



STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION

MICHAEL F. EASLEY  
GOVERNOR

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SECRETARY

January 2, 2004

U.S. Army Corps of Engineers  
Asheville Regulatory Field Office  
151 Patton Avenue / Room 208  
Asheville, North Carolina 28801-5006

**ATTENTION:** Mr. Steve Lund  
NCDOT Coordinator

**SUBJECT:** **Nationwide Permit Application 23 and 13** for the proposed replacement of Bridge No. 27 on SR 1001 (Sulphur Springs Rd) over South Yadkin River. Alexander County in Division 12. Federal Project No. BRZ-1001(16), State Project No. 8.2780601, T.I.P. No. B-3100.

Please find enclosed three copies of the project planning report for the above referenced project, along with a project site map, and plan drawings. NCDOT plans to replace bridge No. 27 with a new bridge estimated to be 130 feet (40 meters) long and located on a new alignment approximately 60 feet (18 meters) north (upstream) of the existing structure. SR 1001 (Sulphur Springs Rd) is part of the State designated bicycle route NC 2 Mountains-to-Sea Bicycling Highway. The proposed roadway cross section will include two 11 foot (3.4 meters) lanes with 6 foot (1.8 meters) grass shoulders. The proposed construction limits are estimated to be approximately 1400 feet (427 meters) long, requiring a proposed right-of-way width that is estimated at 60 ft to a maximum of 170 ft (18 and 52 meters). The proposed clear roadway width is 30 feet (9.2 meters). Since the structure and the approaches are in a curve, the inside lane, and consequently the replacement structure, may be widened slightly during final design. Traffic will be maintained on the existing roadway and bridge during construction. There will be no impacts to jurisdictional wetlands or streams.

### **Bridge Demolition**

Bridge No. 27, constructed in 1951, carries SR 1001 over the South Yadkin River. The existing bridge has an overall length of 127.5 feet (38.9 meters) and a deck width of approximately 23.1 feet (7 meters), measured from the face of the guardrail. The clear roadway width across the bridge (curb to curb) is 22.1 feet (6.7 meters) and carries two lanes of two-way traffic. Approaching Bridge No. 27, SR 1001 is 20 foot (6 meters) paved, two-lane travelway with 5 foot (1.5 meters) grass shoulders. The structure consists of a 3-span, reinforced concrete deck on steel I-beams with an asphalt-wearing surface. The end bents consist of reinforced concrete caps on timber piles. The interior bents consist of reinforced concrete posts and beams. The current weight limit posting for Bridge No. 27 is 18 tons (16,000 kilograms) for single vehicles and 23 tons (20,900 kilograms) for trucks, tractors, and semi-trailers.

NCDOT Bridge Maintenance Unit records indicate that Bridge No. 27 is structurally deficient and functionally obsolete. The January 2001 Bridge Inspection Report states that Bridge No. 27

**MAILING ADDRESS:**  
NC DEPARTMENT OF TRANSPORTATION  
PROJECT DEVELOPMENT AND ENVIRONMENTAL ANALYSIS  
1598 MAIL SERVICE CENTER  
RALEIGH NC 27699-1548

TELEPHONE: 919-715-1500  
FAX: 919-715-1501

WEBSITE: [WWW.NCDOT.ORG](http://WWW.NCDOT.ORG)

**LOCATION:**  
TRANSPORTATION BUILDING  
1 SOUTH WILMINGTON STREET  
RALEIGH NC

has a sufficiency rating of 36.9 out of a possible 100 for a new structure. Replacement of the inadequate structure will result in safer traffic operations. Any demolition activities associated with modifications to Bridge No. 27 will strictly follow NCDOT's Best Management Practices for Bridge Demolition and Removal. Bridge No. 27 will be removed without dropping any components into Waters of the United States during construction.

Permanent Impacts: There will be no permanent impacts to jurisdictional streams from the construction of the proposed bridge.

Temporary Impacts: The proposed bridge will be constructed in such a way that temporary impacts to jurisdictional streams from construction will not occur.

Schedule: NCDOT will request the contractor to complete construction in a timely manner. The project schedule calls for a letting of April 20, 2004 with a date of availability of May 20, 2004. It is expected that the contractor will choose to start construction at that time.

### **Bank Stabilization**

Measures necessary for erosion prevention will be required, in order to protect the integrity of the 7 foot deep, steep channel bank, left of station ~17+80Left. Rip rap will be placed from the top of the bank, to the waters edge, to eliminate potential erosion from water flowing down the 2 foot base ditch.

### **Federally-Protected Species**

Plants and animals with federal classifications of Endangered, Threatened, Proposed Endangered, and Proposed Threatened are protected under provisions of Section 7 and Section 9 of the Endangered Species Act of 1973, as amended. As of January 29, 2003, the Fish and Wildlife Service (FWS) lists one federally protected species (threatened or endangered) for Alexander County (Table 1). A Biological Conclusion of "No Effect" was reached for Bog Turtle, due to lack of suitable habitat.

Table 1. Federally Protected Species for Alexander County.

<b>Common Name</b>	<b>Scientific Name</b>	<i>Status</i>	<i>Biological Conclusion</i>
Bog turtle	<i>Clemmys muhlenbergii</i>	<b>T(S/A)*</b>	<b>No Effect</b>

\*"T (S/A)"- Threatened Due to Similarity of Appearance- a species similar in appearance to another rare species and listed for its protection.

### **Regulatory Approvals**

Section 404 Permit: This project is being processed by the Federal Highway Administration as a "Categorical Exclusion" in accordance with 23 CFR 771.115(b). Therefore, we do not anticipate requesting an individual permit, but propose to proceed under a Nationwide 23 and 13 as authorized by a Nationwide Permits 23 and 13 (67 FR 2020; January 15, 2002).

Section 401 Permit: We anticipate 401 General Certification number 3403 and 3366 will apply to this project. In accordance with 15A NCAC 2H .0501(a), we are providing two copies of this application to the North Carolina Department of Environment and Natural Resources, Division of Water Quality, for their records.

Thank you for your assistance in this project. If you have any questions or need additional information please contact Tyler Stanton at (919) 715-1439.

Sincerely,



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

cc: w/attachment

Mr. John Dorney, Division of Water Quality (2 copies)  
Ms. Marella Buncick, USFWS  
Ms. Marla Chambers, NCWRC  
Mr. Greg Perfetti, P.E., Structure Design

w/o attachment

Mr. David Franklin, USACE, Wilmington  
Mr. Jay Bennett, P.E., Roadway Design  
Mr. Omar Sultan, Programming and TIP  
Ms. Debbie Barbour, P.E., Highway Design  
Mr. David Chang, P.E., Hydraulics  
Mr. Mark Staley, Roadside Environmental  
Mr. John Sullivan, FHWA  
Mr. M. L. Holder, P.E.  
Ms. Trish Simon  
Ms. Missy Dickens

**Office Use Only:**

Form Version May 2002

**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

2. Nationwide, Regional or General Permit Number(s) Requested: 23 & 13

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

4. If payment into the North Carolina Wetlands Restoration Program (NCWRP) is proposed for mitigation of impacts (verify availability with NCWRP prior to submittal of PCN), complete section VIII and check here:

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

**II. Applicant Information**

1. Owner/Applicant Information

Name: North Carolina Department of Transportation

Mailing Address: 1548 Mail Service Center, Raleigh, NC 27699

Telephone Number: 919-733-7844 Fax Number: 919-715-1501

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

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

Name: N/A

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

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

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

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

### III. Project Information

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

1. Name of project: Replacement of Bridge No. 27 on SR 1001 (Sulphur Springs Rd) over South Yadkin River.
2. T.I.P. Project Number or State Project Number (NCDOT Only): B-3100
3. Property Identification Number (Tax PIN): N/A
4. Location  
County: Alexander Nearest Town: Taylorsville  
Subdivision name (include phase/lot number): \_\_\_\_\_  
Directions to site (include road numbers, landmarks, etc.): Bridge No. 27 is located approximately 0.1 mile north of SR 1403, just northeast of Taylorsville.
5. Site coordinates, if available (UTM or Lat/Long): 421673.93750 / 248716.90625  
(Note – If project is linear, such as a road or utility line, attach a sheet that separately lists the coordinates for each crossing of a distinct waterbody.)
6. Property size (acres): N/A
7. Nearest body of water (stream/river/sound/ocean/lake): Yadkin River
8. River Basin: Yadkin  
(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: Highway corridor consisting of a bridge and maintained road shoulders.

10. Describe the overall project in detail, including the type of equipment to be used: \_\_\_\_\_  
Bridge replacement using mechanical highway construction equipment

11. Explain the purpose of the proposed work: NCDOT Bridge Maintenance Unit records indicate that Bridge No. 27 is structurally deficient and functionally obsolete. Bridge No. 27 has a sufficiency rating of 36.9 out of a possible 100 for a new structure. Replacement of the inadequate structure will result in safer 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.

N/A

**V. Future Project Plans**

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

N/A

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

It is the applicant's (or agent's) responsibility to determine, delineate and map all impacts to wetlands, open water, and stream channels associated with the project. The applicant must also provide justification for these impacts in Section VII below. All proposed impacts, permanent and temporary, must be listed herein, and must be clearly identifiable on an accompanying site plan. All wetlands and waters, and all streams (intermittent and perennial) must 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.

Provide a written description of the proposed impacts: There will be no impacts to jurisdictional streams from the construction of the proposed bridge.

1. Individually list wetland impacts below:

Wetland Impact Site Number (indicate on map)	Type of Impact*	Area of Impact (acres)	Located within 100-year Floodplain** (yes/no)	Distance to Nearest Stream (linear feet)	Type of Wetland***
No Impact	No Impacts	0	N/A	N/A	N/A

- \* List each impact separately and identify temporary impacts. 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.
- \*\* 100-Year floodplains are identified through the Federal Emergency Management Agency's (FEMA) Flood Insurance Rate Maps (FIRM), or FEMA-approved local floodplain maps. Maps are available through the FEMA Map Service Center at 1-800-358-9616, or online at <http://www.fema.gov>.
- \*\*\* List a wetland type that best describes wetland to be impacted (e.g., freshwater/saltwater marsh, forested wetland, beaver pond, Carolina Bay, bog, etc.) Indicate if wetland is isolated (determination of isolation to be made by USACE only).

List the total acreage (estimated) of all existing wetlands on the property: 0  
 Total area of wetland impact proposed: 0

2. Individually list all intermittent and perennial stream impacts below:

Stream Impact Site Number (indicate on map)	Type of Impact*	Length of Impact (linear feet)	Stream Name**	Average Width of Stream Before Impact	Perennial or Intermittent? (please specify)

- \* List each impact separately and identify temporary impacts. Impacts include, but are not limited to: culverts and associated rip-rap, dams (separately list impacts due to both structure and flooding), relocation (include linear feet before and after, and net loss/gain), stabilization activities (cement wall, rip-rap, crib wall, 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.
- \*\* Stream names can be found on USGS topographic maps. If a stream has no name, list as UT (unnamed tributary) to the nearest downstream named stream into which it flows. USGS maps are available through the USGS at 1-800-358-9616, or online at [www.usgs.gov](http://www.usgs.gov). Several internet sites also allow direct download and printing of USGS maps (e.g., [www.topozone.com](http://www.topozone.com), [www.mapquest.com](http://www.mapquest.com), etc.).

Cumulative impacts (linear distance in feet) to all streams on site: 0

3. Individually list all open water impacts (including lakes, ponds, estuaries, sounds, Atlantic Ocean and any other water of the U.S.) below:

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

\* List each impact separately and identify temporary impacts. Impacts include, but are not limited to: fill, excavation, dredging, flooding, drainage, bulkheads, etc.

#### 4. Pond Creation

If construction of a pond is proposed, associated wetland and stream impacts should be included above in the wetland and stream impact sections. Also, the proposed pond should be described here and illustrated on any maps included with this application.

Pond to be created in (check all that apply):  uplands  stream  wetlands  
 Describe the method of construction (e.g., dam/embankment, excavation, installation of draw-down valve or spillway, etc.): N/A

Proposed use or purpose of pond (e.g., livestock watering, irrigation, aesthetic, trout pond, local stormwater requirement, etc.): \_\_\_\_\_

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.

There will be no impacts to jurisdictional streams from the construction of the proposed bridge.

### 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 March 9, 2000, 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 NCWRP concurrence shall be placed on hold as incomplete. An applicant may also choose to review the current guidelines for stream restoration in DWQ's Draft Technical Guide for Stream Work in North Carolina, available at <http://h2o.enr.state.nc.us/ncwetlands/strmgide.html>.

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

N/A

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2. Mitigation may also be made by payment into the North Carolina Wetlands Restoration Program (NCWRP). Please note it is the applicant's responsibility to contact the NCWRP at (919) 733-5208 to determine availability and to request written approval of mitigation prior to submittal of a PCN. For additional information regarding the application process for the NCWRP, check the NCWRP website at <http://h2o.enr.state.nc.us/wrp/index.htm>. If use of the NCWRP is proposed, please check the appropriate box on page three and provide the following information:

Amount of stream mitigation requested (linear feet): N/A

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)**

Does the project involve an expenditure of public (federal/state) funds or the use of public (federal/state) land?

Yes

No

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

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.

Will the project impact protected riparian buffers identified within 15A NCAC 2B .0233 (Neuse), 15A NCAC 2B .0259 (Tar-Pamlico), 15A NCAC 2B .0250 (Randleman Rules and Water Supply Buffer Requirements), or other (please identify \_\_\_\_\_)?

Yes  No  If you answered "yes", provide the following information:

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
Total			

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

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

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

Describe impervious acreage (both 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.

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**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.

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**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. 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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**Applicant/Agent's Signature**

12/27/03

**Date**

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

**SR 1001 (Sulphur Springs Road)  
Replace Bridge No. 27 Over South Yadkin River  
Alexander County  
State Project 8.2780601  
Federal Aid Project BRZ-1001(16)  
TIP Project B-3100**

**CATEGORICAL EXCLUSION**

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

**APPROVED:**

5/2/2002 *William D. Gilmore*  
Date *for* **William D. Gilmore, P.E., Manager**  
**Project Development and Environmental Analysis Branch**  
**North Carolina Department of Transportation**

5/2/02 *Clarence W. Coleman, Jr.*  
Date *for* **Nicholas L. Graf, P.E., Division Administrator**  
**Federal Highway Administration**

SR 1001 (Sulphur Springs Road)  
Replace Bridge No. 27 Over South Yadkin River  
Alexander County  
State Project 8.2780601  
Federal Aid Project BRZ-1001(16)  
TIP Project B-3100

CATEGORICAL EXCLUSION

April 2002

Documentation Prepared By  
ARCADIS G&M of North Carolina, Inc.:

*Kristina S. Miller 4/30/02*

Kristina S. Miller, P.E., Project Manager  
ARCADIS G&M of North Carolina, Inc.



For the North Carolina Department of Transportation:

*Mary Alice Dickens*  
Mary Alice Dickens, P.E., Project Development Engineer  
Project Development and Environmental Analysis Branch  
North Carolina Department of Transportation

## SUMMARY OF SPECIAL PROJECT COMMITMENTS

**SR 1001 (Sulphur Springs Road)  
Replace Bridge No. 27 Over South Yadkin River  
Alexander County  
State Project 8.2780601  
Federal Aid Project BRZ-1001(16)  
TIP Project B-3100**

Roadway Design:

- A. The proposed bridge will provide 4-foot (1.2-meter) wide lateral offsets for bicycles and 54-inch (1.4-meter) bicycle safe bridge rails.

Roadside Environmental/Hydraulics:

- B. “*Design Standards for Sensitive Watersheds*” (15A NCAC 04B .0024) will be strictly followed throughout design and construction of the project.

Division 12:

- C. All methods of demolition other than dropping the bridge in the water will be considered and implemented where practical. Bridge demolition activities associated with this project will strictly follow NCDOT’s *Best Management Practices for Bridge Demolition and Removal* (BMPs-BDR). The proposed project falls under Case 3 of the BMPs-BDR.
- D. A section of eroding stream bank is located directly south of the proposed bridge location along the east side of the bank. This section is approximately 20 feet (6 meters) long and 8 feet (2 meters) high. The erosion may be addressed with construction of the proposed structure or may require additional measures. Additional measures could include cutting back the stream bank, re-vegetation, and stabilization with a rock vane. If during final design a rock vane is required, it will be able to shift the flow vectors away from the bank, eliminating erosion at the toe of the stream bank. Minor clearing and disturbance will be required to facilitate construction of the rock vane, including the short-term use of machinery like a track hoe within the river. The access point created for the proposed bridge construction will be utilized also for the stream bank repair.

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**Appendices**

**Appendix A: Agency Coordination response letters**

North Carolina Department of Environment and Natural Resources, Division of Water Quality, January 19, 2000	A-1 through A-2
United States Department of the Interior, Fish and Wildlife Service, February 3, 2000	A-3 through A-7
Federal Energy Regulatory Commission, Atlanta Regional Office, February 10, 2000	A-8
State Historic Preservation Office (SHPO), March 3, 2000	A-9
SHPO, Federal Highway Administration (FHWA), North Carolina Department of Transportation (NCDOT) Concurrence Form for Properties Not Eligible for the National Register of Historic Places, February 3, 2000	A-10

**Appendix B: NCDOT Division of Bicycle and Pedestrian Transportation**

Division of Bicycle and Pedestrian Transportation, February 14, 2000	B-1 through B-3
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<b>Appendix C: USDA-NRCS Farmland Conversion Impact Rating</b>	C-1
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## **I. Purpose of and Need for the Proposed Project**

### **I.A. General Description**

The North Carolina Department of Transportation (NCDOT) proposes to replace Bridge No. 27 on SR 1001 (Sulphur Springs Road) over the South Yadkin River in Alexander County. Figure 1 illustrates the project area. The proposed action is included in the 2002-2008 Transportation Improvement Program (TIP) as a bridge replacement project with \$25,000 allocated for right-of-way acquisition and \$510,000 for construction. The TIP indicates that the proposed project is programmed for right-of-way acquisition in fiscal year 2003 and for construction during fiscal year 2004. This project is part of the Federal Highway Bridge Replacement and Rehabilitation Program and has been classified as a "Categorical Exclusion." The proposed project is not anticipated to have substantial, detrimental environmental impacts.

### **I.B. Purpose Of The Proposed Project**

NCDOT Bridge Maintenance Unit records indicate that Bridge No. 27 is structurally deficient and functionally obsolete. The January 2001 Bridge Inspection Report states that Bridge No. 27 has a sufficiency rating of 36.9 out of a possible 100 for a new structure. Replacement of the inadequate structure will result in safer traffic operations.

### **I.C. Existing Conditions**

The proposed bridge replacement is located on SR 1001, approximately 0.1 mile (160 meters) north of SR 1403, just northeast of Taylorsville, North Carolina. SR 1001 is a part of the state designated bicycle route called NC 2 Mountains-to-Sea Bicycling Highway. No geodetic survey markers are located within the project area. SR 1001, also known as Sulphur Springs Road, is classified as a rural minor collector in the Statewide Functional Classification System and is not a National Highway System route. Although, no residential or commercial structures are located in the immediate vicinity of Bridge No. 27, a household waste disposal center is located approximately 300 feet (92 meters) west of Bridge No. 27. Photographs of the existing study area are shown in Figures 2a and 2b.

Bridge No. 27, constructed in 1951, carries SR 1001 over the South Yadkin River. The existing bridge has an overall length of 127.5 feet (38.9 meters) and a deck width of approximately 23.1 feet (7.0 meters), measured from the face of the guardrail. The clear roadway width across the bridge (curb to curb) is 22.1 feet (6.7 meters) and carries two lanes of two-way traffic. Approaching Bridge No. 27, SR 1001 is a 20-foot (6-meter) paved, two-lane travelway with five-foot (1.5-meter) grass shoulders. The structure consists of a three-span, reinforced concrete deck on steel I-beams with an asphalt-wearing surface. The end bents consist of reinforced concrete caps on timber piles. The interior bents consist of reinforced concrete posts and beams. The current weight limit posting for Bridge No. 27 is 18 tons (16,300 kilograms) for single vehicles and 23 tons (20,900 kilograms) for trucks, tractors, and semi-trailers.

Within the study area, SR 1001 is aligned in a southwest to northeast direction in a tangent section. SR 1001 crosses the South Yadkin River at an angle of approximately 30 degrees. The river flows from north to south at the bridge site. Both of the approach sections are located along horizontal curves with adequate sight distance.

As shown in Figure 3, the existing profile along SR 1001 contains a vertical sag with grades of approximately 8.3 and 3.5 percent. Both roadway approaches include ditch sections which end at the bridge embankment and drain into the river. The existing right-of-way along SR 1001 is approximately 60 feet (18 meters).

#### **I.D. Traffic Volumes, Speed Limit, School Bus Usage, and Emergency Medical Services**

The estimated 2001 average daily traffic (ADT) volume for SR 1001 is 950 vehicles per day (vpd). The 2003 (proposed project letting year) ADT forecast shows an increase to 1,000 vpd. Traffic volumes are predicted to grow to 1,450 vpd by the design year 2023. Truck percentages are expected to remain at two percent for dual-tired vehicles and two percent for truck-tractors and semi-trailers. The speed limit is not posted within the study area, except for a 35-mile per hour (mph) (55 kilometers per hour [km/hr]) curve advisory speed. Due to sight distance limitations along the existing vertical alignment, the design speed over Bridge No. 27 is estimated to be roughly 30 mph (50 km/hr).

To date, no written comments have been received from the Alexander County School System. Verbal comments were collected during a June 8, 2000 telephone interview with Mr. Daryl Moose, the Transportation Director for Alexander County School System. During the interview, Mr. Moose stated that approximately four Alexander County school buses cross Bridge No. 27 twice per day. An off-site detour during construction would add between six to nine miles (9.6 to 14.5 kilometers) onto each of these eight trips. Mr. Moose stated in a subsequent telephone interview on September 19, 2000 that an off-site detour route would likely add 15 to 20 minutes onto each bus trip, increasing salary costs for the school system.

Verbal comments were collected during a September 19, 2000 telephone interview with Mr. Terry Fox, the Emergency Management Director for Alexander County. Mr. Fox explained that two fire departments primarily serve the study area with secondary assistance provided by two other fire departments. The primary fire departments assigned to the study area are located in the cities of Vashti and Hiddenite while assistance is provided by Stony Point and Sugar Loaf. Emergency medical service (EMS) is provided to the study area from Taylorsville, North Carolina. Mr. Fox stated that based on the location of the emergency call, an off-site detour route would potentially delay the fire department and/or EMS arrival by 15 to 20 minutes and would delay the return trip to the fire station and/or the hospital by another 15 to 20 minutes.

On Monday, October 30, 2000 representatives from NCDOT met with Mr. Fox at the project site and examined potential off-site detour routes. Mr. Fox explained that SR 1001 is a primary north-south route for the EMS, and that closure of the roadway during construction would impact their services surrounding our study area. Other roadways in the study area providing a north-south connection had sharp curves and low design speeds, making travel for large EMS vehicles difficult. Mr. Fox requested that traffic be maintained on-site during construction.

#### **I.E. Accident History**

Records from the NCDOT Traffic Engineering Branch indicate that no accidents were reported in the vicinity of the proposed project during the period from January 1995 through March 2000.

### **I.F. Relation to the Thoroughfare Plan**

The proposed bridge replacement project is mentioned in the August 1995 Thoroughfare Planning Report for Alexander County, North Carolina. The Alexander County Thoroughfare Plan received local approval in August 1995 and was adopted by the North Carolina Board of Transportation in October 1995. The plan was prepared by the NCDOT Statewide Planning Branch in coordination with the County of Alexander and the Federal Highway Administration (FHWA). The thoroughfare plan does not include plans for additional improvements to either SR 1001 or to nearby roadways in the study area. The proposed action does not affect any recommendations included in the thoroughfare plan.

## II. Description of the Proposed Action

### II.A. Proposed Improvements

The North Carolina Department of Transportation (NCDOT) proposes to replace Bridge No. 27 over the South Yadkin River in Alexander County, North Carolina. The proposed bridge is to be constructed on new alignment just north (upstream) of the existing structure. Figures 3 and 4 show the proposed functional design and typical sections. The proposed roadway typical section contains two 11-foot (3.4-meter) travel lanes and 6-foot (1.8-meter) grass shoulders. The proposed construction limits are estimated to be approximately 1400 feet (427 meters) long, requiring a proposed right-of-way width that is estimated to vary from 60 feet to a maximum of 170 feet (18 and 52 meters). The proposed clear roadway width is 30 feet (9.2 meters). Since the structure and the approaches are in a curve, the inside lane, and consequently the replacement structure, may be widened slightly during final design.

As requested by the Alexander County Emergency Management Services, traffic will be maintained on-site during construction, along the existing alignment. Potential off-site detour routes are long and not expected to provide adequate service. The Division 12 Office has concurred with this recommendation.

In accordance with the Division of Bicycle and Pedestrian Transportation's memorandum dated February 14, 2000 (see Appendix B-1), the proposed typical section on the bridge will contain two 11-foot (3.4-meter) travel lanes, 4-foot (1.2-meter) wide lateral offsets, and 54-inch (1.4-meter) bicycle safe bridge rails. Similarly, the proposed typical section for the roadway approach includes two 11-foot (3.4-meter) travel lanes and 6-foot (1.8-meter) shoulders, consisting of 4-foot (1.2-meter) full depth pavement and 2-foot (0.6-meter) grass. The proposed project involves approximately 710 feet (216 meters) of the over 24 miles (38.6-kilometers) that comprise SR 1001.

The structure is proposed to be replaced with a new bridge, estimated to be 130 feet (40 meters) long and located approximately 60 feet (18 meters) north (upstream) of the existing bridge. The proposed vertical alignment ties into the existing grades of 8.3 and 3.5 percent, yet lengthens the existing vertical curve. The elevation at the centerline of the proposed bridge is roughly four feet (1.2 meters) higher than the elevation at the centerline of the existing bridge. The proposed design speed is 40 mph (65 km/hr).

The March 2000 Preliminary Hydraulic Investigation Report (updated on June 22, 2001) recommends locating the proposed bridge piers further apart than the existing piers, at approximately 50 feet (15.3 meters), to clear the bankfull channel width. The end spans are recommended to be approximately 40 feet (12.2 meters) long. While the stream channel is not expected to require realignment, the bridge abutment slopes are proposed to be armored with riprap to avoid surface erosion. A section of eroding stream bank is located directly south of the proposed bridge location along the east side of the bank. This section is approximately 20 feet (6 meters) long and 8 feet (2 meters) high. The erosion may be addressed with construction of the proposed structure or may require additional measures. Additional measures could include cutting back the stream bank, re-vegetation, and stabilization with a rock vane. If during final design a rock vane is required, it will be able to shift the flow vectors away from the bank, eliminating erosion at the toe of the stream bank. Minor clearing and disturbance will be required to facilitate construction of the rock vane, including the short-term use of machinery like a track hoe within the river. The access point created for the proposed bridge construction will be utilized also for the stream bank repair.

## II.B. Estimated Construction, Right-of-Way, and Road User Costs

The estimated project cost for the Recommended Alternative B is \$1,464,500, which includes \$64,500 for right-of-way, \$200,000 for engineering and contingencies, and \$1,200,000 for construction, as detailed in Table 1. The 2002-2008 TIP lists the estimated cost of the project at \$535,000, including \$25,000 for right-of-way in fiscal year 2002 and \$510,000 for construction in fiscal year 2003. The total cost of Alternative B is roughly \$665,000 higher than Alternative A and \$779,500 higher than that listed in the TIP.

**Table 1: Estimated Construction and Right-of-Way Costs  
(Based on Current Prices)**

Component	Alternative A	Recommended Alternative B
Existing Structure Removal	\$22,352	\$22,352
Proposed Structure	\$292,500	\$346,500
Roadway Improvements	\$146,445	\$449,450
Traffic Control and Signing	\$5,000	\$15,000
Miscellaneous and Mobilization	\$208,703	\$366,698
<b>Total Construction Cost</b>	<b>\$675,000</b>	<b>\$1,200,000</b>
<b>Engineering and Contingencies</b>	<b>\$100,000</b>	<b>\$200,000</b>
<b>Total Right-of-way Cost</b>	<b>\$24,500.00</b>	<b>\$64,500</b>
<b>Total Project Cost</b>	<b>\$799,500</b>	<b>\$1,464,500</b>

An additional cost variable, the road user cost (RUC), was evaluated for the off-site detour used in Alternative A. RUC is not applicable for the Recommended Alternative B because traffic is proposed to be maintained along the existing SR 1001 during construction. The RUC is the total estimated operating cost incurred by motorists to travel along an off-site detour route during construction activities. It is calculated using the following formula:

$$RUC = (N) (T) (D) (\$)$$

The “N” is the expected number of days the road will be closed for construction. The “T” is the average daily traffic volume expected on the road at the time of construction. The “D” is the distance in miles (or kilometers) that the average road user would have to travel out of his or her way during the time of construction. The “\$” is the estimated cost of operating a vehicle expressed in dollars per mile (or in dollars per kilometer). Therefore, the RDU for Alternative A is estimated at \$969,440, as calculated below:

$$RUC = (365 \text{ days}) (1,000 \text{ vpd}) (8.3 \text{ miles}) (\$0.32/\text{mile}) = \$969,440$$

## II.C. Anticipated Design Exceptions

A design exception is required in order to minimize property acquisition impacts and reduce the cost of the proposed project. An existing curve advisory speed is posted in the study area for 35-mph (55-km/hr) while

the current vertical sag over Bridge No. 27 indicates an even lower design speed of roughly 30 mph (50 km/hr) due to sight distance limitations. The proposed project maintains the existing horizontal design speed and improves the vertical design speed such that both will be at 40 mph (65 km/hr) with a posted advisory speed limit sustained at 35 mph (55 km/hr). A design exception is required for the use of a 900-foot (275-meter) vertical curve, which will result in the proposed 40 mph (65 km/hr) design speed. Since the purpose of the proposed project is to replace a structurally deficient and functionally obsolete structure, the proposed roadway approach ties directly into the existing alignment and does not include additional modifications outside the proposed study area.

#### **II.D. Utility Involvement**

Overhead power lines run along the northwestern side of the roadway and overhead telephone lines are located along the southeastern side. The telephone lines drop below ground on either side of the stream crossing via utility poles. During construction, the existing utilities may need to be relocated. Relocation of public utilities will be completed without long-term interruptions in service. No utilities are attached directly to the bridge structure

### **III. Public Involvement**

In February and March 2000, property owners in the study area were contacted by telephone and were sent letters summarizing both the conversations and current project information. Eight property owners were contacted pertaining to the five properties located nearest to Bridge No. 27. The purpose of the phone calls and letters was to inform them of the proposed project, give them the opportunity to ask questions, and document any comments that they wished to make about the project.

One property owner stated that she was concerned with the inconvenience of an off-site detour route, especially for the people living northeast of the bridge. She also was concerned about impacts to wildlife in the area, and that the South Yadkin River flows into the Alexander County drinking water reservoir.

Three property owners did not expect that the proposed project or planned detour route would create problems for them. Two property owners could not be contacted by telephone and therefore detailed letters were mailed to their addresses.

On March 20, 2002, project update letters were sent to property owners in the study area to notify them of the preferred alternative selection (Alternative B) and provide them with an opportunity to comment. To date, no other comments or replies have been received.



## **IV. Alternatives Considered**

### **IV.A. “Do Nothing” Alternative**

The “Do-Nothing” Alternative is not practical, as it would eventually require closing the road as the existing bridge continues to deteriorate. Closing the existing bridge is not desirable due to the traffic service provided by SR 1001. Rehabilitation of the existing bridge is neither practical nor economical.

### **IV.B. Postponement Alternative**

The Postponement Alternative would delay the necessary replacement of the bridge. Postponement of the proposed improvements would allow the deterioration of the existing bridge to continue. This alternative is not practical or recommended.

### **IV.C. Alternatives Eliminated from Further Consideration**

Alternative A was originally considered by NCDOT, but was eliminated from further consideration due to impacts associated with its use of an off-site detour route. Alternative A proposed to replace Bridge No. 27 at its existing location while closing SR 1001 to traffic during construction. The off-site detour route would have been roughly six to nine miles (9.6 to 14.5 kilometers) long, following SR 1403 (Vashti Road) and SR 1441 (Judd Smith Road) as shown in Figure 5. This detour and other roadways in the study area providing a north-south connection have sharp curves and low design speeds, making travel for large emergency service vehicles difficult. Because SR 1001 is a primary north-south route for emergency services, Alexander County’s Emergency Management requested that SR 1001 be maintained open to traffic during construction. Closure of the roadway during construction would impact their services throughout our study area and the surrounding vicinity. Based on the location of the emergency call, an off-site detour route would potentially delay the fire department and/or emergency medical services arrival by 15 to 20 minutes and would delay the return trip to the fire station and/or the hospital by another 15 to 20 minutes. Alternative A was ultimately rejected because an off-site detour is not able to provide adequate service to emergency vehicles and other users.

### **IV.D. Recommended Alternative**

Alternative B (Recommended), previously discussed in Section II, proposes to replace Bridge No. 27 approximately 60 feet north (upstream) of the existing bridge. SR 1001 will be permanently realigned in the vicinity of the bridge to accomplish this. Traffic will be maintained on the existing roadway and bridge during the project construction. Alternative B is the recommended alternative because it satisfies the purpose of and need for the proposed action while maintaining access through the study area for emergency services and the general public. Any demolition activities associated with modifications to Bridge No. 27 will strictly follow NCDOT’s Best Management Practices for Bridge Demolition and Removal.

The Division 12 Office has concurred with Alternative B as the preferred alternative.

## **V. Effects to the Man-Made and Natural Environment**

### **V.A. Effects To The Man-Made Environment**

#### **V.A.1. Land Use**

##### **V.A.1.a. Local Planning Activities**

While the project is located in Alexander County, it is not located within the municipal limits of any town or city. According to the Alexander County Planning Department, the study area is zoned RA-20 (rural residential and agricultural). This zoning classification allows for public uses with board approval. The study area's land use is defined in the November 1993 *Alexander County Land Development Plan*. This plan is in the very early stages of being updated.

##### **V.A.1.b. Existing Land Use**

Although, no residential or commercial structures are located in the immediate vicinity of Bridge No. 27, a residential household waste disposal center is located approximately 300 feet (92 meters) west of Bridge No. 27.

##### **V.A.1.c. Future Land Use**

No land use changes are planned for the proposed study area.

##### **V.A.1.d. Prime and Important Farmland**

The Farmland Protection Policy Act of 1981 requires all federal agencies or their representatives to consider the impact on prime and important farmland of all construction and land acquisition projects. To comply, Natural Resource Conservation Service (NRCS, formerly the U.S. Soil Conservation Service) was asked to determine the location of all important soils which may be impacted by the proposed project. The U.S. Department of Agriculture determines which soil types meet the criteria for important farmland soils, based on a variety of factors that contribute to a sustained high yield of crops. According to NRCS, while the proposed project will impact approximately one acre (0.4 hectare) of land containing statewide and local important farmland soils, it is not expected to impact land containing prime and unique farmland soils. Of the 168,538 acres (68,205 hectares) of land in Alexander County, an estimated 34,303 acres (13,882 hectares) are identified as prime and unique farmland soils. The impact rating determined through completion of the Farmland Conversion Impact Rating Form AD-1006, shown in Appendix C, indicates that the project's assessment and relative value score is 80 out of a possible 260. A score higher than 160 would indicate that mitigation should be considered.

##### **V.A.1.e. Underground Storage Tanks and Hazardous Materials**

Located just outside the study area, approximately 300 feet (92 meters) west of Bridge No. 27, is a residential household waste disposal center. The disposal center is not expected to have an impact on the proposed project. The NCDOT Geotechnical Unit/GeoEnvironmental Section performed a field reconnaissance of the study area and a public record review to identify UST facilities, hazardous waste sites (dump sites), regulated landfills, and Superfund sites. Based on the field reconnaissance and records search,

there should be no environmental liability concerns for the project. However, unregulated USTs and unregulated landfills may be encountered during the initial right-of-way process. If a site with an unregulated UST or a landfill is identified during the right-of-way process, a Preliminary Site Assessment will be performed prior to right-of-way acquisition to determine the extent of any contamination.

#### **V.A.2. Community Impact Assessment and Socioeconomic Impacts**

No adverse effect on families or communities is expected to result from the proposed project. Residential and commercial relocations are not anticipated. The maximum area of proposed right-of-way acquisition is estimated at 2.8 acres (1.1 hectares). During construction, traffic will be maintained on-site.

##### **V.A.2.a. Neighborhood Characteristics**

The proposed project is located in Alexander County, outside of nearby municipal boundaries. Alexander County is located in the western portion of the State, bounded by Caldwell, Wilkes, Iredell, and Catawba Counties. In 1990, Alexander County had a total population of 27,544 with 50 percent males and 50 percent females. At an annual growth rate, (from 1990 to 1999), of nearly 1.7 percent, the U.S. Census estimates the 1999 population in Alexander County to have increased to 31,984 people. During the same period, the U.S. Census estimates an annual growth rate of 1.6 percent for the State of North Carolina, with a 1990 population of 6,628,000 increasing to approximately 7,650,789.

The racial composition of the county in 1990 consisted of 93.2 percent Caucasians; 6.1 percent African Americans; 0.2 percent American Indians, Eskimos, or Aleuts; 0.1 percent Asians or Pacific Islanders; and 0.4 percent classified as "other races" (1990 U.S. Census). The racial composition of the State in 1990 consisted of 75.5 percent Caucasians; 22.0 percent African Americans; 1.2 percent American Indians, Eskimos, or Aleuts; 0.8 percent Asians or Pacific Islanders; and 0.5 percent classified as "other races" (1990 U.S. Census).

##### **V.A.2.b. Social and Economic Impacts**

While motorists traveling through the proposed study area may experience temporary inconveniences during project construction, they are not expected to sustain any long-term adverse impacts. The local area and surrounding communities are expected to have a beneficial impact due to the replacement of the insufficient bridge.

According to the U.S. Census, Alexander County had a civilian labor force of 15,690 people in 1990. Of the total civilian labor force, 15,084 people are employed and 606 people are unemployed, indicating an unemployment rate of almost 3.9 percent. Alexander County's unemployment rate compared favorably to the State's rate of almost 4.8 percent during the same time period. Nearly ten percent of Alexander County's population was living below the poverty level in 1989 as compared to almost 13 percent of the State's population (1990 U.S. Census).

##### **V.A.2.c. Religious Centers, Schools, and Other Public Facilities**

No religious centers, schools, or other public facilities are located along the proposed project or within the general study area. Therefore, this project is not expected to adversely affect any public facilities.

#### **V.A.2.d. Relocations**

No relocations are expected to result from the proposed project.

#### **V.A.2.e. Environmental Justice**

This Categorical Exclusion has proceeded in accordance with the Executive Order 12898 requirement that each federal agency, to the greatest extent allowed by law, administer and implement its programs, policies, and activities that affect human health or the environment so as to identify and avoid “disproportionately high and adverse” effects on minority and low-income populations. The proposed project will not segment existing minority communities or separate residential areas from nearby services, such as schools, businesses, or parks. The proposed improvements are expected to have an overall positive impact on the surrounding community. Replacing the inadequate bridge will result in safer traffic operations for the public.

#### **V.A.3. Historic and Cultural Resources**

This project is subject to compliance with Section 106 of the National Historical 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.

##### **V.A.3.a. Archaeological Resources**

According to the State Historic Preservation Office (SHPO), there are no recorded archaeological sites within the project boundaries. The area has never been systematically surveyed to determine the location or significance of archaeological resources. SHPO originally recommended in a letter dated March 3, 2000 that an archaeological survey be conducted if construction is planned on a new alignment. To comply with SHPO, an archaeological survey was conducted and no archaeological sites were found within the project boundary. NCDOT is awaiting concurrence from SHPO regarding this issue. No further compliance with Section 106 of the National Historical Preservation Act for archaeological resources is required.

##### **V.A.3.b. Historic Architectural Resources**

No properties listed on or eligible for the National Register of Historic Places are located inside the Area of Potential Effects for the proposed project. The State Historic Preservation Office has concurred with this determination (see Appendix A, page A-10). Since there are no historic properties affected by the proposed action, compliance with Section 106 of the National Historical Preservation Act is complete.

#### **V.A.4. Section 4(f) and Section 6(f) Resources**

##### **V.A.4.a. Section 4(f) Properties**

The study area does not contain public parks, recreation areas, historic sites, or wildlife and waterfowl refuges of national, state, or local significance. No properties subject to protection under Section 4(f) of the USDOT Act of 1966 will be used or directly impacted by the proposed project.

##### **V.A.4.b. Section 6(f) Properties**

No section 6(f) properties are located within the project's study area. Therefore, no right-of-way for the proposed bridge replacement will be required from properties that have been acquired or developed with assistance of Section 6(f) funds.

#### **V.B. Effects To The Natural Environment**

##### **V.B.1. Physical Resources**

Alexander County is situated in the northwestern part of the Piedmont Physiographic Province. The geography of the county consists predominantly of gently sloping to very steep uplands. Narrow, nearly level floodplains exist along most of the streams. Elevations range from approximately 1,020 feet (311 meters) above mean sea level (msl) at the South Yadkin River to approximately 1,080 feet (329 meters) at both the western and eastern perimeters of the project area as depicted on the Hiddenite, North Carolina, USGS topographic quadrangle map.

##### **V.B.1.a. Soils**

The geology underlying the area consists of intrusive rocks of the Inner Piedmont Formations. The rock is mainly metamorphosed granitic rock from the Cambrian to Ordovician Periods. It is equigranular to megacrystic, foliated to massive, and includes Toluca Granite (North Carolina Division of Land Resources, 1985).

One soil association is present in the project area, the Rion Association (*Soil Survey of Alexander County*, U.S. Department of Agriculture, 1995). The Rion Association is comprised of gently sloping to moderately steep, well-drained soils. These soils have loamy subsoil formed in material weathered predominantly from granitic gneiss. Rion soils are the major soils in the association. These soils are found primarily along ridge tops and side slopes. The minor soils in the association include Chewacla, Wehadkee, Wedowee, and Pacolet soils. Chewacla and Wehadkee soils are found primarily on floodplains, and are frequently flooded. Chewacla is listed as a hydric soil for Alexander County. Wedowee and Pacolet soils are located primarily on ridge tops and side slopes. They have predominantly clayey subsoil.

Hydric soils are defined as soils that are saturated, flooded, or ponded long enough during the growing season to develop anaerobic conditions that favor the growth and regeneration of hydrophytic vegetation (Cowardin et al., 1979). Based on information obtained from the *Soil Survey of Alexander County*, (U. S. Department of Agriculture, 1995), Chewacla loam is present along both edges of the South Yadkin River and covers approximately 30 percent of the project area.

### **V.B.1.b. Water Resources**

#### **V.B.1.b.i. Water Characteristics in the Project Area**

Streams, creeks, and tributaries within the project region are part of the Yadkin-Pee Dee River Basin, the second largest river basin in the State. The basin originates on the eastern slopes of the Blue Ridge Mountains in Caldwell, Wilkes, and Surry Counties and extends into a small portion of Virginia. The Yadkin-Pee Dee River Basin drains in a southeasterly direction through portions of North Carolina and South Carolina and ultimately into the Atlantic Ocean.

The South Yadkin River accounts for the majority of surface waters in the project area. The project area is situated immediately downstream of the confluence of Big Branch and the South Yadkin River. The South Yadkin River in the project area is approximately 20 to 25 feet (6.1 to 7.6 meters) wide and greater than 3 feet (1.0 meter) deep. The banks are moderately eroded and are 5 to 10 feet (1.5 to 3.0 meters) high. During field surveys, biologists found that the riverbed was not visible due to muddy water conditions. The bed is assumed to consist of cobble, gravel, and sand.

#### **V.B.1.b.ii. Water Classifications**

The North Carolina Division of Water Quality (NCDWQ) classifies surface waters of the State based on their intended best uses. The South Yadkin River and its tributaries are classified as a public water supply watershed (WS-II). Class WS-II denotes waters protected as water supplies that are generally in predominantly undeveloped watersheds. Point source discharges of wastewater are permitted under certain regulations. Local programs to control nonpoint source and stormwater discharge of pollution are required. All WS-II waters are suitable for all Class C uses, including aquatic life propagation and survival, fishing, wildlife, secondary recreation, and agriculture.

#### **V.B.1.b.iii. Water Quality**

The Ambient Monitoring System (AMS) is a network of stream, lake, and estuarine water quality monitoring stations strategically located for the collection of physical and chemical water quality data. The type of water quality data or parameters collected is determined by the water body's classification and corresponding water-quality standards. The AMS determines the "use support" status of water bodies, meaning how well a water body supports its designated uses. Surface waters (streams, lakes, or estuaries) are rated as Fully Supporting, Support-Threatened, Partially Supporting, or Not Supporting. The waters in the project area are currently rated as Support-Threatened. This category refers to those waters classified as good-fair based on water quality data, in contrast to excellent or good which are considered Fully Supporting.

Benthic macroinvertebrate sampling areas on the South Yadkin River were all downstream of the project area, at SR 1561 in Iredell County and SR 1159 in Davie County. Based on the results taken in 1996, the water quality in the upper part of this subbasin is rated as good to excellent. An excellent rating was issued at the SR 1561 site in Iredell County, approximately 12 miles (19.3 kilometers) downstream of the project area. In addition, 55 fish community sites in the Yadkin-Pee Dee River Basin were sampled and evaluated in 1996. At least one site in every subbasin was sampled using the North Carolina Index of Biotic Integrity (NCIBI). A NCIBI sample was also taken in the South Yadkin River at SR 1561, downstream of the project area, in Iredell County. The NCIBI rating was 42, denoting a "fair" rating.

Point source dischargers throughout North Carolina are regulated through the National Pollutant Discharge Elimination System (NPDES) program. Dischargers are required by law to register for a permit. According to NCDWQ (1998), there are 32 permitted NPDES dischargers in the subbasin, which are all downstream of the project area. The closest permitted discharger is approximately six miles (9.7 kilometers) downstream, immediately north of the Town of Stony Point.

Approximately 85% of the project vicinity is undeveloped, forested lands and thus has no significant non-point source discharge. Most of the remaining area is agricultural lands, pastures, or fallow fields. These types of lands may contribute to non-point source discharges through soil erosion and fertilizer runoff.

#### **V.B.1.c. Physical Resource Impacts**

The project will have minimal impacts to both soils and topography associated with constructing the roadway approaches to the bridge. The primary sources of water-quality degradation in rural areas are agriculture and construction. Precautions will be taken to minimize impacts to water resources in the project area. Construction related impacts to water resources include: loss of aesthetic values, substrate destabilization, bank erosion, increased turbidity, altered flow rates, and possible temperature fluctuations within the stream channel caused by removal of stream-side vegetation. Short-term impacts to water quality from construction activities are related to increased sedimentation and turbidity. Aquatic organisms are very sensitive to discharges and inputs resulting from construction. Appropriate measures will be taken to avoid spillage and control runoff. Such measures will include an erosion and sedimentation control plan, provisions for waste materials and storage, stormwater management measures, and appropriate road maintenance measures. NCDOT's *Best Management Practices for Protection of Surface Waters* (BMPs-PSW) and Sedimentation Control Guidelines will be strictly enforced during the construction stages of the project.

Due to the South Yadkin River's WS-II classification, NCDWQ requests in their letter dated January 19, 2000 that NCDOT strictly adhere to North Carolina regulations entitled "*Designs Standards for Sensitive Watersheds*" (15A NCAC 04B .0024) throughout design and construction of the project. These regulations will be used for the proposed project. The NCDWQ also request that hazardous spill catch basins be installed at the bridge crossing. According to the NCDOT policy, hazardous spill catch basins are installed at bridge crossings that are within 0.5 mile (0.8 kilometer) of a critical area or within 1.0 mile (1.6 kilometers) of an intake location. According to the NCDOT Hydraulics Unit, the nearest critical area and intake location are both over 3 miles away from Bridge No. 27. Consequently, hazardous catch basins are not included in the proposed project.

#### **V.B.2. Biotic Resources**

Biotic resources include aquatic and terrestrial ecosystems. This section describes the existing vegetation and associated wildlife that occur within the project area, as well as the potential impacts of the proposed project on the biotic communities. The project area is composed of different vegetative communities based on topography, soils, hydrology, and disturbance. These systems are interrelated and in many aspects interdependent. The following natural community profiles conform to descriptions according to Weakley et al. (1998, Draft) when applicable. These community names are capitalized in this report. Scientific nomenclature and common name (when applicable) are provided for each plant and animal species listed. Subsequent references to the same organism include only the common name.

### V.B.2.a. Terrestrial Communities

There are four plant communities found in the project area: Sweetgum - (Tuliptree-Red Maple) Temporarily Flooded Forest Alliance, White Oak - (Red Oak-Hickory) Forest Alliance, Pine - Oak - Tuliptree Forest Alliance, and maintained communities.

The Sweetgum - (Tuliptree-Red Maple) Temporarily Flooded Forest Alliance is found in the floodplain on both sides of the South Yadkin River. The canopy dominants of this bottomland forest are river birch (*Betula nigra*), red maple (*Acer rubrum*), and sycamore (*Platanus occidentalis*). Other canopy species include tuliptree (*Liriodendron tulipifera*) and sweetgum (*Liquidambar styraciflua*). The diameter at breast height (dbh) of the canopy trees averages 6 to 8 inches (15 to 20 centimeters). There are dense subcanopy and shrub layers dominated by privet (*Ligustrum sinense*) with some ironwood (*Carpinus caroliniana*) and spicebush (*Lindera benzoin*). Japanese honeysuckle (*Lonicera japonica*) and poison ivy (*Toxicodendron radicans*) were also abundant.

The White Oak - (Red Oak-Hickory) Forest Alliance is a mesic to dry-mesic oak dominated community and is found in the project area, upslope of the floodplain forest described previously. The dominant canopy trees include white oak (*Quercus alba*), southern red oak (*Q. falcata*), and mockernut hickory (*Carya alba*). Other canopy trees include beech (*Fagus grandifolia*), black cherry (*Prunus serotina*), pines (*Pinus* spp.), red maple, and sweetgum. The average canopy tree dbh is 6 to 8 inches (15 to 20 centimeters). The understory consists of dogwood (*Cornus florida*), sourwood (*Oxydendrum arboreum*), ironwood, privet, greenbriar (*Smilax* spp.), and grape (*Vitis* spp.).

A successional pine-dominated community is located in the southwestern quadrant of the project area. It is likely part of an upland Oak-Hickory Forest that was cleared about 10 to 15 years ago. The regenerating forest is the early successional community, best classified as Pine-Oak-Tuliptree Forest Alliance. This community is dominated by short-leaf and scrub pine (*Pinus echinata* and *P. virginiana*), which form a very dense stand approximately 5 to 10 feet (1.5 to 3 meters) tall.

Maintained communities represent areas that are periodically maintained by human influences, such as roadside and power-line right-of-ways, old fields and open areas, and regularly mowed lawns. Maintained communities, which include old field/pasture areas, exist along the SR 1001 right-of-way, on both sides of the bridge. Within the existing SR 1001 right-of-way is a 12 to 15-foot (3.7 to 4.6-meter) wide area that is dominated by herbaceous vegetation such as fescue (*Festuca* spp.) and other grass species (Poaceae), dandelion (*Krigia* spp.), vetch (*Vicia* spp.), pliantain (*Plantago* spp.), field ox-eye daisy (*Chrysanthemum leucanthemum*), Japanese honeysuckle (*Lonicera japonica*), smooth sumac (*Rhus glabra*), and poison ivy (*Toxicodendron radicans*). In the far northeastern quadrant of the study area, is a fallow field or old pasture. This maintained community is dominated by herbaceous vegetation such as broomsedge (*Andropogon* spp.), other grass species (Poaceae), goldenrods (*Solidago* spp.), ragweed (*Ambrosia artemisiifolia*), and trumpet vine (*Campsis radicans*).

Bottomland forests, represented by Sweetgum (Tuliptree-Red Maple) Temporarily Flooded Forest Alliance in the project area, offer high plant diversity due to increased soils fertility and water availability and therefore provide high quality wildlife habitat. These forests along the South Yadkin River, in conjunction with the adjoining upland oak and hickory-dominated forest, provide valuable habitat for a variety of amphibians, reptiles, birds, and mammals. Various salamanders (Ambystomatidae and Plethodontidae) are



expected to utilize ephemeral pools in the floodplain for breeding and are likely to migrate to the adjoining uplands for the remainder of the year. Reptiles in the area are likely to include black rat snakes (*Elaphe obsoleta*), northern water snakes (*Nerodia sipedon sipedon*), eastern box turtles (*Terrapene carolina*), and broadhead skinks (*Eumeces laticeps*).

Mammals inhabiting the area are likely to include gray squirrels (*Sciurus carolinensis*), opossums (*Didelphis virginiana*), raccoons (*Procyon lotor*), eastern moles (*Scalopus aquaticus*), woodland voles (*Microtus pinetorum*), and gray foxes (*Urocyon cinereoagenteus*). The forest edges provide habitat for white-tailed deer (*Odocoileus virginianus*) and eastern cottontail (*Sylvilagus floridanus*). Birds in the area are likely to include the tufted titmouse (*Parus bicolor*), Carolina wren (*Thryothorus ludovicianus*), cardinal (*Cardinalis cardinalis*), yellow-bellied sapsucker (*Melanerpes carolinus*), myrtle warbler (*Dendroica tigrina*), rufus-sided towhee (*Pipilo erythrophthalmus*), woodpeckers (*Dendrocopos* spp.), belted kingfisher (*Megaceryle alcyon*), and sharp-shinned hawk (*Accipiter striatus*).

#### **V.B.2.b. Aquatic Habitats and Wildlife**

The quality of aquatic habitat in the South Yadkin River is expected to be relatively good due to the quantity of undeveloped lands in the surrounding region. The river likely supports numerous sport fishes, including redbreast sunfish (*Lepomis auritus*), bluegill (*Lepomis macrochirus*), crappie (*Pomoxis nigromaculatus* and *P. annularis*), channel catfish (*Ictalurus punctatus*), and carp (*Cyprinus carpio*). Small minnow-type species are likely to include golden shiner (*Notemigonus crysoleucas*), mosquitofish (*Gambusia holbrooki*), spottail shiner (*Notropis hudsonius*), whitefin shiner (*Cyprinella nivea*), fieryblack shiner (*Cyprinella pyrrhomelas*), and tessellated darter (*Etheostoma olmstedii*). Benthic macroinvertebrate sampling was not conducted in the project area.

#### **V.B.2.c. Biotic Resource Impacts**

##### **V.B.2.c.i. Impacts to Terrestrial Communities**

As shown in Table 2, Alternative A is estimated to impact approximately 0.37 acre (0.15 hectare) of Sweetgum - (Tuliptree-Red Maple) Temporarily Flooded Forest Alliance, 0.80 acre (0.32 hectare) of White Oak - (Red Oak-Hickory) Forest Alliance, 0.18 acre (0.07 hectare) of Pine-Oak-Tuliptree Forest Alliance, and 0.16 acre (0.07 hectare) of maintained communities. Overall, Alternative B is expected to impact a larger area of terrestrial communities than Alternative A. Alternative B is estimated to impact approximately 0.18 acre (0.07 hectare) of Sweetgum - (Tuliptree-Red Maple) Temporarily Flooded Forest Alliance, 1.18 acre (0.48 hectare) of White Oak - (Red Oak-Hickory) Forest Alliance, none of the Pine-Oak-Tuliptree Forest Alliance, and 1.43 acres (0.58 hectare) of maintained communities. Temporary fluctuation in populations of animal species that utilize terrestrial areas is anticipated during the course of construction for both Alternative A and B. Slow-moving, burrowing, and/or subterranean organisms will be directly impacted by construction activities, while mobile organisms will be displaced to adjacent communities. Competitive forces in the adapted communities will result in a redefinition of population equilibria.

**Table 2: Estimated Area of Impacts to Terrestrial Communities**

Community	Estimated Area of Impact	
	Alternative A	Recommended Alternative B
Sweetgum - (Tuliptree-Red Maple) Temporarily Flooded Forest Alliance	0.37 acre (0.15 hectare)	0.18 acre (0.07 hectare)
White Oak - (Red Oak-Hickory) Forest Alliance	0.80 acre (0.32 hectare)	1.18 acres (0.48 hectare)
Pine-Oak-Tuliptree Forest Alliance	0.18 acre (0.07 hectare)	0.00 acre (0.00 hectare)
Maintained Communities	0.16 acre (0.07 hectare)	1.43 acres (0.58 hectare)
<b>Total Area of Impact</b>	<b>1.51 acre (0.61 hectare)</b>	<b>2.79 acre (1.13 hectare)</b>

**V.B.2.c.ii. Impacts to Aquatic Habitats and Wildlife**

Aquatic communities are acutely sensitive to changes in their environment. Environmental impacts from construction activities may result in long-term or irreversible effects. Impacts usually associated with in-stream construction include increased channelization and scouring of the streambed. In-stream construction alters the substrate and impacts adjacent streamside vegetation. Such disturbances within the substrate lead to increased siltation, which can clog the gills and/or feeding mechanisms of benthic organisms, fish, and amphibian species. Siltation may also cover benthos with excessive amounts of sediments that inhibit their ability to obtain oxygen. These organisms are slow to recover and usually do not once the stream has been severely impacted.

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

**V.B.3. Jurisdictional Issues**

This section provides descriptions, inventories, and impact analyses pertinent to “Waters of the United States” and rare and protected species.

**V.B.3.a. “Waters of the United States”**

Surface waters and wetlands fall under the broad category of “Waters of the United States,” as defined in Section 33 of the Code of Federal Register (CFR) Part 328.3. Wetlands are those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and under normal circumstances do support, a prevalence of vegetation typically adapted to life in saturated conditions. Any action that proposes to place fill into these areas falls under the jurisdiction of the U.S. Army Corps of Engineers (USACE) under Section 404 of the Clean Water Act (33 U.S.C. 1344).

### **V.B.3.a.i. Surface Waters**

The NCDWQ defines a perennial stream as a clearly defined channel that contains water for the majority of the year. These channels usually have some or all of the following characteristics: distinctive streambed and bank, aquatic life, and groundwater flow or discharge (NCDWQ, 1998). One perennial stream, South Yadkin River, was identified in the project area. Detailed stream characteristics, including specific water-quality designations, are previously discussed on page 13 of this document.

### **V.B.3.a.ii. Jurisdictional Wetlands**

Criteria to determine the presence of jurisdictional wetlands, as described in the USACE *Wetland Delineation Manual*, include evidence of hydric soils, hydrophytic vegetation, and hydrology. A wetland assessment was conducted on May 30, 2001 by ARCADIS G&M biologists. Soils mapped by the Soil Conservation Service and presented in the 1995 Soil Survey for Alexander County show that the Chewacla series occurs on the floodplain adjacent to the South Yadkin River. This soil series is classified as a non-hydric soil that is frequently flooded and which may develop inclusions of a hydric soil in depressed areas. Soil samples were taken in several floodplain areas as part of the delineation process to determine whether any hydric soil characteristics occur on the floodplain in the project area. No redoximorphic features, such as mottling, low chroma soil color, concretions, or other hydric soil features, were observed in the soil samples. All other mapped soils units in the project study area are non-hydric soils. Based on the absence of hydric soil development, it was determined that no jurisdictional wetlands occur in the project study area.

### **V.B.3.a.iii. Impacts to “Waters of the United States”**

The existing bridge does not have piers in the South Yadkin River, and, similarly, the proposed project does not include plans for placement of piers in the river. However, a section of eroding stream bank is located directly south of the proposed bridge location along the east side of the bank. This section is approximately 20 feet (6 meters) long and 8 feet (2 meters) high. The erosion may be addressed with construction of the proposed structure or may require additional measures. Additional measures could include cutting back the stream bank, re-vegetation, and stabilization with a rock vane. If during final design a rock vane is required, it will be able to shift the flow vectors away from the bank, eliminating erosion at the toe of the stream bank. Minor clearing and disturbance will be required to facilitate construction of the rock vane, including the short-term use of machinery like a track hoe within the river. An estimated 145 linear feet (44.2 meters) of stream channel may be impacted during construction of the proposed alternative.

The bridge demolition activities associated with this replacement will strictly follow NCDOT's *Best Management Practices for Bridge Demolition and Removal* (BMPs-BDR). As per the BMPs-BDR, all methods of demolition, other than dropping the bridge in the water, shall be considered and implemented where practical. However, assuming the worst-case scenario that all spans over water are potential discharge, removal of this span could potentially drop a maximum of 50 cubic yards (38.2 cubic meters) of fill into the river. The proposed project falls under Case 3 of the BMPs-BDR. There are no special restrictions on bridge demolition activities associated with this project beyond those outlined in BMPs-PSW and BMPs-BDR.

#### **V.B.3.a.iv. Permit Requirements**

While the U.S. Environmental Protection Agency (USEPA) is the principal administrative agency of the Clean Water Act; the U.S. Army Corps of Engineers (USACE) has the responsibility for implementation, permitting, and enforcement of the provisions of the Act. The USACE regulatory program is defined in 33 CFR 320-330. Permits will be required for highway encroachment into jurisdictional wetland communities and surface waters. The Section 404 Nationwide Permit 23 for approved Categorical Exclusions is expected to be applicable for all impacts to “Waters of the United States” resulting from the proposed project.

In addition, a Section 401 General Water Quality Certification (WQC #2745) is also required for any activity which may result in a discharge into “Waters of the United States” or for which an issuance of a federal permit or license is issued. If foundation test borings are necessary, a General 401 Certification Number 3027/Nationwide Permit No. 6 will be required. Certifications are administered through the Department of Environment and Natural Resources (NCDENR), Division of Water Quality.

Final determination of permit applicability lies with the USACE. NCDOT will coordinate with the USACE after the completion of final design to obtain the necessary permits.

#### **V.B.3.a.v. Wetland and Stream Mitigation**

The USACE has adopted, through the Council on Environmental Quality (CEQ), a mitigation policy which embraces the concepts 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,” specifically wetlands. Mitigation of wetland impacts has been defined by the CEQ to include: avoidance of 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 in sequential order.

The maximum length of stream channel that will be impacted during construction is approximately 145 feet (44.2 meters). For impacts to perennial streams greater than 150 linear feet (45.72 linear meters), NCDWQ requires compensatory mitigation. Compensatory mitigation is not expected to be required by the USACE. A final determination regarding compensatory mitigation requirements rests with the USACE.

### **V.B.3.a.v.(a) Avoidance**

Avoidance 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 United States EPA and the USACE, "appropriate and practicable" measures to offset unavoidable impacts must be determined. 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. It is the project's purpose to replace the structurally deficient and functionally obsolete bridge over the South Yadkin River. Encroachment into surface waters may be inevitable, as riprap will likely be needed for bank stabilization along the river channel.

### **V.B.3.a.v.(b) Minimization**

Minimization includes the examination of appropriate and practicable steps to reduce 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.

Minimization can be effectively employed along the proposed project. Examples of minimization include:

1. Strict enforcement of Best Management Practices (BMPs) to control sedimentation during project construction.
2. Reduction of clearing and grubbing activities.
3. Reduction or elimination of discharges into streams.
4. Reduction of fill slopes at stream/wetland crossings.
5. Sensitive placement of drainage structures.
6. Utilization of a spanning structure over the river.
7. Re-establishment of vegetation on exposed areas, with judicious pesticide and herbicide management.
8. Minimization of "in-stream" activity.
9. Use of responsible litter control practices.

### **V.B.3.a.v.(c) Compensatory Mitigation**

Compensatory mitigation is not normally considered until anticipated impacts to "Waters of the United States" have been avoided and minimized to maximum extent possible. It is recognized that "no net loss of wetlands" functions and values may not be achieved in every permit action. Appropriate and practicable compensatory mitigation is required for unavoidable adverse impacts that remain after all appropriate and practicable minimization has been achieved. Compensatory actions often include restoration, creation and enhancement of "Waters of the United States," specifically wetlands. Such actions should be undertaken in areas adjacent to or contiguous to the discharge site, if practicable. Authorizations under Nationwide Permits usually do not require compensatory mitigation according to the 1989 MOA between the EPA and the USACE. Final decisions concerning compensatory mitigation rest with the USACE.

### **V.B.3.b. Protected Species**

Some populations of fauna and flora have been, or are, in the process of decline due to either natural forces or their inability to coexist with humans. Federal law (under the provisions of Section 7 of the Endangered

Species Act (ESA) of 1973, as amended) requires that any action likely to adversely affect a species classified as federally protected be subject to review by the United States Fish and Wildlife Service (USFWS). Other species may receive additional protection under separate laws. As of June 4, 2001, the USFWS has identified one species threatened due to similarity of appearance (T[S/A]) and two federal species of concern (FSC) potentially occurring in Alexander County. The North Carolina Natural Heritage Program (NCNHP) lists of January 2002 included these species and identified additional species receiving protection under state laws. Table 3 lists the species, their status, and the availability of suitable habitat within the project area.

#### **V.B.3.b.i. 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 ESA of 1973, as amended. One species, the bald eagle (*Haliaeetus leucocephalus*), is federally designated as Threatened in Alexander County. Although the bald eagle is not currently listed on the USFWS list, according to Mr. Allen Ratzlaff, biologist, with the USFWS Asheville office, the bald eagle is expected to be included on the updated USFWS list in June 2002. As such, this species is protected under Section 7 of the ESA of 1973. Furthermore, the bog turtle (*Clemmys muhlenbergii*) is federally designated as Threatened Due to Similarity of Appearance in Alexander County. However, it is not protected under Section 7 of the ESA of 1973. A description of these species is provided.

##### **Bog Turtle (*Clemmys muhlenbergii*)**

Federal Status: THREATENED (Due to Similarity of Appearance)

State Status: THREATENED

Bog turtles are a small, 3 to 4.5-inch (7.6 to 11.4 centimeter) turtle with a weakly keeled upper shell that ranges from light brown to ebony. The species is readily distinguished from other turtles by a large, conspicuous, bright orange to yellow blotch on each side of its head. Bog turtles are semi-aquatic and are infrequently active outside of their muddy habitats, except during specific temperature ranges. They can be found during the spring mating season from June to July and at other times from April to October when the humidity is high, such as after a rain event, and temperatures are in the 70's F (20's C). Bog turtle habitat consists of bogs, swamps, marshy meadows, and other wet environments, specifically those that have soft muddy bottoms. Appropriate habitat for the bog turtle does not exist in the project area.

##### **Bald Eagle (*Haliaeetus leucocephalus*)**

Federal Status: THREATENED

State Status: ENDANGERED

The mature bald eagle (usually 4+ years in age) can be identified by its large white head and short white tail. The body plumage is dark-brown to chocolate-brown in color. Bald eagles can easily be distinguished from other birds by their flat wing soar. They are primarily associated with large bodies of water where food is plentiful. Eagle nests are found in close proximity to water (usually within 0.8 km (0.5 mi)) with a clear flight path to the water, in the largest living tree in an area, with an open view of the surrounding land. Human

disturbance can cause nest abandonment. The breeding season for the bald eagle begins in December and January. Fish are the major food source, although forage items include coots, herons, wounded ducks, and carrion.

Biological Conclusion: *No Effect*

The Yadkin River is too narrow throughout the project area to provide suitable open water habitat and no other open water exists within one mile of the project. Furthermore, there are no pine trees large enough to provide habitat for nests within one mile of the project. Therefore, no impacts to this species from project construction are anticipated.

Table 3: Federal Species of Concern and State Protected Species - Alexander County

Scientific Name	Common Name	Federal Status	State Status	Available Habitat
<b>Vertebrates</b>				
<i>Clemmys muhlenbergii</i>	Bog turtle	T (S/A)	T	No
<i>Corynorhinus rafinesquii</i>	Rafinesque's big-eared bat	FSC	SC	Yes
<i>Crotalus horridus horridus</i>	Timber rattlesnake – Mountain population	--	SR	No
<i>Haliaeetus leucocephalus</i>	Bald eagle	T	E	No
<b>Invertebrates</b>				
<i>Leptoxis dilatata</i>	Seep mudalia	--	T	No
<i>Megathymus cofaqui</i>	Cofaqui skipper	--	SR	No
<i>Papilio cresphontes</i>	Giant swallowtail	--	SR	No
<b>Vascular Plants</b>				
<i>Allium cuthbertii</i>	Striped garlic	--	C	No
<i>Anemone berlandieri</i>	Southern anemone	--	C	No
<i>Arabis hirsuta</i> var. <i>adpressipilis</i>	Hairy rockcress	--	C	No
<i>Berberis canadensis</i>	American barberry	--	SR	No
<i>Cordalis micrantha</i> spp. <i>micrantha</i>	Slender corydalis	--	C	No
<i>Cyperus granitophilus</i>	Granite flatsedge	--	SR	No
<i>Eupatorium incarnatum</i>	Pink thoroughwort	--	SR	No
<i>Pellaea wrightiana</i>	Wright's cliff-brake	--	E-SC	No
<i>Pycnanthemum torrei</i>	Torrey's mountain-mint	--	C	No
<i>Spiraea betulifolia</i> spp. <i>corymbosa</i>	Shinyleaf meadowsweet	--	SR	No
<b>Nonvascular Plants</b>				
<i>Orthotrichum keeverae</i>	Keever's bristle-moss	FSC	E	No

*Status Nomenclature:*

E – Endangered – These species are in danger of extinction throughout all or a significant portion of its range.

T – Threatened – These species are likely to become endangered within the foreseeable future throughout all or a significant portion of its range.

T(S/A) – Threatened due to similarity of appearance - These species are not biologically endangered or threatened and are not subject to consultation under Section 7 of the ESA of 1973.

FSC - Federal Species of Concern – These species 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).

SC – Special Concern      SR – Significantly Rare      C - Candidate



### **V.B.3.c. Impacts to the Floodplain**

Alexander County participates in the National Flood Insurance Program administered by the Federal Emergency Management Agency (FEMA). While Flood Hazard Boundary Maps have been prepared by FEMA, no detailed studies have been conducted in the project area. The bridge crossing occurs in an area where approximate methods have been used to establish the floodplain and where base flood elevations have not been determined. As illustrated in Figure 6, the crossing is found on Alexander County Flood Hazard Boundary Map Panel 370398 0002 A, effective date June 9, 1978. No impact on the floodplain is anticipated since the proposed structure will be similar to the existing bridge.

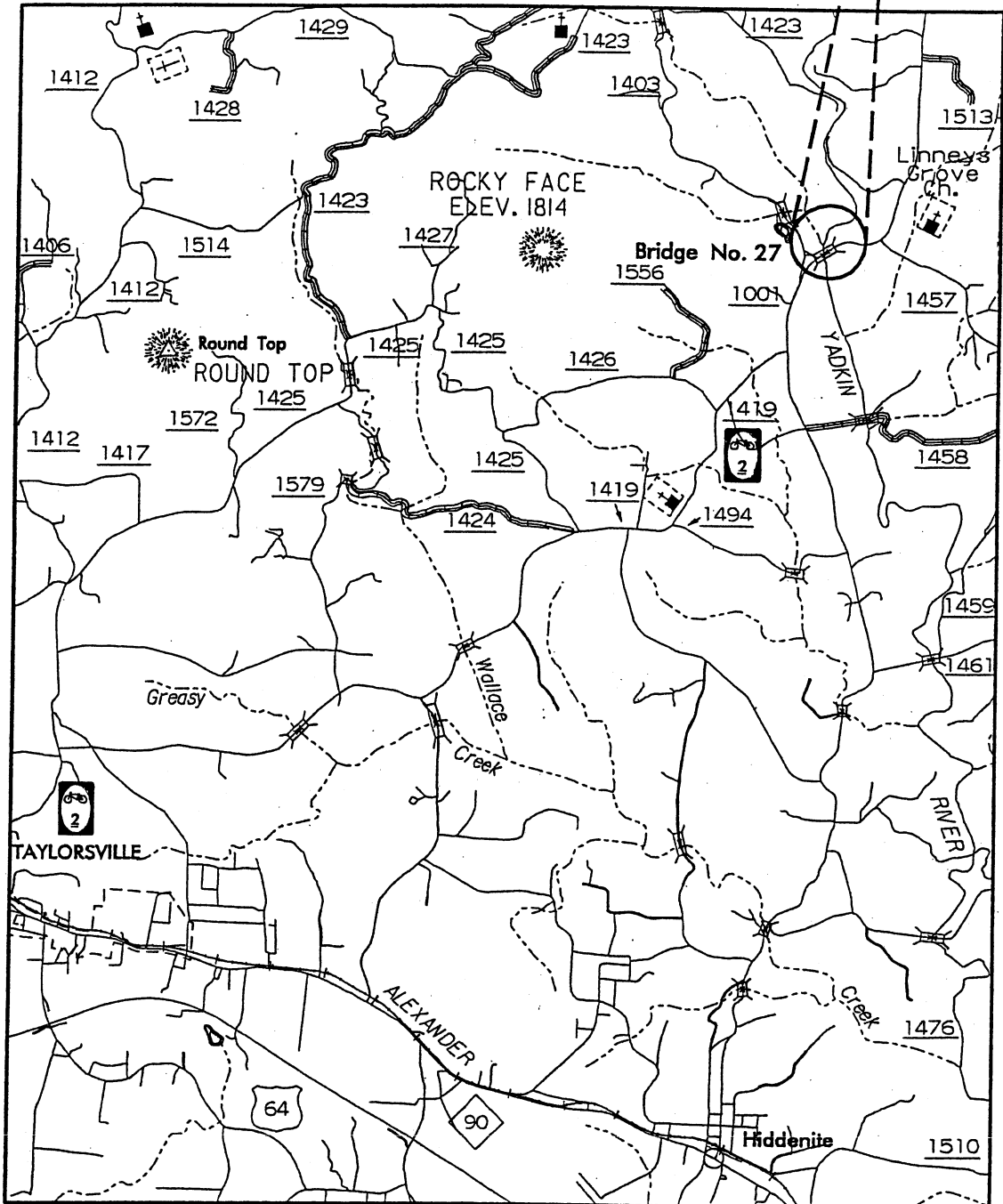
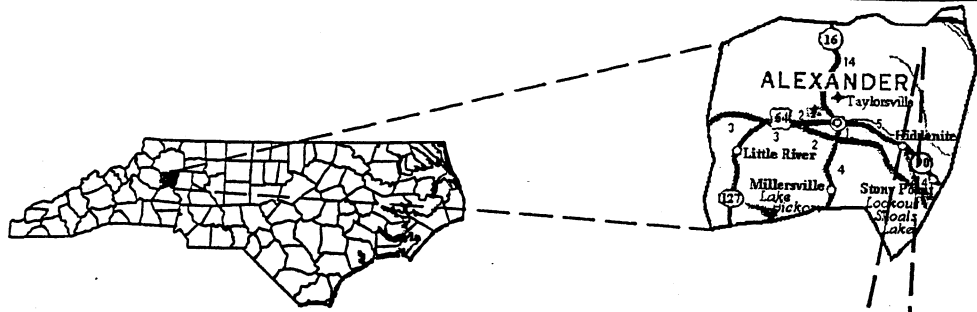
### **V.B.4. Traffic Noise and Air Quality**

Noise levels could temporarily increase during construction. The proposed project will not substantially increase or decrease traffic volumes. Therefore, it will not have substantial impact on noise levels. This evaluation completes the assessment requirements for highway traffic noise (23 CFR Part 772).

The project is located in Alexander County, which is currently designated as an “attainment” area and is in compliance with the National Ambient Air Quality Standards. The proposed project is an air quality “neutral” project. As such, it is not required to be included in the regional emissions analysis and a project level CO analysis is not required. Since the project is located in an attainment area, 40 CFR Part 51 is not applicable. This project is not anticipated to create any adverse effects on the air quality of this attainment area. If vegetation is disposed of by burning, all burning shall be done in accordance with applicable local laws and regulations of the North Carolina SIP for air quality in compliance with 15 NCAC 2D.0520. This evaluation satisfies the 1990 Clean Air Act Amendments (CAAA) and the National Environmental Policy Act of 1969 (NEPA) assessment requirements for air quality.

## **VI. Conclusions**

Based on the studies performed for the proposed project, it is concluded that the project will not result in substantial adverse social, economic, or environmental impacts. The project's "Categorical Exclusion" classification, as defined in 40 CFR 1508.4 and 23 CFR 771.117, is appropriate. The project is expected to have an overall positive impact. Replacement of the inadequate bridge will result in safer traffic operations.



Vicinity Map

0 1 mile



NORTH CAROLINA DEPARTMENT  
OF TRANSPORTATION  
PROJECT DEVELOPMENT AND  
ENVIRONMENTAL ANALYSIS BRANCH

Alexander County  
Replace Bridge No. 27  
over South Yadkin River  
T.I.P. Project B-3100

Figure 1



PHOTO #1: Looking to the northeast, along SR 1001



PHOTO #2: Looking to the southwest, along SR 1001

## Photographs of Existing Roadway Conditions



NORTH CAROLINA DEPARTMENT  
OF TRANSPORTATION  
PROJECT DEVELOPMENT AND  
ENVIRONMENTAL ANALYSIS BRANCH

Alexander County  
Replace Bridge No. 27  
over South Yadkin River  
T.I.P. Project B-3100

Figure 2A



PHOTO #3: South Face of Bridge No. 27



PHOTO #4: North Face of Bridge No. 27

## Photographs of Existing Bridge Conditions



NORTH CAROLINA DEPARTMENT  
OF TRANSPORTATION

PROJECT DEVELOPMENT AND  
ENVIRONMENTAL ANALYSIS BRANCH

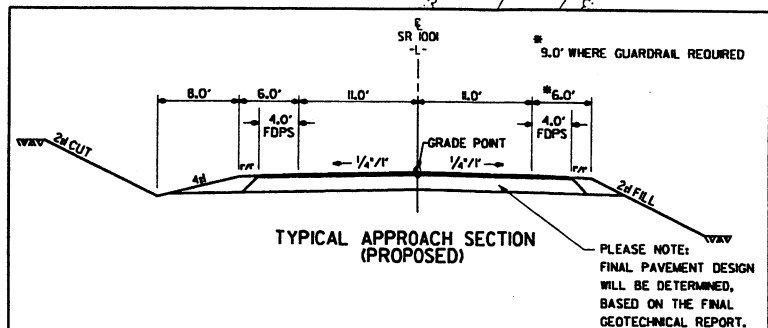
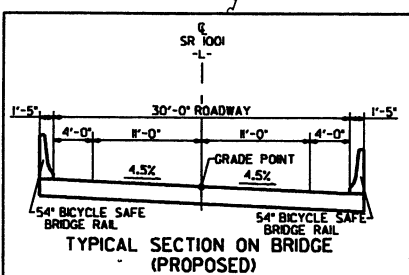
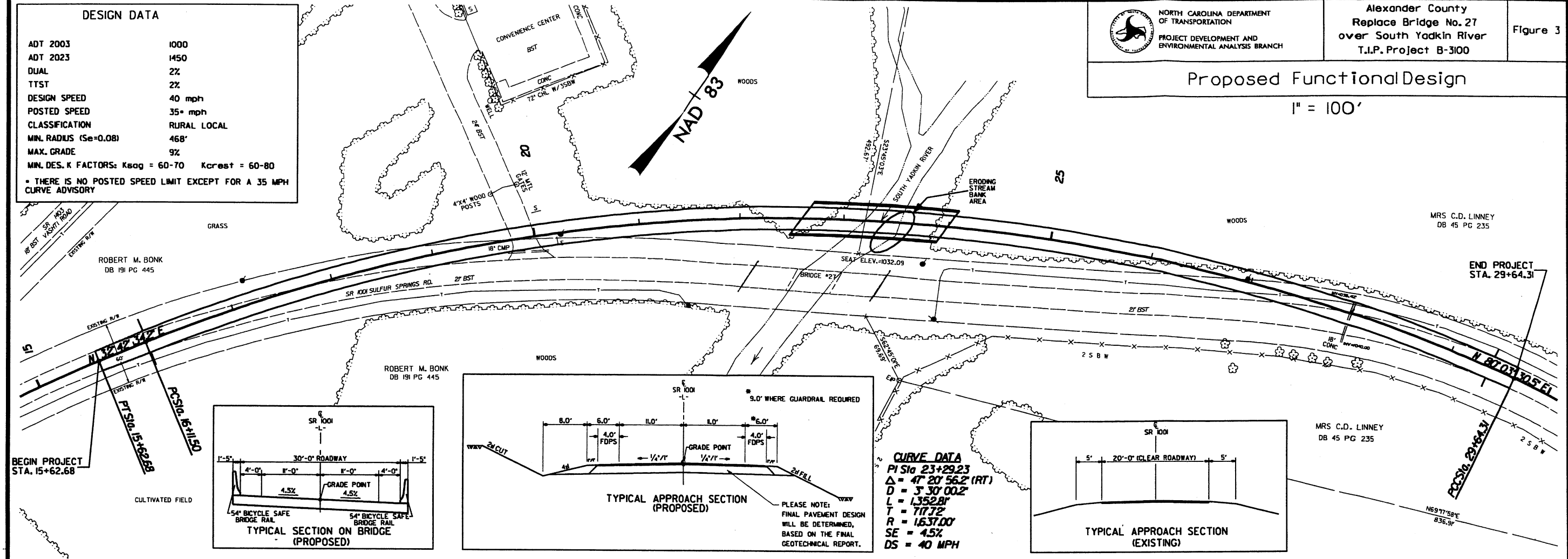
Alexander County  
Replace Bridge No. 27  
over South Yadkin River  
T.I.P. Project B-3100

Figure 2B

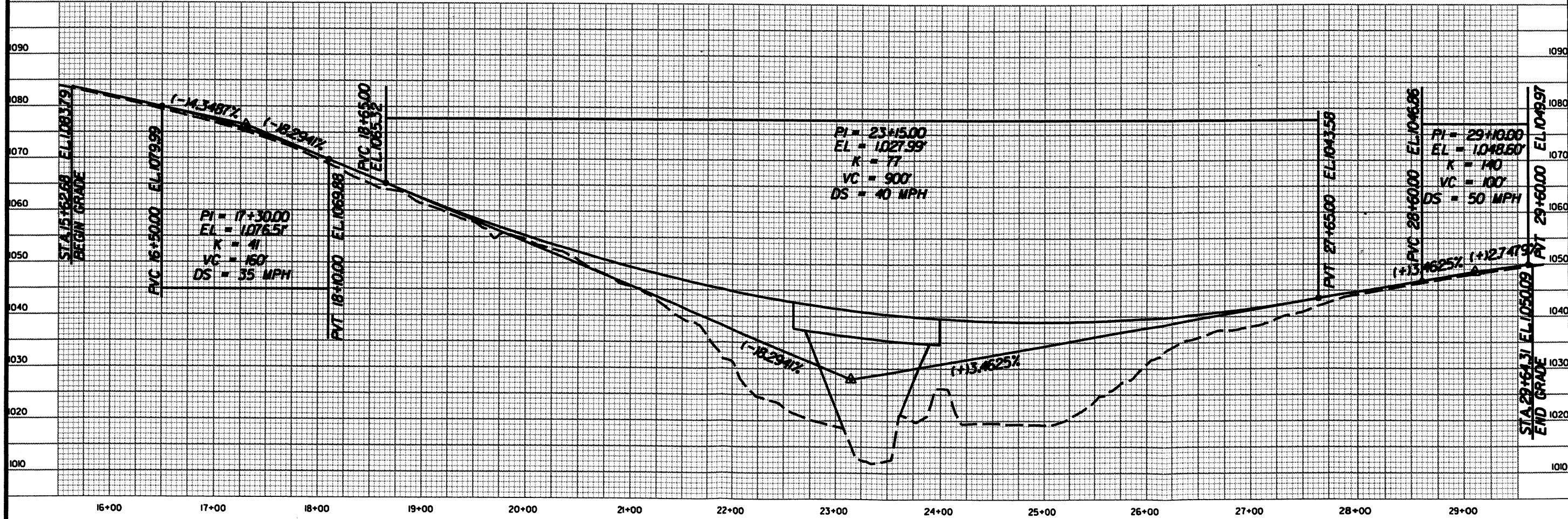
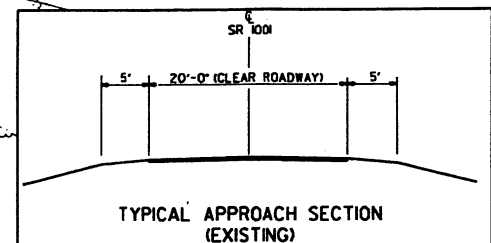
DESIGN DATA

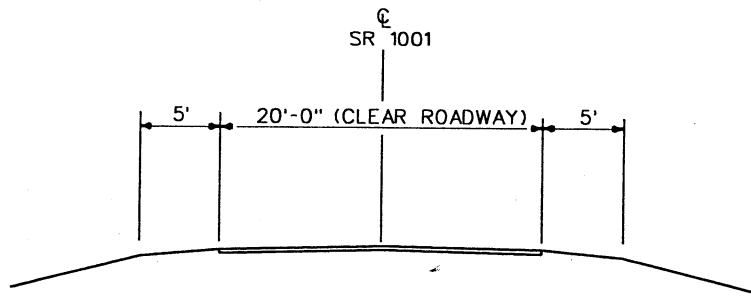
ADT 2003	1000
ADT 2023	1450
DUAL	2%
TTST	2%
DESIGN SPEED	40 mph
POSTED SPEED	35 mph
CLASSIFICATION	RURAL LOCAL
MIN. RADIUS (Se=0.08)	468'
MAX. GRADE	9%
MIN. DES. K FACTORS: K <sub>sup</sub> = 60-70	K <sub>crest</sub> = 60-80

• THERE IS NO POSTED SPEED LIMIT EXCEPT FOR A 35 MPH CURVE ADVISORY

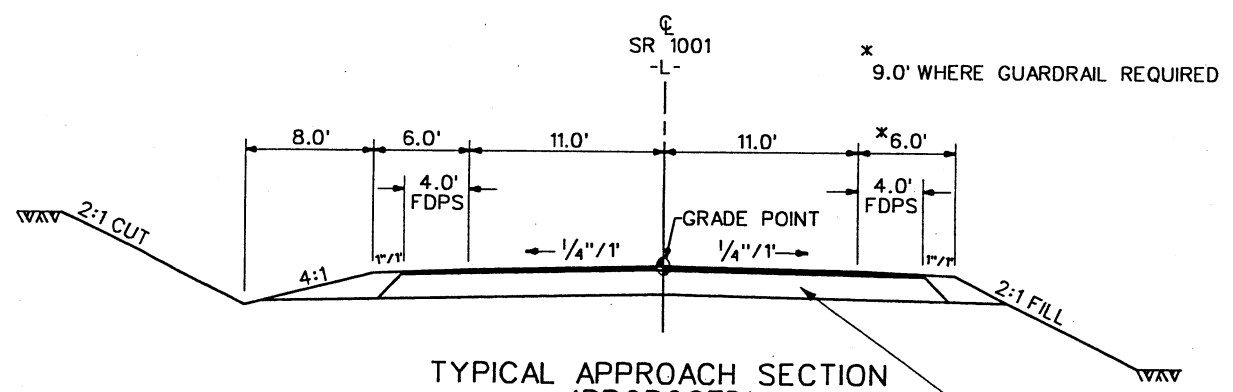


**CURVE DATA**  
 PI Sta 23+29.23  
 Δ = 47° 20' 56.2 (RT)  
 D = 3° 30' 00.2"  
 L = 1352.8'  
 T = 717.72'  
 R = 1637.00'  
 SE = 4.5%  
 DS = 40 MPH



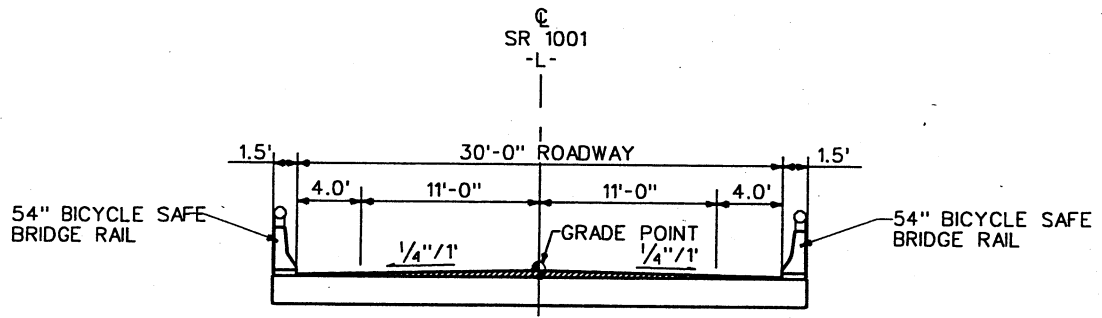


TYPICAL APPROACH SECTION  
(EXISTING)



TYPICAL APPROACH SECTION  
(PROPOSED)

PLEASE NOTE:  
FINAL PAVEMENT DESIGN  
WILL BE DETERMINED,  
BASED ON THE FINAL  
GEOTECHNICAL REPORT.



TYPICAL SECTION ON BRIDGE  
(PROPOSED)

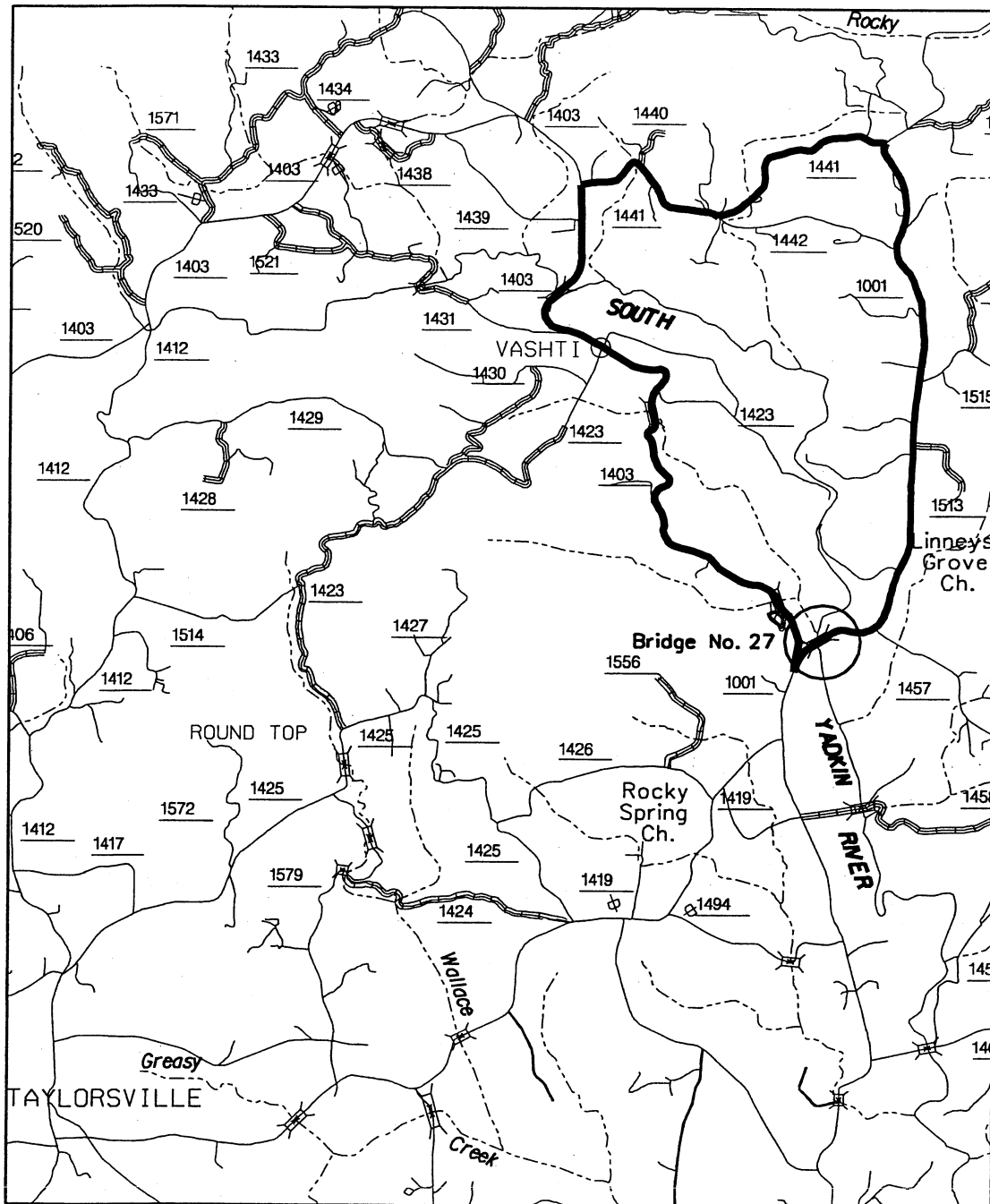
## Proposed Typical Section



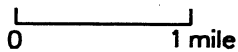
NORTH CAROLINA DEPARTMENT  
OF TRANSPORTATION  
PROJECT DEVELOPMENT AND  
ENVIRONMENTAL ANALYSIS BRANCH

Alexander County  
Replace Bridge No. 27  
over South Yadkin River  
T.I.P. Project B-3100

Figure 4



Off-Site Detour Option

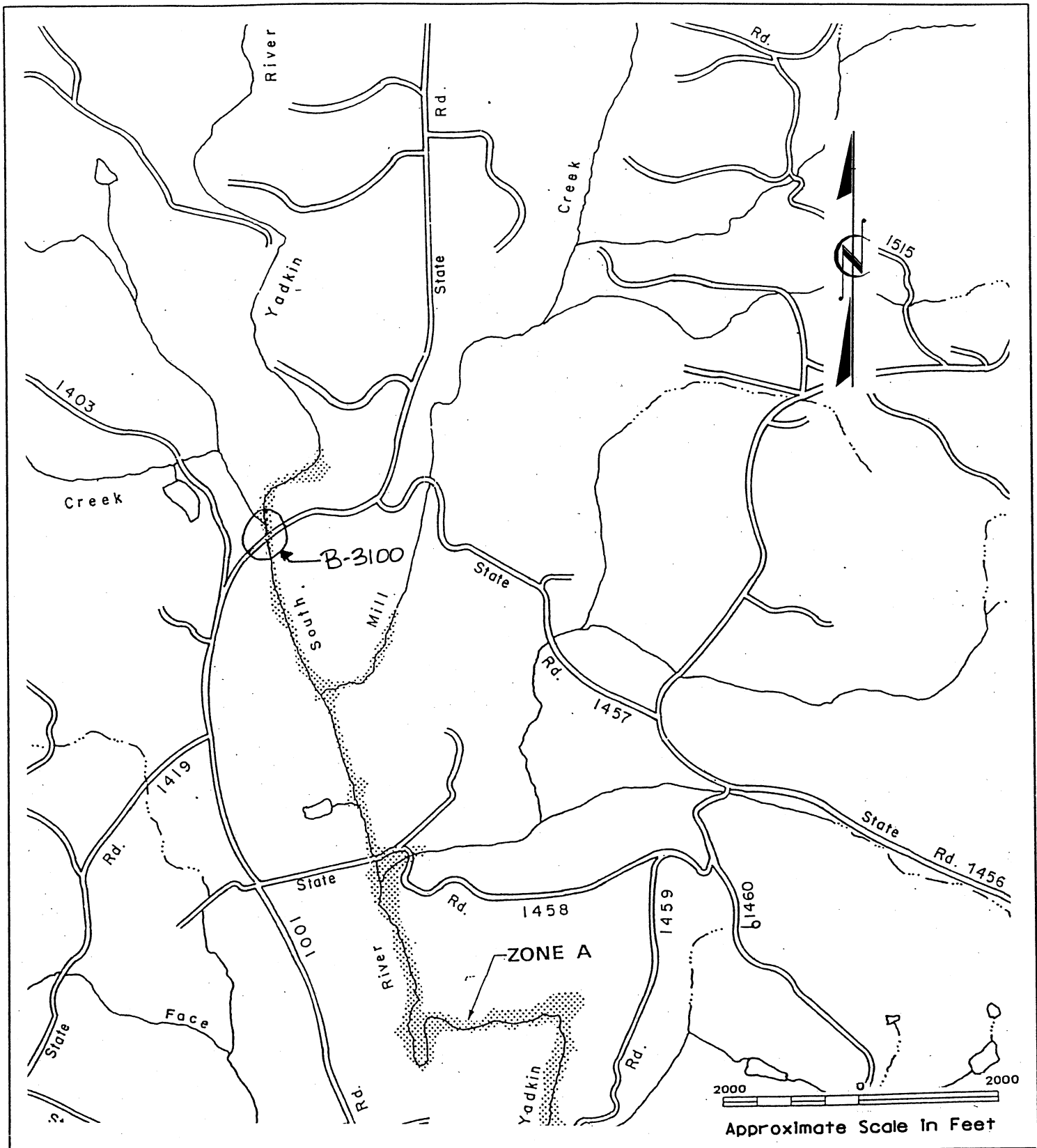


NORTH CAROLINA DEPARTMENT  
OF TRANSPORTATION  
PROJECT DEVELOPMENT AND  
ENVIRONMENTAL ANALYSIS BRANCH

Alexander County  
Replace Bridge No. 27  
over South Yadkin River  
T.I.P. Project B-3100

Figure 5





The map above was obtained from the Federal Emergency Management Agency's Alexander County Flood Hazard Boundary Map, Panel 370398 0002 A, Effective Date June 9, 1978.

## 100-Year Floodplain



NORTH CAROLINA DEPARTMENT  
OF TRANSPORTATION  
  
PROJECT DEVELOPMENT AND  
ENVIRONMENTAL ANALYSIS BRANCH

Alexander County  
Replace Bridge No. 27  
over South Yadkin River  
T.I.P. Project B-3100

Figure 6

**APPENDIX A**

**AGENCY COORDINATION RESPONSE LETTERS,  
Received as of June 25, 2000**

**North Carolina Department of Environment and Natural Resources,  
Division of Water Quality, January 19, 2000**

**A-1 through A-2**

**United States Department of the Interior, Fish and Wildlife Service,  
February 3, 2000**

**A-3 through A-7**

**Federal Energy Regulatory Commission, Atlanta Regional Office,  
February 10, 2000**

**A-8**

**State Historic Preservation Office (SHPO), March 3, 2000**

**A-9**

**SHPO, Federal Highway Administration (FHWA), North Carolina Department of  
Transportation (NCDOT) Concurrence Form for Properties Not Eligible for the  
National Register of Historic Places, February 3, 2000**

**A-10**

Caleb Smith



North Carolina Department of Cultural Resources  
State Historic Preservation Office

David L. S. Brook, Administrator

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

Division of Historical Resources  
David J. Olson, Director

February 26, 2002

MEMORANDUM

TO: William D. Gilmore, Manager  
Project Development and Environmental Analysis Branch  
Division of Highways  
Department of Transportation

FROM: David Brook *for David Brook*

SUBJECT: Bridge #27 on SR 1001 over South Yadkin River, TIP B-3100,  
Alexander County, ER 02-8283

Thank you for your letter November 21, 2001, of transmitting the archaeological survey report by Caleb Smith for the above project.

During the course of the survey, no sites were located within the project area. Mr. Smith has recommended that no further archaeological investigation be conducted in connection with this project. We concur with this recommendation since the project will not involve significant archaeological resources.

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

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

DB:kgc

*Nickens*  
State of North Carolina  
Department of Environment  
and Natural Resources  
Division of Water Quality



James B. Hunt, Jr., Governor  
Bill Holman, Secretary  
Kerr T. Stevens, Director

January 19, 2000

MEMORANDUM

To: William D. Gilmore, P.E., Manager, NCDOT, Project Development & Environmental Analysis  
From: Cynthia F. Van Der Wiele, NC Division of Water Quality *cudw*  
Subject: Scoping comments on the proposed replacement of Bridge No. 27 over South Yadkin River in Alexander County, State Project 8.2780601, TIP B-3100.

This letter is in reference to your correspondence dated January 6, 2000, in which you requested scoping comments for the referenced project. Preliminary analysis of the project reveals that the proposed bridge will span South Yadkin River in the Yadkin-Pee Dee River Basin. The DWQ index number for the stream is 12-108-(1) and the stream is classified as Water Supply II waters. The Division of Water Quality requests that NCDOT consider the following environmental issues for the proposed project:

- A. The document should provide a detailed and itemized presentation of the proposed impacts to wetlands and streams with corresponding mapping.
- B. There should be a discussion on mitigation plans for unavoidable impacts. If mitigation is required, it is preferable to present a conceptual (if not finalized) mitigation plan with the environmental documentation. While the NCDWQ realizes that this may not always be practical, it should be noted that for projects requiring mitigation, appropriate mitigation plans will be required prior to issuance of a 401 Water Quality Certification.
- C. Review of the project reveals that no Outstanding Resource Waters, High Quality Waters, or Trout Waters will be impacted during the project implementation. However, impacts to waters classified as Water Supply II will be impacted. The DWQ requests that DOT strictly adhere to North Carolina regulations entitled "Design Standards in Sensitive Watersheds" (15A NCAC 04B .0024) throughout design and construction of the project. This would apply for any area that drains to streams having WS (Water Supply), ORW (Outstanding Resource Water), HQW (High Quality Water), SA (Shellfish Water) or Tr (Trout Water) classifications.
- D. When practical, the DWQ requests that bridges be replaced on the existing location with road closure. If a detour proves necessary, remediation measures in accordance with the NCDWQ requirements for General 401 Certification 2726/Nationwide Permit No. 33 (Temporary Construction, Access and Dewatering) must be followed.
- E. The DWQ requests that hazardous spill catch basins be installed at any bridge crossing a stream classified as HQW or WS (Water Supply). The number of catch basins installed should be determined by the design of the bridge, so that runoff would enter said basin(s) rather than flowing directly into the stream.
- F. If applicable, DOT should not install the bridge bents in the creek, to the maximum extent practicable.

- G. Wetland and stream impacts should be avoided (including sediment and erosion control structures/measures) to the maximum extent practical. If this is not possible, alternatives that minimize wetland impacts should be chosen. Mitigation for unavoidable impacts will be required by DWQ for impacts to wetlands in excess of one acre and/or to streams in excess of 150 linear feet.
- H. Borrow/waste areas should not be located in wetlands. It is likely that compensatory mitigation will be required if wetlands are impacted by waste or borrow.
- I. DWQ prefers replacement of bridges with bridges. However, if the new structure is to be a culvert, it should be countersunk to allow unimpeded fish and other aquatic organisms passage through the crossing.
- J. If foundation test borings are necessary; it should be noted in the document. Geotechnical work is approved under General 401 Certification Number 3027/Nationwide Permit No. 6 for Survey Activities.
- K. In accordance with the NCDWQ Wetlands Rules { 15A NCAC 2H.0506(b)(6) }, mitigation will be required for impacts of greater than 150 linear feet to any single perennial stream. In the event that mitigation becomes required, the mitigation plan should be designed to replace appropriate lost functions and values. In accordance with the NCDWQ Wetlands Rules { 15A NCAC 2H.0506 (h)(3) }, the Wetland Restoration Program may be available for use as stream mitigation.
- L. Sediment and erosion control measures should not be placed in wetlands.
- M. The 401 Water Quality Certification application will need to specifically address the proposed methods for stormwater management. More specifically, stormwater should not be permitted to discharge directly into the creek. Instead, stormwater should be designed to drain to a properly designed stormwater detention facility/apparatus.
- N. While the use of National Wetland Inventory (NWI) maps and soil surveys is a useful office tool, their inherent inaccuracies require that qualified personnel perform onsite wetland delineations prior to permit approval.

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 Cynthia Van Der Wiele at (919) 733.5715.

cc: Steve Lund, Corps of Engineers  
Mark Cantrell, USFWS  
David Cox, NCWRC  
Personal Files  
Central Files

C:\ncdot\TIP \_\_\_\_\_\comments\\_\_\_\_\_ scoping comments.doc

Nickens



# United States Department of the Interior

## FISH AND WILDLIFE SERVICE

Asheville Field Office  
160 Zillicoa Street  
Asheville, North Carolina 28801

February 3, 2000

Mr. William D. Gilmore, P.E., Manager  
Project Development and Environmental Analysis Branch  
North Carolina Department of Transportation  
P.O. Box 25201  
Raleigh, North Carolina 27611-5201

Dear Mr. Gilmore:

Subject: Replacement of Bridge No. 27 on SR 1001 over the South Yadkin River, Alexander County, North Carolina (T.I.P. Project No. B-3100)

As requested, we have reviewed the subject project and are providing the following comments in accordance with the provisions of Section 7 of the Endangered Species Act of 1973, as amended (16 U.S.C. 1531-1543) (Act), and the Fish and Wildlife Coordination Act, as amended (16 U.S.C. 661-667e).

Our records indicate that, with the exception of the bog turtle (*Clemmys muhlenbergii*), there are no endangered or threatened species recorded from Alexander County. The southern population of the bog turtle, extending from portions of southern Virginia to northern Georgia, is federally listed as threatened due to similarity of appearance. This designation prohibits collecting turtles from this population and bans interstate and international commercial trade. However, this population of the species is not currently considered to be biologically endangered or threatened and therefore is not subject to the provisions of Section 7 of the Act. We do, however, consider the bog turtle in the southern portion of its range as a species of Federal concern due to habitat loss and would appreciate your assistance in protecting this species and its habitat if surveys indicate that it does occur within the area potentially affected by the proposed project.

Although we do not currently have any endangered or threatened species recorded from Alexander County, we have enclosed a list of species of Federal concern that may occur within the impact area of the project. Species of Federal 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 surveys

indicate that any of these species do occur within the area potentially affected by the proposed project.

In addition to the species included on the enclosed list, the brook floater (*Alasmidonta varicosa*), another species of Federal concern, may also occur within the project area. It is our understanding that very little aquatic survey work has been conducted in this portion of the upper Yadkin River system. Recent surveys by personnel with the North Carolina Wildlife Resources Commission have documented a population of the brook floater in the Mitchell River portion of the upper Yadkin River system in Surry County, North Carolina. The absence of records of this species in other parts of this river system may be the result of a lack of survey work. Accordingly, we recommend that surveys be conducted to determine if this or any other rare species occurs within the area potentially affected by the proposed project.

Any environmental document prepared for this project should provide a complete description of the aquatic and terrestrial resources in the project area and a complete description, analysis, and comparison of the available alternatives and their potential effects on these resources. Preference should be given to alignments, stream-crossing structures, and construction techniques that avoid or minimize encroachment and impacts to aquatic and terrestrial resources. We recommend that the existing structure be replaced with a bridge, not a culvert. The new bridge design should include provisions for the roadbed and deck drainage to flow through a vegetated buffer prior to reaching the affected stream. This buffer should be large enough to alleviate any potential effects from the run-off of storm water and pollutants. The bridge design should not alter the natural stream and stream-bank morphology or impede fish passage. Any piers or bents should be placed outside the bank-full width of the streams. The bridges and approaches should be designed to avoid any fill that will result in the damming or constriction of the channel or flood plain. If spanning the flood plain is not feasible, culverts should be installed in the flood plain portion of the approaches in order to restore some of the hydrological functions of the flood plain and reduce high velocities of flood waters within the affected areas. Adequate erosion- and sedimentation-control measures should be in place prior to any ground-disturbing activities. Wet concrete should never be allowed to come into contact with the stream. Heavy equipment should not be operated in the stream channel, and any cutting and removal of woody vegetation along the stream banks should be avoided to the maximum extent possible.

We appreciate having the opportunity to provide these comments. If you have any questions or concerns, please contact Mr. John Fridell of our staff at 828/258-3939, Ext. 225. In any future correspondence concerning this project, please reference our Log Number 4-2-00-058.

Sincerely,



Brian P. Cole  
State Supervisor



Enclosure

cc:

Mr. Ron Linville, Western Piedmont Region Coordinator, North Carolina Wildlife Resources  
Commission, 3855 Idlewild Road, Kernersville, NC 27284-9180

Mr. Bob Johnson, U.S. Army Corps of Engineers, Asheville Regulatory Field Office, 151 Patton  
Avenue, Room 143, Asheville, NC 28801-5006



## ENDANGERED, THREATENED, AND CANDIDATE SPECIES AND FEDERAL SPECIES OF CONCERN, ALEXANDER COUNTY, NORTH CAROLINA

This list was adapted from the North Carolina Natural Heritage Program's County Species List. It is a listing, for Alexander County, 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 herbariums, 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.

**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>ALEXANDER COUNTY</b>		
<b>Vertebrates</b>		
Bog turtle	<i>Clemmys muhlenbergii</i>	T(S/A) <sup>1</sup>
Rafinesque's big-eared bat	<i>Corynorhinus (=Plecotus) rafinesquii</i>	FSC*
<b>Nonvascular Plants</b>		
Keever's bristle-moss	<i>Orthotrichum keeverae</i>	FSC

**KEY:**

Status	Definition
Threatened	A taxon "likely to become endangered within the foreseeable future throughout all or a significant portion of its range."
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.

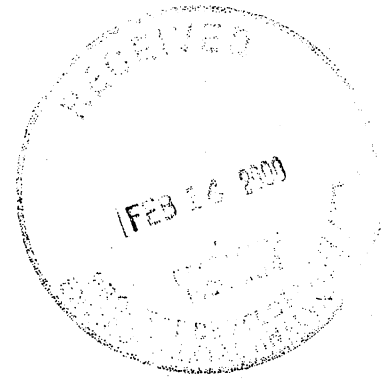
<sup>1</sup>In the November 4, 1997, *Federal Register* (55822-55825), the northern population of the bog turtle (from New York south to Maryland) was listed as T (threatened), and the southern population (from Virginia south to

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.

Vickers

**FEDERAL ENERGY REGULATORY COMMISSION  
ATLANTA REGIONAL OFFICE  
Parkridge 85 North Building  
3125 Presidential Parkway - Suite 300  
Atlanta, Georgia 30340  
(770) 452-3800**

FEB 10 2000



Mr. William D. Gilmore, P.E.  
Manager, Project Development  
and Environmental Analysis Branch  
State of North Carolina  
Department of Transportation  
P.O. Box 25201  
Raleigh, North Carolina 27611-5201

Dear Mr. Gilmore:

B-3100

This acknowledges your letter dated January 6, 2000, soliciting comments on the proposed improvements to Bridge No. 27 on SR 1001 in Alexander County, North Carolina. It appears that the improvement will not impact hydroelectric developments under the jurisdiction of the Federal Energy Regulatory Commission. Therefore, we have no comment.

Sincerely,

A handwritten signature in cursive script that reads "Jerrold W. Gotzmer".

Jerrold W. Gotzmer, P.E.  
Director

Dickens



# North Carolina Department of Cultural Resources

State Historic Preservation Office

David L. S. Brook, Administrator

James B. Hunt Jr., Governor  
Betty Ray McCain, Secretary

Division of Archives and History  
Jeffrey J. Crow, Director

March 3, 2000

## MEMORANDUM

**TO:** William D. Gilmore, P.E., Manager  
Project Development and Environmental Analysis Branch  
Division of Highways  
Department of Transportation

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

**SUBJECT:** Bridge No. 27 on SR 1001 over South Yadkin River, B-3100, Alexander County,  
ER 00-8692

Thank you for your letter of January 6, 2000, concerning the above project.

We have conducted a search of our files and are aware of no structures of historical or architectural importance located within the planning area.

There are no known recorded archaeological sites within the project boundaries. However, the project area has never been systematically surveyed to determine the location or significance of archaeological resources.

We recommend that an archaeological survey be conducted only if new construction is planned on a new alignment.

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.

cc: T. Padgett

	Location	Mailing Address	Telephone/Fax
ADMINISTRATION	507 N. Blount St., Raleigh NC	4617 Mail Service Center, Raleigh NC 27699-4617	(919) 733-4763 • 733-8653
ARCHAEOLOGY	421 N. Blount St., Raleigh NC	4619 Mail Service Center, Raleigh NC 27699-4619	(919) 733-7342 • 715-2671
RESTORATION	515 N. Blount St., Raleigh NC	4613 Mail Service Center, Raleigh NC 27699-4613	(919) 733-6547 • 715-4801
STUDY & PLANNING	515 N. Blount St., Raleigh NC	4618 Mail Service Center, Raleigh NC 27699-4618	(919) 733-6545 • 715-4801

FIP # B-3100

Federal Aid # BRZ-1001(16)

County Alexander

02/03/2000

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

Brief Project Description

Replace Bridge # 27 on SR 1001 over South Yadkin River

On Feb. 3, 2000, representatives of the

- North Carolina Department of Transportation (NCDOT)
- Federal Highway Administration (FHWA)
- North Carolina State Historic Preservation Office (SHPO)
- Other \_\_\_\_\_

reviewed the subject project at

- A scoping meeting
- Historic architectural resources photograph review session/consultation
- Other \_\_\_\_\_

All parties present agreed

- there are no properties over fifty years old within the project's area of potential effect.
- there are no properties less than fifty years old which are considered to meet Criterion Consideration G within the project's area of potential effect.
- there are properties over fifty years old (list attached) within the project's area of potential effect, but based on the historical information available and the photographs of each property, properties identified as \_\_\_\_\_ are considered not eligible for the National Register and no further evaluation of them is necessary.
- there are no National Register-listed properties within the project's area of potential effect.

Signed:

Mary Pope  
Representative, NCDOT

2-3-2000  
Date

Michael R. Durr  
FHWA, for the Division Administrator, or other Federal Agency

2/3/2000  
Date

Carol Alperin  
Representative, SHPO

2/3/2000  
Date

Bill Hark  
State Historic Preservation Officer

2/17/2000  
Date

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

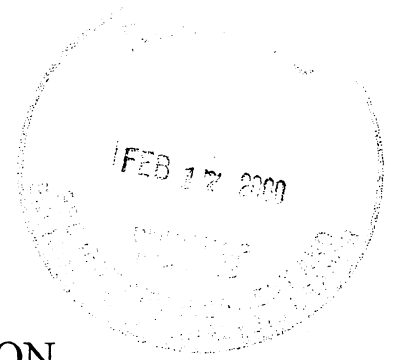
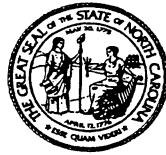
**APPENDIX B**

**COORDINATION WITH THE DIVISION OF BICYCLE AND  
PEDESTRIAN TRANSPORTATION COORDINATION**

Division of Bicycle and Pedestrian Transportation, February 14, 2000

B-1 through B-3

Dickens



STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION

JAMES B. HUNT JR.  
GOVERNOR

P.O. BOX 25201, RALEIGH, N.C. 27611-5201

DAVID MCCOY  
SECRETARY

February 14, 2000

MEMORANDUM TO: William D. Gilmore, PE, Manager  
Project Development and Environmental Analysis Branch  
FROM: *Curtis B. Yates*  
Curtis B. Yates, Director  
SUBJECT: Replacement of Bridge No. 27 on SR 1001  
Over South Yadkin River,  
Alexander County, TIP Project No. B-3100

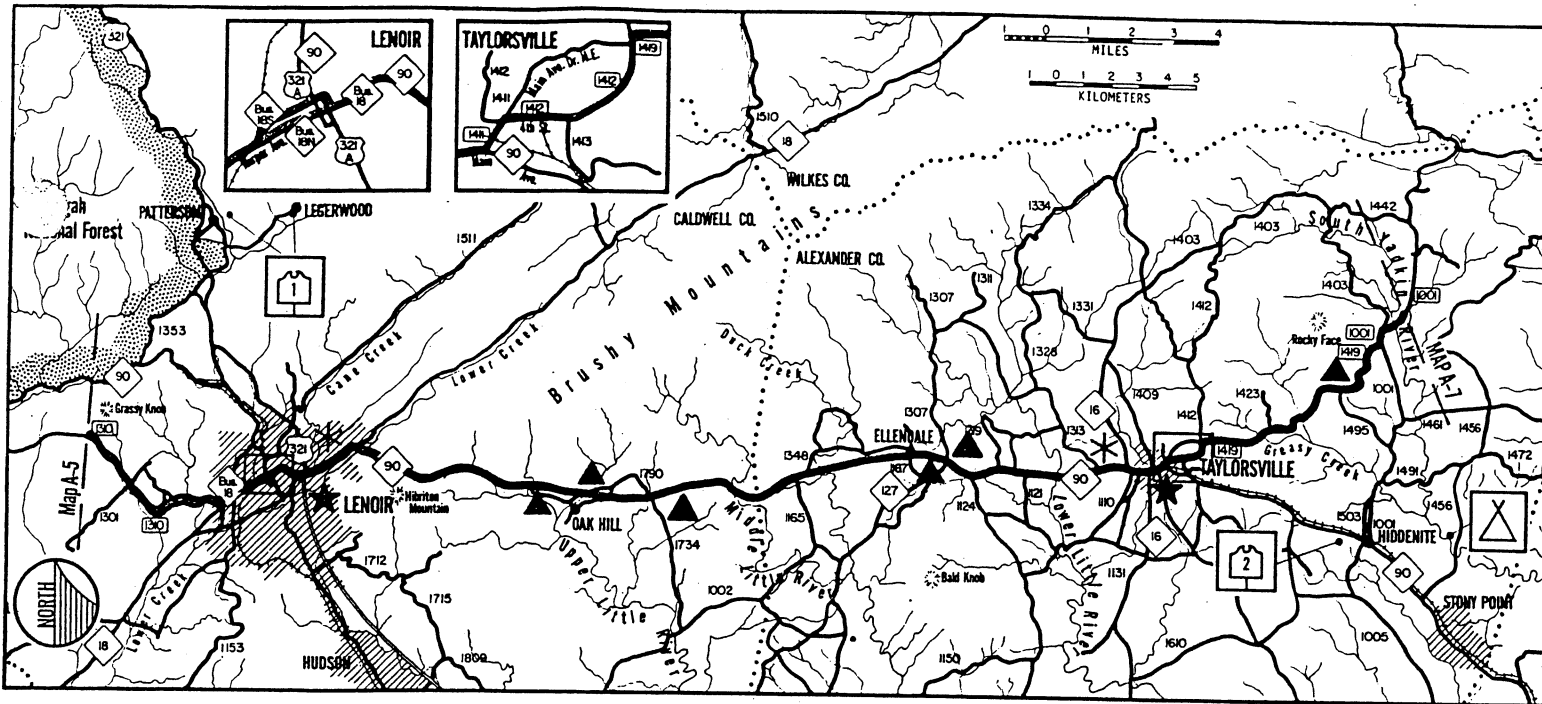
This memo is to respond to your request for comments on the subject bridge replacement project.

This section of SR 1001 in Alexander County is part of a State-designated bicycle route called NC-2 Mountains-to-Sea Bicycling Highway (see attached maps). The replacement bridge should provide AASHTO standard bicycle safety accommodations including the following: a minimum width of at least 4-feet for paved shoulders on the roadway approaches to the new bridge; 4-foot wide lateral offsets on both sides of the new bridge deck; and bridge railing that is 54-inches in height.

We appreciate the opportunity to comment on the subject project. If there is a need for additional information, please contact Tom Norman, Facilities Program Manager, at 715-2342.

CBY/tpn

Attachment



# Carolina Emerald

## A-6

### Services

Numerous country stores offer needed services along the route. Lenoir and Taylorsville provide full services. Camping is available at a private campground near the route.

### Points of Interest

#### 1 Happy Valley

This fertile valley was once the home of the Saura Indians. Settled in the mid-1700's by the white man, the area contains several homes of interest, from different periods in its history. One of these, Fort Defiance, named for a frontier fort which previously stood on the site, is being restored as a museum of period history. It was built between 1788 and 1792 and belonged to General William Lenoir, a prominent leader in the Revolutionary War. Another home, Clover Hill, which was built in 1846, is an exceptional example of the Greek Revival Architecture of that period. Both of these homes are on the National Register of Historic Places.

#### 2 Hiddenite and the Emerald Valley Mines

North Carolina, "nature's sample case", contains a little of nearly all the precious stones and minerals, but not very much of any one. The state is, however, the only known source of hiddenite, an emerald green variety of spodumene.

Hiddenite and emerald were first found in the soil of this area in 1879, by a farmer plowing a field. W.E. Hidden, a mineralogist of note, who happened to be in the area, became interested as he had never seen a crystal of this kind. With the help of a few men, he did some prospecting and found more of this mineral in the ground. He bought the farm and two other tracts of land ad-

joining it and established the Emerald and Hiddenite Mining Company in 1881. Systematic mining was undertaken and proved profitable for many years. Other gems have also been found in the area, including beryl, emerald, quartz, pyrite, and tourmaline.

Today several mines in the area are open to the public for prospecting. Many precious gems have been taken from these mines and are on display in museums throughout the world. The largest single uncut emerald crystal in North America, a 1,438 carat gem, was found in this area in 1969. In 1970, the "Carolina Emerald," now owned by Tiffany and Company was found here. When cut to 13.14 carats, this stone, valued at \$100,000 became the largest and finest cut emerald on this continent.

### General Description

Rolling hills and farmland characterize the terrain of this segment.

Approximately 36 miles/58 kilometers.

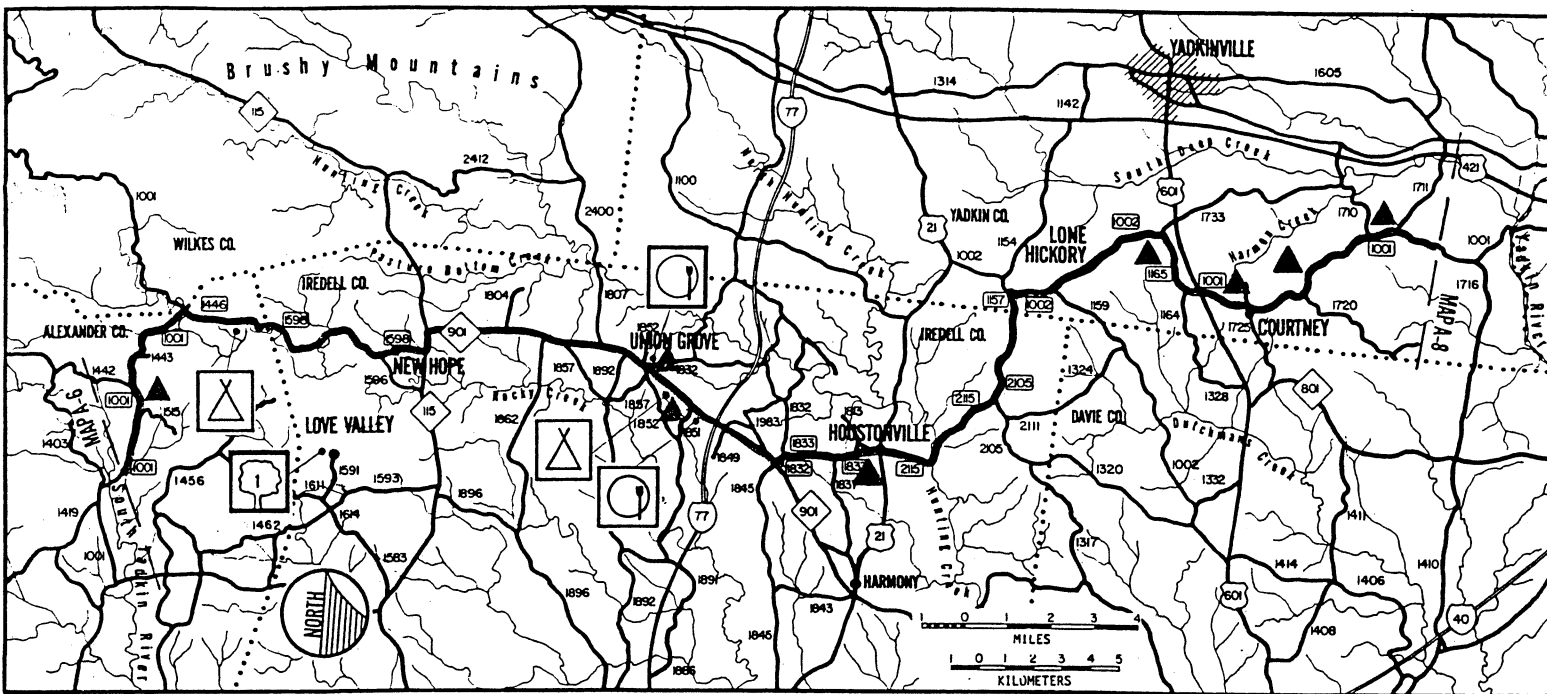
### Roadway Condition

N.C. 90 between Lenoir and Taylorsville has a high quality pavement, the remainder of the roads in the segment are of a rougher pavement type but all are in good condition and well-maintained.

### Hazardous Areas

Traffic in Lenoir is somewhat congested. N.C. 90 between Lenoir and Taylorsville has a moderate amount of truck traffic and a higher volume of automobile traffic than is desirable. 22 miles.





# Bushy Mountains

**A-7**

**Points of Interest**

- 1 Love Valley  
This is a re-creation of an old western town complete with wooden sidewalks and local "cowboys."

**General Description**

Gently rolling hills change gradually to steeper climbs as you begin to skirt the Brushy Mountains in the western part of this segment. After a few miles of such terrain, the hills diminish and you find yourself riding along a level ridge. A few gentle hills complete the segment.

Approximately 42 miles/68 kilometers.

**Roadway Condition**

Most of the roads in this segment have a roughly-paved surface but are in very good condition and are well-maintained.

**Hazardous Areas**

This is a very rural area in which you encounter little traffic and virtually no hazards.

**Services**

Numerous country stores furnish needed services. There are no full service towns in this segment. Camping is available at two private campgrounds in the Union Grove area.

**APPENDIX C**

**USDA-NRCS FARMLAND CONVERSION IMPACT RATING**

# FARMLAND CONVERSION IMPACT RATING

<b>PART I</b> (To be completed by Federal Agency)	Date of Land Evaluation Request April 21, 2000
Name of Project Alexander County, SR 1001, Replace Bridge No. 27 over South Yadkin River. State Project No. 8.2780601, Federal Aid Project No. BRZ-1001(16), TIP No. B-3100	Federal Agency Involved FHWA
Proposed Land Use Road Right-of-way	County and State Alexander County, North Carolina

<b>PART II</b> (To be completed by NRCS)	Date Request Received by NRCS 5-1-2000
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 <input checked="" type="checkbox"/> No <input type="checkbox"/>
Acres Irrigated 0	Average Farm Size 60
Major Crop(s) Corn, wetland wildlife	Farmable Land in Govt. Jurisdiction Acres: 0 %
Name of Land Evaluation System Used LESA	Name of Local Site Assessment System local version LESA
	Date Land Evaluation Returned by NRCS 5-24-2000

PART III (To be completed by Federal Agency)	Alternative Site Rating			
	Site A	Site B	Site C	Site D
A. Total Acres To Be Converted Directly	1.41ac			
B. Total Acres To Be Converted Indirectly				
C. Total Acres in Site	1.80ac			

PART IV (To be completed by NRCS) Land Evaluation Information	Site A	Site B	Site C	Site D
A. Total Acres Prime and Unique Farmland	0			
B. Total Acres Statewide and Local Important Farmland	1			
C. Percentage of Farmland in County or Local Govt. Unit to be Converted	.001			
D. Percentage of Farmland in Govt. Jurisdiction with Same or Higher Relative Value	10			

PART V (To be completed by NRCS) Land Evaluation Criterion	Site A	Site B	Site C	Site D
Relative Value of Farmland to be Converted (Scale of 0 to 100 Points)	50			

PART VI (To be completed by Federal Agency)	Maximum Points	Site A	Site B	Site C	Site D
Site Assessment Criteria (These criteria are explained in 7 CFR 658.5(b))					
1. Area in Nonurban Use	15	15			
2. Perimeter in Nonurban Use	10	10			
3. Percent of Site Being Farmed	20	0			
4. Protection Provided by State and Local Government	20	0			
5. Distance from Urban Built-up Area	0	0			
6. Distance to Urban Support Services	0	0			
7. Size of Present Farm Unit Compared to Average	10	0			
8. Creation of Non-Farmable Farmland	25	0			
9. Availability of Farm Support Services	5	5			
10. On-Farm Investments	20	0			
11. Effects of Conversion on Farm Support Services	25	0			
12. Compatibility with Existing Agricultural Use	10	0			
TOTAL SITE ASSESSMENT POINTS	160	30			
<b>PART VII (To be completed by Federal Agency)</b>					
Relative Value of Farmland (From Part V)	100	50			
Total Site Assessment (From Part VI above or a local site assessment)	160	30			
TOTAL POINTS (Total of above 2 lines)	260	80			

Site Selected:	Date of Selection	Was A Local Site Assessment Used? Yes <input type="checkbox"/> No <input type="checkbox"/>
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Reason For Selection:



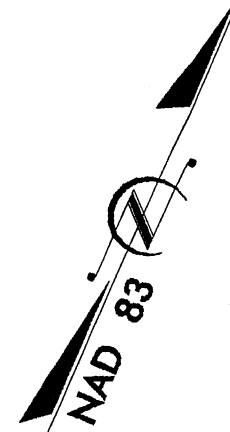
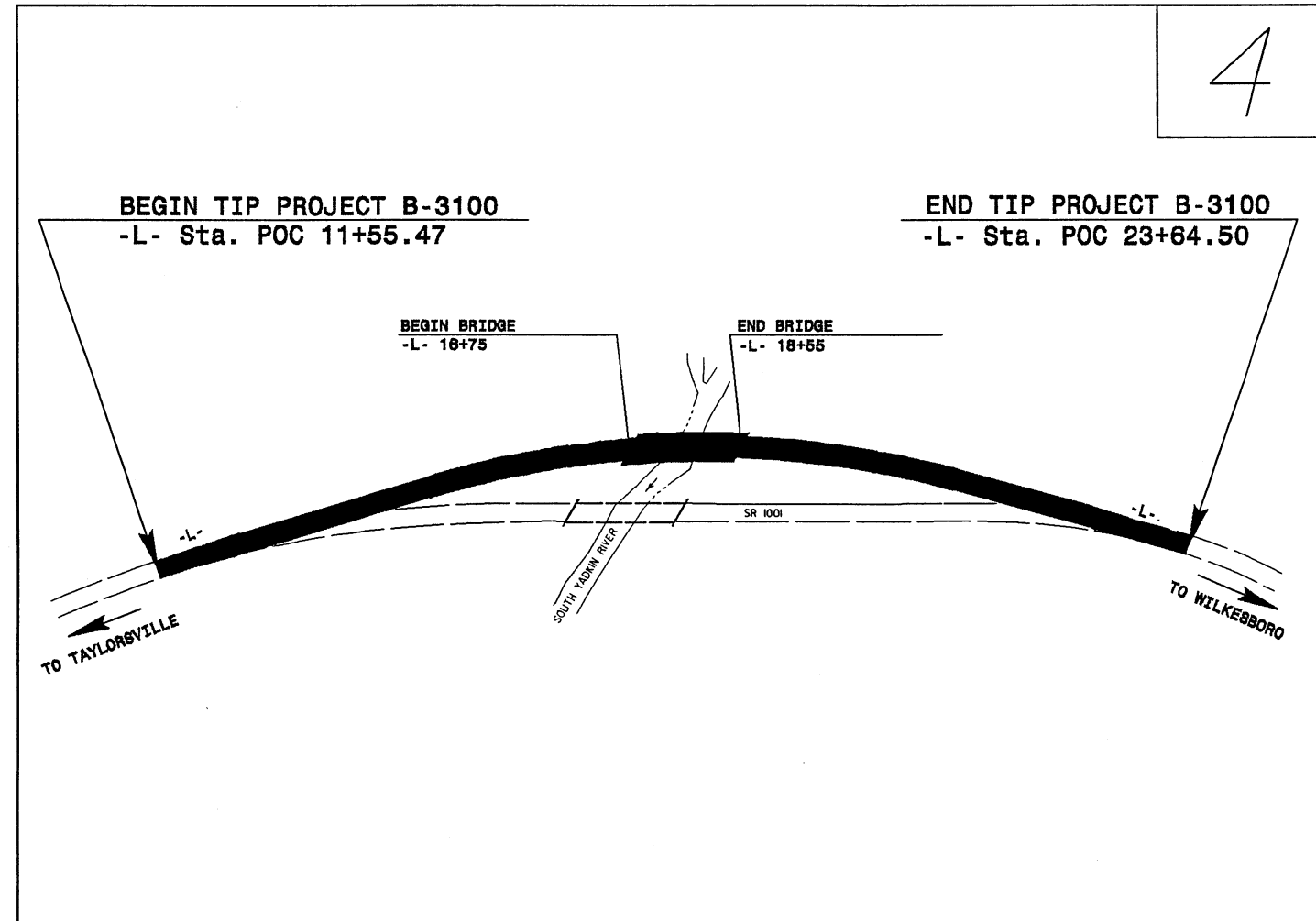
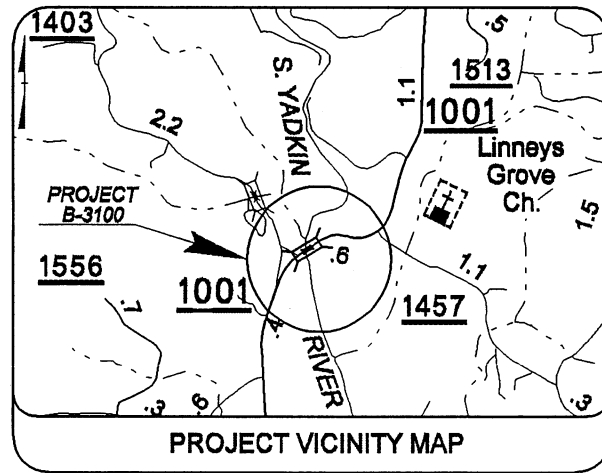
STATE OF NORTH CAROLINA  
DIVISION OF HIGHWAYS

**ALEXANDER COUNTY**

LOCATION: BRIDGE NO. 27 ON SR 1001 OVER SOUTH YADKIN RIVER

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

STATE	STATE PROJECT REFERENCE NO.	NO.	SHEETS
N.C.	B-3100	1	
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
32865.1.1	BRZ-1001(16)	P.E., P.E. for Utilities	
32865.2.2	BRZ-1001(16)	RAW & UTIL	

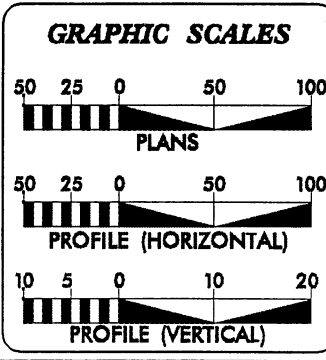


-THIS PROJECT IS NOT WITHIN ANY MUNICIPAL BOUNDARIES  
-CLEARING ON THIS PROJECT SHALL BE TO THE LIMITS ESTABLISHED BY METHOD III

PRELIMINARY PLANS  
DO NOT USE FOR CONSTRUCTION

\$\$\$\$\$SYTIME\$\$\$\$\$  
\$\$\$\$\$DCN\$\$\$\$\$  
\$\$\$\$\$USRNAME\$\$\$\$\$

CONTRACT: C????? TIP PROJECT: B-3100



**DESIGN DATA**

ADT 2004 =	1033
ADT 2024 =	1478
DHY =	10 %
D =	60 %
T =	4 % *
**V =	40 MPH
* TTST 2% DUAL 2%	
**REQUIRES DESIGN EXCEPTION	

**PROJECT LENGTH**

LENGTH ROADWAY TIP PROJECT B-3100	=	0.95 MILES
LENGTH STRUCTURE TIP PROJECT B-3100	=	0.034 MILES
TOTAL LENGTH TIP PROJECT B-3100	=	0.229 MILES

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

<b>2002 STANDARD SPECIFICATIONS</b>	
<b>RIGHT OF WAY DATE:</b> February 27, 2003	<b>GARY LOVERING, P.E.</b> PROJECT ENGINEER
<b>LETTING DATE:</b> April 20, 2004	<b>R. A. SHILLINGLAW, PE</b> PROJECT DESIGN ENGINEER

**HYDRAULICS ENGINEER**

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

**ROADWAY DESIGN ENGINEER**

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

**DIVISION OF HIGHWAYS  
STATE OF NORTH CAROLINA**

STATE DESIGN ENGINEER \_\_\_\_\_ P.E.

**DEPARTMENT OF TRANSPORTATION  
FEDERAL HIGHWAY ADMINISTRATION**

APPROVED \_\_\_\_\_ P.E.

DIVISION ADMINISTRATOR \_\_\_\_\_ DATE \_\_\_\_\_



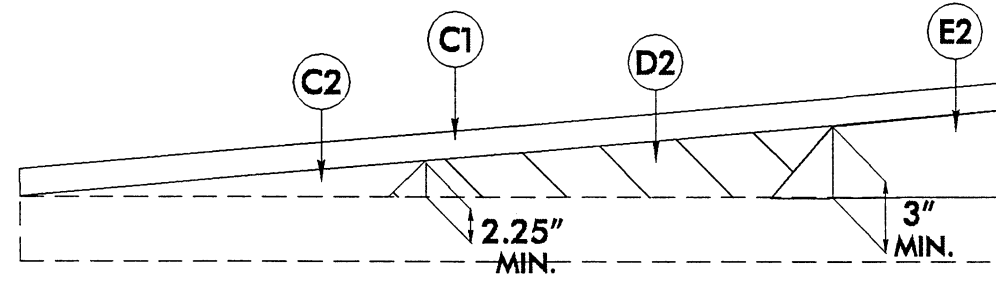
6/2/99

**PAVEMENT SCHEDULE  
FINAL DESIGN**

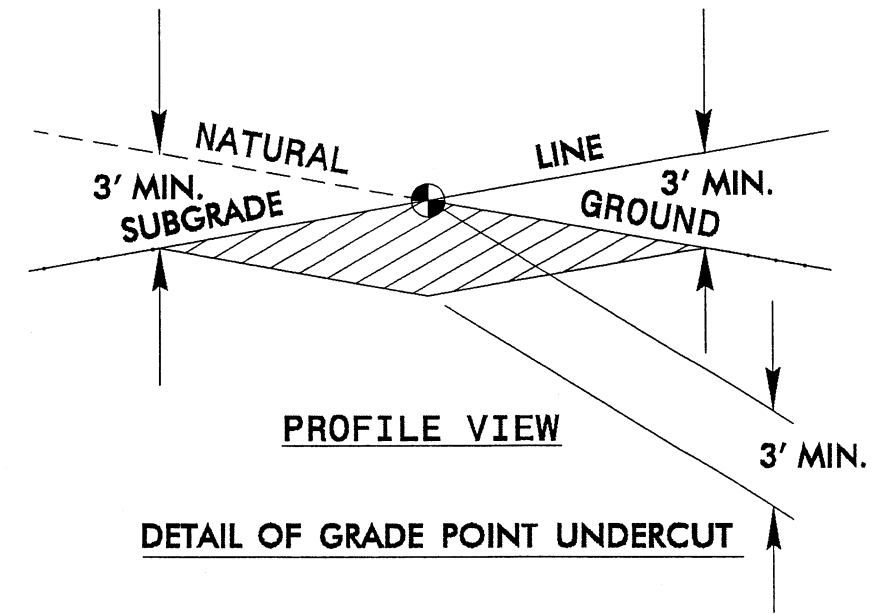
C1	PROP. APPROX. 2.5" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5A, AT AN AVERAGE RATE OF 140 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.
C2	PROP. VAR. DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5A, AT AN AVERAGE RATE OF 112 LBS. PER SQ. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NOT TO EXCEED 1.25" IN DEPTH.
D1	PROP. APPROX. 2.5" 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 2.25" IN DEPTH OR GREATER THAN 4" IN DEPTH.
E1	PROP. APPROX. 3" ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 342 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 5.5" IN DEPTH.
J	PROP. APPROX. 6" AGGREGATE BASE COURSE.
T	EARTH MATERIAL.
W	WEDGING. (SEE WEDGING DETAIL)

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

PROJECT REFERENCE NO. B-3100	SHEET NO. 2
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER
<b>PRELIMINARY PLANS</b> DO NOT USE FOR CONSTRUCTION	

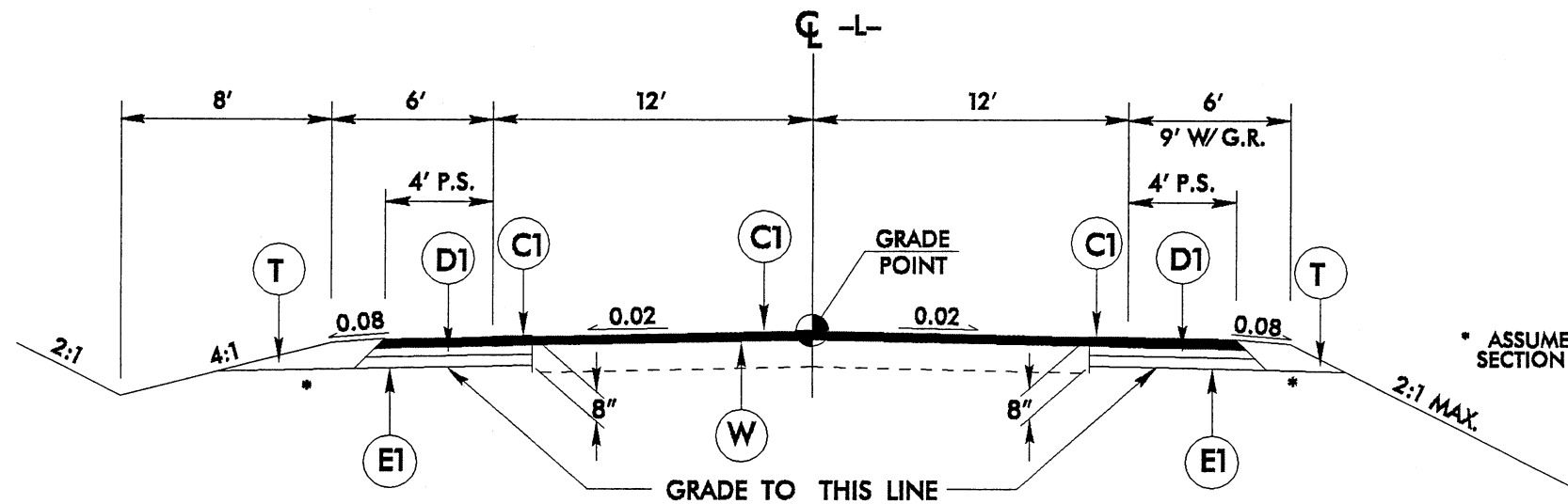


**Wedging Detail For Resurfacing**



**PROFILE VIEW**

**DETAIL OF GRADE POINT UNDERCUT**



\* ASSUMED GRADED SUBGRADE INSTEAD OF TRENCH SECTION TO MATCH REMAINDER OF PROJECT

**TYPICAL SECTION NO. 1**

USE TYPICAL SECTION NO. 1

- L- STA 12+00.64 TO 14+28.71
- L- STA 21+46.76 TO 22+95.95

TRANSITION FROM TYPICAL SECTION NO. 1 TO EXISTING SECTION (INCLUDES RESURF. AND WIDENING)

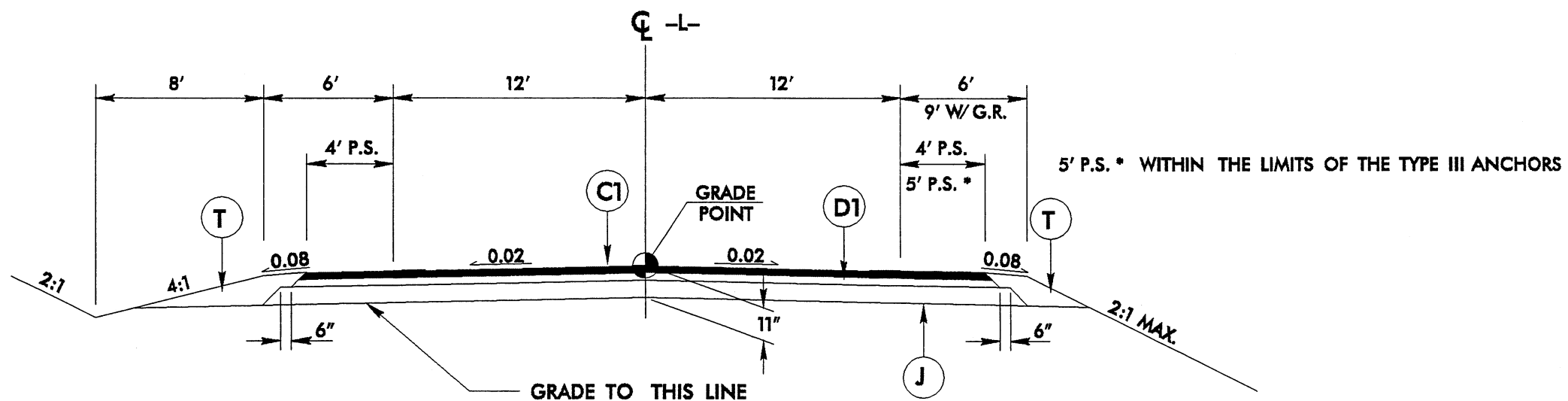
- L- STA. 11+55.47 TO 12+00.64
- L- STA. 22+95.95 TO 23+64.50

SYSTEMS DESIGN  
 CONSULTANTS  
 INCORPORATED

6/22/99

PAVEMENT SCHEDULE (FINAL)	
C1	2.5" S9.5A
C2	VAR. DEPTH S9.5A
D1	2.5" I19.0B
D2	VAR. DEPTH I19.0B
E1	3" B25.0B
E2	VAR. DEPTH B25.0B
J	6" ABC
T	EARTH MATERIAL
W	WEDGING

PROJECT REFERENCE NO.	SHEET NO.
B-3100	2A
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER
<b>PRELIMINARY PLANS</b> <small>DO NOT USE FOR CONSTRUCTION</small>	



### TYPICAL SECTION NO. 2

USE TYPICAL SECTION NO. 2

-L- STA 14+28.71 TO 16+75.00 (BEGIN BRIDGE)

-L- STA 18+55.00 (END BRIDGE) TO 21+46.76

ALL DIMENSIONS ARE IN FEET AND INCHES UNLESS OTHERWISE SPECIFIED.

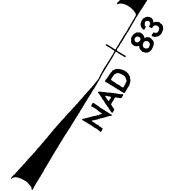
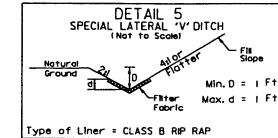
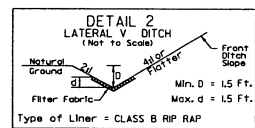
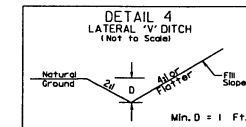
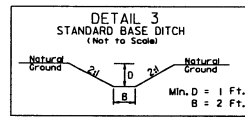
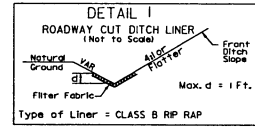




7/27/99  
 R/W REV.12-05-03: CHANGED PROPERTY OWNER NAME FOR PARCEL NO.2  
 CHANGED PROPERTY OWNER NAME, DB, & PG NOS. FOR PARCEL NO.2A  
 -- ADDED PARCEL NO 2AZ FOR ADDITIONAL TEMPORARY EASEMENT

REVISIONS

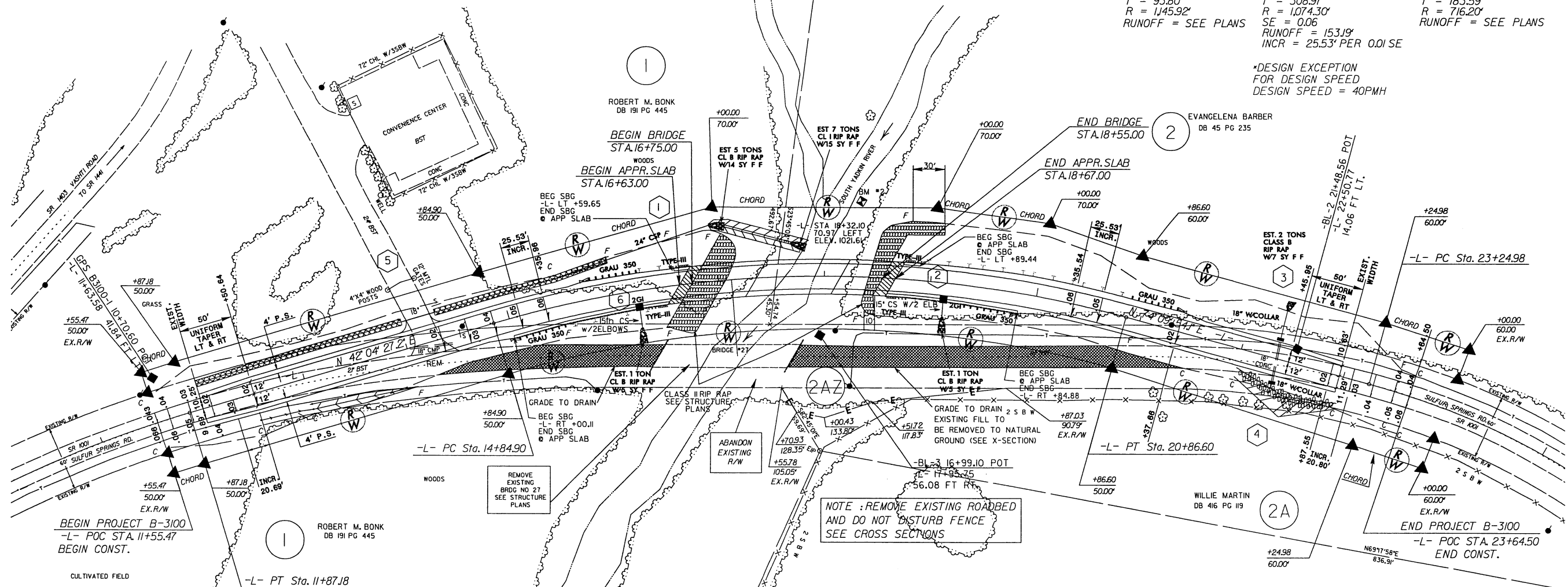
PROJECT REFERENCE NO. B-3100	SHEET NO. 4
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
<b>PRELIMINARY PLANS</b> DO NOT USE FOR CONSTRUCTION	



SEE SHEET 5 FOR -L- PROFILE

PI Sta 10+93.80 $\Delta = 9' 21' 33.2''$ (RT) $D = 5' 00' 00.0''$ $L = 187.18'$ $T = 93.80'$ $R = 1145.92'$ RUNOFF = SEE PLANS	PI Sta 17+93.87 $\Delta = 32' 05' 26.9''$ (RT) $D = 5' 20' 00.0''$ $L = 60.70'$ $T = 308.97'$ $R = 1,074.30'$ $SE = 0.06$ $RUNOFF = 153.19'$ $INCR = 25.53' PER 0.01 SE$	PI Sta 25+08.57 $\Delta = 28' 45' 19.0''$ (RT) $D = 8' 00' 00.0''$ $L = 359.44'$ $T = 183.59'$ $R = 716.20'$ RUNOFF = SEE PLANS
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\*DESIGN EXCEPTION FOR DESIGN SPEED  
 DESIGN SPEED = 40MPH



**DATUM DESCRIPTION**  
 THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCGS FOR MONUMENT "GPS B3100-1" WITH NAD 83 STATE PLANE GRID COORDINATES OF NORTHING: 815741.9128(11) EASTING: 1383118.1760(11) THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.99990522 THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "GPS B3100-1" TO "L- STATION POC 11+55.47" IS S 38° 08' 22.12" E 4265.11 ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES VERTICAL DATUM USED IS NGVD 29

