STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

MICHAEL F. EASLEY
GOVERNOR

LYNDO TIPPETT
SECRETARY

August 24, 2007

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

ATTN: Mr. Monte Matthews
NCDOT Coordinator

SUBJECT: **Nationwide 13 Permit Application** for the proposed replacement of Bridge No. 16 over Middle Fork Creek on SR 1541, Watauga County, Division 11. Federal Aid Project No. BRZ-1541(3), WBS Element 33654.1.1, T.I.P. No. B-4317.

Dear Mr. Matthews:

Please find enclosed the Programmatic Categorical Exclusion (PCE) for the above referenced project, along with half-size design plans, permit drawings, and the Natural Resource Technical Report (NRTR). The North Carolina Department of Transportation (NCDOT) plans to replace Bridge No. 16 over Middle Fork Creek with a new 70-foot long, 28-foot wide structure on the existing alignment. Traffic will use an offsite detour during construction. Project impacts total 15 feet in Middle Fork Creek.

IMPACTS TO WATERS OF THE UNITED STATES

General Description: The project is located in the New River basin (HUC 05050001) and will impact Middle Fork Creek. Middle Fork Creek (Index # 10-1-2-(6)) is assigned a best usage classification of **WS-IV Tr+**, by the N.C. Division of Water Quality (DWQ). Middle Fork Creek is not designated as a North Carolina Natural or Scenic River, or as a National Wild and Scenic River, nor is it listed on the 2004 Final 303(d) list. No designated Outstanding Resource Waters (ORW), Water Supply I (WS-I), or Water Supply II (WS-II) waters occur within 1.0 mile of the project. The project does not drain to a 303(d) stream within one mile of the project limits. Middle Fork Creek is classified as a trout river by the NC Wildlife Resources Commission (WRC). No wetlands occur on the project area.

Temporary Impacts: No temporary impacts are expected from the proposed project.

Permanent Impacts: Permanent stream impacts total 15 feet from the placement of riprap on the banks of Middle Fork Creek at the outlet of an 18-inch Corrugated Metal Pipe. The riprap will be placed only on the banks to prevent erosion and scour on the stream bank.

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

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

WEBSITE: WWW.NCDOT.ORG

LOCATION:
2728 CAPITAL BLVD
SUITE 240
RALEIGH, NC 27604

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

PROJECT SCHEDULE

The project is scheduled to let February 19, 2008 and has a review date of January 1, 2008.

BRIDGE DEMOLITION

Bridge No. 16 is constructed of timber and steel with concrete abutments that are out of the water. Therefore, it is unlikely that there will be any temporary fill resulting from bridge demolition. Best Management Practices for Bridge Demolition and Removal will be implemented.

FEDERALLY-PROTECTED SPECIES

Plants and animals with federal classifications of Endangered, Threatened, Proposed Endangered, and Proposed Threatened are protected under provisions of Section 7 and Section 9 of the Endangered Species Act of 1973, as amended. As of May 10, 2007, the Fish and Wildlife Service (FWS) lists eight federally protected species for Watauga County. The bog turtle is listed as threatened due to similarity of appearance and therefore does not require a biological conclusion. A biological conclusion of "No Effect" has been reached for all other federally protected species.

Federally Protected Species of Watauga County

Scientific Name	Common Name	Federal Status	Biological Conclusion	Habitat Present
Clemmys muhlenbergii	Southern bog turtle	T (S/A)	NA	No
Glaucomys sabrinus coloratus	Carolina northern flying squirrel	E	No Effect	No
Corynorhinus townsendii virginianus	Virginia big eared bat	E	No Effect	No
Microhexura montivaga	Spruce-fir moss spider	E	No Effect	No
Solidago spithamaea	Blue ridge golden rod	T	No Effect	No
Liatris helleri	Heller's blazing star	T	No Effect	No
Hedyotis purpurea var. montana	Roan mountain bluet	E	No Effect	No
Geum radiatum	Spreading avens	E	No Effect	No

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:

- The new bridge will completely span the channel.
- NCDOT will adhere to Design Standards in Sensitive Watersheds.
- Per WRC, in stream work and land disturbance within the 25-foot buffer zone are prohibited during the brown trout spawning season of October 15 through April 15.

MITIGATION
Mitigation is not proposed because permanent impacts are minimal and are due to the placement of riprap on the banks of the Middle Fork Creek, and not in the streambed.

REGULATORY APPROVALS
Section 404 Permit: This project has been processed by the Federal Highway Administration as a "Categorical Exclusion." NCDOT is hereby applying for a Clean Water Act Section 404 Nationwide Permit. The NCDOT requests that these activities be authorized by Nationwide Permit 13.

Section 401 Permit: NCDOT is hereby applying for a 401 Water Quality Certification from DWQ. We anticipate 401 General Certification number 3626 will apply to this project. All general conditions of the Water Quality Certifications will be met. Therefore, in accordance with 15A NCAC 2H, Section .0500(a), we are providing two copies of this application to the DWQ for their records.

Comments from WRC will be requested prior to authorization by the Army Corps of Engineers. By copy of this letter and attachment, NCDOT hereby requests WRC review and that WRC forward their comments to the Corps of Engineers and NCDOT within 30 calendar days of receipt of this application.

Thank you for your assistance with this project. If you have any questions or need additional information, please contact Brett Feulner at bmfeulner@dot.state.nc.us or (919) 715-1488.

A copy of this permit application will be posted on the DOT website at: http://www.ncdot.org/doh/preconstruct/pe/neu/permit.html.

Sincerely,

E. L. Fluet

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

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

w/o attachment
Mr. Art McMillan, P.E., Highway Design
Mr. Majed Alghandour, P.E., Prog. and TIP
Mr. Hank Schwab, PDEA
Mr. Jay Bennett, P.E., Roadway Design
Mr. Scott McLendon, USACE, Wilmington

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 13

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

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

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

II. Applicant Information

1. Owner/Applicant Information
   Name: Gregory J. Thorpe, Ph.D., Environmental Management Director
   Mailing Address: 1598 Mail Service Center
   Raleigh, NC 27699
   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. 16 over Middle Fork Creek

2. T.I.P. Project Number or State Project Number (NCDOT Only): B-4317

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

4. Location
   County: Watauga Nearest Town: Boone
   Subdivision name (include phase/lot number): N/A
   Directions to site (include road numbers/names, landmarks, etc.): The site is located at the crossing of SR 1541 over Middle Fork Creek

5. Site coordinates (For linear projects, such as a road or utility line, attach a sheet that separately lists the coordinates for each crossing of a distinct waterbody.)
   Decimal Degrees (6 digits minimum): 36.1788°N, 81.6604°W

6. Property size (acres): N/A

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

8. River Basin: New River
   (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. NA

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, 15 feet of stream impacts

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)					0

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

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

Stream Impact Number (indicate on map)	Stream Name	Type of Impact	Perennial or Intermittent?	Average Stream Width Before Impact	Impact Length (linear feet)	Area of Impact (acres)
Site 1	Middle Fork Creek	Permanent	Perennial	25	15	0.10
Total Stream Impact (by length and acreage)					15	0.10

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):	0.1
Wetland Impact (acres):	0
Open Water Impact (acres):	0
Total Impact to Waters of the U.S. (acres)	0.1
Total Stream Impact (linear feet):	15

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.): NA
   Proposed use or purpose of pond (e.g., livestock watering, irrigation, aesthetic, trout pond, local stormwater requirement, etc.): NA
   Current land use in the vicinity of the pond: NA
   Size of watershed draining to pond: NA Expected pond surface area: NA

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, a trout moratorium will be observed and the 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 minimal and the placement of riprap will be on the banks of the channel, not in the stream bed.

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. P. Luck for Gregory Thorpe, PhD 8.24.07

Applicant/Agent's Signature **Date**

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

CATEGORICAL EXCLUSION ACTION CLASSIFICATION FORM

TIP Project No.	**B-4317**
State Project No.	**8.2752401**
W.B.S. No.	**33654.1.1**
Federal Project No.	**BRZ-1541(3)**

A. Project Description:

The purpose of this project is to replace Watauga County Bridge No. 16 on SR 1541 over Middle Fork Creek. Bridge No. 16 is 41 feet long. The replacement structure will be a bridge approximately 60 feet long providing a minimum 30 feet clear deck width. The bridge will include two 11-foot lanes and 4-foot offsets. The roadway grade of the new structure will be approximately the same as the existing structure.

The approach roadway will extend approximately 230 feet from the northwest end of the new bridge and approximately 260 feet from the southeast end of the new bridge. The approaches will be widened to include a 22-foot pavement width providing two 11-foot lanes. A 5-foot grass shoulder will be provided with three foot of shoulder added in guardrail locations. The roadway will be designed as a Rural Local Route and a design exception will be required for the 55 mph Statutory Speed. Expressway gutter should be use next to the cuts to minimize any excavation and to minimize and/or eliminate the need for retaining walls.

Traffic will be detoured offsite during construction (see Figure 1).

B. Purpose and Need:

NCDOT Bridge Maintenance Unit records indicate Bridge No. 16 has a sufficiency rating of 49.2 out of a possible 100. The bridge is considered functionally obsolete due to a deck geometry appraisal of 2 out of 9 according to Federal Highway Administration (FHWA) standards. Therefore, this bridge is eligible for FHWA's Bridge Replacement Program.

The superstructure of Bridge No. 16 has timber elements that are forty-five years old. Timber components have a typical life expectancy between 40 to 50 years due to the natural deterioration rate of wood. Rehabilitation of timber components of a structure is generally practical only when a few elements are damaged or prematurely deteriorated. However, past a certain degree of deterioration, most timber elements become impractical to maintain and upon eligibility are programmed for replacement. Components of the timber floor and bridge railing have experienced an increased proportion of deterioration that can no longer be addressed by maintenance activities. The bridge is approaching the end of its useful life.

Bridge No. 16 carries 800 vehicles per day with 1,600 vehicles per day projected for 2025. The substandard deck width of 18 feet is becoming increasingly unacceptable and replacement of the bridge will result in safer traffic operations.

Components of the concrete substructure have experienced increasing degree of deterioration that can no longer be addressed by maintenance activities. Longitudinal I-beams are experiencing increasing scaling, rust, and corrosion. The posted weight limit on the bridge is down to 21 tons for single vehicles and 26 tons for truck-tractor semi-trailers. The bridge is approaching the end of its useful life.

C. Proposed Improvements:

Circle one or more of the following Type II improvements, which apply, to the project:

1. Modernization of a highway by resurfacing, restoration, rehabilitation, reconstruction, adding shoulders, or adding auxiliary lanes (e.g., parking, weaving, turning, climbing).

    a. Restoring, Resurfacing, Rehabilitating, and Reconstructing pavement (3R and 4R improvements)
    b. Widening roadway and shoulders without adding through lanes
    c. Modernizing gore treatments
    d. Constructing lane improvements (merge, auxiliary, and turn lanes)
    e. Adding shoulder drains
    f. Replacing and rehabilitating culverts, inlets, and drainage pipes, including safety treatments
    g. Providing driveway pipes
    h. Performing minor bridge widening (less than one through lane)
    i. Slide Stabilization
    j. Structural BMP's for water quality improvement

2. Highway safety or traffic operations improvement projects including the installation of ramp metering control devices and lighting.

    a. Installing ramp metering devices
    b. Installing lights
    c. Adding or upgrading guardrail
    d. Installing safety barriers including Jersey type barriers and pier protection
    e. Installing or replacing impact attenuators
    f. Upgrading medians including adding or upgrading median barriers
    g. Improving intersections including relocation and/or realignment
    h. Making minor roadway realignment
    i. Channelizing traffic
    j. Performing clear zone safety improvements including removing hazards and flattening slopes
    k. Implementing traffic aid systems, signals, and motorist aid
    l. Installing bridge safety hardware including bridge rail retrofit

3. Bridge rehabilitation, reconstruction, or replacement or the construction of grade separation to replace existing at-grade railroad crossings.

   a. Rehabilitating, reconstructing, or replacing bridge approach slabs
   b. Rehabilitating or replacing bridge decks
   c. Rehabilitating bridges including painting (no red lead paint), scour repair, fender systems, and minor structural improvements
   d. Replacing a bridge (structure and/or fill)

4. Transportation corridor fringe parking facilities.

5. Construction of new truck weigh stations or rest areas.

6. Approvals for disposal of excess right-of-way or for joint or limited use of right-of-way, where the proposed use does not have significant adverse impacts.

7. Approvals for changes in access control.

8. Construction of new bus storage and maintenance facilities in areas used predominantly for industrial or transportation purposes where such construction is not inconsistent with existing zoning and located on or near a street with adequate capacity to handle anticipated bus and support vehicle traffic.

9. Rehabilitation or reconstruction of existing rail and bus buildings and ancillary facilities where only minor amounts of additional land are required and there is not a substantial increase in the number of users.

10. Construction of bus transfer facilities (an open area consisting of passenger shelters, boarding areas, kiosks and related street improvements) when located in a commercial area or other high activity center in which there is adequate street capacity for projected bus traffic.

11. Construction of rail storage and maintenance facilities in areas used predominantly for industrial or transportation purposes where such construction is not inconsistent with existing zoning and where there is no significant noise impact on the surrounding community.

12. Acquisition of land for hardship or protective purposes, advance land acquisition loans under section 3(b) of the UMT Act. Hardship and protective buying will be permitted only for a particular parcel or a limited number of parcels. These types of land acquisition qualify for a CE only where the acquisition will not limit the evaluation of alternatives, including shifts in alignment for planned construction projects, which may be required in the NEPA process. No project development on such land may proceed until the NEPA process has been completed.

13. Acquisition and construction of wetland, stream and endangered species mitigation sites.

14. Remedial activities involving the removal, treatment or monitoring of soil or groundwater contamination pursuant to state or federal remediation guidelines.

D. Special Project Information:

Estimated Cost:

Table 1 Estimated Cost

	Preferred Alternate
Structure	$ 288,000
Roadway Approaches	$ 212,000
Structure Removal	$ 11,000
Misc. & Mob.	$ 104,000
Eng. & Contingencies	$ 110,000
Total Construction Cost	$ 725,000
Right-of-way Costs	$ 378,000
TOTAL PROJECT COST * Cost based on 2006 prices	$ 1,103,000

Estimated Traffic:

Current	-	800 vpd
Year 2025	-	1,600 vpd
TTST	-	1%
Dual	-	2%

Accidents: Traffic Engineering has evaluated a recent three-year period and the one crash that occurred in the vicinity of the project was the result of a motorist claiming to be run off the road. The accident was not associated with the geometry of the bridge or its approach roadways.

Design Exceptions: A design exception will be required for the 55 mph Statutory Speed, sag vertical curve K factor, and vertical curve stopping sight distance.

Bridge Demolition: Bridge No. 16 is constructed of timber and steel and concrete abutments and should be possible to remove with no resulting debris in the water based on standard demolition practices.

Alternatives Discussion:

No Build - No build would result in eventually closing the road which is unacceptable given the volume of traffic served by SR 1541.

Rehabilitation – The bridge was constructed in 1961 and the timber materials within the bridge superstructure are reaching the end of their useful life. Rehabilitation would require replacing the timber components which would effectively constitute replacing the entire deck. The concrete substructure is experiencing increasing deterioration that can no longer be addressed by maintenance activities.

Offsite Detour – Bridge No. 16 will be replaced on the existing alignment. Traffic will be detoured off-site (see Figure 1) during the period of construction. NCDOT Guidelines for Evaluation of Off-site Detours for Bridge Replacement Projects considers multiple drive variables beginning with the additional time traveled by the average road user as a result of utilizing the off-site detour. The off-site detour for this project would include SR 1541, SR 1547, and US 221/US 321. This off-site detour would result in 9.5 minutes additional travel time (6 miles of additional travel) for the average driver. A maximum duration of eight months of construction is expected for this project. Based on the guidelines, the delay falls into a range where the normal evaluation of alternatives can be carried out to determine whether traffic can be detoured off-site or must be maintained on-site.

In this case, maintaining traffic on-site would result in environmental impacts and higher project costs from the construction of an on-site detour. Watauga County Emergency Services has indicated that an off-site detour is acceptable and that services can be adequately rerouted during construction. The conditions on all roads and bridges on the off-site detour are acceptable without the need for improvements. Watauga County School Transportation has indicated that rerouting buses around this project will be workable. Coordination with Watauga County Schools will be done prior to bridge closure. In view of the low impacts to property and the environment, project cost savings, and no major opposition, an off-site detour is recommended. NCDOT Division 11 concurs with these recommendations.

On-site Detour – An on-site detour was not evaluated due to the presence of an acceptable off-site detour.

Staged Construction – Staged construction was not considered because of the availability of an acceptable off-site detour.

New Alignment – Given that the existing alignment for SR 1541 is acceptable, a new alignment was not considered as an alternative.

Other Agency Comments:

The **N.C. Wildlife Resource Commission** and The **U.S. Fish & Wildlife Service,** in standardized letters, provided a request that they prefer off-site detours and any replacement structure be a spanning structure. All environmental concerns were addressed and resolved.

Public Involvement:

A letter was sent by the Location & Surveys Unit to all property owners that may be affected directly by this project. Property owners were invited to comment. A Newsletter was distributed to residents in the immediate area. A Citizens Informational Workshop was held on December 3, 2003 between the hours of 4:00 PM and 7:00 PM at The Media Center of Hardin Elementary School, 361 Jefferson Road, Boone, NC to discuss concerns related to the project. Attendance at the workshop was low, as only four or five residents visited the presentation. Those in attendance were generally in favor of the project.

E. Threshold Criteria

The following evaluation of threshold criteria must be completed for Type II actions

ECOLOGICAL		YES	NO
(1)	Will the project have a substantial impact on any unique or important natural resource?		X
(2)	Does the project involve habitat where federally listed endangered or threatened species may occur?		X
(3)	Will the project affect anadromous fish?		X
(4)	If the project involves wetlands, is the amount of permanent and/or temporary wetland taking less than one-tenth (1/10) of an acre and have all practicable measures to avoid and minimize wetland takings been evaluated?	X	
(5)	Will the project require the use of U. S. Forest Service lands?		X
(6)	Will the quality of adjacent water resources be adversely impacted by proposed construction activities?		X
(7)	Does the project involve waters classified as Outstanding Water Resources (OWR) and/or High Quality Waters (HQW)?		X
(8)	Will the project require fill in waters of the United States in any of the designated mountain trout counties?		X*
(9)	Does the project involve any known underground storage tanks (UST's) or hazardous materials sites?		X

PERMITS AND COORDINATION		YES	NO
(10)	If the project is located within a CAMA county, will the project significantly affect the coastal zone and/or any "Area of Environmental Concern" (AEC)?		X
(11)	Does the project involve Coastal Barrier Resources Act resources?		X
(12)	Will a U. S. Coast Guard permit be required?		X
(13)	Will the project result in the modification of any existing regulatory floodway?		X
(14)	Will the project require any stream relocations or channel changes?		X

SOCIAL, ECONOMIC, AND CULTURAL RESOURCES		YES	NO
(15)	Will the project induce substantial impacts to planned growth or land use for the area?		X
(16)	Will the project require the relocation of any family or business?		X
(17)	Will the project have a disproportionately high and adverse human health and environmental effect on any minority or low-income population?		X
(18)	If the project involves the acquisition of right of way, is the amount of right of way acquisition considered minor?	X	
(19)	Will the project involve any changes in access control?		X
(20)	Will the project substantially alter the usefulness and/or land use of adjacent property?		X
(21)	Will the project have an adverse effect on permanent local traffic patterns or community cohesiveness?		X
(22)	Is the project included in an approved thoroughfare plan and/or Transportation Improvement Program (and is, therefore, in conformance with the Clean Air Act of 1990)?	X	
(23)	Is the project anticipated to cause an increase in traffic volumes?		X

(24)	Will traffic be maintained during construction using existing roads, staged construction, or on-site detours?	X	
(25)	If the project is a bridge replacement project, will the bridge be replaced at its existing location (along the existing facility) and will all construction proposed in association with the bridge replacement project be contained on the existing facility?	X	
(26)	Is there substantial controversy on social, economic, or environmental grounds concerning the project?		X
(27)	Is the project consistent with all Federal, State, and local laws relating to the environmental aspects of the project?	X	
(28)	Will the project have an "effect" on structures/properties eligible for or listed on the National Register of Historic Places?		X
(29)	Will the project affect any archaeological remains which are important to history or pre-history?		X
(30)	Will the project require the use of Section 4(f) resources (public parks, recreation lands, wildlife and waterfowl refuges, historic sites, or historic bridges, as defined in Section 4(f) of the U. S. Department of Transportation Act of 1966)?		X
(31)	Will the project result in any conversion of assisted public recreation sites or facilities to non-recreation uses, as defined by Section 6(f) of the Land and Water Conservation Act of 1965, as amended?		X
(32)	Will the project involve construction in, across, or adjacent to a river designated as a component of or proposed for inclusion in the National System of Wild and Scenic Rivers?		X

F. Additional Documentation Required for Unfavorable Responses in Part E

* Item (8)

Middle Fork South Fork New River has a Stream Index Number of 10-1-2-(6) and a DWQ Best USAGE Classification of WS-IV;Tr:+. This is not technically High Quality Waters, but it has trout-specific conditions. The supplemental classification of Tr does qualify this stream for the Design Standards in Sensitive Watersheds and the "+" indicates this stream eventually drains into a stream with the high quality "ORW" classification and should be treated as sensitive.

G. CATEGORICAL EXCLUSION ACTION CLASSIFICATION FORM

TIP Project No.	**B-4317**
State Project No.	**8.2752401**
W.B.S. No.	**33654.1.1**
Federal Project No.	**BRZ-1541(3)**

A. Project Description:

The purpose of this project is to replace Watauga County Bridge No. 16 on SR 1541 over Middle Fork Creek. Bridge No. 16 is 41 feet long. The replacement structure will be a bridge approximately 60 feet long providing a minimum 30 feet clear deck width. The bridge will include two 11-foot lanes and 4-foot offsets. The roadway grade of the new structure will be approximately the same as the existing structure.

The approach roadway will extend approximately 230 feet from the northwest end of the new bridge and approximately 260 feet from the southeast end of the new bridge. The approaches will be widened to include a 22-foot pavement width providing two 11-foot lanes. A 5-foot grass shoulder will be provided with three foot of shoulder added in guardrail locations. The roadway will be designed as a Rural Local Route and a design exception will be required for the 55 mph Statutory Speed.

Traffic will be detoured offsite during construction (see Figure 1).

Categorical Exclusion Action Classification:

__X__ TYPE II(A)
_____ TYPE II(B)

Approved:

7/25/06 — Date
Bridge Project Development Unit Head
Project Development & Environmental Analysis Branch

7/25/06 — Date
Project Engineer
Project Development & Environmental Analysis Branch

7/25/06 — Date
Project Planning Engineer
Project Development & Environmental Analysis Branch

For Type II (B) projects only:

_____ — Date
John F. Sullivan, III, PE, Division Administrator
Federal Highway Administration

PROJECT COMMITMENTS:

Watauga County
Bridge No. 16 on SR 1541
Over Middle Fork Creek
Federal Aid Project No. BRZ-1541(3)
State Project No. 8.2752401
W.B.S. No. 33654.1.1
T.I.P. No. B-4317

Division 11 Construction Engineer

In order to allow Emergency Management Services (EMS) adequate time to prepare for road closure, the NCDOT will notify Watauga County EMS at (828) 264-4235 thirty days prior to road closure.

Division 11 Construction Engineer

In order to allow Watauga County Division of School Transportation time to prepare for road closure the NCDOT will notify the Transportation Director at (828) 264-7190 thirty days prior to road closure.

Roadside Environmental Unit, Division Resident Engineer – Sensitive Watersheds

Middle Fork South Fork New River Creek has Stream Index Number of 10-1-2-(6) and a DWQ Best USAGE Classification of WS-IV;TR+. Therefore erosion and sedimentation will be controlled through the installation and maintenance of erosion and sedimentation control methods. Middle Fork Creek has trout-specific conditions and will be subject to all Design Standards for Sensitive Watersheds.

Division 11 Construction Engineer – Bridge Demolition

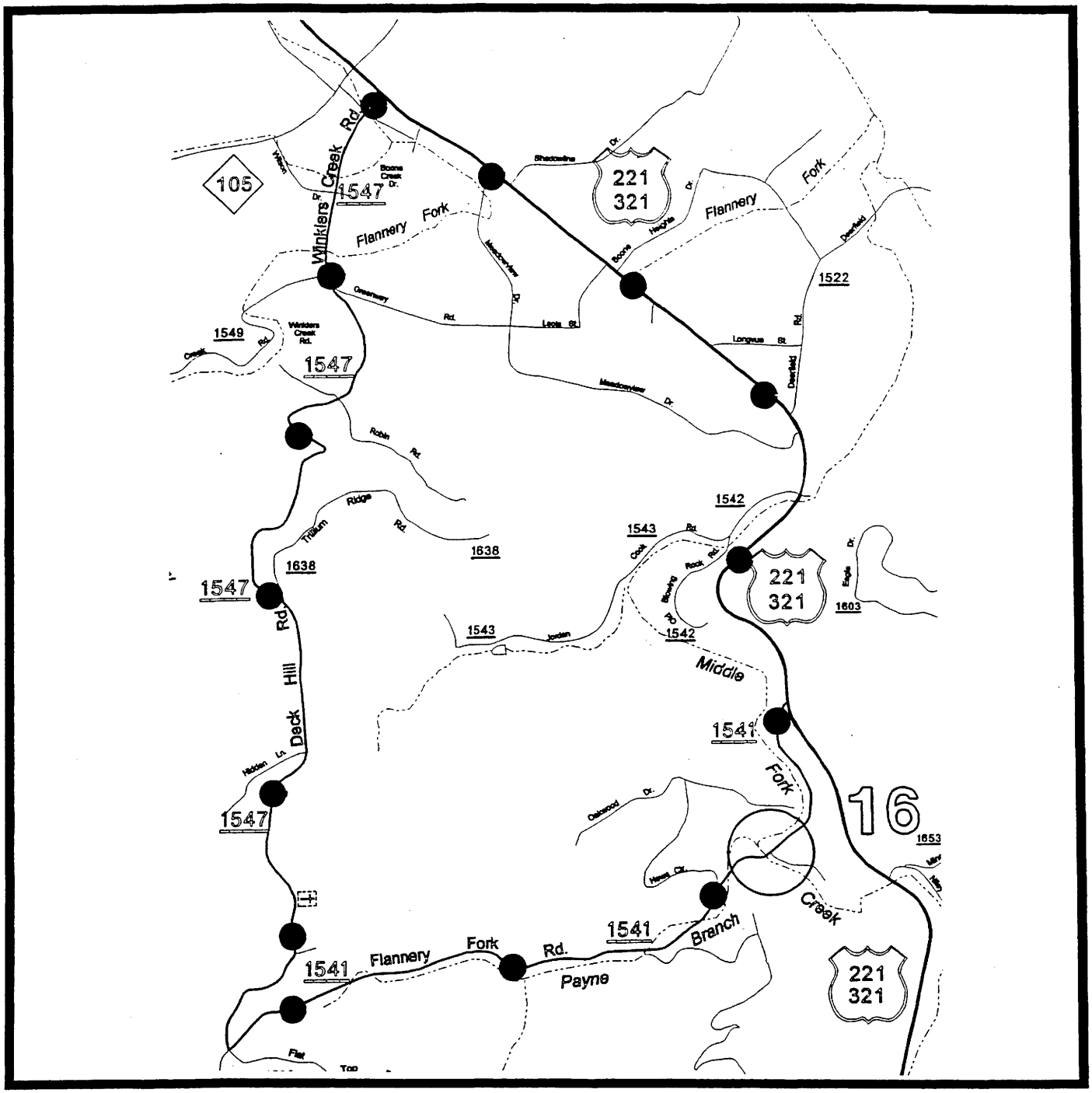
The bridge is constructed of timber and steel with concrete abutments that are out of the water. Therefore, it is unlikely that there will be any temporary fill resulting from bridge demolition. Best management Practices for Bridge Demolition and Removal will be implemented.

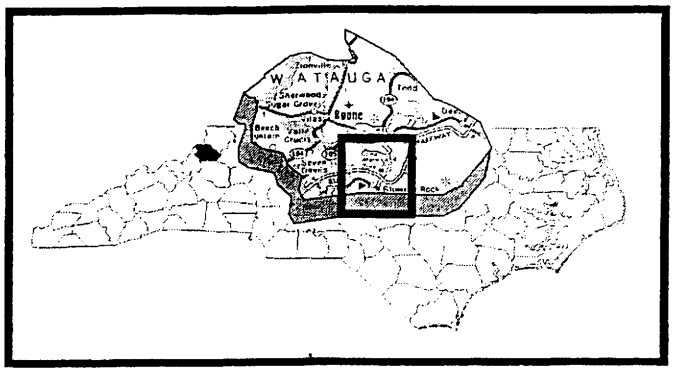
Division Resident Engineer – Trout Issues

NCWRC has commented that Middle Fork Creek is a NCWRC Hatchery Supported Trout Stream. A rainbow and brown trout moratorium (October 15 to April 15) shall be maintained during construction. The following will be implemented to minimize impacts to their habitat:

- In-stream work and land disturbance within the 25-foot buffer zone are prohibited during the brown trout spawning season of October 15 through April 15

- Where concrete is used, work will be accomplished so that wet concrete does not contact the stream water.
- Grading and back filling should be minimized. Tree and shrub growth should be retained if possible to ensure long term availability of shoreline cover for game fish and wildlife.
- Under no circumstances should rock, sand, or other materials be dredged from the stream channel except as required for the construction of the bridge piers.
- Temporary or permanent herbaceous vegetations should be planted on all bare soil within 15 days of completion of ground disturbing activities to provide long-term erosion control.
- Guidelines for Construction Adjacent to Trout Waters will be applied to this project.



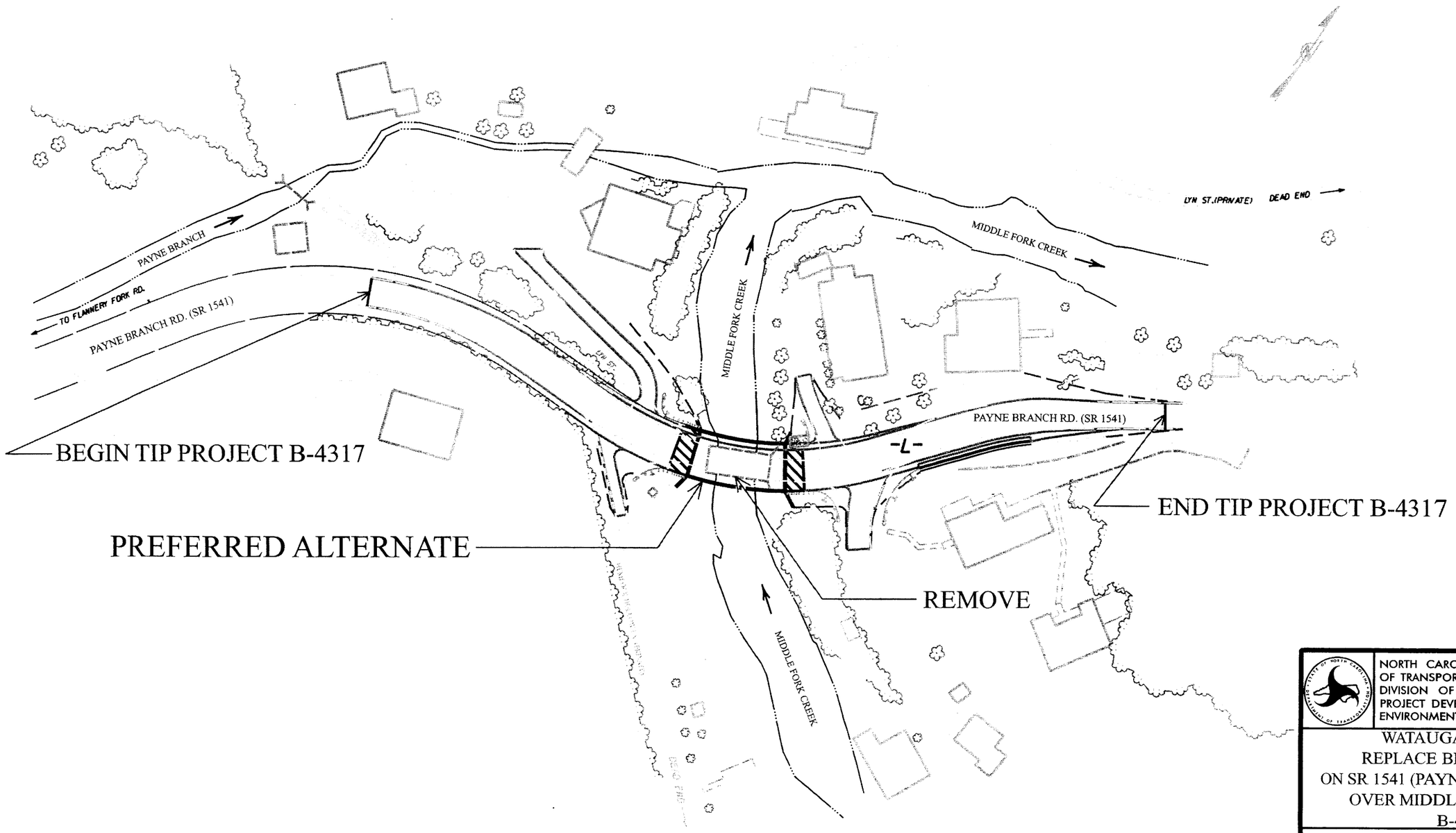


NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
PROJECT DEVELOPMENT & ENVIRONMENTAL ANALYSIS BRANCH

WATAUGA COUNTY
REPLACE BRIDGE 16 ON SR 1541
OVER MIDDLE FORK CREEK
B-4317

Detour

Figure One



NORTH CAROLINA DEPARTMENT
OF TRANSPORTATION
DIVISION OF HIGHWAYS
PROJECT DEVELOPMENT AND
ENVIRONMENTAL ANALYSIS BRANCH

WATAUGA COUNTY
REPLACE BRIDGE NO. 16
ON SR 1541 (PAYNE BRANCH ROAD)
OVER MIDDLE FORK CREEK
B-4317

FIGURE 2

North Carolina Department of Cultural Resources

State Historic Preservation Office

David L. S. Brook, Administrator

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

Division of Historical Resources
David J. Olson, Director

January 23, 2002

MEMORANDUM

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

FROM: David Brook RBH for David Brook

SUBJECT: Replace Bridge No. 16 on SR 1541 over Middle Fork Creek, B-4317, Watauga County, ER 02-8541

Thank you for your letter of September 25, 2001, concerning the above project.

Since there is not architectural survey for the area of potential effect, we recommend that a Department of Transportation architectural historian identify and evaluate any structures over fifty years old and report the findings to us.

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

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

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

DB:kgc

cc: Mary Pope Furr, NCDOT
Matt Wilkerson, NCDOT

Federal Aid #: **BRZ-1541(3)** *TIP #:* **B-4317** *County:* **Watauga**

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

Project Description: **Replace Bridge No. 16 on SR 1541 over Middle Fork Creek, in Watauga County (ER 02-8541)**

On **June** ~~28~~ 29**, 2005**, representatives of the

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

Reviewed the subject project at

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

All parties present agreed

- [ ] There are no properties over fifty years old within the project's area of potential effects.
- [X] There are no properties less than fifty years old which are considered to meet Criteria Consideration G within the project's area of potential effects.
- [X] There are properties over fifty years old within the project's Area of Potential Effects (APE), but based on the historical information available and the photographs of each property, the properties identified as **(list below)** are considered not eligible for the National Register and no further evaluation of them are necessary.

properties # 1 - 3

- [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*)

Signed:

Jennifer Caffrey — 6/29/05

Representative, NCDOT — Date

FHWA, for the Division Administrator, or other Federal Agency — Date

Representative, HPO — 6/29/05 — Date

Peter B. Sandbeck — 6/29/05

State Historic Preservation Officer — Date

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

Natural Resources Technical Report

Proposed Replacement of Bridge No. 16
Over Middle Fork South Fork New River

Watauga County, North Carolina

State Project NO. 8.2752401
NCDOT TIP NO. B-4317

REPLACEMENT OF BRIDGE NO. 16 ON SR 1541 OVER MIDDLE FORK SOUTH FORK NEW RIVER WATAUGA COUNTY

TIP PROJECT NO. B-4317
STATE PROJECT NO. 8.2752401
FEDERAL AID PROJECT NO. BRZ – 1541(3)

NATURAL RESOURCES TECHNICAL REPORT B-4317

PREPARED FOR:

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
PROJECT DEVELOPMENT AND ENVIRONMENTAL ANALYSIS BRANCH

BY:

Stantec Consulting Services Inc.
801 Jones Franklin Road, Suite 300
Raleigh, NC 27606

March 12, 2002

TABLE OF CONTENTS

TABLES

EXHIBITS

APPENDICES

1.0 INTRODUCTION

The following Natural Resources Technical Report is submitted to assist in the preparation of a Categorical Exclusion (CE) document.

1.1 PROJECT DESCRIPTION

The proposed project involves the replacement of Bridge No. 16 over Middle Fork South Fork New River on SR 1541 in Watauga County, North Carolina (Exhibit 1.1.1).

1.2 PURPOSE

The purpose of this technical report is to inventory and describe the various natural resources likely to be impacted by the proposed action. Assessments of the nature and severity of probable impacts to these natural resources are provided, along with recommendations for measures that will minimize resource impacts.

This report identifies areas of particular concern that may affect the selection of a preferred alignment or may necessitate changes in design criteria. Such environmental concerns should be addressed during the preliminary planning stages of the proposed project in order to maintain environmental quality in the most efficient and effective manner. The analyses contained in this document are relevant only in the context of the existing preliminary project boundaries. It may become necessary to conduct additional field investigations should design parameters and criteria change.

1.3 METHODOLOGY

The North Carolina Department of Transportation (NCDOT) provided aerial photography detailing the proposed project study area (Exhibit 1.1.2). Prior to the field investigation published resource information pertaining to the project study area was gathered and reviewed. The information sources used to prepare this report include:

- U.S. Geological Survey (USGS) quadrangle map (Boone);
- Soil Survey Sheets for Watauga County, North Carolina (Draft);

- United States Fish and Wildlife Service (USFWS) National Wetlands Inventory Map;
- USFWS list of protected species (March 22, 2001);
- North Carolina Natural Heritage Program (NCNHP) database of rare species and unique habitats (January 2001);
- North Carolina Department of Transportation (NCDOT) aerial photography of the project study area (1:100); and
- North Carolina Division of Water Quality (DWQ) water resource data.

A general field survey was conducted within the project study area on August 29, 2001. Water resources were identified and their physical characteristics were recorded. Terrestrial community classifications generally follow Schafale and Weakley (1990) where possible, and plant taxonomy follows Radford, *et al.* (1968). Vegetative communities were mapped utilizing aerial photography of the project site (Exhibit 1.1.2). Wildlife were identified using a variety of observation techniques including active searching, visual observations with binoculars, and identifying characteristic signs of wildlife (sounds, tracks, scat, and burrows). Cursory surveys for aquatic organisms, including tactile searches for benthic macroinvertebrates, were performed as well.

Investigation into wetland occurrence in the project study area was conducted using methods outlined in the 1987 Corps of Engineers Wetlands Delineation Manual (Environmental Laboratory, 1987).

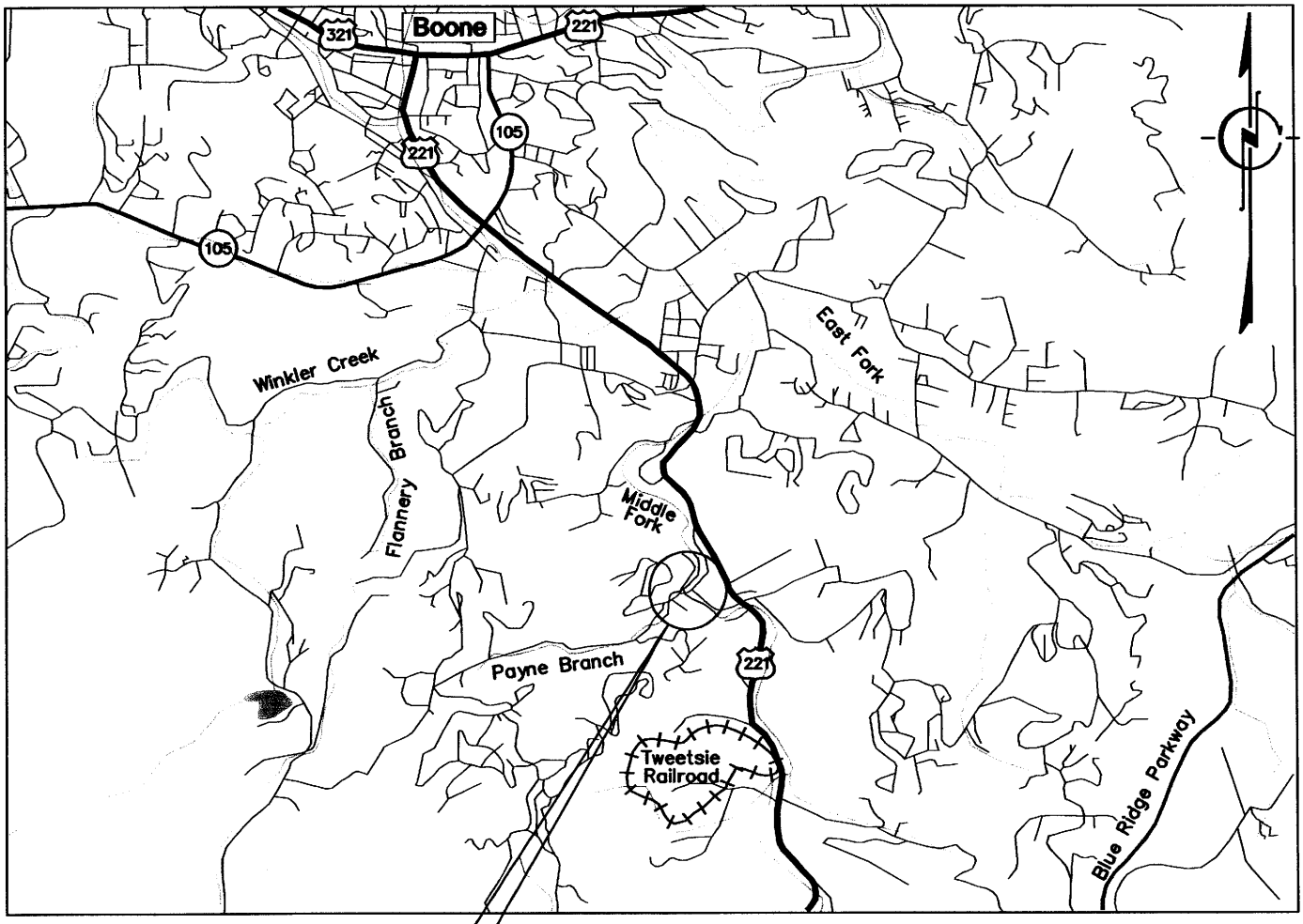
1.4 QUALIFICATIONS OF PRINCIPAL INVESTIGATOR

Investigator:	Michael P. Eagan
Education:	Bachelor of Science, Biology, University of South Florida
Prescribed Fire Boss:	Florida Division of Forestry No. 19982847
Experience:	Environmental Scientist, Stantec, Raleigh, NC, October 2000 to present.
	Land Management Specialist, Southwest Florida Water Management District, Brooksville, FL, 1999 to 2000.
	Ecologist, Biological Research Associates, Inc., Tampa, FL, 1991 to 1999.
Expertise:	Threatened and Endangered species surveys, natural community assessment, mapping and management, wetland mitigation design and monitoring.

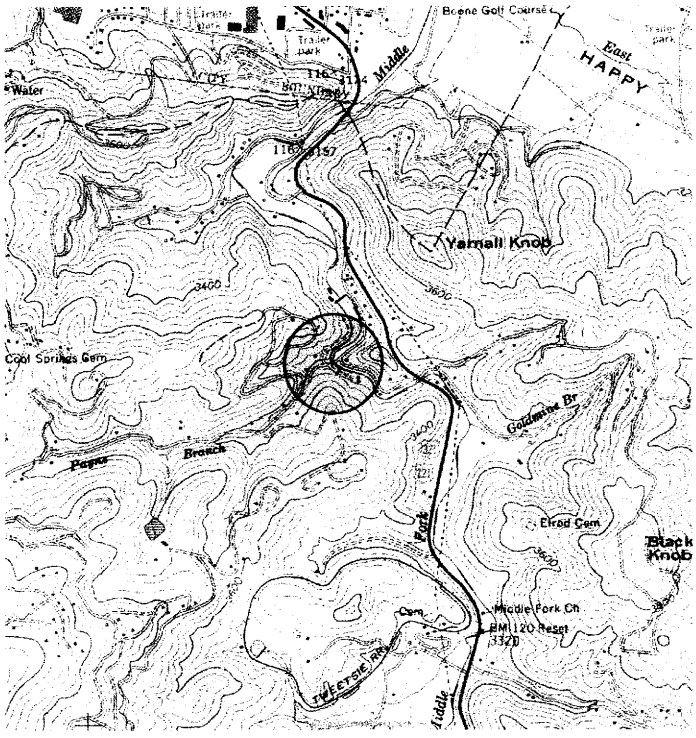
1.5 DEFINITIONS

For the purposes of this document, the following terms are used concerning the limits of natural resources investigation:

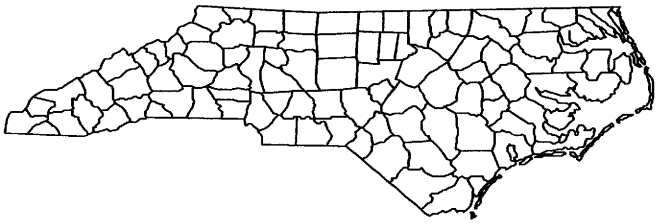
- Project study area – denotes the potential construction area;
- Project vicinity – includes an area extending 0.5 miles (0.8 kilometers) on all sides of the project study area;
- Project region – equals an area represented by a United States Geological Survey (USGS) 7.5-minute quadrangle map with the project study area occupying the central position.



Site Location



Watagua County



North Carolina Department of Transportation

SR 1541
Replace Bridge No. 16 over Middle Fork Creek
B-4317
Watagua County, North Carolina
Project Vicinity

Not to Scale

Exhibit 1.1.1

US Geological Survey April 8, 1994

Legend

- Maintained–Disturbed Community
- Rich Cove Forest Community
- Aquatic
- Project Study Area

North Carolina
Department of Transportation

SR 1541
Replace Bridge No. 16
over Middle Fork Creek
B-4317
Watagua County, North Carolina
Project Study Area

Not to Scale

Exhibit 1.1.2

2.0 PHYSICAL RESOURCES

2.1 PHYSIOGRAPHY AND SOILS

The project lies within the Blue Ridge Mountain Physiographic Province. The topography of the project vicinity is characterized as rolling hills with moderate to steeply sloping banks along the major streams. Elevations in the project vicinity range from approximately 3,200 to 4,400 feet (975 to 1,341 meters) above mean sea level (msl). The elevation in the project study area is approximately 3,280 feet (1,000 meters) above msl.

Watauga County does not have a published soil survey; however, field sheets are available for review. The soil series found within the project study area are described below.

Dellwood very gravelly loamy fine sand, two to five percent slopes, occasionally flooded, is mapped throughout the project study area. This soil is a nearly level to gently sloping, very deep, moderately well drained soil found on flood plains in the Southern Appalachian Mountains. Permeability is moderately rapid. The seasonal high water table is within a depth of two to four feet (0.6 to 1.2 meters). This mapping unit is not listed on the hydric soils list.

Ashe-Chestnut complex, very rocky, 30 to 50 percent slopes, is mapped along the hillside southwest of the bridge. This map unit consists of steep Chestnut and Ashe soils found on the ridges and mountain slopes of the Southern Appalachian Mountains. Chestnut soils are moderately deep and well drained. Permeability is moderately rapid. Ashe soils are moderately deep and somewhat excessively well drained. Permeability is moderately rapid. A significant amount of gravel and cobbles are present throughout these soils; occasional stones are scattered over the surface. Neither Ashe nor Chestnut soils are listed on the hydric soils list.

2.2 WATER RESOURCES

The proposed project falls within the New River Basin, with a subbasin designation of 05-07-01. Waters within the project study area include the Middle Fork South Fork New River.

2.2.1 Water Resource Characteristics

The Middle Fork South Fork New River flows north through the proposed project study area with a width of approximately 37 feet (11.3 meters). The flow was moderate on the day of the field investigation. The substrate consisted of cobbles, gravel, and sand. The water was clear on the day of the site visit. The depth of the water ranged from a few inches in the riffles to over two feet (0.6 meters) in the pools.

Streams have been assigned a best usage classification by the North Carolina Division of Water Quality (DWQ) [formerly the Division of Environmental Management (DEM)] which reflects water quality conditions and potential resource usage. Within the project study area, the classification for the Middle Fork South Fork New River (Index No. 10-1-2-(6), 2/01/93) is "WS-IV Tr +". A classification of "WS-IV" indicates waters used as sources of water supply for drinking, culinary, or food processing purposes. WS-IV waters are generally in moderately to highly developed watersheds. The "Tr" denotes trout waters, which is a supplemental classification to protect freshwaters for natural trout propagation and survival of stocked trout. The "+" symbol identifies waters subject to a special management strategy in order to protect downstream waters that are designated Outstanding Resource Waters (ORW).

No waters classified as High Quality Waters (HQW), Water Supplies (WS-I: undeveloped watershed, or WS-II: predominately undeveloped watersheds), or ORW occur within one mile (1.6 kilometers) of the project study area.

Point sources, such as wastewater discharges, located throughout North Carolina are permitted through the National Pollutant Discharge Elimination System (NPDES) program. One NPDES permittee is located within one mile (1.6 kilometers) of the project study area. Advanced Realty Property Management/Summit Woods (NC0039608) is located approximately 0.5 miles (0.8 kilometers) upstream of the project study area. The facility is permitted to discharge industrial processing and commercial wastewater.

Non-point source refers to runoff that enters surface waters through stormwater flow or no defined point of discharge. Stormwater runoff from SR 1541 and the surrounding residential properties may reach Middle Fork South Fork New River and cause water quality degradation through the addition of oil or gas residuals, particulate rubber, fertilizers, or other sources of contamination.

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. Samples are evaluated on the number of taxa present of intolerant groups [Ephemeroptera, Plecoptera, Trichoptera (EPT)] and a taxa richness value (EPT S) is calculated. A biotic index value is also calculated for the sample that summarizes tolerance data for all species in each collection. The two rankings are given equal weight in final site classification. The biotic index and taxa richness values primarily reflect the effects of chemical pollution and are a poor measure of the effects of such physical pollutants as sediment. Stream and river reaches are assigned a final bioclassification of either Excellent, Good, Good/Fair, Fair, or Poor.

According to the information obtained from the New River Basinwide Water Quality Management Plan (NCDENR, 2000), the DWQ does not have a sampling station on the Middle Fork South Fork New River at the project study area. The closest station is located approximately 900 feet (274 meters) upstream of the project site. This station was last sampled in November 1989 and received a rating of Good.

2.2.2 Anticipated Impacts to Water Resources

Impacts to water resources in the project study area are likely to result from activities associated with project construction, such as clearing and grubbing on streambanks, riparian canopy removal, instream construction, fertilizers and pesticides used in revegetation, and pavement construction. The following impacts to surface water resources are likely to result from the above mentioned construction activities:

- Increased sedimentation and siltation downstream of the crossing and increased erosion in the project study area;
- Changes in light incidence and water clarity due to increased sedimentation and vegetation removal;
- Alteration of water levels and flows due to interruptions and/or additions to surface and ground water flow from construction;
- Changes in and destabilization of water temperature due to vegetation removal;
- Changes in dissolved oxygen (DO) levels;

- Increased nutrient loading during construction via runoff from exposed areas;
- Increased concentrations of toxic compounds in roadway runoff;
- Increased potential for release of toxic compounds such as fuel and oil from construction equipment and other vehicles; and
- Alteration of stream discharge due to silt loading and changes in surface and groundwater drainage patterns.

In order to minimize potential impacts to water resources in the project study area, NCDOT's Best Management Practices (BMPs) for the Protection of Surface Waters should be strictly enforced during the construction phase of the project. Impacts can be further reduced by limiting instream activities and revegetating stream banks immediately following the completion of grading.

3.0 BIOTIC RESOURCES

Living systems described in the following sections include communities of associated plants and animals. These descriptions refer to the dominant flora and fauna in each community and the relationship of these biotic components. 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 current characteristics. Scientific nomenclature and common names (when applicable) are used for the plant and animal species described. Subsequent references to the same species include the common name only.

3.1 TERRESTRIAL COMMUNITIES

The predominant terrestrial communities found in the project study area are maintained/disturbed and rich cove forest. Dominant faunal components associated with these terrestrial areas are discussed in each community description. Many species are adapted to the entire range of habitats found within the project study area but may not be mentioned separately in each community description.

3.1.1 Maintained/Disturbed Community

The maintained/disturbed community comprises the majority of the project study area and includes the road shoulders and residential properties within the project study area. 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.), white clover (*Trifolium repens*), red clover (*Trifolium pratense*), goldenrod (*Solidago* sp.), aster (*Aster* sp.), wild onion (*Allium cernuum*), dandelion (*Taraxacum officinale*), and plantain (*Plantago* sp.).

The animal species present in these disturbed habitats are opportunistic and capable of surviving on a variety of resources, ranging from vegetation (flowers, leaves, fruits, and seeds) to both living and dead faunal components. A Mourning Dove (*Zenaida macroura*), Carolina Chickadee (*Poecile carolinensis*), and Cedar Waxwing (*Bombycilla cedrorum*) were observed during the site visit. Other species such as the Eastern chipmunk (*Tamias striatus*), Eastern mole (*Scalopus aquaticus*), House Sparrow (*Passer domesticus*), Eastern Bluebird (*Sialia sialis*), American Robin (*Turdus migratorius*),

American Crow (*Corvus brachyrhynchos*), Northern Mockingbird (*Mimus polyglottos*), and garter snake (*Thamnophis sirtalis*) are often attracted to these disturbed habitats.

3.1.2 Rich Cove Forest Community

This community is found along the hillside southwest of the bridge. The canopy layer includes northern red oak (*Quercus rubra*), cucumber tree (*Magnolia acuminata*), yellow buckeye (*Aesculus octandra*), yellow birch (*Betula lutea*), black locust (*Robinia pseudoacacia*), and Eastern hemlock (*Tsuga canadensis*). The understory consists of dogwood (*Cornus florida*), striped maple (*Acer pensylvanicum*), mountain laurel (*Kalmia latifolia*), mountain pepperbush (*Clethra acuminata*), and rhododendron (*Rhododendron* sp.). The herbaceous layer includes violets (*Viola* sp.), Christmas fern (*Polystichum acrostichoides*), cut-leaved coneflower (*Rudbeckia laciniata*), spikenard (*Aralia racemosa*), common greenbrier (*Smilax rotundifolia*), and poison ivy (*Toxicodendron radicans*).

Species which may reside or forage in these areas include Tufted Titmouse (*Baeolophus bicolor*), Carolina Wren (*Thryothorus ludovicianus*), Ovenbird (*Seiurus aurocapillus*), White-breasted Nuthatch (*Sitta carolinensis*), American toad (*Bufo americanus*), Eastern box turtle (*Terrapene carolina carolina*), northern short-tailed shrew (*Blarina brevicauda*), grey squirrel (*Sciurus carolinensis*), and white-tailed deer (*Odocoileus virginianus*).

3.2 AQUATIC COMMUNITIES

The aquatic community in the project study area includes the Middle Fork South Fork New River. Vegetation along the stream banks consists of maintained grasses as well as pale jewelweed (*Impatiens pallida*) and spotted jewelweed (*Impatiens capensis*). Scattered trees along the banks include black willow (*Salix nigra*), Eastern hemlock, and tulip poplar (*Liriodendron tulipifera*). Mallards (*Anas platyrhynchos*) were observed along the stream on the day of the site visit. Stoneflies (Plecoptera), mayflies (Ephemeroptera), caddisflies (Trichoptera), water pennies (Coleoptera), and black flies (Diptera), were found under stones and woody debris in the creek.

According to Mr. Kevin Hining, District 7 Assistant Fisheries Biologist for the North Carolina Wildlife Resource Commission (NCWRC), wild brown trout (*Salmo trutta*) and rainbow trout (*Oncorhynchus mykiss*) are found in the Middle Fork South Fork New River.

3.3 SUMMARY OF ANTICIPATED IMPACTS TO BIOTIC COMMUNITIES

Biotic community impacts resulting from project construction are addressed separately as terrestrial impacts and aquatic impacts. Impacts to terrestrial communities, particularly in locations exhibiting slopes, can result in the aquatic community receiving heavy sediment loads as a consequence of erosion. Construction impacts may not be restricted to the communities in which the construction activity occurs.

3.3.1 Terrestrial Communities

The rich cove forest and the maintained/disturbed communities serve as nesting, foraging, and shelter habitat for fauna. Removal of plants and other construction related activities would result in the displacement and mortality of faunal species in residence. Individual mortalities are likely to occur to terrestrial animals from construction machinery used during clearing activities.

Project construction will result in clearing and degradation of portions of these communities. Often, project construction does not require the use of the entire right-of-way; therefore, actual impacts may be considerably less.

3.3.2 Aquatic Communities

Impacts to the aquatic community of the Middle Fork South Fork New River will result from the replacement of Bridge No. 16. Impacts are likely to result from the physical disturbance of aquatic habitat. Activities such as the removal of trees, as well as the construction of the bridge and approach work will likely result in an increase in sediment loads and water temperatures and a decrease in dissolved oxygen. Construction activities can also increase the possibility of toxins, such as engine fluids and particulate rubber, entering the waterways. The combination of these factors can potentially cause the displacement and mortality of fish and local populations of invertebrates which inhabit these areas.

Impacts to aquatic communities can be minimized by strict adherence to BMPs.

4.0 SPECIAL TOPICS

4.1 WATERS OF THE UNITED STATES: JURISDICTIONAL ISSUES

Wetlands and surface waters fall under the broad category of "Waters of the United States" as defined in 33 CFR 328.3 and in accordance with provisions of Section 404 of the Clean Water Act (33 U.S.C. 1344). Waters of the United States are regulated by the United States Army Corps of Engineers (USACE).

Investigation into wetland occurrence in the project impact area was conducted using methods outlined in the 1987 Corps of Engineers Wetlands Delineation Manual (Environmental Laboratory, 1987). No jurisdictional wetlands were found within the project study area.

Project construction cannot be accomplished without infringing on jurisdictional surface waters. Anticipated surface water impacts fall under the jurisdiction of the USACE.

4.2 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".

A Nationwide Permit 23 is likely to be applicable for all impacts to Waters of the United States resulting from the proposed project. This permit authorizes activities undertaken, assisted, authorized, regulated, funded or financed, in whole or part, by another federal agency or department where that agency or department has determined, pursuant to the Council on Environmental Quality (CEQ) Regulation for the Implementing the Procedural Provisions of the National Environmental Policy Act:

(1) that the activity, work, or discharge is categorically excluded from environmental documentation because it is included within a category of actions which neither individually nor cumulatively have a significant effect on the environment, and

(2) the office of the Chief of Engineers has been furnished notice of the agency's or department's application for the categorical exclusion and concurs with that determination.

A Nationwide Permit 33 will be required if an on-site temporary detour is needed during construction of Bridge No. 16. This permit authorizes temporary structures, work and discharges, including cofferdams, necessary for construction activities or access fills or dewatering of construction sites; provided the associated primary activity is authorized by the USACE or the U.S. Coast Guard, or for other construction activities not subject to the USACE or U.S. Coast Guard regulations.

A 401 Water Quality Certification, administered through the DWQ, will also be required. This certification is issued for any activity which may result in a discharge into waters for which a federal permit is required.

4.2.1 Bridge Demolition

The removal of the substructure may create some disturbance in the streambed. Conditions in the stream will not raise sediment concerns since the substrate contains cobbles, gravel, and sand; therefore, a turbidity curtain is not recommended.

According to comments received from Mr. Kevin Hining, District 7 Assistant Fisheries Biologist for the NCWRC, Middle Fork South Fork New River is Designated Public Mountain Trout Water and classified as Hatchery Supported by the NCWRC. As stated previously in Section 3.2, wild brown trout and rainbow trout are found in this stream; therefore, instream construction is prohibited from November 1 to April 15 to avoid impacts on trout reproduction.

4.2.2 Mitigation

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

Avoidance - Avoidance examines all appropriate and practicable possibilities of averting impacts to waters of the United States. According to a 1990 Memorandum of Agreement (MOA) between the

Environmental Protection Agency (EPA) 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.

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

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. Such actions should be undertaken in areas adjacent to or contiguous with the discharge site.

Compensatory mitigation is required for those projects authorized under Section 404 Nationwide Permits that result in the fill or alteration of more than 0.5 acre (0.2 hectares) of wetlands and/or 300 linear feet (91.4 meters) of streams.

4.3 RARE AND PROTECTED SPECIES

Some populations of plants and animals have been or are in the process of decline due to factors such as natural forces, competition from introduced species, or human related impacts such as destruction of habitat. Rare and protected species listed for Watauga County and any likely impacts to these species as a result of the proposed project construction are discussed in the following sections.

4.3.1 Federally Protected Species

Plants and animals with federal classification of Endangered (E), Threatened (T), Proposed Endangered (PE), and Proposed Threatened (PT) are protected under provisions of Section 7 and Section 9 of the Endangered Species Act of 1973, as amended.

The United States Fish and Wildlife Service (USFWS) lists six federally protected species for Watauga County as of the March 22, 2001 listing (Table 4.3.1).

A review of the NCNHP database of rare species and unique habitats shows no recorded occurrences of any federally protected species in the project vicinity.

TABLE 4.3.1

FEDERALLY-PROTECTED SPECIES FOR WATAUGA COUNTY

Scientific Name (Common Name)	Status
Clemmys muhlenbergii (Bog turtle)	T(S/A)
Glaucomys sabrinus coloratus (Carolina northern flying squirrel)	E
Microhexura montivaga (Spruce-fir moss spider)	E
Geum radiatum (Spreading avens)	E
Houstonia montana (Roan mountain bluet)	E
Liatris helleri (Heller's blazing star)	T

NOTES:

E Endangered (a species that is in danger of extinction throughout all or a significant portion of its range).

T Threatened (a species that is likely to become endangered within the foreseeable future throughout all or a significant portion of its range).

T(S/A) Threatened Due to Similarity of Appearance (a species that is threatened due to similarity of appearance with other rare species and is listed for its protection).

Clemmys muhlenbergii	(Bog turtle)	T(S/A)
Family:	Emydidae	
Date Listed:	November 4, 1997	

Bog turtles are small [3 to 4.5 inches (7.6 to 11.4 centimeters)] semiaquatic turtles that have a dark brown carapace and black plastrons. They usually exhibit distinctive orange or yellow blotches on each side of the head and neck.

The bog turtle inhabits shallow, spring fed fens, sphagnum bogs, swamps, marshy meadows, pastures which have soft, muddy bottoms, and clear, cool, slow-flowing water, often forming a network of rivulets. Bog turtles inhabit damp grassy fields, bogs, and marshes in the mountains and upper Piedmont.

The bog turtle is not biologically endangered or threatened and is not subject to Section 7 consultation.

Glaucomys sabrinus coloratus	(Carolina northern flying squirrel)	E
Family:	Sciuridae	
Date Listed:	July 1, 1985	

Carolina northern flying squirrels are small nocturnal mammals that are three to five ounces (85 to 142 grams) in weight and 10 to 12 inches (25 to 31 centimeters) in length. They possess a long, broad, flattened tail, prominent eyes, and dense fur. The northern flying squirrels closely resemble southern flying squirrels but are larger and have richer colors. Adults are gray with a brownish, tan, or reddish wash on the back, and grayish white or buffy white undersides. The northern flying squirrel can apparently subsist on lichens and certain fungi, but also eats certain seeds, buds, fruit, staminate cones, insects, and other animal material.

They typically live at elevations above 5,000 feet (1,524 meters) in spruce-fir forests and forests of mixed conifers and hardwoods. They use both areas to search for food, while the hardwood areas are needed for nesting sites. Research suggests that the more aggressive southern flying squirrel has begun to force the northern species out of the hardwood forests, which reduces favorable

nesting sites and, therefore, reproduction by the northern flying squirrel.

Habitat is not present in the project study area; the project study area is located at approximately 3,200 feet (975 meters) above msl, which is well below the elevation for suitable habitat. A search of the NCNHP database showed no recorded occurrences of this species within the project vicinity. It can be concluded that the construction of the proposed project will not impact the Carolina northern flying squirrel.

BIOLOGICAL CONCLUSION: NO EFFECT

Microhexura montivaga	(Spruce-fir moss spider)	E
Family:	Dipluridae	
Date Listed:	February 6, 1995	

The **spruce-fir moss spider** is a small [0.10 to 0.15 inches (0.25 to 0.38 centimeters)] spider which ranges in color from light brown to yellow-brown to a darker reddish brown. It has no markings on its abdomen. It is identified by its chelicerae which project forward beyond the anterior edge of the carapace. It also has very long spinnerets and a second pair of book lungs.

The spruce-fir moss spider inhabits only mature Fraser fir and red spruce forest communities of the highest elevations [greater than 5,000 feet (1,524 meters)]. The typical habitat is well drained, damp moss mats growing on rocks and boulders. It prefers well-shaded places in these forests where it constructs tube shaped webs in the interface between the moss mat and rock surface.

No habitat is present for the spruce-fir moss spider within the project study area. The project study area is located at approximately 3,200 feet (975 meters) above msl, which is well below the elevation for suitable habitat. A search of the NCNHP showed no recorded occurrences of this species within the project vicinity. It can be concluded that the construction of the proposed project will not impact the spruce-fir moss spider.

BIOLOGICAL CONCLUSION: NO EFFECT

Geum radiatum	(Spreading avens)	E
Family:	Rosaceae	
Date Listed:	April 5, 1990	

Spreading avens is a perennial herb topped with an indefinite cyme of large, bright, yellow flowers. Its leaves are mostly basal with large terminal lobes and small laterals, and they arise from horizontal rhizomes. Plant stems grow eight to 20 inches (20 to 51 centimeters) tall. Flowering occurs from June to September, and the fruits are produced from August to October.

Spreading avens inhabits high elevation cliffs, outcrops, and steep slopes which are exposed to full sun. It is also found in thin, gravelly soils or grassy balds near summit outcrops. The adjacent spruce/fir forests [generally found above 5,500 feet (1,676 meters) in elevation] are dominated by red spruce and Fraser fir. The substrate at all the population sites is composed of various igneous, metamorphic, and sedimentary rocks.

No habitat is located in the project study area for this species; the project study area is approximately 3,200 feet (975 meters) above msl, which is well below the elevation for suitable habitat. A search of the NCNHP database showed no recorded occurrences of this species within the project vicinity. It can be concluded that the construction of the proposed project will not impact spreading avens.

BIOLOGICAL CONCLUSION: NO EFFECT

Houstonia montana	(Roan mountain bluet)	E
Family:	Rubiaceae	
Date Listed:	April 5, 1990	

Roan mountain bluet is a perennial herb with erect or ascending, unbranched or weakly terminally branched stems up to 8.5 inches (21 centimeters) tall. Its inflorescence is a few-flowered cyme with bright, deep purple flowers. Flowering occurs from late May through August, with peak flowering usually in June and July. This variety is distinguished from other bluets by its relatively large reddish purple flowers, compact stature and clump-forming growth habit, and its exposed mountaintop habitat.

Roan mountain bluet inhabits high elevation [4,200 to 6,300 feet (1,280 to 1,920 meters)] cliffs, outcrops, and steep slopes which are exposed to full sunlight.

No habitat is located in the project study area for Roan mountain bluet; the project study area is located at approximately 3,200 feet (975 meters) above msl, which is well below the elevation for suitable habitat. A search of the NCNHP database showed no recorded occurrences of this species within the project vicinity. It can be concluded that the construction of the proposed project will not impact Roan mountain bluet.

BIOLOGICAL CONCLUSION: NO EFFECT

Liatris helleri	(Heller's blazing star)	T
Family:	Asteraceae	
Date Listed:	November 19, 1987	

Heller's blazing star is a perennial herb with one or more erect or arching stems which arise from a tuft of narrow pale green basal leaves. Its stems reach up to 16 inches (41 centimeters) in height and are topped by a showy spike of lavender flowers [three to eight inches (eight to 20 centimeters) long], which are present from July through September. Fruits are present from September through October.

Heller's blazing star is endemic to the northern Blue Ridge Mountains where it occurs on high elevation rocky summits. It grows in shallow, acidic soils which are exposed to full sunlight.

No habitat is located in the project study area for Heller's blazing star; the project study area is located at approximately 2,640 feet (805 meters) above msl, is well below the summit, and contains no rocky outcrops. A search of the NCNHP database showed no recorded occurrences of this species within the project vicinity. It can be concluded that the construction of the proposed project will not impact Heller's blazing star.

BIOLOGICAL CONCLUSION: NO EFFECT

4.3.2 Federal Species of Concern

Federal Species of Concern (FSC) are not legally protected under the Endangered Species Act and are not subject to any of its provisions, including Section 7, until they are formally proposed or listed as Threatened of Endangered. FSC are defined as species that are under consideration for listing for which there is insufficient information to support listing.

Some of these species are listed as Endangered, Threatened, or Special Concern by the NCNHP list of Rare Plant and Animal Species and are afforded state protection under the State Endangered Species Act and the North Carolina Plant Protection and Conservation Act of 1979. Table 4.3.2 includes listed FSC species for Watauga County and their state classifications (January 2001).

A review of the NCNHP database of rare species and unique habitats showed one recorded occurrence of an FSC species in the project vicinity. The Kanawha minnow (*Phenacobius teretulus*) was found in an unnamed tributary to the Watauga River approximately 0.5 miles (0.8 kilometers) downstream of the project study area.

TABLE 4.3.2

FEDERAL SPECIES OF CONCERN FOR WATAUGA COUNTY

Scientific Name (Common Name)	North Carolina Status	Habitat Present
*Neotoma magister** (Alleghany woodrat)	SC	Yes
*Sylvilagus obscurus** (Appalachian cottontail)	SR	Yes
Dendroica cerulea (Cerulean Warbler)	SR	Yes
Cryptobranchus alleganiensis (Hellbender)	SC	Yes
Phenacobius teretulus (Kanawha minnow)	SC	Yes
Poecile atricapillus practicus (Southern Appalachian Black-capped Chickadee)	SC	No
Loxia curvirostra (Southern Appalachian Red Crossbill)	SR (PSC)	No
Aegolius acadicus (Southern Appalachian Saw-whet Owl)	SC (PT)	No
Sphyrapicus varius appalachiensis (Southern Appalachian Yellow-bellied Sapsucker)	SR (PSC)	No
*Sorex palustris punctulatus** (Southern water shrew)	SC	Yes
Speyeria diana (Diana fritillary butterfly)	SR	Yes
Lasmigona subviridus (Green floater)	E	Yes
Geum geniculatum (Bent avens)	T	Yes
*Poa paludigena** (Bog bluegrass)	E	No
Juglans cinerea (Butternut)	W5	Yes

Scientific Name (Common Name)	North Carolina Status	Habitat Present
Abies fraseri (Fraser fir)	C	No
*Euphorbia purpurea*** (Glade spurge)	C	Yes
Lilium grayi (Gray's lily)	T-SC	Yes
Cardamine clematitis (Mountain bittercress)	C	Yes
Delphinium exaltatum (Tall larkspur)	E-SC	Yes

NOTES:

- C Candidate (species for which population monitoring and conservation action is recommended).
- E Endangered (species which are afforded protection by state laws).
- T Threatened (species which are afforded protection by state laws).
- SC Special Concern (species which are afforded protection by state laws).
- SR Significantly Rare (species for which population monitoring and conservation action is recommended).
- P Proposed (species that have been formally proposed for listing, but have not yet completed the legally mandated listing process).
- W Watch list (any other species believed to be rare and of conservation concern in the state but not warranting active monitoring at this time)
- * Historic record - the species was last observed in the county more than 50 years ago (USFWS)
- ** Obscure record – the date and/or location of observation is uncertain (USFWS)

4.3.3 Summary of Anticipated Impacts

No habitat is present in the project study area for any federally protected species. According to the NCNHP, there have been no recorded occurrences of any rare or protected species within the project study area. Therefore, no impacts to either federal or state listed species are anticipated.

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APPENDICES

APPENDIX A
Photographic Record

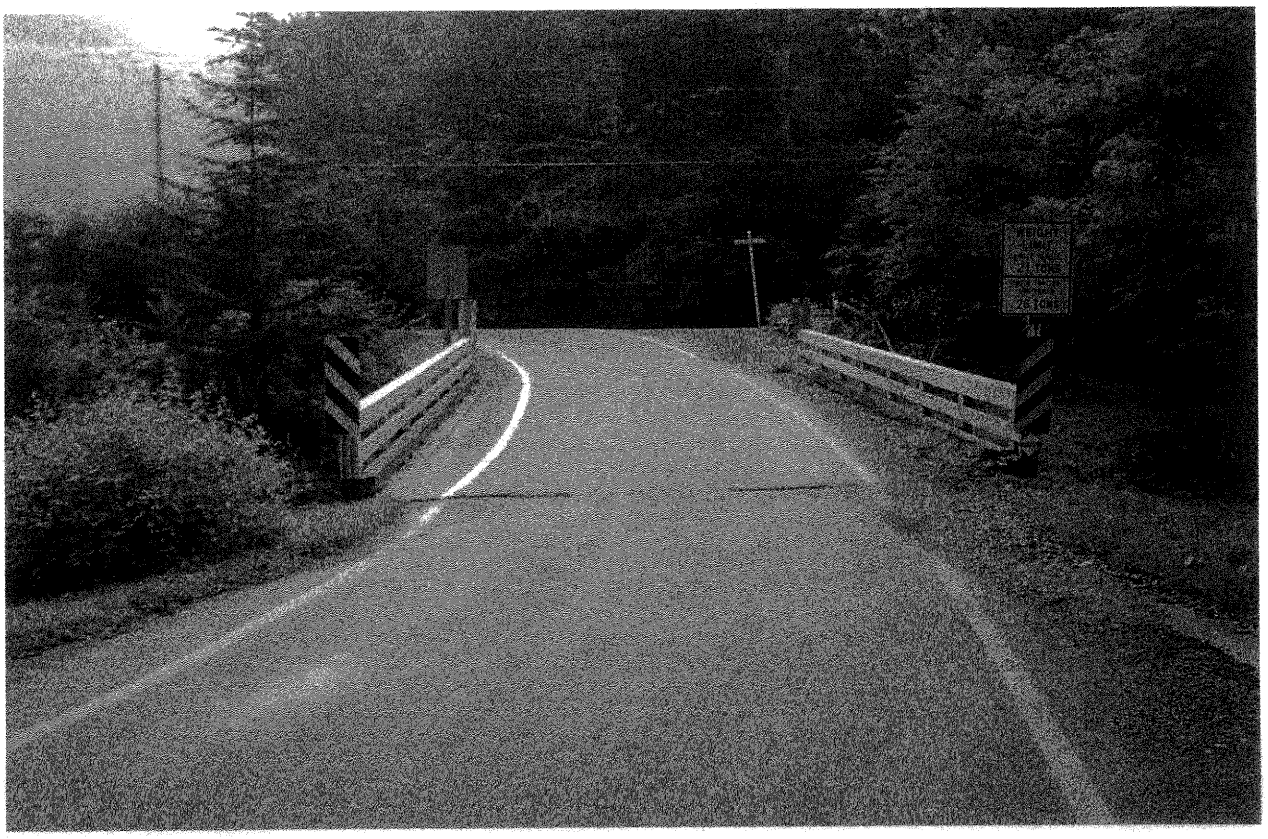


Photo #1: Bridge No. 16 facing East.

Photo #2: Bridge No. 16 facing West.

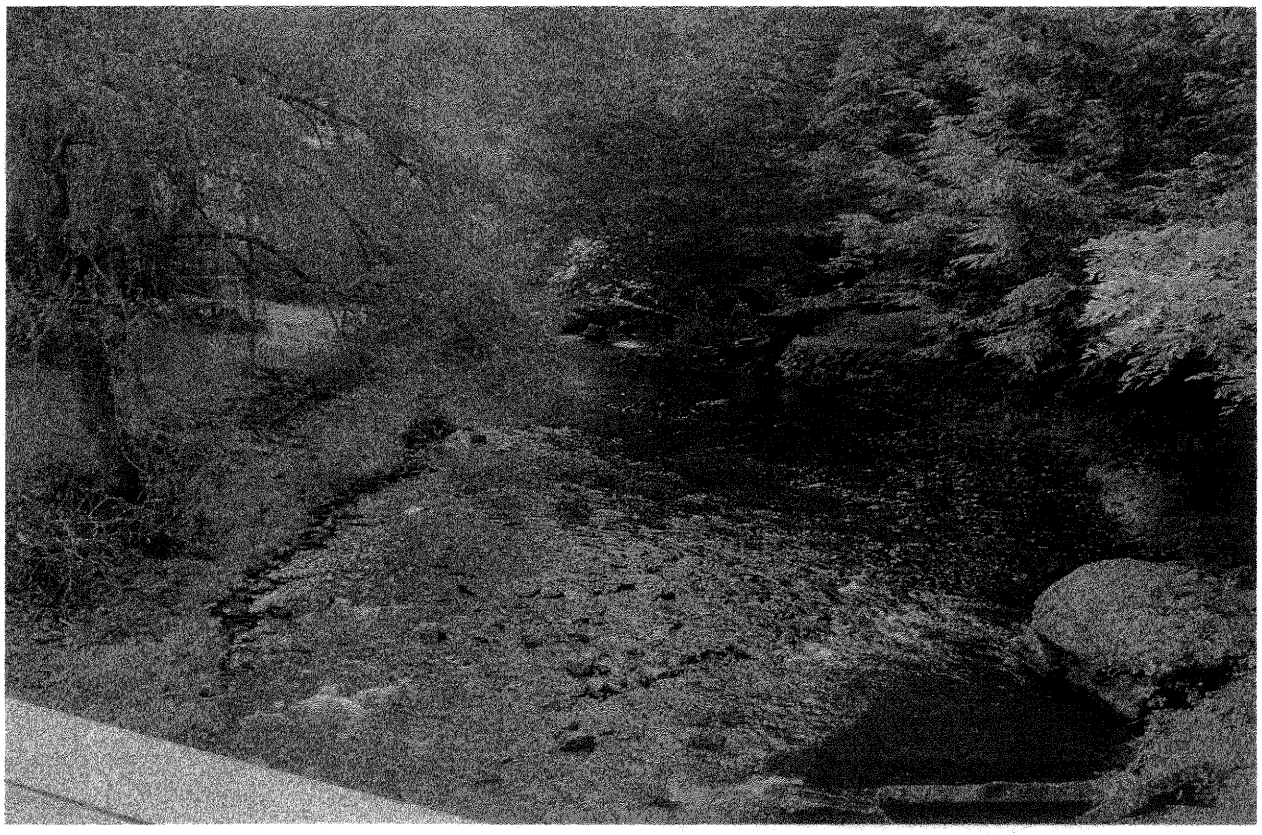
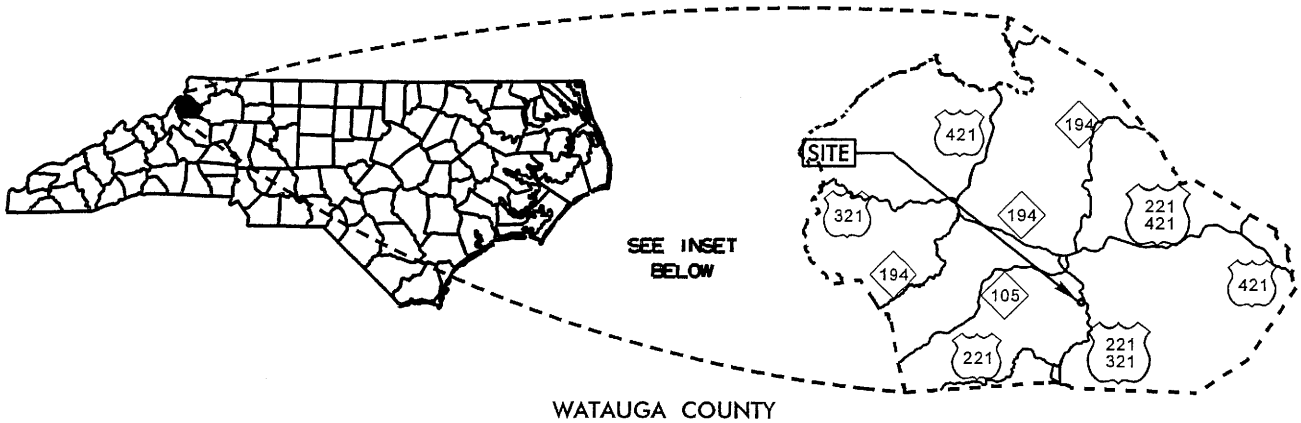
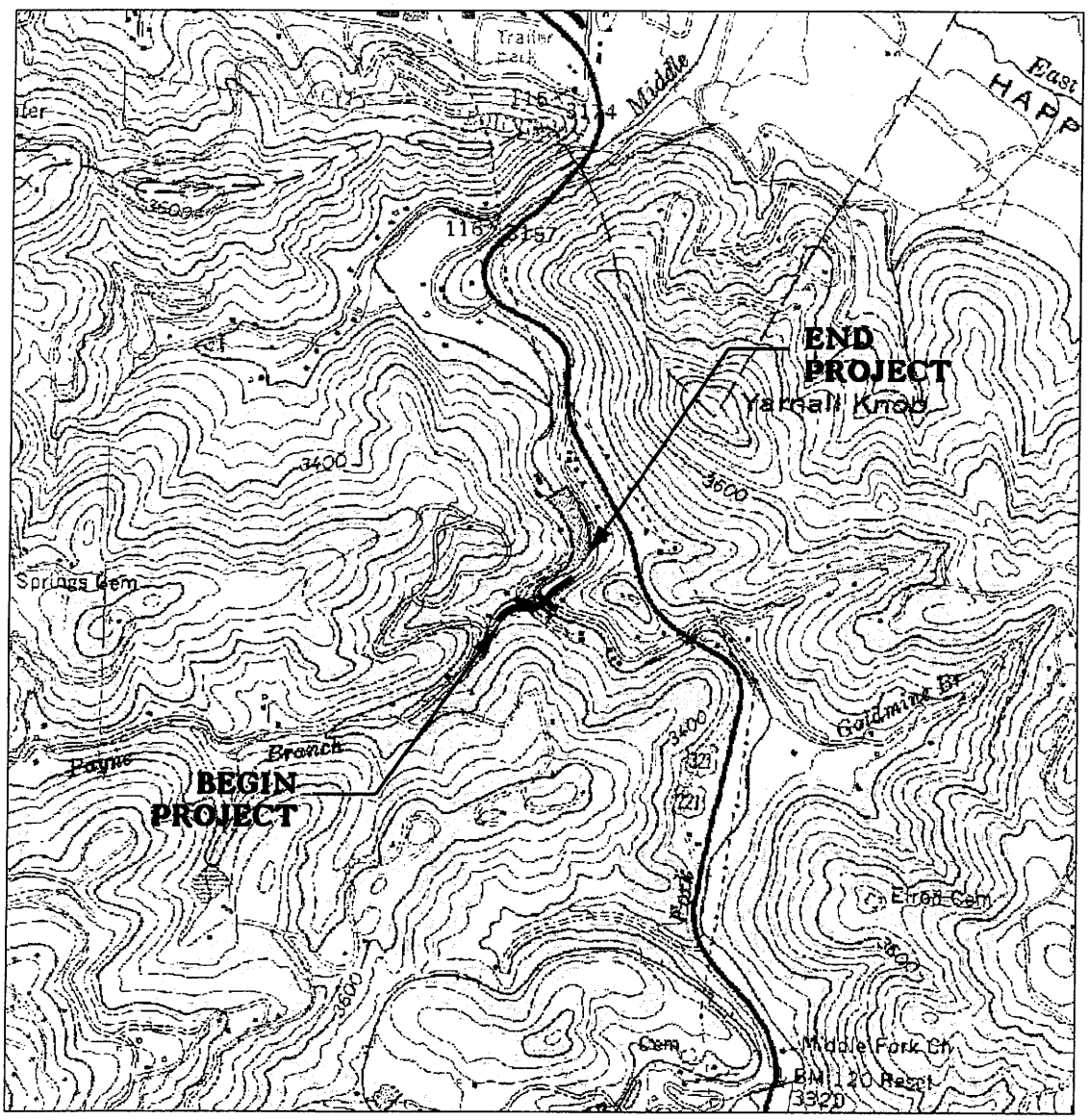


Photo #3: Middle Fork South Fork New River facing upstream.

Photo #4: Middle Fork South Fork New River facing downstream.



WATAUGA COUNTY



WETLAND IMPACTS

N.C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS

WATAUGA COUNTY
PROJECT: 33654.1.1 (B-4317)
BRIDGE NO.16 OVER
MIDDLE FORK CREEK ON
SR 1541 (PAYNE BRANCH ROAD)

SHEET 1 OF 9 **4/12/07**

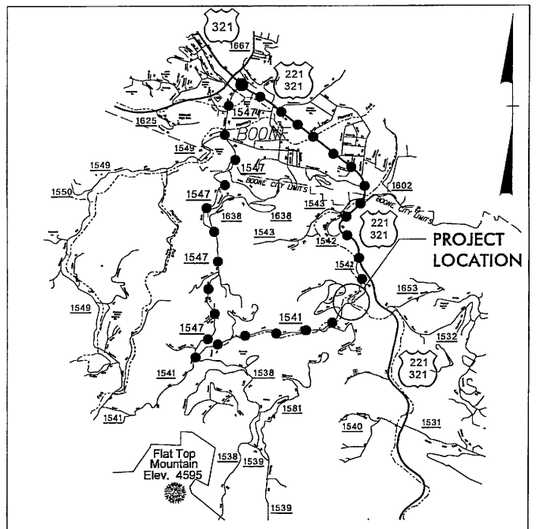
05/08/09

TIP PROJECT: B-4317

CONTRACT:

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

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



VICINITY MAP

OFFSITE DETOUR

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

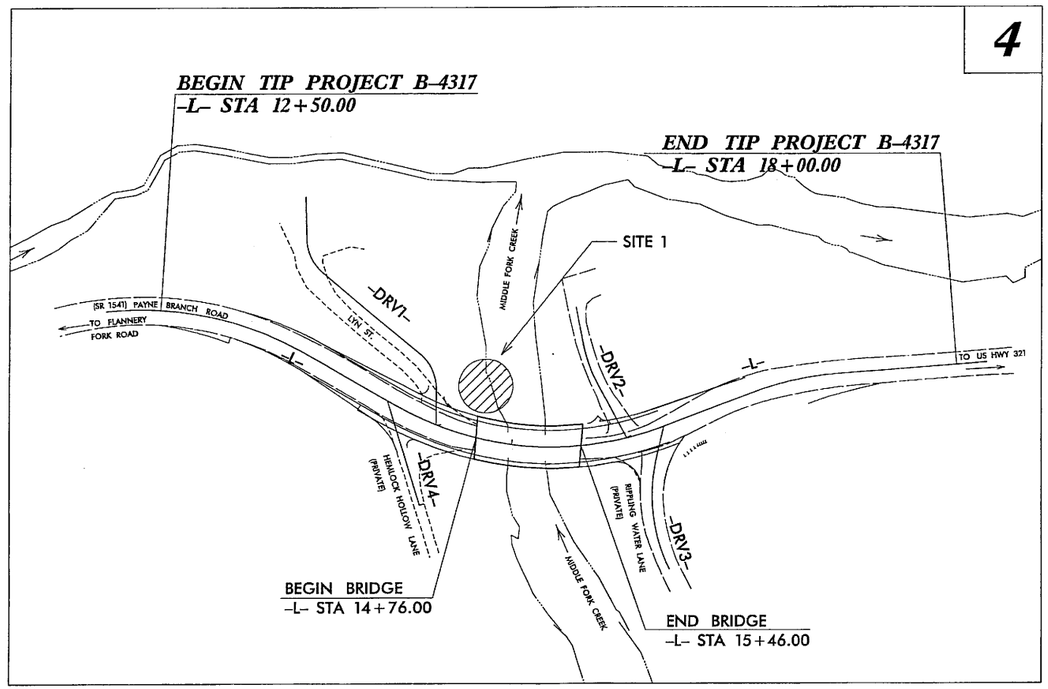
WATAUGA COUNTY

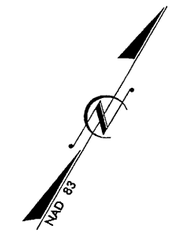
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-4317	1	

STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION
33654.1.1	BRZ-1541(3)	PE
33654.2.1	BRZ-1541(3)	ROW & UTIL

LOCATION: BRIDGE NO. 16 OVER MIDDLE FORK CREEK ON SR 1541 (PAYNE BRANCH ROAD)

TYPE OF WORK: GRADING, PAVEMENT, DRAINAGE AND STRUCTURE





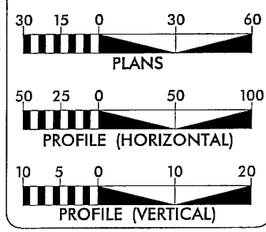
** DESIGN EXCEPTION REQUIRED FOR DESIGN SPEED (30mph), MINIMUM HORIZONTAL CURVE RADIUS (205') AND HORIZONTAL STOPPING SIGHT DISTANCE (120').

NOTE:
THIS PROJECT IS NOT WITHIN ANY MUNICIPAL BOUNDARIES.
CLEARING ON THIS PROJECT SHALL BE PERFORMED TO THE LIMITS ESTABLISHED BY METHOD III.

Permit Drawing
Sheet 2 of 9

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

GRAPHIC SCALES



DESIGN DATA

ADT 2008 = 1009
ADT 2028 = 1705
DHV = 10 %
D = 60%
T = 3% *
** V = 55 MPH
FUNC CLASS = LOCAL RURAL
* TTST 1% + DUAL 2%

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT B-4317 = 0.091 MILES

LENGTH STRUCTURE TIP PROJECT B-4317 = 0.013 MILES

TOTAL LENGTH TIP PROJECT B-4317 = 0.104 MILES

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

2006 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE: FEBRUARY 16, 2007

LETTING DATE: FEBRUARY 19, 2008

GARY LOVERING, PE
PROJECT ENGINEER

ANTHONY C. WEST
PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER

P.E.
SIGNATURE:

ROADWAY DESIGN ENGINEER

P.E.
SIGNATURE:

DIVISION OF HIGHWAYS STATE OF NORTH CAROLINA

P.E.
STATE DESIGN ENGINEER

8/17/99

REVISIONS

PROJECT REFERENCE NO.	SHEET NO.
B-4317	4
NW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

TYPE 8 SKETCH

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

30 15 0 30 60
PLAN SCALE: 1" = 30'

NAD 83

ENGLISH

PI Sta 12+55.11
Δ = 56° 31' 07.2" (RT)
D = 25° 27' 53.2"
L = 221.95'
T = 120.94'
R = 225.00'

PI Sta 15+16.57
Δ = 51° 26' 50.2" (LT)
D = 27° 56' 57.0"
L = 184.07'
T = 98.76'
R = 205.00'

PI Sta 16+92.45
Δ = 16° 22' 01.9" (RT)
D = 27° 56' 57.0"
L = 58.56'
T = 29.48'
R = 205.00'

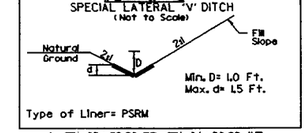
PI Sta 10+37.58
Δ = 49° 28' 14.0" (LT)
D = 190° 59' 09.4"
L = 25.90'
T = 13.82'
R = 30.00'

PI Sta 11+46.11
Δ = 47° 56' 59.1" (RT)
D = 190° 59' 09.4"
L = 25.11'
T = 13.34'
R = 30.00'

PI Sta 10+54.61
Δ = 17° 44' 06.0" (RT)
D = 57° 17' 44.8"
L = 30.95'
T = 15.60'
R = 100.00'

PI Sta 10+82.74
Δ = 41° 33' 33.3" (RT)
D = 52° 05' 13.5"
L = 79.79'
T = 41.74'
R = 110.00'

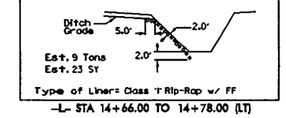
DETAIL #2
SPECIAL LATERAL "V" DITCH
(Not to Scale)



Type of Liner= PSRM

-L- STA 13+50.00 TO STA 14+20.00 (LT)

DETAIL #1
RIP RAP AT EMBANKMENT
(Not to Scale)



Type of Liner= Class 'I' Rip-Rap w/ FF

-L- STA 14+66.00 TO 14+78.00 (LT)

DENOTES FILL IN SURFACE WATER

BEN E. & SHIRLEE G. EDWARDS DB 45 PG 351

TIMOTHY L. TUMBIOLO DB 28 PG 450

SARAH BORDERS & REBECCA KIRKMAN NO REF.

MELISSA JOHNSON DB 121 PG 54

BEN & SHIRLEE G. EDWARDS DB 163 PG 402

JAMIE Z. GOERS & AMY Z. TOWNSEND DB 471 PG 3

APPALACHIAN STATE UNIVERSITY DB 50 PG 350

BARBARA H. NEWTON DB 205 PG 457

FRANCES SHROPSHIRE DB 102 PG 534

TAMMY W. STEPHENS DB 690 PG 5

CHARLES H. & CAROLYN B. MOORE DB 270 PG 555

DONNA L. MERRELL DB 352 PG 542

ARTHUR D. CAMPBELL DB 382 PG 107

SITE 1

PAYNE BRANCH

MIDDLE FORK CREEK

PAYNE BRANCH RD.(SR 1541) 19' BST

TO FLANNERY FORK RD.

TO US HWY 321

EXISTING R/W

LYN ST.(PRIVATE) DEAD END

HEMLOCK HOLLOW LN.(PRIVATE) DEAD END

RIPPLING WATERS LN.(PRIVATE)

CLASS I RIP RAP EMBANKMENT SEE DETAIL #1 EST 9 TONS EST 23 SY FF

SPECIAL LATERAL "V" DITCH W/PSRM SEE DETAIL #2 EST 45 SY

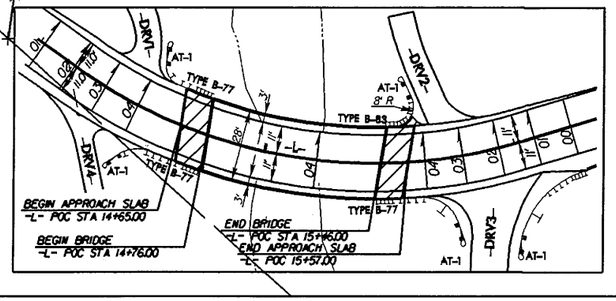
EXCAVATION W/ CLASS I RIP RAP EST 88 TONS EST 134 SY FF EST 259 CY EXCAV.

CLASS I RIP RAP EST 1 TON EST 5 SY FF

SEPTIC FIELD AS PER PROPERTY OWNER

APPROX. LOCATION SEPTIC FIELD

SKETCH OF BRIDGE IN RELATIONSHIP TO PAVEMENT

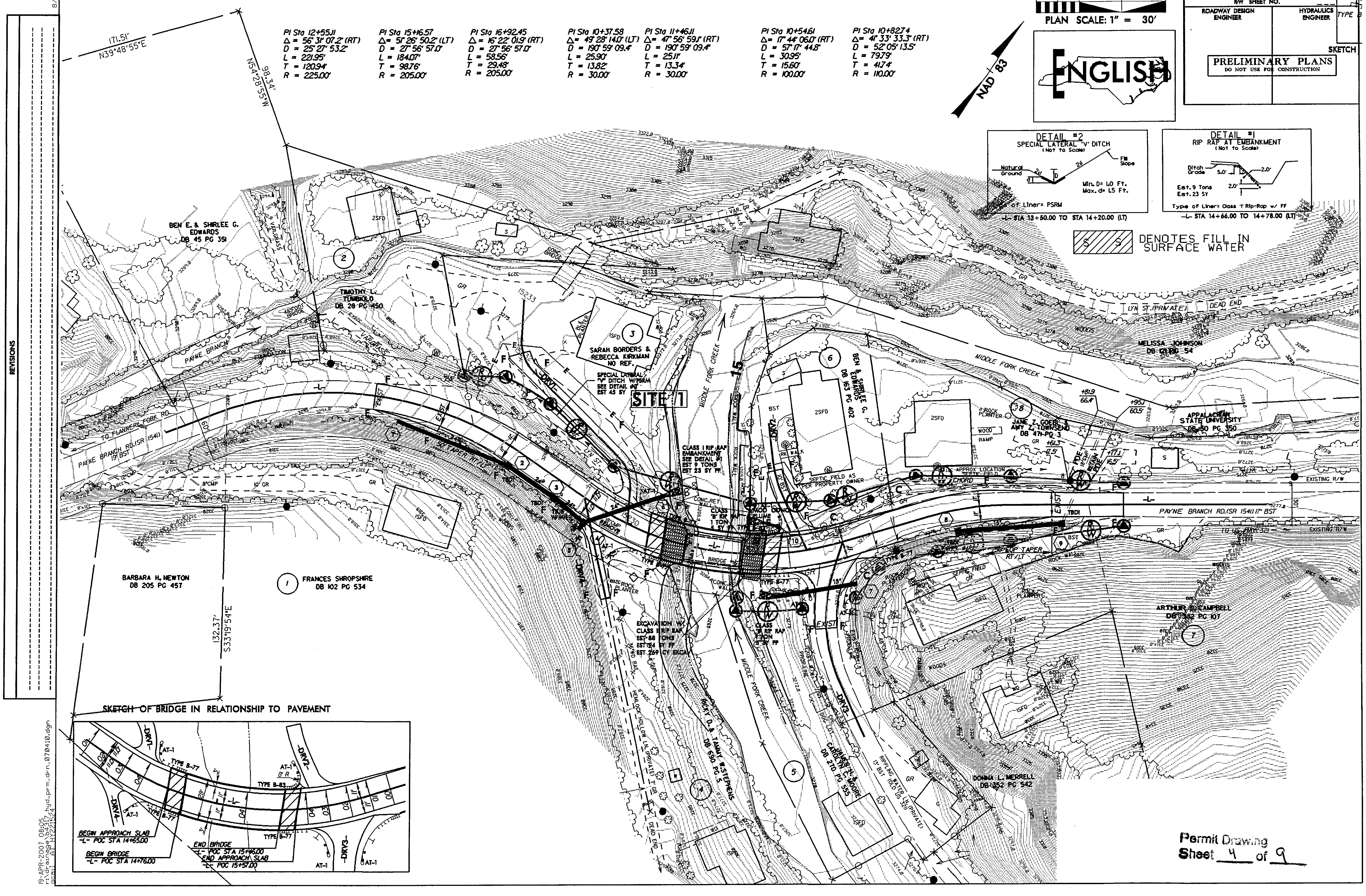


Permit Drawing
Sheet 3 of 9

19-APR-2007 08:05
r:\drainage\b4317_hyd_prm_drn_070410.dgn
geol AT H7221624

PROJECT REFERENCE NO.	SHEET NO.
B-4317	4
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



Permit Drawing
Sheet 4 of 9

5/28/99

PROJECT REFERENCE NO.	SHEET NO.
B-4317	5
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

50 25 0 50 100
PROFILE (HORIZONTAL)

10 5 0 10 20
PROFILE (VERTICAL)

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

BM #2 ELEVATION = 3281.96'
-L- STA 15+09.31 (125.48' RT)
RR SPIKE SET IN BASE OF
12" LOCUST TREE

-L-

BEGIN TIP PROJECT B-4317
-L- STA 12+50.00

END TIP PROJECT B-4317
-L- STA 18+00.00

BEGIN GRADE B-4317
-L- STA 13+00.00

END GRADE B-4317
-L- STA 17+50.00

PI = 14+75.00
EL = 3,275.36'
K = 43
VC = 350'

3,288.67

3,276.51

(-)7.605%

(+)0.4182%

EXCAVATION
W/ CLASS II RIP RAP
EST 88 TONS
EST 94 SY FF
EST 269 CU YDS

BRIDGE HYDRAULIC DATA		
DESIGN DISCHARGE	= 4150	CFS
DESIGN FREQUENCY	= 25	YRS
DESIGN HW ELEVATION	= 3277.8	FT
BASE DISCHARGE	= 6220	CFS
BASE FREQUENCY	= 100	YRS
BASE HW ELEVATION	= 3280.6	FT
OVERTOPPING DISCHARGE	= -4150	CFS
OVERTOPPING FREQUENCY	= -25	YRS
OVERTOPPING ELEVATION	= 3276.8	FT
	=	FT
DATE OF SURVEY	= 04/04/06	
W.S. ELEVATION AT DATE OF SURVEY	= 3265.6	FT

3,310 / 3,300 / 3,290 / 3,280 / 3,270 / 3,260

11+00 12+00 13+00 14+00 15+00 16+00 17+00 18+00

-DRV1-

BEGIN GRADE
-DRV1- STA 10+15.09

PI = 10+40.00
EL = 3,278.59'
V = 40.00'
K = 10

PI = 10+90.00
EL = 3,274.70'
V = 60.00'
K = 7

END GRADE
-DRV1- STA 11+48.75

3,279.59

3,275.12

(-)14.0145%

(-)7.7800%

(+)0.7149%

-DRV2-

BEGIN GRADE
-DRV2- STA 10+14.80

PI = 10+30.00
EL = 3,275.49'
V = 20.00'
K = 1

END GRADE
-DRV2- STA 10+50.00

3,275.99

3,272.35

(-)13.2895%

(-)5.2000%

(-)1.0000%

PI = 10+50.00
EL = 3,272.45'
V = 20.00'
K = 1

-DRV3-

BEGIN GRADE
-DRV3- STA 10+80.00

END GRADE
-DRV3- STA 11+28.53

3,277.13

3,276.43

(-)10.6470%

(-)12.0000%

PI = 11+00.00
EL = 3,277.00'
V = 40.00'
K = 29

-DRV4-

BEGIN GRADE
-DRV4- STA 10+00.00

PI = 10+10.00
EL = 3,280.16'
V = 20.00'
K = 2

END GRADE
-DRV4- STA 10+56.06

3,280.76

3,281.25

(+)3.1000%

(-)12.4752%

(-)16.0000%

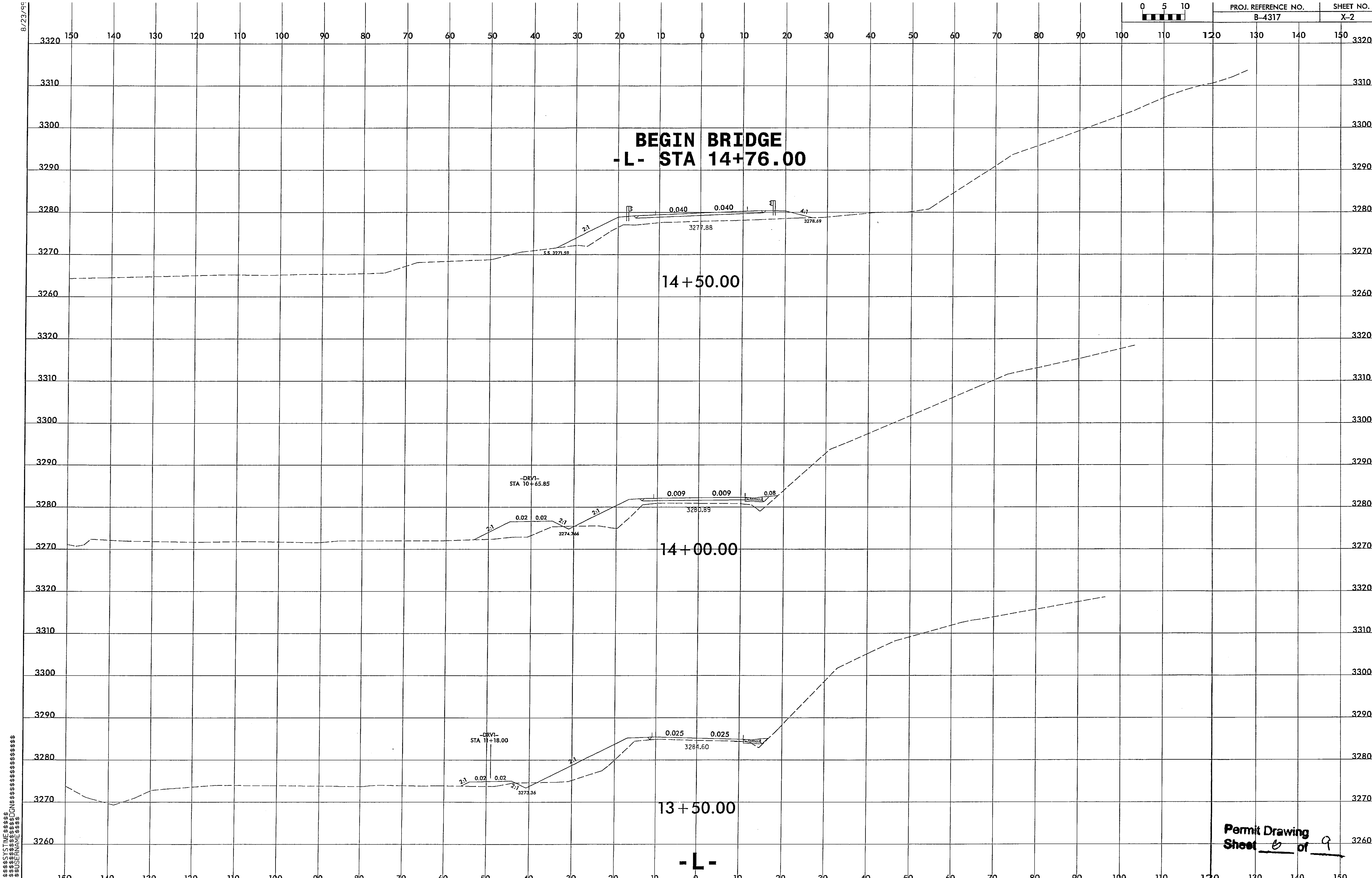
PI = 10+50.00
EL = 3,281.40'
V = 12.00'
K = 2

3,280 / 3,270 / 3,260

10+00 11+00 10+00 11+00 10+00 11+00 10+00 11+00

Permit Drawing
Sheet 5 of 9

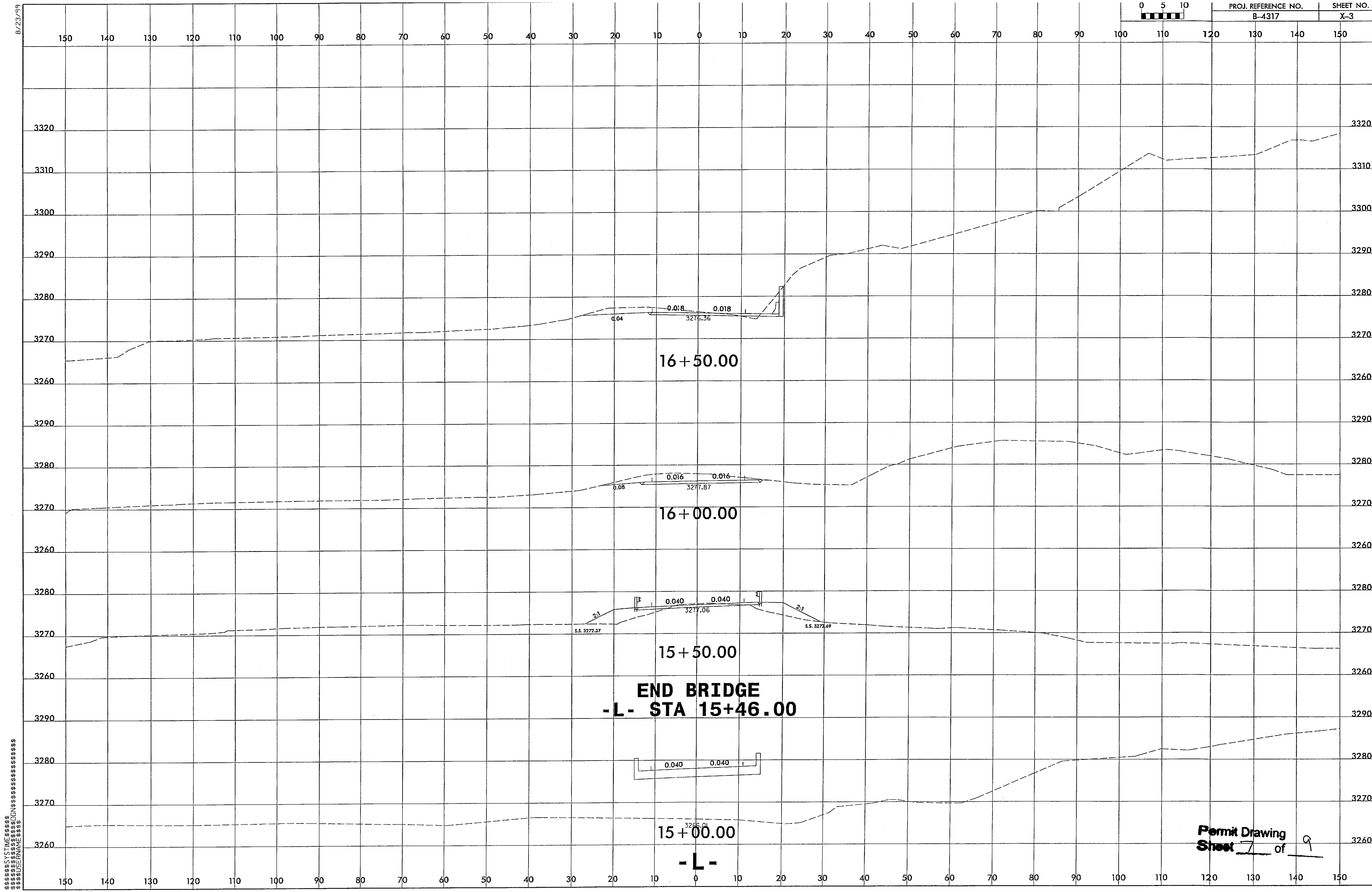
$$$$SYSTIME$$$$
$$$$DESIGN$$$$
$$$$USERNAME$$$$



PROJ. REFERENCE NO. B-4317

SHEET NO. X-2

Permit Drawing
Sheet 6 of 9


PROJ. REFERENCE NO.
B-4317
SHEET NO.
X-3
0 5 10
8/23/99
16+50.00
0.018
0.018
0.04
3276.36
16+00.00
0.016
0.016
0.08
3277.87
15+50.00
0.040
0.040
3277.06
2:1
S.S. 3272.37
S.S. 3272.69
END BRIDGE
-L- STA 15+46.00
0.040
0.040
15+00.00
3266.01
-L-
Permit Drawing
Sheet 7 of 9
$$$$$$SYSTIME$$$$$
$$$$$$DGN$$$$$$$$$$$$$$$$$$$$$$$
$$$$USERNAME$$$$

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	14+76 -L- LT	Embankment Rip Rap						0.010		15		
TOTALS:					0.00		0.00	0.010		15		

Anticipate no impacts due to proposed bridge or construction phasing.

NC DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

WATAUGA COUNTY
PROJECT: 33654.1.1 (B-4317)

SHEET 8 OF 9

ATN Revised 3/31/05

Apr-07

PROPERTY OWNERS

NAMES AND ADDRESSES

PARCEL NO.	NAMES	ADDRESSES
3	SARAH AND REBECCA BORDERS	946 SHERWOOD LANE STATESVILLE, NC 28677

NCDOT

DIVISION OF HIGHWAYS

WATAUGA COUNTY

PROJECT: 33654.1.1 (B-4317)

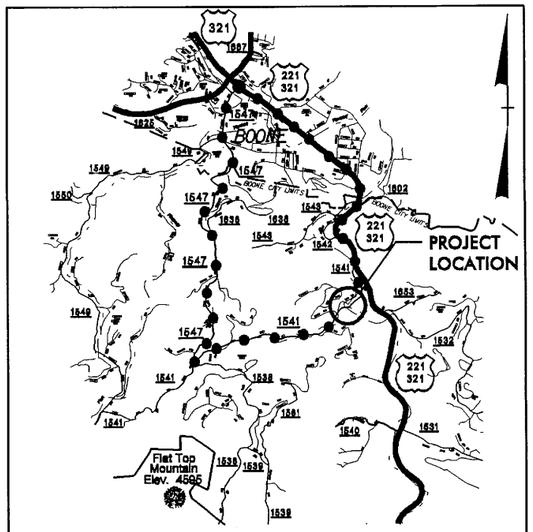
REPLACE BRIDGE #16
OVER MIDDLE FORK CRK
ON SR 1541 (PAYNE BRANCH RD)

09/08/99

TIP PROJECT: B-4317

CONTRACT:

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



VICINITY MAP

OFFSITE DETOUR

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

WATAUGA COUNTY

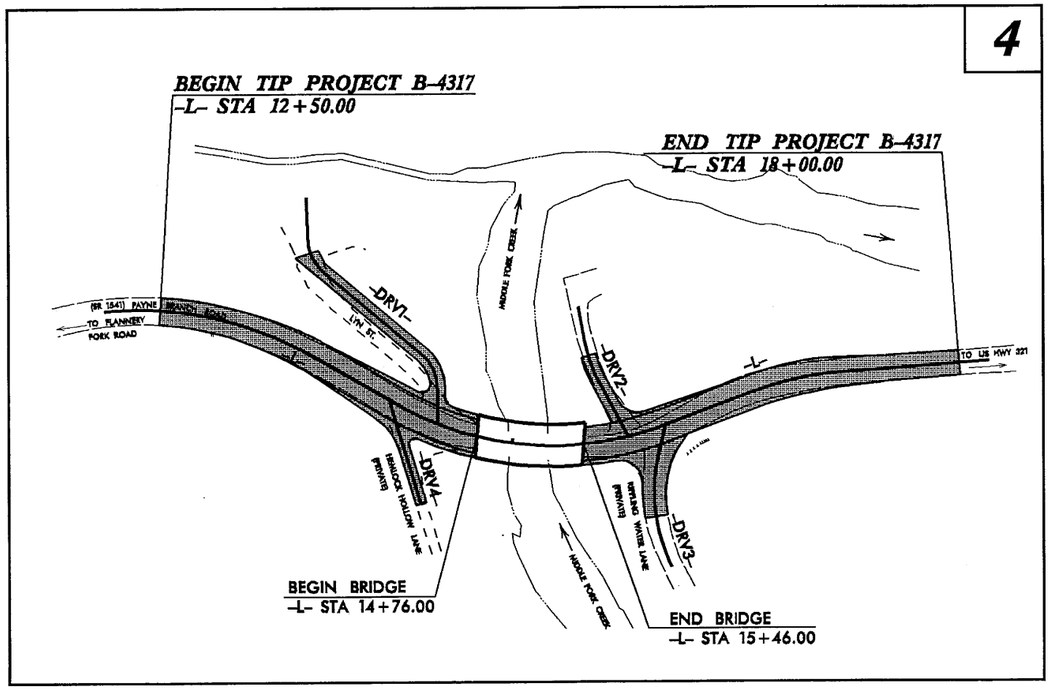
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-4317	1	

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
33654.1.1	BRZ-1541(3)	PE
33654.2.1	BRZ-1541(3)	ROW & UTIL

LOCATION: BRIDGE NO. 16 OVER MIDDLE FORK CREEK ON SR 1541 (PAYNE BRANCH ROAD)

TYPE OF WORK: GRADING, PAVEMENT, DRAINAGE AND STRUCTURE

NAD 83



** DESIGN EXCEPTION REQUIRED FOR DESIGN SPEED (30mph), MINIMUM HORIZONTAL CURVE RADIUS (205') AND HORIZONTAL STOPPING SIGHT DISTANCE (120').

NOTE:
THIS PROJECT IS NOT WITHIN ANY MUNICIPAL BOUNDARIES.
CLEARING ON THIS PROJECT SHALL BE PERFORMED TO THE LIMITS ESTABLISHED BY METHOD III.

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

GRAPHIC SCALES

30 15 0 30 60
PLANS

50 25 0 50 100
PROFILE (HORIZONTAL)

10 5 0 10 20
PROFILE (VERTICAL)

DESIGN DATA

ADT 2008 = 1009
ADT 2028 = 1705
DHV = 10 %
D = 60%
T = 3% *
** V = 55 MPH
FUNC CLASS = LOCAL RURAL
* TTST 1% + DUAL 2%

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT B-4317 = 0.091 MILES

LENGTH STRUCTURE TIP PROJECT B-4317 = 0.013 MILES

TOTAL LENGTH TIP PROJECT B-4317 = 0.104 MILES

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

2006 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
FEBRUARY 16, 2007

LETTING DATE:
FEBRUARY 19, 2008

GARY LOVERING, PE
PROJECT ENGINEER

ANTHONY C. WEST
PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER

SIGNATURE: P.E.

ROADWAY DESIGN ENGINEER

SIGNATURE: P.E.

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

P.E.
STATE DESIGN ENGINEER

18-APR-2007 15:14
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$$$$USERNAME$$$$

5/28/99

PROJECT REFERENCE NO.	SHEET NO.
B-4317	1-B

*S.U.E = SUBSURFACE UTILITY ENGINEER

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

CONVENTIONAL SYMBOLS

ROADS & RELATED ITEMS

- Edge of Pavement
- Curb
- Prop. Slope Stakes Cut (C)
- Prop. Slope Stakes Fill (F)
- Prop. Woven Wire Fence
- Prop. Chain Link Fence
- Prop. Barbed Wire Fence
- Prop. Wheelchair Ramp (WCR)
- Curb Cut for Future Wheelchair Ramp (CCFR)
- Exist. Guardrail
- Prop. Guardrail
- Equality Symbol
- Pavement Removal

RIGHT OF WAY

- Baseline Control Point
- Existing Right of Way Marker
- Exist. Right of Way Line w/Marker
- Prop. Right of Way Line with Proposed R/W Marker (Iron Pin & Cap)
- Prop. Right of Way Line with Proposed (Concrete or Granite) R/W Marker
- Exist. Control of Access Line (CA)
- Prop. Control of Access Line (CA)
- Exist. Easement Line (E)
- Prop. Temp. Construction Easement Line (E)
- Prop. Temp. Drainage Easement Line (TDE)
- Prop. Perm. Drainage Easement Line (PDE)

HYDROLOGY

- Stream or Body of Water
- River Basin Buffer (BZ)
- Flow Arrow
- Disappearing Stream
- Spring
- Swamp Marsh
- Shoreline
- Falls, Rapids
- Prop Lateral, Tail, Head Ditches (FLOW)

STRUCTURES

MAJOR

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

MINOR

- Head & End Wall (CONC HW)
- Pipe Culvert
- Footbridge
- Drainage Boxes (CB)
- Paved Ditch Gutter

UTILITIES

- Exist. Pole
- Exist. Power Pole
- Prop. Power Pole
- Exist. Telephone Pole
- Prop. Telephone Pole
- Exist. Joint Use Pole
- Prop. Joint Use Pole
- Telephone Pedestal (T)
- U/G Telephone Cable Hand Hold (PH)
- Cable TV Pedestal (C)
- U/G TV Cable Hand Hold (PH)
- U/G Power Cable Hand Hold (PH)
- Hydrant
- Satellite Dish
- Exist. Water Valve
- Sewer Clean Out
- Power Manhole (P)
- Telephone Booth
- Cellular Telephone Tower
- Water Manhole (W)
- Light Pole
- H-Frame Pole
- Power Line Tower
- Pole with Base
- Gas Valve
- Gas Meter
- Telephone Manhole (T)
- Power Transformer
- Sanitary Sewer Manhole (S)
- Storm Sewer Manhole
- Tank; Water, Gas, Oil
- Water Tank With Legs
- Traffic Signal Junction Box (S)
- Fiber Optic Splice Box (F)
- Television or Radio Tower
- Utility Power Line Connects to Traffic Signal Lines Cut Into the Pavement (TS)

- Recorded Water Line (W)
- Designated Water Line (S.U.E.*) (W)
- Sanitary Sewer (SS)
- Recorded Sanitary Sewer Force Main (FSS)
- Designated Sanitary Sewer Force Main(S.U.E.*) (FSS)
- Recorded Gas Line (G)
- Designated Gas Line (S.U.E.*) (G)
- Storm Sewer (S)
- Recorded Power Line (P)
- Designated Power Line (S.U.E.*) (P)
- Recorded Telephone Cable (T)
- Designated Telephone Cable (S.U.E.*) (T)
- Recorded U/G Telephone Conduit (TC)
- Designated U/G Telephone Conduit (S.U.E.*) (TC)
- Unknown Utility (S.U.E.*) (PUTL)
- Recorded Television Cable (TV)
- Designated Television Cable (S.U.E.*) (TV)
- Recorded Fiber Optics Cable (FO)
- Designated Fiber Optics Cable (S.U.E.*) (FO)
- Exist. Water Meter
- U/G Test Hole (S.U.E.*)
- Abandoned According to U/G Record (ATTUR)
- End of Information (E.O.I.)

BOUNDARIES & PROPERTIES

- State Line
- County Line
- Township Line
- City Line
- Reservation Line
- Property Line
- Property Line Symbol (PL)
- Exist. Iron Pin (EIP)
- Property Corner
- Property Monument (ECM)
- Property Number (123)
- Parcel Number (6)
- Fence Line
- Existing Wetland Boundaries (WW & ISBW) (WLB)
- Proposed Wetland Boundaries (WLB)
- Existing Endangered Animal Boundaries (EAB)
- Existing Endangered Plant Boundaries (EPB)

BUILDINGS & OTHER CULTURE

- Buildings
- Foundations
- Area Outline
- Gate
- Gas Pump Vent or U/G Tank Cap
- Church
- School
- Park
- Cemetery
- Dam
- Sign (S)
- Well (W)
- Small Mine
- Swimming Pool

TOPOGRAPHY

- Loose Surface
- Hard Surface
- Change in Road Surface
- Curb
- Right of Way Symbol (R/W)
- Guard Post (GP)
- Paved Walk
- Bridge
- Box Culvert or Tunnel
- Ferry
- Culvert
- Footbridge
- Trail, Footpath
- Light House

VEGETATION

- Single Tree
- Single Shrub
- Hedge
- Woods Line
- Orchard
- Vineyard (VINEYARD)

RAILROADS

- Standard Gauge (CSX TRANSPORTATION)
- RR Signal Milepost (MILEPOST 35)
- Switch (SWITCH)

revised 02/02/00

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$$$$USERNAME$$$$

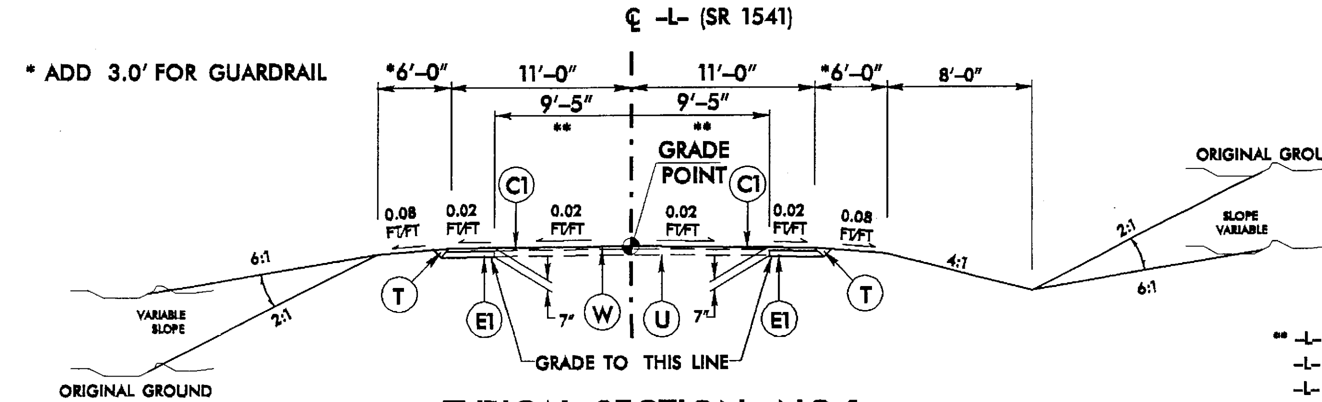
PROJECT REFERENCE NO.	SHEET NO.
B-4317	2
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

FINAL PAVEMENT SCHEDULE

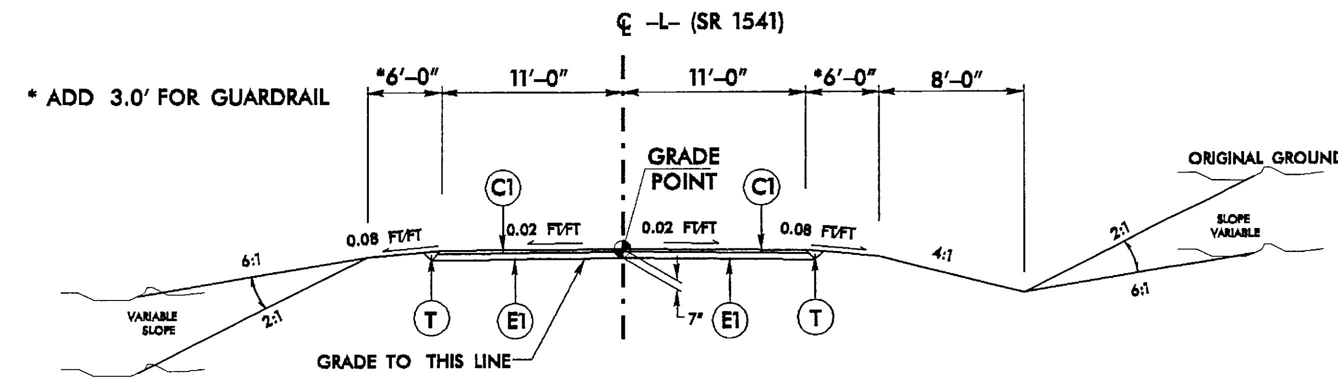
C1	PROP. APPROX. 3" ASPHALT CONCRETE SURFACE COURSE, TYPE SF9.5A, AT AN AVERAGE RATE OF 165 LBS. PER SQ. YD. TO BE PLACED IN EACH OF TWO LAYERS
C2	PROP. VAR. DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE SF9.5A, AT AN AVERAGE RATE OF 110 LBS. PER SQ. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NOT TO EXCEED 2" IN DEPTH.
E1	PROP. APPROX. 4" ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.
E2	PROP. VAR. DEPTH ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1" DEPTH, TO BE PLACED IN LAYERS NOT TO EXCEED 5.5" IN DEPTH OR LESS THAN 3" IN DEPTH
J	8" AGGREGATE BASE COURSE
R	EXPRESSWAY GUTTER.
T	EARTH MATERIAL.
U	EXISTING PAVEMENT
W	VARIABLE DEPTH ASPHALT PAVEMENT. (SEE WEDGING DETAIL)

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



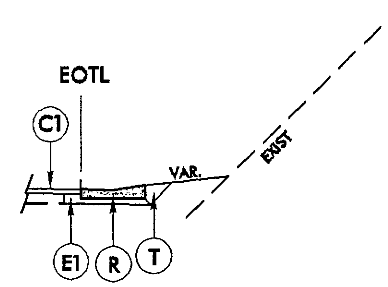
TYPICAL SECTION NO.1

USE TYPICAL SECTION NO. 1
** -L- STA 12+50.00 TO 13+00.00 (RESURFACING ONLY)
-L- STA 13+00.00 TO 13+50.00
-L- STA. 17+00.00 TO 17+50.00
** -L- STA. 17+50.00 TO 18+00.00 (RESURFACING ONLY)

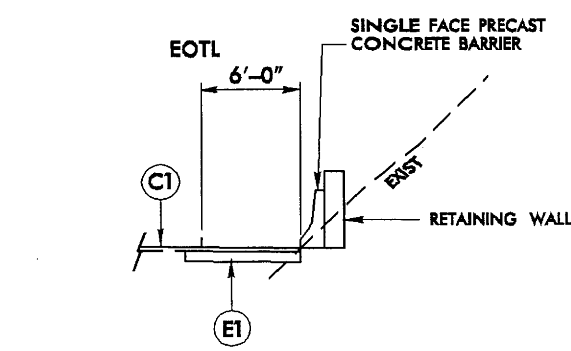


TYPICAL SECTION NO.2

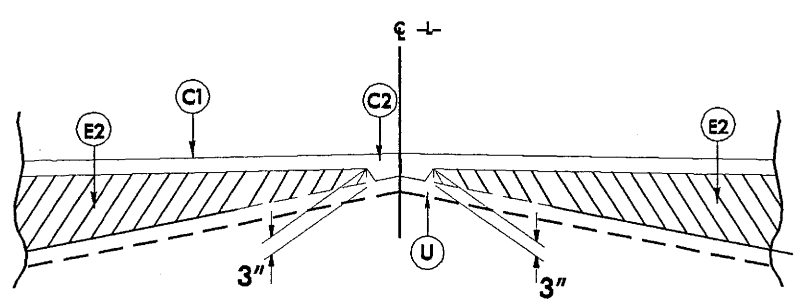
USE TYPICAL SECTION NO. 2
-L- STA. 13+50 TO 14+76.00 (BGN BRG)
-L- STA. 15+46.00 (END BRG) TO 17+00.00



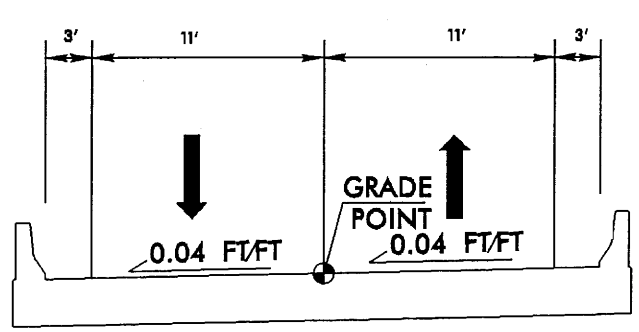
USE IN CONJUNCTION W/TYPICAL SECTION NOS. 1 & 2
-L- STA. 13+00.00 TO 14+00.00 RT.



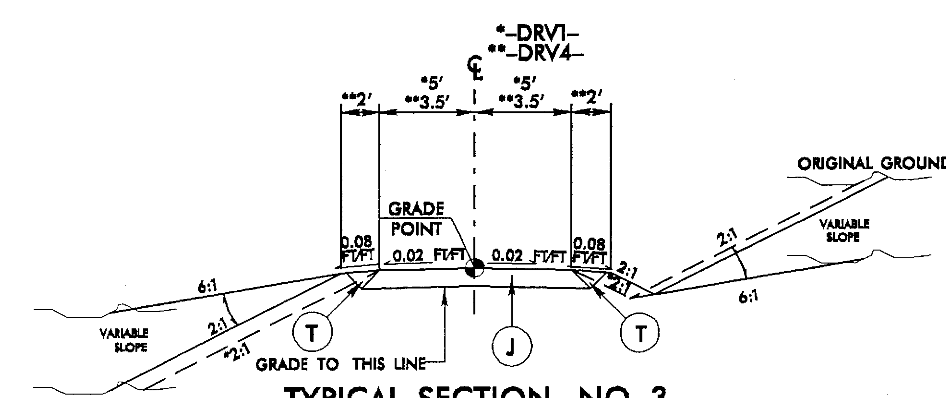
USE IN CONJUNCTION W/TYPICAL SECTION NO. 2
-L- STA. 16+25.00 TO 17+00.00 RT.



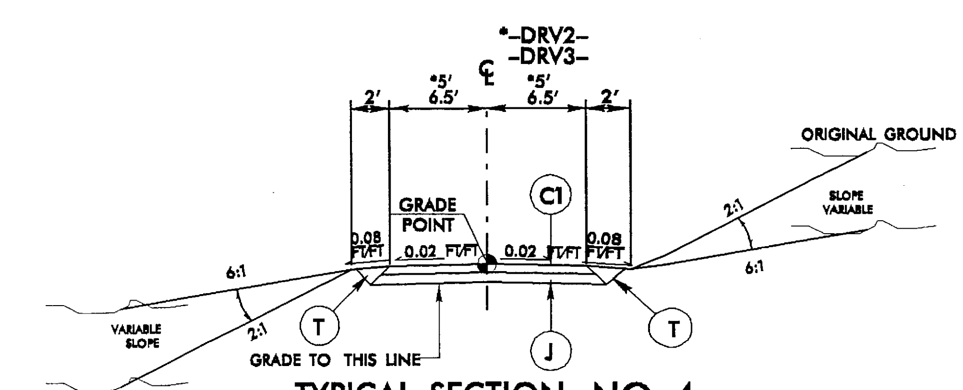
Detail Showing Method of Wedging



TYPICAL SECTION ON STRUCTURE



TYPICAL SECTION NO. 3
*-DRV1- STA. 10+15.09 TO 11+48.75
**-DRV4- STA. 10+00.00 TO 10+56.06



TYPICAL SECTION NO. 4
*-DRV2- STA. 10+14.80 TO 10+60.00
-DRV3- STA. 10+80.00 TO 11+28.53

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PROJECT REFERENCE NO.	SHEET NO.
B-4317	4
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

30 15 0 30 60
PLAN SCALE: 1" = 30'

NAD 83

-L-			-DRV1-		-DRV2-	-DRV3-
PI Sta 12+55.11	PI Sta 15+16.57	PI Sta 16+92.45	PI Sta 10+37.58	PI Sta 11+46.11	PI Sta 10+54.61	PI Sta 10+82.74
Δ = 56° 31' 07.2" (RT)	Δ= 51° 26' 50.2" (LT)	Δ = 16° 22' 01.9" (RT)	Δ= 49° 28' 14.0" (LT)	Δ= 47° 56' 59.1" (RT)	Δ= 17° 44' 06.0" (RT)	Δ= 41° 33' 33.3" (RT)
D = 25° 27' 53.2"	D = 27° 56' 57.0"	D = 27° 56' 57.0"	D = 190° 59' 09.4"	D = 190° 59' 09.4"	D = 57° 17' 44.8"	D = 52° 05' 13.5"
L = 221.95'	L = 184.07'	L = 58.56'	L = 25.90'	L = 25.11'	L = 30.95'	L = 79.79'
T = 120.94'	T = 98.76'	T = 29.48'	T = 13.82'	T = 13.34'	T = 15.60'	T = 41.74'
R = 225.00'	R = 205.00'	R = 205.00'	R = 30.00'	R = 30.00'	R = 100.00'	R = 110.00'

-BL-4 7+64.54-PINC =
-L- POC STA 12+64.82 (19.79' LT)

PT -DRV1- STA 11+57.88

END CONSTRUCTION
-DRV1- POC STA 11+48.75

PC -DRV1- STA 11+32.77

PT -DRV1- STA 10+49.67

PC -DRV1- STA 10+23.76

PT -DRV2- STA 10+69.96

END CONSTRUCTION
-DRV2- POC STA 10+60.00

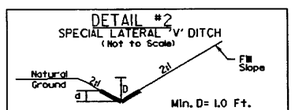
PC -DRV2- STA 10+39.01

-L- POC STA 15+76.36 =
-DRV2- STA 10+00.00

PT -L- STA 16+01.88 =
-DRV3- STA 11+41.63

BL-6 12+24.51-PINC =
-L- POC STA 17+01.49 (16.64 LT)

DETAIL #2
SPECIAL LATERAL "V" DITCH
(Not to Scale)

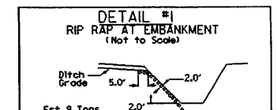


Min. D= 1.0 Ft.
Max. d= 1.5 Ft.

Type of Liner= PSRM

-L- STA 13+50.00 TO STA 14+20.00 (LT)

DETAIL #1
RIP RAP AT EMBANKMENT
(Not to Scale)



Est. 9 Tons
Est. 23 SY

Type of Liner= Class "I" Rip-Rap w/ FF

-L- STA 14+66.00 TO STA 14+78.00 (LT)

BEGIN TIP PROJECT B-4317
-L- POC STA 12+50.00

BEGIN EXPRESSWAY
GUTTER -L- STA 13+00.00

PT -L- STA 13+56.12

END EXPRESSWAY
GUTTER -L- STA 14+00.00

-L- POT STA 14+13.27 =
-DRV4- STA 10+72.08

PC -L- STA 14+17.81

-L- POC STA 14+48.79 =
-DRV1- STA 10+00.00

BEGIN CONSTRUCTION
-DRV4- STA 10+00.00

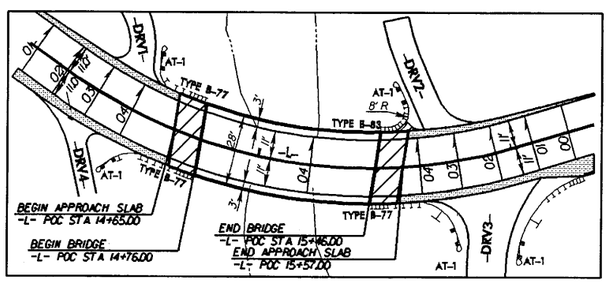
BEGIN APPROACH SLAB
-L- POC STA 14+65.00

BEGIN BRIDGE
-L- POC STA 14+76.00

-BL-5 9+95.25-PINC=
-BY-25 5+00.00-POT=
-L- STA 14+82.76 (25.93 RT)

BM#2 -BL- STA 9+95.25 (1105.75' RT) =
-L- STA 15+09.31 (125.48' RT)
ELEV = 3281.96'

SKETCH OF BRIDGE IN RELATIONSHIP TO PAVEMENT



BEGIN RETAINING WALL
-L- STA 16+25.00

-BY-11 6+02.12-PINC =
-L- STA 15+74.55 (24.00 RT)

PT -L- STA 17+21.53

END RETAINING WALL
-L- STA 17+00.00

PC -L- STA 16+62.97

END TIP PROJECT B-4317
-L- POT STA 18+00.00

PAVED SHOULDER

NOTE: DESIGN EXCEPTION REQUIRED FOR DESIGN SPEED (30mph), MINIMUM HORIZONTAL CURVE RADIUS (205') AND HORIZONTAL STOPPING SIGHT DISTANCE (120').

SEE SHEET 5 FOR -L- & DRV PROFILES
SEE SHEET S-1 TO S__ FOR STRUCTURES

REVISIONS

8/17/96

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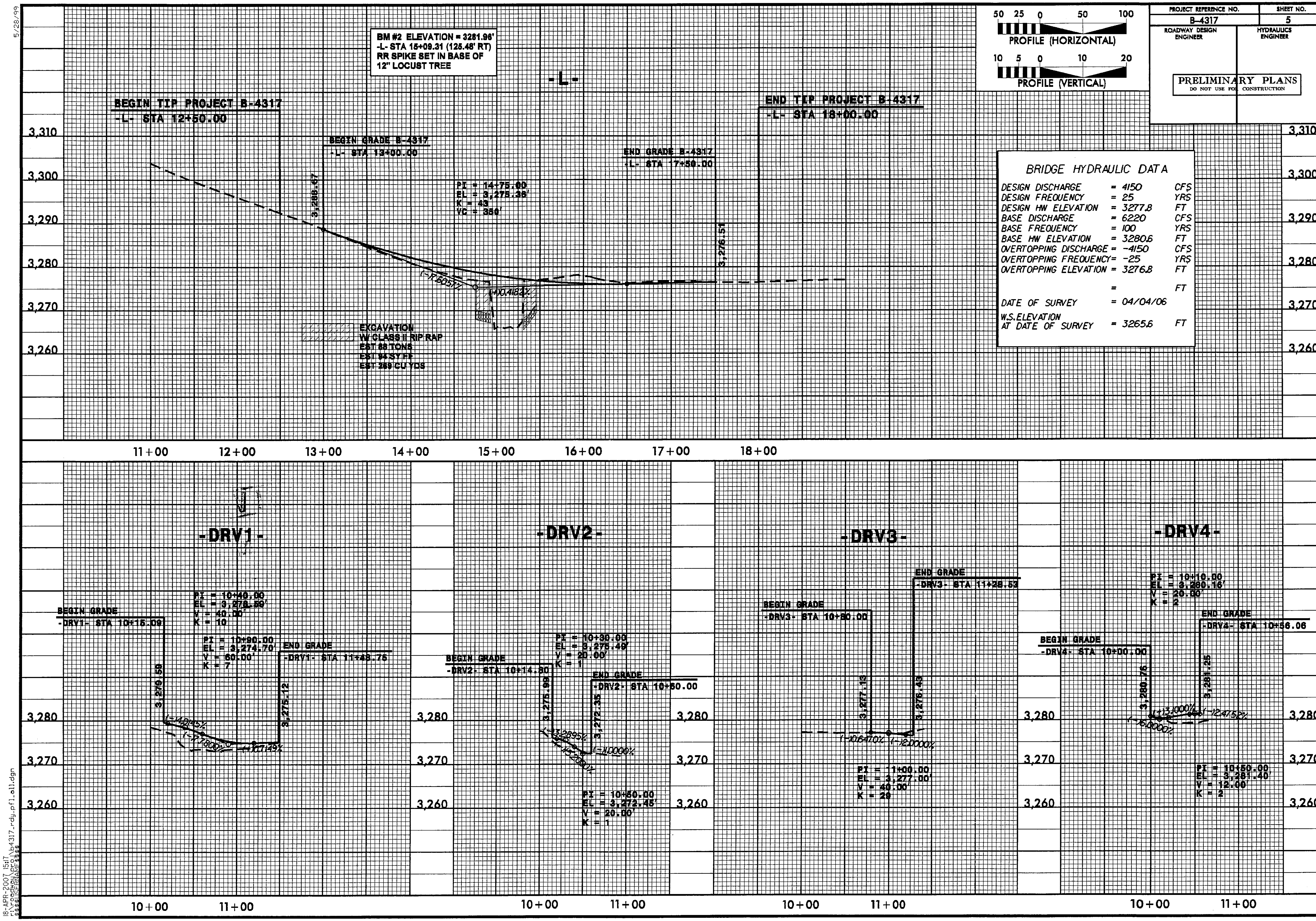

PROJECT REFERENCE NO. B-4317
SHEET NO. 5
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
PROFILE (HORIZONTAL)
PROFILE (VERTICAL)
-L-
BM #2 ELEVATION = 3281.96'
-L- STA 15+09.31 (125.48' RT)
RR SPIKE SET IN BASE OF
12" LOCUST TREE
BEGIN TIP PROJECT B-4317
-L- STA 12+50.00
END TIP PROJECT B-4317
-L- STA 18+00.00
BEGIN GRADE B-4317
-L- STA 13+00.00
END GRADE B-4317
-L- STA 17+50.00
PI = 14+75.00
EL = 3,275.38'
K = 43
VC = 350'
EXCAVATION
W/ CLASS II RIP RAP
EST 88 TONS
EST 94 SY FF
EST 259 CU YDS
-DRV1-
BEGIN GRADE
-DRV1- STA 10+15.09
END GRADE
-DRV1- STA 11+43.75
PI = 10+40.00
EL = 3,278.59'
V = 40.00'
K = 10
PI = 10+90.00
EL = 3,274.70'
V = 60.00'
K = 7
-DRV2-
BEGIN GRADE
-DRV2- STA 10+14.30
END GRADE
-DRV2- STA 10+60.00
PI = 10+30.00
EL = 3,275.49'
V = 20.00'
K = 1
PI = 10+50.00
EL = 3,272.45'
V = 20.00'
K = 1
-DRV3-
BEGIN GRADE
-DRV3- STA 10+80.00
END GRADE
-DRV3- STA 11+28.53
PI = 11+00.00
EL = 3,277.00'
V = 40.00'
K = 29
-DRV4-
BEGIN GRADE
-DRV4- STA 10+00.00
END GRADE
-DRV4- STA 10+56.06
PI = 10+10.00
EL = 3,280.16'
V = 20.00'
K = 2
PI = 10+50.00
EL = 3,281.40'
V = 12.00'
K = 2
11+00
12+00
13+00
14+00
15+00
16+00
17+00
18+00
10+00
3,310
3,300
3,290
3,280
3,270
3,260

BRIDGE HYDRAULIC DATA

DESIGN DISCHARGE	= 4150	CFS
DESIGN FREQUENCY	= 25	YRS
DESIGN HW ELEVATION	= 3277.8	FT
BASE DISCHARGE	= 6220	CFS
BASE FREQUENCY	= 100	YRS
BASE HW ELEVATION	= 3280.6	FT
OVERTOPPING DISCHARGE	= -4150	CFS
OVERTOPPING FREQUENCY	= -25	YRS
OVERTOPPING ELEVATION	= 3276.8	FT
	=	FT
DATE OF SURVEY	= 04/04/06	
W.S. ELEVATION AT DATE OF SURVEY	= 3265.6	FT