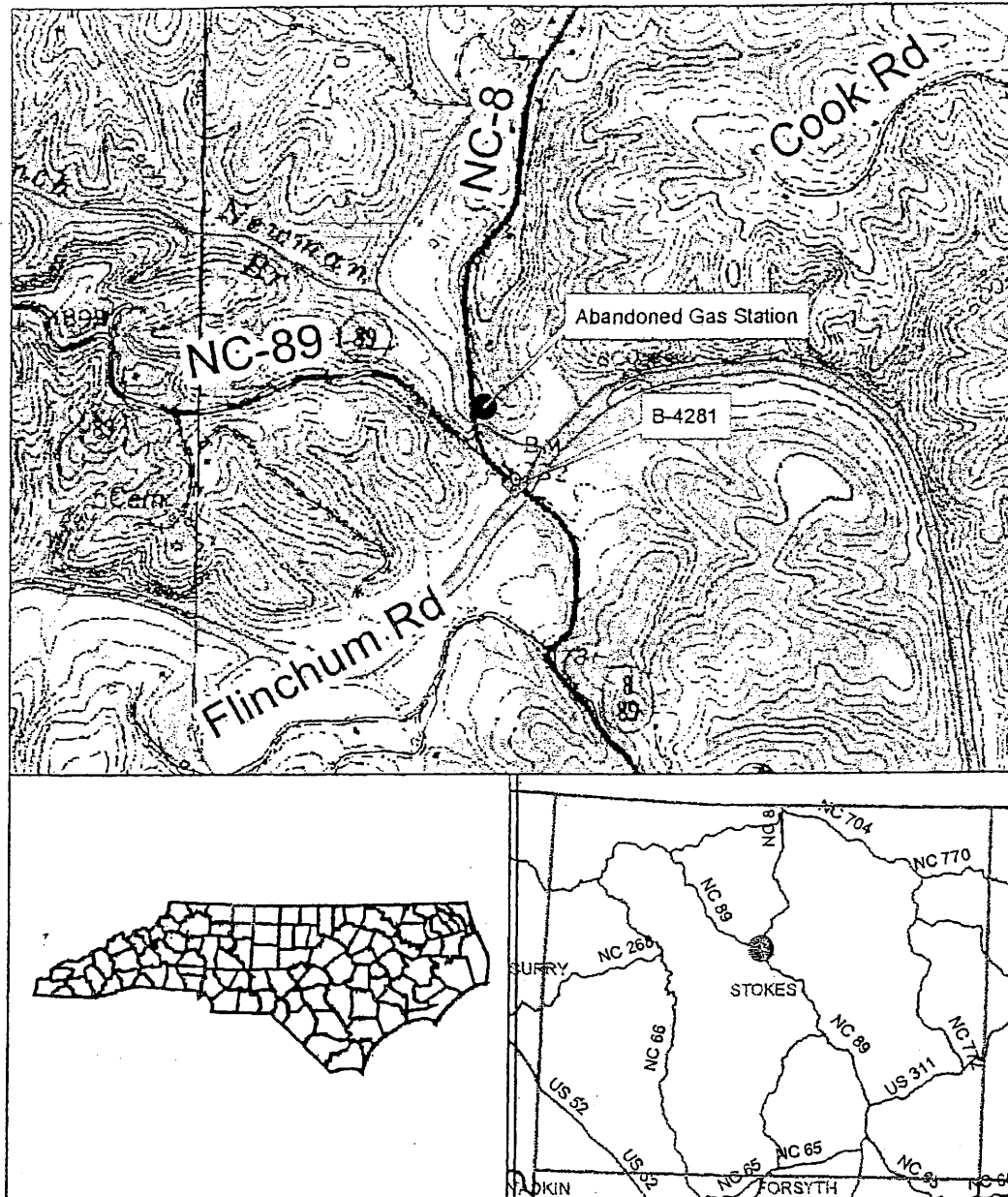
If there are any questions regarding these Geotechnical comments, please contact Clinton B. Little, L.G. or John L. Pilipchuk, L.G., P.E. at (704)-455-8902

NWW/CP/CBL/JLP/dbm

Attachments: 4 sheets

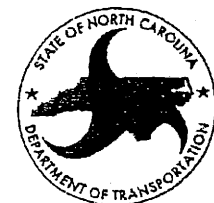
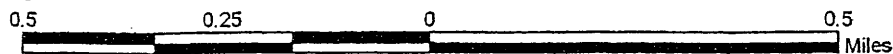
Figure 1

## B-4281 GeoEnvironmental Site Map



NCDOT Geotechnical Engineering Unit  
GeoEnvironmental Section

B-4281  
Bridge 60 on NC 8 and NC 89 over Dan River





**APPENDIX B****Known and Potential GeoEnvironmental Impact Sites**

---

**Property Name**

One Story Abandoned Business

East side of NC 8 just north of NC 89  
Intersection**Property Owner:**

Unknown

**UST Owner:** Unknown**Facility ID #:** Unknown

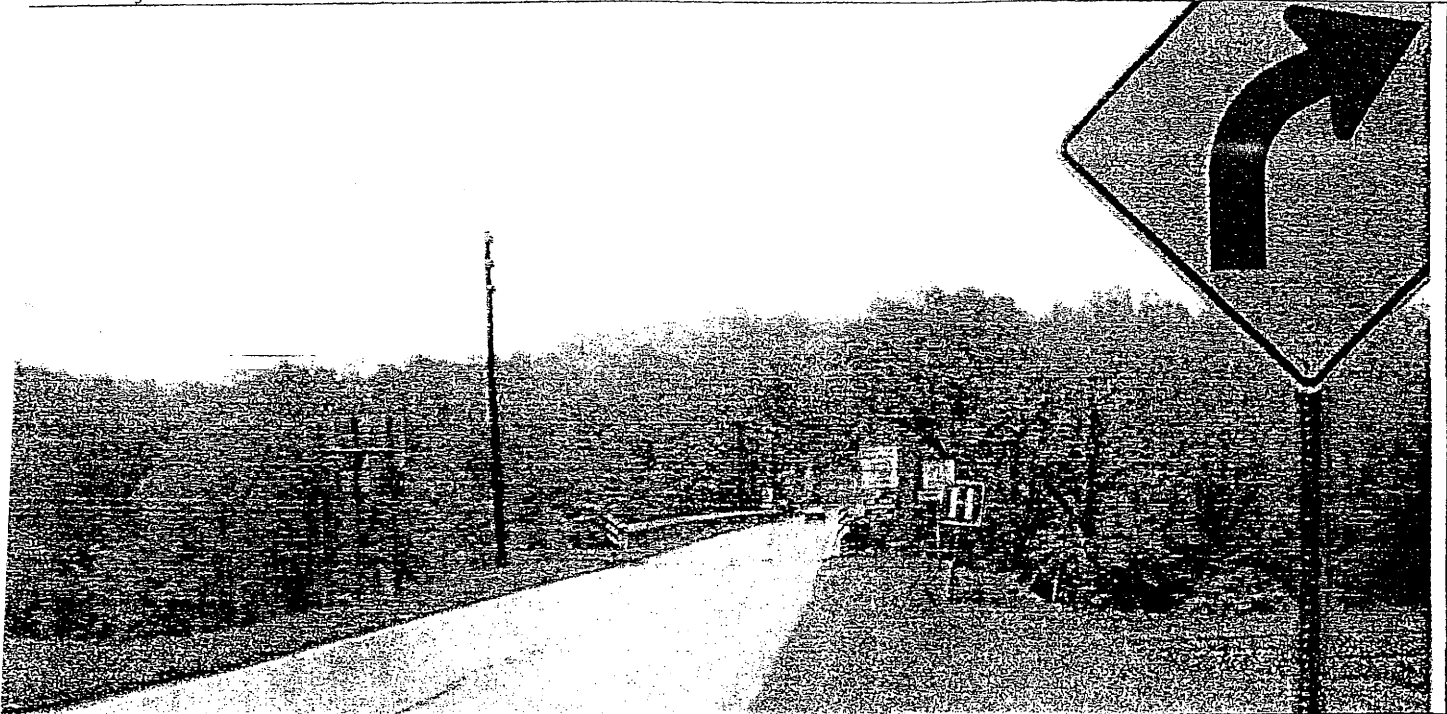
This property is on the East side of NC 8 just north of the NC 89 intersection. The one story abandoned building was likely a former gas station. Both a tank fill port and vent pipe were noted in the northern corner of the building. This property will likely be outside the project limits of this bridge placement.

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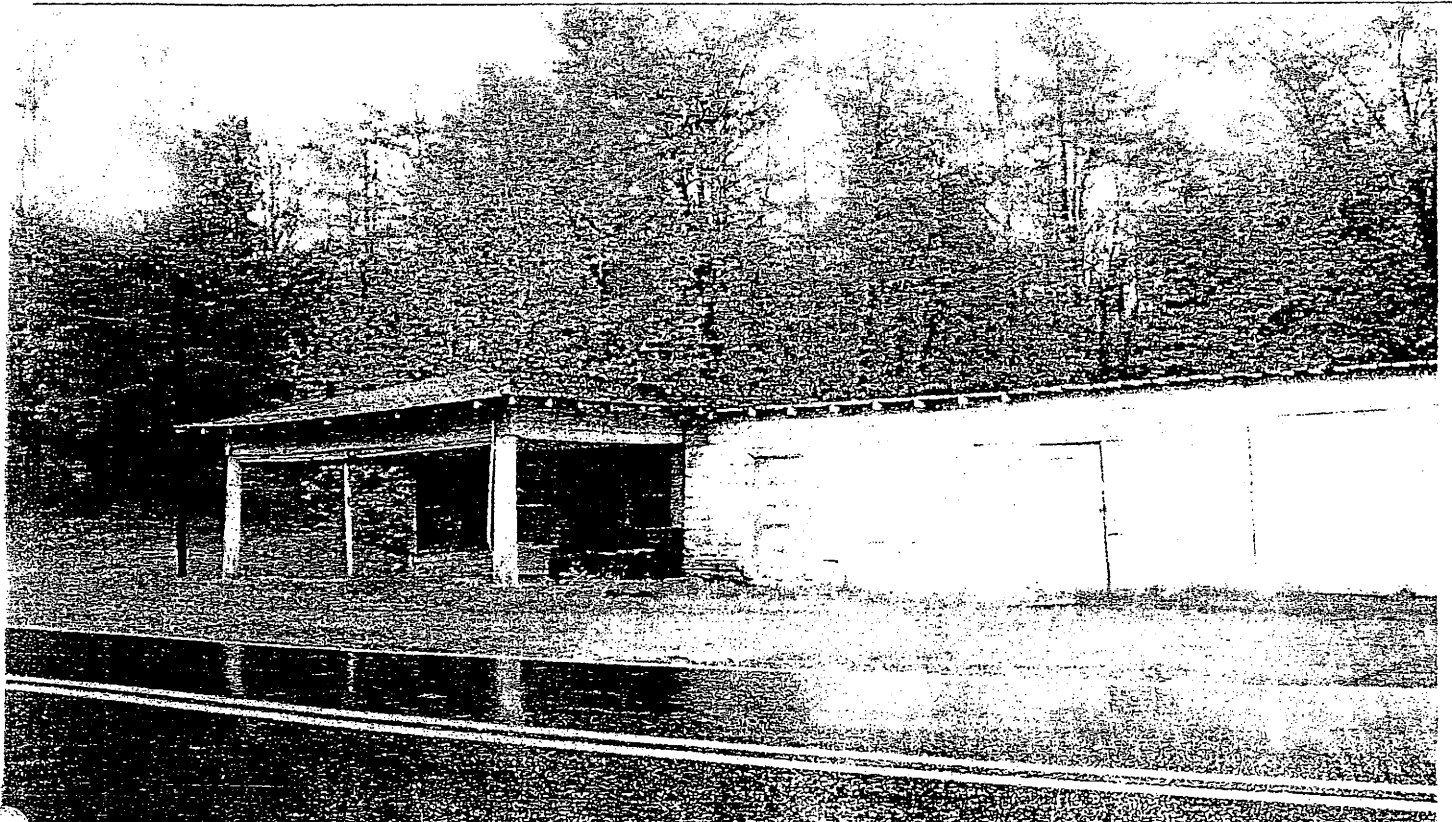
APPENDIX C

Project: B-4281

Date: 4-26-04



Bridge 60 on NC 8 & 89 over Dan River in Stokes County Looking Southeast



Abandoned gas station on NC 8 just north of the Bridge 60