Buncombe County

Bridge No. 220 on SR 2098 over Reems Creek

Federal-Aid Project No. BRZ-2098(1)

State Project 8.2844601

WBS # 33402.1.1

TIP Project No. B-4036

CATEGORICAL EXCLUSION

UNITED STATES DEPARTMENT OF TRANSPORTATION

FEDERAL HIGHWAY ADMINISTRATION

AND

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

DIVISION OF HIGHWAYS

APPROVED:

04/24/06
DATE

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

5/2/06
DATE

for John F. Sullivan III, P.E.
Division Administrator, FHWA

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

MICHAEL F. EASLEY
GOVERNOR

LYNDO TIPPETT
SECRETARY

January 2, 2008

U. S. Army Corps of Engineers
151 Patton Avenue
Room 208
Asheville, NC 28801-5006

ATTN: Mr. David Baker
NCDOT Coordinator

Dear Sir:

Subject: **Clean Water Act Nationwide Permit 13 application** for replacement of Bridge No. 220 on SR 2098 (Herron Cove Road) over Reems Creek, Federal Aid No. BRZ-2098(1), State Project No. 8.2844601, Buncombe County, Division 13, TIP No. B-4036. WBS Element No. 33402.1.1.

Please see the enclosed Pre-Construction Notification, permit drawings, design plans and Rapanos jurisdictional determination form for the subject project. A Categorical Exclusion (May 2006) and Right of Way Consultation (May 2007) were completed for this project and distributed shortly thereafter. Additional copies are available upon request. The North Carolina Department of Transportation (NCDOT) proposes to replace the 76.6 foot Bridge No. 220 with a single span box beam bridge of approximately 105 feet in length. The new structure will be built on the same alignment as the existing bridge. During construction, traffic will be routed to an offsite detour. There will be a total of 91 feet of permanent impacts to the Reems Creek due to the placement of Class B rip rap in three ditches for bank stabilization.

IMPACTS TO WATERS OF THE UNITED STATES

General Description: There is one jurisdictional stream on the project site: Reems Creek. This water resource is located in the French Broad River Basin (subbasin 04-03-02, Hydrological Cataloguing Unit 06010105). The North Carolina Division of Water Quality (NCDWQ) index number for the Reems Creek is 6-87-1. Reems Creek is classified by

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

TELEPHONE: 919-715-1500
FAX: 919-715-1501
WEBSITE: WWW.DOH.DOT.STATE.NC.US

LOCATION:
2728 CAPITOL BOULEVARD
PARKER LINCOLN BUILDING, SUITE 168
RALEIGH NC 27699

the Division of Water Quality as a **C-Tr** water body. Neither High Quality Waters (HQW), Water Supplies (WS-I or WS-II), Outstanding Resource Waters (ORW) nor waters listed on the 303 (d) list occur in the project area or within 1.0 mile downstream of waters in the project area. The average baseflow width of the Reems Creek is approximately 25 feet. Average depth is approximately 1-2 feet.

Permanent Impacts: There will be a total of 91 feet of permanent impacts to Reems Creek. Site 1 encompasses three ditches that will have Class B rip rap placed where they enter Reems Creek. Rip rap will be used for bank stabilization to control erosion at these sites.

Temporary Impacts: There will be no temporary impacts associated with this project.

Bridge Demolition: Bridge No. 220 has a superstructure that consists of timber floor on I-beams with an asphalt wearing surface and timber railing. The substructure consists of reinforced concrete abutments, and one interior bent consisting of a timber cap on timber piles with concrete sills. Bridge No. 220, including it's interior bent will be removed without appreciable fill in "Waters of the United States".

Utility Impacts: There will be no impacts to jurisdictional waters due to utilities.

FEDERALLY PROTECTED SPECIES

Plants and animals with federal classifications of Endangered, Threatened, Proposed Endangered and Proposed Threatened are protected under provisions of Section 7 and Section 9 of the Endangered Species Act of 1973, as amended. As of May 10, 2007 the United States Fish and Wildlife Service (USFWS) list 13 species under federal protection for Buncombe County (Table 1). Surveys have determined that there is no suitable habitat for the listed species. The NC Natural Heritage database of rare species and unique habitats was reviewed in September 2007. There is no documentation of federally listed species or unique habitats occurring within 1 mile of the project area.

Table 1. Species Under Federal Protection in Buncombe County

Common Name	Scientific Name	Federal Status	Habitat	Biological Conclusion
Bog turtle	*Clemmys muhlenbuergii*	T (S/A)	No	Not required
Carolina northern flying squirrel	*Glaucomys sabrinus coloratus*	E	No	No Effect
Spotfin chub	*Hybopsis monacha*	T	No	No Effect
Gray bat	*Myotis grisescens*	E	No	No Effect
Eastern cougar	*Puma concolor couguar*	E	No	No Effect
Appalachian elktoe	*Alasmidonta raveneliana*	E	No	No Effect
Oyster mussel	*Epioblasma capsaeformis*	E	No	No Effect
Tan riffleshell	*Epioblasma florentina walkeri*	E	No	No Effect
Bunched arrowhead	*Sagittaria fasciculata*	E	No	No Effect
Mountain sweet pitcher plant	*Sarracenia jonesii*	E	No	No Effect
Spreading avens	*Geum radiatum*	E	No	No Effect
Virginia spiraea	*Spiraea virginiana*	T	No	No Effect
Rock gnome lichen	*Gymnoderma lineare*	E	No	No Effect

AVOIDANCE, MINIMIZATION AND MITIGATION

Avoidance and Minimization:
Avoidance examines all appropriate and practicable possibilities of averting impacts to "Waters of the United States". The NCDOT is committed to incorporating all reasonable and practicable design features to avoid and minimize jurisdictional impacts, and to provide full compensatory mitigation of all remaining, unavoidable jurisdictional stages; minimization measures were incorporated as part of the project design.

- Best Management Practices will be followed for this project as outlined in "NCDOT's Best Management Practices for Construction and Maintenance Activities".
- Best Management Practices will be used during demolition of the existing bridge.
- Use of a single span structure.
- There will be no deck drains allowed to discharge directing into Reems Creek.
- Preformed scour holes will be used to treat stormwater from the bridge and adjacent road before entering the stream.
- Use of offsite detour.
- There will be an in-stream and 25-foot buffer work moratorium from October 15 to April 15 for protection of trout.

Mitigation:
Permanent impacts for this project are 91 feet due to bank stabilization. Because the proposed impacts do not constitute a "loss of Waters of the United States", no mitigation is proposed.

SCHEDULE

The project schedule calls for a June 17, 2008 Let date with a date of availability on July 29, 2008. The review date for the project is April 29, 2008.

REGULATORY APPROVALS

Section 404 Permit: It is anticipated that impacts relating to use of rip rap for bank stabilization will be authorized under Section 404 Nationwide Permit No. 13 (Bank Stabilization). We therefore request the issuance of a Nationwide Permit 13 for these activities.

Section 401 Permit: We anticipate 401 General Certification No. 3689 will apply to this project. All general WQC conditions will be adhered to during project construction. Therefore, in accordance with 15A NCAC 2H, Section .0500(a) and 15A NCAC 2B.0200 we are providing two copies of this application to the North Carolina Department of Environmental and Natural Resources, Division of Water Quality, for their records.

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

Thank you for your assistance with this project. If you have any questions or need additional information please contact Jason Dilday at jldilday@dot.state.nc.us or (919) 715-5535. The application will be posted at http://207.4.62.65/PDEA/PermApps/.

Sincerely,

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

cc:
W/attachment
Mr. Brian Wrenn, NCDWQ (2 Copies)
Ms. Marella Buncick, USFWS
Ms. Marla Chambers, NCWRC
Mr. Harold Draper, TVA

W/o attachment
Dr. David Chang, P.E., Hydraulics
Mr. Victor Barbour, P.E., Project Services Unit
Mr. Greg Perfetti, P.E., Structure Design
Mr. Mark Staley, Roadside Environmental
Mr. J.J. Swain, P.E. (Div. 13), Division Engineer
Mr. Roger Bryan (Div. 13), DEO
Mr. Jay Bennett, P.E., Roadway Design
Mr. Majed Alghandour, P. E., Programming and TIP
Mr. Art McMillan, P.E., Highway Design
Mr. Scott McLendon, USACE, Wilmington
Mr. Joseph Miller, P.E., PDEA Project Planning Engineer

Office Use Only: Form Version March 05

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

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

I. Processing

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

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

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

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

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

II. Applicant Information

1. Owner/Applicant Information
   Name: Gregory J. Thorpe, Ph.D., Environmental Management Director
   Mailing Address: 1598 Mail Service Center
   _____
   _____
   _____
   Telephone Number: (919) 733-3141 Fax Number: (919) 733-9794
   E-mail Address: jldilday@dot.state.nc.us

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

III. Project Information

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

1. Name of project: Bridge 220 over Reams Creek

2. T.I.P. Project Number or State Project Number (NCDOT Only): B-4036

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

4. Location
   County: Buncombe Nearest Town: Weaverville
   Subdivision name (include phase/lot number): N/A
   Directions to site (include road numbers/names, landmarks, etc.): SR 2098, Herron Cove Road

5. Site coordinates (For linear projects, such as a road or utility line, attach a sheet that separately lists the coordinates for each crossing of a distinct waterbody.)
   Decimal Degrees (6 digits minimum): 35'41'04' °N -82'33'40' °W

6. Property size (acres): N/A

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

8. River Basin: French Broad Basin
   (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: Residental and forest communities

10. Describe the overall project in detail, including the type of equipment to be used: Bridge No. 220 will be replaced with a single span bridge of approximately 105 feet in length using standard bridge demolition and construction equipment.

11. Explain the purpose of the proposed work: Bridge No. 19 is proposed for replacement due to a sufficiency rating of 40 out of a possible 100 for a new structure. The bridge is considered functionally obsolete and structurally deficient according to FHWA standards.

IV. Prior Project History

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

V. Future Project Plans

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

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

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

1. Provide a written description of the proposed impacts: There will be a total of 91 feet of permanent impacts to Reems Creek. Site 1 encompasses three ditches that will have Class B rip rap placed where they enter Reems Creek. Rip rap will be used for bank stabilization to control erosion at these sites.

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

Wetland Impact Site Number (indicate on map)	Type of Impact	Type of Wetland (e.g., forested, marsh, herbaceous, bog, etc.)	Located within 100-year Floodplain (yes/no)	Distance to Nearest Stream (linear feet)	Area of Impact (acres)
No wetlands					
Total Wetland Impact (acres)					0

3. List the total acreage (estimated) of all existing wetlands on the property: 0

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

Stream Impact Number (indicate on map)	Stream Name	Type of Impact	Perennial or Intermittent?	Average Stream Width Before Impact	Impact Length (linear feet)	Area of Impact (acres)
1	Reems Creek	Perm	Perennial	25 ft	91	0.05
Total Permanent Stream Impact (by length and acreage)					91	0.05

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

Open Water Impact Site Number	Name of Waterbody (if applicable)	Type of Impact	Type of Waterbody (lake, pond, estuary, sound, bay,	Area of Impact

(indicate on map)			ocean, etc.)	(acres)
No Impacts				
Total Open Water Impact (acres)				0

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

Stream Impact (acres):	0.05 (permanent)
Wetland Impact (acres):	0
Open Water Impact (acres):	0
Total Impact to Waters of the U.S. (acres)	0.05 (permanent)
Total Stream Impact (linear feet):	91 (permanent)

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

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

VII. Impact Justification (Avoidance and Minimization)

Specifically describe measures taken to avoid the proposed impacts. It may be useful to provide information related to site constraints such as topography, building ordinances, accessibility, and financial viability of the project. The applicant may attach drawings of alternative, lower-impact site layouts, and explain why these design options were not feasible. Also discuss how impacts were minimized once the desired site plan was developed. If applicable, discuss construction techniques to be followed during construction to reduce impacts. Traffic will be placed on a n offsite detour. The new bridge will be a spanning structure. NCDOT Best Management Practices will be implemented during all phases of construction and demolition.

VIII. Mitigation

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

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

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

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

   There is 91 feet of permanent impacts to Reems Creek. Mitigation is not proposed for this project because impacts do not constitute a "loss of Waters of the United States".

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

Amount of stream mitigation requested (linear feet): 0
Amount of buffer mitigation requested (square feet): 0
Amount of Riparian wetland mitigation requested (acres): 0
Amount of Non-riparian wetland mitigation requested (acres): 0
Amount of Coastal wetland mitigation requested (acres): 0

IX. Environmental Documentation (required by DWQ)

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

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

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

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

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

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

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

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

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

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

XI. Stormwater (required by DWQ)

Describe impervious acreage (existing and proposed) versus total acreage on the site. Discuss stormwater controls proposed in order to protect surface waters and wetlands downstream from the property. If percent impervious surface exceeds 20%, please provide calculations demonstrating total proposed impervious level. There will be no deck drains allowed to discharge directly into Reems Creek. Preformed scour holes will be used to treat runoff so that stormwater will not be discharged directly into the stream. The bridge will be replaced on the same alignment as the previous structure.

XII. Sewage Disposal (required by DWQ)

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

XIII. Violations (required by DWQ)

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

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

XIV. Cumulative Impacts (required by DWQ)

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

XV. Other Circumstances (Optional):

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

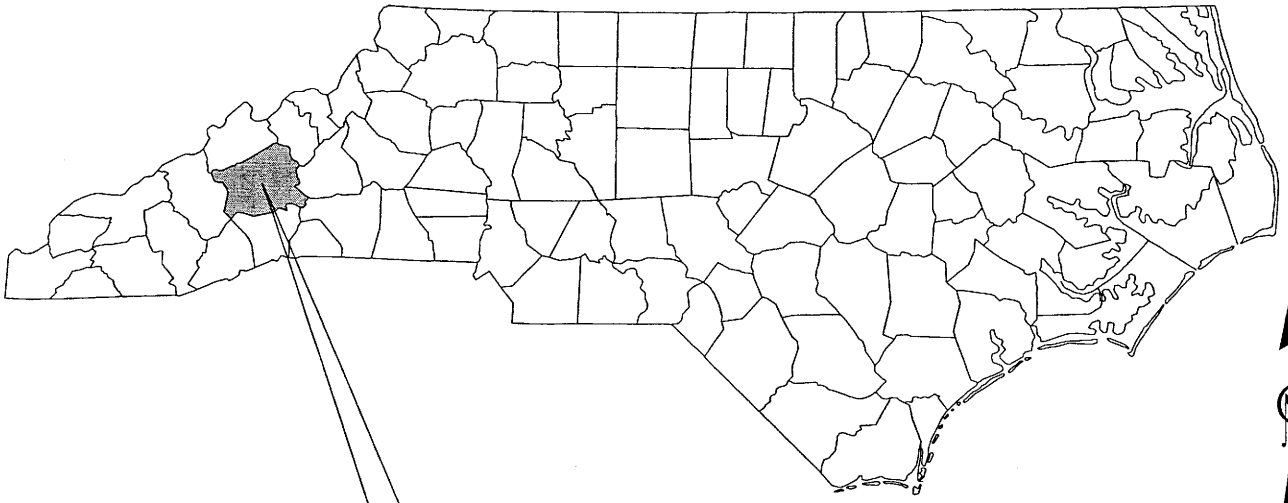
N/A

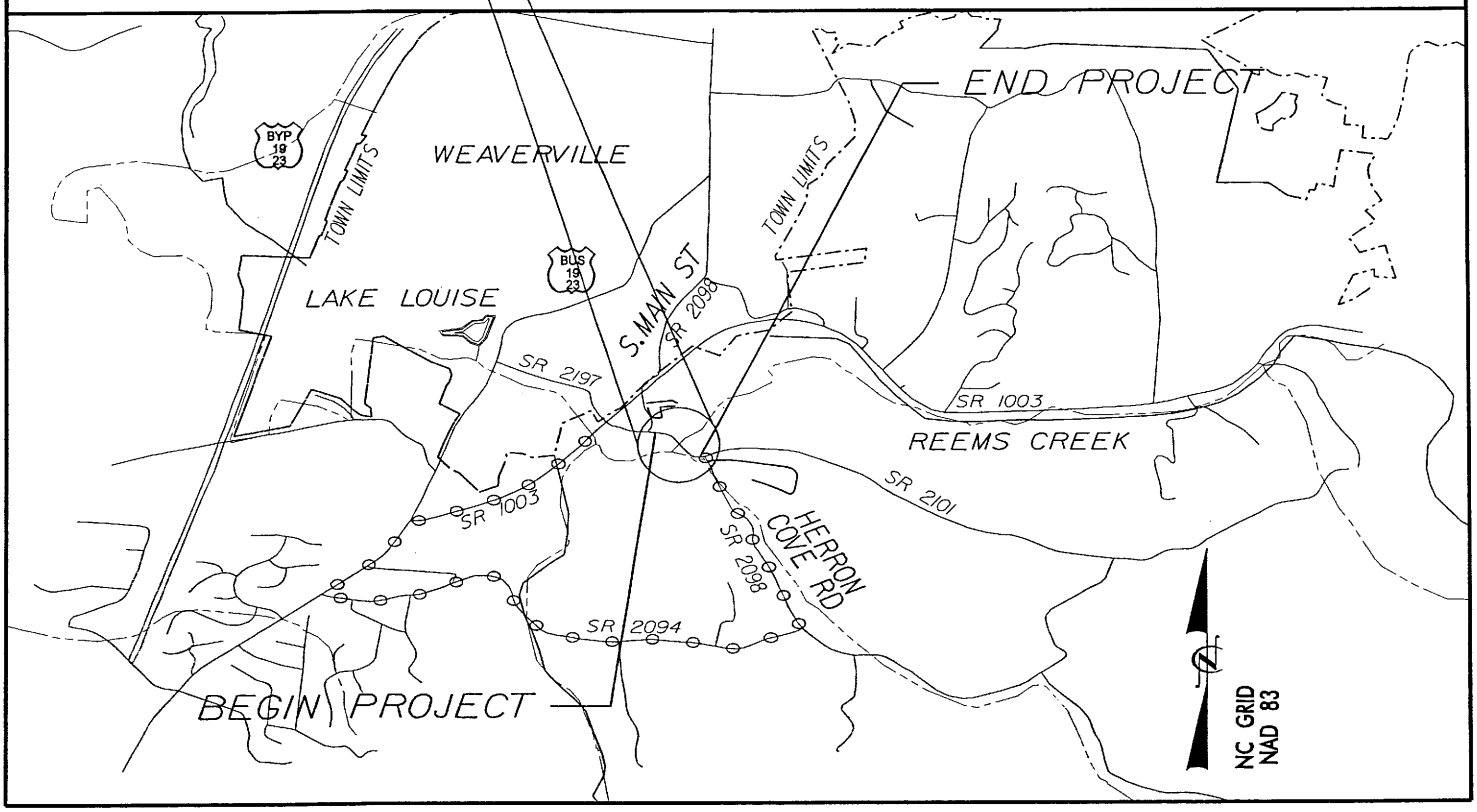
E. L. Luck 1·3·08

Applicant/Agent's Signature **Date**

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

NORTH CAROLINA





WETLAND PERMIT DRAWING
VICINITY MAP
B-4036

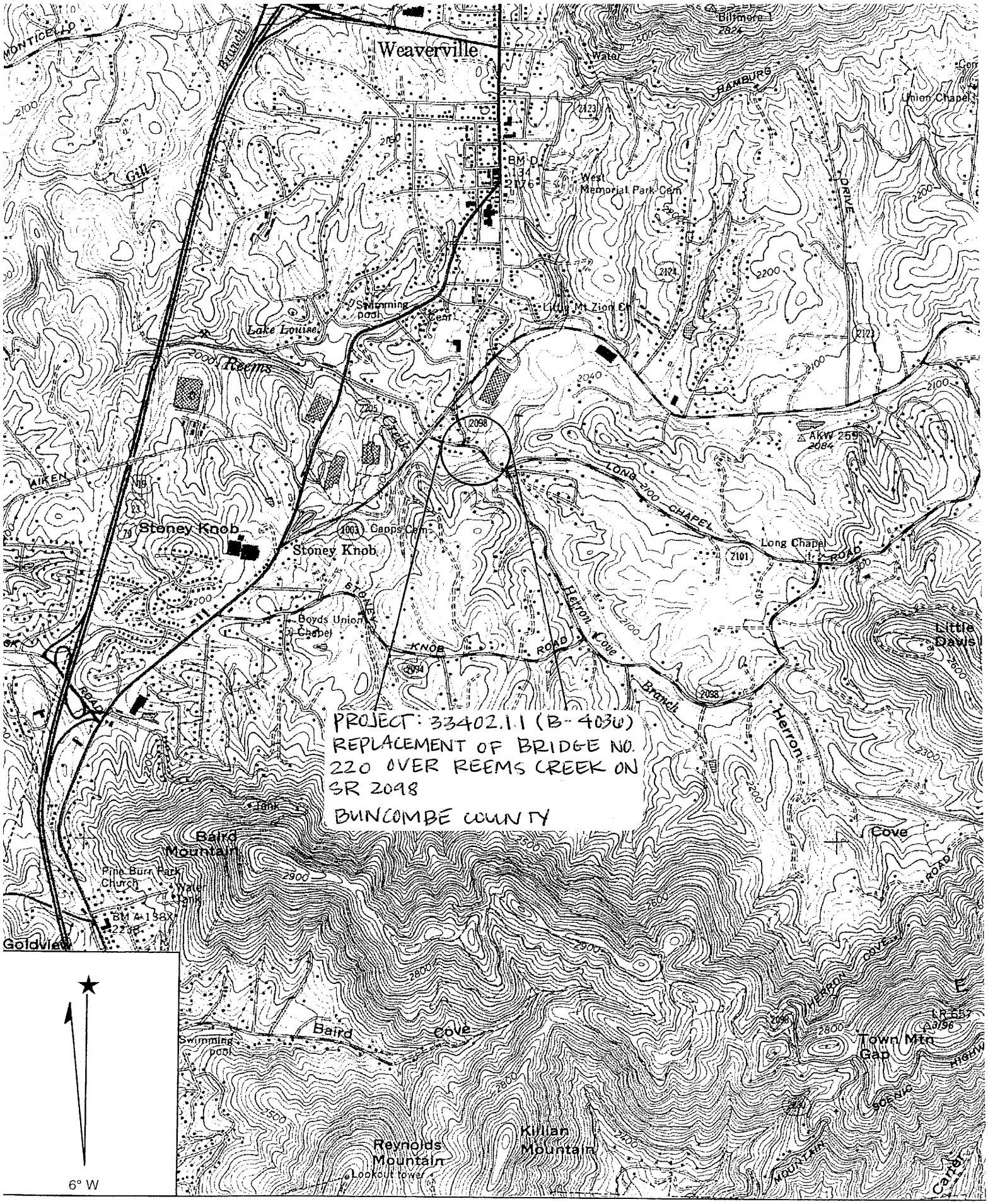
Permit Drawing
Sheet 1 of 8

DIVISION OF HIGHWAYS
BUNCOMBE COUNTY

PROJECT: 33402.1.1 (B-4036)
REPLACEMENT OF BRIDGE NO.220
OVER REEMS CREEK
ON SR 2098

8/6/2007

8/6/2007 R:\01036\9\Permits\V8_Wetland vicinity map.dgn



Name: WEAVERVILLE
Date: 2/27/2007
Scale: 1 inch equals 2000 feet

Permit Drawing
Sheet 2 **of** 8

Location: 035° 40' 39.4" N 082° 33' 37.7" W
Caption: Project: 33402.1.1 (B-4036)
Replacement of Bridge No. 220 Over Reems Cr. on SR 2098

OWNER'S NAME	ADDRESS
(3) Balcrank Products, Inc.	1 Balcrank Way Weaverville, NC 28787
(4) Capps, Jerome E. and Peggy H.	12 Herron Cove Road Weaverville, NC 28787
(5) Dyer, Louise A. and Holbert, Deanna	28 Longs Chapel Road Weaverville, NC 28787

PROPERTY OWNER NAME AND ADDRESS

ermit Drawing
Sheet 3 of 8

DIVISION OF HIGHWAYS
BUNCOMBE COUNTY

PROJECT: 33402.1.1 (B-4036)
REPLACEMENT OF BRIDGE NO. 220
OVER REEMS CREEK
ON SR 2098

8/16/2007

R:\0\0036\19\Permits\V8_Wetland Property Owners.dgn
8/16/2007

WETLAND PERMIT IMPACT SUMMARY

			WETLAND IMPACTS					SURFACE WATER IMPACTS				
Site No.	Station (From/To)	Structure Size / Type	Permanent Fill In Wetlands (ac)	Temp. Fill In Wetlands (ac)	Excavation in Wetlands (ac)	Mechanized Clearing in Wetlands (ac)	Hand Clearing in Wetlands (ac)	Permanent SW impacts (ac)	Temp. SW impacts (ac)	Existing Channel Impacts Permanent (ft)	Existing Channel Impacts Temp. (ft)	Natural Stream Design (ft)
1	-L- 13+89	Rip Rap Embankment						<0.01		31		
1	-L- 14+08	Rip Rap Embankment						<0.01		31		
1	-L- 14+26	Rip Rap Embankment						<0.01		29		
TOTALS:								<0.03		91		

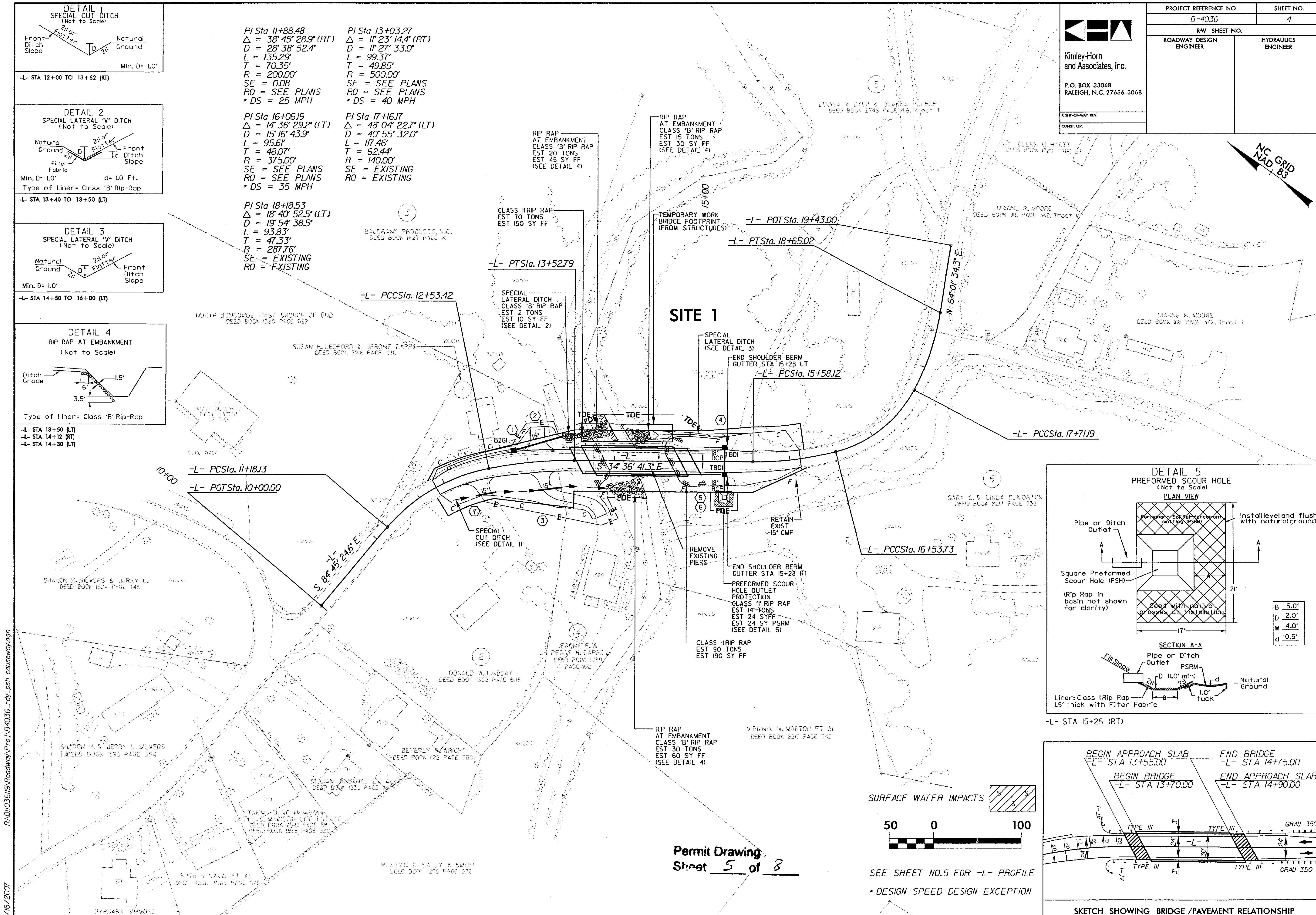
Permit Drawing
4 of 8

NC DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

BUNCOMBE COUNTY
PROJECT: 33402.1.1 (B-4036)

7/25/2007

ATN Revised 3/31/05



PROJECT REFERENCE NO. B-4036
SHEET NO. 4
RW SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
Kimley-Horn and Associates, Inc.
P.O. BOX 33068
RALEIGH, N.C. 27636-3068
NC GRID NAD 83
DETAIL 1
SPECIAL CUT DITCH
(Not to Scale)
Front Ditch Slope
2:1 or Flatter
Natural Ground
Min. D= 1.0'
-L- STA 12+00 TO 13+62 (RT)
DETAIL 2
SPECIAL LATERAL 'V' DITCH
(Not to Scale)
Natural Ground
Filter Fabric
Front Ditch Slope
Min. D= 1.0'
d= 1.0 Ft.
Type of Liner= Class 'B' Rip-Rap
-L- STA 13+40 TO 13+50 (LT)
DETAIL 3
SPECIAL LATERAL 'V' DITCH
(Not to Scale)
Natural Ground
Front Ditch Slope
Min. D= 1.0'
-L- STA 14+50 TO 16+00 (LT)
DETAIL 4
RIP RAP AT EMBANKMENT
(Not to Scale)
Ditch Grade
1.5'
6'
3.5'
Type of Liner= Class 'B' Rip-Rap
-L- STA 13+50 (LT)
-L- STA 14+12 (RT)
-L- STA 14+30 (LT)
PI Sta 11+88.48
Δ = 38° 45' 28.9" (RT)
D = 28° 38' 52.4"
L = 135.29'
T = 70.35'
R = 200.00'
SE = 0.08
RO = SEE PLANS
* DS = 25 MPH
PI Sta 13+03.27
Δ = 11° 23' 14.4" (RT)
D = 11° 27' 33.0"
L = 99.37'
T = 49.85'
R = 500.00'
SE = SEE PLANS
RO = SEE PLANS
* DS = 40 MPH
PI Sta 16+06.19
Δ = 14° 36' 29.2" (LT)
D = 15° 16' 43.9"
L = 95.61'
T = 48.07'
R = 375.00'
SE = SEE PLANS
RO = SEE PLANS
* DS = 35 MPH
PI Sta 17+16.17
Δ = 48° 04' 22.7" (LT)
D = 40° 55' 32.0"
L = 117.46'
T = 62.44'
R = 140.00'
SE = EXISTING
RO = EXISTING
PI Sta 18+18.53
Δ = 18° 40' 52.5" (LT)
D = 19° 54' 38.5"
L = 93.83'
T = 47.33'
R = 287.76'
SE = EXISTING
RO = EXISTING
SITE 1
RIP RAP AT EMBANKMENT CLASS 'B' RIP RAP EST 20 TONS EST 45 SY FF (SEE DETAIL 4)
RIP RAP AT EMBANKMENT CLASS 'B' RIP RAP EST 15 TONS EST 30 SY FF (SEE DETAIL 4)
CLASS II RIP RAP EST 70 TONS EST 150 SY FF
TEMPORARY WORK BRIDGE FOOTPRINT (FROM STRUCTURES)
-L- POT Sta. 19+43.00
-L- PT Sta. 18+65.02
-L- PT Sta. 13+52.79
-L- PCC Sta. 12+53.42
SPECIAL LATERAL DITCH CLASS 'B' RIP RAP EST 2 TONS EST 10 SY FF (SEE DETAIL 2)
SPECIAL LATERAL DITCH (SEE DETAIL 3)
END SHOULDER BERM GUTTER STA 15+28 LT
-L- PCS Sta. 15+58.12
-L- PCC Sta. 17+71.19
-L- PC Sta. 11+18.13
-L- POT Sta. 10+00.00
S 34° 36' 41.3" E
S 84° 45' 24.6" E
N 64° 01' 34.3" E
SPECIAL CUT DITCH (SEE DETAIL 1)
REMOVE EXISTING PIERS
RETAIN EXIST 15" CMP
END SHOULDER BERM GUTTER STA 15+28 RT
PREFORMED SCOUR HOLE OUTLET PROTECTION CLASS 'I' RIP RAP EST 14 TONS EST 24 SYFF EST 24 SY PSRM (SEE DETAIL 5)
CLASS II RIP RAP EST 90 TONS EST 190 SY FF
RIP RAP AT EMBANKMENT CLASS 'B' RIP RAP EST 30 TONS EST 60 SY FF (SEE DETAIL 4)
-L- PCC Sta. 16+53.73
TDE
PDE
TBDI
18" RCP
LOUISA A. DYER & DEANNA HOLBERT DEED BOOK 2749 PAGE 116, Tract II
GLENN M. HYATT DEED BOOK 1120 PAGE 57
DIANNE R. MOORE DEED BOOK 116 PAGE 342, Tract II
DIANNE R. MOORE DEED BOOK 116 PAGE 342, Tract I
BALERANK PRODUCTS, INC. DEED BOOK 1627 PAGE 14
NORTH BUNCOMBE FIRST CHURCH OF GOD DEED BOOK 1580 PAGE 692
SUSAN H. LEDFORD & JEROME CAPPS DEED BOOK 2216 PAGE 470
SHARON H. SILVERS & JERRY L. DEED BOOK 1504 PAGE 745
GARY C. & LINDA C. MORTON DEED BOOK 2217 PAGE 739
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DONALD W. LINDSAY DEED BOOK 1602 PAGE 605
VIRGINIA M. MORTON ET AL DEED BOOK 2217 PAGE 743
SHARON H. & JERRY L. SILVERS DEED BOOK 1395 PAGE 354
BEVERLY N. WRIGHT DEED BOOK 1122 PAGE 700
WILLIAM H. BANKS ET AL DEED BOOK 1333 PAGE 16
TAMMY JUNE MCMAHAN
W. KEVIN & SALLY A. SMITH DEED BOOK 1259 PAGE 338
RUTH B. DAVIS ET AL
BARBARA SIMMONS
DETAIL 5
PREFORMED SCOUR HOLE
(Not to Scale)
PLAN VIEW
Pipe or Ditch Outlet
Install level and flush with natural ground
Square Preformed Scour Hole (PSH)
(Rip Rap in basin not shown for clarity)
Seed with native grasses at installation
21'
17'
B 5.0'
D 2.0'
W 4.0'
d 0.5'
SECTION A-A
Pipe or Ditch Outlet
Fill Slope
PSRM
D (1.0' min)
Natural Ground
1.0' tuck
Liner: Class I Rip Rap 1.5' thick with Filter Fabric
-L- STA 15+25 (RT)
BEGIN APPROACH SLAB -L- STA 13+55.00
END BRIDGE -L- STA 14+75.00
BEGIN BRIDGE -L- STA 13+70.00
END APPROACH SLAB -L- STA 14+90.00
TYPE III
GRAU 350
AT-1
SKETCH SHOWING BRIDGE /PAVEMENT RELATIONSHIP
SURFACE WATER IMPACTS
50 0 100
SEE SHEET NO.5 FOR -L- PROFILE
* DESIGN SPEED DESIGN EXCEPTION
Permit Drawing Sheet 5 of 8
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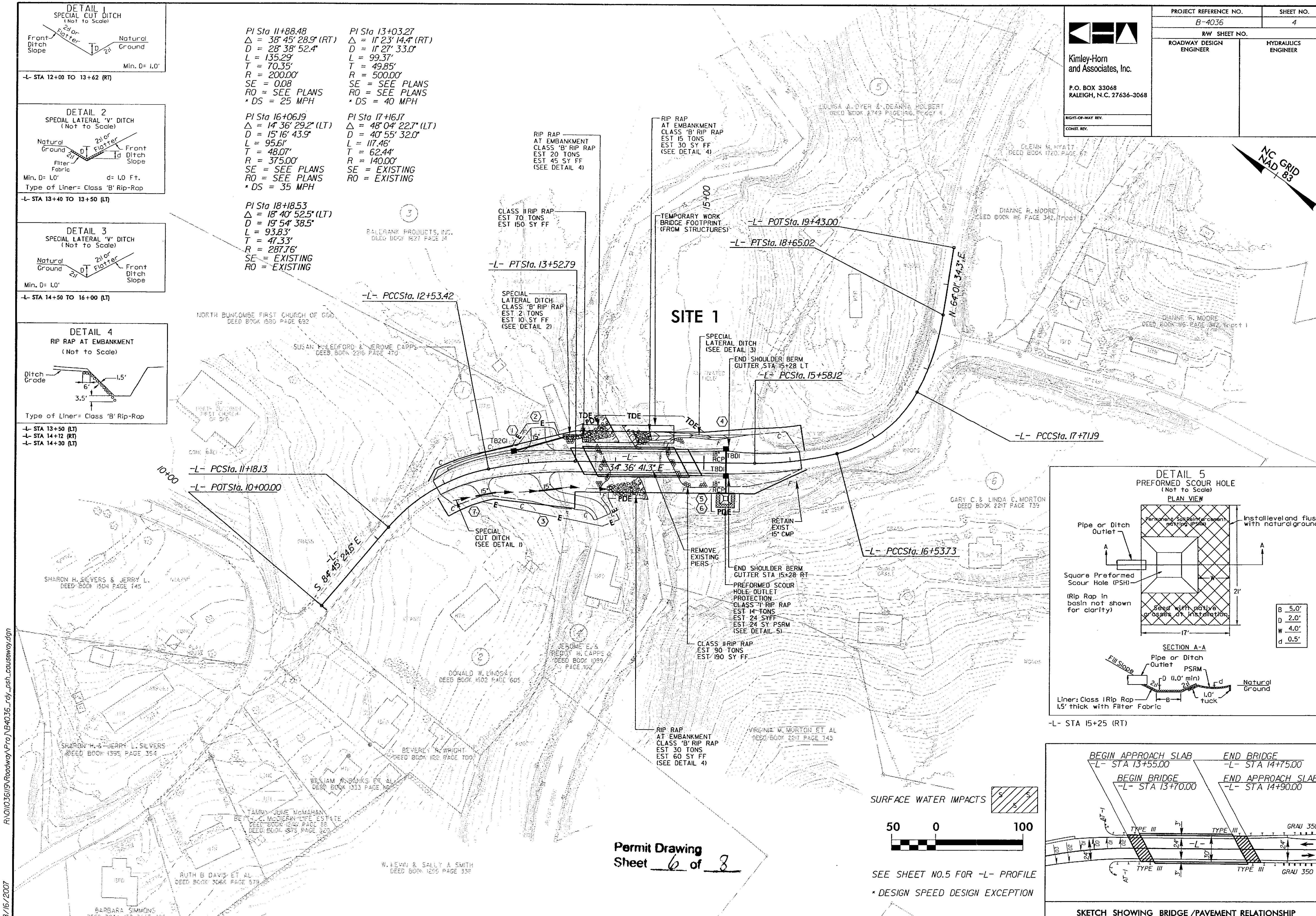
8/16/2007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Min. D= 1.0'
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(Not to Scale)
Ditch Grade
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PI Sta 18+18.53
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(Rip Rap in basin not shown for clarity)
Seed with native grasses at installation
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d 0.5'
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Natural Ground
Liner: Class I Rip Rap 1.5' thick with Filter Fabric
1.0' tuck
-L- STA 15+25 (RT)
BEGIN APPROACH SLAB -L- STA 13+55.00
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50 0 100
SEE SHEET NO.5 FOR -L- PROFILE
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Permit Drawing Sheet 6 of 8
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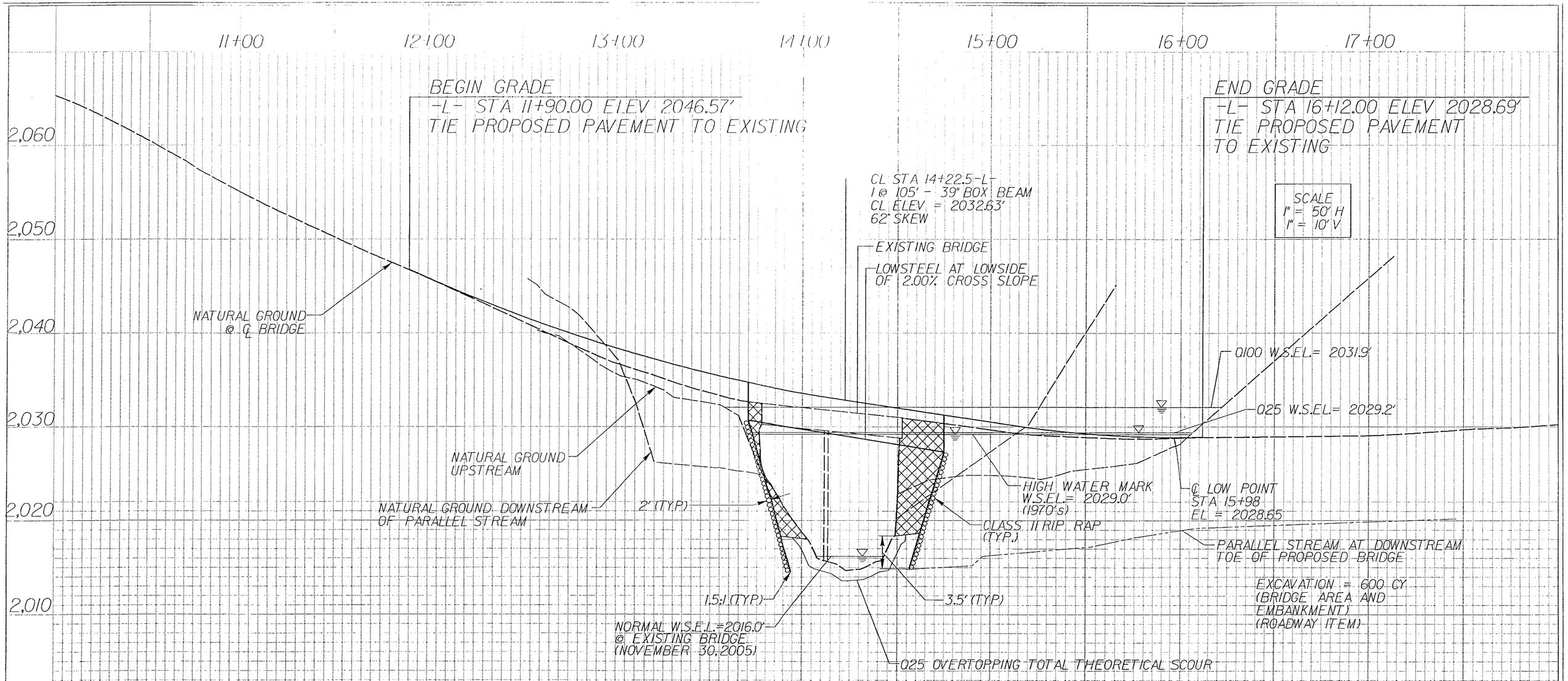
8/16/2007



WETLAND PERMIT DRAWING
BSR PROFILE
B-4036

Permit Drawing
Sheet 7 of 8

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NCDOT
DIVISION OF HIGHWAYS
BUNCOMBE COUNTY
PROJECT 33402.1.1 (B-4036)
REPLACEMENT OF BRIDGE NO.220
OVER REEMS CREEK
ON SR 2098

7/25/2007

BM#2
CHISLED SQUARE IN NE
CORNER OF CONCRETE PAD
-L- STA 13+41.24 (47.64' RT)
ELEV 2035.78'

BM#3
SPIKE NAIL IN 22" HAWTHORN
-L- STA 14+46.65 (66.02' LT)
ELEV 2026.66'

BEGIN GRADE
-L- STA 11+90.00 ELEV 2046.57'
TIE PROPOSED PAVEMENT TO EXISTING

BEGIN BRIDGE
-L- STA 13+70.00
ELEV 2034.53'

PI = 13+05.00
EL = 2,036.15'
VC = 230'
K = 38
V = 30 MPH

CL STA 14+22.50 -L-
1 @ 105' - 39" BOX BEAM
CL ELEV = 2032.63'
62° SKEW

EXISTING BRIDGE

END BRIDGE
-L- STA 14+75.00
ELEV 2031.05'

PI = 15+62.00
EL = 2,028.44'
VC = 100'
K = 29
V = 25 MPH

END GRADE
-L- STA 16+12.00 ELEV 2028.69'
TIE PROPOSED PAVEMENT
TO EXISTING

(-)9.0609%
-9.00%
-9.87%
-1.0%
(-)3.0000%
(+)0.5000%
+2.88%
+1.80%

BEGIN SPECIAL
DITCH GRADE RT
-L- STA 12+00.00
ELEV = 2043.00'

PI (RT) = 13+00.00
ELEV = 2034.00'

BEGIN SPECIAL
DITCH GRADE LT
-L- STA 13+40.00
ELEV = 2031.60'

END SPECIAL
DITCH GRADE LT
-L- STA 13+50.00
ELEV = 2031.50'

END SPECIAL
DITCH GRADE RT
-L- STA 13+62.00
ELEV = 2028.50'

2' (TYP)
3.5' (TYP)
CLASS II
RIP RAP (TYP)
NORMAL W.S. ELEV. = 2016.01'
(11/30/05)

BEGIN SPECIAL
DITCH GRADE LT
-L- STA 14+50.00
ELEV = 2023.29'

PI = 15+50.00
ELEV = 2026.17'

END SPECIAL
DITCH GRADE LT
-L- STA 16+00.00
ELEV = 2027.07'

-L- HERRON COVE ROAD (SR 2098)

2,070
2,060
2,050
2,040
2,030
2,020
2,010
2,000
1,990

10 11 12 13 14 15 16 17

BRIDGE HYDRAULIC DATA

DESIGN DISCHARGE	= 4000 CFS
DESIGN FREQUENCY	= 25 YR
DESIGN HW ELEVATION	= 2029.20 FT
BASE DISCHARGE	= 5800 CFS
BASE FREQUENCY	= 100 YR
BASE HW ELEVATION	= 2031.90 FT
OVERTOPPING DISCHARGE	= 3700 CFS
OVERTOPPING FREQUENCY	= <25 YR
OVERTOPPING ELEVATION	= 2028.65 FT
DATE OF SURVEY	= 11/30/2005
W.S. ELEVATION AT DATE OF SURVEY	= 2016.01 FT

RIGHT-OF-WAY REV.

CONST. REV.

Kimley-Horn and Associates, Inc.
P.O. BOX 33068
RALEIGH, N.C. 27636-3068

PROJECT REFERENCE NO.	SHEET NO.
B-4036	5
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

SEE SHEET NO. 4 FOR -L- PLAN

UNCLASSIFIED STRUCTURE EXCAVATION

Permit Drawing
Sheet 8 of 8

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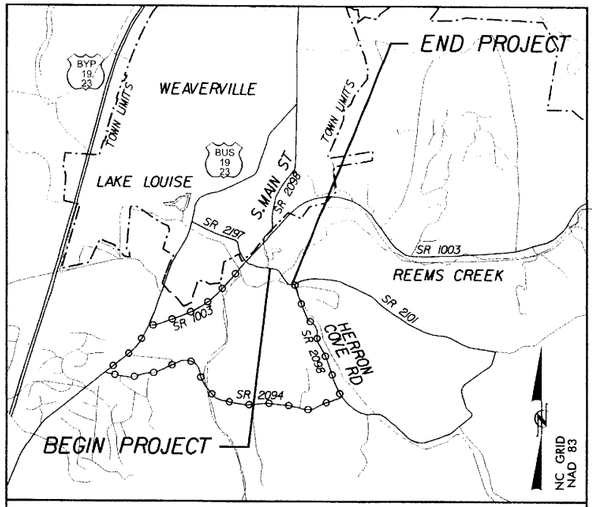
1/25/2007

TIP PROJECT: B-4036

SEE SHEET 1-A FOR INDEX OF SHEETS
SEE SHEET 1-B FOR CONVENTIONAL PLAN SHEET SYMBOLS



VICINITY MAP

OFF-SITE DETOUR ROUTE

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

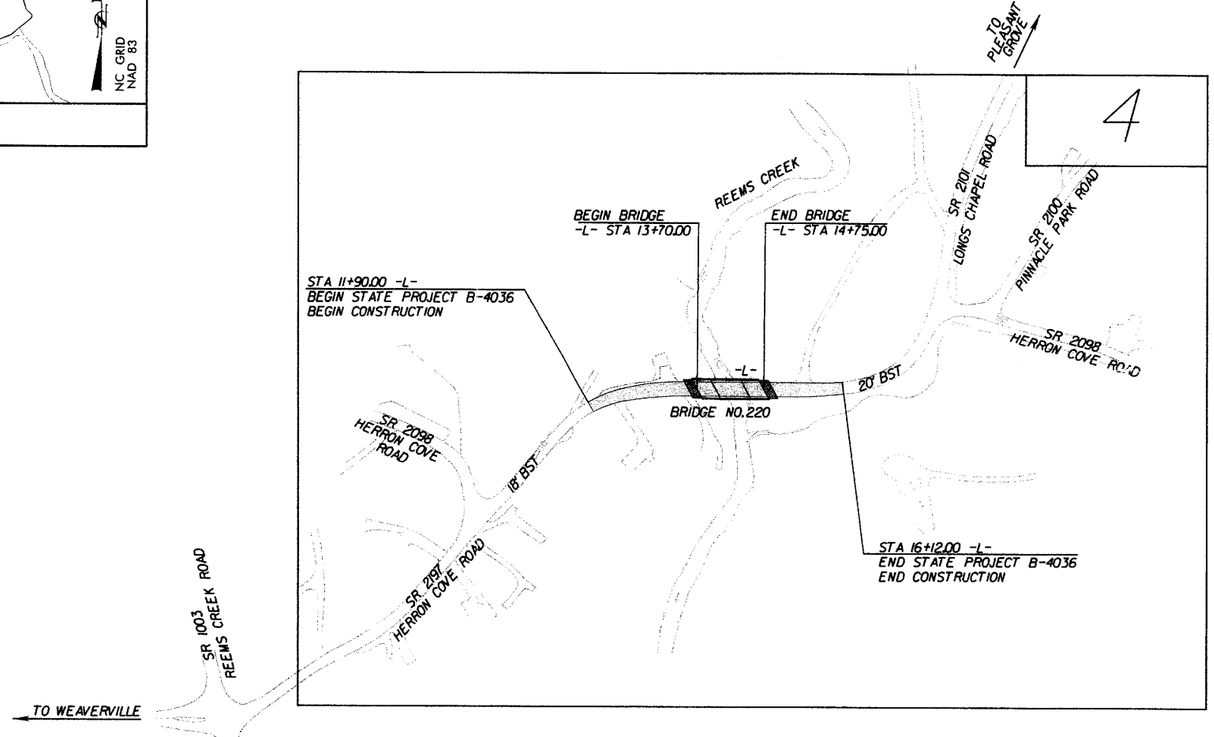
BUNCOMBE COUNTY

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-4036	1	

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
33402.1.1	BRZ-2098(1)	P.E.
33402.2.1	BRZ-2098(1)	RIGHT-OF-WAY
33402.2.1	BRZ-2098(1)	UTILITIES

LOCATION: BRIDGE NO. 220 OVER REEMS CREEK ON SR 2098
TYPE OF WORK: GRADING, PAVING, DRAINAGE, AND STRUCTURE

NC GRID NAD 83



NCDOT CONTACT: B.D. TAYLOR, P.E.
PROJECT ENGINEER
ROADWAY DESIGN UNIT

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

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

CONTRACT:

R:\0110361\5\Roadway\Proj\B4036_rdy_tshdgn

7/27/2007

GRAPHIC SCALES

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

DESIGN DATA

ADT 2008 = 1,900 VPD
ADT 2030 = 3,100 VPD
DHV = 9%
D = 55%
T = 4% *
V = 25 mph

DESIGN EXCEPTION:
DESIGN SPEED

* (TTST 1% + DUAL 3%)

PROJECT LENGTH

LENGTH OF ROADWAY TIP PROJECT B-4036 = 0.060 MILE

LENGTH OF STRUCTURE TIP PROJECT B-4036 = 0.020 MILE

TOTAL LENGTH OF TIP PROJECT B-4036 = 0.080 MILE

PLANS PREPARED FOR THE NCDOT BY:

Kimley-Horn and Associates, Inc.

Post Office Box 33068
Raleigh, North Carolina 27636

2006 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
JUNE 15, 2007

LETTING DATE:
JUNE 17, 2008

JEFFREY W. MOORE, PE
PROJECT ENGINEER

J. JASON PACE
PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER

SIGNATURE: P.E.

ROADWAY DESIGN ENGINEER

SIGNATURE: P.E.

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

P.E.
STATE HIGHWAY DESIGN ENGINEER

PROJECT REFERENCE NO.	SHEET NO.
B-4036	1-B

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

Note: Not to Scale

S.U.E. = Subsurface Utility Engineering

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

CONVENTIONAL PLAN SHEET SYMBOLS

BOUNDARIES AND PROPERTY:

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

BUILDINGS AND OTHER CULTURE:

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

HYDROLOGY:

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

RAILROADS:

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

RIGHT OF WAY:

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

ROADS AND RELATED FEATURES:

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

VEGETATION:

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

EXISTING STRUCTURES:

MAJOR:

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

MINOR:

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

UTILITIES:

POWER:

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

TELEPHONE:

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

WATER:

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

TV:

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

GAS:

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

SANITARY SEWER:

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

MISCELLANEOUS:

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

R:\01\036\19\Roadway\Proj\B4036_rdy_tsh.dgn

7/27/2007

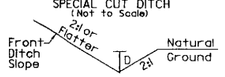
PROJECT REFERENCE NO.	SHEET NO.
B-4036	4
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

Kimley-Horn and Associates, Inc.
P.O. BOX 33068
RALEIGH, N.C. 27636-3068

RIGHT-OF-WAY REV.
CONST. REV.

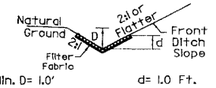
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

DETAIL 1
SPECIAL CUT DITCH
(Not to Scale)



-L- STA 12+00 TO 13+62 (RT)

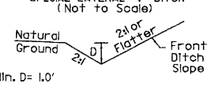
DETAIL 2
SPECIAL LATERAL 'V' DITCH
(Not to Scale)



Type of Liner= Class 'B' Rip-Rap

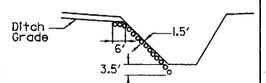
-L- STA 13+40 TO 13+50 (LT)

DETAIL 3
SPECIAL LATERAL 'V' DITCH
(Not to Scale)



-L- STA 14+50 TO 16+00 (LT)

DETAIL 4
RIP RAP AT EMBANKMENT
(Not to Scale)



Type of Liner= Class 'B' Rip-Rap

-L- STA 13+50 (LT)
-L- STA 14+12 (RT)
-L- STA 14+30 (LT)

-L-

PI Sta 11+88.48
Δ = 38° 45' 28.9" (RT)
D = 28° 38' 52.4"
L = 135.29'
T = 70.35'
R = 200.00'
SE = 0.08
RO = SEE PLANS
* DS = 25 MPH

PI Sta 13+03.27
Δ = 11° 23' 14.4" (RT)
D = 11° 27' 33.0"
L = 99.37'
T = 49.85'
R = 500.00'
SE = SEE PLANS
RO = SEE PLANS
* DS = 40 MPH

PI Sta 16+06.19
Δ = 14° 36' 29.2" (LT)
D = 15° 16' 43.9"
L = 95.61'
T = 48.07'
R = 375.00'
SE = SEE PLANS
RO = SEE PLANS
* DS = 35 MPH

PI Sta 17+16.17
Δ = 48° 04' 22.7" (LT)
D = 40° 55' 32.0"
L = 117.46'
T = 62.44'
R = 140.00'
SE = EXISTING
RO = EXISTING

PI Sta 18+18.53
Δ = 18° 40' 52.5" (LT)
D = 19° 54' 38.5"
L = 93.83'
T = 47.33'
R = 287.76'
SE = EXISTING
RO = EXISTING

REMOVE EXIST. BRIDGE (STRUCTURE ITEM)

RIP RAP AT EMBANKMENT CLASS 'B' RIP RAP EST 15 TONS EST 30 SY FF (SEE DETAIL 4)

RIP RAP AT EMBANKMENT CLASS 'B' RIP RAP EST 20 TONS EST 45 SY FF (SEE DETAIL 4)

BEGIN BRIDGE
-L- STA 13+70.00

BEGIN APPROACH SLAB
-L- STA 13+55.00

-L- PTSta. 13+52.79

SPECIAL LATERAL DITCH CLASS 'B' RIP RAP EST 2 TONS EST 10 SY FF (SEE DETAIL 2)

-L- PCCSta. 12+53.42

-L- POTSta. 19+43.00

-L- PTSta. 18+65.02

BM #3
-L- STA 14+46.65
OFF 66.02' LT
ELEV. = 2026.66
SPIKE NAIL IN 22" HAWTHORN

END BRIDGE
-L- STA 14+75.00

END APPROACH SLAB
-L- STA 14+90.00

SPECIAL LATERAL DITCH (SEE DETAIL 3)

END SHOULDER BERM GUTTER STA 15+28 LT

-L- PCSta. 15+58.12

-L- PCCSta. 17+71.9

-L- POC Sta. 11+90.00
BEGIN STATE PROJECT B-4036
BEGIN CONSTRUCTION

-L- PCSta. 11+18.13

-L- POTSta. 10+00.00

-L- S 84° 45' 24.6" E

-L- S 34° 36' 41.3" E

N. 64° 01' 34.3" E

-L- POC Sta. 16+12.00
END STATE PROJECT B-4036
END CONSTRUCTION

-L- PCCSta. 16+53.73

SPECIAL CUT DITCH (SEE DETAIL 1)

SHOP CURVED GUARDRAIL R=7.5'

SHOP CURVED GUARDRAIL R=12'

RETAIN EXISTING TREES

SHOULDER BERM GUTTER -L- STA 12+10 TO STA 12+90 LT

RETAIN EXIST 15" CMP

105' TAPER (35:1)

70' TAPER (35:1)

PREFORMED SCOUR HOLE OUTLET PROTECTION CLASS 'I' RIP RAP EST 14 TONS EST 24 SYFF EST 24 SY PSRM (SEE DETAIL 5)

TOP OF BANK

-BL- 2
-L- STA 9+08 +/-
OFF 11' RT +/-

-BY- 6
-L- STA 9+91 +/-
OFF 138' LT +/-

-BL- 3
-L- STA 14+74.98
OFF 11.58' LT

-BL- 4
-L- STA 16+82.28
OFF 12.30' RT

-BL- 5
-L- STA 18+51.22
OFF 56.24' RT

BM #2
-L- STA. 13+41.24
OFF 47.54' RT
ELEV. = 2035.78
CHISLED SQUARE IN NE CORNER OF CONC PAD

BM #4
-L- STA 18+27.39
OFF 293.87' RT
ELEV. = 2029.21
SPIKE IN 11" BLACK WALNUT

(1) SUSAN H. LEDFORD & JEROME CAPPS, DEED BOOK 2216 PAGE 470

(2) DONALD W. LINDSAY, DEED BOOK 1602 PAGE 605

(3) BALCRANK PRODUCTS, INC., DEED BOOK 1627 PAGE 14

(4) JEROME E. & PEGGY H. CAPPS, DEED BOOK 1089 PAGE 102

(5) LOUISA A. DYER & DEANNA HOLBERT, DEED BOOK 2749 PAGE 416, Tract II

(6) GARY C. & LINDA C. MORTON, DEED BOOK 2217 PAGE 739

(7) W. KEVIN & SALLY A SMITH, DEED BOOK 1255 PAGE 338

GLENN M. HYATT, DEED BOOK 1720 PAGE 57

DIANNE R. MOORE, DEED BOOK 1116 PAGE 342, Tract II

DIANNE R. MOORE, DEED BOOK 1116 PAGE 342, Tract I

NORTH BUNCOMBE FIRST CHURCH OF GOD, DEED BOOK 1580 PAGE 692

SHARON H. SILVERS & JERRY L. DEED BOOK 1504 PAGE 745

SHARON H. & JERRY L. SILVERS, DEED BOOK 1395 PAGE 354

BEVERLY R. WRIGHT, DEED BOOK 1122 PAGE 700

WILLIAM W. BANKS ET AL, DEED BOOK 1333 PAGE 86

TAMMY JUNE McMAHAN, BETTY C. McGIFFIN LIFE ESTATE, DEED BOOK 1240 PAGE 88, DEED BOOK 1975 PAGE 320

RUTH B DAVIS ET AL, DEED BOOK 3066 PAGE 579

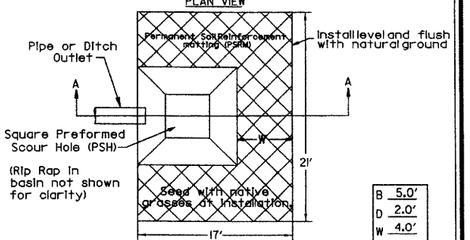
BARBARA SIMMONS, DEED BOOK 1133 PAGE 425

VIRGINIA M. MORTON ET AL, DEED BOOK 2217 PAGE 743

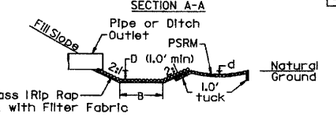
NC GRID NAD 83

DETAIL 5
PREFORMED SCOUR HOLE
(Not to Scale)

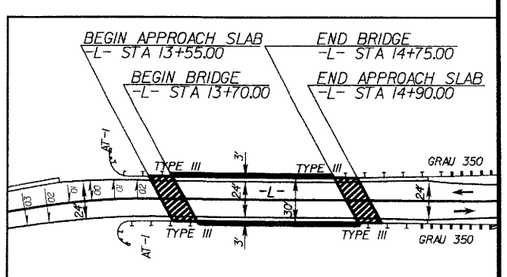
PLAN VIEW



SECTION A-A



-L- STA 15+25 (RT)



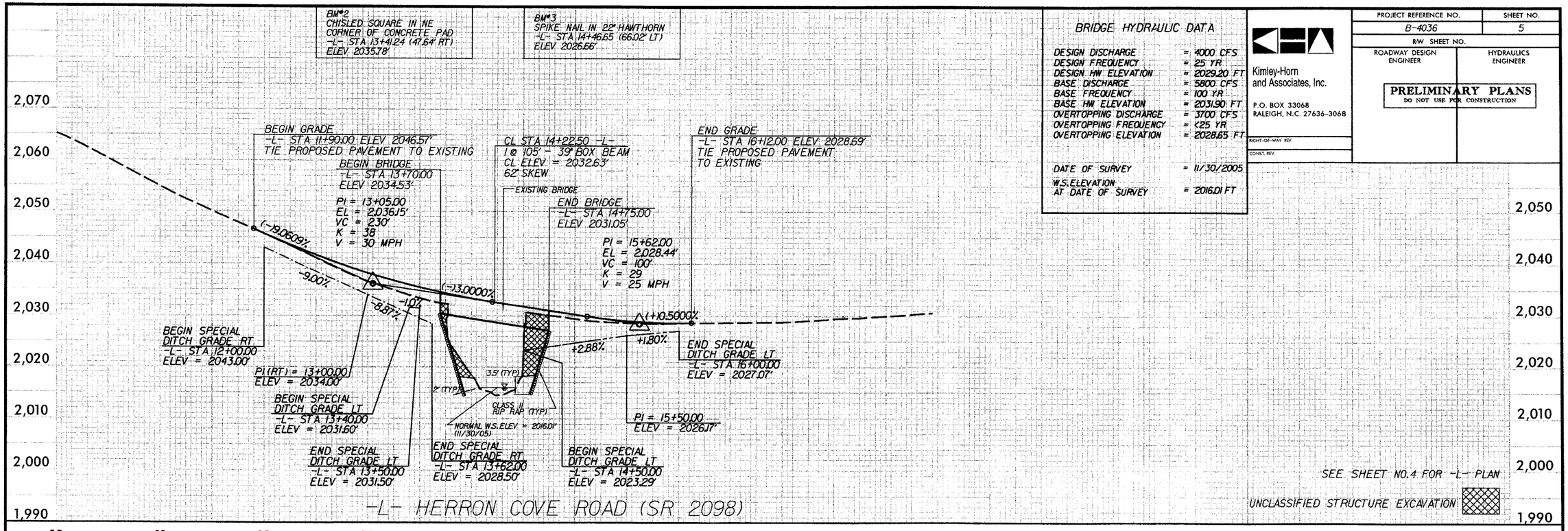
SKETCH SHOWING BRIDGE / PAVEMENT RELATIONSHIP

SEE SHEET NO.5 FOR -L- PROFILE

* DESIGN SPEED DESIGN EXCEPTION

R:\II\036II9\Roadway\Proj\B4036_rdy_pshdgn

7/27/2007



BRIDGE HYDRAULIC DATA

DESIGN DISCHARGE	= 4000 CFS
DESIGN FREQUENCY	= 25 YR
DESIGN HW ELEVATION	= 2029.20 FT
BASE DISCHARGE	= 5800 CFS
BASE FREQUENCY	= 100 YR
BASE HW ELEVATION	= 2031.90 FT
OVERTOPPING DISCHARGE	= 3700 CFS
OVERTOPPING FREQUENCY	= <25 YR
OVERTOPPING ELEVATION	= 2028.65 FT
DATE OF SURVEY	= 11/30/2005
W.S. ELEVATION AT DATE OF SURVEY	= 2016.01 FT

RIGHT-OF-WAY REV.

CONST. REV.

Kimley-Horn and Associates, Inc.
P.O. BOX 33068
RALEIGH, N.C. 27636-3068

PROJECT REFERENCE NO.	SHEET NO.
B-4036	5
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER

HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

SEE SHEET NO.4 FOR -L- PLAN

UNCLASSIFIED STRUCTURE EXCAVATION

APPROVED JURISDICTIONAL DETERMINATION FORM
U.S. Army Corps of Engineers

This form should be completed by following the instructions provided in Section IV of the JD Form Instructional Guidebook.

SECTION I: BACKGROUND INFORMATION

A. REPORT COMPLETION DATE FOR APPROVED JURISDICTIONAL DETERMINATION (JD):

B. DISTRICT OFFICE, FILE NAME, AND NUMBER: B-4036 (Bridge No. 220 over Reems Creek)

C. PROJECT LOCATION AND BACKGROUND INFORMATION:
State:NC County/parish/borough: Buncombe City: Weaverville
Center coordinates of site (lat/long in degree decimal format): Lat. 35'41'04"° **N**, Long. 82'33'40'° **W**.
Universal Transverse Mercator:
Name of nearest waterbody: Reems Creek
Name of nearest Traditional Navigable Water (TNW) into which the aquatic resource flows: French Broad River
Name of watershed or Hydrologic Unit Code (HUC): 06010105
☒ Check if map/diagram of review area and/or potential jurisdictional areas is/are available upon request.
☐ Check if other sites (e.g., offsite mitigation sites, disposal sites, etc…) are associated with this action and are recorded on a different JD form.

D. REVIEW PERFORMED FOR SITE EVALUATION (CHECK ALL THAT APPLY):
☐ Office (Desk) Determination. Date:
☐ Field Determination. Date(s):

SECTION II: SUMMARY OF FINDINGS

A. RHA SECTION 10 DETERMINATION OF JURISDICTION.

There **Appear to be no** *"navigable waters of the U.S."* within Rivers and Harbors Act (RHA) jurisdiction (as defined by 33 CFR part 329) in the review area. [*Required*]
☐ Waters subject to the ebb and flow of the tide.
☐ Waters are presently used, or have been used in the past, or may be susceptible for use to transport interstate or foreign commerce.
Explain: .

B. CWA SECTION 404 DETERMINATION OF JURISDICTION.

There **Are** *"waters of the U.S."* within Clean Water Act (CWA) jurisdiction (as defined by 33 CFR part 328) in the review area. [*Required*]

1. **Waters of the U.S.**
   a. **Indicate presence of waters of U.S. in review area (check all that apply):** [1]
      ☐ TNWs, including territorial seas
      ☐ Wetlands adjacent to TNWs
      ☒ Relatively permanent waters[2] (RPWs) that flow directly or indirectly into TNWs
      ☐ Non-RPWs that flow directly or indirectly into TNWs
      ☐ Wetlands directly abutting RPWs that flow directly or indirectly into TNWs
      ☐ Wetlands adjacent to but not directly abutting RPWs that flow directly or indirectly into TNWs
      ☐ Wetlands adjacent to non-RPWs that flow directly or indirectly into TNWs
      ☐ Impoundments of jurisdictional waters
      ☐ Isolated (interstate or intrastate) waters, including isolated wetlands

   b. **Identify (estimate) size of waters of the U.S. in the review area:**
      Non-wetland waters: 500 linear feet: 25 width (ft) and/or acres.
      Wetlands: acres.

   c. **Limits (boundaries) of jurisdiction** based on: **Established by OHWM.**
      Elevation of established OHWM (if known): .

2. **Non-regulated waters/wetlands (check if applicable):**[3]
   ☐ Potentially jurisdictional waters and/or wetlands were assessed within the review area and determined to be not jurisdictional.
   Explain: .

---

[1] Boxes checked below shall be supported by completing the appropriate sections in Section III below.
[2] For purposes of this form, an RPW is defined as a tributary that is not a TNW and that typically flows year-round or has continuous flow at least "seasonally" (e.g., typically 3 months).
[3] Supporting documentation is presented in Section III.F.

SECTION III: CWA ANALYSIS

A. TNWs AND WETLANDS ADJACENT TO TNWs

The agencies will assert jurisdiction over TNWs and wetlands adjacent to TNWs. If the aquatic resource is a TNW, complete Section III.A.1 and Section III.D.1. only; if the aquatic resource is a wetland adjacent to a TNW, complete Sections III.A.1 and 2 and Section III.D.1.; otherwise, see Section III.B below.

1. **TNW**
   Identify TNW: .

   Summarize rationale supporting determination: .

2. **Wetland adjacent to TNW**
   Summarize rationale supporting conclusion that wetland is "adjacent": .

B. CHARACTERISTICS OF TRIBUTARY (THAT IS NOT A TNW) AND ITS ADJACENT WETLANDS (IF ANY):

This section summarizes information regarding characteristics of the tributary and its adjacent wetlands, if any, and it helps determine whether or not the standards for jurisdiction established under *Rapanos* have been met.

The agencies will assert jurisdiction over non-navigable tributaries of TNWs where the tributaries are "relatively permanent waters" (RPWs), i.e. tributaries that typically flow year-round or have continuous flow at least seasonally (e.g., typically 3 months). A wetland that directly abuts an RPW is also jurisdictional. If the aquatic resource is not a TNW, but has year-round (perennial) flow, skip to Section III.D.2. If the aquatic resource is a wetland directly abutting a tributary with perennial flow, skip to Section III.D.4.

A wetland that is adjacent to but that does not directly abut an RPW requires a significant nexus evaluation. Corps districts and EPA regions will include in the record any available information that documents the existence of a significant nexus between a relatively permanent tributary that is not perennial (and its adjacent wetlands if any) and a traditional navigable water, even though a significant nexus finding is not required as a matter of law.

If the waterbody[4] is not an RPW, or a wetland directly abutting an RPW, a JD will require additional data to determine if the waterbody has a significant nexus with a TNW. If the tributary has adjacent wetlands, the significant nexus evaluation must consider the tributary in combination with all of its adjacent wetlands. This significant nexus evaluation that combines, for analytical purposes, the tributary and all of its adjacent wetlands is used whether the review area identified in the JD request is the tributary, or its adjacent wetlands, or both. If the JD covers a tributary with adjacent wetlands, complete Section III.B.1 for the tributary, Section III.B.2 for any onsite wetlands, and Section III.B.3 for all wetlands adjacent to that tributary, both onsite and offsite. The determination whether a significant nexus exists is determined in Section III.C below.

1. **Characteristics of non-TNWs that flow directly or indirectly into TNW**

   (i) General Area Conditions:
   Watershed size: **square miles**
   Drainage area: **square miles**
   Average annual rainfall: inches
   Average annual snowfall: inches

   (ii) Physical Characteristics:
   (a) Relationship with TNW:
   ☒ Tributary flows directly into TNW.
   ☐ Tributary flows through **10 (or more)** tributaries before entering TNW.

   Project waters are **30 (or more)** river miles from TNW.
   Project waters are **1 (or less)** river miles from RPW.
   Project waters are **30 (or more)** aerial (straight) miles from TNW.
   Project waters are **1 (or less)** aerial (straight) miles from RPW.
   Project waters cross or serve as state boundaries. Explain: .

   Identify flow route to TNW[5]: .
   Tributary stream order, if known: .

---

[4] Note that the Instructional Guidebook contains additional information regarding swales, ditches, washes, and erosional features generally and in the arid West.

[5] Flow route can be described by identifying, e.g., tributary a, which flows through the review area, to flow into tributary b, which then flows into TNW.

(b) General Tributary Characteristics (check all that apply):

Tributary is:
- ☐ Natural
- ☐ Artificial (man-made). Explain: .
- ☐ Manipulated (man-altered). Explain: .

Tributary properties with respect to top of bank (estimate):
- Average width: feet
- Average depth: feet
- Average side slopes: **Vertical (1:1 or less).**

Primary tributary substrate composition (check all that apply):
- ☐ Silts
- ☐ Sands
- ☐ Concrete
- ☐ Cobbles
- ☐ Gravel
- ☐ Muck
- ☐ Bedrock
- ☐ Vegetation. Type/% cover:
- ☐ Other. Explain: .

Tributary condition/stability [e.g., highly eroding, sloughing banks]. Explain: .
Presence of run/riffle/pool complexes. Explain: .
Tributary geometry: **Relatively straight**
Tributary gradient (approximate average slope): %

(c) Flow:

Tributary provides for: **Intermittent but not seasonal flow**
Estimate average number of flow events in review area/year: **20 (or greater)**
Describe flow regime: .
Other information on duration and volume: .

Surface flow is: **Discrete and confined.** Characteristics: .

Subsurface flow: **Unknown**. Explain findings: .
- ☐ Dye (or other) test performed: .

Tributary has (check all that apply):
- ☐ Bed and banks
- ☐ OHWM[6] (check all indicators that apply):
  - ☐ clear, natural line impressed on the bank
  - ☐ changes in the character of soil
  - ☐ shelving
  - ☐ vegetation matted down, bent, or absent
  - ☐ leaf litter disturbed or washed away
  - ☐ sediment deposition
  - ☐ water staining
  - ☐ other (list):
  - ☐ the presence of litter and debris
  - ☐ destruction of terrestrial vegetation
  - ☐ the presence of wrack line
  - ☐ sediment sorting
  - ☐ scour
  - ☐ multiple observed or predicted flow events
  - ☐ abrupt change in plant community
- ☐ Discontinuous OHWM.[7] Explain: .

If factors other than the OHWM were used to determine lateral extent of CWA jurisdiction (check all that apply):
- ☒ High Tide Line indicated by:
  - ☐ oil or scum line along shore objects
  - ☐ fine shell or debris deposits (foreshore)
  - ☐ physical markings/characteristics
  - ☐ tidal gauges
  - ☐ other (list):
- ☒ Mean High Water Mark indicated by:
  - ☐ survey to available datum;
  - ☐ physical markings;
  - ☐ vegetation lines/changes in vegetation types.

(iii) Chemical Characteristics:

Characterize tributary (e.g., water color is clear, discolored, oily film; water quality; general watershed characteristics, etc.).
Explain: .
Identify specific pollutants, if known: .

---

[6]A natural or man-made discontinuity in the OHWM does not necessarily sever jurisdiction (e.g., where the stream temporarily flows underground, or where the OHWM has been removed by development or agricultural practices). Where there is a break in the OHWM that is unrelated to the waterbody's flow regime (e.g., flow over a rock outcrop or through a culvert), the agencies will look for indicators of flow above and below the break.
[7]Ibid.

(iv) Biological Characteristics. Channel supports (check all that apply):

- ☐ Riparian corridor. Characteristics (type, average width): .
- ☐ Wetland fringe. Characteristics: .
- ☐ Habitat for:
  - ☐ Federally Listed species. Explain findings: .
  - ☐ Fish/spawn areas. Explain findings: .
  - ☐ Other environmentally-sensitive species. Explain findings: .
  - ☐ Aquatic/wildlife diversity. Explain findings: .

2. Characteristics of wetlands adjacent to non-TNW that flow directly or indirectly into TNW

(i) Physical Characteristics:

(a) General Wetland Characteristics:

Properties:

Wetland size: acres

Wetland type. Explain: .

Wetland quality. Explain: .

Project wetlands cross or serve as state boundaries. Explain: .

(b) General Flow Relationship with Non-TNW:

Flow is: **Intermittent flow**. Explain: .

Surface flow is: **Discrete and confined**

Characteristics: .

Subsurface flow: **Unknown**. Explain findings: .

- ☐ Dye (or other) test performed: .

(c) Wetland Adjacency Determination with Non-TNW:

- ☐ Directly abutting
- ☐ Not directly abutting
  - ☐ Discrete wetland hydrologic connection. Explain: .
  - ☐ Ecological connection. Explain: .
  - ☐ Separated by berm/barrier. Explain: .

(d) Proximity (Relationship) to TNW

Project wetlands are **30 (or more)** river miles from TNW.

Project waters are **30 (or more)** aerial (straight) miles from TNW.

Flow is from: **Wetland to/from navigable waters.**

Estimate approximate location of wetland as within the **500-year or greater** floodplain.

(ii) Chemical Characteristics:

Characterize wetland system (e.g., water color is clear, brown, oil film on surface; water quality; general watershed characteristics; etc.). Explain: .

Identify specific pollutants, if known: .

(iii) Biological Characteristics. Wetland supports (check all that apply):

- ☐ Riparian buffer. Characteristics (type, average width): .
- ☐ Vegetation type/percent cover. Explain: .
- ☐ Habitat for:
  - ☐ Federally Listed species. Explain findings: .
  - ☐ Fish/spawn areas. Explain findings: .
  - ☐ Other environmentally-sensitive species. Explain findings: .
  - ☐ Aquatic/wildlife diversity. Explain findings: .

3. Characteristics of all wetlands adjacent to the tributary (if any)

All wetland(s) being considered in the cumulative analysis: **30 (or more)**

Approximately ( ) acres in total are being considered in the cumulative analysis.

For each wetland, specify the following:

Directly abuts? (Y/N)	Size (in acres)	Directly abuts? (Y/N)	Size (in acres)

Summarize overall biological, chemical and physical functions being performed: .

C. SIGNIFICANT NEXUS DETERMINATION

A significant nexus analysis will assess the flow characteristics and functions of the tributary itself and the functions performed by any wetlands adjacent to the tributary to determine if they significantly affect the chemical, physical, and biological integrity of a TNW. For each of the following situations, a significant nexus exists if the tributary, in combination with all of its adjacent wetlands, has more than a speculative or insubstantial effect on the chemical, physical and/or biological integrity of a TNW. Considerations when evaluating significant nexus include, but are not limited to the volume, duration, and frequency of the flow of water in the tributary and its proximity to a TNW, and the functions performed by the tributary and all its adjacent wetlands. It is not appropriate to determine significant nexus based solely on any specific threshold of distance (e.g. between a tributary and its adjacent wetland or between a tributary and the TNW). Similarly, the fact an adjacent wetland lies within or outside of a floodplain is not solely determinative of significant nexus.

Draw connections between the features documented and the effects on the TNW, as identified in the *Rapanos* Guidance and discussed in the Instructional Guidebook. Factors to consider include, for example:

- Does the tributary, in combination with its adjacent wetlands (if any), have the capacity to carry pollutants or flood waters to TNWs, or to reduce the amount of pollutants or flood waters reaching a TNW?
- Does the tributary, in combination with its adjacent wetlands (if any), provide habitat and lifecycle support functions for fish and other species, such as feeding, nesting, spawning, or rearing young for species that are present in the TNW?
- Does the tributary, in combination with its adjacent wetlands (if any), have the capacity to transfer nutrients and organic carbon that support downstream foodwebs?
- Does the tributary, in combination with its adjacent wetlands (if any), have other relationships to the physical, chemical, or biological integrity of the TNW?

Note: the above list of considerations is not inclusive and other functions observed or known to occur should be documented below:

1. **Significant nexus findings for non-RPW that has no adjacent wetlands and flows directly or indirectly into TNWs.** Explain findings of presence or absence of significant nexus below, based on the tributary itself, then go to Section III.D: .

2. **Significant nexus findings for non-RPW and its adjacent wetlands, where the non-RPW flows directly or indirectly into TNWs.** Explain findings of presence or absence of significant nexus below, based on the tributary in combination with all of its adjacent wetlands, then go to Section III.D: .

3. **Significant nexus findings for wetlands adjacent to an RPW but that do not directly abut the RPW.** Explain findings of presence or absence of significant nexus below, based on the tributary in combination with all of its adjacent wetlands, then go to Section III.D: .

D. DETERMINATIONS OF JURISDICTIONAL FINDINGS. THE SUBJECT WATERS/WETLANDS ARE (CHECK ALL THAT APPLY):

1. **TNWs and Adjacent Wetlands.** Check all that apply and provide size estimates in review area:
   - ☐ TNWs: linear feet width (ft), Or, acres.
   - ☐ Wetlands adjacent to TNWs: acres.

2. **RPWs that flow directly or indirectly into TNWs.**
   - ☒ Tributaries of TNWs where tributaries typically flow year-round are jurisdictional. Provide data and rationale indicating that tributary is perennial: NCDWQ stream form score of 39.
   - ☐ Tributaries of TNW where tributaries have continuous flow "seasonally" (e.g., typically three months each year) are jurisdictional. Data supporting this conclusion is provided at Section III.B. Provide rationale indicating that tributary flows seasonally: .

Provide estimates for jurisdictional waters in the review area (check all that apply):
- ☒ Tributary waters: **500** linear feet **25** width (ft).
- ☐ Other non-wetland waters: acres.
  Identify type(s) of waters: .

3. **Non-RPWs[8] that flow directly or indirectly into TNWs.**
   ☐ Waterbody that is not a TNW or an RPW, but flows directly or indirectly into a TNW, and it has a significant nexus with a TNW is jurisdictional. Data supporting this conclusion is provided at Section III.C.

   Provide estimates for jurisdictional waters within the review area (check all that apply):
   - ☐ Tributary waters: linear feet width (ft).
   - ☐ Other non-wetland waters: acres.
     Identify type(s) of waters: .

4. **Wetlands directly abutting an RPW that flow directly or indirectly into TNWs.**
   ☐ Wetlands directly abut RPW and thus are jurisdictional as adjacent wetlands.
   - ☐ Wetlands directly abutting an RPW where tributaries typically flow year-round. Provide data and rationale indicating that tributary is perennial in Section III.D.2, above. Provide rationale indicating that wetland is directly abutting an RPW: .

   - ☐ Wetlands directly abutting an RPW where tributaries typically flow "seasonally." Provide data indicating that tributary is seasonal in Section III.B and rationale in Section III.D.2, above. Provide rationale indicating that wetland is directly abutting an RPW: .

   Provide acreage estimates for jurisdictional wetlands in the review area: acres.

5. **Wetlands adjacent to but not directly abutting an RPW that flow directly or indirectly into TNWs.**
   ☐ Wetlands that do not directly abut an RPW, but when considered in combination with the tributary to which they are adjacent and with similarly situated adjacent wetlands, have a significant nexus with a TNW are jurisidictional. Data supporting this conclusion is provided at Section III.C.

   Provide acreage estimates for jurisdictional wetlands in the review area: acres.

6. **Wetlands adjacent to non-RPWs that flow directly or indirectly into TNWs.**
   ☐ Wetlands adjacent to such waters, and have when considered in combination with the tributary to which they are adjacent and with similarly situated adjacent wetlands, have a significant nexus with a TNW are jurisdictional. Data supporting this conclusion is provided at Section III.C.

   Provide estimates for jurisdictional wetlands in the review area: acres.

7. **Impoundments of jurisdictional waters.[9]**
   As a general rule, the impoundment of a jurisdictional tributary remains jurisdictional.
   - ☐ Demonstrate that impoundment was created from "waters of the U.S.," or
   - ☐ Demonstrate that water meets the criteria for one of the categories presented above (1-6), or
   - ☐ Demonstrate that water is isolated with a nexus to commerce (see E below).

E. ISOLATED [INTERSTATE OR INTRA-STATE] WATERS, INCLUDING ISOLATED WETLANDS, THE USE, DEGRADATION OR DESTRUCTION OF WHICH COULD AFFECT INTERSTATE COMMERCE, INCLUDING ANY SUCH WATERS (CHECK ALL THAT APPLY):[10]
- ☐ which are or could be used by interstate or foreign travelers for recreational or other purposes.
- ☐ from which fish or shellfish are or could be taken and sold in interstate or foreign commerce.
- ☐ which are or could be used for industrial purposes by industries in interstate commerce.
- ☐ Interstate isolated waters. Explain: .
- ☐ Other factors. Explain: .

Identify water body and summarize rationale supporting determination: .

---

[8] See Footnote # 3.
[9] To complete the analysis refer to the key in Section III.D.6 of the Instructional Guidebook.
[10] **Prior to asserting or declining CWA jurisdiction based solely on this category, Corps Districts will elevate the action to Corps and EPA HQ for review consistent with the process described in the Corps/EPA *Memorandum Regarding CWA Act Jurisdiction Following Rapanos.***

Provide estimates for jurisdictional waters in the review area (check all that apply):
- ☐ Tributary waters: linear feet width (ft).
- ☐ Other non-wetland waters: acres.
  - Identify type(s) of waters: .
- ☐ Wetlands: acres.

F. NON-JURISDICTIONAL WATERS, INCLUDING WETLANDS (CHECK ALL THAT APPLY):
- ☐ If potential wetlands were assessed within the review area, these areas did not meet the criteria in the 1987 Corps of Engineers Wetland Delineation Manual and/or appropriate Regional Supplements.
- ☐ Review area included isolated waters with no substantial nexus to interstate (or foreign) commerce.
  - ☐ Prior to the Jan 2001 Supreme Court decision in "*SWANCC*," the review area would have been regulated based solely on the "Migratory Bird Rule" (MBR).
- ☐ Waters do not meet the "Significant Nexus" standard, where such a finding is required for jurisdiction. Explain: .
- ☐ Other: (explain, if not covered above): .

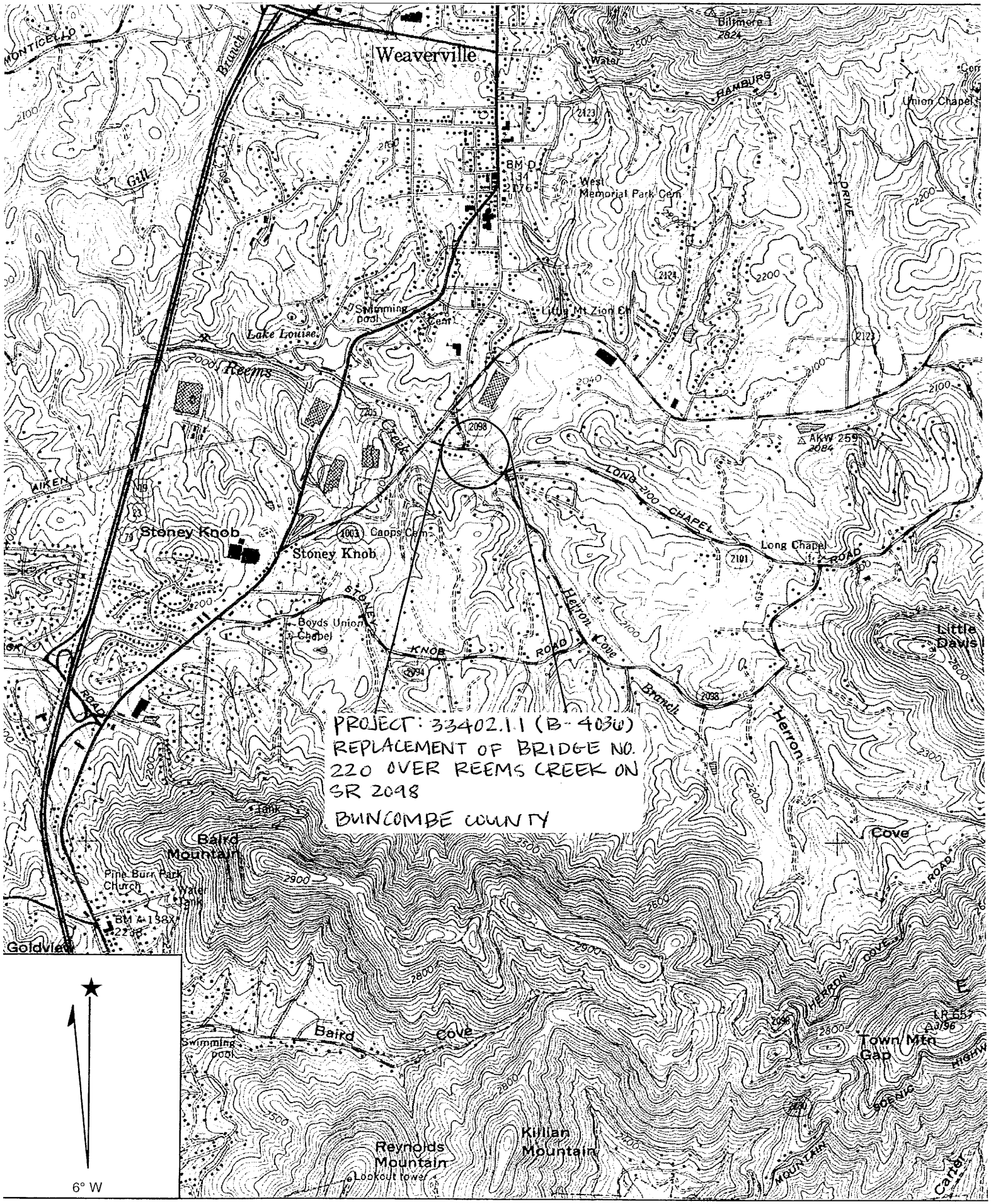
Provide acreage estimates for non-jurisdictional waters in the review area, where the sole potential basis of jurisdiction is the MBR factors (i.e., presence of migratory birds, presence of endangered species, use of water for irrigated agriculture), using best professional judgment (check all that apply):
- ☐ Non-wetland waters (i.e., rivers, streams): linear feet width (ft).
- ☐ Lakes/ponds: acres.
- ☐ Other non-wetland waters: acres. List type of aquatic resource: .
- ☐ Wetlands: acres.

Provide acreage estimates for non-jurisdictional waters in the review area that do not meet the "Significant Nexus" standard, where such a finding is required for jurisdiction (check all that apply):
- ☐ Non-wetland waters (i.e., rivers, streams): linear feet, width (ft).
- ☐ Lakes/ponds: acres.
- ☐ Other non-wetland waters: acres. List type of aquatic resource: .
- ☐ Wetlands: acres.

SECTION IV: DATA SOURCES.

A. SUPPORTING DATA. Data reviewed for JD (check all that apply - checked items shall be included in case file and, where checked and requested, appropriately reference sources below):
- ☐ Maps, plans, plots or plat submitted by or on behalf of the applicant/consultant: .
- ☐ Data sheets prepared/submitted by or on behalf of the applicant/consultant.
  - ☐ Office concurs with data sheets/delineation report.
  - ☐ Office does not concur with data sheets/delineation report.
- ☐ Data sheets prepared by the Corps: .
- ☐ Corps navigable waters' study: .
- ☐ U.S. Geological Survey Hydrologic Atlas: .
  - ☐ USGS NHD data.
  - ☐ USGS 8 and 12 digit HUC maps.
- ☐ U.S. Geological Survey map(s). Cite scale & quad name: .
- ☐ USDA Natural Resources Conservation Service Soil Survey. Citation: .
- ☐ National wetlands inventory map(s). Cite name: .
- ☐ State/Local wetland inventory map(s): .
- ☐ FEMA/FIRM maps: .
- ☐ 100-year Floodplain Elevation is: (National Geodectic Vertical Datum of 1929)
- ☐ Photographs: ☐ Aerial (Name & Date): .
  - or ☐ Other (Name & Date): .
- ☐ Previous determination(s). File no. and date of response letter: .
- ☐ Applicable/supporting case law: .
- ☐ Applicable/supporting scientific literature: .
- ☐ Other information (please specify): .

B. ADDITIONAL COMMENTS TO SUPPORT JD: .



Name: WEAVERVILLE
Date: 2/27/2007
Scale: 1 inch equals 2000 feet

Permit Drawing
Sheet 2 of 8

Location: 035° 40' 39.4" N 082° 33' 37.7" W
Caption: Project: 33402.1.1 (B-4036)
Replacement of Bridge No. 220 Over Reems Cr. on SR 2098

Buncombe County

Bridge No. 220 on SR 2098 over Reems Creek

Federal-Aid Project No. BRZ-2098(1)

State Project 8.2844601

WBS Project # 33402.1.1

TIP Project No. B-4036

CATEGORICAL EXCLUSION

April 2006

Document Prepared by:
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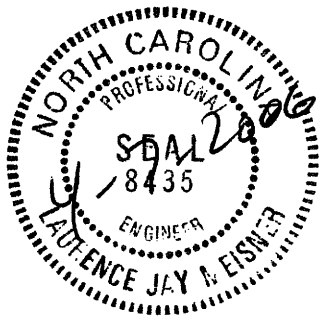
Senior Vice President



For the North Carolina Department of Transportation

Joseph Miller, P.E.
Project Manager
Western Region Project Development Unit

PROJECT COMMITMENTS

Buncombe County
Bridge No. 220 on SR 2098 over Reems Creek
Federal-Aid Project No. BRZ-2098(1)
State Project 8.2844601
WBS # 33402.1.1
TIP Project No. B-4036

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

Project Development and Environmental Analysis Branch:

Approval under Section 26a of the Tennessee Valley Authority (TVA) Act will be required. A copy of the approved Categorical Exclusion (CE) will be provided to the TVA.

Division Construction/Project Services Unit:

There will be an in-stream and 25-foot buffer work moratorium from October 15 to April 15.

The "Guidelines for Construction of Highway Improvements Adjacent to or Crossing Trout Waters in North Carolina" (October 27, 1992) will be adhered to throughout design and construction of this project.

Buncombe County
SR 2098
Bridge No. 220 Over Reems Creek
Federal-Aid Project No. BRZ-2098(1)
State Project No. 8.2844601
WBS Project No. 33402.1.1
T.I.P. No. B-4036

INTRODUCTION: The replacement of Bridge No. 220 is included in the 2006-2012 North Carolina Department of Transportation (NCDOT) Transportation Improvement Program (TIP) and the Federal-Aid Bridge Replacement Program. The location is shown in Figure 1. No substantial environmental impacts are anticipated. The project is classified as a Federal "Categorical Exclusion."

I. PURPOSE AND NEED STATEMENT

Bridge Maintenance Unit records indicate the bridge has a sufficiency rating of 40.0 out of a possible 100 for a new structure. The bridge is considered functionally obsolete and structurally deficient. The replacement of this inadequate structure will result in safer and more efficient traffic operations.

II. EXISTING CONDITIONS

Bridge No. 220 is located on SR 2098 (Herron Cove Road) in Buncombe County. SR 2098 is classified as a rural local route in the Statewide Functional Classification System. Land use in the project area is woodland and residential. Private residences and maintained yards are located in the southeast, southwest and northwest quadrants. There is an old barn located northeast of the bridge.

There is a water line, sewer line, phone lines and aerial power lines located on the downstream (west) side (Figure 4). Utility impacts are expected to be high.

Bridge No. 220 was constructed in 1960. The existing structure is 76.6 feet in length and consists of two spans with the maximum span at approximately 40.8 feet. The clear roadway width is 19 feet, providing two travel lanes with no effective shoulder width. The existing right of way width is 60 feet. The superstructure of Bridge No. 220 consists of a timber floor on I-beams with an asphalt wearing surface and timber railing. The substructure of the bridge consists of reinforced concrete abutments, and one interior bent consisting of a timber cap on timber piles with concrete sills. The bed to crown height is approximately 16 feet. The normal depth of flow is 1.5 feet. The posted weight limit is 15 tons for single vehicles and 20 tons for truck-tractor semi-trailers.

The approach roadway from the northwest is on a horizontal curve with a length of 214 feet using a radius of 250 feet before entering a 55-foot tangent in advance of the bridge. The approach roadway from the southeast is on a horizontal curve with a length of 255

feet using a radius of 180 feet before entering a 141-foot tangent in advance of the bridge. Residential driveways are located less than 50 feet from the north end of the bridge and a residential driveway is located 100 feet from the south end of the bridge to the east side of the road. The speed limit on SR 2098 (Herron Cove Road) in the vicinity of the bridge is not posted, therefore a statutory speed limit of 55 miles per hour (mph) applies.

The estimated 2004 average daily traffic volume is 1,700 vehicles per day (vpd). The projected traffic volume is expected to increase to 3,100 vpd by the design year 2030. The volumes include 1 percent TTST and 3 percent dual tired vehicles.

This section of SR 2098 in Buncombe County is not part of a designated bicycle route and is not listed in the TIP as needing incidental bicycle accommodations. Five (5) school buses cross this bridge four (4) times daily for a total of twenty (20) daily trips.

There were two (2) accidents reported for the three-year period from September 1, 2001 through August 31, 2004.

III. ALTERNATIVES

A. Project Description

The proposed replacement structure for Bridge No. 220 is a three-span sloping abutment bridge. It is anticipated that the bridge length will be approximately 110 feet. The final bridge length and type will be determined during final design. The proposed bridge will consist of two 12-foot travel lanes with eight-foot shoulders.

The drainage area for the bridge is 26.4 square miles and is located in a FEMA Detailed Study area. The channel geometry is such that there is a large floodplain on the East side and a small floodplain on the West side. The length and opening size of the proposed structure may increase or decrease as necessary to accommodate peak flows, as determined by a detailed hydraulic analysis to be performed during the final design phase of the project.

The proposed approach roadway will consist of a 40-foot travelway providing two 12-foot travel lanes with eight-foot shoulders (Figure 3). The proposed right-of-way width is variable. The design speed will be 60 mph.

B. Build Alternatives

Two (2) build alternatives studied for replacing the existing bridge are described below.

Alternative 1 (Preferred – Figure 2A) replaces the existing bridge in-place while maintaining traffic with an off-site detour. In Alternative 1, the bridge is replaced with roadway improvements at the existing location. The detour route includes SR 2094 (Stoney Knob Road) to the south and SR 1003 (Reems Creek Road) to

the north, both providing access to Old Business 19-23 (Weaverville Highway) along a 2.7-mile route.

Alternative 2 (Figure 2B) replaces the existing bridge on new alignment 45 feet downstream of the existing bridge while maintaining traffic on the existing bridge during construction. Alternative 2 was not selected as the preferred because it is not cost-effective and increases impacts to adjacent properties.

C. Alternatives Eliminated from Further Study

The "Do-Nothing" Alternative will eventually necessitate removal of the bridge. This is not desirable due to the traffic service provided by SR 2098.

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

D. Preferred Alternative

Alternative 1 was selected as the preferred alternative because it is more cost-effective and provides less impact to adjacent properties than Alternative 2. The Division Engineer concurs with Alternative 1 as the preferred alternative.

IV. ESTIMATED COSTS

The estimated costs, based on current 2004 prices, are as follows:

	Alternative 1 (Preferred)	Alternative 2
Structure Removal (existing)	$15,400.00	$15,400.00
Structure (proposed)	$264,000.00	$264,000.00
Roadway approaches	$173,550.00	$190,620.00
Miscellaneous and Mobilization	$119,050.00	$127,980.00
Engineering and Contingencies	$78,000.00	$102,000.00
ROW/Const. Easements/Utilities	$310,000.00	$342,500.00
Total	$960,000.00	$1,042,500.00

The estimated cost of the project, as shown in the 2006-2012 Transportation Improvement Program, is $1,130,000 including $330,000 for right-of-way and $700,000 for construction.

V. NATURAL RESOURCES

A. Methodology

Field investigations were conducted along the project study area on October 10, 2003. Pedestrian surveys were undertaken to determine natural resource conditions and to document natural communities, wildlife, and the presence of protected species or their habitats.

Published information regarding the project study area and region was derived from a number of sources including: United States Geological Survey (USGS) 7.5-minute topographical quadrangle map (Weaverville, North Carolina), United States Fish and Wildlife Service (USFWS) database reviews, National Wetland Inventory (NWI) map, NCDOT aerial photography (1" = 200'), and Natural Resources Conservation Service (NRCS) soil survey mapping of Buncombe County.

Surface waters within the project study area were evaluated in the field to document their physical characteristics and jurisdictional status. Water resources information was obtained from publications of the North Carolina Department of Environment and Natural Resources Division of Water Quality (NCDENR-DWQ).

Approximate boundaries of plant communities were mapped in the field utilizing aerial photography of the project study area. Dominant plant species were identified in each strata for each plant community. Plant community descriptions are based on the classifications utilized by Schafale and Weakley (1990). Plant names follow the nomenclature found in Radford *et al.* (1968).

Wildlife occurrences were determined through visual field observations, evaluation of habitat-types within the project study area, secondary indicators of species (tracks, scat, and burrows), as well as a review of supporting literature (Coe, 1994, Martof, *et al*, 1980, and Webster, 1985). Field observations and literature reviews (Bogan, 2002, Jenkins and Burkhead, 1993, Voshell, Jr., 2002) were utilized to assess aquatic life.

Information concerning the potential occurrence of federal and state protected species within the project study area and project vicinity was obtained from the USFWS list of protected species (updated February 5, 2003 – current update as of November 9, 2004) and the North Carolina Natural Heritage Program (NCNHP) database of rare species and unique habitats (updated January 2004 – current update as of November 9, 2004). Field evaluations of the project study area were conducted to identify suitable habitat for protected species. If suitable habitat was identified, field surveys were conducted for federally listed endangered or threatened species.

Jurisdictional wetlands were identified and delineated based on the methodology outlined in the *1987 Corps of Engineers Wetlands Delineation Manual* (Environmental Laboratory, 1987). Wetland systems were classified based on the U.S. Fish and Wildlife Service *Classification of Wetlands and Deepwater Habitats of the United States* (Cowardin, *et al*, 1979).

B. Physiography and Soils

Buncombe County is situated in the Blue Ridge Mountain physiographic province of western North Carolina. The county encompasses 646 square miles and is primarily rural. The county ranges in elevation from approximately 1,900 feet mean sea level (MSL) where the Broad River flows into adjoining Henderson County to over 6,000 feet MSL. Elevations within the project study area range from approximately 2,020 to 2,040 feet MSL. The land uses surrounding and within the project study area are residential homes interspersed with forested and agricultural land.

The geologic features underlying the project study area are associated with the Blue Ridge Belt, specifically, muscovite-biotite gneiss which is sulfidic and interlayered with mica schist, minor amphibolite, and hornblende gneiss rock (North Carolina Division of Land Resources, 1985). The project vicinity is located within the Oconee Supergroup.

The portion of Buncombe County within the project study area has been mapped by NRCS under the currently provisional (unpublished) soil survey. Official soil series descriptions were obtained from the NRCS. A brief description of unofficial soil types mapped by NRCS and/or observed during field investigation is as follows:

The Evard-Urban land complex (2 to 8 percent slopes) consists mainly of very deep, well-drained, sandy loams on narrow to medium ridge tops and irregular or convex slopes. The surface layer is typically brown loam up to 5.0 inches thick. Permeability is moderate and surface runoff is low to medium. The Evard-Urban land complex occurs along moderate slopes within the western portion of the project study area.

Rosman fine sandy loam (0 to 3 percent slopes) consists mainly of very deep, well-drained to moderately well-drained soils on nearly level floodplains. The surface layer is typically dark brown loam up to 15 inches thick. Permeability is moderately rapid and surface runoff is slow. In the project study area, Rosman fine sandy loam occurs along the floodplain of Reems Creek.

French loam (0 to 3 percent slopes) consists of very deep, somewhat poorly drained soils on nearly level floodplains. The surface layer is typically dark brown loam up to 12 inches thick. Permeability is moderate and surface runoff is medium. French loam occurs along the floodplain of Herron Cove Branch (a

tributary to Reems Creek) in the eastern portion of the project area.

French loam and Rosman fine sandy loam are not listed as hydric soils of Buncombe County; however, they are listed as soil units that typically contain inclusions of hydric soils (USDA, 1995).

C. Water Resources

1. Waters Impacted

Streams, creeks, and tributaries within the project vicinity are part of the Reems Creek watershed within the French Broad River Basin. The French Broad River basin covers approximately 2,842 square miles.

Reems Creek and Herron Cove Branch account for the surface waters in the project study area. The project study area is situated upstream of the confluence of Reems Creek and the Pigeon River. It is located in NCDWQ Subbasin 04-03-02 and USGS Hydrologic Unit 06010105 (NCDWQ 2003). This section of Reems Creek from just south of the intersection of Reem's Creek Road (SR 2098) and Eller Road (SR 2191) to US 23, which includes the project study area, has been assigned by the NCDWQ the Stream Index # 6-87-1 (NCDWQ 2003).

The NCDWQ classifies surface waters of the state based on their intended best uses. Reems Creek and Herron Cove Branch in the project vicinity has been assigned a primary water resource classification of "C-Tr" (NCDWQ 2003). Class "C" refers to waters that are protected for secondary recreation, fishing, wildlife, fish and aquatic life propagation and survival, agriculture, and other uses found suitable for Class "C" waters. Secondary recreation includes wading, boating, and other uses involving human body contact with water where such activities take place in an infrequent, unorganized, or incidental manner. There are no restrictions on watershed development or types of discharges in Class "C" waters. The surface water classification of "Tr" is a supplemental classification intended to protect freshwaters for natural trout propagation and survival of stocked trout. No surface waters classified as High Quality Water (HQW), Water Supplies (WS-I or WS-II), or Outstanding Resource Waters (ORW) occur within one mile of the project area (NCDWQ 2003). Reems Creek and Herron Cove Branch are not designated as essential fish habitat and do not contain anadromous and warm water fish species.

2. Water Resource Characteristics

Reems Creek is a perennial stream that flows generally in a southwesterly direction. The top of bank width is approximately 25 feet wide with a

wetted width of 15 to 20 feet. One to two feet of moderately flowing water was observed within the channel during the site visit. Reems Creek has a bankfull depth of 4 feet throughout the project study area. The 3 to 5 feet tall stream banks appeared stable. The substrate consisted of silt and sand with cobble and gravel riffle sections. The water was clear with moderate sediment deposition. The channel morphology exhibits strong indicators of a perennial channel. Excellent habitat conditions exist within the channel for numerous aquatic species. The stream received a NCDWQ stream classification of 39 and a USACE stream quality score of 72. NCDWQ stream classification forms are contained in the Appendix. USACE Stream Quality Assessment worksheets are located in the Appendix.

Based on Rosgen classification methods and field observation, Reems Creek is an "F" channel. It is entrenched with a meandering, riffle/pool channel on a low gradient with a high width/depth ratio.

Herron Cove Branch is a perennial stream that flows generally in a northwest direction into Reems Creek 100 feet downstream of the bridge. The top of bank width is approximately 15 feet wide with a wetted width of 10 feet. Less than one foot of moderately flowing water was observed within the channel during the site visit. Herron Cove Branch has a bankfull depth of two feet throughout the project study area. The 3 to 6 feet tall stream banks appeared stable. The substrate consisted of silt and sand with cobble and gravel riffle sections. The water was clear with moderate sediment deposition. The stream received a NCDWQ stream classification of 33.5 and a USACE stream quality score of 72. NCDWQ stream classification forms are contained in the Appendix. USACE stream quality assessment worksheets are located in the Appendix.

Based on Rosgen classification methods and field observation, Herron Cove Branch is a "G" channel. It is an entrenched, narrow, and deep, step/pool channel with low sinuosity.

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. No AMS monitoring stations exist on Reems Creek within the project area or upstream of the project within the project vicinity (NCDWQ 2003).

Point source dischargers located 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 (2003), there are two permitted NPDES dischargers in the subbasin, with one of those being a major discharger

(>0.5 MGD). However, there are no registered point discharges are located in or directly upstream of the project study area.

Nonpoint source discharge refers to runoff that enters surface waters through stormwater, snowmelt or atmospheric deposition. Land use activities such as land development, construction, mining operations, crop production, animal feeding lots, failing septic systems, landfills, roads and parking lots are contributors of nonpoint source pollutants. The land uses surrounding and within the project study area are residential homes with forest and agricultural land. Nonpoint source pollution from the residential areas may include lawn fertilizer, failing septic systems, and sediment.

3. Anticipated Impacts to Water Resources

a) General Impacts

The proposed project is expected to impact both soils and topography. The topography within the project study area is gently sloping. The construction of a new bridge and/or road improvements is likely to require the removal of soils and the placement of fill. No adverse long-term impacts to soils and topography are expected from the proposed bridge replacement.

The primary sources of water-quality degradation in rural areas are agricultural operations and construction. Aquatic organisms are very sensitive to discharges and inputs resulting from construction. Potential impacts associated with construction of the proposed project include: increased sedimentation, scouring of the streambed, soil compaction, and loss of shading due to vegetation removal. Increased sedimentation from lateral flows is also expected. Measures to minimize these potential impacts include the formulation of 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* and Sedimentation Control guidelines will be strictly enforced during the construction stages of the project.

NCDOT will strictly adhere to North Carolina's "*Design Standards in Sensitive Watersheds*" (15A NCAC 04B .0024) throughout design and construction of the project because of the classification as trout waters. Due to the potential for water quality impacts during construction, North Carolina Wildlife Resources Commission (NCWRC) requests an in-stream construction moratorium to limit the effects on fishery resources.

The NCWRC has requested an in-stream and 25-foot buffer work moratorium from October 15 to April 15 for trout.

4. Impacts Related to Bridge Demolition and Removal

The superstructure of Bridge No. 220 consists of a timber floor on I-beams with an asphalt wearing surface and timber railing. The substructure of the bridge consists of reinforced concrete abutments, and one interior bent consisting of a timber cap on timber piles with concrete sills. The bridge has 2 unequal spans that total 77 feet in length.

It should be possible for the superstructure and substructure elements to be removed without resulting in any temporary fill in "Waters of the United States" during demolition and removal. The superstructure and substructure elements noted above can be cut and removed without any temporary fill falling into Reems Creek during demolition.

D. Biotic Resources

This section describes the existing vegetation and associated wildlife that occur within the project study area. The project study area is composed two vegetative communities based on topography, soils, hydrology, and disturbance. These systems are interrelated and in many aspects interdependent. Scientific nomenclature and common name (when applicable) are provided for each plant and animal species listed. Subsequent references to the same organism only include the common name.

1. Plant Communities

The two plant communities observed in the project study area are low mountain alluvial forest and maintained-disturbed area.

a) Low Mountain Alluvial Forest

This community occurs along the banks of Reems Creek and to a lesser extent along Herron Cove Branch within the project study area. The tree canopy in this community is non-contiguous with gaps interspersed throughout the area. This alluvial forest community can best be described as a variation of Montane Alluvial Forest (Schafale and Weakley, 1990). These forests occur along stream and river floodplains at moderate to high elevations. They are palustrine and flood on an intermittent basis. According to Schafale and Weakley (1990), the Montane Alluvial Forest may be eroded or disturbed by catastrophic floods. These forests occur throughout the mountain region except in the lower valleys.

Dominant tree species observed within the alluvial forest at the time of site investigation include red maple (*Acer rubrum*), sycamore (*Platanus occidentalis*), black walnut (*Juglans nigra*), river birch (*Betula nigra*), tulip tree (*Liriodendron tulipifera*), chestnut oak (*Quercus prinus*), northern red oak (*Quercus rubra*), southern red oak (*Quercus falcata*), white oak (*Quercus alba*), sassafras (*Sassafras albidum*), silver maple (*Acer saccharinum*), Canada hemlock (*Tsuga canadensis*), and Virginia pine (*Pinus virginiana*). Dominant sapling and shrub species observed at the time of site investigation include ironwood (*Carpinus caroliniana*), sourwood (*Oxydendrum arboreum*), spicebush (*Lindera benzoin*), black cherry (*Prunus serotina*), hickory (*Carya* spp.), pale rhododendron (*Rhododendron maximum*), black locust (*Robinia pseudo-acacia*), tag alder (*Alnus serrulata*), chinquapin (*Castanea pumila*), elderberry (*Sambucus canadensis*), autumn olive (*Elaeagnus umbellata*), smooth sumac (*Rhus glabra*), witch-hazel (*Hamamelis virginiana*), wild hydrangea (*Hydrangea arborescens*), Chinese privet (*Ligustrum sinense*), sweet leaf (*Symplocos tinctoria*), flowering dogwood (*Cornus florida*), and multiflora rose (*Rosa multiflora*). Dominant herbaceous species observed at the time of site investigation include violets (*Viola* spp.), blackberry (*Rubus* sp.), creeping grass (*Microsteguim vimineum*), common plantain (*Plantago major*), asters (*Aster* spp.), Christmas fern (*Polystichum acrostichoides*), partridgeberry (*Mitchella repens*), henbit (*Lamium amplexicaule*), pokeweed (*Phytolacca americana*), goldenrod (*Solidago* sp.), chicory (*Chichorium intybus*), clover (*Trifolium* spp.), giant cane (*Arundinaria* sp.), common mullein (*Verbascum thapsus*), and Pennsylvania smartweed (*Polygonum pensylvanicum*). Dominant vine species observed at the time of site investigation include poison ivy (*Toxicodendron radicans*), Japanese honeysuckle (*Lonicera japonica*), common greenbrier (*Smilax rotundifolia*), morning glory (*Ipomoea* sp.), trumpet creeper (*Campsis radicans*), grape (*Vitis* spp.), and Virginia creeper (*Parthenocissus quinquefolia*).

b) Maintained-Disturbed Land

These communities are located along the rights-of-way of SR 2098, residential lawns, and agricultural areas including a plowed field and pasture.

No mature trees were observed within the maintained-disturbed area; however, saplings and seedlings of the following species

were observed: red maple, sycamore, black walnut, tulip tree, flowering dogwood, Virginia pine, and black cherry. The following shrub species were observed: elderberry, autumn olive, sumac, witch-hazel, hydrangea, Chinese privet, blackberry, and multiflora rose. Dominant herbaceous species observed at the time of site investigation include violets (*Viola* sp.), creeping grass, Queen Anne's lace (*Daucus carota*), henbit, pokeweed, chicory, clover, and giant cane. Dominant vine species observed at the time of site investigation include poison ivy, Japanese honeysuckle, common greenbrier, trumpet creeper, and Virginia creeper.

2. Wildlife

The alluvial forest community in conjunction with open agricultural lands and other disturbed areas offer high plant diversity and water availability; thus providing high quality wildlife habitat. These communities provide a variety of habitat for amphibians, reptiles, birds, and mammals.

The maintained roadside, pasture, and cropland provide rich ecotones for foraging, while the alluvial forest provides foraging and cover. Raccoon (*Procyon lotor*) tracks and past beaver (*Castor canadensis*) activity were observed along Reems Creek. Wildlife accustomed to human activity was sighted such as the American crow (*Corvus brachyrhynchos*), northern mockingbird (*Mimus polyglottos*), northern cardinal (*Cardinalis cardinalis*), and Carolina chickadee (*Poecile carolinensis*).

Common mammals which could be expected to utilize the project study area habitat include Virginia opossum (*Didelphis virginiana*), smoky shrew (*Sorex fumeus*), woodchuck (*Marmota monax*), shrews and moles (*Insectivora*), eastern cottontail (*Sylvilagus floridanus*), eastern chipmunk (*Tamias striatus*), woodchuck (*Marmota monax*), gray squirrel (*Sciurus carolinensis*), eastern harvest mouse (*Reithrodontomys humulis*), muskrat (*Ondatra zibethicus*), coyote (*Canis latrans*), and white-tailed deer (*Odocoileus virginianus*).

Common birds which could be expected to utilize the project study area habitat include hairy woodpecker (*Picoides villosus*), downy woodpecker (*P. pubescens*), eastern wood-pewee (*Contopus virens*), eastern phoebe (*Sayornis phoebe*), blue jay (*Cyanocitta cristata*), barn swallow (*Hirundo rustica*), tufted titmouse (*Parus bicolor*), white-breasted nuthatch (*Sitta carolinensis*), American robin (*Turdus migratorius*), yellow warbler (*Dendroica petechia*), and brown-headed cowbird (*Molothrus ater*). Game species such as woodcock (*Scolopax minor*) and wild turkey (*Meleagris gallopavo*) may be present. Predatory birds such as red-tailed

hawk (*Buteo jamaicensis*) and eastern screech owl (*Otus asio*) are likely to be found in the project vicinity.

Common reptiles and amphibians which could be expected to utilize the project area habitat include brown snake (*Storeria dekayi*), northern water snake (*Nerodia sipedon*), rat snake (*Elaphe obsoleta*), eastern fence lizard (*Sceloporus undulatus*), five-lined skink (*Eumeces fasciatus*), broadhead skink (*E. laticeps*), snapping turtle (*Chelydra serpentina*) and eastern box turtle (*Terrapene carolina*).

3. Aquatic Communities

Reems Creek provides aquatic habitat within the project study area. The physical characteristics (size and water quality) of the stream, as well as the adjacent terrestrial community, directly influence faunal composition of this aquatic community. The quality of aquatic habitat within the project study area is expected to be high due in large part to a natural mix of riffles, runs, and pools. Woody debris located throughout the stream provides habitat, shade, and concealment pockets for several aquatic species. Aquatic invertebrates are a major component of aquatic ecosystems, as primary and secondary consumers, as well as prey items for organisms higher in the food chain.

Insects typically found in this type of community include mayflies (Ephemeroptera), stoneflies (Plecoptera), caddisflies (Trichoptera), dragonflies (*Odonata* sp.) and aquatic beetles (Coleoptera). Flathead mayflies (Heptageniidae), abundant stoneflies, and caddisfly casings were observed during field review.

Brown trout (*Salmo trutta*) and rainbow trout (*Oncorhynchus mykiss*) are small gamefish that typically occur in this community. Small non-game fish in the area that inhabit Reems Creek include the following: redbreast sunfish (*Lepomis auritus*), bluegill (*Lepomis macrochirus*), Hiawassee shiner (*Notropis scabriceps*), logperch (*Percina caprodes*), blacknose dace (*Rhinichthys atratulus*), longnose dace (*R. cataractae*), creek chub (*Semotilus atromaculatus*), white sucker (*Catostomus commersoni*), northern hog sucker (*Hypentelium nigricans*), and mottled sculpin (*Cottus bairdi*).

No freshwater mussels were found by field surveys conducted on September 10, 2003 and October 22, 2003. The searches were conducted upstream and downstream on Reems Creek within the project area.

4. Anticipated Impacts to Biotic Communities

a) Terrestrial Communities

Table 1 describes the acreage of plant communities within the construction limits.

TABLE 1
ANTICIPATED IMPACTS TO PLANT COMMUNITIES

Community Type	Alternative 1(Preferred) Impact Acres	Alternative 2 Impact Acres
Low Mountain Alluvial Forest	0	0
Maintained-Disturbed	1.28	1.44

Due to the minimal disturbance of plant communities anticipated as a result of the bridge replacement, substantial impacts to terrestrial wildlife populations are not expected.

Loss of wildlife is an unavoidable aspect of development. Temporary fluctuations in populations of animal species that utilize these communities are anticipated during the course of construction. 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.

b) Aquatic Communities

Aquatic organisms are acutely sensitive to changes in their environment, and environmental impacts from construction activities may result in long term or irreversible effects. Impacts usually associated with in-stream construction include alterations to the substrate and impacts to 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.

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.

Specific impacts to "Waters of the United States" have been determined based on the construction limits (Table 2).

TABLE 2
ANTICIPATED IMPACTS TO JURISDICTIONAL STREAMS
(LINEAR FEET WITHIN CONSTRUCTION LIMITS)

Jurisdictional Stream	Alternative 1 (Preferred) Linear Feet	Alternative 2 Linear Feet
Reems Creek	50	43
Herron Cove Branch	69	197

E. Special Topics

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

Section 404 of the Clean Water Act requires regulation of discharges into "Waters of the United States." 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.

Wetlands, defined in 33 CFR 328.3, are those areas that are inundated or saturated by surface water or groundwater at a frequency and duration sufficient to support, and under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions.

The project study area was surveyed for jurisdictional wetlands in accordance with guidelines for wetland definition as given in the *1987 Corps of Engineers Wetlands Delineation Manual.* This approach incorporates three criteria in delineating wetlands: (1) the presence of hydrophytic vegetation, (2) the presence of hydric soils, and (3) evidence of wetland hydrology. All three criteria must be present in a given location for an area to be considered a jurisdictional wetland. No jurisdictional wetlands were identified within the project study area.

2. Permits

Impacts to jurisdictional surface waters are anticipated to occur as a result of project construction.

a) Section 404 of the Clean Water Act

Impacts to "Waters of the United States" come under the jurisdiction of the USACE. Permits are required for highway encroachment into jurisdictional wetlands and streams. Any action that proposes to place fill into these areas falls under the jurisdiction of the USACE under Section 404 of the Clean Water Act (33 USC 1344). The Nationwide Permit 23 should cover the impacts to jurisdictional streams in the project study area. Nationwide Permit 33 may be needed for temporary construction access.

b) Section 401 Water Quality Certification

A Section 401 General Water Quality Certification 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 is required. The NCDENR-DWQ has regulatory input through Section 401 Water Quality Certification. The issuance of a required Section 401 certification is a prerequisite to the issuance of a Section 404 permit.

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

c) TVA

Reems Creek is located in the Tennessee Valley Authority's (TVA) Land Management District. Approval pursuant to Section 26a of the TVA Act is required for all construction and development involving streams or floodplains in the Tennessee River drainage basin.

3. 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 project 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 aspects (avoidance, minimization, and compensatory mitigation) must be considered in sequential order.

Avoidance mitigation examines all appropriate and practicable possibilities of averting impacts to "Waters of the United States."

Minimization includes the examination of appropriate and practicable steps to reduce the adverse impacts to "Waters of the United States." Compensatory mitigation is not normally considered until anticipated impacts to "Waters of United States" have been avoided and minimized to the maximum extent possible.

In accordance with 15A NCAC 2H.0506 (h) and 40 CFR 1508.20, mitigation will be required for impacts to jurisdictional streams when these impacts are equal to or greater than 150 linear feet per stream. In addition, mitigation may be required for wetland impacts exceeding 0.10 acre. It is anticipated that the bridge replacement over Reems Creek will likely impact less than 150 linear feet of stream. No wetlands are located in the project study area. For Alternative 1, the Preferred Alternative, no stream mitigation requirement is anticipated. Therefore, no stream or wetland mitigation requirement is anticipated. However, final permit/mitigation decisions will be determined by the USACE and NCDWQ.

NCDENR has adopted permanent Nutrient Sensitive Waters Management Strategy rules to protect and maintain 50-foot wide riparian buffers in several watersheds across the state. At this time, surface waters in the French Broad River Basin are not subject to NCDENR's Nutrient Sensitive Waters Management Strategy rules.

The buffer protection regulations in the French Broad River Basin apply in watersheds classified as Water Supply Watersheds which would not include Reems Creek and Herron Cove Branch.

F. Rare and Protected Species

Federal law under the provisions of Section 7 of the Endangered Species Act (ESA) of 1973, as amended, requires that any action likely to adversely affect a federally protected species be subject to review by the USFWS. Other species may warrant protection under separate state laws.

Plants and animals with federal classifications of Endangered (E), Threatened (T), Proposed Endangered (PE), and Proposed Threatened (PT) are protected under provisions of Section 7 and Section 9 of the ESA. The USFWS lists twelve federally protected species for Buncombe County with one threatened due to similarity of appearance.

TABLE 3 FEDERALLY PROTECTED SPECIES FOR BUNCOMBE COUNTY			
Common name	**Scientific name**	**Federal Status**	**Biological Conclusion**
Bog turtle	*Clemmys muhlenbergii*	T(S/A)	N/A
Carolina northern flying squirrel	*Glaucomys sabrinus coloratus*	Endangered	No Effect
Spotfin chub	*Hybopsis monacha*	Threatened	No Effect
Gray bat	*Myotis grisescens*	Endangered	No Effect
Eastern cougar	*Puma concolor couguar*	Endangered	No Effect
Appalachian elktoe	*Alasmidonta raveneliana*	Endangered	No Effect
Oyster mussel	*Epioblasma capsaeformis*	Endangered	No Effect
Bunched arrowhead	*Sagittaria fasciculata*	Endangered	No Effect
Mountain sweet pitcher plant	*Sarracenia jonesii*	Endangered	No Effect
Spreading avens	*Geum radiatum*	Endangered	No Effect
Rock gnome lichen	*Gymnoderma lineare*	Endangered	No Effect
Virginia spiraea	*Spiraea virginiana*	Threatened	No Effect

Bog turtle (*Clemmys muhlenbergii*)
Animal Family: Emydidae
Date Listed: November 4, 1997
Bog turtles are small (3 to 4.5-inch) reptiles with a weakly keeled carapace (upper shell) that ranges in color from light brown to ebony. This species is easily 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 inhabit muddy, bog-like habitats. 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 and temperatures are in the 70s. Bog turtle habitat consists of bogs, swamps, marshy meadows, and other wet environments, specifically those which exhibit soft muddy bottoms.

The northern population of the bog turtle (from New York south to Maryland) was listed as federally threatened, and the southern population (from Virginia south to Georgia) was listed as federally threatened due to similarity of appearance. The southern populations are not protected under Section 7 of the Endangered Species Act; however, the T(S/A) designation bans the collection and

interstate or international commercial trade of bog turtles from the southern population (USFWS 2004).

This site contains no wetlands; therefore, suitable habitat for the bog turtle is not present. No bog turtles were observed in the project vicinity. The NCNHP has no records of any known populations of the bog turtle within a one-mile radius of the project area. No impacts to this species from project construction are anticipated.

Carolina northern flying squirrel (*Glaucomys sabrinus coloratus*)
Animal Family: Sciuridae
Date Listed: July 1, 1985
The northern flying squirrel is a small nocturnal mammal that inhabits the high elevation ecotone between coniferous and northern hardwood forest. This high elevation habitat usually occurs greater than 5,500 feet above MSL. These squirrels are 10 to 12 inches long and weigh 3 to 5 ounces. Adults are gray with a light brown to reddish cast on their backs and light gray to white or buff undersides. The broad tails and folds of skin between the wrist and ankles form wing-like surfaces that enable these animals to glide downward from tree to tree or tree to ground. These mammals eat a wide variety of foods such as lichens, mushroom, seeds, nuts, insects and fruits. These squirrels nest in tree cavities such as woodpecker holes and usually produce one litter in the early spring (USFWS 2004).

Suitable habitat for the Carolina northern flying squirrel, consisting of mixed deciduous/coniferous forests located 5,500 feet above MSL, does not exist within the project area. Review of NCNHP maps indicated no known populations of this species within one mile of the project area. No impacts to this species from project construction are anticipated.

Biological Conclusion: **No Effect**

Eastern cougar (*Felis concolor couguar*)
Animal Family: Felidae
Date Listed: June 4, 1973
The eastern cougar is described as a large, unspotted, long-tailed cat. Its body and legs are a uniform fulvous or tawny hue, and its belly is pale reddish or reddish white. The inside of this cat's ears are light-colored, with a blackish color behind the ears. Cougars feed primarily on deer, but their diet may also include small mammals, wild turkeys, and occasionally domestic livestock, when available. Cougars begin breeding when two or three years old and breed thereafter once every two to three years. A typical litter size is three, with the newborn kittens weighing 8 to 16 ounces.

The primary habitat appears to be large wilderness areas with an adequate food supply. Cougars avoid human-developed areas and have been considered by

some as extirpated for this reason. Male cougars typically occupy a range of 25 or more square miles, and females from 5 to 20 square miles. Sightings have been reported in three North Carolina areas including the Nantahala National Forest, the northern portion of the Uwharrie National Forest, and North Carolina's southeastern counties. The remaining population of this species is extremely small, with exact numbers unknown (USFWS, 2004).

There are no large expanses of relatively undeveloped lands within the in the project study area. Also, cougars are not likely in the project area due to the frequency of human activity within the study area and localized development near the study area. The NCNHP has no records of any known populations of the eastern cougar within a one-mile radius of the project area. No impacts to this species from project construction are anticipated.

Biological Conclusion: No Effect

Gray bat (*Myotis grisescens*)
Animal Family: Vespertilionidae
Date Listed: April 28, 1976
The gray bat is the largest of its genus in the eastern United States. It weighs between 0.25 and 0.56 ounces and has a forearm that reaches from 1.6 to 1.8 inches in length. This bat can be distinguished from other eastern bats by its uni-colored dorsal fur and by its wing membrane that connects to the foot at the ankle. Other eastern species of bats have bi- or tri-colored dorsal fur and have a wing membrane that connects to the base of their first toe. The gray bat's fur is dark gray for a short time after it molts in July or August and then turns to a russet color in between molts. It is known to feed on aquatic insects, especially mayflies.

This bat inhabits only caves or cave-like habitats. They are very selective about which caves they will inhabit. The caves are usually located within 0.62 miles of a river or reservoir and have a specific temperature in both the summer and the winter.

A memorandum dated July 2, 2002 serves as a programmatic screening/survey for the project. The results of the habitat evaluation indicated poor roosting habitat and no evidence of bats. Review of NCNHP maps indicated no known populations of this species within one mile of the project study area. No impacts to this species from project construction are anticipated.

Biological Conclusion: No Effect

Spotfin Chub (*Hybopsis monacha*)
Animal Family: Cyprinidae
Date Listed: September 9, 1994
Spotfin chub is a small fish growing to a maximum size of 3.6 inches in length. The body is elongate; usually there is one pair of minute, terminal labial barbels; scales are moderate to somewhat small in size; and a distinctive large black spot is present in the caudal region. The spotfin chub is restricted to the Tennessee River drainage where it once occurred widely in 12 tributary systems distributed over five states. The spotfin chub inhabits moderate to large streams, 50 to 200 feet average width, with a good current, clear water, and cool to warm temperatures. These streams have pools frequently alternating with riffles (USFWS 2004).

The project study area is not located within the Little Tennessee River Basin where this species is known to occur. No impacts to this species from project construction are anticipated.

Biological conclusion: No Effect

Appalachian elktoe (*Alasmidonta raveneliana*)
Animal Family: Unionidae
Date Listed: November 23, 1994
The Appalachian elktoe, listed in 1994 by the USFWS, is a kidney-shaped freshwater mussel endemic to the upper Tennessee River system in western North Carolina and eastern Tennessee. The adult shell reaches 3.5 inches in length and is usually dark brown with prominent to obscure greenish rays. This mussel inhabits relatively shallow medium-sized creeks and rivers with moderate to fast flowing water. It is generally found in gravelly substrates mixed with cobbles and boulders or occasionally in silt-free, coarse sandy substrates. Reproduction is similar to that of other freshwater mussels, and the banded sculpin (*Cottus carolinea*) has been identified as a host species for developing glochidia. Historically, this mussel was found in the French Broad River system, including French Broad main stem and the Little River in Transylvania County (USFWS, 2004).

Suitable habitat for the Appalachian elktoe consisting of shallow medium-sized creeks with fast flowing water and clean, silt-free, gravel substrates is readily available in the project area. Review of NCNHP maps indicated no known populations of this species within one mile of the project area. A mussel survey conducted by qualified aquatic biologists on September 10, 2003 and October 22, 2003 found no mussels in the project study area. No impacts to this species from project construction are anticipated.

Biological Conclusion: No Effect

Oyster mussel (*Epioblasma capsaeformis*)
Animal Family: Unionidae
Date Listed: January 10, 1997
The oyster mussel is a small, up to 2.1 inches in length, freshwater mussel. Its distinguishing characteristic is the pronounced development of the posterior-ventral region in the females. The outer shell or perostracum is dull to sub-shiny yellowish to green with numerous thin dark green rays. The inside shell or nacre is whitish to bluish-white in color. This mussel inhabits small to mediums sized streams with a coarse sand to boulder substrate (no mud) and moderate to swift currents (USFWS, 2004).

Suitable habitat for the oyster mussel consisting of small to mediums sized streams with a coarse sand to boulder substrate (no mud) and moderate to swift currents is readily available in the project area. Review of NCNHP maps indicated no known populations of this species within one mile of the project area. A mussel survey conducted by qualified aquatic biologists on September 10, 2003 and October 22, 2003 found no mussels in the project study area. No impacts to this species from project construction are anticipated.

Biological Conclusion: **No Effect**

Bunched arrowhead (*Sagittaria fasciculata*)
Plant Family: Alismataceae
Date Listed: July 25, 1979
Bunched arrowhead is an emergent aquatic perennial herb, which grows 6.0 to 13.0 inches in height. Its spatulate-shaped leaves reach 12 inches long and 0.3 inch wide, and stem from the base of the plant. Three white petals are present during flowering and fruiting occurs from May to July.

Bunched arrowhead grows in seepage areas that have little or no net flow but are not stagnant. The soil in the seepages can be characterized as sandy loams overtopped by a muck layer ranging in depth from 9.8 to 23.6 inches (USFWS, 2004).

Review of NCNHP maps indicated no known populations of this species within one mile of the project area. No seepages are located in the project study area; therefore no suitable habitat for the bunched arrowhead exists within the project study area. No impacts to this species from project construction are anticipated.

Biological Conclusion: **No Effect**

Mountain sweet pitcher plant (*Sarracenia jonesii*)
Plant family: Sarraceniaceae
Date listed: September 30, 1988
Mountain sweet pitcher plant is a perennial, carnivorous herb. Its leaves form pitchers that are hollow, trumpet shaped, and dull green with criss-crossing

maroon to purple veination. The deep maroon flowers are three to four inches wide and borne singly at the top of a stalk in the spring, usually in May. Due to its distinct appearance, this plant is readily identifiable outside of its spring flowering season. This species inhabits wet bogs with mucky surfaces and sandy bottoms. Review of NCNHP maps indicated no known populations of this species within one mile of the project area. No mucky bog habitat is present; therefore no suitable habitat exists in the project study area. No impacts to this species from project construction are anticipated.

Biological Conclusion: No Effect

Spreading avens (*Geum radiatum*)
Plant family: Rosaceae
Date listed: April 5, 1990
Spreading avens is a perennial herb of the Rosaceae family. The densely pubescent plant forms a basal rosette arising from horizontal rhizomes. The basal leaves are kidney-shaped, serrate, and three to six inches wide. The inflorescence is an indefinite cyme supporting a few, large (1 to 2 inches in diameter), yellow flowers. Flowering occurs from June through September. This plant is found in sunny locations such as high elevation rocky balds, pockets of soil on nearly vertical cliffs, and shrub-free (due to rock or ice falls) grassy areas at the base of cliffs. These sunny/rocky openings are surrounded by spruce-fir (*Picea rubens-Abies fraseri*) forests that generally occur above 5,500 feet elevation (USFWS, 2004).

The highest elevation in the study area is approximately 2,100 feet above MSL, well below the high elevation habitats where this plant grows. Review of NCNHP maps indicated no known populations of this species within one mile of the project area. No suitable habitats such as rocky balds or vertical cliffs were observed in the project study area. No impacts to this species from project construction are anticipated.

Biological Conclusion: No Effect

Virginia spiraea (*Spiraea virginiana*)
Plant family: Rosaceae
Date listed: June 15, 1990
Virginia spiraea grows from 2 to 10 feet tall and has arching, upright stems. This shrub bears cream-colored flowers on branched and flat-topped axles. Its alternate leaves are of different sizes and shapes. Spiraea spreads clonally and forms dense clumps, which spread in rock crevices and around boulders. Flowering occurs in June and July.

Virginia spiraea occurs along rocky, flood-scoured riverbanks in gorges or canyons. Flood scouring is essential to this plant's survival because it eliminates

taller woody competitors and creates river wash deposits and early successional habitats. Spiraea is found in thickets (USFWS, 2004).

Review of NCNHP maps indicated no known populations of this species within one mile of the project area. No rocky, flood scoured riverbanks exist within the project study area; therefore no habitat for Virginia spiraea is located within the project study area. No impacts to this species from project construction are anticipated.

Biological Conclusion: No Effect

Rock gnome lichen (*Gymnoderma lineare*)
Plant family: Cladoniaceae
Date listed: January 18, 1995
Rock gnome lichen is a squamulose lichen of the reindeer moss family. This species is the only member of its genus occurring in North America. It occurs in small (usually less than one square yard), dense colonies of narrow, strappy, leaf-like pads. These strap-like lobes are usually blue-gray on the upper surface and generally shiny white on the lower surfaces. The fruiting bodies are borne at the tips of the strap-like lobes and are black, in contrast to the red to brown fruiting bodies of other reindeer moss lichens. These lichens fruit from July through September. The rock gnome lichen is endemic to the southern Appalachian Mountains of North Carolina and Tennessee. They primarily inhabit vertical rock faces in areas of high humidity such as river gorges or areas frequently bathed in fog. Most populations occur above an elevation of 5,000 feet (USFWS, 2004).

The project study area lacks suitable habitat for the rock gnome lichen consisting of high humidity environments such as deep river gorges or other seepy wet rock faces. The highest elevation in the project study area is approximately 3,050 feet above MSL, well below the elevations (2,020 to 2,040 feet above MSL) preferred by this species. Review of NCNHP maps indicated no known populations of this species within one mile of the project area. No impacts to this species from project construction are anticipated.

Biological Conclusion: No Effect

There are 33 federal species of concern listed by the USFWS for Buncombe County (Table 4). Federal species of concern (FSC) are not afforded federal protection under the Endangered Species Act and are not subject to any of its provisions, including Section 7. NCNHP records indicated no recorded occurrences of FSC within one mile of the project study area.

TABLE 4 FEDERAL SPECIES OF CONCERN FOR BUNCOMBE COUNTY				
Common Name	**Scientific Name**	**State Status****	**Habitat Requirement**	**Habitat Present**
Bachman's sparrow	*Aimophila aestivalis*	SC*	open longleaf pine forests, old fields [breeding season only]	No
Southern Appalachian saw-whet owl	*Aegolius acadicus*	T	spruce-fir forests or mixed hardwood/spruce forests (for nesting)	No
Rafinesque's big-eared bat	*Corynorhinus (=Plecotus) rafinesquii*	T*	roosts in old buildings, caves, and mines, usually near water	No
Hellbender	*Cryptobranchus alleganiensis*	SC	large and clear fast-flowing streams	No
Cerulean warbler	*Dendroica cerulea*	SR	mature hardwood forests; steep slopes and coves in mountains	No
Blotched chub	*Erimystax insignis*	SR	primarily French Broad drainage	No
Southern Appalachian red crossbill	*Loxia curvirostra*	SC	coniferous forests, preferably spruce-fir	No
Eastern small-footed myotis	*Myotis leibii*	SC	roosts in hollow trees (warmer months), in caves and mines (winter)	No
Southern Appalachian woodrat	*Neotoma floridana haematoreia*	SC	rocky places in deciduous or mixed forests	No
Alleghany woodrat	*Neotoma magister*	SC	rocky places and abandoned buildings in deciduous or mixed forests in the northern mountains and adjacent Piedmont	No
Longhead darter	*Percina macrocephala*	SC*	larger creeks and small to medium sized rivers often in silty areas	No
Southern Appalachian black-capped chickadee	*Poecile atricapillus practicus*	SC	high elevation forests, mainly spruce-fir [breeding season only]	No
Paddlefish	*Polyodon spathula*	E*	French Broad River	No
Southern water shrew	*Sorex palustris punctulatus*	SC	stream banks in montane forests	No
Southern Appalachian yellow-bellied sapsucker	*Sphyrapicus varius appalaciensis*	SC	mature, open hardwoods with scattered dead trees [breeding season only]	No
Appalachian Bewick's wren	*Thryomanes bewickii altus*	E*	woodland borders or openings, farmlands or brushy fields, at high elevations [breeding season only]	No
French Broad crayfish	*Cambarus reburrus*	W2	tributaries of French Broad River	No
Tawny crescent butterfly	*Phycoides batesii batesii*	SR*	rocky ridges, woodland openings, at higher elevations; host plants -- asters, mainly *Aster undulatus*	No
Diana fritillary butterfly	*Speyeria diana*	SR*	rich woods and adjacent edges and openings; believed extirpated from	No

			the lower Piedmont; host plants -- violets (Viola)	
Fraser fir	*Abies fraseri*	SR-L	spruce-fir forests	No
Piratebush	*Buckleya distichophylla*	E	bluffs, dry slopes, forests on lower slopes	No
Cain's reedgrass	*Calamagrostis cainii*	E	high elevation rocky summits	No
Glade spurge	*Euphorbia purpurea*	SR-T	forests, especially over mafic rock	No
Mountain heartleaf	*Hexastylis contracta*	E	acidic forests under rhododendron	No
French Broad heartleaf	*Hexastylis rhombiformis*	SR-L	cove forests	No
Butternut	*Juglans cinerea*	Not Listed	cove forest and rich woods	No
Gray's lily	*Lilium grayi*	T-SC	bogs, wet meadows, seeps, grassy balds, high elevation forests	No
Fraser's loosestrife	*Lysimachia fraseri*	E*	forests, roadsides	No
Sweet pinesap	*Monotropsis odorata*	SR-T	dry forests and bluffs	No
Pinnate-lobed black-eyed susan	*Rudbeckia triloba* var. *pinnatoloba*	SR-T	mafic cliffs	No
Carolina saxifrage	*Saxifraga caroliniana*	SR-T	high to middle elevation moist cliffs and rock outcrops	No
Divided-leaf ragwort	*Senecio millefolium*	T	on or near rock outcrops	No
Mountain catchfly	*Silene ovata*	SR-T	rich slopes, cove forests, montane oak-hickory forests	No

*Historic record – the species was last observed in the county more than 50 years ago.
**E=Endangered, T=Threatened, SC=Special Concern, SR=Significantly Rare, L=Limited range, T=Throughout

VI. CULTURAL RESOURCES

A. Compliance Guidelines

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

B. Historic Architecture

A field survey of the Area of Potential Effects (APE) for Bridge No. 220 was conducted. In a letter dated January 28, 2003, the State Historic Preservation Officer (SHPO) determined that the project as proposed will not affect any historic architectural properties either listed in or eligible for listing in the

National Register of Historic Places within the APE. A copy of the letter is included in the Appendix.

C. Archaeology

In a memorandum dated March 14, 2006, it was stated by SHPO that there were no sites located within the project area during the course of the NCDOT archaeology survey. NCDOT recommended that no further archaeological investigation be conducted in connection with this project. SHPO concurred with this statement since the project will not involve significant archaeological resources. A copy of this memorandum is included in the Appendix.

VII. ENVIRONMENTAL EFFECTS

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

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

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

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

No adverse impact on the community is anticipated. Right-of-way acquisition will be limited. No relocations are expected with the implementation of the proposed alternative and access to a residential driveway, shown as blocked in its current location by new guard rail, will be resolved during final design.

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

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

The Farmland Protection Policy Act requires all federal agencies or their representatives to consider the potential impacts to prime and important farmland soils by all land acquisition and construction projects. Prime and important farmland soils are defined by the Natural Resources Conservation Service (NRCS). Since there are no prime or important farmlands in the immediate vicinity of the proposed bridge the Farmland Protection Policy does not apply.

The project is located in Buncombe County, which has been determined to be in compliance with the National Ambient Air Quality Standards. 40 CFR Parts 51 and 93

are not applicable because the proposed project is located in an attainment area. This project is not anticipated to create any adverse effects on the air quality of this attainment area.

This project is an air quality "neutral" project, so it is not required to be included in the regional emission analysis (if applicable) and a project level CO analysis is not required.

The traffic volumes will not increase or decrease because of this project. The project's impact on noise and air quality will not be substantial.

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

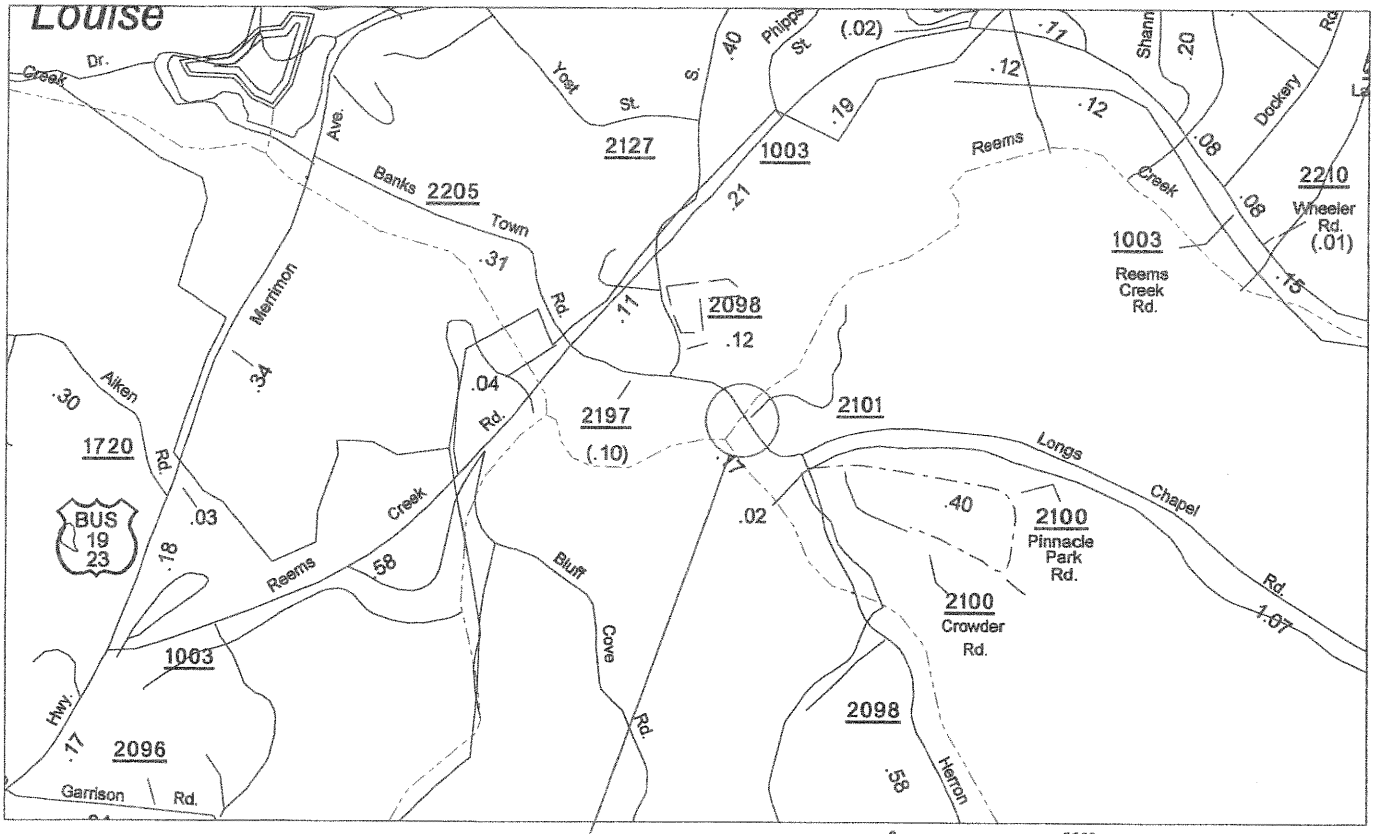
A field reconnaissance survey was conducted in the vicinity of the project and based on the survey, there are no anticipated underground storage tank (UST) impacts with this project. Research shows that no regulated or unregulated landfills or dumpsites occur within the project limits, and no superfund sites were identified in the vicinity of the project.

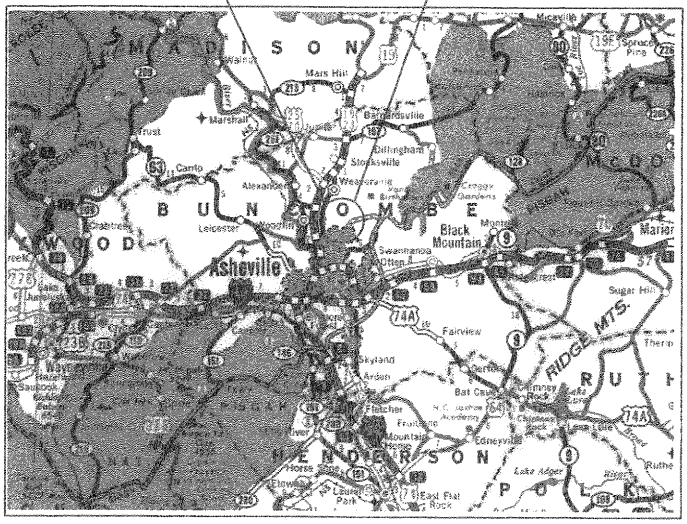
Buncombe County is a participant in the National Flood Insurance Program. The project site on Reems Creek is included in a Detailed FEMA Study area. A copy of the Flood Insurance Rate Map is shown in Figure 5. The project is not anticipated to increase the level or extent of the upstream flood hazard and no practical alternatives exist to crossing the flood plain. All reasonable measures will be taken to minimize harm to the flood plain.

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

VIII. PUBLIC INVOLVEMENT

Efforts were undertaken early in the planning process (January 2003) to contact local officials to involve them in the project development with scoping letters. A newsletter was mailed to local residents and public officials on July 8, 2004 announcing a Citizens' Informational Workshop. A Citizens' Informational Workshop was held on July 27, 2004 at Weaverville Elementary School in Weaverville, Buncombe County, from 4:30 p.m. to 6:30 p.m. Alternative 1 was presented as the Preferred Alternative due to the reduced impacts to adjacent properties and reduced cost of construction. The citizens and local officials in attendance preferred Alternative 1.





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NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
PROJECT DEVELOPMENT &
ENVIRONMENTAL ANALYSIS BRANCH

BUNCOMBE COUNTY

BRIDGE NO. 220 ON SR 2098 OVER REEMS CREEK

TIP NO. B-4036

VICINITY MAP
FIGURE 1

h:\PN\0110360\68\graphics\220FIG1.dgn
10/08/2004

NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
PROJECT DEVELOPMENT &
ENVIRONMENTAL ANALYSIS BRANCH

BUNCOMBE COUNTY

BRIDGE NO.220 ON SR 2098
OVER REEMS CREEK

TIP NO. B-4036

25 0 50

FIGURE 2A
ALTERNATIVE 1
(PREFERRED)

NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
PROJECT DEVELOPMENT &
ENVIRONMENTAL ANALYSIS BRANCH

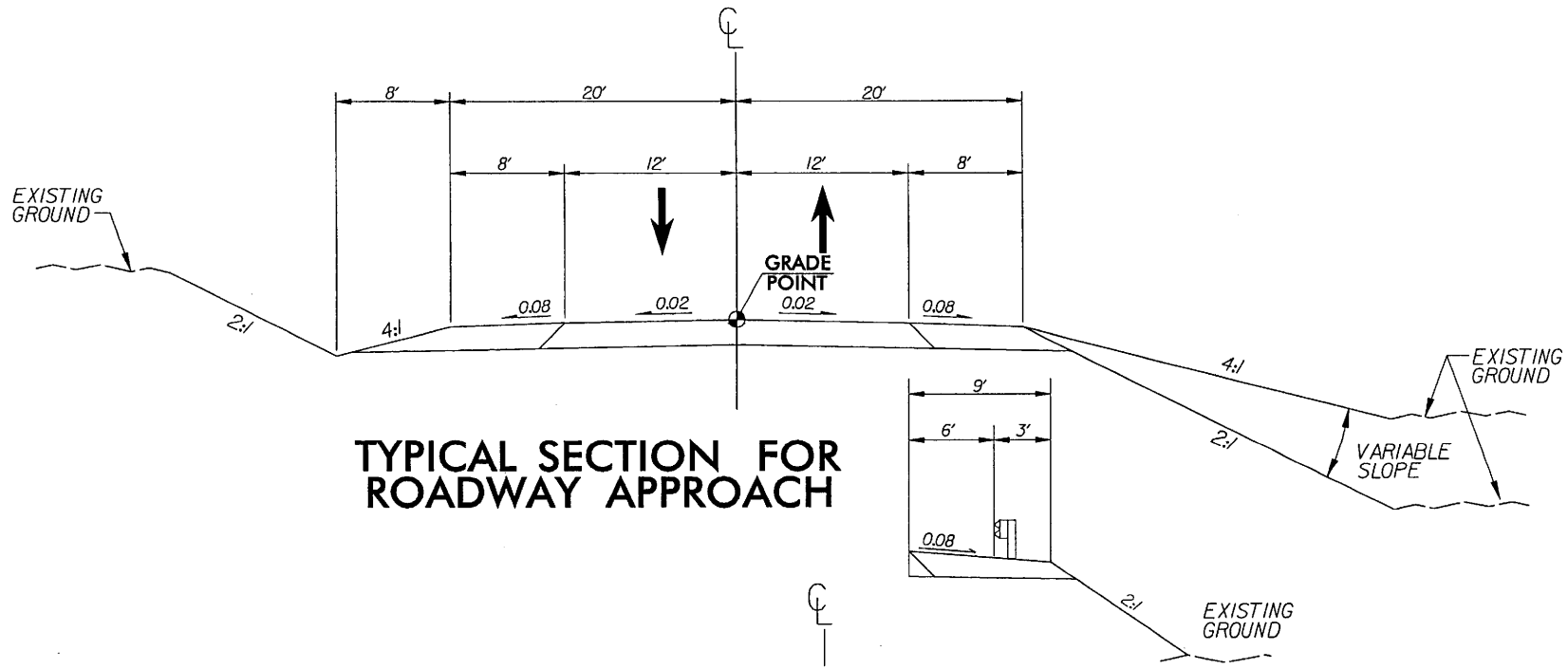
BUNCOMBE COUNTY

BRIDGE NO.220 ON SR 2098
OVER REEMS CREEK

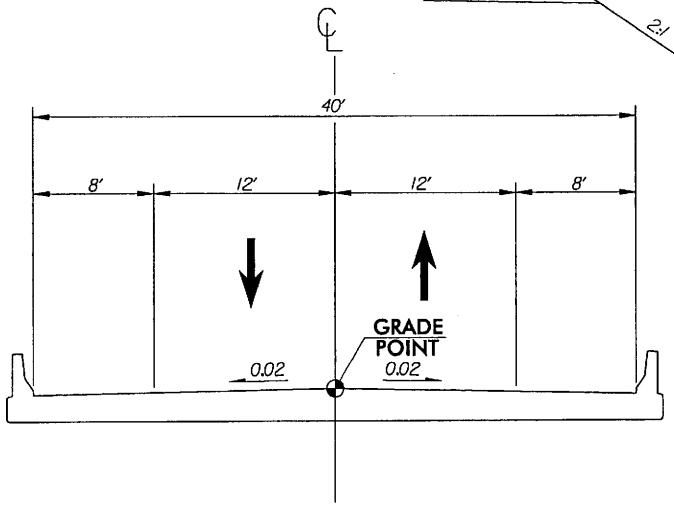
TIP NO. B-4036

25 0 50

FIGURE 2B
ALTERNATIVE 2



TYPICAL SECTION FOR ROADWAY APPROACH



TYPICAL SECTION FOR PROPOSED STRUCTURE

DESIGN DATA

FUNCTIONAL CLASSIFICATION:
RURAL LOCAL
DESIGN SPEED – 60 mph
2004 ADT – 1,700 vpd
2030 ADT – 3,100 vpd
DUAL – 3 %, TTST – 1 %

NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
PROJECT DEVELOPMENT &
ENVIRONMENTAL ANALYSIS BRANCH

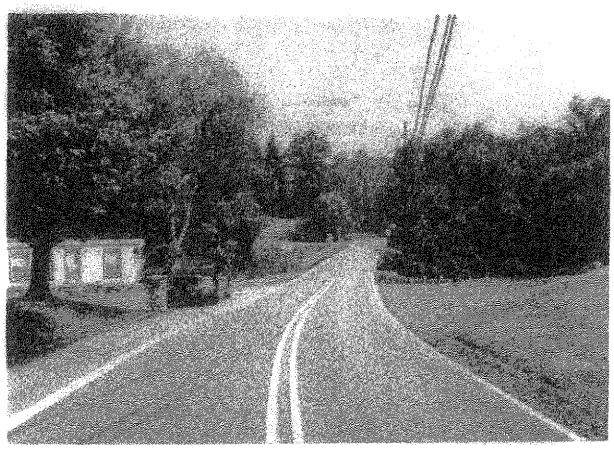
BUNCOMBE COUNTY

BRIDGE NO. 220 ON SR 2098
OVER REEMS CREEK

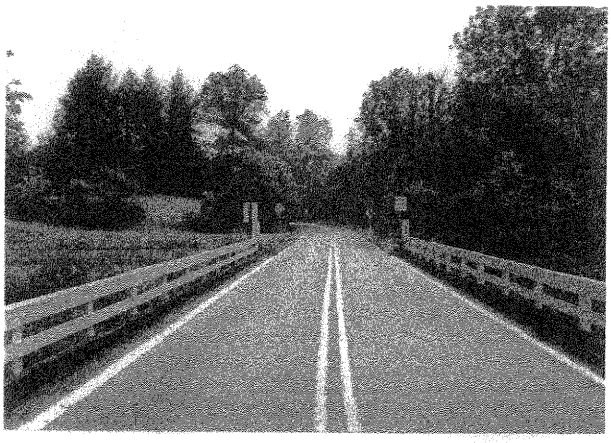
TIP NO. B-4036

FIGURE 3

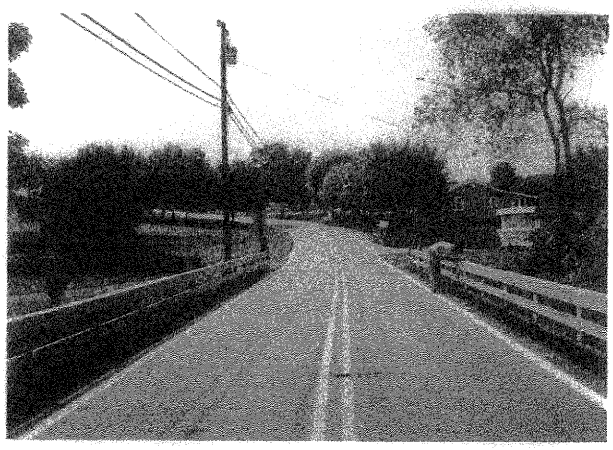
FIGURE 4 – COLOR PHOTOGRAPHS
B-4036 Buncombe County
Bridge No. 220 on SR 2098 over
Reems Creek



Looking Southeast along SR 2098 toward
Bridge No. 220

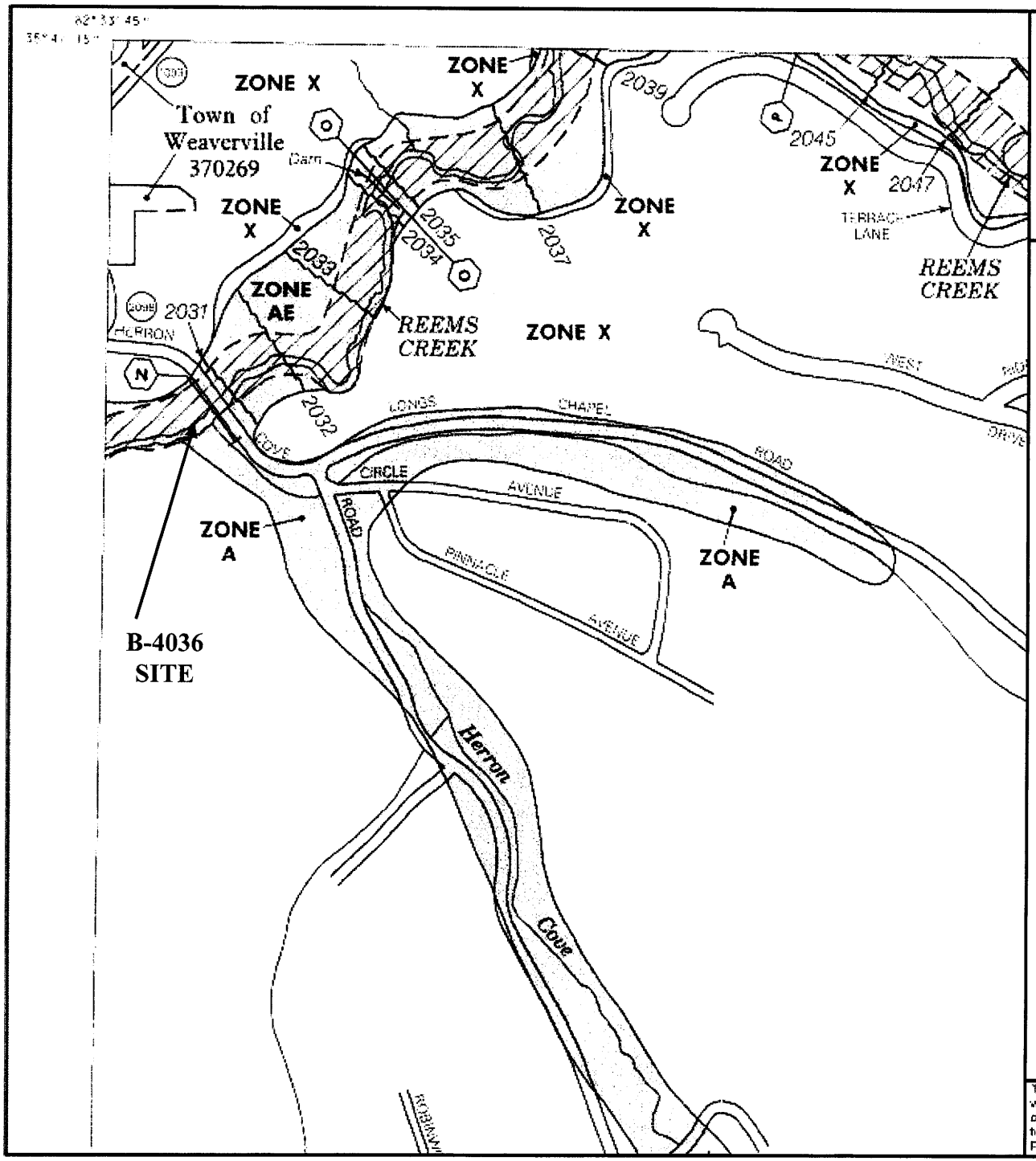


Looking Southeast on Bridge No. 220
from the Northwest Side of SR 2098



Looking Northwest on Bridge No. 220
from the Southeast Side of SR 2098

Looking East toward Bridge No. 220
from the West Side



APPROXIMATE SCALE

500 0 500 FEET

FIGURE 5 – FLOODPLAIN MAP

NATIONAL FLOOD INSURANCE PROGRAM

FIRM

FLOOD INSURANCE RATE MAP

BUNCOMBE COUNTY, NORTH CAROLINA AND INCORPORATED AREAS

PANEL 191 OF 550

(SEE MAP INDEX FOR PANELS NOT PRINTED)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]

[illegible]

MAP NUMBER
37021C0191 C

EFFECTIVE DATE:
MAY 6, 1996

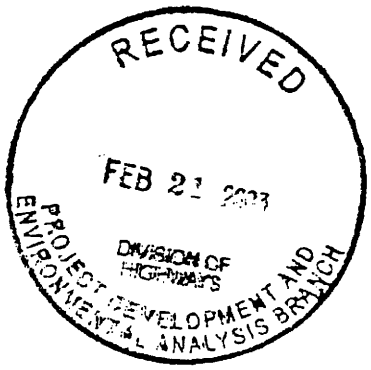
Federal Emergency Management Agency

Appendix

United States Department of the Interior

NATIONAL PARK SERVICE
Blue Ridge Parkway
199 Hemphill Knob Road
Asheville, North Carolina 28803

IN REPLY REFER TO



L7619
PIN 1280

February 11, 2003

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

Subject: Request for comments on Bridge Replacement Projects B-4032, B-4036, B-4037, B-4258, B-4261, B-2988, B-4144, B-4291

Dear Dr. Thorpe:

Thank you for the opportunity to comment on the above referenced projects. Parkway staff reviewed the scoping document and the potential impacts of the proposed project on resource values that may be present on National Park Service (NPS) lands and have the following comments:

The proposed projects should have no impact to park natural resources.

In reference to Bridge Number 262, over south Hominy Creek on SR 3452 connecting to State Route 151: SR 151 is an important connecting road to the Blue Ridge Parkway. Would this bridge construction in any way delay SR 151 traffic or reroute vehicular traffic on the Blue Ridge Parkway from SR 151? If so what would be the delay duration? We would want to review detour sign planning, if applicable. Otherwise, we have no visual impact concerns to the Blue Ridge Parkway, as this bridge is located out of the park viewshed area.

In reference to Bridge Number 13, on SR 1890 and near SR 276, crossing over the East Fork of the Pigeon River: SR 276 is an important connecting road to the Blue Ridge Parkway. Would this bridge construction in any way delay SR 276 traffic or reroute vehicular traffic on the Blue Ridge Parkway from SR 276? If so what would be the delay duration? We would want to review detour sign planning, if applicable. Otherwise, we have no visual impact concerns to the Blue Ridge Parkway, as this bridge is located out of the park viewshed area.

Again, thank you for the opportunity to review and comment on these important bridge replacement projects. If you have any questions, please contact Suzette Molling, Environmental Protection Specialist, at 828/271-4779 ext. 219.

Sincerely,

Daniel W. Brown
Superintendent

cc: Park Resident Landscape Architect, BLRI
Chief, Branch of Resource Management, BLRI
Highlands District Ranger, BLRI
Highlands District Resource Management Specialist, BLRI

SH

CESAW-RG-A October 7, 2002

MEMORANDUM FOR NORTH CAROLINA DEPARTMENT OF TRANSPORTATION (NCDOT), PROJECT DEVELOPMENT AND ENVIRONMENTAL ANALYSIS BRANCH, BRIDGE REPLACEMENT PLANNING UNIT, ATTN: William T. Goodwin

SUBJECT: Natural Resources Technical Reports, Bridge Replacement Projects, CFY 2005

1. The purpose of this memorandum is to respond to your request for our comments on the 29 bridge replacement projects in Division 13 that are listed on the attached sheet.

2. Based on the referenced reports, 16 project sites exhibit characteristics that would cause us to place them in your yellow or red categories meaning that additional close coordination with resource and regulatory agencies should be maintained for successful project completion. These characteristics include the presence of high quality aquatic habitat, outstanding resource waters, trout fisheries, suitable habitat for endangered species and unresolved endangered species issues. Under these circumstances, we would normally recommend that the existing bridge structures be replaced with another spanning structure and that the construction of onsite detours be avoided unless the detours are also spanning structures. These 16 projects include the following TIP's: B-4032, B-4037, B-4038, B-4044, B-4046, B-4047, B-4183, B-4199, B-4202, B-4258, B-4259, B-4260, B-4261, B-4265, B-4266 and B-4330.

3. The remaining 13 project sites lack the distinguishing characteristics referenced above and therefore we would place them in your green category meaning that normal processing procedures should be able to address anticipated impacts to aquatic resources. These 13 projects include the following TIP's: B-4036, B-4039, B-4040, B-4041, B-4043, B-4045, B-4194, B-4192, B-4195, B-4196, B-4197, B-4198 and B-4264.

4. Please be reminded that all 29 of these proposed projects are located in trout waters counties and will require pre-discharge notification to this office and the North Carolina Wildlife Resources Commission prior to the use of any Nationwide Permit.

5. If you have any questions, please contact me at telephone (828) 271-7980, extension 4.

Steven W. Lund

Steven W. Lund
Regulatory Project Manager
Asheville Regulatory Field Office

DEPARTMENT OF THE ARMY
WILMINGTON DISTRICT, CORPS OF ENGINEERS
151 PATTON AVENUE
ROOM 208
ASHEVILLE, NORTH CAROLINA 28801-5006

COPY

REPLY TO
ATTENTION OF:

CESAW-RG-A

May 23, 2003

MEMORANDUM FOR NORTH CAROLINA DEPARTMENT OF TRANSPORTATION (NCDOT), PROJECT DEVELOPMENT AND ENVIRONMENTAL ANALYSIS BRANCH, ATTN: Gregory J. Thorpe, PhD, Environmental Management Director

SUBJECT: Natural Resources Technical Reports, Bridge Replacement Projects, 2002-2008 Transportation Improvement Plan

1. The purpose of this memorandum is to respond to your requests of January 6, 2003, April 10, 2003 and May 6, 2003 with supplemental information provided on May 13, 2003 seeking our comments on 6 bridge replacement projects in Division 10 and 12 bridge replacement projects in Division 13.

2. Based on the referenced reports and other information provided, 12 project sites exhibit characteristics that would cause us to place them in your yellow to red categories meaning that additional close coordination with resource and regulatory agencies should be maintained for successful project completion. These characteristics include the presence of high quality aquatic habitat, outstanding resource waters, trout fisheries, presence of wetlands, presence of endangered species or suitable habitat for endangered species and unresolved endangered species issues. Under these circumstances, we would normally recommend that the existing bridge structure be replaced with another spanning structure and that construction of onsite detours be avoided unless the detours are also spanning structures. In addition, bridge demolition should not result in any discharge into waters or wetlands at the site. These 12 projects include the following TIP's: B-3905, B-4032, B-4036, B-4037, B-4051, B-4182, B-4258, B-4262, B-4278, B-4294, B-4295, B-4296.

3. The remaining 6 project sites lack the distinguishing characteristics referenced above and we would therefore place them in your green category meaning that normal processing procedures should be able to address anticipated impacts to aquatic resources. These 6 projects include the following TIP's: B-3813, B-3815, B-3874, B-3907, B- 4261, B-4263.

4. Please be reminded that all 12 projects in Division 13 are located in trout waters counties and will require pre-discharge notification to this office and the North Carolina Wildlife Resources Commission prior to the use of any Nationwide Permit.

5. If you have any questions, please contact me at telephone (828) 271-7980, extension 4.

Steven W. Lund
Regulatory Project Manager

Cc: William T. Goodwin
Bridge Replacement Planning Unit

COPY

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

Michael Easley, Governor
Bill Ross, Secretary
Gregory Thorpe, Director

NCDENR
NORTH CAROLINA DEPARTMENT OF ENVIRONMENT AND NATURAL RESOURCES

June 18, 2002

Memorandum To: William T. Goodwin, Jr., PE, Unit Head
Bridge Replacement Planning Unit
Project Development and Environmental Analysis Branch

Through: John Dorney
NC Division of Water Quality

From: Robert Ridings
NC Division of Water Quality

Subject: Review of Natural Systems Technical Reports for bridge replacement projects scheduled for construction in CFY 2005: "Green Light" Projects: B-4077, B-4082, B-4090, B-4152, B-4248, B-4036, B-4059, B-4060, B-4155, B-4158, B-4177, B-4178, B-4198, B-4197, B-4194, & B-4192.

On all projects, use of proper sediment and erosion control will be needed. Sediment and erosion control measures should not be placed in wetlands. Sediment should be removed from any water pumped from behind a cofferdam before the water is returned to the stream.

This office would prefer bridges to be replaced with new bridges. However if the bridge must be replaced by a culvert and 150 linear feet or more of stream is impacted, a stream mitigation plan will be needed prior to the issuance of a 401 Water Quality Certification. 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

For permitting, any project that falls under the Corps of Engineers' Nationwide Permits 23 or 33 do not require written concurrence by the NC Division of Water Quality. Notification and courtesy copies of materials sent to the Corps, including mitigation plans, are required. For projects that fall under the Corps of Engineers Nationwide Permit 14 or Regional General Bridge Permit 31, the formal 401 application process will be required including appropriate fees and mitigation plans.

Any proposed culverts shall be installed in such a manner that the original stream profile is not altered (i.e. the depth of the channel must not be reduced by a widening of the streambed). Existing stream dimensions are to be maintained above and below locations of culvert extensions.

Do not use any machinery in the stream channels unless absolutely necessary. Additionally, vegetation should not be removed from the stream bank unless it is absolutely necessary. NCDOT should especially avoid removing large trees and undercut banks. If large, undercut trees must be removed, then the trunks should be cut and the stumps and root systems left in place to minimize damage to stream banks.

Special Note on projects B-4077 and B-4090: these waters are classified as 303(d) waters. Special measures for sediment control will be needed

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.

North Carolina Wildlife Resources Commission

Charles R. Fullwood, Executive Director

MEMORANDUM

TO: William T. Goodwin, P.E., Unit Head
Bridge Replacement Planning Unit
Project Development and Environmental Analysis Branch, NCDOT

FROM: Owen F. Anderson, Mountain Region Coordinator
Habitat Conservation Program

DATE: July 3, 2002

SUBJECT: Scoping and Natural Resources Technical Report, Replace Bridge No 220 on SR 2098 Over Reems Creek, Buncombe County, TIP No. B-4036
Fish and Wildlife Project Status: YELLOW

Biologists with the North Carolina Wildlife Resources Commission familiar with the project area have reviewed the technical report for the subject project to assess the potential for adverse impacts to fish and wildlife resources. Our comments are provided in accordance with provisions of the National Environmental Policy Act (42 U.S.C. 4332(2)(c)) and the Fish and Wildlife Coordination Act (48 Stat. 401, as amended; 16 U.S.C. 661-667d).

The proposed work involves the replacement of bridge number 220 on SR 2098 over Reems Creek. Construction impacts on fish and wildlife resources will depend on the extent of disturbance in the streambed and surrounding floodplain areas. The vegetation surrounding the bridge is mostly disturbed and wildlife habitat value is low. The narrow riparian corridor is composed mostly of piedmont/mountain bottomland forest with discontinuous wetland fringe along the stream. This narrow riparian provides valuable wildlife cover and a travel cover in the disturbed landscape.

The Division of Water Quality classifies this reach of Reems Creek as C trout. Heron Cove Branch, a tributary that has its confluence a short distance downstream of the bridge is also classified as C trout. Additionally, Reems Creek is designated as a hatchery-supported trout

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

stream by the NCWRC. It is the opinion of biologists with the NCWRC that this project could result in adverse impacts to trout.

Based on historical ranges and suitable habitat, there is potential for the Appalachian elktoe (*Alasmidonta raveneliana*), the oyster mussel (*Epioblasma capsaeformis*) and the tan riffleshell (*Epioblasma florentine walkeri*) to exist in the area. Therefore, we concur with the proposal do perform a mussel survey. The findings will need to be considered in the alternatives analysis and design of the project.

We prefer bridge designs that do not alter the natural stream morphology or impede fish passage. Efforts should be made during design to place bridge supports outside of the bankfull channel. Bridge designs should also include provisions for the deck drainage to flow through a vegetated upland buffer prior to reaching the subject surface waters. Correction of altered stream morphology at the road crossing should be considered during design. Waste rock and dirt from bridge construction and road realignments should be disposed of in upland areas that are outside of riparian area and above the 100-year floodplain.

Streams and riparian zones provide connectivity of the landscape; and thus, are natural movement corridors for terrestrial wildlife species. Bridge designs should consider leaving sufficient corridors under the bridge to encourage movement of wildlife under the bridge rather than across the highway. The movement of animals, especially larger animals (e.g., deer and bear), under the bridge may reduce automobile crashes involving wildlife. Where feasible, increasing the riparian corridor width under the bridge is recommended.

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

Listed below are our standard recommendations on this project. Because the Corps of Engineers (COE) recognizes the project county as a "trout water county", the NCWRC will review any nationwide or general 404 permits for the proposed projects and will likely request the following as conditions of the 404 permit.

1. This bridge should be replaced with another spanning structure.

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

3. Live concrete should not be allowed to contact the water in or entering into the stream. Water that has inadvertently come in contact with live concrete should not be discharged to surface waters but should be disposed in an upland area.

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

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

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

7. Sedimentation and erosion control measures sufficient to protect High Quality Waters must be implemented prior to any ground disturbing activities. Structures should be maintained regularly, especially following rainfall events.

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

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

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

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

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

13. Wastewater from drilling operations should not be discharged to surface waters but should be pumped to upland areas.

14. **Instream construction and construction within the 25-foot buffer is prohibited during the trout-spawning period of October 15 to April 15 to avoid impacts on trout reproduction.**

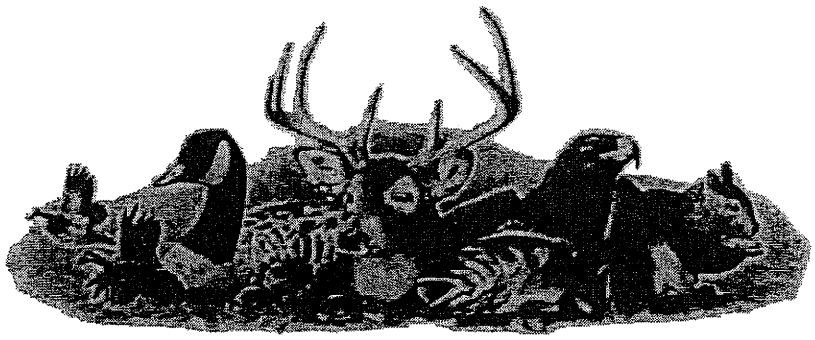
15. Discharge of materials into surface waters from demolition of the old bridge should be avoided as much as practicable. Any materials that inadvertently reach surface waters should be removed.

16. Discharging hydroseed mixtures and washing out hydroseeders and other equipment in or adjacent to surface waters is strictly prohibited.

17. Suitable mussel habitat exists at this project site and rare mussels are known from this drainage; therefore the project area should be surveyed for fish and freshwater mussels. NCDOT biologist Mr. Tim Savidge should be notified. If survey results reveal the presence of listed species, special measures to protect these sensitive species may be required. NCDOT should also contact the U.S. Fish and Wildlife Service for information on requirements of the Endangered Species Act as it relates to the project

Thank you for the opportunity to review and comment during the early stages of these projects. If you have any questions regarding these comments, please contact me at (828) 452-2546.

cc: Mr. Steve Lund, NCDOT Coordinator, COE, Asheville
Ms. Marella Buncick, Biologist, USFWS Asheville
Ms. Cynthia Van Der Wiele, Highway Coordinator, Division of Water Quality



North Carolina Wildlife Resources Commission

Charles R. Fullwood, Executive Director

TO: John Wadsworth, Project Planning Engineer
Project Development and Environmental Analysis Branch, NCDOT

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

DATE: March 21, 2003

SUBJECT: Scoping review of NCDOT's proposed bridge replacement projects B-4032, B-4036, B-4037, B-4258, B-4261, B-2988, B-4144, B-4291 in Buncombe, Rutherford, Haywood and Transylvania Counties.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

down to the natural ground elevation. The area should be stabilized with grass and planted with native tree species. Tall fescue should not be used in riparian areas. If the area that is reclaimed was previously wetlands, NCDOT should restore the area to wetlands. If successful, the site may be used as wetland mitigation for the subject project or other projects in the watershed.

Project specific comments:

1. B-4032, Buncombe Co., Bridge No. 130 over the Broad River. The Broad River is classified as C-Tr and rainbow trout are present. An in-stream and 25-foot buffer work moratorium from January 1 to April 15 should apply.

2. B-4036, Buncombe Co., Bridge No. 220 over Reems Creek. Reems Creek is classified as C-Tr and is hatchery supported trout water. An in-stream and 25-foot buffer work moratorium from October 15 to April 15 should apply.

3. B-4037, Buncombe Co., Bridge No. 262 over South Hominy Creek. South Hominy Creek is classified as C-Tr and rainbow and brown trout are present. An in-stream and 25-foot buffer work moratorium from October 15 to April 15 should apply.

4. B-4258, Rutherford Co., Bridge No. 7 over the Broad River. The Broad River flows into Lake Lure just downstream of this bridge and is classified as B-Tr and C-Tr in the project vicinity. The site is downstream of Hatchery Supported Trout Water and an in-stream and 25-foot buffer work moratorium for rainbow trout, from January 1 to April 15, is most appropriate for this project.

5. B-4261, Rutherford Co., Bridge Nos. 39 and 37 over Fork of Cathey's Creek. The Santee chub (*Cyprinella zanema*), a state listed significantly rare fish species, occurs both upstream and downstream of the project. An in-stream work moratorium to protect smallmouth bass and redbreast sunfish, from May 1 to July 15, is most appropriate for this project.

6. B-2988, Haywood Co., Bridge No. 13 over the East Fork of the Pigeon River. The East Fork of the Pigeon River is classified as WS-III Tr in the project area and rainbow and brown trout are present. Appalachian elktoe (*Alasmidonta raveneliana*), a federal and state listed endangered mussel species and the olive darter (*Percina squamata*), a state listed special concern fish species, are present in the Pigeon River downstream of the East Fork Pigeon River confluence. An in-stream and 25-foot buffer work moratorium from October 15 to April 15 should apply. Special precautions should be taken to prevent sedimentation downstream.

7. B-4144, Haywood Co., Bridge No. 211 over Richland Creek. Trout are present in Richland Creek, class B waters, which joins the Pigeon River not far downstream of the project site. Longear sunfish (*Lepomis megalotis*), a state significantly rare fish species, has been observed in Richland Creek upstream of the project. An in-stream and 25-foot buffer work moratorium from October 15 to April 15 should apply.

8. B-4291, Transylvania Co., Bridge No. 193 over the Davidson River. Rainbow and brown trout are present in the project area of Davidson River, class C waters, which joins the French Broad River not far downstream of the project site. The creeper (*Strophitus undulatus*), a state listed threatened mussel species, is present in the French Broad River immediately downstream of the confluence of the Davidson River. Two amphibian species, the common mudpuppy (*necturus maculosus*), state special concern, and the hellbender (*Cryptobranchus alleganiensis*), federal species of concern and state special concern, have been found in the Davidson River upstream of the project site. An in-stream and 25-foot buffer work moratorium from October 15 to April 15 should apply. Special precautions should be taken to prevent sedimentation downstream. In addition, a public access area should be incorporated into the plans for this project.

We request that NCDOT routinely minimize adverse impacts to fish and wildlife resources in the vicinity of bridge replacements. The NCDOT should install and maintain sedimentation control measures throughout the life of the project and prevent wet concrete from contacting water in or entering into these streams. Replacement of bridges with spanning structures of some type, as opposed to pipe or box culverts, is recommended in most cases. Spanning structures allow wildlife passage along streambanks, reducing habitat fragmentation and vehicle related mortality at highway crossings.

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

cc: Cynthia Van Der Wiele, DWQ
Marella Buncick, USFWS
Sarah Kopplin, NHP

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

Division of Historical Resources
David J. Olson, Director

January 28, 2003

MEMORANDUM

TO: Greg Thorpe, Manager
Project Development and Environmental Analysis Branch
NCDOT Division of Highways

B-4036a

FROM: David Brook /s/ David Brook

SUBJECT: Bridge 220 on SR 2098, Buncombe Co., ER 02-8497

We have received notification of a nationwide permit application for the above project and would like to comment.

The proposed project is at, or in very close proximity, to previously recorded site 31BN19.

We recommend that a comprehensive survey be conducted by an experienced archaeologist to identify and evaluate the significance of archaeological remains that may be damaged or destroyed by the proposed project. Potential effects on unknown resources must be assessed prior to the initiation of construction activities.

Two copies of the resulting archaeological survey report, as well as one copy of the appropriate site forms, should be forwarded to us for review and comment as soon as they are available and well in advance of any construction activities.

A list of archaeological consultants who have conducted or expressed an interest in contract work in North Carolina is available at www.arch.dcr.state.nc.us/consults. The archaeologists listed, or any other experienced archaeologist, may be contacted to conduct the recommended survey.

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

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

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

cc: Wadsworth, NCDOT
Wilkerson, NCDOT
Mary Pope Furr, NCDOT

North Carolina Department of Cultural Resources

State Historic Preservation Office

Peter B. Sandbeck, Administrator

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

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

March 14, 2006

MEMORANDUM

To: Matt Wilkerson, Archaeology Supervisor
NCDOT - Office of Human Environment

FROM: Peter Sandbeck PBS for Peter Sandbeck

SUBJECT: Bridge No. 220 on SR 2098, B-4036, Buncombe County, ER 02-8497

Thank you for your letter transmitting the archaeological survey for the above project. We apologize for the delay in our response.

The report meets our office's guidelines and those of the Secretary of the Interior. During the course of the survey, no sites were located within the project area. Mr. Zinn 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 considerations. If you have any questions concerning the above comment, please contact Renee Gledhill-Earley, environmental review coordinator, at 919.733.4763. In all future communication concerning this project, please cite the above referenced tracking number.

cc: Jesse Zinn, NCDOT

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

Buncombe County Public Schools

Transportation Department
74 Washington Avenue
Asheville, North Carolina 28804
Phone: (828) 232-4240 – Fax: (828) 252-8637

July 23, 2001

Mr. Davis Moore
North Carolina Department of Transportation
Project Development and Environmental Analysis Branch
1548 Mail Service Center
Raleigh, NC 27699-1548

RE: Replacement of Bridge Number 220 located on SR 2098 over Reems Creek

Dear Mr. Moore:

I am writing in response to your request concerning the number of school buses that cross bridge number 220 on Herron Cove Road in Buncombe County. Five school buses cross this bridge four times a day. This does not include the parents who transport their children to and/or from school. Students who live in this area attend Weaverville Elementary School, Weaverville Primary School, North Buncombe Middle School, and North Buncombe High School.

Buses could be temporarily rerouted onto Reems Creek Road and Stoney Knob Road during bridge construction, if it is not feasible to provide an on-site detour with the replacement of the bridge at its existing location or provide the permanent realignment of the road with a new bridge while maintaining traffic on the existing bridge. Please notify the Buncombe County Schools' Transportation Department at the address above when a date has been set for the beginning of this project. This will provide us with sufficient time to establish new bus runs with the schools that are affected.

If you need additional information, please contact me at the address or telephone number listed above.

Sincerely,

Harold F. Laflin
Director of Transportation

Attachment

pc: Mr. Marshall Roberts

County of Buncombe

BUNCOMBE COUNTY EMERGENCY MANAGEMENT AGENCY

EMERGENCY OPERATING CENTER
35 WOODFIN STREET
ASHEVILLE, NORTH CAROLINA 28801

M. Jerry Vehaun **Director of Emergency Services**

Mr. Davis Moore
NCDOT
Project Development &
Environmental Analysis Branch
1548 Mail Service Center
Raleigh, North Carolina 27699-1548

July 3, 2001

Re: State Project No. 8.2844701 - B-4037
State Project No. 8.2844601 - B-4036
State Project No. 8.1845601 - B-4032

Dear Mr. Moore:

In reply to your request for information regarding the above listed projects, there are no problems which we will not be able to address by re-routing emergency vehicles while these projects are underway. There are no unworkable situations involved with these three projects.

Should you need additional information, please feel free to contact me.

Sincerely,

M. Jerry VeHaun, Director
Emergency Services

RELOCATION REPORT

North Carolina Department of Transportation
RELOCATION ASSISTANCE PROGRAM

[X] E.I.S. [ ] CORRIDOR [ ] DESIGN

PROJECT:	8.2844601	COUNTY	BUNCOMBE	Alternate 1 Of 2 Alternates
I.D. NO.:	B-4036	F.A. PROJECT		
DESCRIPTION OF PROJECT:	Bridge Number 220 on SR 2098 (Herron Cove Road) over Reems Creek			

ESTIMATED DISPLACEES

Type of Displacees	Owners	Tenants	Total	Minorities
Residential	1	0	1	0
Businesses	0	0	0	0
Farms	0	0	0	0
Non-Profit	0	0	0	0

INCOME LEVEL

0-15M	15-25M	25-35M	35-50M	50 UP
0	0	1	0	0

VALUE OF DWELLING / DSS DWELLING AVAILABLE

Owners		Tenants		For Sale		For Rent	
0-20M	0	$ 0-150	0	0-20M	5	$ 0-150	0
20-40M	0	150-250	0	20-40M	11	150-250	1
40-70M	1	250-400	0	40-70M	16	250-400	7
70-100M	0	400-600	0	70-100M	18	400-600	11
100 UP	0	600 UP	0	100 UP	36	600 UP	6
TOTAL	1		0		86		25

ANSWER ALL QUESTIONS

Yes	No	Explain all "YES" answers.
	X	1. Will special relocation services be necessary?
	X	2. Will schools or churches be affect by displacement?
X		3. Will business services still be available after project?
	X	4. Will any business be displaced? If so, indicate size, type, estimated number of employees, minorities, etc.
	X	5. Will relocation cause a housing shortage?
		6. Source for available housing (list).
	X	7. Will additional housing programs be needed?
X		8. Should Last Resort Housing be considered?
	X	9. Are there large, disabled, elderly, etc. families?
	X	10. Will public housing be needed for project?
X		11. Is public housing available?
X		12. Is it felt there will be adequate DSS housing housing available during relocation period?
	X	13. Will there be a problem of housing within financial means?
		14. Are suitable business sites available (list source). **N/A**
		15. Number months estimated to complete RELOCATION? **12 months**

REMARKS (Respond by Number)

3. **Business services will not be disrupted due to the project.**
6. **Beverly-Hanks Realtors and local real estate publications indicate that sufficient DSS housing properties will be available.**
8. **As necessary in accordance with State law.**
12. **Beverly-Hanks Realtors and local real estate publications indicate that sufficient DSS housing properties will be available.**

You may notice a difference in the number of displacees on the Relocation EIS Report and the Appraisal Cost Estimate. This is due to possible proximity damage being a factor on the Cost Estimate Report and improvements not actually in the proposed acquisition areas shown on the plans.

Daryl C. Roberts — Right of Way Agent — 7-21-03 — Date

Ann Simpson — Relocation Coordinator — 8-1-03 — Date

Form 15.4 Revised 09-02

Original & Copy 1: Relocation Coordinator
Copy 2: Division Relocation File

RELOCATION REPORT

North Carolina Department of Transportation
RELOCATION ASSISTANCE PROGRAM

[X] E.I.S. [ ] CORRIDOR [ ] DESIGN

PROJECT:	8.2844601	COUNTY	BUNCOMBE	Alternate 2 Of 2 Alternates	
I.D. NO.:	B-4036	F.A. PROJECT			
DESCRIPTION OF PROJECT:	Bridge Number 220 on SR 2098 (Herron Cove Road) over Reems Creek				

ESTIMATED DISPLACEES

Type of Displacees	Owners	Tenants	Total	Minorities
Residential	0	0	0	0
Businesses	0	0	0	0
Farms	0	0	0	0
Non-Profit	0	0	0	0

INCOME LEVEL

0-15M	15-25M	25-35M	35-50M	50 UP
0	0	0	0	0

VALUE OF DWELLING				DSS DWELLING AVAILABLE			
Owners		Tenants		For Sale		For Rent	
0-20M	0	$ 0-150	0	0-20M	5	$ 0-150	0
20-40M	0	150-250	0	20-40M	11	150-250	1
40-70M	0	250-400	0	40-70M	16	250-400	7
70-100M	0	400-600	0	70-100M	18	400-600	11
100 UP	0	600 UP	0	100 UP	36	600 UP	6
TOTAL	0		0		86		25

ANSWER ALL QUESTIONS

Yes	No	Explain all "YES" answers.
	x	1. Will special relocation services be necessary?
	x	2. Will schools or churches be affect by displacement?
x		3. Will business services still be available after project?
	x	4. Will any business be displaced? If so, indicate size, type, estimated number of employees, minorities, etc.
	x	5. Will relocation cause a housing shortage?
		6. Source for available housing (list).
	x	7. Will additional housing programs be needed?
x		8. Should Last Resort Housing be considered?
	x	9. Are there large, disabled, elderly, etc. families?
	x	10. Will public housing be needed for project?
x		11. Is public housing available?
x		12. Is it felt there will be adequate DSS housing housing available during relocation period?
	x	13. Will there be a problem of housing within financial means?
		14. Are suitable business sites available (list source). **N/A**
		15. Number months estimated to complete RELOCATION? **N/A**

REMARKS (Respond by Number)

No relocatees on this alternate.

***You may notice a difference in the number of displacees on the Relocation EIS Report and the Appraisal Cost Estimate. This is due to possible proximity damage being a factor on the Cost Estimate Report and improvements not actually in the proposed acquisition areas shown on the plans.*

Daryl C Roberts	7-21-03	Am Simpson	8-1-03
Right of Way Agent	Date	Relocation Coordinator	Date

Form 15.4 Revised 09-02

Original & Copy 1: Relocation Coordinator
Copy 2: Division Relocation File

NCDWQ Stream Classification Form

Project Name	B-4036	River Basin	French Broad	County	Buncombe	Evaluator	BAR
DWQ Prj Number		Nearest Stream	Reems Creek	Latitude		Signature	BAR
Date	10/10/2003	USGS QUAD	Weaverville	Longitude		Location	Bridge #220 on SR 2098

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

Primary Field Indicators

I. Geomorphology	Absent	Weak	Moderate	Strong	Score
1) Is There A Riffle-Pool Sequence?	0	1	2	**3**	3
2) Is The USDA Texture In Streambed Different From Surrounding Terrain?	0	1	2	**3**	3
3) Are Natural Levees Present?	0	1	2	3	1
4) Is The Channel Sinuous?	0	1	**2**	3	2
5) Is There An Active (Or Relic) Floodplain Present?	0	**1**	2	3	1
6) Is The Channel Braided?	**0**	1	2	3	0
7) Are Recent Alluvial Deposits Present?	0	**1**	2	3	1
8) Is There A Bankfull Bench Present?	0	1	**2**	3	2
9) Is A Continuous Bed & Bank Present?	0	1	2	**3**	3
*(*NOTE: If Bed & Bank Caused By Ditching And WITHOUT Sinuosity Then Score=0*)*					
10) Is A 2nd Order Or Greater Channel (As Indicated On Topo Map And/Or In Field) Present?	**Yes**	**3**	**No**	0	3
PRIMARY GEOMORPHOLOGY INDICATOR POINTS:					19

II. Hydrology	Absent	Weak	Moderate	Strong	
1) Is There A Groundwater Flow/Discharge Present?	0	1	2	3	1
PRIMARY HYDROLOGY INDICATOR POINTS:					1

III. Biology	Absent	Weak	Moderate	Strong	
1) Are Fibrous Roots Present In Streambed?	**3**	2	1	0	3
2) Are Rooted Plants Present In Streambed?	**3**	2	1	0	3
3) Is Periphyton Present?	0	**1**	2	3	1
4) Are Bivalves Present?	**0**	1	2	3	0
PRIMARY BIOLOGY INDICATOR POINTS:					7

Secondary Field Indicators:

I. Geomorphology	Absent	Weak	Moderate	Strong	
1) Is There A Head Cut Present In Channel?	0	**0.5**	1	1.5	0.5
2) Is There A Grade Control Point In Channel?	0	**0.5**	1	1.5	0.5
3) Does Topography Indicate A Natural Drainage Way?	0	0.5	1	**1.5**	1.5
SECONDARY GEOMORPHOLOGY INDICATOR POINTS:					2.5

II. Hydrology	Absent	Weak	Moderate	Strong	
1) Is This Year's (Or Last's) Leaflitter Present In Streambed?	1.5	**1**	0.5	0	1
2) Is Sediment On Plants (Or Debris) Present?	**0**	0.5	1	1.5	0
3) Are Wrack Lines Present?	0	0.5	**1**	1.5	1
4) Is Water In Channel *And* >48 Hrs. Since Last Known Rain? (*NOTE: If Ditch Indicated In #9 Above Skip This Step And #5 Below*)	0	0.5	1	**1.5**	1.5
5) Is There Water In Channel During Dry Conditions Or In Growing Season)?	0	0.5	1	**1.5**	1.5
6) Are Hydric Soils Present In Sides Of Channel (Or In Headcut)?	**Yes**	**1.5**	**No**	0	1.5
SECONDARY HYDROLOGY INDICATOR POINTS:					6.5

III. Biology		Absent	Weak	Moderate	Strong	
1) Are Fish Present?		0	0.5	**1**	1.5	1
2) Are Amphibians Present?		**0**	0.5	1	1.5	0
3) Are Aquatic Turtles Present?		**0**	0.5	1	1.5	0
4) Are Crayfish Present?		**0**	0.5	1	1.5	0
5) Are Macrobenthos Present?		0	0.5	1	**1.5**	1.5
6) Are Iron Oxidizing Bacteria/Fungus Present?		**0**	0.5	1	1.5	0
7) Is Filamentous Algae Present?		**0**	0.5	1	1.5	0
8) Are Wetland Plants In Streambed?	SAV	**Mostly OBL**	**Mostly FACW**	**Mostly FAC**	**Mostly FACU/UPL**	
	2	1	0.75	**0.5**	0	0.5
*(*NOTE: If Total Absence Of All Plants In Streambed As Noted Above Skip This Step UNLESS SAV Present*)*						
SECONDARY BIOLOGY INDICATOR POINTS:						3

TOTAL POINTS (Primary + Secondary)	(If Greater Than Or Equal To 19 Points The Stream Is At Least Intermittent)	39

NCDWQ Stream Classification Form

Project Name	B-4036	River Basin	French Broad	County	Buncombe	Evaluator	BAR
DWQ Prj Number		Nearest Stream	Herron Cove Branch	Latitude		Signature	BAR
Date	10/10/2003	USGS QUAD	Weaverville, NC	Longitude		Location	Bridge no. 220 SR 2098

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

Primary Field Indicators

I. Geomorphology	Absent	Weak	Moderate	Strong	Score
1) Is There A Riffle-Pool Sequence?	0	1	2	**3**	3
2) Is The USDA Texture In Streambed Different From Surrounding Terrain?	0	1	2	**3**	3
3) Are Natural Levees Present?	0	**1**	2	3	1
4) Is The Channel Sinuous?	0	**1**	2	3	1
5) Is There An Active (Or Relic) Floodplain Present?	0	**1**	2	3	1
6) Is The Channel Braided?	**0**	1	2	3	0
7) Are Recent Alluvial Deposits Present?	0	**1**	2	3	1
8) Is There A Bankfull Bench Present?	0	**1**	2	3	1
9) Is A Continuous Bed & Bank Present?	0	1	2	**3**	3
(NOTE: If Bed & Bank Caused By Ditching And WITHOUT Sinuosity Then Score=0*)*					
10) Is A 2nd Order Or Greater Channel (As Indicated On Topo Map And/Or In Field) Present?	**Yes**	**3**	**No**	0	3
PRIMARY GEOMORPHOLOGY INDICATOR POINTS:					7

II. Hydrology	Absent	Weak	Moderate	Strong	
1) Is There A Groundwater Flow/Discharge Present?	0	**1**	2	3	1
PRIMARY HYDROLOGY INDICATOR POINTS:					1

III. Biology	Absent	Weak	Moderate	Strong	
1) Are Fibrous Roots Present In Streambed?	3	2	**1**	0	1
2) Are Rooted Plants Present In Streambed?	3	2	**1**	0	1
3) Is Periphyton Present?	0	**1**	2	3	1
4) Are Bivalves Present?	**0**	1	2	3	0
PRIMARY BIOLOGY INDICATOR POINTS:					3

Secondary Field Indicators:

I. Geomorphology	Absent	Weak	Moderate	Strong	
1) Is There A Head Cut Present In Channel?	0	**0.5**	1	1.5	0.5
2) Is There A Grade Control Point In Channel?	0	**0.5**	1	1.5	0.5
3) Does Topography Indicate A Natural Drainage Way?	0	0.5	1	**1.5**	1.5
SECONDARY GEOMORPHOLOGY INDICATOR POINTS:					2.5

II. Hydrology	Absent	Weak	Moderate	Strong	
1) Is This Year's (Or Last's) Leaflitter Present In Streambed?	1.5	1	**0.5**	0	0.5
2) Is Sediment On Plants (Or Debris) Present?	**0**	0.5	1	1.5	0
3) Are Wrack Lines Present?	0	0.5	**1**	1.5	1
4) Is Water In Channel *And* >48 Hrs. Since Last Known Rain? (*NOTE: If Ditch Indicated In #9 Above Skip This Step And #5 Below*)	0	0.5	1	**1.5**	1.5
5) Is There Water In Channel During Dry Conditions Or In Growing Season)?	0	0.5	1	**1.5**	1.5
6) Are Hydric Soils Present In Sides Of Channel (Or In Headcut)?	**Yes**	**1.5**	**No**	0	1.5
SECONDARY HYDROLOGY INDICATOR POINTS:					6

III. Biology		Absent	Weak	Moderate	Strong	
1) Are Fish Present?		0	0.5	**1**	1.5	1
2) Are Amphibians Present?		**0**	0.5	1	1.5	0
3) Are Aquatic Turtles Present?		**0**	0.5	1	1.5	0
4) Are Crayfish Present?		**0**	0.5	1	1.5	0
5) Are Macrobenthos Present?		0	0.5	1	**1.5**	1.5
6) Are Iron Oxidizing Bacteria/Fungus Present?		**0**	0.5	1	1.5	0
7) Is Filamentous Algae Present?		0	0.5	**1**	1.5	1
8) Are Wetland Plants In Streambed?	SAV	Mostly OBL	Mostly FACW	Mostly FAC	Mostly FACU/UPL	
	2	1	0.75	**0.5**	0	0.5
(NOTE: If Total Absence Of All Plants In Streambed As Noted Above Skip This Step UNLESS SAV Present*)*						
SECONDARY BIOLOGY INDICATOR POINTS:						4

TOTAL POINTS (Primary + Secondary)	(If Greater Than Or Equal To 19 Points The Stream Is At Least Intermittent)	33.5

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

STREAM QUALITY ASSESSMENT WORKSHEET

Provide the following information for the stream reach under assessment:

1. Applicant's name: NCDOT/B-4036
2. Evaluator's name: Beth Reed
3. Date of evaluation: 10/10/03
4. Time of evaluation: 9:00 am
5. Name of stream: Herron Cove Branch
6. River basin: French Broad
7. Approximate drainage area: 300 acres
8. Stream order: 1st
9. Length of reach evaluated: 198 feet
10. County: Buncombe
11. Site coordinates (if known): prefer in decimal degrees.
12. Subdivision name (if any): _____

Latitude (ex. 34.872312): 35.683605 Longitude (ex. -77.556611): -82.5608108

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

13. Location of reach under evaluation (note nearby roads and landmarks and attach map identifying stream(s) location): SR2098 at Barns Creek

14. Proposed channel work (if any): _____

15. Recent weather conditions: Fair

16. Site conditions at time of visit: Fair

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

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

19. Does channel appear on USGS quad map? (YES) NO 20. Does channel appear on USDA Soil Survey? (YES) NO

21. Estimated watershed land use: 20 % Residential ___% Commercial ___% Industrial 30 % Agricultural
50 % Forested ___% Cleared / Logged ___% Other (_____)

22. Bankfull width: 15 feet 23. Bank height (from bed to top of bank): 2 feet

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

25. Channel sinuosity: ____Straight ___Occasional bends ✓ Frequent meander ___Very sinuous ___Braided channel

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

Total Score (from reverse): 75 **Comments:** _____

Evaluator's Signature_____ **Date** 10/10/03

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

STREAM QUALITY ASSESSMENT WORKSHEET

	#	CHARACTERISTICS	ECOREGION POINT RANGE			SCORE
			Coastal	Piedmont	Mountain	
PHYSICAL	1	**Presence of flow / persistent pools in stream** (no flow or saturation = 0; strong flow = max points)	0 – 5	0 – 4	0 – 5	5
	2	**Evidence of past human alteration** (extensive alteration = 0; no alteration = max points)	0 – 6	0 – 5	0 – 5	4
	3	**Riparian zone** (no buffer = 0; contiguous, wide buffer = max points)	0 – 6	0 – 4	0 – 5	3
	4	**Evidence of nutrient or chemical discharges** (extensive discharges = 0; no discharges = max points)	0 – 5	0 – 4	0 – 4	4
	5	**Groundwater discharge** (no discharge = 0; springs, seeps, wetlands, etc. = max points)	0 – 3	0 – 4	0 – 4	1
	6	**Presence of adjacent floodplain** (no floodplain = 0; extensive floodplain = max points)	0 – 4	0 – 4	0 – 2	1
	7	**Entrenchment / floodplain access** (deeply entrenched = 0; frequent flooding = max points)	0 – 5	0 – 4	0 – 2	1
	8	**Presence of adjacent wetlands** (no wetlands = 0; large adjacent wetlands = max points)	0 – 6	0 – 4	0 – 2	0
	9	**Channel sinuosity** (extensive channelization = 0; natural meander = max points)	0 – 5	0 – 4	0 – 3	3
	10	**Sediment input** (extensive deposition = 0; little or no sediment = max points)	0 – 5	0 – 4	0 – 4	3
	11	**Size & diversity of channel bed substrate** (fine, homogenous = 0; large, diverse sizes = max points)	NA*	0 – 4	0 – 5	5
STABILITY	12	**Evidence of channel incision or widening** (deeply incised = 0; stable bed & banks = max points)	0 – 5	0 – 4	0 – 5	4
	13	**Presence of major bank failures** (severe erosion = 0; no erosion, stable banks = max points)	0 – 5	0 – 5	0 – 5	4
	14	**Root depth and density on banks** (no visible roots = 0; dense roots throughout = max points)	0 – 3	0 – 4	0 – 5	3
	15	**Impact by agriculture, livestock, or timber production** (substantial impact = 0; no evidence = max points)	0 – 5	0 – 4	0 – 5	2
HABITAT	16	**Presence of riffle-pool/ripple-pool complexes** (no riffles/ripples or pools = 0; well-developed = max points)	0 – 3	0 – 5	0 – 6	5
	17	**Habitat complexity** (little or no habitat = 0; frequent, varied habitats = max points)	0 – 6	0 – 6	0 – 6	6
	18	**Canopy coverage over streambed** (no shading vegetation = 0; continuous canopy = max points)	0 – 5	0 – 5	0 – 5	2
	19	**Substrate embeddedness** (deeply embedded = 0; loose structure = max)	NA*	0 – 4	0 – 4	3
BIOLOGY	20	**Presence of stream invertebrates** (see page 4) (no evidence = 0; common, numerous types = max points)	0 – 4	0 – 5	0 – 5	5
	21	**Presence of amphibians** (no evidence = 0; common, numerous types = max points)	0 – 4	0 – 4	0 – 4	0
	22	**Presence of fish** (no evidence = 0; common, numerous types = max points)	0 – 4	0 – 4	0 – 4	3
	23	**Evidence of wildlife use** (no evidence = 0; abundant evidence = max points)	0 – 6	0 – 5	0 – 5	5
		Total Points Possible	100	100	100	
		TOTAL SCORE (also enter on first page)				72

* These characteristics are not assessed in coastal streams.

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

STREAM QUALITY ASSESSMENT WORKSHEET

Provide the following information for the stream reach under assessment:

1. Applicant's name: NCDOT
2. Evaluator's name: Beth Reed
3. Date of evaluation: 10/10/03
4. Time of evaluation: 9:30am
5. Name of stream: Reems Creek
6. River basin: French Broad
7. Approximate drainage area: 900 acres
8. Stream order: 3rd
9. Length of reach evaluated: 65 feet
10. County: Buncombe
11. Site coordinates (if known): prefer in decimal degrees.
12. Subdivision name (if any):

Latitude (ex. 34.872312): 35.684458 Longitude (ex. -77.556611): -82.561023

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

13. Location of reach under evaluation (note nearby roads and landmarks and attach map identifying stream(s) location): SR 2098 at Reems Creek

14. Proposed channel work (if any):_____

15. Recent weather conditions: Fair

16. Site conditions at time of visit: Fair

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

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

19. Does channel appear on USGS quad map? (YES) NO
20. Does channel appear on USDA Soil Survey? (YES) NO

21. Estimated watershed land use: 20 % Residential ___% Commercial ___% Industrial 30 % Agricultural
50 % Forested ___% Cleared / Logged ___% Other (_____)

22. Bankfull width: 25 feet
23. Bank height (from bed to top of bank): 3-5 feet

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

25. Channel sinuosity: ____Straight ___Occasional bends ✓ Frequent meander ___Very sinuous ___Braided channel

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

Total Score (from reverse): 72 **Comments:**_____

Evaluator's Signature_____ **Date** 10/10/03

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STREAM QUALITY ASSESSMENT WORKSHEET

	#	CHARACTERISTICS	ECOREGION POINT RANGE			SCORE
			Coastal	Piedmont	Mountain	
PHYSICAL	1	**Presence of flow / persistent pools in stream** (no flow or saturation = 0; strong flow = max points)	0 – 5	0 – 4	0 – 5	5
	2	**Evidence of past human alteration** (extensive alteration = 0; no alteration = max points)	0 – 6	0 – 5	0 – 5	4
	3	**Riparian zone** (no buffer = 0; contiguous, wide buffer = max points)	0 – 6	0 – 4	0 – 5	3
	4	**Evidence of nutrient or chemical discharges** (extensive discharges = 0; no discharges = max points)	0 – 5	0 – 4	0 – 4	4
	5	**Groundwater discharge** (no discharge = 0; springs, seeps, wetlands, etc. = max points)	0 – 3	0 – 4	0 – 4	1
	6	**Presence of adjacent floodplain** (no floodplain = 0; extensive floodplain = max points)	0 – 4	0 – 4	0 – 2	1
	7	**Entrenchment / floodplain access** (deeply entrenched = 0; frequent flooding = max points)	0 – 5	0 – 4	0 – 2	1
	8	**Presence of adjacent wetlands** (no wetlands = 0; large adjacent wetlands = max points)	0 – 6	0 – 4	0 – 2	0
	9	**Channel sinuosity** (extensive channelization = 0; natural meander = max points)	0 – 5	0 – 4	0 – 3	3
	10	**Sediment input** (extensive deposition = 0; little or no sediment = max points)	0 – 5	0 – 4	0 – 4	3
	11	**Size & diversity of channel bed substrate** (fine, homogenous = 0; large, diverse sizes = max points)	NA*	0 – 4	0 – 5	5
STABILITY	12	**Evidence of channel incision or widening** (deeply incised = 0; stable bed & banks = max points)	0 – 5	0 – 4	0 – 5	4
	13	**Presence of major bank failures** (severe erosion = 0; no erosion, stable banks = max points)	0 – 5	0 – 5	0 – 5	4
	14	**Root depth and density on banks** (no visible roots = 0; dense roots throughout = max points)	0 – 3	0 – 4	0 – 5	3
	15	**Impact by agriculture, livestock, or timber production** (substantial impact = 0; no evidence = max points)	0 – 5	0 – 4	0 – 5	2
HABITAT	16	**Presence of riffle-pool/ripple-pool complexes** (no riffles/ripples or pools = 0; well-developed = max points)	0 – 3	0 – 5	0 – 6	5
	17	**Habitat complexity** (little or no habitat = 0; frequent, varied habitats = max points)	0 – 6	0 – 6	0 – 6	6
	18	**Canopy coverage over streambed** (no shading vegetation = 0; continuous canopy = max points)	0 – 5	0 – 5	0 – 5	2
	19	**Substrate embeddedness** (deeply embedded = 0; loose structure = max)	NA*	0 – 4	0 – 4	3
BIOLOGY	20	**Presence of stream invertebrates** (see page 4) (no evidence = 0; common, numerous types = max points)	0 – 4	0 – 5	0 – 5	5
	21	**Presence of amphibians** (no evidence = 0; common, numerous types = max points)	0 – 4	0 – 4	0 – 4	0
	22	**Presence of fish** (no evidence = 0; common, numerous types = max points)	0 – 4	0 – 4	0 – 4	3
	23	**Evidence of wildlife use** (no evidence = 0; abundant evidence = max points)	0 – 6	0 – 5	0 – 5	5
		Total Points Possible	100	100	100	
		TOTAL SCORE (also enter on first page)				72

* These characteristics are not assessed in coastal streams.