STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

MICHAEL F. EASLEY
GOVERNOR

LYNDO TIPPETT
SECRETARY

April 4, 2007

US Army Corps of Engineers
Regulatory Branch
PO Box 1890
Wilmington, NC 28402

ATTENTION: Mr. John Thomas
NCDOT Coordinator

Subject: **Nationwide 33 Permit Application** for the for the replacement of Bridge No. 334 over Yadkin River on SR 1517, Caldwell County. Federal Aid Project No. BRZ-1517(3), State Project No. 8.2733501, Division 11, TIP Project No. B-4054, WBS Element 33419.1.1.

Dear Mr. Thomas:
Please find enclosed a copy of the Categorical Exclusion (CE), Pre-construction Notification (PCN), Permit Drawings, and ½ size plans for the above referenced project. Bridge No. 334 over the Yadkin River will be replaced with a new 120-foot long, 24-foot 10-inch wide structure to the north of the existing structure. Traffic will use the existing structure during construction of the new bridge. No permanent impacts will occur. Proposed temporary impacts to the Yadkin River consist of 0.03 acre of temporary fill from the use of two work pads that will be used to remove the old bridge and build the new bridge. After construction is completed, the temporary work pads will be removed and the area restored to pre-construction elevations.

IMPACTS TO WATERS OF THE UNITED STATES
General Description: The project is located in the Yadkin River basin (HUC 03040101) and will cross the Yadkin River. The Yadkin River has been assigned a best usage classification of **C Tr**, by the N.C. Division of Water Quality. The Yadkin River does not support trout at this site and the NCWRC has not requested a moratorium for trout. The Yadkin River is not designated as a North Carolina Natural or Scenic River, or as a National Wild and Scenic River, nor is it listed as a 303(d) stream. No designated Outstanding Resource Waters (ORW), Water Supply I (WS-I), or Water Supply II (WS-II) waters occur within 1.0 miles of the project study area.

Temporary Impacts: Proposed temporary impacts to the Yadkin River will total 0.03 acre of temporary fill. At no time will over half of the width of the Yadkin River be impacted by the fill.

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

TELEPHONE: 919-715-1334
FAX: 919-715-5501

WEBSITE: WWW.DOH.DOT.STATE.NC.US

LOCATION:
2728 CAPITOL BOULEVARD
PARKER LINCOLN BUILDING, SUITE 240
RALEIGH NC 27699

Permanent Impacts: No permanent impacts will occur to the Yadkin River. No wetlands occur within the project area.

Utility Impacts: No impacts will occur due to utility relocations.

Project Schedule: The project currently has a let date of December 18, 2007.

BRIDGE DEMOLITION:
Bridge No. 334 is composed of a timber deck with a 1-inch asphalt-wearing surface supported on steel beams. The substructure consists of reinforced concrete abutments and pier. The timber will be removed without dropping components into Waters of the United States. Best Management Practice's for Bridge Demolition and Removal will be followed in addition to Best Management Practices for the Protection of Surface Waters.

FEDERALLY-PROTECTED SPECIES
Plants and animals with federal classifications of Endangered, Threatened, Proposed Endangered, and Proposed Threatened are protected under provisions of Section 7 and Section 9 of the Endangered Species Act of 1973, as amended. As of January 29, 2007 the US Fish and Wildlife Service (FWS) lists five federally protected species for Caldwell County (Table 1). The Virginia big-eared bat has been added to the list of federally protected species that occur in Caldwell County. A habitat analysis assessment was conducted for the Virginia big-eared bat on August 23, 2006. The project does not contain the preferred habitat for the Virginia big-eared bat. Therefore, the biological conclusion for the Virginia big-eared bat is "No Effect." The bog turtle is listed as Threatened due to similarity of appearance and does not require a biological conclusion. The biological conclusions of No Effect reached for the other three federally protected species in the CE remain valid.

Table 1. Federally-Protected Species for Caldwell County

Common Name	Scientific Name	Federal Status	Habitat Present	Biological Conclusion
Virginia big-eared bat	*Corynorhinus townsendii virginianus*	E	No	No Effect
Bog Turtle	*Clemmys muhlenbergii*	T(S/A)	No	NA
Spruce-fir moss spider	*Microhexura montivaga*	T	No	No Effect
Dwarf-flowered heartleaf	*Hexastylis naniflora*	T	No	No Effect
Heller's blazing star	*Liatris helleri*	T	No	No Effect

E-Endangered, T-Threatened, T(S/A)- threatened due to similarity of appearance

AVOIDANCE AND MINIMIZATION:
The NCDOT is committed to incorporating all reasonable and practicable design features to avoid and minimize jurisdictional impacts, and to provide full compensatory mitigation of all remaining, unavoidable jurisdictional impacts. Avoidance measures were taken during the

planning and NEPA compliance stages; minimization measures were incorporated as part of the project design and include:

- Best Management Practices for the Protection of Surface Waters and Bridge Demolition and Removal will be followed.
- No bents will be placed in the water.

MITIGATION
Proposed project impacts are temporary, therefore no mitigation is proposed.

REGULATORY APPROVALS
Section 404 Permit: This project has been processed by the Federal Highway Administration as a "Categorical Exclusion" in accordance with 23 CFR 771.115(b). The NCDOT requests issuance of a Nationwide Permit 33 to authorize the impacts described above.

Section 401 Permit: We anticipate 401 General Certification number 3366 will apply to this project. All general conditions of the Water quality Certifications will be met. No written concurrence is required. 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 Environment and Natural Resources, Division of Water Quality, for their notification.

If you have any questions or need additional information, please contact Brett Feulner at (919) 715-1488.

Sincerely,

E. L. Lude

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

w/attachment
Mr. John Hennessy, NCDWQ 2 Copies
Ms. Marella Buncick, USFWS
Mr. Victor Barbour, Project Services Unit
Mr. Greg Perfetti, P.E., Structure Design
Mr. Heath Slaughter, Div. 11 Environmental Officer
Ms. Marla Chambers, NCWRC
Dr. David Chang, P.E., Hydraulics
Mr. Mark Staley, Roadside Environmental
Mr. Michael A. Pettyjohn, P.E. Div. 11 Engineer

w/o attachment
Mr. Jay Bennett, P.E., Roadway Design
Ms. Vince Rhea, P.E., PDEA
Mr. Majed Alghandour, P. E., Programming and TIP
Mr. Scott McLendon, USACE, Wilmington
Mr. Art McMillan, P.E., Highway Design

Office Use Only: Form Version March 05

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

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

I. Processing

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

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

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

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

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

II. Applicant Information

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

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

III. Project Information

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

1. Name of project: Replacement of Bridge No. 334 over the Yadkin River

2. T.I.P. Project Number or State Project Number (NCDOT Only): B-4054

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

4. Location
   County: Caldwell Nearest Town: Lenoir
   Subdivision name (include phase/lot number): N/A
   Directions to site (include road numbers/names, landmarks, etc.): The site is located at the crossing SR 1517 over Yadkin River

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): 34.4432 °N 77.8339 °W

6. Property size (acres): N/A

7. Name of nearest receiving body of water: Yadkin

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

9. Describe the existing conditions on the site and general land use in the vicinity of the project at the time of this application: Forestland

10. Describe the overall project in detail, including the type of equipment to be used: Standard DOT construction equipment.

11. Explain the purpose of the proposed work: The purpose is to replace the old bridge that is functionally obsolete and structurally deficient.

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.
No

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: The project impacts are as follows, 0.032 acre of temp fill in the Yadkin River

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

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

3. List the total acreage (estimated) of all existing wetlands on the property: 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)
Site 1	Yadkin	Temporary	Perennial	50		0.032
Total Stream Impact (by length and acreage)						0.032

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

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

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

Stream Impact (acres):	0.032
Wetland Impact (acres):	0
Open Water Impact (acres):	0
Total Impact to Waters of the U.S. (acres)	0.032
Total Stream Impact (linear feet):	0

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. Best management Practices for the protection of Surface Waters and BMP's for Bridge demolition and removal, proposed bridge will span the creek

_____

_____

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.
   No mitigation is proposed because the proposed impacts are temporary.

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

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

IX. Environmental Documentation (required by DWQ)

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

2. If yes, does the project require preparation of an environmental document pursuant to the requirements of the National or North Carolina Environmental Policy Act (NEPA/SEPA)? Note: If you are not sure whether a NEPA/SEPA document is required, call the SEPA coordinator at (919) 733-5083 to review current thresholds for environmental documentation.

Yes ☒ No ☐

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

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

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

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

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

Zone*	Impact (square feet)	Multiplier	Required Mitigation
1		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. _____

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.Approximately the same as current conditions

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)

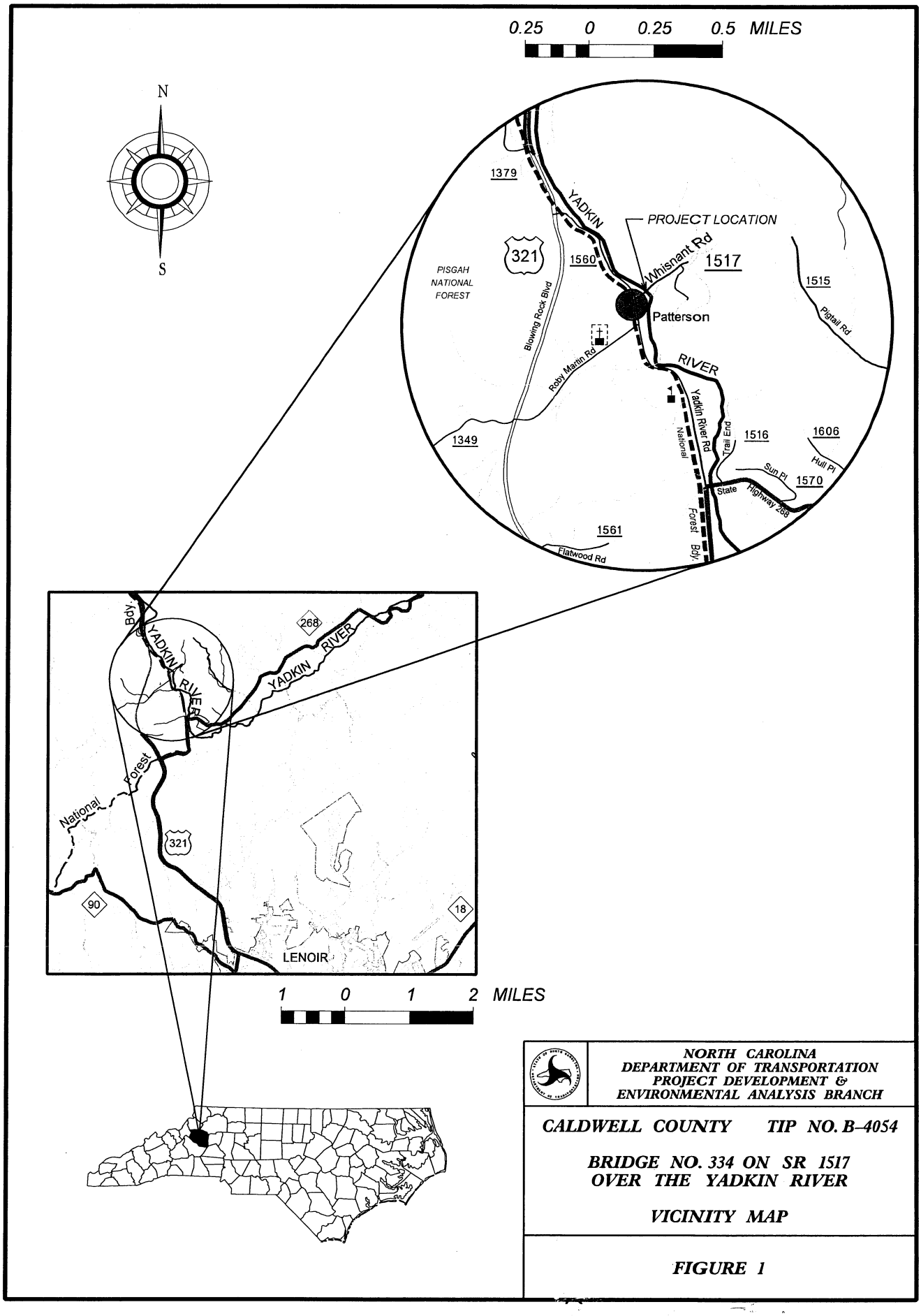
Will this project (based on past and reasonably anticipated future impacts) result in additional development, which could impact nearby downstream water quality? Yes ☐ No ☒
If yes, please submit a qualitative or quantitative cumulative impact analysis in accordance with the most recent North Carolina 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:
Replace an existing structure

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).

E. L. Lusk 4.3.07

Applicant/Agent's Signature **Date**
(Agent's signature is valid only if an authorization letter from the applicant is provided.)



NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
PROJECT DEVELOPMENT &
ENVIRONMENTAL ANALYSIS BRANCH

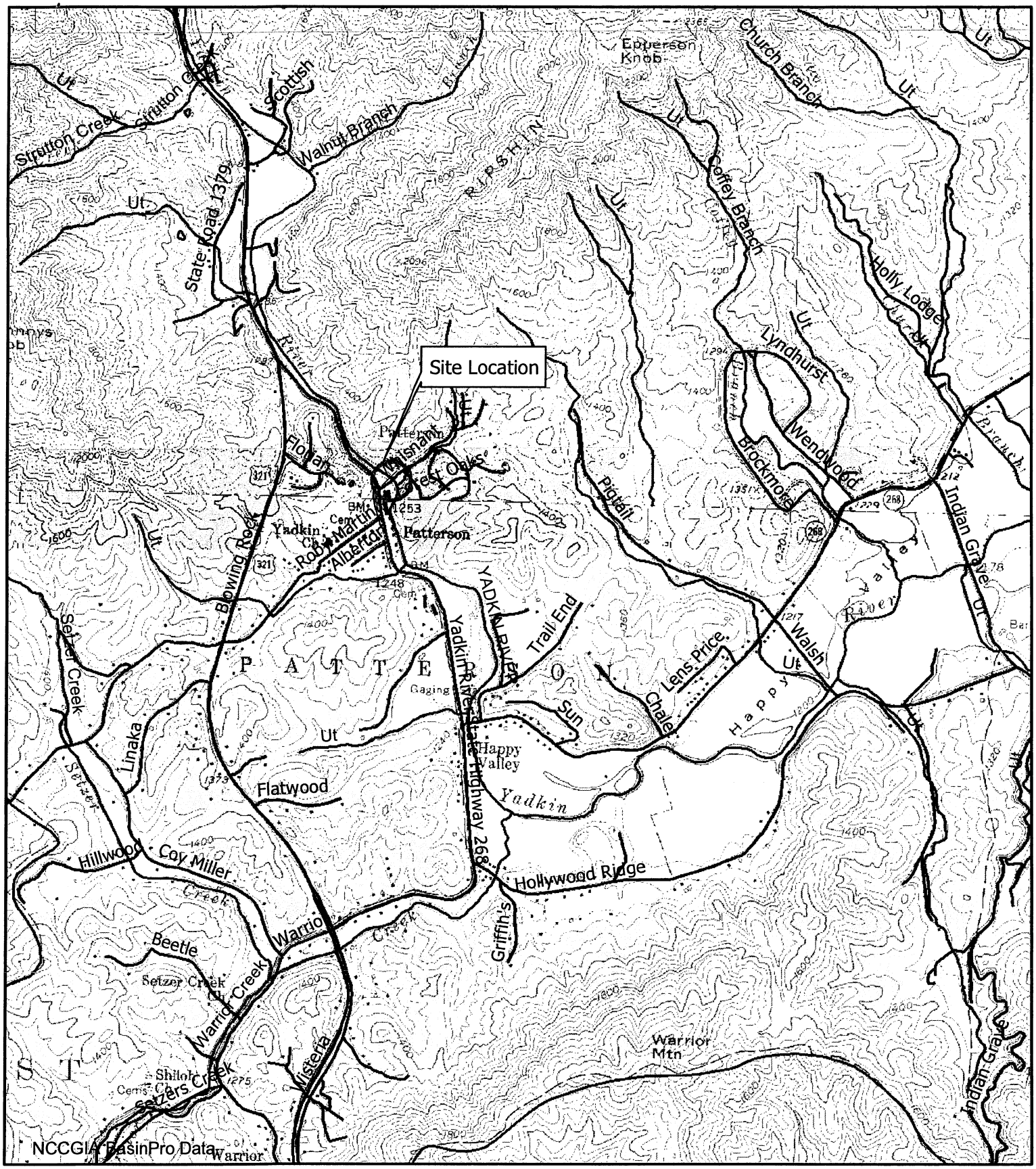
CALDWELL COUNTY TIP NO. B-4054

BRIDGE NO. 334 ON SR 1517 OVER THE YADKIN RIVER

VICINITY MAP

FIGURE 1

Permit Drawing
Sheet 1 of 5



B-4054

BRIDGE No. 334
OVER YADKIN RIVER
CALDWELL COUNTY

Permit Drawing
Sheet 2 of 5

M A Engineering
CONSULTANTS, INC.

8/17/99

PROJECT REFERENCE NO.	SHEET NO.
B-4054	4
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

MA Engineering CONSULTANTS, INC.
598 East Chatham Street Suite 137 Cary, NC 27511
Phone: 919.297.0220 Fax: 919.297.0221

-L-

PI Sta 10+68.00	PI Sta 15+07.45	PI Sta 18+33.93
Δ = 15° 57′ 44.3″ (LT)	Δ = 11° 25′ 34.7″ (RT)	Δ = 8° 36′ 35.1″ (LT)
D = 11° 48′ 48.8″	D = 6° 13′ 40.1″	D = 3° 50′ 24.7″
L = 135.12′	L = 183.47′	L = 224.20′
T = 68.00′	T = 92.04′	T = 112.31′
R = 485.00′	R = 920.00′	R = 1,492.00′
SE = SEE PLANS	SE = 0.04	EXISTING CURVE
V = 30 MPH	V = 30 MPH	

BEGIN STATE PROJECT B-4054
-L- POC Sta. 10+10.00

-Y-

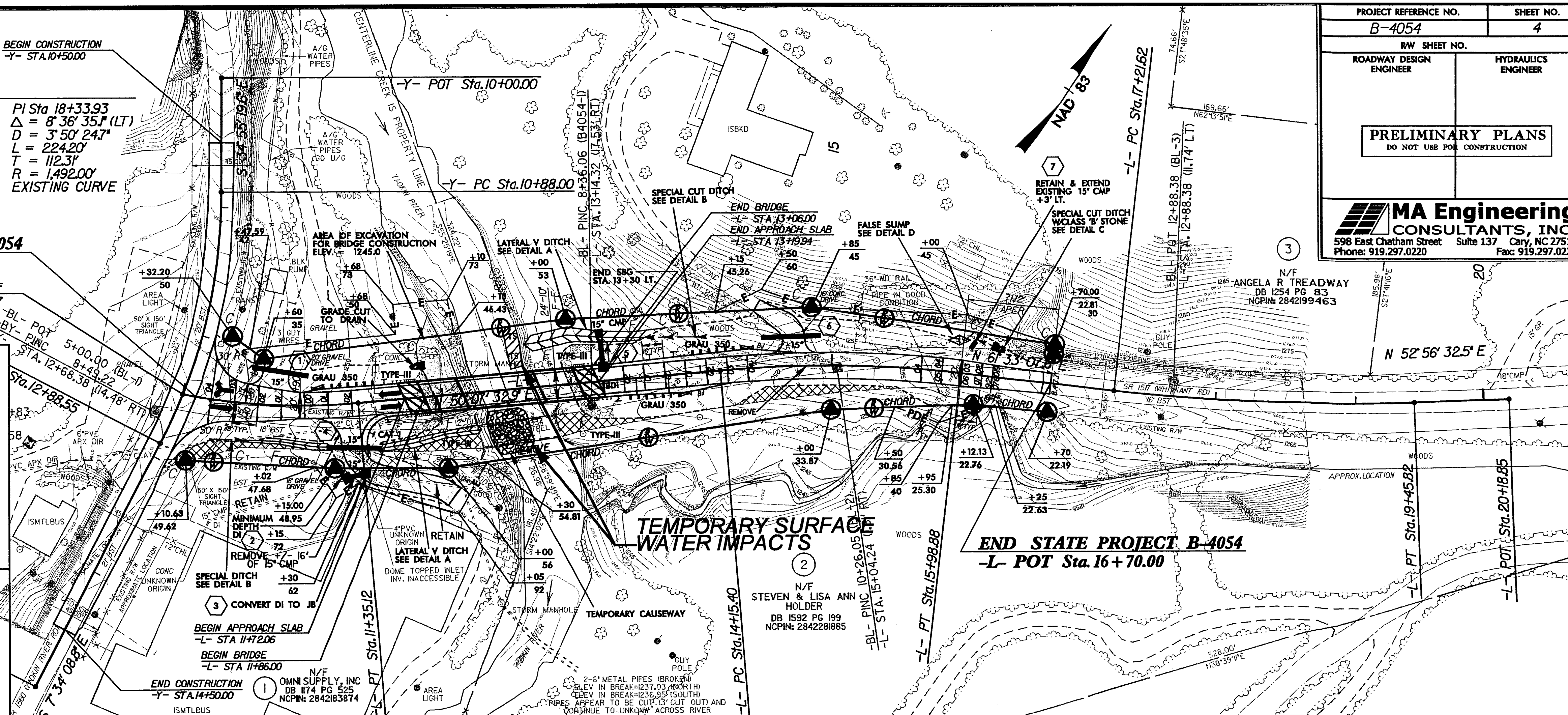
PI Sta 11+90.23
Δ = 27° 21′ 10.7″ (RT)
D = 13° 38′ 19.4″

-L- PC Sta.10+00.00=
-Y- POC Sta.12+48.67

F F F F	FILL IN WETLAND (NONE)
S S S S	PERMANENT SURFACE WATER IMPACT (NONE)
TS TS TS TS	TEMPORARY SURFACE WATER IMPACT
TF TF TF TF	TEMPORARY FILL IN WETLAND (NONE)

WETLAND PERMIT

TEMPORARY SURFACE WATER IMPACT FROM STA. -L- 12+31 TO 12+78



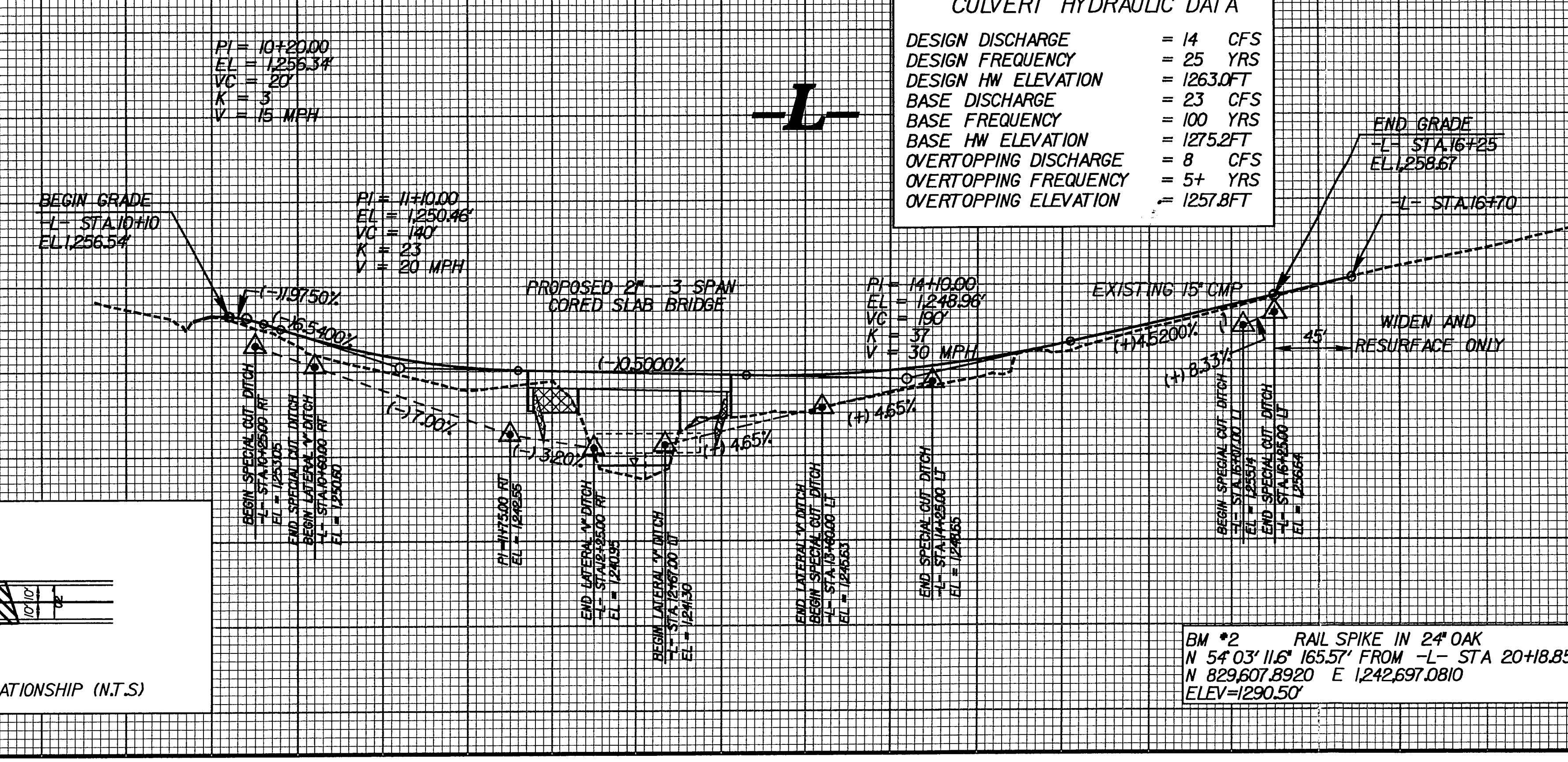
BM #1 RAIL SPIKE IN 15″ OAK
-Y- STA 13+34 (90′ RT.)
N 828,835.3900 E 1,241,651.2420
ELEV=1266.58′

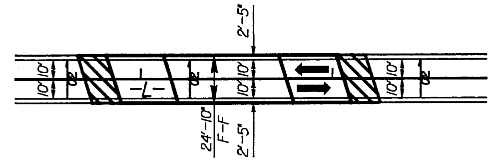
BRIDGE HYDRAULIC DATA

DESIGN DISCHARGE	= 2400 CFS
DESIGN FREQUENCY	= 5 YRS
DESIGN HW ELEVATION	= 1246.1 FT
BASE DISCHARGE	= 10760 CFS
BASE FREQUENCY	= 100 YRS
BASE HW ELEVATION	= 1256.4FT
OVERTOPPING DISCHARGE	= 5000 CFS
OVERTOPPING FREQUENCY	= 10+ YRS
OVERTOPPING ELEVATION	= 1250.0FT
DATE OF SURVEY	= 3/2005
W.S.ELEVATION AT DATE OF SURVEY	= 1238.8FT

CULVERT HYDRAULIC DATA

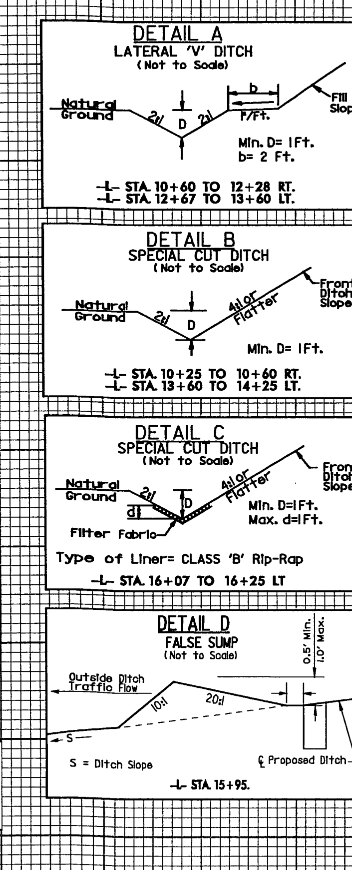
DESIGN DISCHARGE	= 14 CFS
DESIGN FREQUENCY	= 25 YRS
DESIGN HW ELEVATION	= 1263.0FT
BASE DISCHARGE	= 23 CFS
BASE FREQUENCY	= 100 YRS
BASE HW ELEVATION	= 1275.2FT
OVERTOPPING DISCHARGE	= 8 CFS
OVERTOPPING FREQUENCY	= 5+ YRS
OVERTOPPING ELEVATION	= 1257.8FT





SKETCH SHOWING BRIDGE/PAVEMENT RELATIONSHIP (N.T.S)

BM #2 RAIL SPIKE IN 24″ OAK
N 54°03′11.6″ 165.57′ FROM -L- STA 20+18.85
N 829,607.8920 E 1,242,697.0810
ELEV=1290.50′



REVISIONS

$$$$$$SYSTIME$$$$ $$$$$$$$$DGN$$$$$$$$$$$$$$ $$$$$$USERNAME$$$$

8/17/99

REVISIONS

PROJECT REFERENCE NO.	SHEET NO.
B-4054	4
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

MA Engineering CONSULTANTS, INC.
598 East Chatham Street Suite 137 Cary, NC 27511
Phone: 919.297.0220 Fax: 919.297.0221

-L-

PI Sta 10+68.00	PI Sta 15+07.45	PI Sta 18+33.93
Δ = 15° 57′ 44.3″ (LT)	Δ = 11° 25′ 34.7″ (RT)	Δ = 8° 36′ 35.1″ (LT)
D = 11° 48′ 48.8″	D = 6° 13′ 40.1″	D = 3° 50′ 24.7″
L = 135.12′	L = 183.47′	L = 224.20′
T = 68.00′	T = 92.04′	T = 112.31′
R = 485.00′	R = 920.00′	R = 1,492.00′
SE = SEE PLANS	SE = 0.04	EXISTING CURVE
V = 30 MPH	V = 30 MPH	

BEGIN STATE PROJECT B-4054
-L- POC Sta. 10+10.00

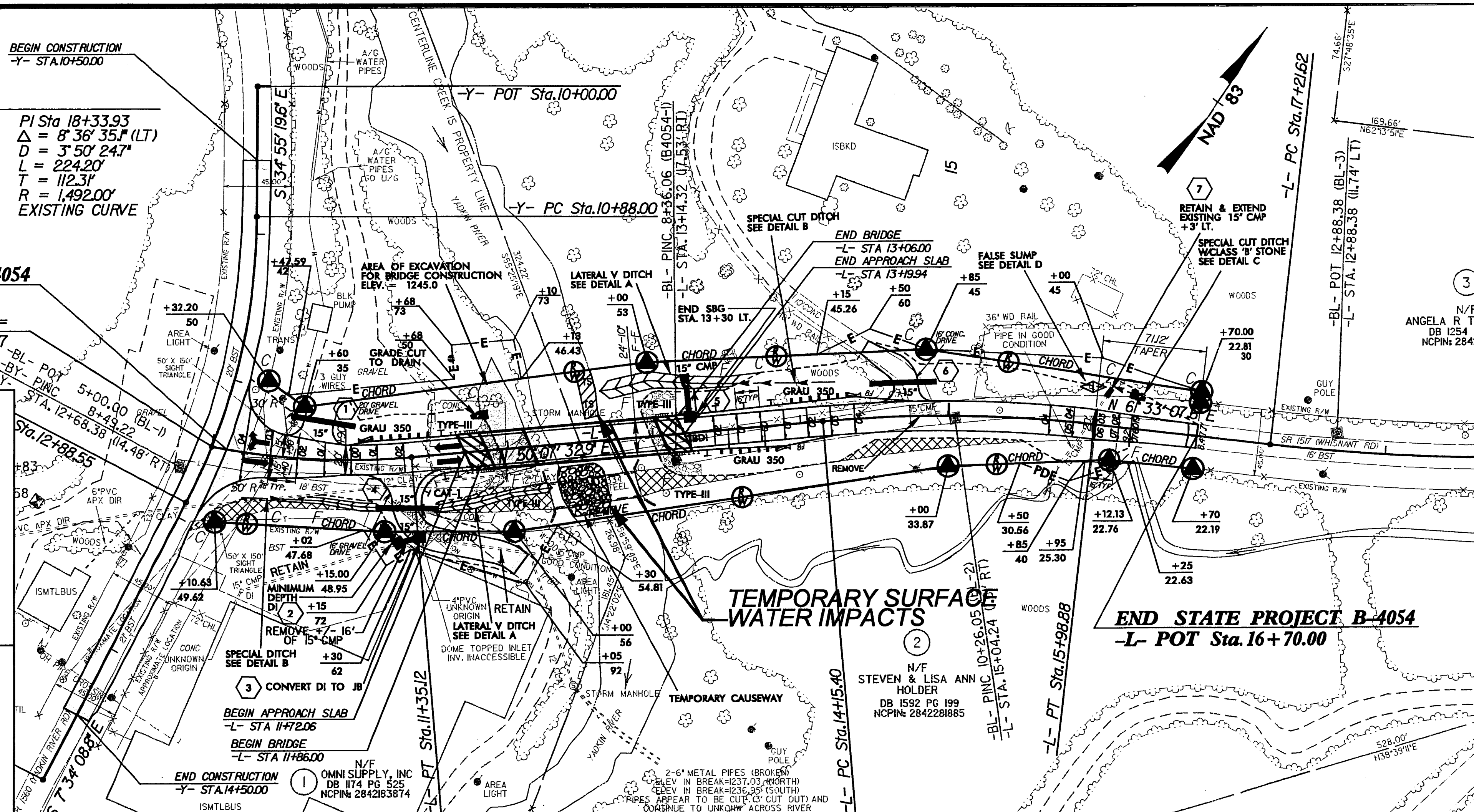
-Y-
PI Sta 11+90.23
Δ = 27° 21′ 10.7″ (RT)
D = 13° 38′ 19.4″

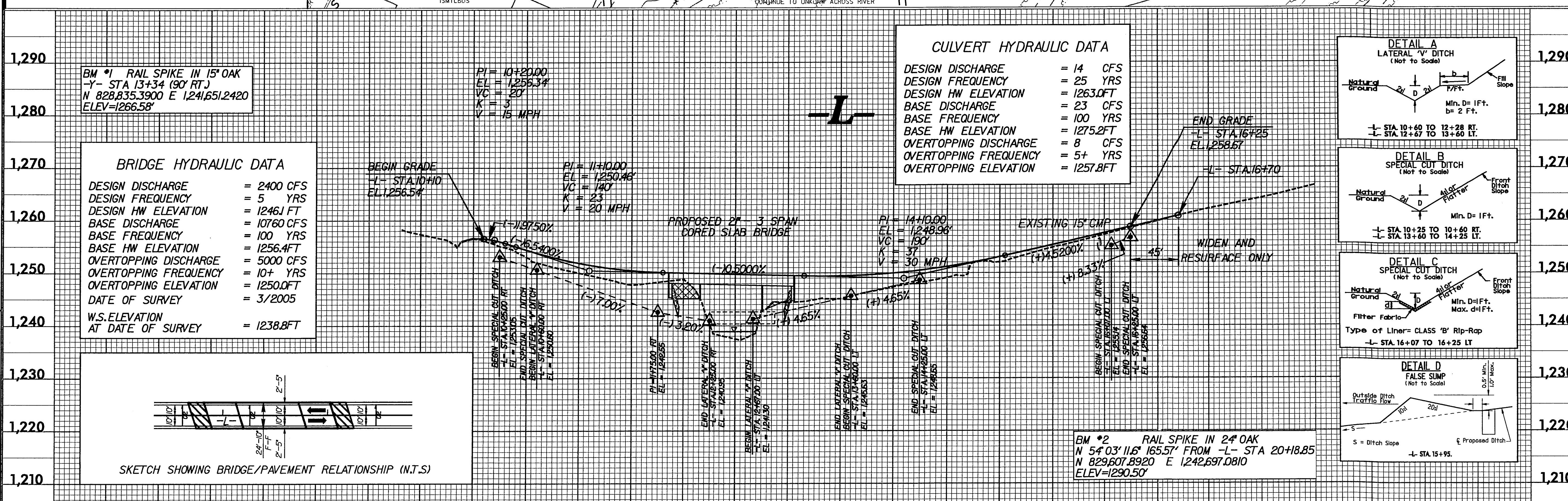
-L- PC Sta.10+00.00=
-Y- POC Sta.12+48.67

FILL IN WETLAND
PERMANENT SURFACE WATER IMPACT
TEMPORARY SURFACE WATER IMPACT
TEMPORARY FILL IN WETLAND

WETLAND PERMIT

TEMPORARY SURFACE WATER IMPACT FROM STA. -L- 12+31 TO 12+78





BM #1 RAIL SPIKE IN 15″ OAK
-Y- STA 13+34 (90′ RT.)
N 828,835.3900 E 1,241,651.2420
ELEV=1266.58′

BRIDGE HYDRAULIC DATA

DESIGN DISCHARGE	= 2400 CFS
DESIGN FREQUENCY	= 5 YRS
DESIGN HW ELEVATION	= 1246.1 FT
BASE DISCHARGE	= 10760 CFS
BASE FREQUENCY	= 100 YRS
BASE HW ELEVATION	= 1256.4FT
OVERTOPPING DISCHARGE	= 5000 CFS
OVERTOPPING FREQUENCY	= 10+ YRS
OVERTOPPING ELEVATION	= 1250.0FT
DATE OF SURVEY	= 3/2005
W.S.ELEVATION AT DATE OF SURVEY	= 1238.8FT

SKETCH SHOWING BRIDGE/PAVEMENT RELATIONSHIP (N.T.S)

CULVERT HYDRAULIC DATA

DESIGN DISCHARGE	= 14 CFS
DESIGN FREQUENCY	= 25 YRS
DESIGN HW ELEVATION	= 1263.0FT
BASE DISCHARGE	= 23 CFS
BASE FREQUENCY	= 100 YRS
BASE HW ELEVATION	= 1275.2FT
OVERTOPPING DISCHARGE	= 8 CFS
OVERTOPPING FREQUENCY	= 5+ YRS
OVERTOPPING ELEVATION	= 1257.8FT

BM #2 RAIL SPIKE IN 24″ OAK
N 54° 03′ 11.6″ 165.57′ FROM -L- STA 20+18.85
N 829,607.8920 E 1,242,697.0810
ELEV=1290.50′

DETAIL A
LATERAL 'V' DITCH
(Not to Scale)
Min. D= 1Ft.
b= 2 Ft.
-L- STA. 10+60 TO 12+28 RT.
-L- STA. 12+67 TO 13+60 LT.

DETAIL B
SPECIAL CUT DITCH
(Not to Scale)
Min. D= 1Ft.
-L- STA. 10+25 TO 10+60 RT.
-L- STA. 13+60 TO 14+25 LT.

DETAIL C
SPECIAL CUT DITCH
(Not to Scale)
Min. D=1Ft.
Max. d=1Ft.
Filter Fabric
Type of Liner= CLASS 'B' Rip-Rap
-L- STA. 16+07 TO 16+25 LT

DETAIL D
FALSE SUMP
(Not to Scale)
S = Ditch Slope
-L- STA. 15+95.

Permit Drawing
Sheet 4 of 5

$$$$$SYSTIME$$$$
$$$$$$DGN$$$$$$$$$$$$$$$$$
$$$$$USERNAME$$$$

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	12+31 TO 12+78 L-	27" Cored Slab 1@30', 1@60', &1&30'							0.032			
TOTALS:									0.03			

NC DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

CALDWELL COUNTY
WBS - 33419.1.1 (B-4054)

Permit Drawing
Sheet 5 of 5

2/5/2007

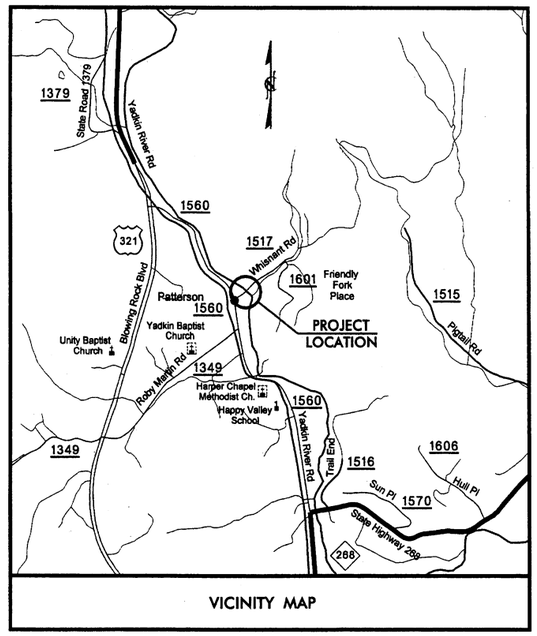
ATN Revised 3/31/05

05/08/99

TIP PROJECT: B-4054

CONTRACT:

See Sheet 1-A For Index of Sheets
See Sheet 1-B For Symbology



VICINITY MAP

R/W

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

CALDWELL COUNTY

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-4054	1	

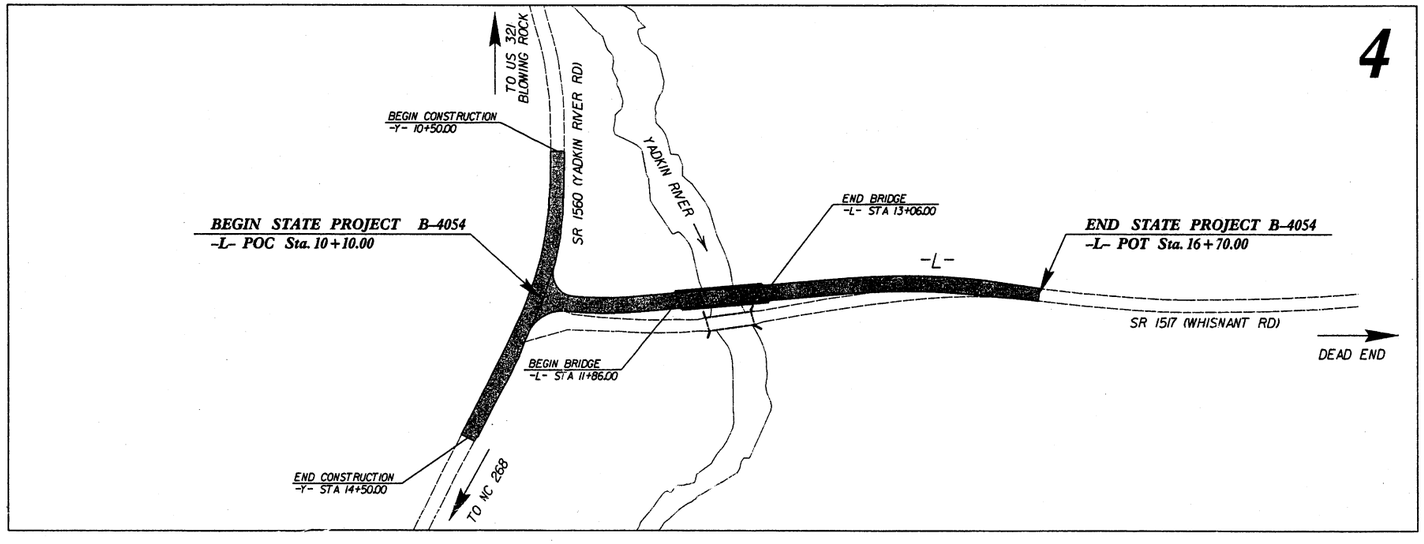
STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
33419.1.1	BRZ-1517(3)	PE
33419.2.1	BRZ-1517(3)	R/W, UTILITIES

LOCATION: ***BRIDGE NO. 334 OVER YADKIN RIVER ON SR 1517***

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

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

NC GRID NAD 83



THIS PROJECT IS NOT WITHIN ANY MUNICIPAL BOUNDARIES.

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

NCDOT CONTACT:

MR. DOUG TAYLOR, PE – ENGINEERING COORDINATION SECTION ENGINEER ROADWAY DESIGN UNIT

GRAPHIC SCALES

PLANS 0 50 100

PROFILE (HORIZONTAL) 0 50 100

PROFILE (VERTICAL) 0 10 20

DESIGN DATA

ADT 2007 = 265
ADT 2027 = 526
DHV = 9 %
D = 60 %
T = 3 % *
V = 30 MPH **
* (TTST 1% + DUAL 2%)
FUNCT CLASS = RURAL LOCAL

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT B-4054	=	*0.102 mile*
LENGTH STRUCTURES TIP PROJECT B-4054	=	*0.023 mile*
TOTAL LENGTH TIP PROJECT B-4054	=	*0.125 mile*

** DESIGN EXCEPTION REQUIRED FOR SAG VERTICAL CURVE

Prepared For:
DIVISION OF HIGHWAYS
1000 Birch Ridge Dr., Raleigh, NC, 27610
By:
MA ENGINEERING CONSULTANTS, INC.
502 E. CHATHAM STREET, SUITE 137
CARY, NORTH CAROLINA 27511
(919) 270-0220

2006 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE: AUGUST 1, 2006

LETTING DATE: DECEMBER 18, 2007

BURKE EVANS, PE
PROJECT ENGINEER

K.S. HUTCHENS
PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER

SIGNATURE: P.E.

ROADWAY DESIGN ENGINEER

SIGNATURE: P.E.

DIVISION OF HIGHWAYS STATE OF NORTH CAROLINA

STATE HIGHWAY DESIGN ENGINEER P.E.

07/24/2006
R:\Roadway\Proj\B4054_rdy_tsh.dgn
10:22:41 AM

10/25/05

PROJECT REFERENCE NO.	SHEET NO.
B-4054	1-B

Note: Not to Scale

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

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

CONVENTIONAL PLAN SHEET SYMBOLS

BOUNDARIES AND PROPERTY:

- State Line
- County Line
- Township Line
- City Line
- Reservation Line
- Property Line
- Existing Iron Pin — EIP
- Property Corner
- Property Monument — 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
- Proposed Right of Way Line with Iron Pin and Cap Marker
- Proposed Right of Way Line with Concrete or Granite Marker
- Existing Control of Access
- Proposed Control of Access
- Existing Easement Line — E
- Proposed Temporary Construction Easement — E
- Proposed Temporary Drainage Easement — TDE
- Proposed Permanent Drainage Easement — PDE
- Proposed Permanent Utility Easement — PUE

ROADS AND RELATED FEATURES:

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

VEGETATION:

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

EXISTING STRUCTURES:

MAJOR:

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

MINOR:

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

UTILITIES:

POWER:

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

TELEPHONE:

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

WATER:

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

TV:

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

GAS:

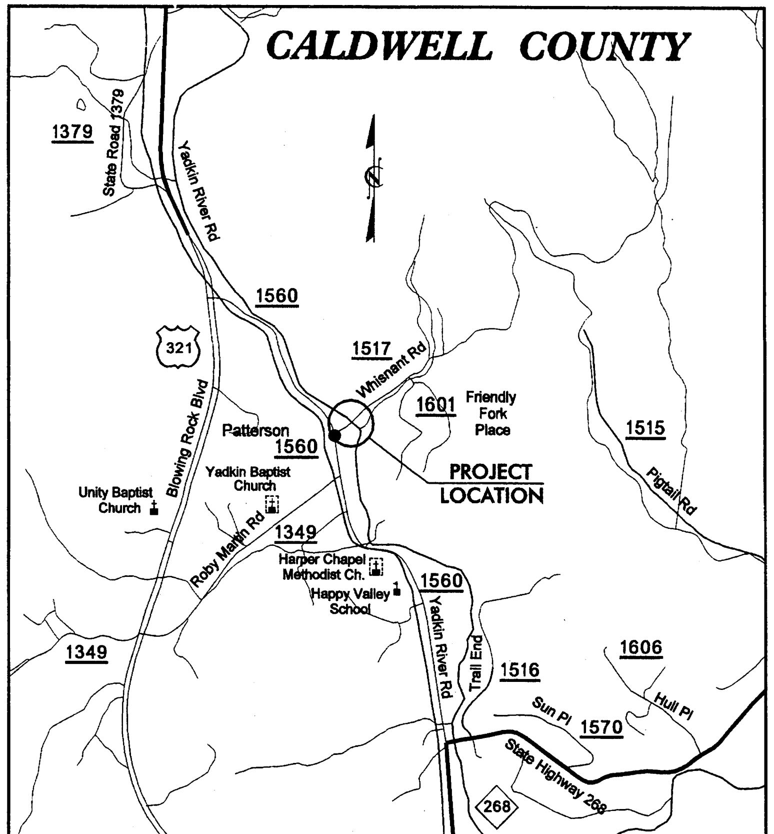
- Gas Valve
- Gas Meter
- Recorded U/G Gas Line — G
- Designated U/G Gas Line (S.U.E.*) — G
- Above Ground Gas Line — A/G Gas

SANITARY SEWER:

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

MISCELLANEOUS:

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



VICINITY MAP

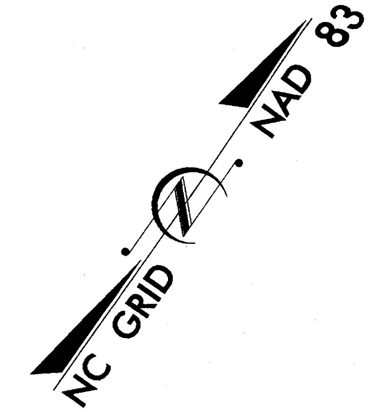
SURVEY CONTROL SHEET B-4054

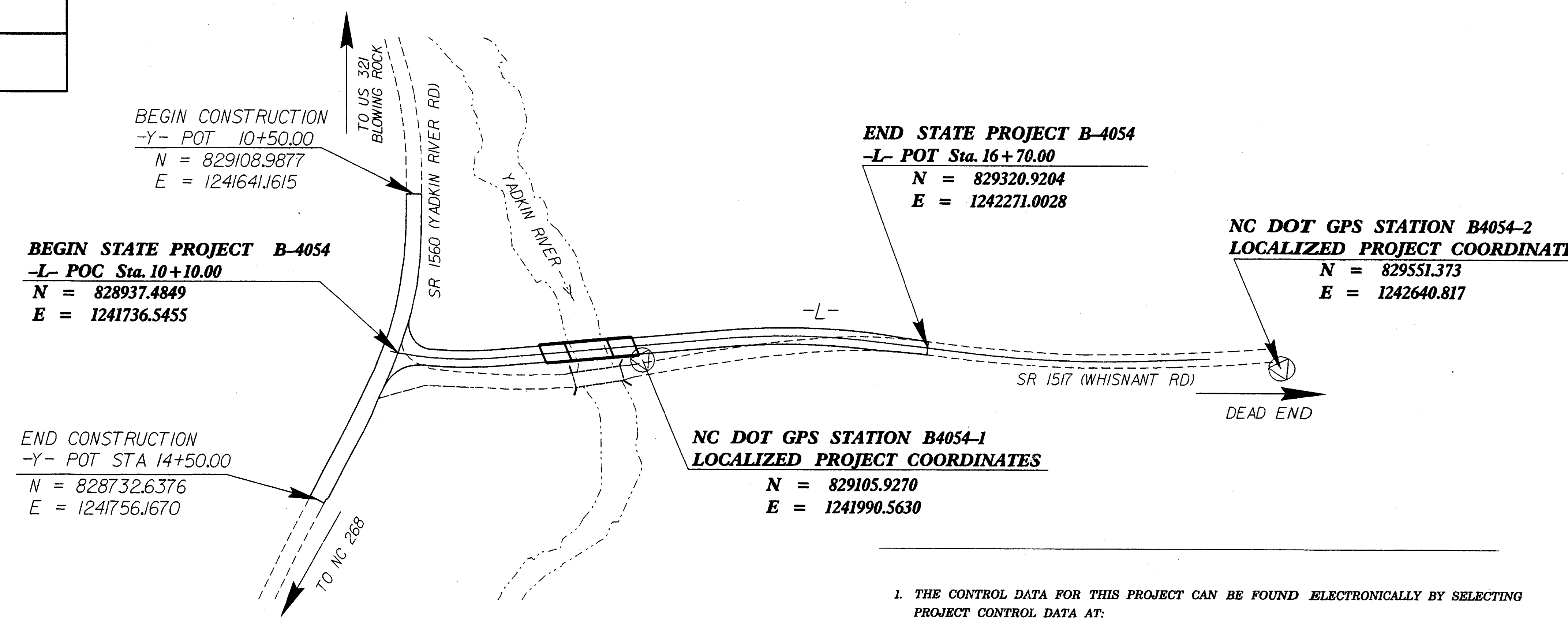
BL POINT	DESC.	NORTH	EAST	ELEVATION	L STATION	OFFSET
1	(BL-1)	828910.0130	1241717.5170	1254.84′	OUTSIDE PROJECT LIMITS	
4054	(B4054-1)	829105.9270	1241990.5630	1243.18′	13+14.32	17.53 RT
2	(BL-2)	829236.4360	1242128.6300	1252.43′	15+04.24	1.61 RT
3	(BL-3)	829377.6770	1242349.7000	1264.60′	17+66.59	11.74 LT

BY POINT	DESC.	NORTH	EAST	ELEVATION	Y STATION	OFFSET
4	(BY-4)	828563.3910	1241759.9950	1249.15	OUTSIDE PROJECT LIMITS	
10	(BL-1)	828910.0130	1241717.5170	1254.84	12+68.38	14.48 RT
5	(BY-5)	829226.1870	1241560.7320	1270.79	OUTSIDE PROJECT LIMITS	

TBM #1 ELEVATION = 1266.58
N 828835 E 1241651
-Y- STATION 13+34 90′ RIGHT
RAILROAD SPIKE IN 15" OAK

TBM #2 ELEVATION = 1290.50
N 829608 E 1242697
OUTSIDE PROJECT LIMITS
RAILROAD SPIKE IN 24" OAK





DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCDOT FOR MONUMENT "B4054-1"
WITH NAD 83 STATE PLANE GRID COORDINATES OF
NORTHING: 829106.029(ft) EASTING: 1241990.295(ft)
THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.99990296
THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "B4054-1" TO -L- STATION 10+10.00 IS
S 56°24′26″ W 304.62
ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES
VERTICAL DATUM USED IS NGVD 29

NOTE: DRAWING NOT TO SCALE

1. *THE CONTROL DATA FOR THIS PROJECT CAN BE FOUND ELECTRONICALLY BY SELECTING PROJECT CONTROL DATA AT:*
   HTTP://WWW.DOH.DOT.STATE.NC.US/PRECONSTRUCT/HIGHWAY/LOCATION/PROJECT/

   THE FILES TO BE FOUND ARE AS FOLLOWS:
   B4054_LS_CONTROL_060727.TXT

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

◬ *INDICATES GEODETIC CONTROL MONUMENTS USED OR SET FOR HORIZONTAL PROJECT CONTROL BY THE NCDOT LOCATION AND SURVEYS UNIT.*
PROJECT CONTROL ESTABLISHED USING GLOBAL POSITIONING SYSTEM.
NETWORK ESTABLISHED FROM EXISTING HARN MONUMENTATION

**B4054-1 WAS REPLACED BY NCDOT DUE TO MONUMENT DISTURBANCE AND DOES NOT REFLECT THE SAME COORDINATE VALUES AS SHOWN IN THE DATUM DESCRIPTION.*

6/2/99
31-JUL-2006 14:48
r:\roadway\proj\b4054_ls_1c_060731.dgn

8/2/99

PROJECT REFERENCE NO.	SHEET NO.
B-4054	2
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

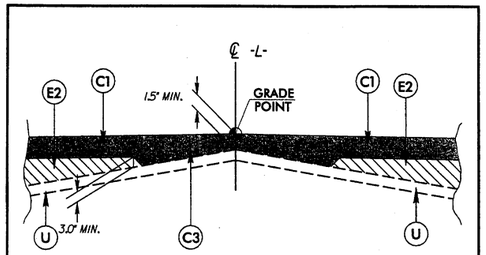
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

MA Engineering CONSULTANTS, INC.
598 East Chatham Street Suite 137 Cary, NC 27511
Phone: 919.297.0220 Fax: 919.297.0221

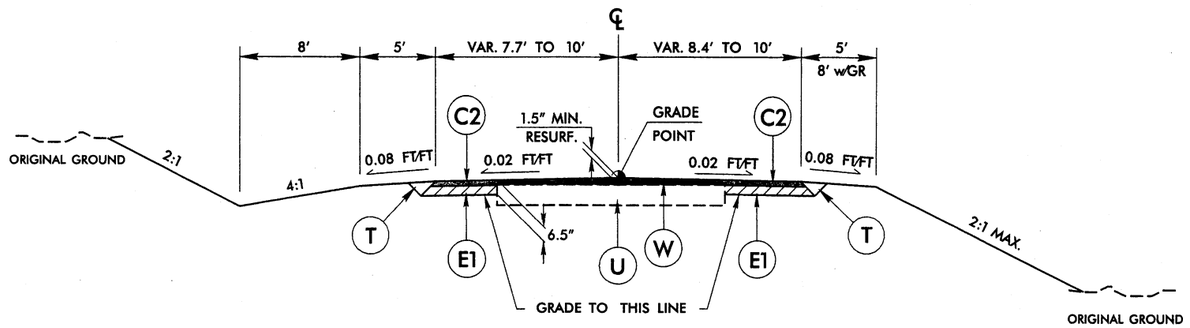
PAVEMENT SCHEDULE

C1	PROP. APPROX. 1.5" ASPHALT CONCRETE SURFACE COURSE, TYPE SF9.5A, AT AN AVERAGE RATE OF 165 Lbs PER SQUARE YARD.
C2	PROP. APPROX. 3" ASPHALT CONCRETE SURFACE COURSE, TYPE SF9.5A, AT AN AVERAGE RATE OF 165 Lbs PER SQUARE YARD IN TWO LAYERS.
C3	PROP. VARIABLE DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE SF9.5A, AT AN AVERAGE RATE OF 110 Lbs PER SQUARE YARD PER 1" DEPTH, TO BE PLACED IN LAYERS NOT LESS THAN 1.0" OR GREATER THAN 1.5" IN DEPTH.
E1	PROP. APPROX. 4.0" ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 456 Lbs PER SQUARE YARD.
E2	PROP. VARIABLE DEPTH ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 114 Lbs PER SQUARE YARD PER 1" DEPTH, TO BE PLACED IN LAYERS NOT LESS THAN 3.0" OR GREATER THAN 5.5" IN DEPTH.
T	EARTH MATERIAL
U	EXISTING PAVEMENT
W	VARIABLE DEPTH ASPHALT PAVEMENT (SEE STANDARD WEDGING DETAIL THIS SHEET)

PAVEMENT EDGE SLOPES AND TRENCH SLOPES ARE 1:1 UNLESS SHOWN OTHERWISE.

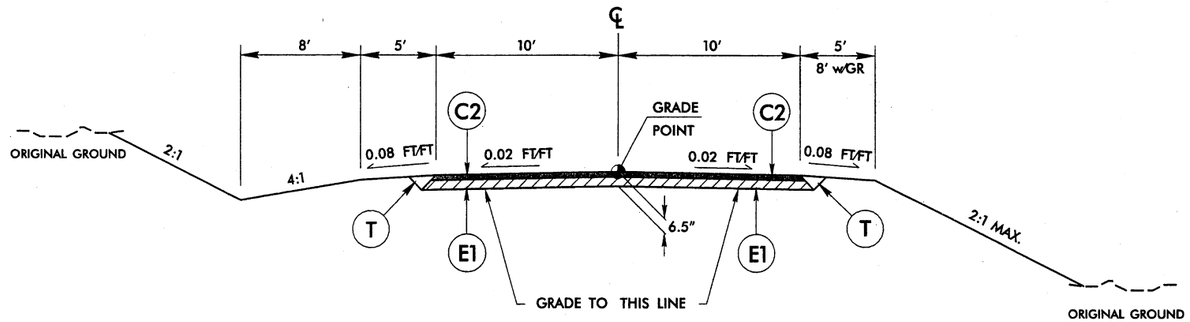


DETAIL SHOWING METHOD OF WEDGING



TYPICAL SECTION NO. 1

FROM –L– STA. 10+10.00 TO STA. 10+40.00
FROM –L– STA. 14+52.00 TO STA. 16+25.00
FROM –L– STA. 16+25.00 TO STA. 16+70.00 (WIDEN & RESURFACE ONLY)
FROM –Y– STA. 10+50.00 TO STA. 14+50.00 (RESURFACE ONLY)



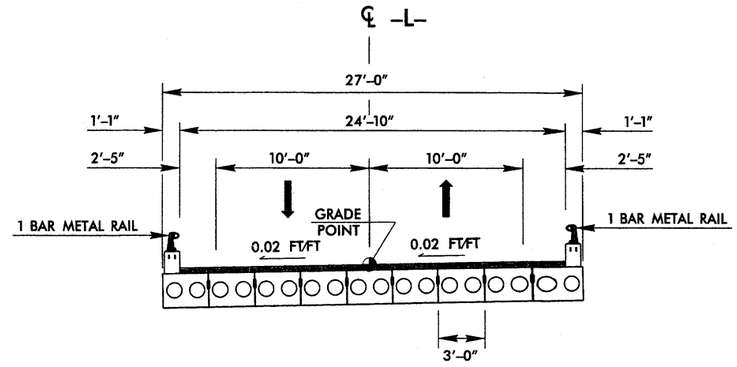
TYPICAL SECTION NO. 2

FROM –L– STA. 10+40.00 TO STA. 11+86.00 (BEGIN BRIDGE)
FROM –L– STA. 13+06.00 (END BRIDGE) TO STA. 14+52.00

SUMMARY OF EARTHWORK

IN CUBIC YARDS

LOCATION	UNCLASSIFIED EXCAVATION	UNDERCUT	EMBT+%	BORROW	WASTE
–L– 10+10 TO 11+86 (BEGIN BRIDGE)	107		377	270	
–L– 13+06 (END BRIDGE) TO 16+70	581		681	100	
TOTAL EARTHWORK	688		1058	370	
WASTE TO REPLACE BORROW					
PROJECT TOTAL	688		1058	370	
SAY	700		1075	375	



TYPICAL SECTION ON STRUCTURE

FROM –L– STA. 11+86.00 TO STA. 13+06.00

07/24/2006
11:28:55 AM
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PROJECT REFERENCE NO.	SHEET NO.
B-4054	4
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

-L-

PI Sta 10+68.00	PI Sta 15+07.45	PI Sta 18+33.93
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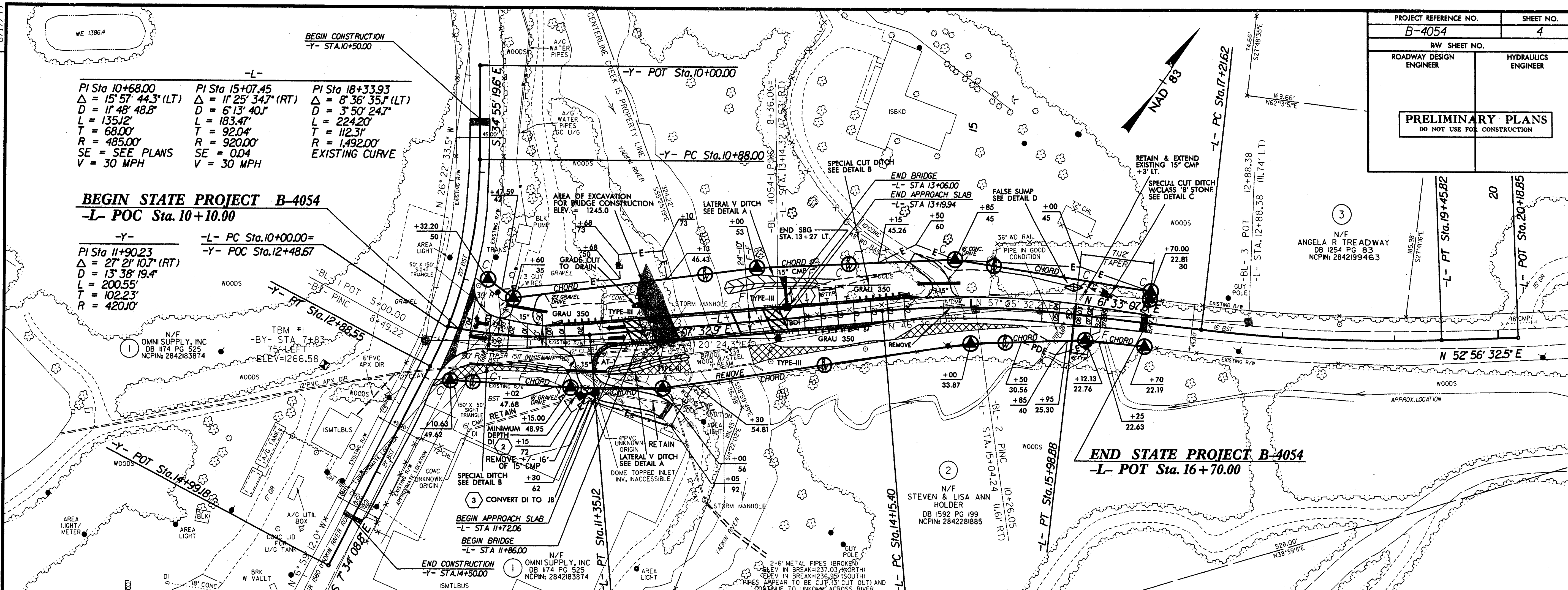
V = 30 MPH	V = 30 MPH	

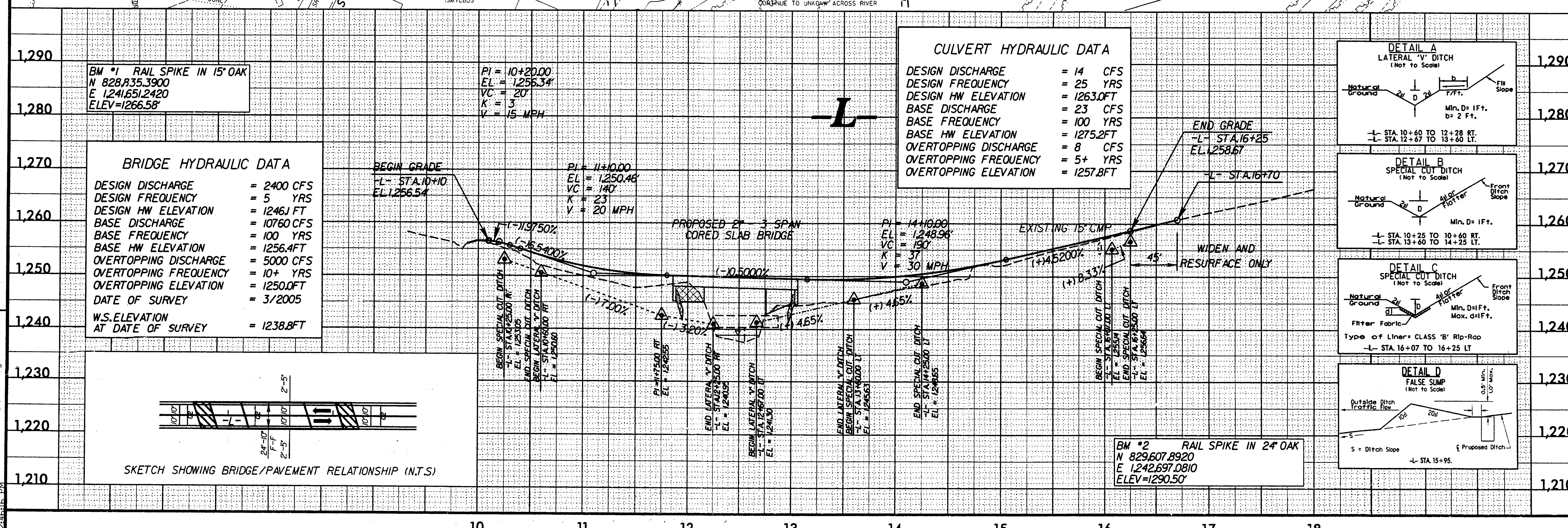
-Y-

PI Sta 11+90.23
Δ = 27° 2' 10.7" (RT)
D = 13° 38' 19.4"
L = 200.55'
T = 102.23'
R = 420.10'

BEGIN STATE PROJECT B-4054
-L- POC Sta. 10+10.00

END STATE PROJECT B-4054
-L- POT Sta. 16+70.00





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N 828,835.3900
E 1,241,651.2420
ELEV=1266.58'

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W.S. ELEVATION AT DATE OF SURVEY	= 1238.8 FT

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BASE FREQUENCY	= 100 YRS
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OVERTOPPING DISCHARGE	= 8 CFS
OVERTOPPING FREQUENCY	= 5+ YRS
OVERTOPPING ELEVATION	= 1257.8 FT

SKETCH SHOWING BRIDGE/PAVEMENT RELATIONSHIP (N.T.S)

BM #2 RAIL SPIKE IN 24" OAK
N 829,607.8920
E 1,242,697.0810
ELEV=1290.50'

DETAIL A — LATERAL 'V' DITCH (Not to Scale)
Min. D= 1 Ft. b= 2 Ft.
-L- STA. 10+60 TO 12+28 RT.
-L- STA. 12+67 TO 13+60 LT.

DETAIL B — SPECIAL CUT DITCH (Not to Scale)
Min. D= 1 Ft.
-L- STA. 10+25 TO 10+60 RT.
-L- STA. 13+60 TO 14+25 LT.

DETAIL C — SPECIAL CUT DITCH (Not to Scale)
Min. D=1 Ft. Max. d=1 Ft.
Type of Liner= CLASS 'B' Rip-Rap
-L- STA. 16+07 TO 16+25 LT

DETAIL D — FALSE SUMP (Not to Scale)
S = Ditch Slope
-L- STA. 15+95.

REVISIONS

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	B-4054	1

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

11+50.00

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11+25.00

S.S. 1250.196 | 12+ | 0.0173 | 0.0173 | 2:1 | 4:1 | 1248.242 | 1248.91 | 1244.08 | EP | EP

11+00.00

S.S. 1251.491 | 12+ | 0.0034 | 0.0034 | 2:1 | 5:1 | 1249.536 | 1250.00 | 1247.8 | EP | EP

10+75.00

12+ | 0.0105 | 0.0105 | 2:1 | 4:1 | 1249.55 | 1251.19 | EP | EP

10+50.00

12+ | 0.0244 | 0.0244 | 2:1 | 4:1 | 1251.08 | EP | EP

10+25.00

12+ | 0.0382 | 0.0382 | 2:1 | 4:1 | 1255.10 | EP | EP

10+00.00

12+

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12+75.00

12+50.00

12+25.00

12+00.00

11+75.00

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4-1
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0.0827
1250.48
1248.651
1248.18
EP
EP

14+00.00

S.S. 1251.839
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0.0170
0.0170
2-1
1249.96
1247.910
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EP
S.S. 1246.841

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S.S. 1248.499
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4-1
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S.S. 1245.891

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S.S. 1244.990 EP

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0.0000
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1244.00
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EP
S.S. 1243.840 EP

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4:1

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251.43

EP

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S.S. 1257.684

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253.93

251.328

252.06

EP

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S.S. 1256.132

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4:1

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125.84

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S.S. 1257.061

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251.16

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EP

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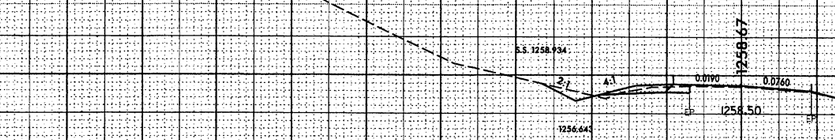

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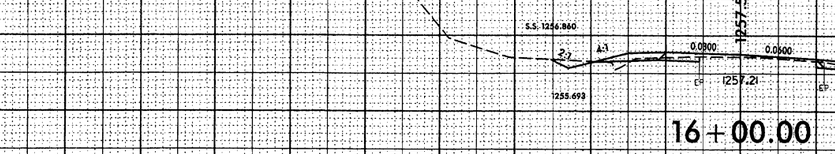

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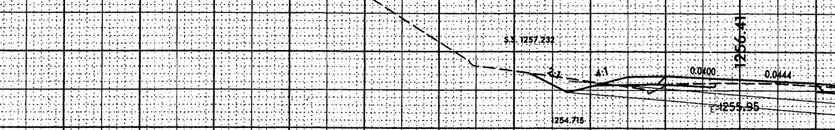

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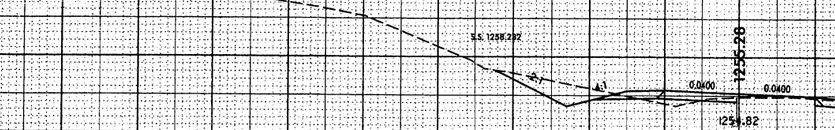

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1259.78

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Caldwell County

Bridge No. 334 on SR 1517 (Whisnant Road)

over the Yadkin River

Federal-Aid Project No. BRZ-1517 (3)

State Project No. 8.2733501

W.B.S. No. 33419.1.1

T.I.P. Project No. B-4054

CATEGORICAL EXCLUSION

UNITED STATES DEPARTMENT OF TRANSPORTATION

FEDERAL HIGHWAY ADMINISTRATION

AND

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

DIVISION OF HIGHWAYS

APPROVED:

11/23/04
DATE

FOR **Gregory J. Thorpe, PhD.**
Environmental Management Director
Project Development & Environmental Analysis Branch
North Carolina Department of Transportation

11/29/04
DATE

for **John F. Sullivan, III PE**
Division Administrator
Federal Highway Administration

Caldwell County

Bridge No. 334 on SR 1517 (Whisnant Road)

over the Yadkin River

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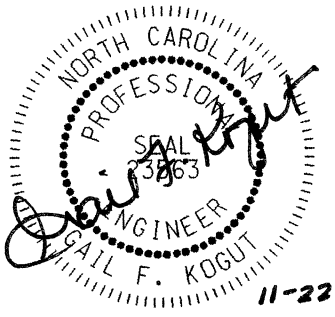
W.B.S. No. 33419.1.1

T.I.P. Project No. B-4054

CATEGORICAL EXCLUSION

November 2004

Document Prepared By:
MA Engineering Consultants, Inc.
598 East Chatham Street, Suite 137
Cary, NC 27511



11-22-04

Gail F. Kogut, PE
Project Manager

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Senior Associate

For the North Carolina Department of Transportation:

Vincent J. Rhea, PE
Project Manager
Project Development & Environmental Analysis Branch

Caldwell County
Bridge No. 334 on SR 1517 (Whisnant Road)
over the Yadkin River
Federal-Aid Project No. BRZ-1517 (3)
State Project No. 8.2733501
W.B.S. No. 33419.1.1
T.I.P. Project No. B-4054

PROJECT COMMITMENTS

In addition to the standard Nationwide Permit No. 23 and No. 33 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, NCDOT's Guidelines for Best Management Practices for Bridge Demolition and Removal, General Certification Conditions, and Section 401 Conditions of Certification, the following special commitments have been agreed to by NCDOT:

Division 11

1.) The NCDOT will observe a moratorium on in-water work and work in the 25-foot buffer between May 1 and July 15 to protect the fry and egg stages of small-mouthed bass.

Caldwell County
Bridge No. 334 on SR1517 (Whisnant Road)
over the Yadkin River
Federal-Aid Project No. BRZ-1517 (3)
State Project No. 8.2733501
W.B.S. No. 33419.1.1
T.I.P. Project No. B-4054

INTRODUCTION: The replacement of Bridge No. 334 is included in the 2004-2010 North Carolina Department of Transportation (NCDOT) Transportation Improvement Program and in the Federal-Aid Bridge Replacement Program. The location is shown in Figure 1. No substantial environmental impacts are anticipated. The project is classified as a Federal "Categorical Exclusion".

I. PURPOSE AND NEED STATEMENT

The NCDOT Bridge Maintenance Unit records indicated that at the time of its inclusion in the Transportation Improvement Program (TIP) in 1998, the bridge had a sufficiency rating of 47.2 out of a possible 100 for a new structure. Since then, repairs have been made to the superstructure to raise its sufficiency rating to 57.3. However, no additional repairs or upgrades can be made to raise the sufficiency rating further. The bridge is considered functionally obsolete. The replacement of this inadequate structure will result in safer and more efficient traffic operations.

II. EXISTING CONDITIONS

Bridge No. 334 is located on SR 1517 (Whisnant Road) in Caldwell County over the Yadkin River (Figure 2-1). SR 1517 is classified as Rural Local in the Statewide Functional Classification System.

Bridge No. 334 was constructed in 1958. The existing structure is a narrow one-lane, two-span low water bridge with an overall length of 62.0 ft. (18.9m) and a clear roadway width of 15.8 ft. (4.8m). The bridge superstructure consists of timber deck with a 1 inch (2.54cm) asphalt wearing surface supported on steel beams. The substructure consists of reinforced concrete abutments and pier. Bridge No. 334 currently has posted weight limits of 20 tons (18.1 metric tons) for single vehicle (SV) and 26 tons (23.6 metric tons) for truck-tractor semi-trailer (TTST). There is no posted speed limit in the vicinity of this bridge. However, the speed limit on SR 1560 is 35 mph (55 km/hr). The approach roadway for Bridge No. 334 is a two-lane 18.0 ft. (5.5m) wide road with 4.0 ft. (1.2m) grassed shoulders (Figure 2-1).

The creek bed to roadway crown point height is 6.0 ft. (1.8m) and the normal depth of the Yadkin River is 3.0 ft. (0.9m).

The Yadkin River is classified as a Trout Water by the DWQ and as an Undesignated Mountain Trout Water by the North Carolina Wildlife Resource Commission (NCWRC).

There is a dam approximately 450 ft. (140m) upstream from the bridge location. According to the Area Locating Engineer, this dam is owned and operated by Omni Supply, Inc. The dam feeds raw water into the packing tissue production process throughout the plant located at the intersection of Frank Whisnant Road (SR 1517) and Yadkin River Road (SR 1560).

Aerial telephone and power service lines cross the northeastern approach of the bridge. High-tension power transmission lines cross the southwestern bridge approach. Water mains and service connection valves can be found in the southwest quadrant near the pump house. Omni Supply, Inc. pipes steam from their boilers across Yadkin River Road into their plant.

The current estimated average daily traffic (ADT) volume is 100 vehicles per day (vpd). The projected ADT is 500 vpd by the design year 2025. The percentages of truck traffic are 2% dual-tired vehicles and 1% TTST. SR 1517 is a dead-end two-lane rural facility. NC 268 is the main arterial through the valley.

SR 1517 is not a part of a designated bicycle route nor is it listed in the Transportation Improvement Program (TIP) as needing bicycle accommodations. There is no indication that an unusual number of bicyclists use this roadway.

No accidents were reported in the vicinity of the bridge during a recent three-year period.

No school buses cross Bridge No. 334.

Land use in the basin is forested, cultivated, or pastureland with scattered residential areas.

There are no survey markers in the project vicinity.

III. ALTERNATIVES

A. Project Description

The proposed structure will provide a 28-foot (8.5-meter) minimum clear roadway width to allow for two 11-foot (3.4-meter) travel lanes and 3-foot (1.0-meter) minimum shoulders on each side. The approach roadway will consist of two 11-foot (3.4-meter) travel lanes with 5-foot (1.5-meter) unpaved shoulders. Refer to Figure 3.

The estimated structure requirements are based on the historic performances of the existing structure and field observations of the site. Based on field reconnaissance of the site and a preliminary hydraulic analysis, the existing structure can be replaced with a

bridge. The existing roadway elevation would be slightly raised. Two alternatives are considered (See Figures 4A and 4B).

B. Build Alternatives

Alternative 1 (Preferred)

Alternative 1 proposes to construct the bridge slightly upstream of the existing location while maintaining traffic on the existing bridge during construction. The bridge would be approximately 75 ft. (22.9m) in length.

Alternative 2

Alternative 2 proposes to replace the bridge in place while maintaining traffic on an on-site temporary detour bridge upstream of the existing location. The proposed structure length would be approximately 90 ft. (27.4m). The temporary bridge would be approximately 62 ft. (18.9m) in length. This alternative will involve a more complicated structural design since a portion of the bridge is within the horizontal curve.

C. Alternatives Eliminated from Further Study

The "do-nothing" alternative will eventually necessitate closure and/or removal of the bridge effectively removing this section of SR 1517 from traffic service.

SR 1517 is a dead-end two-lane, rural facility, therefore an off-site detour is not available for this project.

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

D. Preferred Alternative

Alternative 1, constructing the bridge slightly upstream of the existing location while maintaining traffic on the existing bridge during construction, is the preferred alternative.

Alternative 1 will have a larger hydraulic opening than either the existing bridge or Alternative 2; therefore the existing flooding problem can be alleviated to a greater extent with Alternative 1. Alternative 2 will have greater environmental impacts: relocating the bridge upstream will minimize impacts to the floodplain and the unnamed tributary downstream of the existing bridge site. Alternative 1 would establish the construction limits further from the tributary. The proposed bridge would be wider than existing to adhere to NCDOT's current bridge policy. With a wider proposed bridge and therefore a wider construction limit than existing, lateral encroachment into the unnamed tributary's floodplain is expected in Alternative 2.

Replacing the bridge in place does not improve the horizontal alignment of the roadway. Improvement to the horizontal alignment would increase the sight distance at the intersection with SR 1560 thereby removing the hazard associated with accessing SR

1560 from SR 1517. The costs of construction and removal of the temporary bridge increase the total project cost of Alternative 2. In addition, the business in the southwest quadrant will be affected by Alternative 2.

E. Design Exceptions

There is no posted speed limit on site, therefore the statutory speed limit of 55mph (90 km/hr) is applicable. Therefore the design speed is 60mph (95km/hr). However, the vertical profile can not be raised sufficiently to attain this design speed. Therefore, a design exception will be requested for the vertical alignment.

IV. ESTIMATED COSTS

The estimated costs for each alternative, based on current (2004) prices, are shown in Table 1.

Table 1: Estimated Costs

	Alternative 1	Alternative 2
Structure Removal (existing)	8,160	8,160
Structure (proposed)	185,625	222,750
Temporary Detour Bridge	0	64,480
Roadway Approaches	148,072	140,574
Miscellaneous and Mobilization	96,143	108,036
Engineering and Contingencies	62,000	81,000
ROW/Const. Easements/Utilities	69,000	69,000
TOTAL	$ 569,000	$ 694,000

The total estimated cost of the project, as shown in the 2004-2010 Transportation Improvement Program, is $700,000 including $50,000 for right-of-way and $550,000 for construction.

V. NATURAL RESOURCES

A Natural Resources Technical Report was prepared by M A Engineering Consultants, Inc. and is available at the North Carolina Department of Transportation (NCDOT) office.

Natural resources within the project study area were evaluated to provide: 1) an assessment of biotic resources; 2) an evaluation of potential impacts resulting from construction; and 3) a preliminary determination of permit needs.

A. Methodology

A qualified biologist conducted Field investigations along the project study area during the months of June and July 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.

Information regarding the project area and region was derived from a number of resources including: U.S. U.S. Geological Survey (USGS) Buffalo Cove and Lenoir 7.5-minute quadrangle map (1967 and 1993), Soil Survey Sheets of Caldwell County, North Carolina (1995), United States Fish and Wildlife Service (USFWS) National Wetlands Inventory (NWI) Mapping (1999), USFWS list of protected species (February 25, 2003), North Carolina Department of Environmental and Natural Resources (NCDENR) Basinwide Information Management System, North Carolina Center for Geographical Information and Analysis (NCCGIA) BasinPro GIS Million-Acre Edition Data (June 2002), North Carolina Natural Heritage Program (NCNHP) list of rare animal species (January 2001), NCNHP list of rare plant species (January 2002); NCNHP County status database (accessed June 2003), NCDOT aerial photography of the project study area (1:100), and North Carolina Division of Water Quality (DWQ) water resource data (2003).

B. Physiography and Soils

The project lies within the Blue Ridge Physiographic Province. This mountainous region is composed of rocks from over approximately 500 million to over one billion years old (North Carolina Geological Survey, 1991). This complex mixture of igneous, sedimentary and metamorphic rock has repeatedly been squeezed, fractured, faulted and twisted into folds. The project study area is found within the Alligator Back Formation of the Blue Ridge Belt. The Alligator Back Formation is characterized by clastic metasedimentary rock and mafic and felsic metavolcanic rock composed of gneiss, schist, metagrawacke, amphibolite, and calc-silicate granofels. The general topography is characterized by steep, deeply dissected mountains interspersed with narrow flats adjacent to streams. Elevations in the project vicinity range from approximately 1,200 to 2,200 feet (360 to 670 meters) above mean sea level (msl). Elevations in the project study area range from approximately 1,240 to 1,400 feet (380 to 430 meters) above msl.

According to the general soil map for Caldwell County (USDA, 1989), the project study area is within the Chewacla-Masada-Congaree soil association. The soils in this association are described as nearly level to strongly sloping, somewhat poorly drained to well drained soils that have a loamy or clayey subsoil or loamy underlying material. Soil series found within the project study area are Buncombe loamy sand, frequently flooded; Cecil sandy clay loam, 8 to 15 percent slope; Chewacla fine sandy loam occasionally flooded; Congaree fine sandy loam, occasionally flooded; Masada loam, 8 to 15 percent slopes; Pacolet fine sandy loam, 25 to 40 percent slopes; State loam, 2 to 8 percent slope; and Wehadkee loam, frequently flooded. The North Carolina Natural Resource Conservation Service has classified two of the above soil series as hydric; Chewacla-Masada-Congaree soil association and Wehadkee loam, frequently flooded.

C. Water Resources

C.1. Water Impacted

The proposed project falls in the Yadkin-Pee Dee River Basin, within the DWQ subbasin designated 03-07-01 and the USGS 8-digit Hydrologic Unit Code (HUC) 03040101. Waters within the project vicinity include the Yadkin River [12-(1), 4/15/1963] and an unnamed tributary to the Yadkin River (UT1) [NCDENR, 2003(a)]. The Yadkin River and UT1 are depicted on the USGS 7.5-minute topographic map and the County Soil Survey map; therefore, they both meet the definition of a perennial stream.

C.2. Water Resources Characteristics

Within the project study area, the classification for the Yadkin River is "C; Tr" and by definition all unclassified tributaries inherit the classification of the stream they discharge into. Class "C" waters are suitable for secondary recreation, fishing, wildlife, fish and aquatic life propagation and survival, and agriculture. Class "Tr" denotes trout waters, which is a supplemental classification to protect freshwaters for propagation of natural trout and survival of stocked trout. According to the information obtained from the DWQ *Yadkin-Pee Dee River Basinwide Water Quality Management Plan* [NCDENR 2003(b)], the Yadkin River has a use support rating of Supporting, based on the monitored method.

The Yadkin River was approximately 630 feet (192 meters) in length within the project study area. Stream width was approximately 54.0 feet (16.5 meters) upstream of the bridge. Due to elevated water level and rapid flow rate a measurement of the water depth was impossible. The substrate appeared to consist of silt, sand, pebbles, cobbles and bedrock. The river had well-defined, vegetated banks. The stream reach exhibited well-defined pool-riffle sequences. Water clarity was slightly turbid. Based on this preliminary characterization, the Yadkin River can be classified as a Rosgen Stream Classification Type C-channel (Rosgen 1996).

UT1 length within the project study area is approximately 310 feet (95 meters). Stream width was approximately 8.0 feet (2.4 meters) and the average water depth was 0.30 feet (0.09 meters). There were defined riffle-pool sequences within this portion of the reach. Water clarity was clear. However, there was evidence that the channel may be in a state of transition, so a classification is not offered.

No waters classified as Water Supplies (WS-I: undeveloped watershed, or WS-II: predominantly undeveloped watersheds), High Quality Waters (HQW), Outstanding Resource Waters (ORW) or designated as an impaired water body under Section 303(d) of the Clean Water Act occur within 1.0 mile (1.6 kilometers) of the project study area.

The Basinwide Monitoring Program, managed by the DWQ, is part of an ongoing ambient water quality monitoring program that addresses long-term trends in water quality. The program monitors ambient water quality by sampling at fixed sites for selected benthic macroinvertebrates, which are sensitive to water quality conditions. According to the information obtained from the *Yadkin-Pee Dee River Basinwide Water Quality Management Plan* [NCDENR, 2003(b)], the DWQ has one sampling station

upstream from the project study area. This site is located on the Yadkin River along US 321, south of Preston Creek and north of SR 1379. The US 321 station was last sampled in 2002 and received a rating of "Good".

Point sources, such as wastewater discharges, located throughout North Carolina are permitted through the National Pollutant Discharge Elimination System (NPDES) program through the NCDENR. One active NPDES permit is located directly downstream from the project study area. The Omni-Supply, River Road site was permitted September 30, 1998 (permit number NC0006254) (NCCGIA, 2001).

C.3. Anticipated Impacts to Water Resources

The proposed project is expected to affect both soils and topography. The topography is variable with moderate to abrupt changes in elevation. The proposed construction of a new bridge or associated road improvements will require the removal of soils and the placement of fill material.

The primary sources of water quality degradation in urban areas are stormwater runoff and construction. Construction of a new bridge and approaches may disturb the stream banks and expose the soil surface. This may cause water quality degradation from runoff and sedimentation. In addition, increased impervious areas can introduce other elements of degradation to water resources. These elements may include hydrocarbons, toxic substances, debris, and other pollutants. Anticipated impacts to water resources include: additional substrate destabilization, bank erosion, increased turbidity, altered flow rates, and possible temperature fluctuations within the stream channel caused by the removal of streamside vegetation.

NCDOT will ensure that preventative and control Best Management Practices (BMP's) are employed to prevent or reduce water pollution as described in the NCDOT handbook *Best Management Practices for the Protection of Surface Waters*.

According to Mr. Doug Besler, NCWRC District 8 Biologist, this section of the Yadkin River does not hold trout species: however, the NCWRC has requested a moratorium on in-stream construction and stream crossing to protect egg and fry stages of smallmouth bass.

C.4. Impacts Related to Bridge Demolition and Removal

BMP's for Bridge Demolition and Removal may be categorized as one of three cases: Case 1, Case 2, or Case 3. The replacement of Bridge No. 334 may be classified as a Case 2 or Case 3. Case 2 categories allow no work at all in the water during moratorium periods. Case 3 categories have no special restrictions beyond those outlined in the *Best Management Practices for the Protection of Surface Waters* handbook. Limiting in-stream activities and revegetating stream banks immediately following the completion of grading can further reduce impacts.

The existing structure consists of timber deck with a 1 inch (2.54cm) asphalt wearing surface supported on steel beams. The substructure consists of reinforced concrete

abutments and pier. The timber will be removed without dropping components into Waters of the United States.

D. Biotic Resources

This section describes the vegetation and associated wildlife within the project area that was observed during the field survey. The project area is composed of different vegetative communities based on topography, soils, hydrology, and disturbance regimes. Potential impacts affecting these communities are also discussed. Classification of plant communities is based on a system used by the NCNHP (Schafale and Weakley, 1990). If a community is modified or otherwise disturbed such that it does not fit into an NCNHP classification, it is given a name that best describes its current characteristics. Scientific nomenclature and common names (when applicable) are provided for each plant and animal species listed. Subsequent references to the same organism include only the common name.

D.1. Plant Communities

The predominant terrestrial communities found in the project study area are White Pine Forest, Piedmont/Low Mountain Alluvial Forest, and Urban/Disturbed Community. These communities are described in detail below and presented in Figure 5.

White Pine Forest

The White Pine Forest community described here appears to be the result of human induced forces rather than a stand formed by natural processes. White pine is the dominant canopy species and the understory is composed of hardwood saplings, rhododendron and abundant herbaceous plants. The dominant plants in the project study area included white pine (*Pinus strobus*), American holly (*Ilex opaca*), great laurel (*Rhododendron maximum*), white oak (*Quercus alba*), American beech (*Fagus grandifolia*), wake robin (*Trillium erectum*), Solomon's seal (*Polygonatum biflorum*), and greenbrier (*Smilax rotundifolia*). Elevations within this community range from approximately 1,240 to 1,400 feet (380 to 430 meters) msl. Within the project study area approximately 0.5 acres (0.2 hectares) of this community exist.

Piedmont/Low Mountain Alluvial Forest

This community lies between SR 1517 and the White Pine Forest. Dominant canopy species observed included sycamore (*Platanus occidentalis*), red maple (*Acer rubrum*), river birch (*Betula nigra*), and tag alder (*Alnus serrulata*). Additional woody and herbaceous species present included American holly, pale jewelweed (*Impatiens pallida*), common greenbrier (*Smilax rotundifolia*), poison ivy (*Toxicodendron radicans*), blackberry (*Rubus* sp.) and honeysuckle (*Lonicera* sp.). Elevations within this community lie below 1300 feet (400 meters) msl. Within the project study area approximately 0.5 acres (0.2 hectares) of this community exist.

Urban/Disturbed Community

The Urban/Disturbed Community includes the road shoulders, power line right-of-way, residential and agricultural areas and industrial or commercial areas (Exhibit 1.3.1). Many plant species are adapted to these disturbed and regularly maintained areas. The dominant species within the project study area include fescue (*Festuca* sp.), ryegrass

(*Lolium* sp.), clover (*Trifolium* sp.), thistle (*Cirsium* sp.), sunflower (*Helianthus* sp.), pokeweed (*Phytolacca americana*), lespedeza (*Lespedeza* sp.), broom sedge (*Andropogon virginicus*), foxtail (*Setaria* sp.), cinquefoil (*Potentilla* sp.), asters (*Aster* sp.), wild onion (*Allium cernuum*), dandelion (*Taraxacum officinale*), blackberry, and plantain (*Plantago* sp.). Within the project study area, approximately 5.2 acres (2.1 hectares) of this community exist.

D.2. Wildlife

Wildlife associated with these plant communities include ubiquitous mammals such as raccoon (*Procyon lotor*), striped skunk (*Mephitis mephitis*), white-tailed deer (*Odocoileus virginianus*), Virginia opossum (*Didelphis virginiana*), southern flying squirrel (*Glaucomys volans*), eastern chipmunk (*Tamias striatus*), and gray squirrel (*Sciurus carolinensis*).

Avian species which may utilize these communities include northern cardinal (*Cardinalis cardinalis*), tufted titmouse (*Baeolophus bicolor*), mourning dove (*Zenaida macroura*), ovenbird (*Seiurus aurocapillus*), eastern phoebe (*Sayornis phoebe*), Carolina chickadee (*Poecile carolinensis*), gray catbird (*Dumetella carolinensis*), American crow (*Corvus brachyrhynchos*), dark-eyed junco (*Junco hyemalis*), white-breasted nuthatch (*Sitta carolinensis*), downy woodpecker (*Picoides pubescens*), blue jay (*Cyanocitta cristata*), northern mockingbird (*Mimus polyglottos*), and northern parula (*Parula americana*).

Other wildlife which may reside or forage in the above communities include the two-lined salamander (*Eurycea bislineata*), slimy salamander (*Plethodon glutinosus*), Fowler's toad (*Bufo woodhousei*), spring peeper (*Hyla crucifer*), American toad (*Bufo americanus*), eastern box turtle (*Terrapene carolina*), five-lined skink (*Eumeces fasciatus*), and the ringneck snake (*Diadophis punctatus*).

D.3. Aquatic Communities

Aquatic systems in the project study area include the Yadkin River and an unnamed tributary to the Yadkin River. The Yadkin River appears to be a high groundwater-low runoff third order or greater perennial stream. In addition, it appears to have a confined valley form with a low (0.0 – 0.019) to medium (0.002 – 0.02) gradient. The unnamed tributary appears to be a low groundwater-high runoff first order perennial stream. It has a confined valley with a medium (0.002 – 0.02) slope. Banks of both streams were well vegetated. Wildlife observed during the site investigation included mayfly and caddisfly larvae, snail, and fish. Additional wildlife expected includes seal salamander (*Desmognathus monticola*), blackbelly salamander (*Desmognathus quadramaculatus)*, green frog *(Rana clamitans*), northern water snake (*Nerodia sipedon*), rosyside dace (*Clinostomus funduloides*), bluehead chub (*Nocomis leptocephalus*), sandbar shiner (*Notropis scepticus*), marginated madtom (*Noturus insignis*), fantail darter (*Etheostoma flabellare*), rainbow trout (*Oncorhynchus mykiss*), brown trout (*Salmo trutta*), brook trout (*Salvelinus fontinalis*) and smallmouth bass (*Micropterus dolomieu*).

D.4. Anticipated Impacts to Biotic Communities

The project study area consists of approximately 0.5 acres (0.2 hectares) of White Pine Forest, 0.5 acres (0.2 hectares) of Piedmont/Low Mountain Alluvial Forest, and 5.2 acres (2.1 hectares) of Urban/Disturbed Community. The preferred alternative, Alternative 1, has the potential to encroach into these natural vegetative communities. Based on a preliminary analysis, the total acreage that may be affected within each natural vegetative community is shown in Table 2.

Table 2: Anticipated Impacts to Vegetative Communities

	Alternative 1	Alternative 2
White Pine Forest	0 A (0 ha)	0 A (0 ha)
Piedmont/ Low Mountain Alluvial Forest	0.08 A (0.03 ha)	0.08 A (0.03 ha)
Urban/Disturbed	0.59 A (0.24 ha)	0.59 A (0.24 ha)
Total	0.67 A (0.27 ha)	0.65 A (0.27 ha)

Loss of wildlife is an unavoidable aspect of development. Temporary fluctuations in populations of animal species, which 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.

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

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

E. Special Topic

E.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. Environmental Protection Agency (USEPA) is the principal

administrative agency of the Clean Water Act; however, 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.

Water bodies, including lakes, rivers, and streams, are subject to jurisdictional consideration under the Section 404 program. Wetlands are also identified as "Waters of the United States." 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. 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 U.S.C. 1344).

Surface Waters

The NCDWQ defines a perennial stream as a clearly defined channel that contains water for the majority of the year. These channels usually have some or all of the following characteristics: distinctive streambed and bank, aquatic life, and groundwater flow or discharge. Since the Yadkin River and the Unnamed Tributary appear on either the USGS 7.5-minute quadrangle map or the County Soil Survey map, they can be classified as perennial streams. Detailed stream characteristics, including specific water-quality designations, are presented in Section C: Water Resources.

Jurisdictional Wetlands

There are no jurisdictional wetlands associated with the project study area.

E.2. Permits

In accordance with Section 404 of the Clean Water Act (33 U.S.C. 1344), a permit is required from the USACE for projects of this type for the discharge of dredged or fill material into "Waters of the United States". The specific permit(s) will be determined once alternatives have been chosen and potential impacts have been calculated. A Nationwide Permit No. 23 (Approved Categorical Exclusion) is likely to be applicable for all impacts to Waters of the United States resulting from the proposed project. A Nationwide Permit No. 33 (Temporary Construction, Access or Dewatering) may be required if an on-site temporary detour or construction platform is needed during construction of Bridge No. 334. A Regional General Permit No. 198200031 may be required if the discharge of dredged or fill material in "Waters of the United States" is unavoidable.

A 401 Water Quality Certification, administered through the DWQ, will also be required. This certification is issued for any activity that may result in a discharge into waters for which a federal permit is required. Applicable General Certifications (GC) may include GC 3403, GC 3366, and GC 3404 for the matching USACE Nationwide Permit 23, Nationwide Permit 33, and Regional General Permit 198200031, respectively.

Impacts to the aquatic community of the Yadkin River may result from the replacement of Bridge No. 334. The removal of the substructure may create some disturbance in the

streambed. Conditions in the stream may raise sediment concerns since the substrate contains silt; therefore, a turbidity curtain is recommended.

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

A moratorium on in-stream construction and stream crossing will be required to protect populations of smallmouth bass.

E.3. Buffer Rules

At the time of this report, the Yadkin River Basin was not subject to riparian buffer regulations.

E.4. Mitigation

The USACE has adopted, through the Council on Environmental Quality (CEQ), a mitigation policy which embraces the concepts of "no net loss of wetlands" and sequencing. The purpose of this policy is to restore and maintain the chemical, biological, and physical integrity of "Waters of the United States," specifically wetlands. Mitigation of wetland impacts has been defined by the CEQ to include: avoiding impacts, minimizing impacts, and compensating for impacts (40 CFR 1508.20). Avoidance, minimization, and compensatory mitigation must be considered sequentially.

Avoidance

Avoidance mitigation examines all appropriate and practicable possibilities of averting impacts to "Waters of the United States." According to a 1990 Memorandum of Agreement (MOA) between the USEPA and the USACE, in determining "appropriate and practicable" measures to offset unavoidable impacts, such measures should be appropriate to the scope and degree of those impacts and practicable in terms of cost, existing technology, and logistics in light of overall project purposes. No jurisdictional wetlands will be impacted; however, some unavoidable impacts to surface waters may result from project construction.

Minimization

Minimization includes the examination of appropriate and practicable steps to reduce the adverse impacts to "Waters of the United States." Implementation of these steps will be required through project modifications and permit conditions. Minimization typically focuses on decreasing the footprint of the proposed project through the reduction of median widths, right-of-way widths, fill slopes, and/or road shoulder widths. The following methods are suggested to minimize adverse impacts to "Waters of the United States:"

1. Strictly enforce Best Management Practices (BMP's) to control sedimentation during project construction;
2. Clearing and grubbing activity should be minimized;

3. Decrease or eliminate discharges into the North Pacolet River's tributary;
4. Reestablishment of vegetation on exposed areas with judicious pesticide and herbicide management;
5. Minimization of "in-stream" activity; and
6. Use responsible litter control practices.

Compensatory Mitigation

Compensatory mitigation is not normally considered until anticipated impacts to "Waters of the United States" have been avoided and minimized to the maximum extent possible. It is recognized that "no net loss of wetlands" functions and values may not be achieved in each and every permit action. Appropriate and practicable compensatory mitigation is required for unavoidable adverse impacts, which remain after all appropriate, and practicable minimization has been required. Compensatory actions often include restoration, creation and enhancement of Waters of the United States, specifically wetlands. Such action should be undertaken in areas adjacent to or contiguous to the discharge site.

Nationwide Permits usually do not require mitigation according to the MOA between the USEPA and the USACE. However, prior to the use of any nationwide permit within any of the 25 designated counties of North Carolina that contain trout waters, notification must be given to the Wilmington USACE District Engineer along with a written statement of compliance with all of the conditions of the applicable nationwide permit. This notification will include comments and recommendations from NCWRC. A plan to provide compensatory mitigation for all unavoidable adverse impacts to the mountain trout waters must be included in the information sent to the NCWRC.

F. Rare and Protected Species

Some populations of fauna and flora have been, or are, in the process of decline due to either natural forces or their inability to coexist with humans. Federal law, under the provisions of Section 7 of the Endangered Species Act (ESA) of 1973, as amended, requires that any action likely to adversely affect a species classified as federally-protected be subject to review by the USFWS. Other species may receive additional protection under separate laws. The USFWS lists three federally-protected species for Caldwell County as of the February 5, 2003 listing.

F.1. Federally Protected Species

Spruce-fir moss spider (*Microhexura montivaga*)

Federal Status: Endangered
State Status: Significantly Rare
Date Listed: February 6, 1995

The spruce-fir moss spider occurs in well-drained moss and liverwort mats growing on rocks or boulders. These mats are found in well-shaded areas of mature, high elevation [5,000 feet (1,520 meters)] spruce-fir forests. This species is currently known from one population in Tennessee and three populations in North Carolina; one in Avery/Caldwell Counties and two in Swain County.

BIOLOGICAL CONCLUSION: *NO EFFECT*
Suitable habitat for the spruce-fir moss spider is not present in the project study area due to the lack of spruce-fir forest and the relatively low elevation of the study area. NCNHP has no records of any known populations of the spruce-fir moss spider within a one-mile radius of the project area. Therefore, this species will not be impacted as a result of project construction.

Dwarf-flowered heartleaf (*Hexastylis naniflora*)
Federal Status: Threatened
State Status: Threatened
Date Listed: March 11, 1967

The **dwarf-flowered heartleaf** is found only in eight western piedmont counties in North Carolina and the adjacent portions of South Carolina. The dwarf-flowered heartleaf has heart-shaped leaves, supported by long thin petioles that grow from a subsurface rhizome. The flowers are found near the base of the petioles. Fruits mature from mid-May to early July. Dwarf-flowered heartleaf populations are found along bluffs and adjacent slopes, in boggy areas next to streams and creeks, and along the slopes of nearby hillsides and ravines. This plant grows in acidic soils in regions with a cool moist climate. Plants are found on acidic sandy soils on bluffs and ravines and are usually associated with mountain laurel (*Kalmia latifolia*) thickets in hardwood forests. The soils preferred by this species include Pacolet, Madison gravelly sandy loam, and Musella fine sandy loam.

BIOLOGICAL CONCLUSION: *NO EFFECT*
Suitable habitat is not located in the project study area and a search of the NCNHP database showed no recorded occurrences of this species within the project vicinity. The project study area was canvassed during the site investigation and no specimens of dwarf-flowered heartleaf were observed. It can be concluded that the construction of the proposed project will not impact any populations of dwarf-flowered heartleaf.

Heller's blazing star (*Liatris helleri*)
Federal Status: Threatened
State Status: Threatened-Special Concern
Federally Listed: November 19, 1987

Heller's blazing star is endemic to high elevation ledges of rock outcrops of the northern Blue Ridge Mountains in North Carolina. Known populations of this plant occur at elevations of 3,500 to 6,000 feet (1,100 to 1,800 meters). Heller's blazing star is a short, stocky plant that has one or more erect stems that arise from a tuft of narrow, pale green basal leaves. Heller's blazing star is an early pioneer species growing on grassed rock outcrops where it is exposed to full sunlight. Heller's blazing star prefers shallow acid soils associated with granite rocks.

BIOLOGICAL CONCLUSION: *NO EFFECT*
Suitable habitat for Heller's blazing star is not present in the project study area due to the lack of high elevation ledges and rock outcrops and the relatively low elevation of

the study area. NCNHP has no records of any known populations of the Heller's blazing star within a one-mile radius of the project area. Therefore, this species will not be impacted as a result of project construction

F.2. Federal Species of Concern

As of February 5, 2003 there were seventeen federal species of concern species listed by the USFWS for Caldwell County. These species are not protected under the provisions of Section 7 of the Endangered Species Act. Federal species of concern species are defined as species under consideration for listing for which there is insufficient information to support listing as threatened or endangered (formerly C2 candidate species). The status of these species may be upgraded at any time, thus they are included here for consideration. A review of NCNHP data depicting known populations of these federal species of concern found no populations within a one mile (1.6 km) radius of the project study area. Protections afforded to species listed under state law are not applicable to this project. Table 3 lists the federal species of concern, their state status, and the existence of suitable habitat within the project area.

Table 3: Federal species of concern for Caldwell County

Common Name	Scientific Name	Federal Status	State Status	Habitat Requirements	Available Habitat
Vertebrates					
Alleghany woodrat	*Neotoma magister*	FSC*	SC	Rocky cliffs, caves, bottomland hardwoods between 800 to 2500 feet elevation	Yes
Southern Appalachian northern saw-whet owl	*Aegolius acadicus*	FSC	SC	Spruce-fir forests or mixed hardwood/spruce forest	No
Southern Appalachian red crossbill	*Loxia curvirostra*	FSC	SR	Coniferous forests, preferably spruce-fir	No
Southern Appalachian black-capped chickadee	*Poecile atricapilla practica*	FSC	SC	High elevation forests, mainly spruce-fir	No
Southern Appalachian yellow-bellied sapsucker	*Sphyrapicus varius appalachiensis*	FSC	SR	Mature, open hardwoods with scattered dead trees	No
Invertebrates					
Brook floater	*Alasmidonta varicosa*	FSC	E	Piedmont systems and along the Blue Ridge escarpment of Catawba River Systems	No
Diana fritillary butterfly	*Speyeria diana*	FSC	SR	Rich woods and adjacent edges and openings	Yes

Table 3: Federal species of concern for Caldwell County

Common Name	Scientific Name	Federal Status	State Status	Habitat Requirements	Available Habitat
Edmund's snaketail dragonfly	*Ophiogomphus edmundo*	FSC	SR	Blue Ridge escarpment streams	No
Mountain River skimmer	*Macromia margarita*	FSC*	SR	Moderate elevation, high-quality streams and rivers.	No
Vascular Plants					
Fraser fir	*Abies fraseri*	FSC	SR-L	Boreal forests and balds above 4,500 feet.	No
Mountain bittercress	*Cardamine clematitis*	FSC	SR-T	High elevation seeps, shaded outcrops and streambanks	Yes
Bent avens	*Geum geniculatum*	FSC	T	High elevation forest, stream banks, and seepage slopes	No
Butternut	*Juglans cinerea*	FSC	W5A	Cove forests, rich woods	No
Gray's lily	*Lilium grayi*	FSC	T-SC	High elevation grassy balds, meadows, mountain bogs and seeps	No
Sweet pinesap	*Monotropsis odorata*	FSC*	SR-T	Dry forests and bluffs.	Yes
Riparian vervain	*Verbena riparia*	FSC*	SR-T	Not known	N/A
Nonvascular Plants					
Liverwort	*Plagiochila sullivantii var. sullivantii*	FSC	SR-L	On moist rocks in spray zone of waterfall.	No

NOTES:

FSC: Federal Species of Concern - A taxon which may or may not be listed in the future (formerly Federal C2 candidate species).

SC: Special Concern - Any species of plant in North Carolina which requires monitoring.

SR: Significantly rare species.

T-: Threatened - any resident species of plant or animal which is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range.

E-: Endangered - any species or higher taxon of plant whose continued existence as a viable component of the State's flora/fauna is determined to be in jeopardy.

-L: The range of the species is **limited** to North Carolina and adjacent states. These are species which may have 20-50 populations in North Carolina, but fewer than 50 populations range wide.

-T: These species are rare **throughout** their ranges (fewer than 100 populations total).

W5a: Watch Category 5a - Rare because of severe decline.

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

VI. CULTURAL RESOURCES

A. Compliance Guidelines

This project is subject to compliance with Section 106 of the National Historic Preservation Act of 1966, as amended, implemented by the Advisory Council on Historic

Preservation's Regulations for Compliance with Section 106, codified at 36 CFR Part 800. Section 106 requires that for federally-funded, licensed, or permitted projects having an effect on properties listed in or eligible for the National Register of Historic Places, the Advisory Council on Historic Preservation be given the opportunity to provide comment.

B. Historic Architecture

A field study of the area of potential effect (APE) was conducted on June 10, 2003. The APE is defined as the geographic area or areas within which an undertaking or project may directly or indirectly cause alterations in the character or use of historic properties. All structures within the APE were photographed and later reviewed by the State Historic Preservation Office (HPO). In a concurrence form dated November 25, 2003, the State Historic Preservation Officer (SHPO) stated that there were no structures of historical or architectural importance located within the planning area based on historical information available and the review of the photographs. Therefore, no further compliance with Section 106 is required. A copy of the SHPO memorandum is included in the Appendix.

C. Archaeology

The State Historic Preservation Officer (SHPO), in a memorandum dated December 18, 2003 stated that they have "no comment on the undertaking as proposed." A copy of the SHPO memorandum is included in the Appendix.

VII. ENVIRONMENTAL EFFECTS

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

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

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

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

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

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

No 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.

This Categorical Exclusion has proceeded in accordance with the Executive Order 12898 requirement that each federal agency, to the greatest extent allowed by law, administers and implements its programs, policies, and activities that affect human health or the environment so as to identify and avoid "disproportionately high and adverse" effects on minority and low-income populations. The proposed project will not directly impact minority or low-income residences, segment existing minority communities, or separate residential areas from nearby services such as schools.

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

No geodetic monuments will be impacted during construction of this 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). There are no prime or important farmlands in the immediate vicinity of the proposed bridge.

No adverse effects to air quality are expected to result from this project. The project is in an air quality "neutral" project, so it is not required to be included in the regional emissions analysis (if applicable), and a project level CO analysis is not required. Since the proposed project is located in an attainment area, 40 CFR Part 51 and 93 are not applicable. If vegetation or wood debris is disposed of by open burning, it shall be done in accordance with applicable local laws and regulations of the North Carolina State Implementation Plan (SIP) for air quality in compliance with 15 NCAC 2D.0520 and the 1990 Clean Air Act and the National Environmental Policy Act. This evaluation completes the assessment requirements for air quality and no additional reports are required.

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

An examination of North Carolina Department of Environment and Natural Resources (DENR), Division of Water Quality (DWQ), Groundwater Section and the North Carolina Department of Human Resources, Solid Waste Management Section records by the NCDOT Geotechnical Engineering Unit revealed no hazardous waste sites in the project area.

A field investigation revealed that two regulated underground storage tanks did exist in the project study area. An examination of records of DENR's Division of Waste Management, Underground Storage Tank Section, revealed that the business, Sealed Air Corp. had three underground storage tanks removed after a leakage in 1993.

Caldwell County is a participant in the National Flood Insurance Program. The Yadkin River is in an area included in a detailed FEMA flood study. Attached is a copy of the Flood Insurance Rate Map, on which are shown the approximate limits of the 100-year flood plain in the vicinity of the project (Figure 6).

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 to contact local officials to involve them in the project development with scoping letters. For this bridge replacement study, all of the alternatives will provide for the maintenance of traffic on-site during construction of the replacement structure. There are minimal impacts to surrounding properties and no anticipated relocatees. Therefore, no formal public involvement program was initiated. However, a newsletter was sent to the local residents to inform them of the project.

IX. AGENCY COMMENTS

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

1. United States Department of the Interior Fish & Wildlife Service (USFWS)

   Comment: "*. . . we recommend conducting habitat assessments and surveying any suitable habitat prior to any further planning.*"

   Response: No suitable habitats occur within the project study area for the federally listed species known to occur in Caldwell County except dwarf-flowered heartleaf *(Hexastylis naniflora).* A survey was conducted for this species during the blooming season and no specimens were found.

2. North Carolina Wildlife Resources Commission (NCWRC)

   Comment: "*A moratorium prohibiting in-stream work is recommended from May 1 to July 15 to protect the egg and fry stages of smallmouth bass.*"

   Response: A moratorium will be observed as noted in the special Project Commitments.

3. North Carolina Department of Environment & Natural Resources - Division of Water Quality (NCDENR - DWQ)

   Comment: *"A moratorium prohibiting in-stream work and land disturbance within the 25-foot trout buffer is recommended from October 15 to April 15 . . . There are 30-foot vegetated buffer requirements in WS waters in addition to the requirements to minimize storm water runoff and maximum use of BMP's."*

   Response: According to the NCWRC's District Biologist, there are no trout in the Yadkin River in the project vicinity. Therefore, the trout buffer is not required. However, since smallmouth bass are present, the NCWRC has requested that a moratorium from May 1 to July 15 be observed to protect the egg and fry stages. In addition, the Yadkin River is not a IV water; therefore the 30-foot vegetative buffer does not apply.

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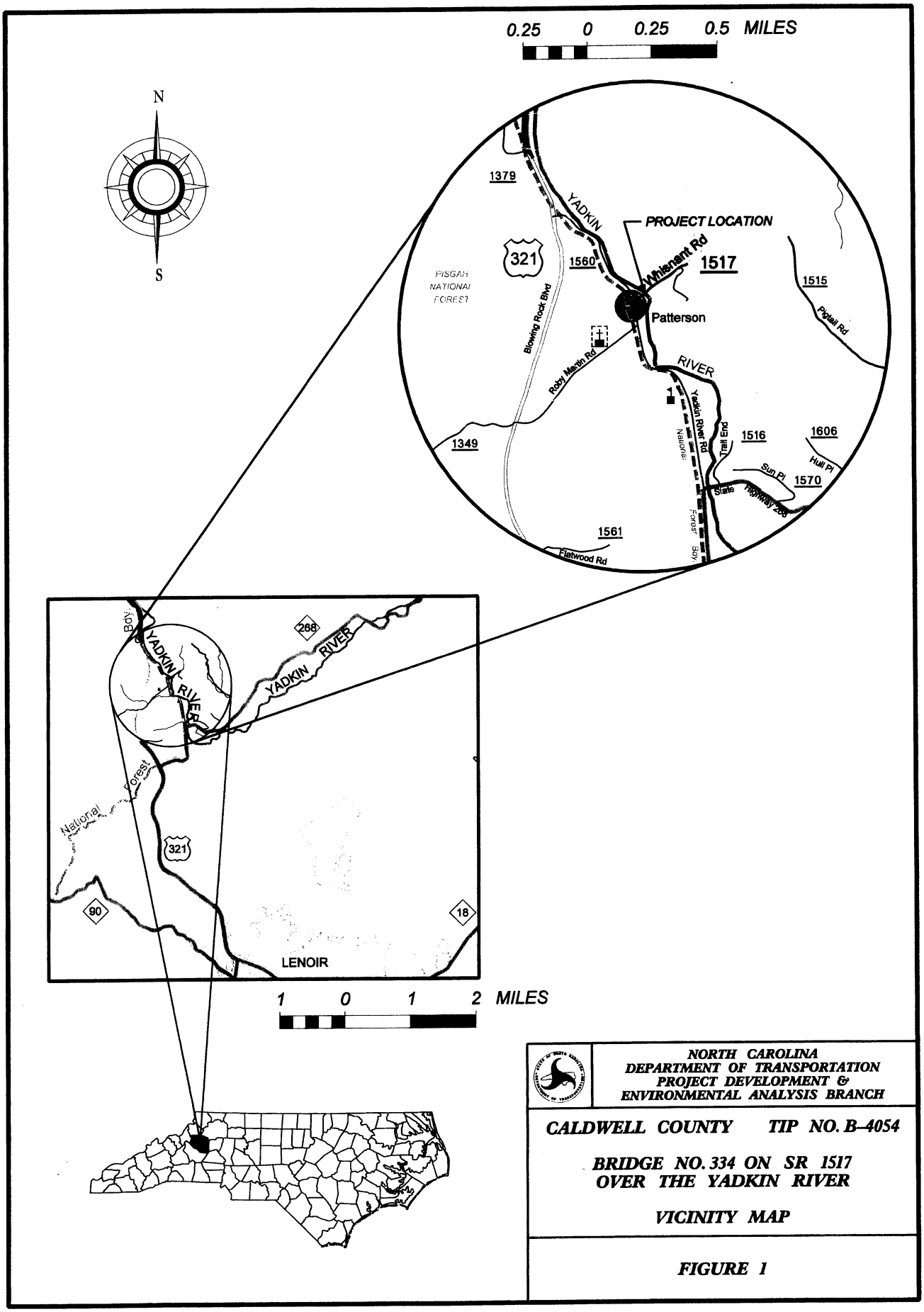
FIGURES



NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
PROJECT DEVELOPMENT &
ENVIRONMENTAL ANALYSIS BRANCH

CALDWELL COUNTY TIP NO. B-4054

BRIDGE NO. 334 ON SR 1517 OVER THE YADKIN RIVER

VICINITY MAP

FIGURE 1

VIEW OF SOUTH-WESTERN APPROACH

VIEW OF NORTHEAST-ERN APPROACH

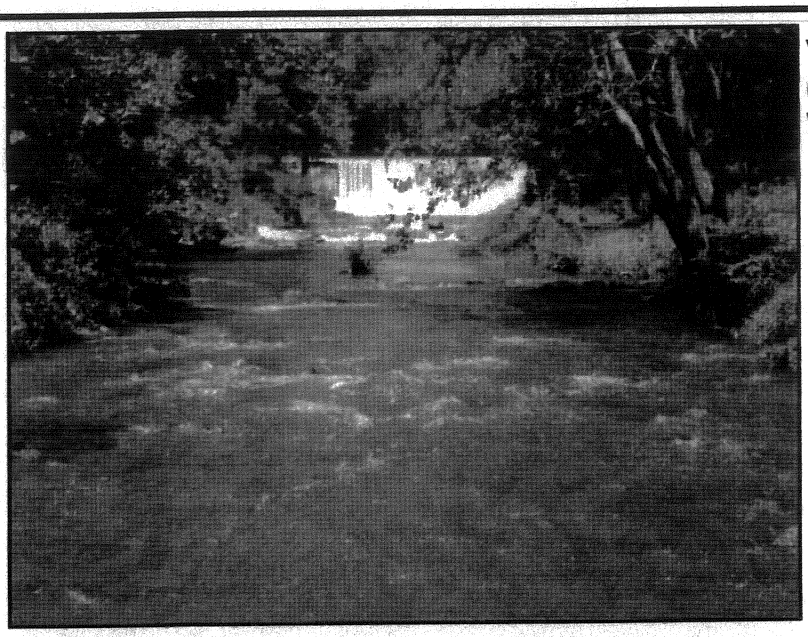
NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
PROJECT DEVELOPMENT &
ENVIRONMENTAL ANALYSIS

CALDWELL COUNTY TIP NO. B-4054

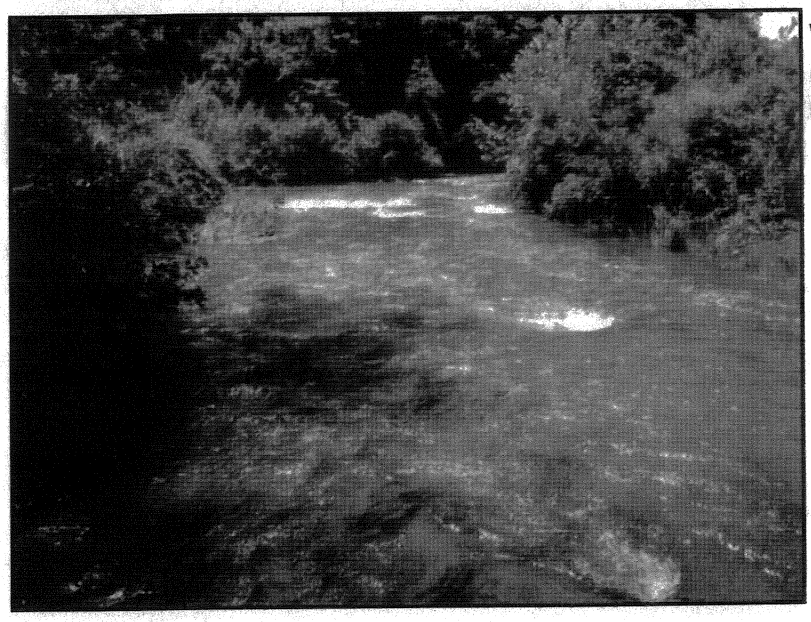
BRIDGE NO. 334 ON SR 1517
OVER THE YADKIN RIVER

PHOTOGRAPHS

Figure 2-1



VIEW UPSTREAM (LOOKING NORTH-WEST)



VIEW DOWNSTREAM (LOOKING SOUTH-EAST)

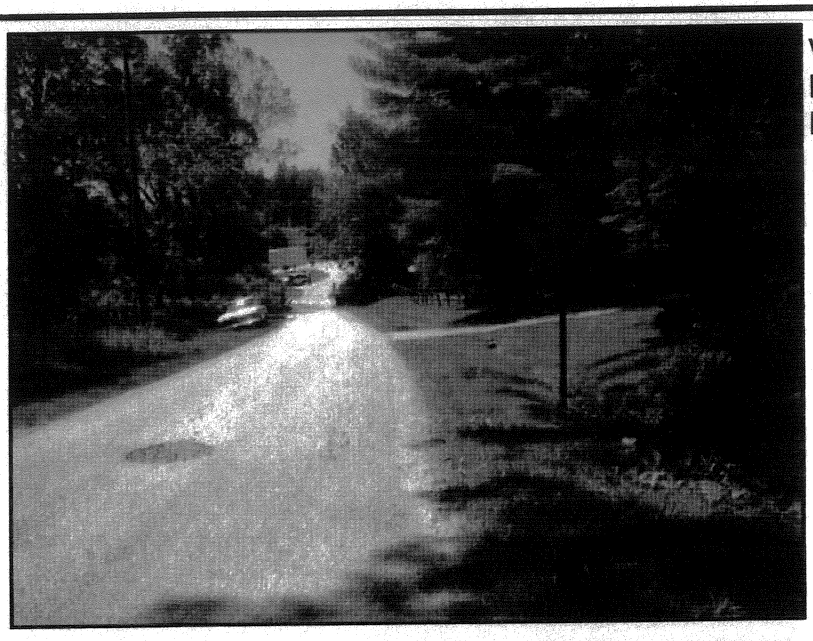
NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
PROJECT DEVELOPMENT &
ENVIRONMENTAL ANALYSIS

CALDWELL COUNTY ***TIP NO. B-4054***

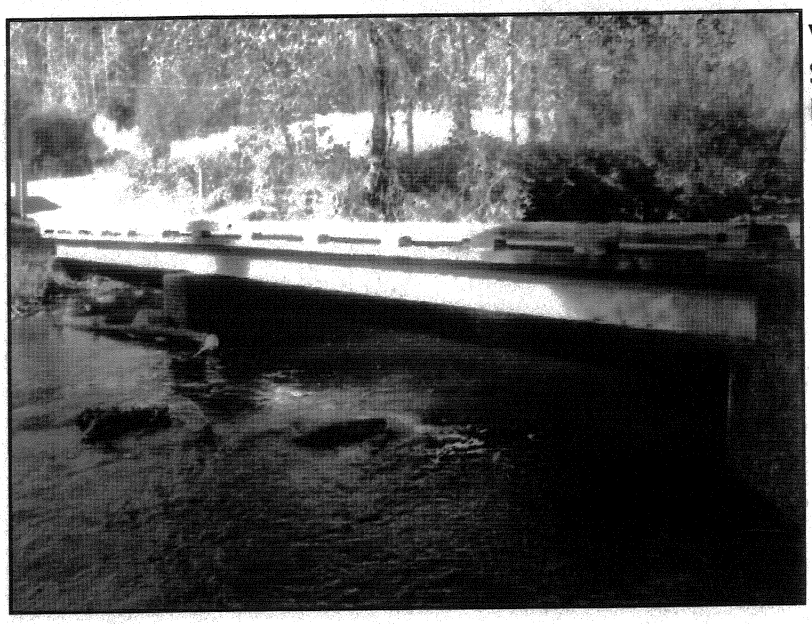
BRIDGE NO. 334 ON SR 1517
OVER THE YADKIN RIVER

PHOTOGRAPHS

Figure 2-2



VIEW OF BRIDGE FROM POINT NORTH EAST OF SITE



VIEW OF DOWN-STREAM FACE OF BRIDGE

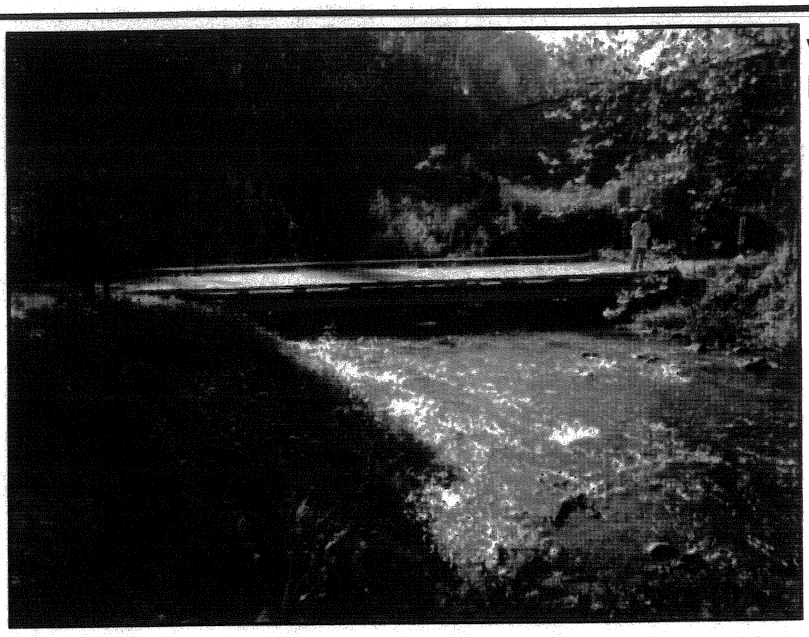
NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
PROJECT DEVELOPMENT &
ENVIRONMENTAL ANALYSIS

CALDWELL COUNTY *TIP NO. B-4054*

BRIDGE NO. 334 ON SR 1517
OVER THE YADKIN RIVER

PHOTOGRAPHS

Figure 2-3



VIEW OF UPSTREAM FACE OF BRIDGE

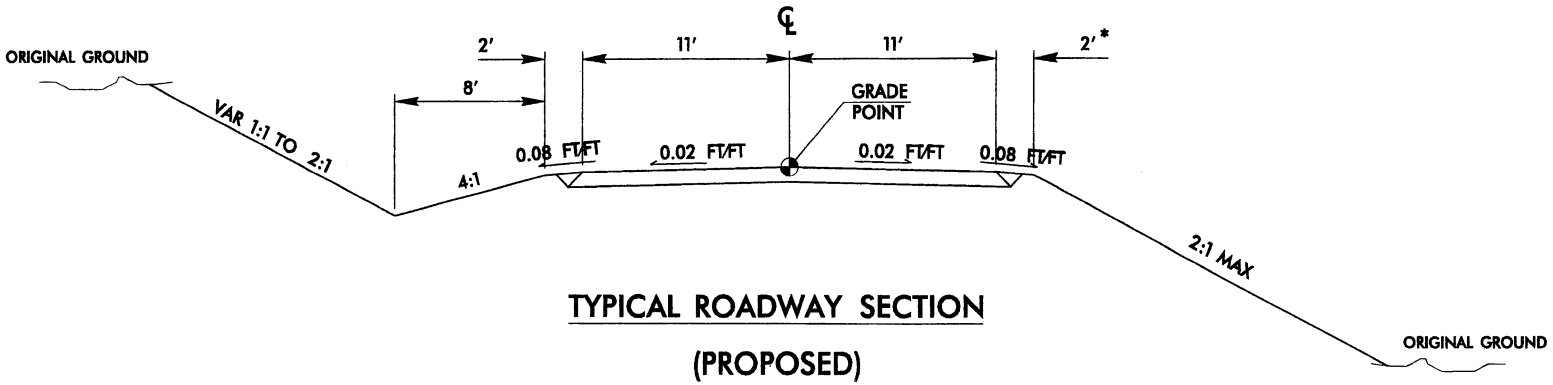
NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
PROJECT DEVELOPMENT &
ENVIRONMENTAL ANALYSIS

CALDWELL COUNTY TIP NO. B-4054

BRIDGE NO. 334 ON SR 1517
OVER THE YADKIN RIVER

PHOTOGRAPHS

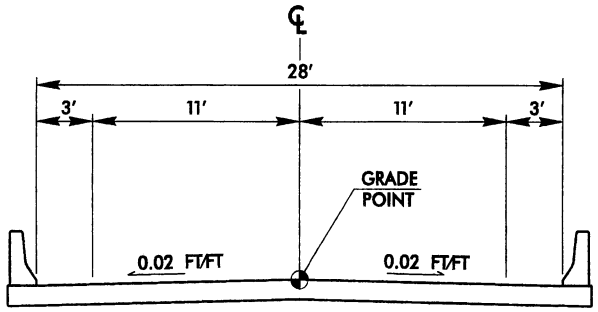
Figure 2-4



TYPICAL ROADWAY SECTION

(PROPOSED)

*ADD 3' FOR GUARDRAIL



TYPICAL SECTION ON PROPOSED BRIDGE

TRAFFIC DATA

ADT 2002 = 200
ADT 2025 = 500
DUAL 2%
TTST 1%
FUNCTIONAL CLASSIFICATION: RURAL LOCAL
LOS = A

NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
PROJECT DEVELOPMENT &
ENVIRONMENTAL ANALYSIS BRANCH

CALDWELL COUNTY TIP NO. B-4054

BRIDGE NO. 334 ON SR 1517
OVER THE YADKIN RIVER

TYPICAL SECTION

FIGURE 3

8/17/99

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

FUNCTIONAL PLANS
DO NOT USE FOR CONSTRUCTION

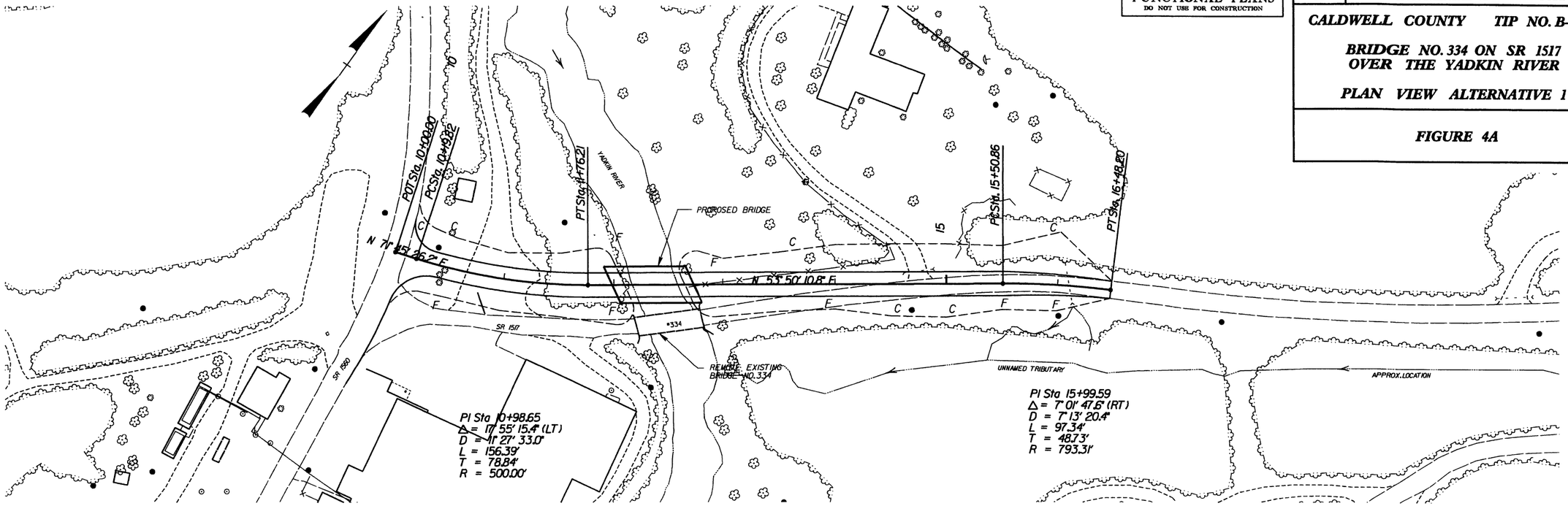
NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
PROJECT DEVELOPMENT &
ENVIRONMENTAL ANALYSIS BRANCH

CALDWELL COUNTY TIP NO. B-4054

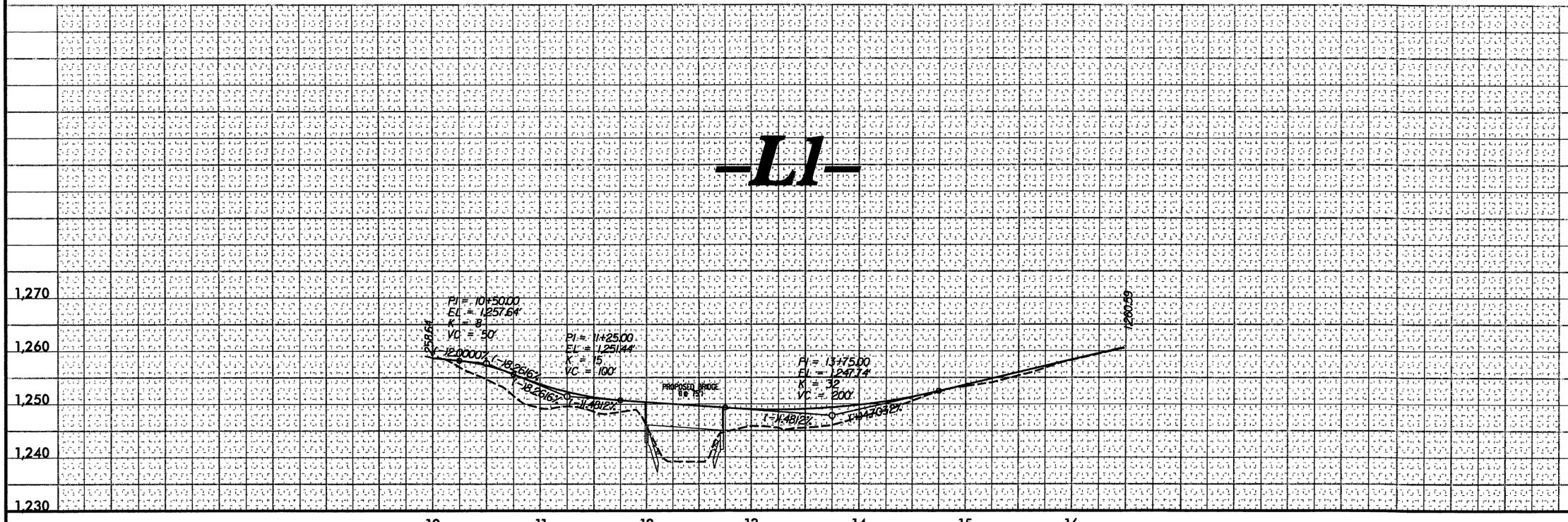
BRIDGE NO. 334 ON SR 1517
OVER THE YADKIN RIVER

PLAN VIEW ALTERNATIVE 1

FIGURE 4A



-L1-



8/17/99

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

FUNCTIONAL PLANS
DO NOT USE FOR CONSTRUCTION

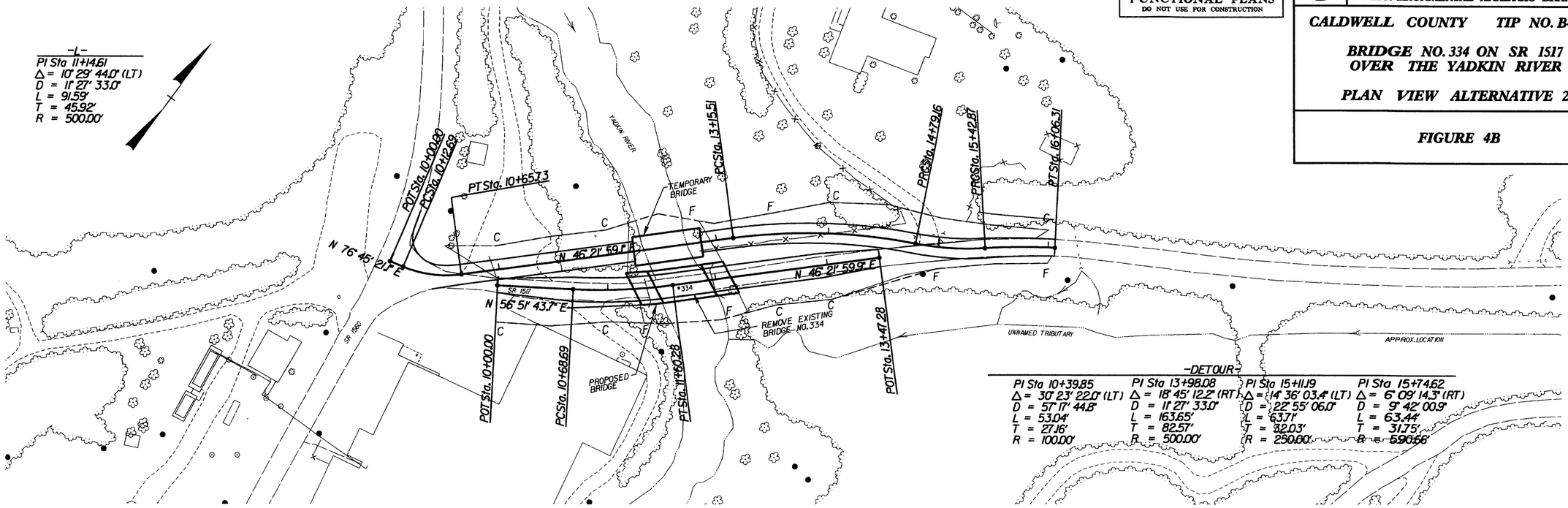
NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
PROJECT DEVELOPMENT &
ENVIRONMENTAL ANALYSIS BRANCH

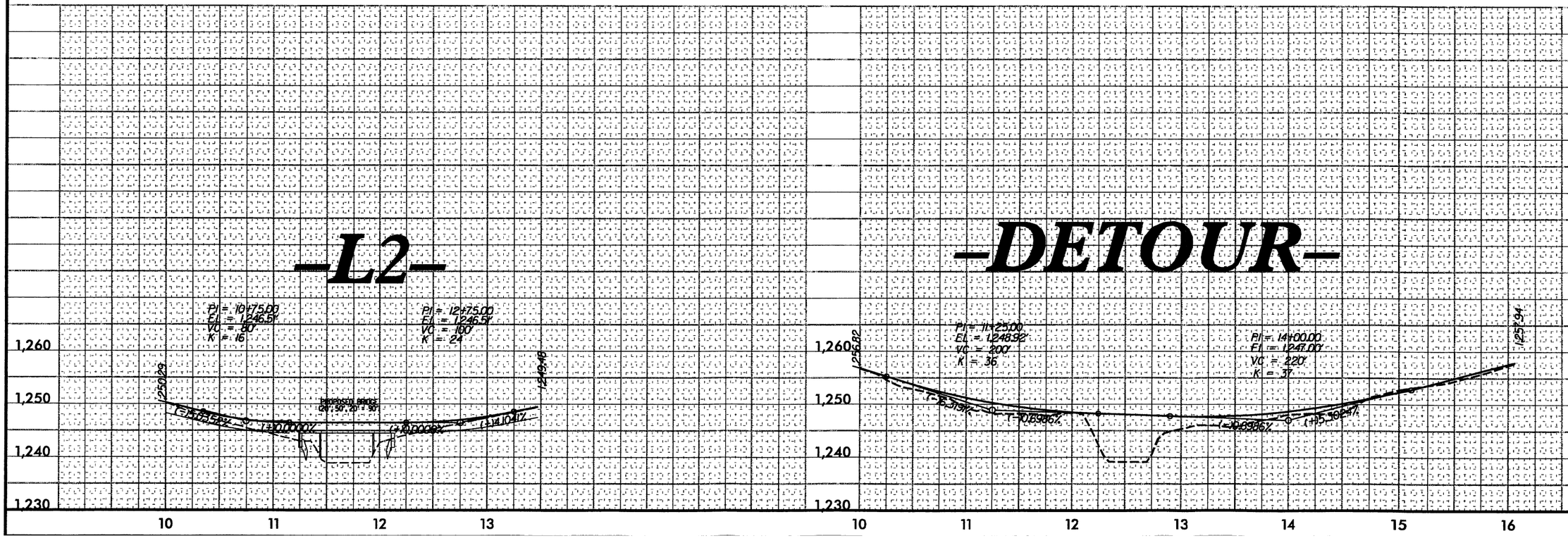
CALDWELL COUNTY TIP NO. B-4054

BRIDGE NO. 334 ON SR 1517 OVER THE YADKIN RIVER

PLAN VIEW ALTERNATIVE 2

FIGURE 4B





NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
PROJECT DEVELOPMENT &
ENVIRONMENTAL ANALYSIS BRANCH

CALDWELL COUNTY TIP NO. B-4054

BRIDGE NO. 334 ON SR 1517
OVER THE YADKIN RIVER

NATURAL COMMUNITIES
AND SURFACE WATERS

FIGURE 5

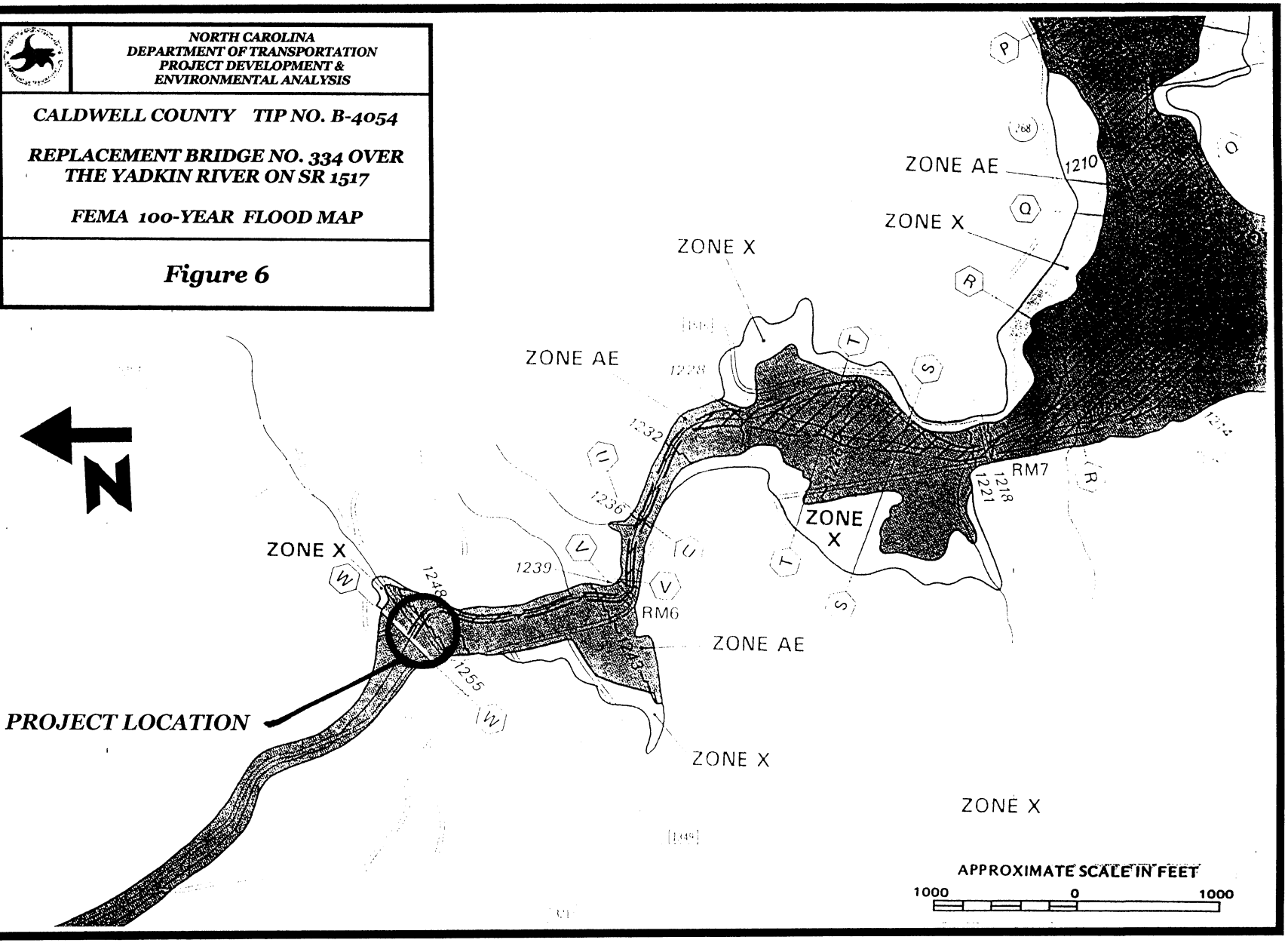
NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
PROJECT DEVELOPMENT &
ENVIRONMENTAL ANALYSIS

CALDWELL COUNTY TIP NO. B-4054

REPLACEMENT BRIDGE NO. 334 OVER THE YADKIN RIVER ON SR 1517

FEMA 100-YEAR FLOOD MAP

Figure 6



APPENDIX

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Asheville Field Office
160 Zillicoa Street
Asheville, North Carolina 28801

October 3, 2003

RECEIVED
OCT 6 2003
DIVISION OF HIGHWAYS
PROJECT DEVELOPMENT AND ENVIRONMENTAL ANALYSIS BRANCH

Gregory J. Thorpe, Ph.D.
Environmental Management Director, PDEA
North Carolina Department of Transportation
1548 Mail Service Center
Raleigh, North Carolina 27699-1548

Dear Dr. Thorpe:

Subject: Proposed Bridge Replacement Projects in Alexander, Alleghany, Avery, Burke, Caldwell, McDowell, Watauga, and Wilkes Counties, North Carolina

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

The information we received for these projects includes brief descriptions of the proposed alternatives, but not the structures that will replace the existing bridges, nor does it include any environmental information regarding the streams or whether habitat assessments or surveys for rare species have been conducted for any of these projects. Therefore, our comments are limited primarily to the known locations of listed species and federal species of concern. When the categorical exclusions are prepared and more information is available regarding environmental effects, we can offer more substantive comments.

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

McDowell County - Projects B-4190 (Log No. 4-2-03-449), B-4191 (Log No. 4-2-03-451), and B-4189 (Log No. 4-2-03-452); **Alexander County** - Project B-4005 (Log No. 4-2-03-453); and **Caldwell County** - Project B-4054 (Log No. 4-2-03-454). Our records for these counties and project areas indicate no known locations of listed species in the project areas. However, we recommend conducting habitat assessments and surveying any suitable habitat in the project areas for these species prior to any further planning or on-the-ground activities to ensure that no adverse impacts occur to them.

Avery County - Project B-3608 (Log No. 4-2-03-455) and **Wilkes County** - Project B-4325 (Log No. 4-2-03-456). Our records indicate known locations for the threatened (due to similarity of appearance) bog turtle (*Clemmys muhlenbergii*) near these projects. Habitat assessments and surveys of suitable habitat should be conducted in the project areas for this species. If the bog turtle occurs in the project areas, it should be protected from impacts.

Alleghany County - Project B-4008 (Log No. 4-2-03-457). Our records indicate known locations of the threatened (due to similarity of appearance) bog turtle (*Clemmys muhlenbergii*) and a federal species of concern--gray's lily (*Lillium grayi*)--near this project. Habitat assessments and surveys of suitable habitat should be conducted in the project area for these species. If they occur in the project area, they should be protected from impacts.

Watauga County - Project B-4315 (Log No. 4-2-03-458). Our records indicate known locations for the green floater mussel (*Lasmigona subviridis*) and Diana fritillary butterfly (*Speyeria diana*) (both of which are federal species of concern) near the project area. Habitat assessments and surveys of suitable habitat should be conducted in the project area for these species. If they occur in the project area, they should be protected from impacts.

Burke County - Project B-4042 (Log. No. 4-2-03-459). Our records indicate known locations of the brook floater mussel (*Alasmidonta varicosa*) (a federal species of concern) near the project area. Habitat assessments and surveys of suitable habitat should be conducted in the project area for this species and other native freshwater mussels. If native freshwater mussels are found to occur in the project area, they should be protected from impacts.

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

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

Sincerely,

Brian P. Cole
Field Supervisor

Enclosure

cc:

Mr. Steve Lund, U.S. Army Corps of Engineers, Asheville Regulatory Field Office, 151 Patton Avenue, Room 208, Asheville, NC 28801-5006

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

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

ENDANGERED, THREATENED, AND CANDIDATE SPECIES AND FEDERAL SPECIES OF CONCERN, ALEXANDER, ALLEGHANY, AVERY, BURKE, CALDWELL, McDOWELL, WATAUGA, AND WILKES COUNTIES, NORTH CAROLINA

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

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

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

COMMON NAME	SCIENTIFIC NAME	STATUS
ALEXANDER COUNTY		
Vertebrates		
Bog turtle	*Clemmys muhlenbergii*	T(S/A)[1]
Rafinesque's big-eared bat	*Corynorhinus rafinesquii*	FSC*
Vascular Plants		
Torrey's mountain-mint	*Pycnanthemum torrei*	FSC*
Nonvascular Plants		
Keever's bristle-moss	*Orthotrichum keeverae*	FSC
ALLEGHANY COUNTY		
Vertebrates		
Bog turtle	*Clemmys muhlenbergii*	T(S/A)[1]
Hellbender	*Cryptobranchus alleganiensis*	FSC
Eastern small-footed myotis	*Myotis (=subulatus) leibii*	FSC
Kanawha minnow	*Phenacobius teretulus*	FSC
Invertebrates		
Grayson crayfish ostracod	*Ascetocythere cosmeta*	FSC
Pygmy snaketail	*Ophiogomphus howei*	FSC
Diana fritillary butterfly	*Speyeria diana*	FSC
Regal fritillary butterfly	*Speyeria idalia*	FSC

COMMON NAME	SCIENTIFIC NAME	STATUS
Vascular Plants		
"Fen" sedge	*Carex* sp. 2	FSC
Cuthbert's turtlehead	*Chelone cuthbertii*	FSC
Tall larkspur	*Delphinium exaltatum*	FSC*
Gray's lily	*Lilium grayi*	FSC
Sweet pinesap	*Monotropsis odorata*	FSC*
Carolina saxifrage	*Saxifraga caroliniana*	FSC
Nonvascular Plants		
Keever's bristle-moss	*Orthotrichum keeverae*	FSC

AVERY COUNTY

Critical Habitat Designation: Spruce-fir moss spider, *Microhexura montivaga* - Critical habitat designated (see the July 6, 2001, *Federal Register*, 66:35547-35566).

Vertebrates		
Southern Appalachian saw-whet owl	*Aegolius acadicus*	FSC
Bog turtle	*Clemmys muhlenbergii*	T(S/A)[1]
Virginia big-eared bat	*Corynorhinus townsendii virginianus*	Endangered
Hellbender	*Cryptobranchus alleganiensis*	FSC
Blotched chub	*Erimystax insignis*	FSC
Carolina northern flying squirrel	*Glaucomys sabrinus coloratus*	Endangered
Southern Appalachian red crossbill	*Loxia curvirostra*	FSC
Southern rock vole	*Microtus chrotorrhinus carolinensis*	FSC
Eastern small-footed bat	*Myotis leibii*	FSC
Alleghany woodrat	*Neotoma magister*	FSC
Southern Appalachian black-capped chickadee	*Poecile atricapillus practicus*	FSC
Southern water shrew	*Sorex palustris punctulatus*	FSC
Southern Appalachian yellow-bellied sapsucker	*Sphyrapicus varius appalaciensis*	FSC
Appalachian cottontail	*Sylvilagus obscurus*	FSC
Appalachian Bewick's wren	*Thryomanes bewickii altus*	FSC
Invertebrates		
Grayson crayfish ostracod	*Ascetocythere cosmeta*	FSC
Spruce-fir moss spider	*Microhexura montivaga*	Endangered
Diana fritillary butterfly	*Speyeria diana*	FSC
Regal fritillary butterfly	*Speyeria idalia*	FSC
Vascular Plants		
Fraser fir	*Abies fraseri*	FSC
Mountain bittercress	*Cardamine clematitis*	FSC
Cuthbert's turtlehead	*Chelone cuthbertii*	FSC
Tall larkspur	*Delphinium exaltatum*	FSC*
Bent avens	*Geum geniculatum*	FSC
Spreading avens	*Geum radiatum*	Endangered

COMMON NAME	SCIENTIFIC NAME	STATUS
Roan Mountain bluet	*Houstonia montana*	Endangered
Butternut	*Juglans cinerea*	FSC
Heller's blazing star	*Liatris helleri*	Threatened
Gray's lily	*Lilium grayi*	FSC
Bog bluegrass	*Poa paludigena*	FSC
Carolina saxifrage	*Saxifraga caroliniana*	FSC
Blue Ridge goldenrod	*Solidago spithamaea*	Threatened
Nonvascular Plants		
Rock gnome lichen	*Gymnoderma lineare*	Endangered
A liverwort	*Plagiochila sullivantii* var. *sullivantii*	FSC
A liverwort	*Plagiochila virginica* var. *caroliniana*	FSC
A liverwort	*Sphenolobopsis pearsonii*	FSC

BURKE COUNTY

Critical Habitat Designation: Mountain golden heather, *Hudsonia montana* - The area bounded by the following: on the west by the 2200' contour; on the east by the Linville Gorge Wilderness Boundary north from the intersection of the 2200' contour and the Shortoff Mountain Trail to where it intersects the 3400' contour at "The Chimneys"--then follow the 3400' contour north until it reintersects the Wilderness Boundary--then follow the Wilderness Boundary again northward until it intersects the 3200' contour extending west from its intersection with the Wilderness Boundary until it begins to turn south--at this point the Boundary extends due east until it intersects the 2200' contour.

Vertebrates		
Bog turtle	*Clemmys muhlenbergii*	T(S/A)[1]
Rafinesque's big-eared bat	*Corynorhinus rafinesquii*	FSC
Bald eagle	*Haliaeetus leucocephalus*	Threatened (proposed for delisting)
Southern Appalachian woodrat	*Neotoma floridana haematoreia*	FSC
Alleghany woodrat	*Neotoma magister*	FSC
Invertebrates		
Brook floater	*Alasmidonta varicosa*	FSC
Edmund's snaketail dragonfly	*Ophiogomphus edmundo*	FSC*
Pygmy snaketail dragonfly	*Ophiogomphus howei*	FSC
Diana fritillary butterfly	*Speyeria diana*	FSC
Vascular Plants		
Cuthbert's turtlehead	*Chelone cuthbertii*	FSC
Spreading avens	*Geum radiatum*	Endangered
Dwarf-flowered heartleaf	*Hexastylis naniflora*	Threatened
Mountain golden heather	*Hudsonia montana*	Threatened
Small whorled pogonia	*Isotria medeoloides*	Threatened
Butternut	*Juglans cinerea*	FSC
Heller's blazing star	*Liatris helleri*	Threatened
Sweet pinesap	*Monotropsis odorata*	FSC
Carolina saxifrage	*Saxifraga caroliniana*	FSC

COMMON NAME	SCIENTIFIC NAME	STATUS
Nonvascular Plants		
A liverwort	*Cephaloziella obtusilobula*	FSC*
A liverwort	*Plagiochila sullivantii* var. *spinigera*	FSC
A liverwort	*Plagiochila sullivantii* var. *sullivantii*	FSC
A liverwort	*Porella wataugensis*	FSC*
McDOWELL COUNTY		
Vertebrates		
Bog turtle	*Clemmys muhlenbergii*	T(S/A)[1]
Olive-sided flycatcher	*Contopus borealis*	FSC
Cerulean warbler	*Dendroica cerulea*	FSC
Bald eagle	*Haliaeetus leucocephalus*	Threatened (proposed for delisting)
Southern Appalachian woodrat	*Neotoma floridana haematoreia*	FSC*
Alleghany woodrat	*Neotoma magister*	FSC
Invertebrates		
Bennett's Mill Cave water slater	*Caecidotea carolinensis*	FSC
Diana fritillary butterfly	*Speyeria diana*	FSC
Vascular Plants		
Roan sedge	*Carex roanenis*	FSC
Cuthbert's turtlehead	*Chelone cuthbertii*	FSC
Tall larkspur	*Delphinium exaltatum*	FSC**
Mountain golden heather	*Hudsonia montana*	Threatened
Rocky shoal spider lily	*Hymenocallis coronaria*	FSC
Small whorled pogonia	*Isotria medeoloides*	Threatened
Butternut	*Juglans cinerea*	FSC
Gray's lily	*Lilium grayi*	FSC
Sweet pinesap	*Monotropsis odorata*	FSC
Northern oconee-bells	*Shortia galacifolia* var. *brevistyla*	FSC
WATAUGA COUNTY		
Critical Habitat Designation: Spruce-fir moss spider, *Microhexura montivaga* - Critical habitat designated (see the July 6, 2001, *Federal Register*, 66:35547-35566).		
Vertebrates		
Southern Appalachian saw-whet owl	*Aegolius acadicus*	FSC
Bog turtle	*Clemmys muhlenbergii*	T(S/A)[1]
Hellbender	*Cryptobranchus alleganiensis*	FSC
Cerulean warbler	*Dendroica cerulea*	FSC
Carolina northern flying squirrel	*Glaucomys sabrinus coloratus*	Endangered
Southern Appalachian red crossbill	*Loxia curvirostra*	FSC
Alleghany woodrat	*Neotoma magister*	FSC*
Southern Appalachian black-capped chickadee	*Poecile atricapillus practicus*	FSC
Kanawha minnow	*Phenacobius teretulus*	FSC
Southern water shrew	*Sorex palustris punctulatus*	FSC*

COMMON NAME	SCIENTIFIC NAME	STATUS
Southern Appalachian yellow-bellied sapsucker	*Sphyrapicus varius appalaciensis*	FSC
Appalachian cottontail	*Sylvilagus obscurus*	FSC*
Invertebrates		
Green floater	*Lasmigona subviridis*	FSC
Spruce-fir moss spider	*Microhexura montivaga*	Endangered
Diana fritillary butterfly	*Speyeria diana*	FSC
Vascular Plants		
Fraser fir	*Abies fraseri*	FSC
Mountain bittercress	*Cardamine clematitis*	FSC
Tall larkspur	*Delphinium exaltatum*	FSC
Glade spurge	*Euphorbia purpurea*	FSC**
Bent avens	*Geum geniculatum*	FSC
Spreading avens	*Geum radiatum*	Endangered
Roan Mountain bluet	*Houstonia montana*	Endangered
Butternut	*Juglans cinerea*	FSC
Heller's blazing star	*Liatris helleri*	Threatened
Gray's lily	*Lilium grayi*	FSC
Bog bluegrass	*Poa paludigena*	FSC*
Nonvascular Plants		
A liverwort	*Porella wataugensis*	FSC*
WILKES COUNTY		
Vertebrates		
Bog turtle	*Clemmys muhlenbergii*	T(S/A)[1]
Cerulean warbler	*Dendroica cerulea*	FSC
Invertebrates		
Diana fritillary butterfly	*Speyeria diana*	FSC
Regal fritillary butterfly	*Speyeria idalia*	FSC
Vascular Plants		
Butternut	*Juglans cinerea*	FSC
Torrey's mountain-mint	*Pycnanthemum torrei*	FSC*
Nonvascular Plants		
Keever's bristle-moss	*Orthotrichum keeverae*	FSC

KEY:

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

FSC	A Federal species of concern--a species that may or may not be listed in the future (formerly C2 candidate species or species under consideration for listing for which there is insufficient information to support listing).
T(S/A)	Threatened due to similarity of appearance (e.g., American alligator)--a species that is threatened due to similarity of appearance with other rare species and is listed for its protection. These species are not biologically endangered or threatened and are not subject to Section 7 consultation.

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

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

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

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

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

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

U.S. Department of Agriculture

FARMLAND CONVERSION IMPACT RATING

PART I (To be completed by Federal Agency)	Date Of Land Evaluation Request 9/25/03
Name Of Project Replacement of Bridge No. 334 on SR 1517	Federal Agency Involved FHWA-NCDOT
Proposed Land Use Roadway	County And State Caldwell County, NC
PART II (To be completed by SCS)	Date Request Received By SCS 10-01-2003

Does the site contain prime, unique, statewide or local important farmland? (If no, the FPPA does not apply – do not complete additional parts of this form).	Yes ☐	No ☒	Acres Irrigated	Average Farm Size

Major Crop(s)	Farmable Land In Govt. Jurisdiction Acres: %	Amount Of Farmland As Defined in FPPA Acres: %
Name Of Land Evaluation System Used	Name Of Local Site Assessment System	Date Land Evaluation Returned By SCS

PART III (To be completed by Federal Agency)	Alternative Site Rating Site A	Site B	Site C	Site D
A. Total Acres To Be Converted Directly				
B. Total Acres To Be Converted Indirectly				
C. Total Acres In Site				
PART IV (To be completed by SCS) Land Evaluation Information				
A. Total Acres Prime And Unique Farmland				
B. Total Acres Statewide And Local Important Farmland				
C. Percentage Of Farmland In County Or Local Govt. Unit To Be Converted				
D. Percentage Of Farmland In Govt. Jurisdiction With Same Or Higher Relative Value				
PART V (To be completed by SCS) Land Evaluation Criterion Relative Value Of Farmland To Be Converted (Scale of 0 to 100 Points)				

PART VI (To be completed by Federal Agency) Site Assessment Criteria (These criteria are explained in 7 CFR 658.5(b)	Maximum Points				
1. Area In Nonurban Use					
2. Perimeter In Nonurban Use					
3. Percent Of Site Being Farmed					
4. Protection Provided By State And Local Government					
5. Distance From Urban Builtup Area					
6. Distance To Urban Support Services					
7. Size Of Present Farm Unit Compared To Average					
8. Creation Of Nonfarmable Farmland					
9. Availability Of Farm Support Services					
10. On-Farm Investments					
11. Effects Of Conversion On Farm Support Services					
12. Compatibility With Existing Agricultural Use					
TOTAL SITE ASSESSMENT POINTS	160				
PART VII (To be completed by Federal Agency)					
Relative Value Of Farmland (From Part V)	100				
Total Site Assessment (From Part VI above or a local site assessment)	160				
TOTAL POINTS (Total of above 2 lines)	260				

Site Selected:	Date Of Selection	Was A Local Site Assessment Used? Yes ☐ No ☐

Reason For Selection:

Tennessee Valley Authority, 300 West Summit Hill Drive, Knoxville, Tennessee 37902-1499

September 12, 2003

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

Dear Dr. Thorpe:

REQUEST FOR COMMENTS ON BRIDGE REPLACEMENT PROJECTS B-4042, B-4054, B-4189, B-4190, AND B-4191, YADKIN AND CATAWBA RIVER WATERSHEDS, BURKE, CALDWELL, AND MCDOWELL COUNTIES, NORTH CAROLINA

TVA has reviewed the project descriptions provided in your letters of August 18, 2003, on the proposed bridge replacements in Burke, Caldwell, and McDowell Counties. It appears that there is no TVA permit or other TVA involvement associated with these projects:

- B-4042, Bridge #274 on SR 1248 over Canoe Creek, Burke County
- B-4054, Bridge #334 on SR 1517 over Yadkin River, Caldwell County
- B-4189, Bridge #49 on NC 226 over South Muddy Creek, McDowell County
- B-4190, Bridge #37 on NC 226 over Hopper Creek, McDowell County
- B-4191, Bridge #82 on NC 226 over Jacktown Creek, McDowell County

Should you have any questions, please contact Harold M. Draper at (865) 632-6889 or hmdraper@tva.gov.

Sincerely,

Jon M. Loney, Manager
NEPA Administration
Environmental Policy and Planning

cc: Mr. John Sullivan, Division Administrator
Federal Highway Administration
310 New Bern Avenue, Suite 410
Raleigh, North Carolina 27601

RECEIVED
NOV
DIVISION OF HIGHWAYS
PROJECT DEVELOPMENT AND ENVIRONMENTAL ANALYSIS BRANCH

North Carolina Wildlife Resources Commission

Charles R. Fullwood, Executive Director

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

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

DATE: November 5, 2003

SUBJECT: Scoping review of NCDOT's proposed bridge replacement projects B-4008, B-3608, B-4054, B-4315, B-4325, B-4189, B-4190, B-4191, B-4042, and B-4005 in Alexander, Alleghany, Avery, Caldwell, Burke, McDowell, Watauga, and Wilkes, 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 projects. 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.

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

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-4005, Alexander Co., Bridge No.70 over Grassy Creek on SR 1331. Grassy Creek is Class C waters. Santee chub (*Cyprinella zanema*), state Significantly Rare (SR), and brook floater (*Alasmidonta varicosa*), Federal Species of Concern (FSC) and state Threatened (T), may be present downstream in the Lower Little River. No special concerns indicated at this time in the project vicinity. Standard requirements should apply.

2. B-4008, Alleghany Co., Bridge No. 39 over Little River on SR 1193. Little River is classified as C Trout and is Hatchery Supported (HS) Designated Public Mountain Trout Waters (DPMTW). The Kanawha minnow (*Phenacobius teretulus*), FSC and state Special Concern (SC); Kanawha darter (*Etheostoma kanawhae*), state SR; tonguetied minnow (*Exoglossum laurae*), state SR; and bog turtle (*Glyptemys muhlenbergii*), state T and federal Threatened due to Similarity of Appearance, may occur in the project area or downstream. A moratorium prohibiting in-stream work and land disturbance within the 25-foot trout buffer is recommended from October 15 to April 15 to protect the egg and fry stages of trout. Sediment and erosion control measures should adhere to the design standards for sensitive watersheds. The bridge should be replaced with another spanning structure.

3. B-3608, Avery Co., Bridge No. 44 over North Toe River on US 19E. The North Toe River is classified as WS-III Trout and is HS DPMTW with excellent rainbow and brown trout habitat. The blotched chub (*Erimystax insignis*), FSC and state SR, occurs in the project area. Appalachian elktoe (*Alasmidonta raveneliana*), federal and state Endangered (E), and wavy-rayed lampmussel (*Lampsilis fasciola*), state SC, occur in the North Toe River downstream of Spruce Pine, NC. A moratorium prohibiting in-stream work and land disturbance within the 25-foot trout buffer is recommended from October 15 to April 15 to protect the egg and fry stages of trout. Sediment and erosion control measures should adhere to the design standards for sensitive watersheds. The bridge should be replaced with another spanning structure.

4. B-4042, Burke Co., Bridge No. 274 over Canoe Creek on SR 1248. Canoe Creek is Class C water. No special concerns indicated. Standard requirements should apply.

5. B-4054, Caldwell Co., Bridge No. 334 over the Yadkin River on SR 1517 (Whisnant Road). The Yadkin River, although classified as C Trout, supports smallmouth bass in the project area. A moratorium prohibiting in-stream work is recommended from May 1 to July 15 to protect the egg & fry stages of smallmouth bass.

6. B-4189, McDowell Co., Bridge No. 49 over South Muddy Creek on NC 226. South Muddy Creek is Class C waters and is within the Muddy Creek drainage. Sediment and erosion control is a major concern, as a watershed restoration project is under way to reduce negative impacts to downstream resources, particularly in the Catawba River. Downstream of the project area, South Muddy Creek, Muddy Creek and the Catawba River have the WS-IV

classification. Catawba River resources of concern include brown and rainbow trout tailwater fisheries and state listed mussels, the notched rainbow (*Villosa constricta*), state SC, and the creeper (*Strophitus undulatus*), state T, which are present near the mouth of Muddy Creek. Sediment and erosion control measures should adhere to the design standards for sensitive watersheds.

7. B-4190, McDowell Co., Bridge No. 37 over Hoppers Creek on NC 226. Hoppers Creek is Class C waters and is within the Muddy Creek drainage. Sediment and erosion control is a major concern, as a watershed restoration project is under way to reduce negative impacts to downstream resources, particularly in the Catawba River. Downstream of the project area, Hoppers Creek, South Muddy Creek, Muddy Creek and the Catawba River have the WS-IV classification. Catawba River resources of concern include brown and rainbow trout tailwater fisheries and state listed mussels, the notched rainbow (*Villosa constricta*), state SC, and the creeper (*Strophitus undulatus*), state T, which are present near the mouth of Muddy Creek. Sediment and erosion control measures should adhere to the design standards for sensitive watersheds.

8. B-4191, McDowell Co., Bridge No. 82 over Jacktown Creek on NC 226. Jacktown Creek is Class C waters and is within the Muddy Creek drainage. Sediment and erosion control is a major concern, as a watershed restoration project is under way to reduce negative impacts to downstream resources, particularly in the Catawba River. Downstream of the project area, North Muddy Creek, Muddy Creek and the Catawba River have the WS-IV classification. Catawba River resources of concern include brown and rainbow trout tailwater fisheries and state listed mussels, the notched rainbow (*Villosa constricta*), state SC, and the creeper (*Strophitus undulatus*), state T, which are present near the mouth of Muddy Creek. Sediment and erosion control measures should adhere to the design standards for sensitive watersheds.

9. B-4315, Watauga Co., Bridge No. 62 over Bairds Creek on NC 194. Bairds Creek is Class C waters and flows into the Watauga River, classified as B Trout HQW, not far from the project site. Trout may occur in the project area. The green floater (*Lasmigona subviridis*), FSC and state E, is present in the Watauga River downstream of the project. Sediment and erosion control measures should adhere to the design standards for sensitive watersheds.

10. B-4325, Wilkes Co., Bridge No. 718 over Middle Fork Reddies River on SR 1580. Middle Fork Reddies River is classified WS-II Trout and is HS DPMTW from the project site upstream. Both trout and smallmouth bass are present. At this time, a moratorium prohibiting in-stream work and land disturbance within the 25-foot trout buffer is anticipated from October 15 to April 15 to protect the egg and fry stages of trout. Sediment and erosion control measures should adhere to the design standards for sensitive watersheds. The bridge should be replaced with another spanning structure.

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, NC DWQ
Marella Buncick, USFWS
Sarah McRae, NC NHP

Michael F. Easley, Governor
William G. Ross Jr., Secretary
North Carolina Department of Environment and Natural Resources

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

RECEIVED
OCT 21 2003
DIVISION OF HIGHWAYS
ENVIRONMENTAL ANALYSIS BRANCH
PROJECT DEVELOPMENT AND

October 16, 2003

MEMORANDUM

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

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

THROUGH: John R. Dorney, Supervisor, DWQ 401 Unit

SUBJECT: Scoping Review of NCDOT's proposed bridge replacement projects: B-4008, B-3608, B-4054, B-4315, B-4325, B-4190, B-4189, B-4191, B-4042, and B-4005.

In reply to your correspondence dated August 18, 2003 (received August 28, 2003) to Cynthia Van der Wiele, in which you requested comments for the referenced projects, the NC Division of Water Quality has the following comments:

I. General Comments Regarding Bridge Replacement Projects

1. If corrugated metal pipe arches, reinforced concrete pipes, or concrete box culverts are used to replace the bridge, then DWQ recommends the use of Nationwide Permit No. 14 rather than Nationwide Permit 23.

2. Bridge demolition should be performed using Best Management Practices developed by NCDOT.

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

4. Bridge deck drains should not discharge directly into the stream; stormwater should be directed across the bridge and pre-treated through site-appropriate means (grassed swales, pre-formed scour holes, vegetated buffers, etc.) before entering the stream. Please refer to NCDOT Best Management Practices for the Protection of Surface Waters

5. Live concrete should not be allowed to contact the water in or entering into the stream. Concrete is mostly made up of lime (calcium carbonate) and when in a dry or wet state (not hardened) calcium carbonate is very soluble in water and has a pH of approximately 12. In an unhardened state concrete or cement will change the pH of fresh water to very basic and will cause fish and other macroinvertebrate kills.

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

7. If temporary access roads or detours are constructed, they should be removed back to original ground elevations immediately upon the completion of the project. Disturbed areas should be seeded or mulched to stabilize the soil and native tree species should be planted with a spacing of not more than 10'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 re-vegetate naturally and minimizes disturbed soil.

N. C. Division of Water Quality, 401 Wetlands Certification Unit,
1650 Mail Service Center, Raleigh, NC 27699-1650 (Mailing Address)
2321 Crabtree Blvd., Raleigh, NC 27604-2260 (Location)
(919) 733-1786 (phone), 919-733-6893 (fax), (http://h2o.enr.state.nc.us/ncwetlands)
Customer Service # 1-877-623-6748

8. A clear bank (rip rap-free) area of at least 10 feet should remain on each side of the steam underneath the bridge.

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

10. Bare soil should be stabilized through vegetation or other means as quickly as feasible to prevent sedimentation of water resources.

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

12. Heavy equipment should be operated from the bank rather than in stream channels in order to minimize sedimentation and reduce the likelihood of introducing other pollutants into streams. This equipment should be inspected daily and maintained to prevent contamination of surface waters from leaking fuels, lubricants, hydraulic fluids, or other toxic materials.

II. General Comments if Replacing the Bridge with a Culvert

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

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

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

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

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

North Carolina Department of Cultural Resources
State Historic Preservation Office
David L. S. Brook, Administrator

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

Division of Historical Resources

RECEIVED
DEC
DIVISION OF HIGHWAYS
PROJECT DEVELOPMENT AND ENVIRONMENTAL ANALYSIS BRANCH

December 18, 2003

MEMORANDUM

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

FROM: David Brook for David Brook

SUBJECT: Replace Bridge No. 334 on SR 1517 over Yadkin River, B-4054, Caldwell County, ER03-2341

Thank you for your letter of August 18, 2003, concerning the above project.

We have conducted a review of the proposed undertaking and are aware of no historic resources which would be affected by the project. Therefore, we have no comment on the undertaking as proposed.
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: Mary Pope Furr, NCDOT
SCH

Federal Aid #BRZ-1517(3) *TIP #* **B-4054** *County*: **Caldwell**

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

Project Description: Replace Bridge #334 on Whisnant Road over the Yadkin River.

On November 25, 2003, representatives of the

- [x] North Carolina Department of Transportation (NCDOT)
- [x] Federal Highway Administration (FHWA)
- [x] North Carolina State Historic Preservation Office (HPO)
- [ ] Other

Reviewed the subject project at

- [ ] Scoping meeting
- [x] Historic architectural resources photograph review session/consultation
- [ ] Other

All parties present agreed

- [x] There are no properties over fifty years old within the project's area of potential effects.
- [x] There are no properties less than fifty years old which are considered to meet Criteria Consideration G within the project's area of potential effects.
- [ ] There are properties over fifty years old within the project's Area of Potential Effects (APE), but based on the historical information available and the photographs of each property, the property identified as _____ is considered not eligible for the National Register and no further evaluation of it is necessary.
- [x] There are no National Register-listed or Study Listed properties within the project's area of potential effects.
- [x] All properties greater than 50 years of age located in the APE have been considered at this consultation, and based upon the above concurrence, all compliance for historic architecture with Section 106 of the National Historic Preservation Act and GS 121-12(a) has been completed for this project.
- [x] There are no historic properties affected by this project. (*Attach any notes or documents as needed*)
  Dam #4 is outside the APE.

Signed:

J. Cathey — 11/25/03
Representative, NCDOT — Date

Michael C Dawson — 11/25/03
FHWA, for the Division Administrator, or other Federal Agency — Date

Laura D Williams — 11/25/03
Representative, HPO — Date

Renee Gledhill-Earley — 11/25/03
State Historic Preservation Officer — Date

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

Caldwell County Schools

1914 Hickory Blvd SW
Lenoir, NC 28645
Telephone 828-728-8407
Fax 828-728-0012

Donnie Bassinger, Assistant Superintendent

September 5, 2003

Gregory J. Thorpe, Ph. D., Director
N C Department of Transportation
Project Development and Environmental Analysis
1548 Mail Service Center
Raleigh, NC 27699-6322

Dear Mr. Thorpe:

This is in response to your letter of August 28, 2003. The project is Caldwell County Bridge #334 on SR 1517 over the Yadkin River, TIP Project No. B-4054. Your letter requests feedback on the impact of this bridge project.

Based on my information from our Bus Garage, this will not impact any of our buses traveling over this bridge.

Sincerely,

Donnie Bassinger
Assistant Superintendent
Caldwell County Schools