STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

MICHAEL F. EASLEY
GOVERNOR

LYNDO TIPPETT
SECRETARY

December 14, 2004

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

ATTENTION: Mr. John T. Thomas, Jr.
NCDOT Coordinator

Dear Mr. Thomas:

Subject: **Nationwide 33 application,** for the replacement of Bridge No. 94 over Laurel Fork Creek on SR 1111, Watauga County. Division 11. Federal Aid Project No. BRZ-1111(1), State Project No. 8.2751801 TIP Project No. B-3709.

Please find enclosed copies of the project planning report, project planning report addendum, permit drawings and ½ size plans for the above referenced project. The document states that Bridge No. 94 will be replaced in-place with a new bridge (Alternative B). The original document stated the preferred alternative (Alternative A) was to replace the bridge on a new location. Detailed hydrological and hydraulic design studies were conducted for the project. Due to the topography and location of the existing bridge, being in close proximity of NC 105, it was determined from a construction feasibility meeting that the best location for the replacement bridge would be in the existing location with a one lane on site detour (Alternative B). These changes are noted in the Addendum to the project planning report attached to this application.

The proposed replacement structure for Bridge No. 94 is a cored slab bridge approximately 110 feet in length. The existing structure is 77 ft long. The proposed bridge will be at approximately the same elevation as the existing bridge and will consist of two 9 ft travel lanes and 2 ft-11 in of lateral clearance on each side of the structure. The roadway approaches will provide two 9 ft travel lanes with 6 ft shoulders, 2 ft of the shoulders being paved. Total project length is 375 ft.

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

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

WEBSITE: WWW.NCDOT.ORG

LOCATION:
2728 CAPITAL BLVD
PLB SUITE 168
RALEIGH NC 27604

IMPACTS TO WATERS OF THE UNITED STATES

GENERAL DESCRIPTION: This project is located in the Watauga River Basin within USGS hydrologic unit 06010103 (sub-basin 04-02-01). The proposed bridge replacement is over Laurel Fork Creek, which has been assigned a Division of Water Quality best usage classification of "C Tr". No wetlands are located within the project area.

PERMANENT IMPACTS: No permanent stream or wetland impacts are anticipated. Buffer rules do not apply to the Watauga River Basin, therefore there will be no buffer impacts associated with this project.

TEMPORARY IMPACTS: Approximately 0.03 acre of temporary fill will occur in Laurel Fork Creek as a result of a temporary causeway and three culvert pipes associated with the construction of the temporary on-site detour. The culvert pipes will be placed at grade due to bedrock.

BRIDGE DEMOLITION: The superstructure for Bridge No. 94 consists of a timber deck on steel I-beams. The substructure consists of timber caps, piles, and bulkheads at both abutments. It is anticipated that the bridge superstructure and substructure will be removed without dropping components into Waters of the United States. All guidelines for bridge demolition and removal will be followed in addition to Best Management Practices for the Protection of Surface Waters and BMP's for Bridge Demolition and Removal.

Case 2 of NCDOT's BMP-BDR applies prohibiting in-stream work and land disturbance activities within 25 feet of Laurel Fork Creek. Case 2 will be in effect during the brown and brook trout spawning season and during the rainbow trout spawning season of October 15 through April 15 to protect the egg and fry stages of trout from off-site sedimentation during construction.

UTILITIES: According to NCDOT's Utilities Coordination Unit and Project Services Unit no impacts to waters of the United States are anticipated from utilities as a result of relocation.

MITIGATION

The Corps of Engineers has adopted, through the Council on Environmental Quality (CEQ), a wetland mitigation policy that 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 the Waters of the United States. Mitigation of wetland and surface water 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). Executive Order 11990 (Protection of Wetlands) and Department of Transportation Order 5660.1A (Preservation of the Nations Wetlands), emphasize protection of the functions and values provided by wetlands.

These directives require that new construction in wetlands be avoided as much as possible and that all practicable measures are taken to minimize or mitigate impacts to wetlands.

AVOIDANCE AND MINIMIZATION: The NCDOT is committed to incorporating all reasonable and practicable design features to avoid and minimize wetland impacts, and to provide full compensatory mitigation of all remaining wetland impacts. Avoidance measures were taken during the planning and NEPA phases; minimization measures were incorporated as part of the project design and include:

- Sediment and erosion control measures will adhere to the Design Standards for Sensitive Watersheds (*15A NCAC 4B.0024*).
- Preformed scour holes will be constructed to diffuse stormwater runoff.
- Trees and vegetation within the 25-foot stream buffer zone damaged during construction will be replanted with the same mixture of species existing prior to project initiation.
- "Guidelines for Construction of Highway Improvements Adjacent to or Crossing Trout Waters in North Carolina" (October 27, 1992) will be adhered to throughout the life of this project.
- Sufficient space for wildlife movement under the bridge has been provided.
- Southwest quadrant has 1-1/2:1 slopes to avoid fill in the stream (Detail C – Sheet 8 of 12 on permit drawings).
- No bents will be placed in the stream.

COMPENSATORY MITIGATION: The Department has avoided and minimized impacts to jurisdictional resources to the greatest extent possible as described above. There are no permanent impacts from this project to streams or wetlands that require mitigation.

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 February 2003 the U.S. Fish and Wildlife Service (USFWS) lists six federally protected species for Watauga County including the bog turtle, Carolina northern flying squirrel, spruce-fir moss spider, Heller's blazing star, spreading avens, and Roan mountain bluet (Table 1).

Field surveys were conducted for the Carolina northern flying squirrel, spruce-fir moss spider, Heller's blazing star, spreading avens and Roan mountain bluet on September 26, 2000. The southern species of bog turtle is listed due to similarity of appearance and a biological conclusion is not required. No suitable habitat was found during the survey and no specimens were observed for any of the listed species.

A biological conclusion of "No effect" has been rendered for the Carolina northern flying squirrel, spruce-fir moss spider, Heller's blazing star, spreading avens and Roan mountain bluet.

A Right-of-Way Consultation was completed on December 30, 2003 evaluating any potential changes in habitat or occurrences in regards to federally protected species listed within the project area since completion of the Categorical Exclusion. According to the consultation, the biological conclusion of "No effect" remains valid for all of the species.

Table 1- Federally Protected Species of Watauga County

Common Name	Scientific Name	Federal Status	Habitat Present	Biological Conclusion
Bog Turtle	*Clemmys muhlenbergii*	T(S/A)	N	NA
Carolina northern flying squirrel	*Glaucomys sabrinus coloratus*	E	N	No effect
Spruce-fir moss spider	*Microhexura montivaga*	E	N	No effect
Heller's blazing star	*Liatris helleri*	T	N	No effect
Spreading avens	*Geum radiatum*	E	N	No effect
Roan mountain bluet	*Houstonia montana (=Hedyotis purpurea var. montana)*	E	N	No effect

REGULATORY APPROVALS

Section 404 Permit: It is anticipated that the construction of the temporary causeway and detour structure will be authorized under Section 404 Nationwide Permit 33 (Temporary Construction Access and Dewatering). We are, therefore, requesting the issuance of a Nationwide Permit 33 authorizing construction of the temporary causeway and detour.

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

A copy of this permit application will be posted on the NCDOT website at: http://www.ncdot.org/planning/pe/naturalunit/permit.html

If you have any questions or need additional information, please contact Jon Scott at (919) 715-1340.

Sincerely,

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

cc: w/ attachment

Mr. John Hennessy, NC Division of Water Quality (2 copies)
Ms. Marla Chambers, NC Wildlife Resources Commission
Ms. Marella Buncick, US Fish and Wildlife Service
Mr. Harold Draper, Tennessee Valley Authority
Mr. Greg Perfetti, P.E., Structure Design
Dr. David Chang, P.E., Hydraulics
Mr. Michael Pettyjohn, P.E., Division Engineer
Mr. Heath Slaughter, DEO

w/o attachment

Mr. David Franklin, USACE, Wilmington
Mr. Jay Bennett, P.E., Roadway Design
Mr. Omar Sultan, Programming and TIP
Mr. Art McMillan, P.E., Highway Design
Mr. Mark Staley, Roadside Environmental
Mr. John Wadsworth, P.E., Project Planning Engineer
Ms. Beth Harmon, EEP
Mr. Carl Goode, P.E., Office of Human Environment

Office Use Only: Form Version May 2002

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

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

I. Processing

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

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

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

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

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

II. Applicant Information

1. Owner/Applicant Information
   Name: Gregory J. Thorpe, Ph.D., Environmental Management Director
   Mailing Address: 1598 Mail Service Center
   Raleigh, North Carolina 27699-1598
   Telephone Number: (919) 733-3141 Fax Number: (919) 733-9794
   E-mail Address: gthorpe@dot.state.nc.us

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

III. Project Information

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

1. Name of project: Replacement of Bridge no. 94 over Laurel Fork Creek on SR 1111

2. T.I.P. Project Number or State Project Number (NCDOT Only): B-3709

3. Property Identification Number (Tax PIN): _____

4. Location
   County: Watauga Nearest Town: Boone
   Subdivision name (include phase/lot number): _____
   Directions to site (include road numbers, landmarks, etc.): The project site is located on SR 1111 near it's intersection with NC 105.

5. Site coordinates, if available (UTM or Lat/Long): 36-11-54N, 81-44-26W
   (Note – If project is linear, such as a road or utility line, attach a sheet that separately lists the coordinates for each crossing of a distinct waterbody.)

6. Property size (acres): _____

7. Nearest body of water (stream/river/sound/ocean/lake): Laurel Fork Creek

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

9. Describe the existing conditions on the site and general land use in the vicinity of the project at the time of this application: Land use northeast (upstream) and southwest (downstream) of the bridge is mainly a mixture of undeveloped (forested) and residential properties. There

is a power line located south of the bridge that extends between the stream and NC 105. It is anticipated that no impacts will occur as a result of relocating any utilities.

10. Describe the overall project in detail, including the type of equipment to be used: Bridge No. 94 over Laurel Fork Creek will be replaced in-place with a new bridge. During construction, traffic will be maintained using a temporary on-site detour south of the existing bridge.

11. Explain the purpose of the proposed work: The purpose of this proposed project is to replace the existing bridge structure, which is considered functionally obsolete and structurally deficient. Replacement of the existing structure will result in safer and more efficient traffic operations.

IV. Prior Project History

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

N/A

V. Future Project Plans

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

N/A

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

It is the applicant's (or agent's) responsibility to determine, delineate and map all impacts to wetlands, open water, and stream channels associated with the project. The applicant must also provide justification for these impacts in Section VII below. All proposed impacts, permanent and temporary, must be listed herein, and must be clearly identifiable on an accompanying site plan. All wetlands and waters, and all streams (intermittent and perennial) must be shown on a delineation map, whether or not impacts are proposed to these systems. Wetland and stream evaluation and delineation forms should be included as appropriate. Photographs may be included at the applicant's discretion. If this proposed impact is strictly for wetland or stream mitigation, list and describe the impact in Section VIII below. If additional space is needed for listing or description, please attach a separate sheet.

1. Provide a written description of the proposed impacts: The proposed project will create approximately 0.03 acres of temporary fill in Laurel Fork Creek. The temporary fill will be

composed of Class II Riprap for construction of a temporary causeway and from three 96" culvert pipes placed in the streambed for construction of a temporary on-site detour structure.

2. Individually list wetland impacts below:

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

* List each impact separately and identify temporary impacts. Impacts include, but are not limited to: mechanized clearing, grading, fill, excavation, flooding, ditching/drainage, etc. For dams, separately list impacts due to both structure and flooding.

** 100-Year floodplains are identified through the Federal Emergency Management Agency's (FEMA) Flood Insurance Rate Maps (FIRM), or FEMA-approved local floodplain maps. Maps are available through the FEMA Map Service Center at 1-800-358-9616, or online at http://www.fema.gov.

*** List a wetland type that best describes wetland to be impacted (e.g., freshwater/saltwater marsh, forested wetland, beaver pond, Carolina Bay, bog, etc.) Indicate if wetland is isolated (determination of isolation to be made by USACE only).

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

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

Stream Impact Site Number (indicate on map)	Type of Impact*	Area of Impact (acres)	Stream Name**	Average Width of Stream Before Impact	Perennial or Intermittent? (please specify)
1	Temporary fill to surface waters	0.03	Laurel Fork Creek	35 feet	Perennial

* List each impact separately and identify temporary impacts. Impacts include, but are not limited to: culverts and associated rip-rap, dams (separately list impacts due to both structure and flooding), relocation (include linear feet before and after, and net loss/gain), stabilization activities (cement wall, rip-rap, crib wall, gabions, etc.), excavation, ditching/straightening, etc. If stream relocation is proposed, plans and profiles showing the linear footprint for both the original and relocated streams must be included.

** Stream names can be found on USGS topographic maps. If a stream has no name, list as UT (unnamed tributary) to the nearest downstream named stream into which it flows. USGS maps are available through the USGS at 1-800-358-9616, or online at www.usgs.gov. Several internet sites also allow direct download and printing of USGS maps (e.g., www.topozone.com, www.mapquest.com, etc.).

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

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

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

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

5. Pond Creation

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

Pond to be created in (check all that apply): ☐ uplands ☐ stream ☐ wetlands

Describe the method of construction (e.g., dam/embankment, excavation, installation of draw-down valve or spillway, etc.):_____

_____

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

_____

Size of watershed draining to pond:_____ Expected pond surface area:_____

VII. Impact Justification (Avoidance and Minimization)

Specifically describe measures taken to avoid the proposed impacts. It may be useful to provide information related to site constraints such as topography, building ordinances, accessibility, and financial viability of the project. The applicant may attach drawings of alternative, lower-impact site layouts, and explain why these design options were not feasible. Also discuss how impacts were minimized once the desired site plan was developed. If applicable, discuss construction techniques to be followed during construction to reduce impacts.

Several alternatives for replacement of Bridge No. 94 were considered including a "No-Build" alternative. The "No-Build" alternative will eventually necessitate removal of the existing structure and closure of SR 1111 (Old Danner Road). This is not desirable due to the service provided by SR 1111. Alternative B (replace in-place with an on-site temporary detour) was chosen since the existing structure was inadequate for construction equipment to reach the west side of Laurel Fork Creek. Alternative A (replace on new location) was originally chosen, but an onsite visit determined that this would not be feasible for reasons outlined above. Avoidance and minimization measures include: Sediment and erosion control measures will adhere to the Design Standards for Sensitive Watersheds (*15A NCAC 4B.0024*); Preformed scour holes will be constructed to diffuse stormwater runoff; Trees and vegetation within the 25-foot stream buffer

zone damaged during construction will be replanted with the same mixture of species existing prior to project initiation; "Guidelines for Construction of Highway Improvements Adjacent to or Crossing Trout Waters in North Carolina" (October 27, 1992) will be adhered to throughout the life of this project; Sufficient space for wildlife movement under the bridge has been provided; Southwest quadrant has 1-1/2:1 slopes to avoid fill in the stream (Detail C – Sheet 8 of 12 on permit drawings); No bents will be placed in the stream.

VIII. Mitigation

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

USACE – In accordance with the Final Notice of Issuance and Modification of Nationwide Permits, published in the Federal Register on March 9, 2000, mitigation will be required when necessary to ensure that adverse effects to the aquatic environment are minimal. Factors including size and type of proposed impact and function and relative value of the impacted aquatic resource will be considered in determining acceptability of appropriate and practicable mitigation as proposed. Examples of mitigation that may be appropriate and practicable include, but are not limited to: reducing the size of the project; establishing and maintaining wetland and/or upland vegetated buffers to protect open waters such as streams; and replacing losses of aquatic resource functions and values by creating, restoring, enhancing, or preserving similar functions and values, preferable in the same watershed.

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

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

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

the NCWRP is proposed, please check the appropriate box on page three and provide the following information:

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

IX. Environmental Documentation (required by DWQ)

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

Yes ☒ No ☐

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

Yes ☒ No ☐

If yes, has the document review been finalized by the State Clearinghouse? If so, please attach a copy of the NEPA or SEPA final approval letter.

Yes ☒ No ☐

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

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

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

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

Identify the square feet and acreage of impact to each zone of the riparian buffers. If buffer mitigation is required calculate the required amount of mitigation by applying the buffer multipliers.

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

Total			

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

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

XI. Stormwater (required by DWQ)

Describe impervious acreage (both existing and proposed) versus total acreage on the site. Discuss stormwater controls proposed in order to protect surface waters and wetlands downstream from the property.

XII. Sewage Disposal (required by DWQ)

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

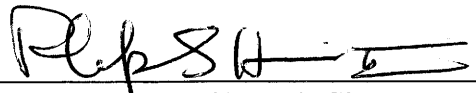
XIII. Violations (required by DWQ)

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

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

XIV. Other Circumstances (Optional):

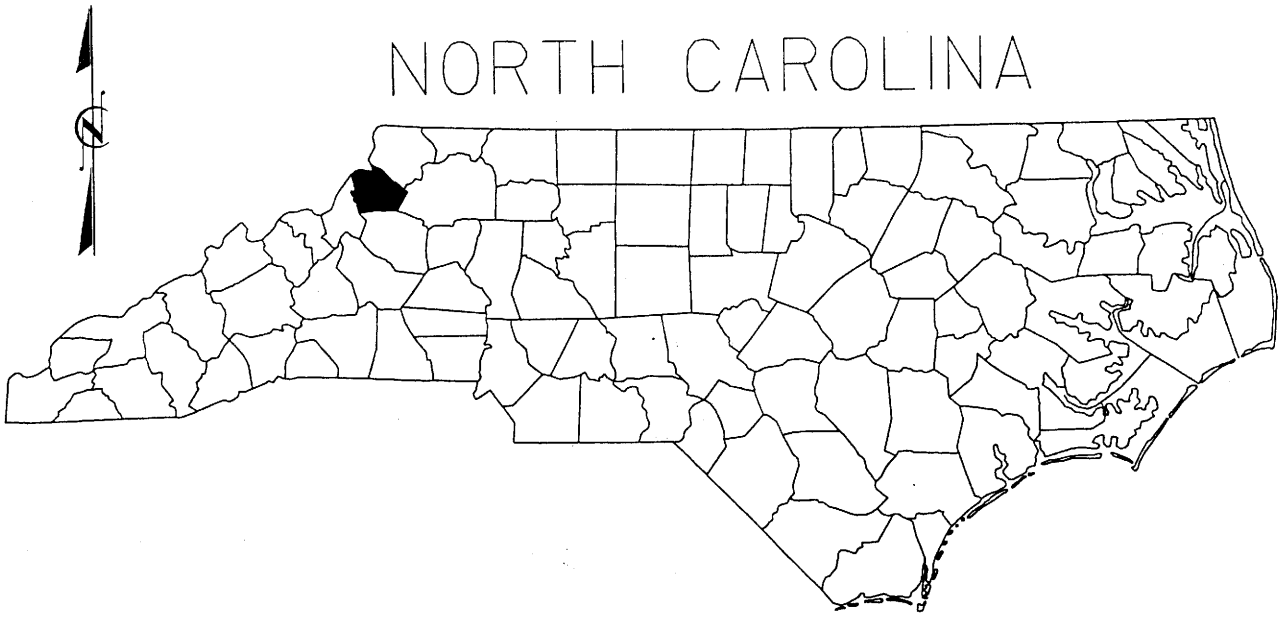
It is the applicant's responsibility to submit the application sufficiently in advance of desired construction dates to allow processing time for these permits. However, an applicant may choose to list constraints associated with construction or sequencing that may impose limits on work schedules (e.g.,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

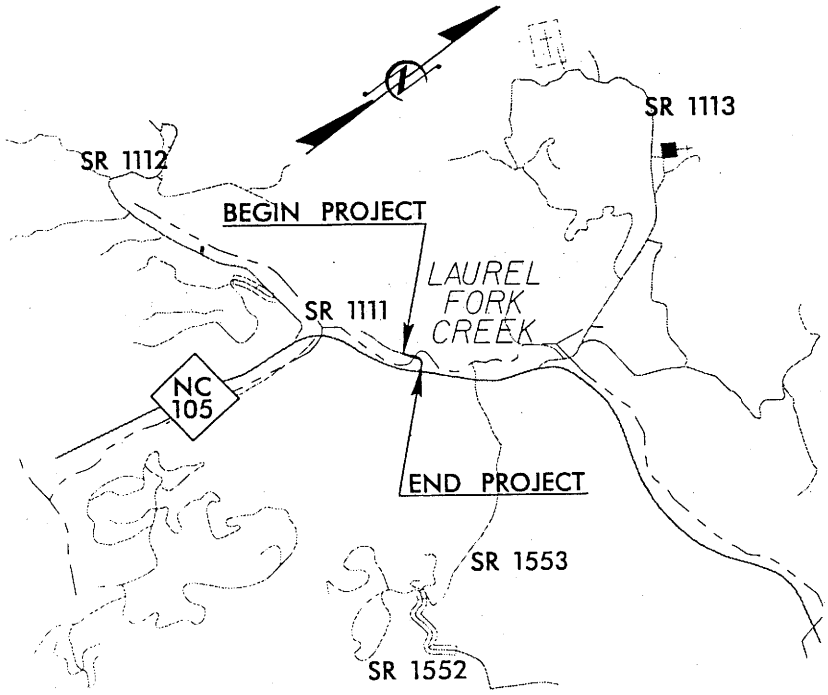


12/14/04

Applicant/Agent's Signature **Date**

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





VICINITY MAPS

(NOT TO SCALE)

NCDOT

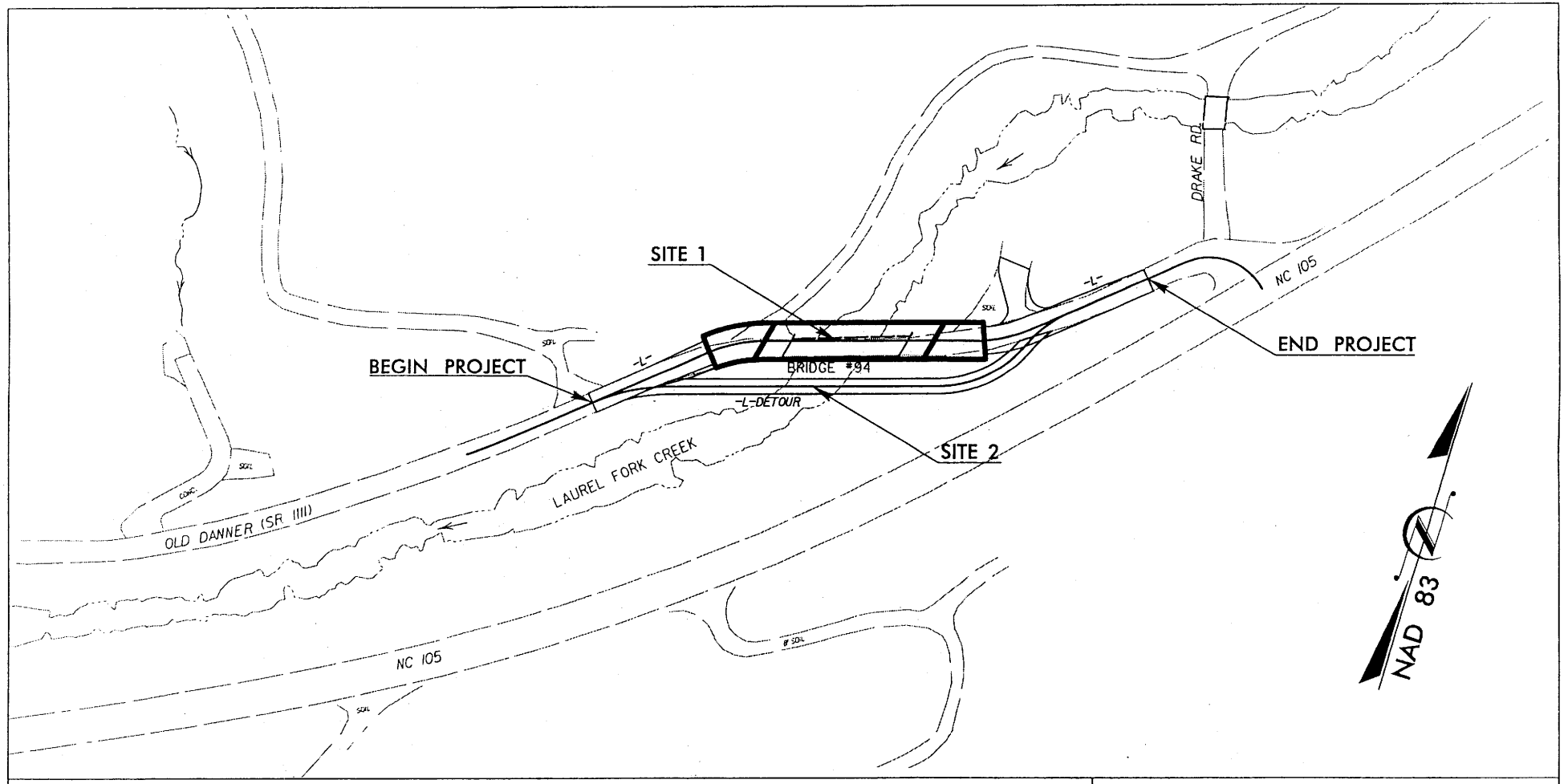
DIVISION OF HIGHWAYS

WATAUGA COUNTY

PROJECT: 8.2751801 (B-3709)

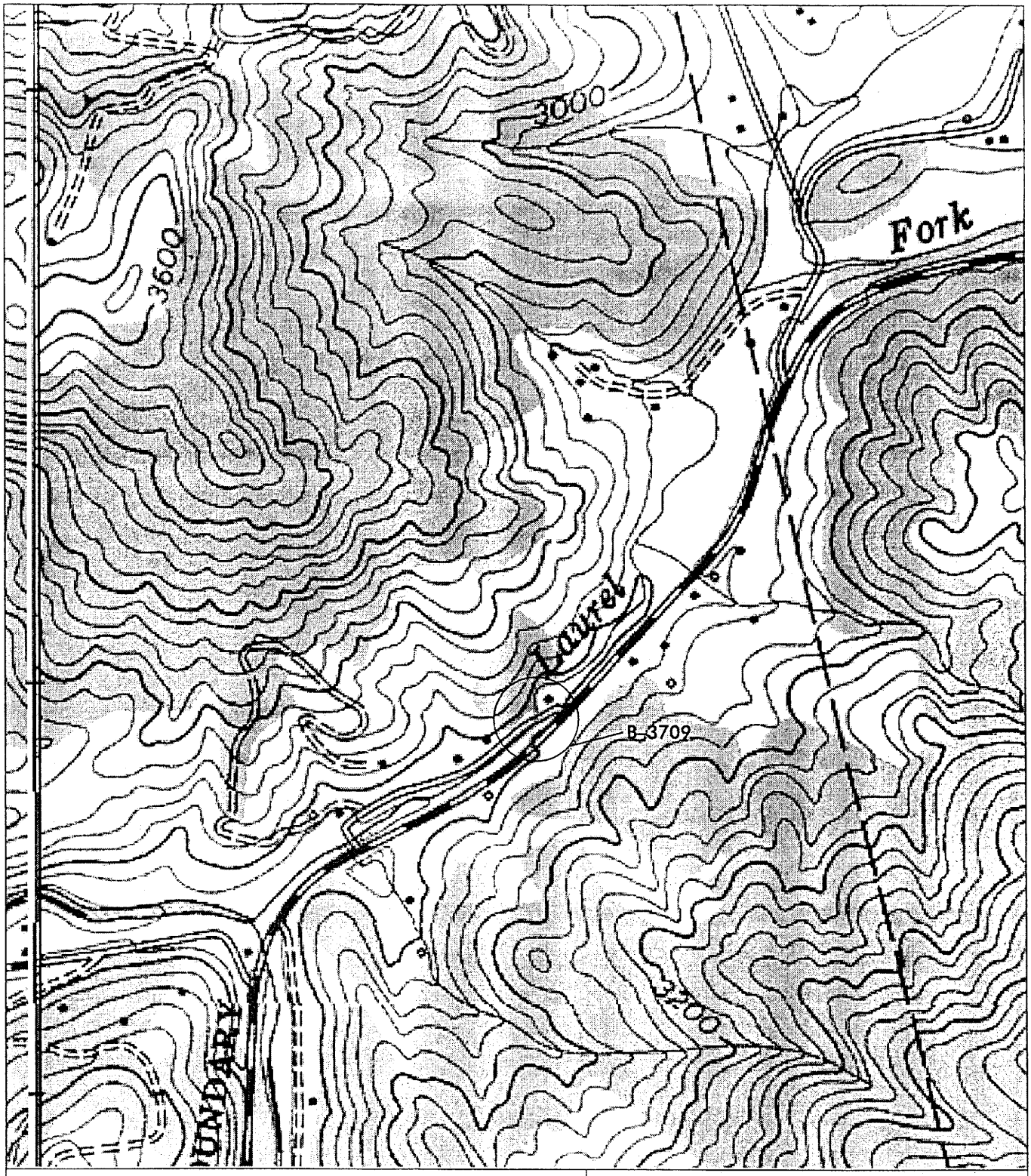
BRIDGE NO. 94 OVER LAUREL FORK CREEK SR. 1111 (OLD DANNER ROAD)

SHEET 1 OF 12 5/17/04



SITE MAP
(NOT TO SCALE)

NCDOT
DIVISION OF HIGHWAYS
WATAUGA COUNTY
PROJECT: 8.2751801 (B-3709)
BRIDGE NO. 94 OVER LAUREL FORK CREEK SR. 1111 (OLD DANNER ROAD)



TOPO MAP

SCALE 1" = 1000'

NCDOT

DIVISION OF HIGHWAYS

WATAUGA COUNTY

PROJECT: 8.2751801 (B-3709)

BRIDGE NO. 94 OVER LAUREL FORK CREEK SR. 1111 (OLD DANNER ROAD)

SHEET 3 OF 12 5/17/04

PROPERTY OWNERS

NAMES AND ADDRESSES

PARCEL NO.	NAMES	ADDRESSES
1	Charles William Connor	1200 Lloyd White Road, Clover, SC 29710
2	BSHT, LLC	151 Mr. Bish Blvd., Boone, NC 28607

NCDOT

DIVISION OF HIGHWAYS

WATAUGA COUNTY

PROJECT: 8.2751801 (B-3709)

BRIDGE NO. 94 OVER LAUREL FORK CREEK SR. 1111 (OLD DANNER ROAD)

WETLANDS IMPACT PERMIT SUMMARY

Site No.	Station (From/To)	Structure Size / Type	Fill In Wetlands (ac)	Temp. Fill In Wetlands (ac)	Excavation In Wetlands (ac)	Mechanized Clearing (Method III) (ac)	Fill In SW (Natural) (ac)	Fill In SW (Pond) (ac)	Temp. Fill In SW (ac)	Existing Channel Impacted (ft)	Natural Stream Design (ft)
1	16+99 -L-	1@30',1@50',1@30' Cored Slab Bridge							0	0	
1	16+99 -L-	Temporary Causeway At Bridge							0.01		
2	16+64 -L- DET	3 @ 96" CS Pipes (Temporary)							0.02		
TOTALS:			0	0	0	0	0	0	0.03	0	0

NCDOT

DIVISION OF HIGHWAYS
WATAUGA COUNTY
PROJECT 8.2751801 (B-3709)
BRIDGE NO. 94 OVER
LAUREL FORK CREEK
ON SR 1111 (OLD DANNER ROAD)

Form Revised 3/22/01

PROJECT REFERENCE NO.	SHEET NO.
B-3709	2-B

R/W SHEET NO.

ROADWAY DESIGN ENGINEER — HYDRAULICS ENGINEER

MULKEY ENGINEERS & CONSULTANTS

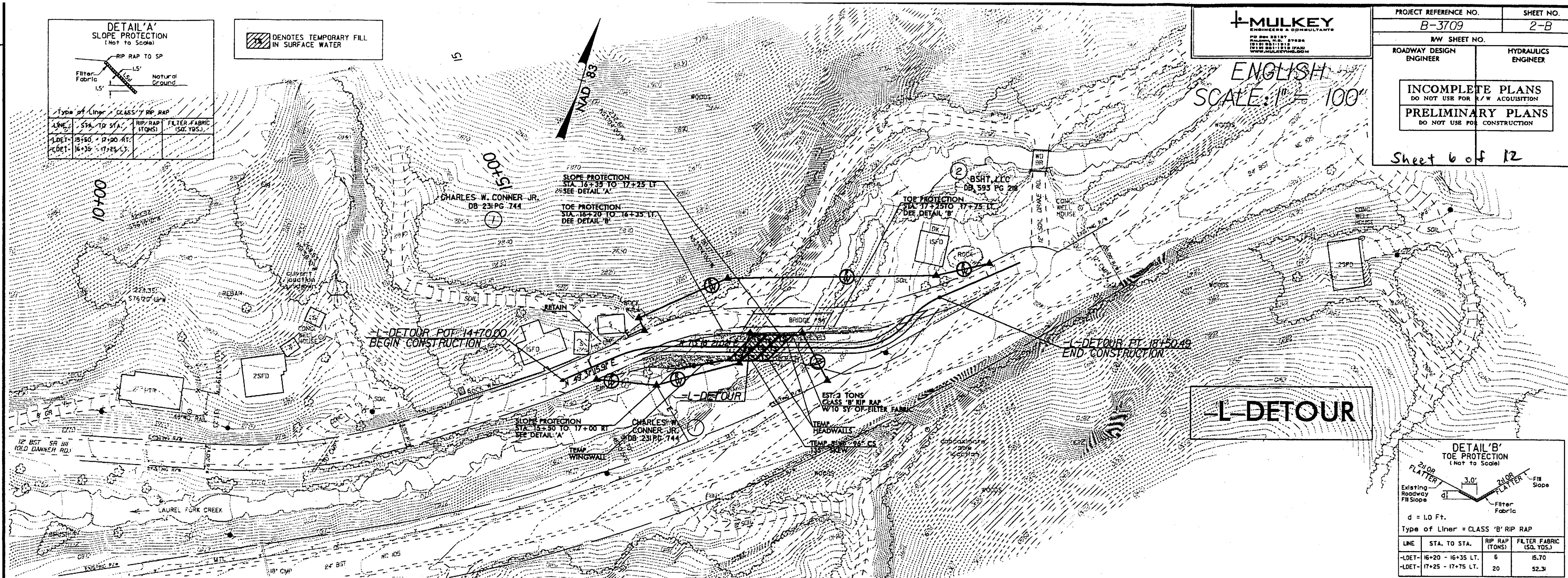
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

Sheet 6 of 12

ENGLISH
SCALE: 1" = 100'

DENOTES TEMPORARY FILL IN SURFACE WATER



DETAIL 'A'
SLOPE PROTECTION
(Not to Scale)

RIP RAP TO SP — Filter Fabric — Natural Ground — 1.5' — 1.5'

Type of Liner = CLASS 'I' RIP RAP

LINE	STA. TO STA.	RIP/RAP (TONS)	FILTER FABRIC (SQ. YDS.)
-LDET-	15+50 - 17+00 RT.		
-LDET-	16+35 - 17+25 LT.		

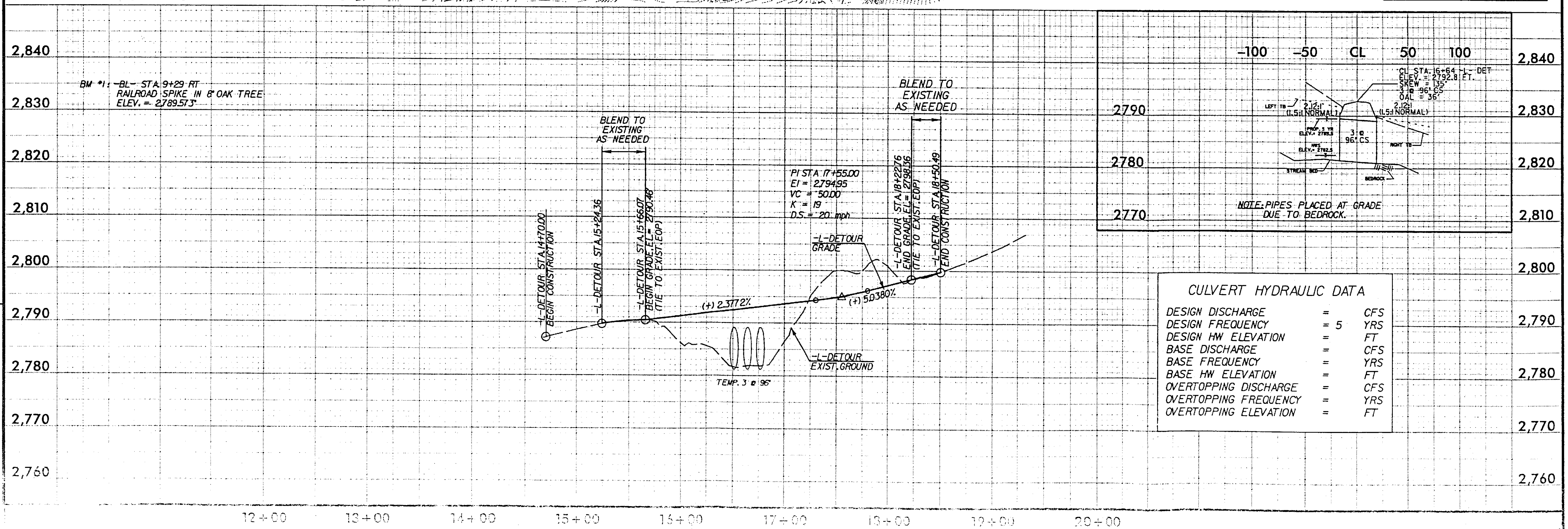
DETAIL 'B'
TOE PROTECTION
(Not to Scale)

2:1 OR FLATTER — 3.0' — Existing Roadway Fill Slope — Filter Fabric — Fill Slope

d = 1.0 Ft.

Type of Liner = CLASS 'B' RIP RAP

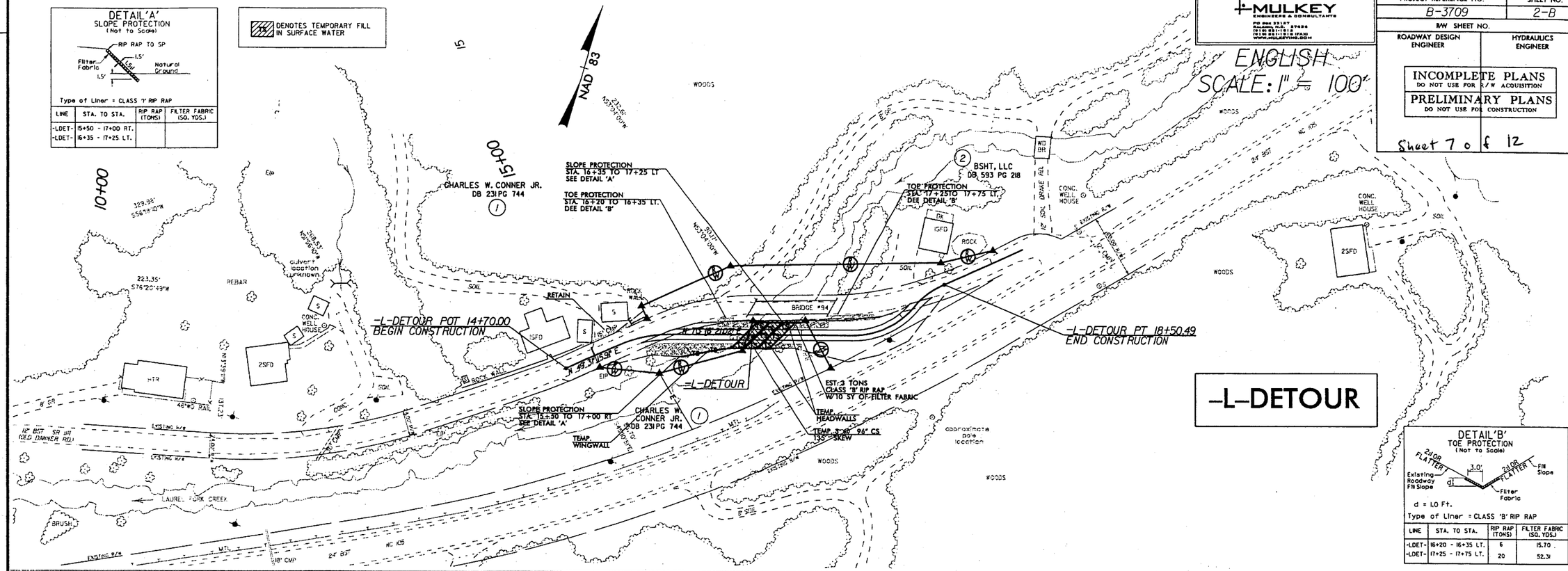
LINE	STA. TO STA.	RIP RAP (TONS)	FILTER FABRIC (SQ. YDS.)
-LDET-	16+20 - 16+35 LT.	6	15.70
-LDET-	17+25 - 17+75 LT.	20	52.31



CULVERT HYDRAULIC DATA

DESIGN DISCHARGE	=		CFS
DESIGN FREQUENCY	=	5	YRS
DESIGN HW ELEVATION	=		FT
BASE DISCHARGE	=		CFS
BASE FREQUENCY	=		YRS
BASE HW ELEVATION	=		FT
OVERTOPPING DISCHARGE	=		CFS
OVERTOPPING FREQUENCY	=		YRS
OVERTOPPING ELEVATION	=		FT

REVISIONS



PROJECT REFERENCE NO.	SHEET NO.
B-3709	2-B
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

Sheet 7 of 12

MULKEY
ENGINEERS & CONSULTANTS
PO Box 33127
Raleigh, N.C. 27636
(919) 851-1912
(919) 851-1918 (FAX)
www.mulkeyinc.com

ENGLISH
SCALE: 1" = 100'

REVISIONS

SLOPE PROTECTION
STA. 16+35 TO 17+25 LT
SEE DETAIL 'A'

TOE PROTECTION
STA. 16+20 TO 16+35 LT.
DEE DETAIL 'B'

TOE PROTECTION
STA. 17+25 TO 17+75 LT.
DEE DETAIL 'B'

SLOPE PROTECTION
STA. 15+50 TO 17+00 RT
SEE DETAIL 'A'

TEMP. WINGWALL

EST. 3 TONS
CLASS 'B' RIP RAP
W/10 SY OF FILTER FABRIC

TEMP. HEADWALLS

TEMP. 3 @ 96" CS
135° SKEW

▨ DENOTES TEMPORARY FILL IN SURFACE WATER

-L-DETOUR

DETAIL 'A'
SLOPE PROTECTION
(Not to Scale)

Type of Liner = CLASS 'I' RIP RAP

LINE	STA. TO STA.	RIP RAP (TONS)	FILTER FABRIC (SQ. YDS.)
-LDET-	15+50 - 17+00 RT.		
-LDET-	16+35 - 17+25 LT.		

DETAIL 'B'
TOE PROTECTION
(Not to Scale)

d = 1.0 Ft.

Type of Liner = CLASS 'B' RIP RAP

LINE	STA. TO STA.	RIP RAP (TONS)	FILTER FABRIC (SQ. YDS.)
-LDET-	16+20 - 16+35 LT.	6	15.70
-LDET-	17+25 - 17+75 LT.	20	52.31

BM #1: -BL- STA. 9+29 RT
RAILROAD SPIKE IN 8" OAK TREE
ELEV. = 2789.573'

PI STA 17+55.00
El = 2,794.95
VC = 50.00
K = 19
DS. = 20 mph

CL STA. 16+64 -L- DET
ELEV. = 2792.8 FT.
SKEW = 135°
3 @ 96" CS
OAL = 36'

NOTE: PIPES PLACED AT GRADE DUE TO BEDROCK.

CULVERT HYDRAULIC DATA

DESIGN DISCHARGE	=		CFS
DESIGN FREQUENCY	=	5	YRS
DESIGN HW ELEVATION	=		FT
BASE DISCHARGE	=		CFS
BASE FREQUENCY	=		YRS
BASE HW ELEVATION	=		FT
OVERTOPPING DISCHARGE	=		CFS
OVERTOPPING FREQUENCY	=		YRS
OVERTOPPING ELEVATION	=		FT

DENOTES TEMPORARY FILL IN SURFACE WATERS

MULKEY
ENGINEERS & CONSULTANTS

PROJECT REFERENCE NO.	SHEET NO.
B-3709	4
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

Sheet 8 of 12

ENGLISH
SCALE: 1" = 100'

NAD 83

REVISIONS

10+00 15+00

CHARLES W. CONNER JR. DB 231PG 744 (1)

BSHT, LLC DB 593 PG 218 (2)

4' PAVED DITCH STA. 15+65 TO 16+05

TIE TO EXISTING DITCH DO NOT DISTURB EXISTING ROCK WALL

+60.00 -L- 20.00 LT

+25.00 EX. R/W

-L- POT 15+25.00 BEGIN PROJECT

RETAIN 64' (8" PIPE CLEANOUT)

CLASS II RIP RAP W/FILTER FABRIC (STR. PAY ITEM)

-L- DETOUR

-L- POT 19+00.00 END PROJECT

HAUL ROAD

15" CSP

SLOPE PROTECTION STA. 16+50 TO 16+44 SEE DETAIL 'C'

PREFORMED SCOUR HOLE -L- STA. 17+40.00 SEE DETAIL 'D'

PREFORMED SCOUR HOLE -L- STA. 16+15.00 SEE DETAIL 'D'

BM #1 ELEV. = 2789.573

CAUSEWAY QUANTITIES
VOLUME OF CLASS II RIP RAP BELOW ORDINARY HIGH WATER= 38 YD³

BM #1: -BL- STA 9+29 RT
RAILROAD SPIKE IN 8" OAK TREE
ELEV. = 2789.573'

-L- STA 15+25.00 BEGIN CONSTRUCTION
-L- STA 15+50.00 BEGIN GRADE, EL= 2790.79
-L- STA 16+44.00 BEGIN BRIDGE
-L- STA 17+54.00 END BRIDGE
-L- STA 18+55.00 END GRADE, EL=2800.77
-L- STA 19+00.00 END CONSTRUCTION

(+) 3.845%
(+) 2.275%
(+) 6.928%

PI STA 16+25.00
EI = 2793.68
VC = 50.00
K = 32
D.S. = 35 mph

PI STA 18+15.00
EI = 2798.00
VC = 80.00
K = 17
D.S. = 20 mph

CORED SLAB
4' TYP.
HEIGHT = N.W.S. + 2'
N.W.S. 2789.9
C.P.M. 2783.9
EXIST. GROUND

TEMPORARY CAUSEWAY
CLASS II RIP RAP
USE COARSE AGGREGATE SURFACE AS NEEDED

DETAIL 'C'
SLOPE PROTECTION
(Not to Scale)

Type of Liner = CLASS "II" RIP RAP

LINE	STA. TO STA.	RIP RAP (TONS)	FILTER FABRIC (SQ. YDS.)
-L-	15+50 - 16+44 LT.	100	

DITCH DETAIL 'D'
PREFORMED SCOUR HOLE WITH LEVEL SPREADER APRON
(NOT TO SCALE)

Section A-A

NOTE: 'B' denotes size of basin. For example, 5.0 Ft. x 5.0 Ft. PSH, B=5.0

NOTE: The Permanent Soil Reinforcement matting (PSR) shall be seeded with native grasses at installation.

STATION	B FT.	D FT.	W_{PSR} FT.	d FT.	CLASS I RIP RAP TONS	DDE FT³	FILTER FABRIC FT²	PSRM FT²
-L- 16+15 LT.	4.0	1.0	4.0	0.5	6.0	475	230	180
-L- 17+40 LT.	4.0	1.0	4.0	0.5	6.0	475	230	180

2,840 2,830 2,820 2,810 2,800 2,790 2,780 2,770 2,760

12+00 13+00 14+00 15+00 16+00 17+00 18+00 19+00 20+00

PROJECT REFERENCE NO.	SHEET NO.
B-3709	4
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

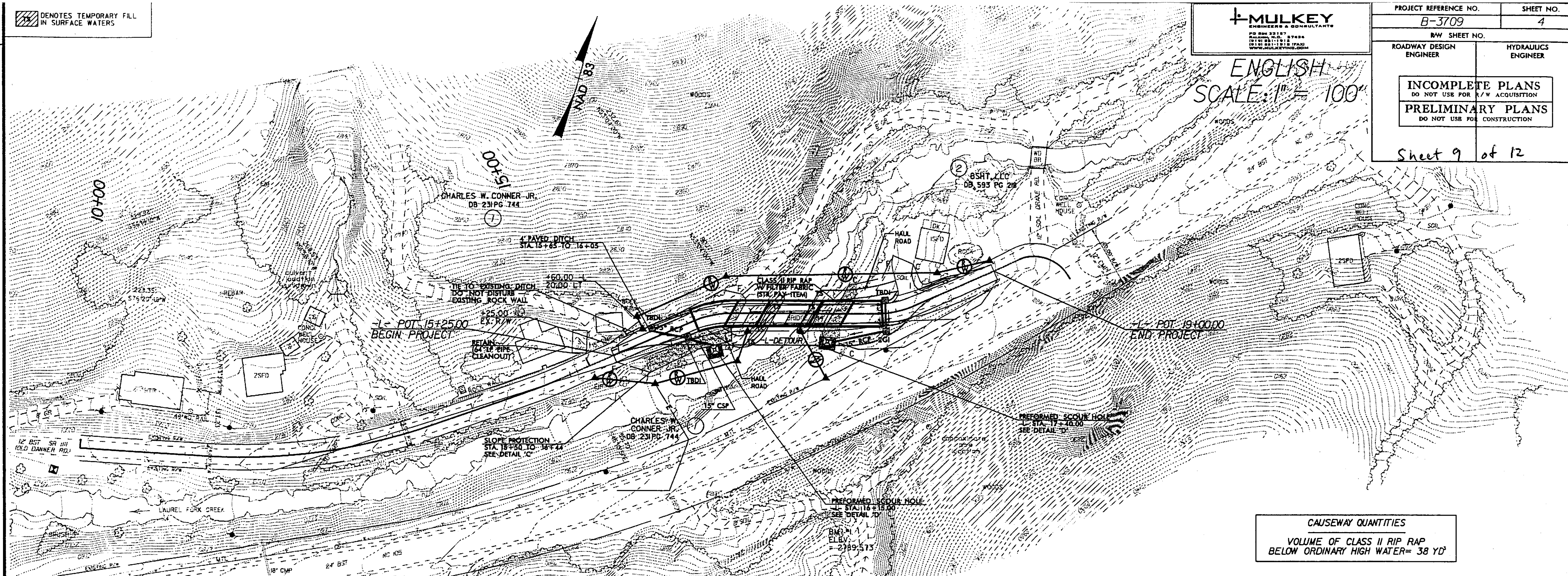
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

Sheet 9 of 12

MULKEY ENGINEERS & CONSULTANTS

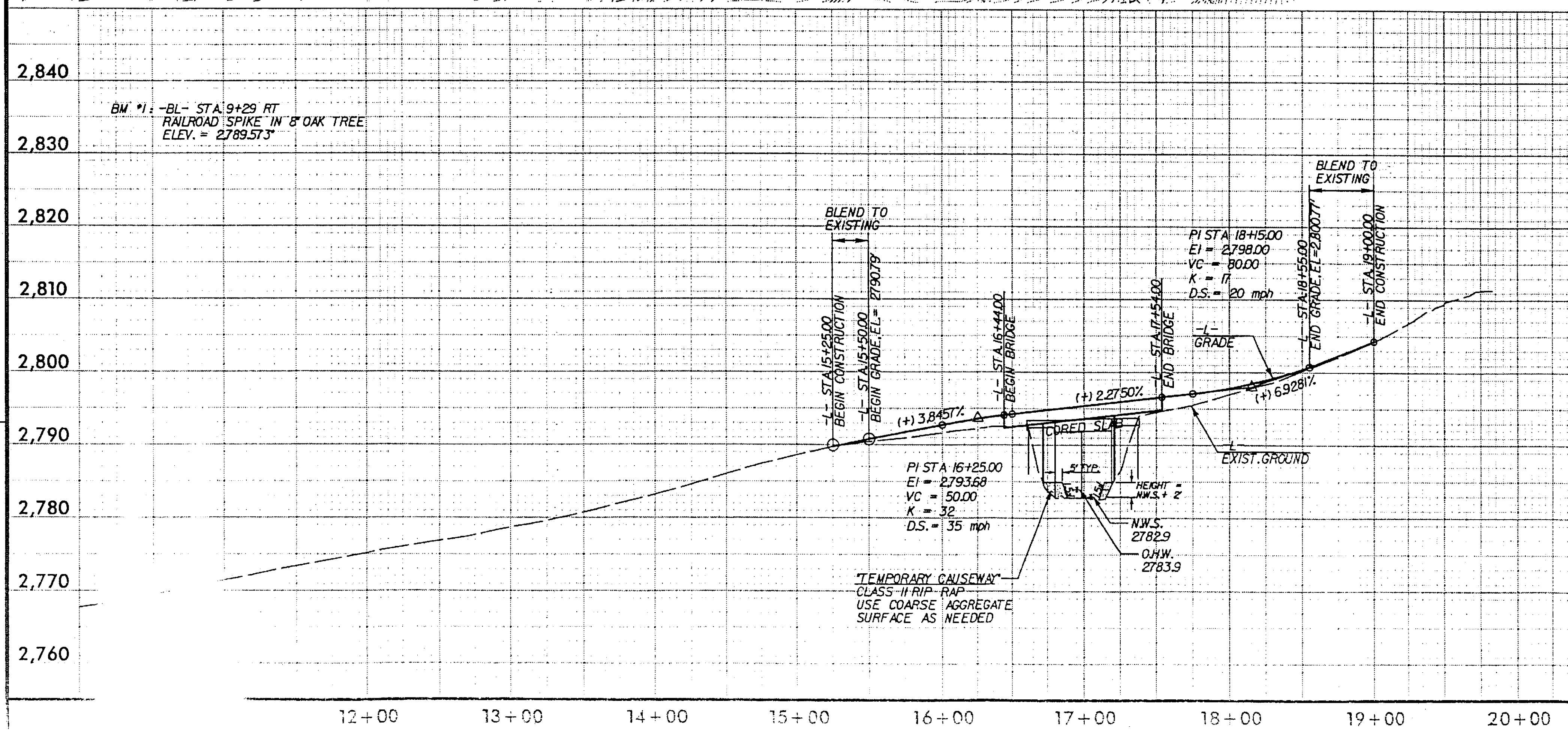
DENOTES TEMPORARY FILL IN SURFACE WATERS

ENGLISH
SCALE: 1" = 100'



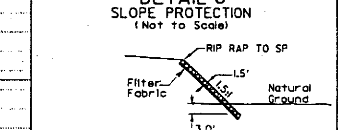
NAD 83
10+00
15+00
CHARLES W. CONNER JR.
DB 231 PG 744
4' PAVED DITCH
STA. 15+65 TO 16+05
TIE TO EXISTING DITCH
DO NOT DISTURB
EXISTING ROCK WALL
+60.00
20.00 LT
+25.00
EX. R/W
-L- POT 15+25.00
BEGIN PROJECT
RETAIN 24" PIPE (CLEANOUT)
CLASS II RIP RAP
W/ FILTER FABRIC
2SFD
BSHT, LLC
DB 593 PG 216
HAUL ROAD
-L- DETOUR
15" CSP
HAUL ROAD
CHARLES W. CONNER JR.
DB 231 PG 744
SLOPE PROTECTION
STA. 15+50 TO 16+44
SEE DETAIL 'C'
-L- POT 19+00.00
END PROJECT
PREFORMED SCOUR HOLE
-L- STA. 17+40.00
SEE DETAIL 'D'
PREFORMED SCOUR HOLE
-L- STA. 16+15.00
SEE DETAIL 'D'
BM #1
ELEV. = 2789.573'
LAUREL FORK CREEK
NC 105
WOODS

CAUSEWAY QUANTITIES
VOLUME OF CLASS II RIP RAP BELOW ORDINARY HIGH WATER= 38 YD^3



2,840
2,830
2,820
2,810
2,800
2,790
2,780
2,770
2,760
BM #1: -BL- STA. 9+29 RT
RAILROAD SPIKE IN 8" OAK TREE
ELEV. = 2,789.573'
BLEND TO EXISTING
-L- STA.15+25.00 BEGIN CONSTRUCTION
-L- STA.15+50.00 BEGIN GRADE EL= 2790.79
-L- STA.16+44.00 BEGIN BRIDGE
(+) 3.8457%
(+) 2.2750%
CORED SLAB
PI STA 16+25.00
EL = 2,793.68
VC = 50.00
K = 32
D.S. = 35 mph
HEIGHT = N.W.S. + 2'
N.W.S. 2782.9
O.H.W. 2783.9
"TEMPORARY CAUSEWAY"
CLASS II RIP RAP
USE COARSE AGGREGATE SURFACE AS NEEDED
-L- STA.17+54.00 END BRIDGE
-L- GRADE
EXIST. GROUND
PI STA 18+15.00
EL = 2,798.00
VC = 80.00
K = 17
D.S. = 20 mph
(+) 6.9281%
BLEND TO EXISTING
-L- STA.18+55.00 END GRADE EL= 2,800.77
-L- STA.19+00.00 END CONSTRUCTION
12+00
13+00
14+00
15+00
16+00
17+00
18+00
19+00
20+00

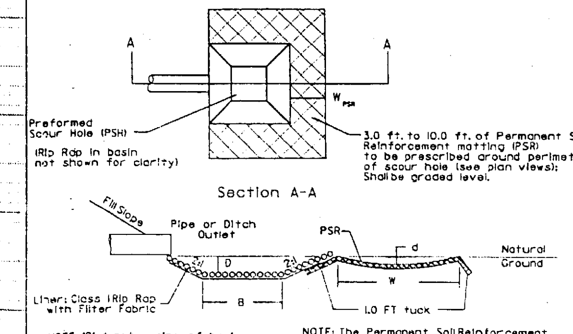
DETAIL 'C'
SLOPE PROTECTION
(Not to Scale)



Type of Liner = CLASS 'II' RIP RAP

LINE	STA. TO STA.	RIP RAP (TONS)	FILTER FABRIC (SQ. YDS.)
-L-	15+50 - 16+44 LT.	100	

DITCH DETAIL 'D'
PREFORMED SCOUR HOLE WITH LEVEL SPREADER APRON
(NOT TO SCALE)



Preformed Scour Hole (PSH)
(Rip Rap in basin not shown for clarity)
3.0 ft. to 10.0 ft. of Permanent Soil Reinforcement matting (PSR) to be prescribed around perimeter of scour hole (see plan views). Shall be graded level.
Section A-A
Fill Slope
Pipe or Ditch Outlet
PSR
Natural Ground
Liner: Class I Rip Rap with Filter Fabric
B
W
1.0 FT tuck

NOTE: 'B' denotes size of basin; For example: 5.0ft.x 5.0ft. PSH, B=1.5

NOTE: The Permanent Soil Reinforcement matting (PSR) shall be seeded with native grasses at installation.

STATION	B FT.	D FT.	W_{PSH} FT.	d FT.	CLASS I RIP RAP TONS	DDE FT^3	FILTER FABRIC FT^2	PSRM FT^2
-L- 16+15 LT.	4.0	1.0	4.0	0.5	6.0	475	230	180
-L- 17+40 LT.	4.0	1.0	4.0	0.5	6.0	475	230	180

REVISIONS

Rev. 3-6-21

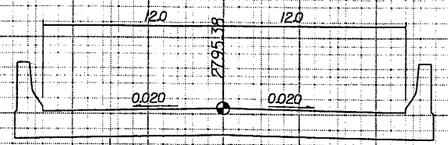
0 5	PROJ. REFERENCE NO.	SHEET NO.
	B-3709	X-3

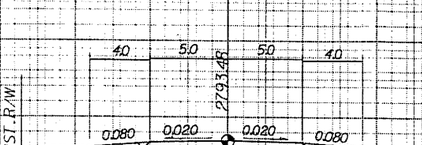
Sheet 10 of 12

70 60 50 40 30 20 10 0 10 20 30 40 50 60 70

2810 2805 2800 2795 2790 2785 2780

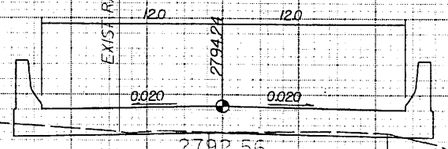
-L- DETOUR
16+93.48



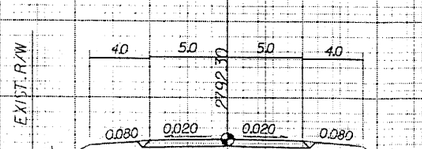


2782.75
EOP
EOP
17+00.00

-L- STA. 16+44.00
BEGIN BRIDGE



-L- DETOUR
16+43.48



16+50.00

-L- W/ -L DETOUR-

70 60 50 40 30 20 10 0 10 20 30 40 50 60 70

2810 2805 2800 2795 2790 2785

0 5	PROJ. REFERENCE NO.	SHEET NO.
	B-3709	X-4

Sheet 11 of 12

Rev. 3-0-2

70 60 50 40 30 20 10 0 10 20 30 40 50 60 70

2810 2805 2800 2795 2790

EXIST. R/W

6.0 9.0 9.0 6.0

2797.2

0.080 2:1 0.020 0.020 0.080 2:1

2795.81

EOP EOP

-L- DETOUR
17+73.93

EXIST. R/W

1.6 2.0 4.0 5.2 5.2 4.0 1.0

2795.9

0.062 0.005 0.032 0.077

TEMP. 15:1

EXIST. R/W

USE TEMP. BARRIER

EOS EOP

2810 2805 2800 2795 2790

17+80.00

-L- STA. 17+54.00
END BRIDGE

EXIST. R/W

12.0 12.0

2796.52

0.020 0.020

2794.51

EOP EOP

EXIST. R/W

17+43.48

4.0 5.0 5.0 4.0 1.0

2794.72

0.080 0.020 0.020 0.080 2:1

EOS EOP

2810 2805 2800 2795 2790

PROP. R/W

2785

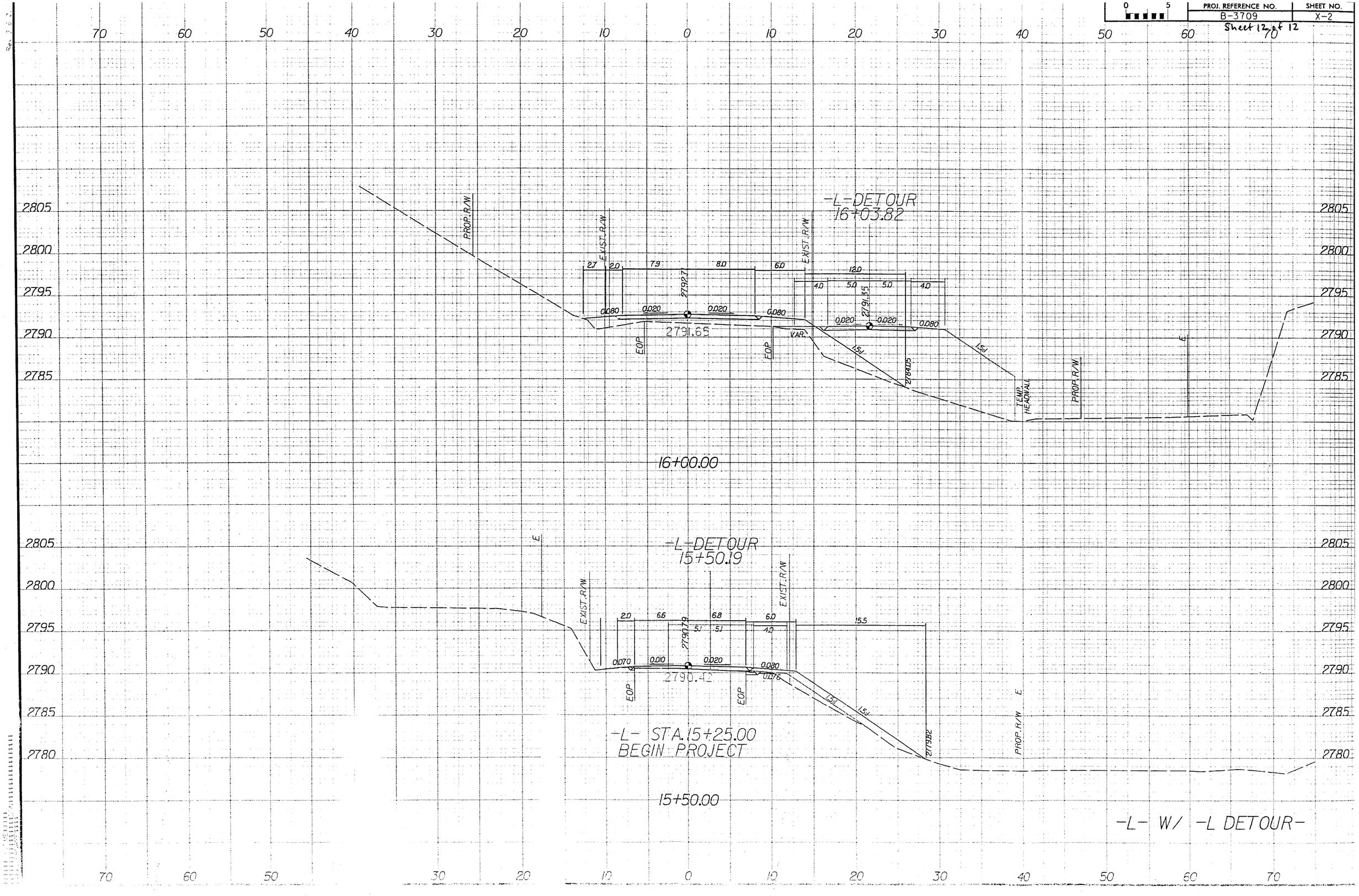
-L- W/ -L DETOUR-

17+50.00

70 60 50 40 20 10 0 10 20 30 40 50 60 70

0 5	PROJ. REFERENCE NO.	SHEET NO.
	B-3709	X-2

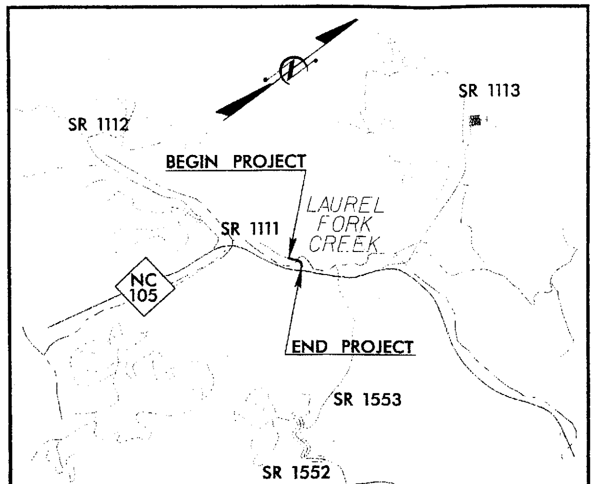
Sheet 12 of 12



TIP: B-3709

CONTRACT:

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



VICINITY MAP

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

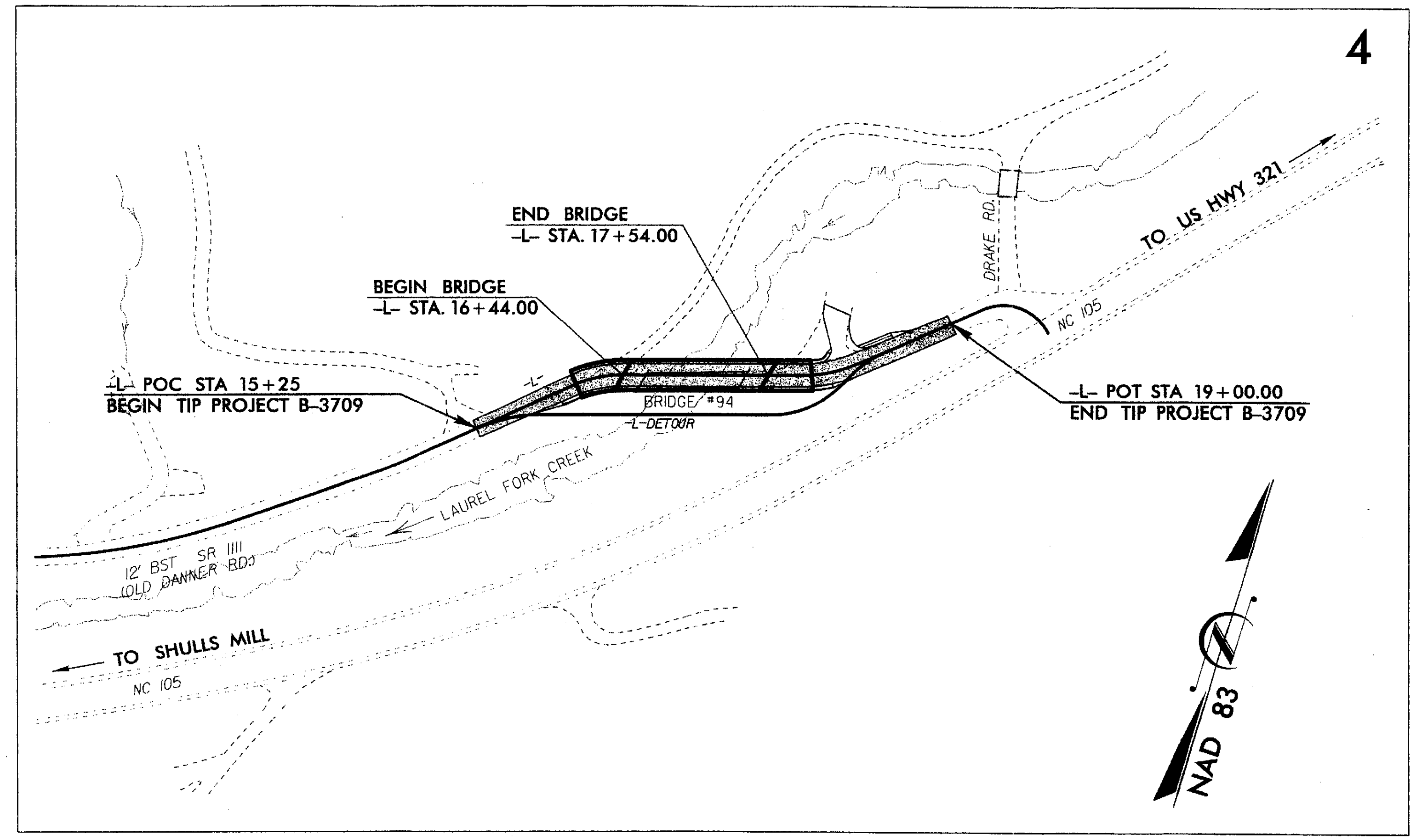
WATAUGA COUNTY

LOCATION: BRIDGE NO. 94 OVER LAUREL FORK CREEK ON SR 1111 (OLD DANNER ROAD)

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

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-3709	1	

WBS NO.	F. A. PROJ. NO.	DESCRIPTION
33249.1.1	BRZ-1111(1)	P.E.
33249.2.2	BRZ-1111(1)	R/W, UTIL



THIS PROJECT IS NOT WITHIN ANY MUNICIPAL BOUNDARIES.

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

MULKEY ENGINEERS & CONSULTANTS

NCDOT CONTACT : TERESA BRUTON, PE
PROJECT ENGINEER - DESIGN SERVICES

GRAPHIC SCALES

50 25 0 50 100
PLANS

50 25 0 50 100
PROFILE (HORIZONTAL)

10 5 0 10 20
PROFILE (VERTICAL)

DESIGN DATA

ADT 2003 = 24
ADT 2025 = 40
DHV = 25 %
D = 70 %
T = 4 % *
V = 20 MPH **
FUNCTION. CLASS. = RURAL LOCAL

* TTST 1 % DUAL 3 %
** DESIGN EXCEPTION FOR DESIGN SPEED (20 mph)

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT B-3709 = 0.050 MI
LENGTH STRUCTURE TIP PROJECT B-3709 = 0.021 MI
TOTAL LENGTH TIP PROJECT B-3709 = 0.071 MI

Prepared In the Office of:
MULKEY ENGINEERS & CONSULTANTS
FOR THE NORTH CAROLINA DEPT. OF TRANSPORTATION

2002 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
JUNE 30, 2004

LETTING DATE:
JULY 19, 2005

TIM S. HAYES, PE
PROJECT ENGINEER

JOHNNY R. BANKS
PROJECT MANAGER

HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

P.E.
SIGNATURE:

ROADWAY DESIGN ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

P.E.
SIGNATURE:

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

P.E.
STATE DESIGN ENGINEER

DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

APPROVED
DIVISION ADMINISTRATOR DATE

MULKEY ENGINEERS & CONSULTANTS

PROJECT REFERENCE NO.	SHEET NO.
B-3709	1-B
R/W SHEET NO.	

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

CONVENTIONAL SYMBOLS

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

*S.U.E = SUBSURFACE UTILITY ENGINEER

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	C A
Prop. Control of Access Line	C A
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	
Cable TV Pedestal	C
U/G TV Cable Hand Hold	
U/G Power Cable Hand Hold	
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	
Storm Sewer Manhole	S
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.*)	?UTL
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	X WW & ISBW
Existing Wetland Boundaries	WLB
High Quality Wetland Boundary	HQ WLB
Medium Quality Wetland Boundaries	MQ WLB
Low Quality Wetland Boundaries	LQ 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

MULKEY
ENGINEERS & CONSULTANTS
PO BOX 33127
RALEIGH, N.C. 27636
(919) 851-1912
(919) 851-1918 (FAX)
WWW.MULKEYINC.COM

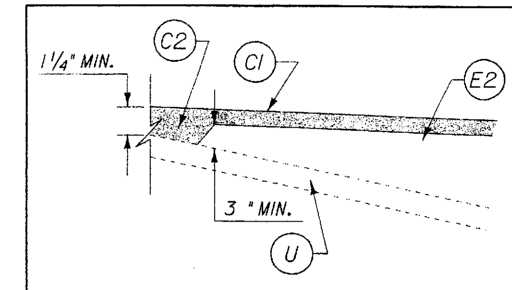
PROJECT REFERENCE NO.	SHEET NO.
B-3709	2
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

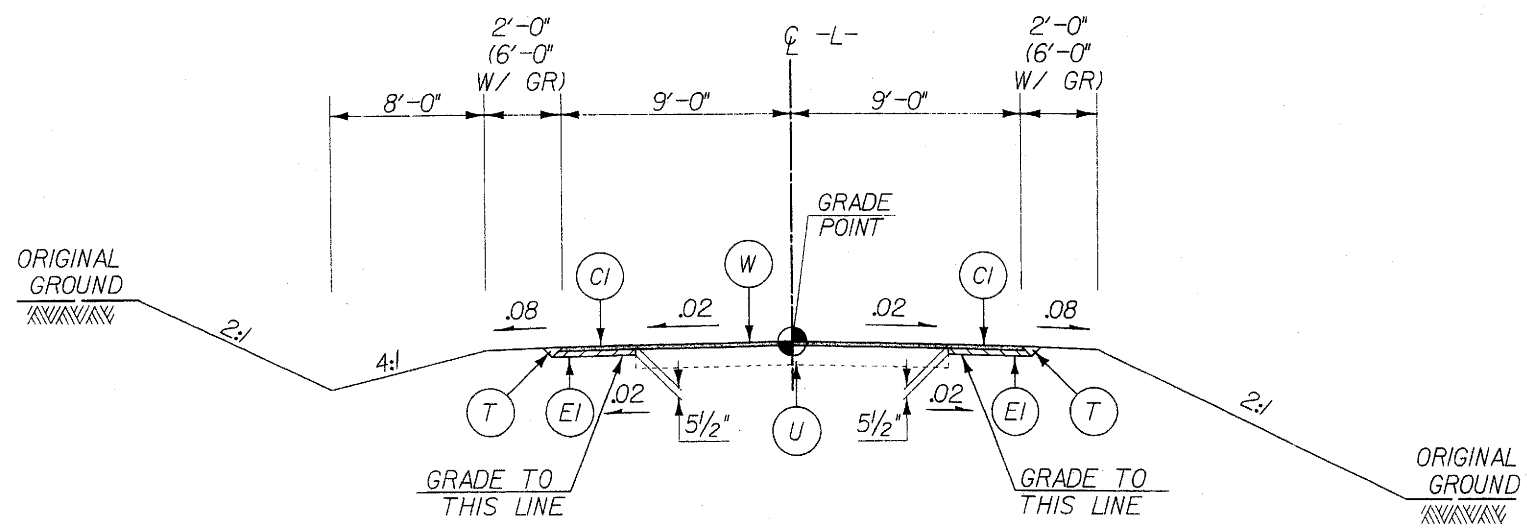
PAVEMENT SCHEDULE

C1	PROPOSED APPROXIMATE 2 1/2" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5A AT AN AVERAGE RATE OF 140 LBS. PER SQ.YARD IN EACH OF TWO LAYERS.
C2	PROPOSED VARIABLE DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5A, AT AN AVERAGE RATE OF 112 LBS. PER SQ.YARD, PER 1" DEPTH, TO BE PLACED IN LAYERS NOT LESS THAN 1 1/4" OR GREATER THAN 1 1/2" IN DEPTH.
E1	PROPOSED APPROXIMATE 3" ASPHALT CONCRETE BASE COURSE. TYPE B25.0B AT AN AVERAGE RATE OF 342 LBS. PER SQ.YARD.
E2	PROPOSED VARIABLE DEPTH ASPHALT CONCRETE BASE COURSE, TYPE B25.0B AT AN AVERAGE RATE OF 114 LBS. PER SQ.YARD PER 1" DEPTH, TO BE PLACED IN LAYERS NOT LESS THAN 3" IN DEPTH OR GREATER THAN 5 1/2" IN DEPTH.
R1	CONCRETE EXPRESSWAY GUTTER
T	EARTH MATERIAL
U	EXISTING PAVEMENT
W	WEDGING (SEE WEDGING DETAIL (W))

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



WEDGING DETAIL (W)



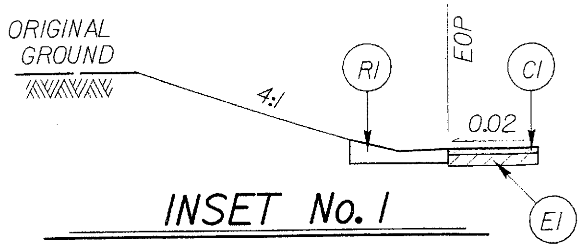
TYPICAL SECTION No. 1

USE TYPICAL SECTION No. 1 AS FOLLOWS:
TRANSITION FROM EXISTING TO T.S. NO. 1 FROM -L- STA. 15+25.00 TO STA. 15+50.00
FROM -L- STA. 15+50.00 TO STA. 16+00 +/-
FROM -L- STA. 18+25 +/- TO STA. 18+55.00
TRANSITION FROM T.S. NO. 1 TO EXISTING FROM -L- STA. 18+55.00 TO STA. 19+00.00

PROJECT REFERENCE NO.	SHEET NO.
B-3709	2-A
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER

MULKEY ENGINEERS & CONSULTANTS

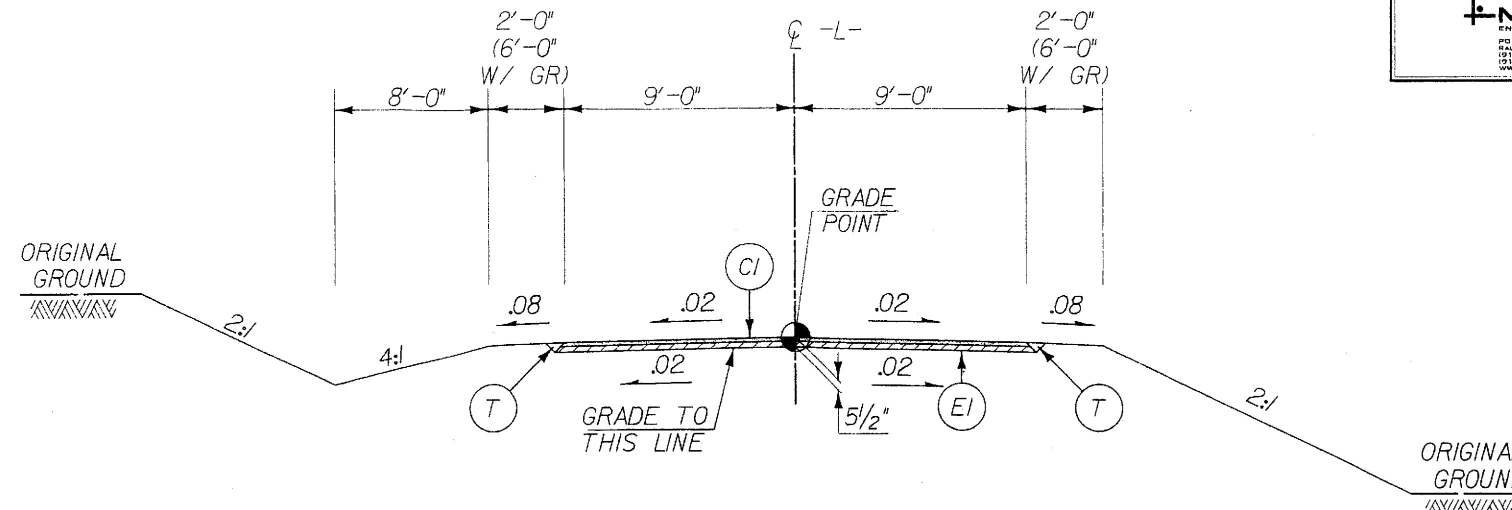
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



INSET No. 1

TO BE USED IN CONJUNCTION WITH TYPICAL SECTION No.2 AS FOLLOWS:

FROM -L- STA.18+27.80 TO STA.18+55.00 LT



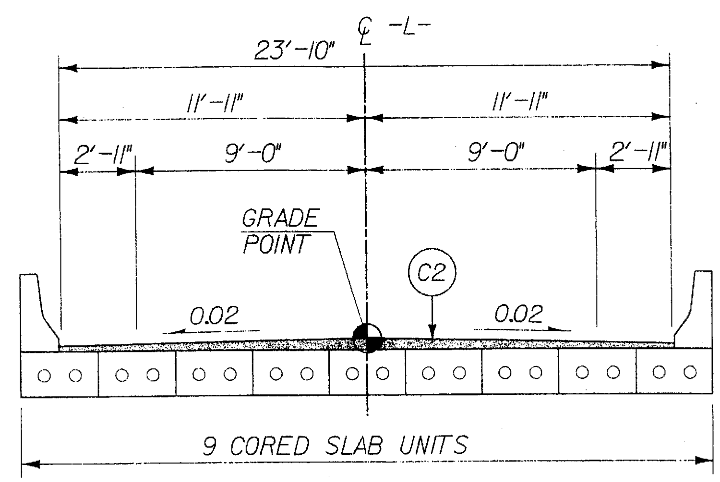
TYPICAL SECTION No. 2

USE TYPICAL SECTION No.2 AS FOLLOWS:

FROM -L- STA.16+00.00 +/- TO STA.16+44.00 (BEGIN BRIDGE)
FROM -L- STA.17+54.00 (END BRIDGE) TO STA.18+25 +/-

CI	2 ½" S9.5A
C2	VAR.DEPTH S9.5A
EI	3" B25.0B
E2	VAR.DEPTH B25.0B
RI	CONC.EXPRESSWAY GUTTER
T	EARTH MATERIAL
U	EXIST.PAVEMENT
W	WEDGING

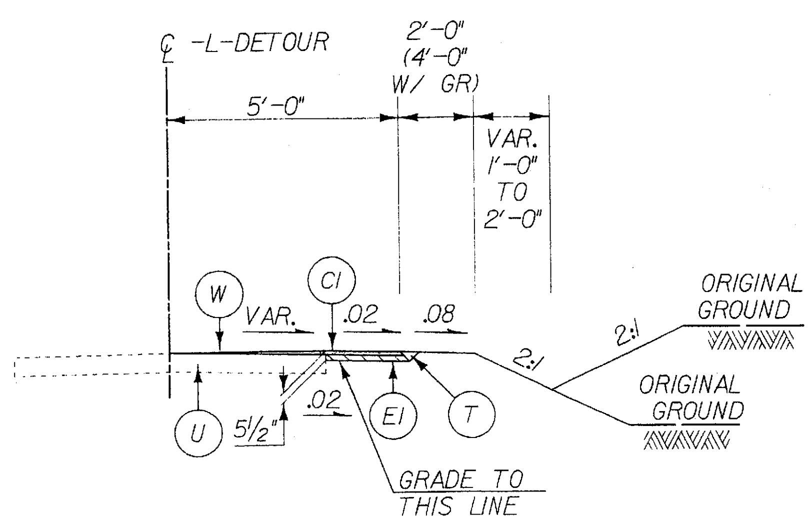
NOTE:
1. SEE SHEET 2 FOR DETAILED DESCRIPTION OF PAVEMENT SCHEDULE.
2. ALL PAVEMENT EDGES ARE 1:1 UNLESS OTHERWISE NOTED.



TYPICAL SECTION No. 3

USE TYPICAL SECTION No.3 AS FOLLOWS:

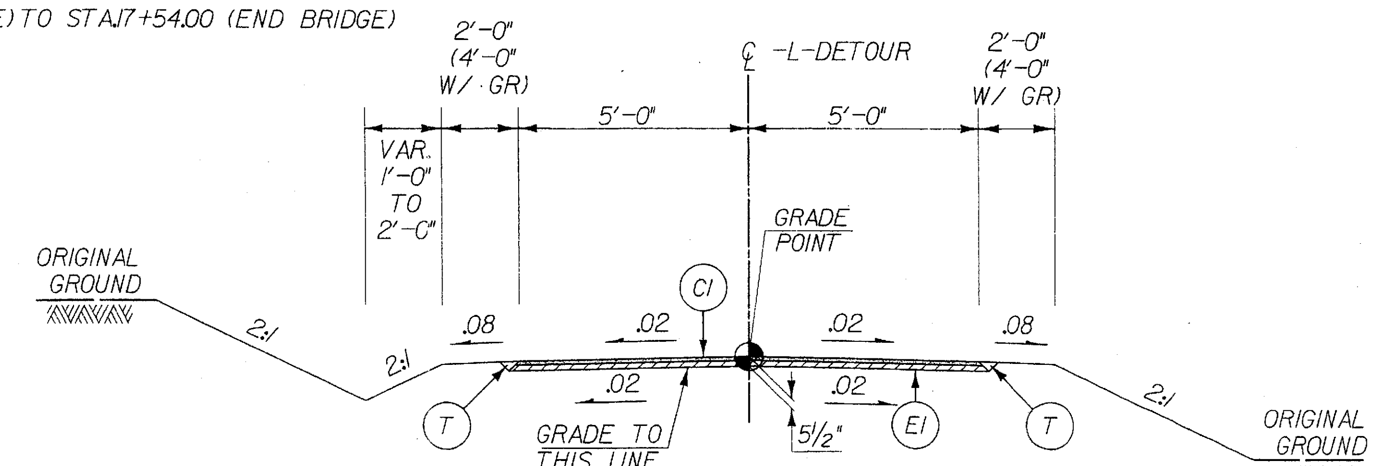
FROM -L- STA.16+44.00 (BEGIN BRIDGE) TO STA.17+54.00 (END BRIDGE)



TYPICAL SECTION No. 4

USE TYPICAL SECTION No.4 AS FOLLOWS:

TRANSITION FROM EXISTING TO T.S. NO.3 FROM -L-DETOUR STA.15+24.36 TO STA.15+66.07
FROM -L-DETOUR STA.15+66.07 TO STA.15+80 +/-
FROM -L-DETOUR STA.18+14 +/- TO STA.18+22.76
TRANSITION FROM T.S. NO.3 TO EXISTING FROM -L-DETOUR STA.18+22.76 TO STA.18+55.49



TYPICAL SECTION No. 5

USE TYPICAL SECTION No.5 AS FOLLOWS:

FROM -L-DETOUR STA.15+80 +/- TO STA.18+14 +/-

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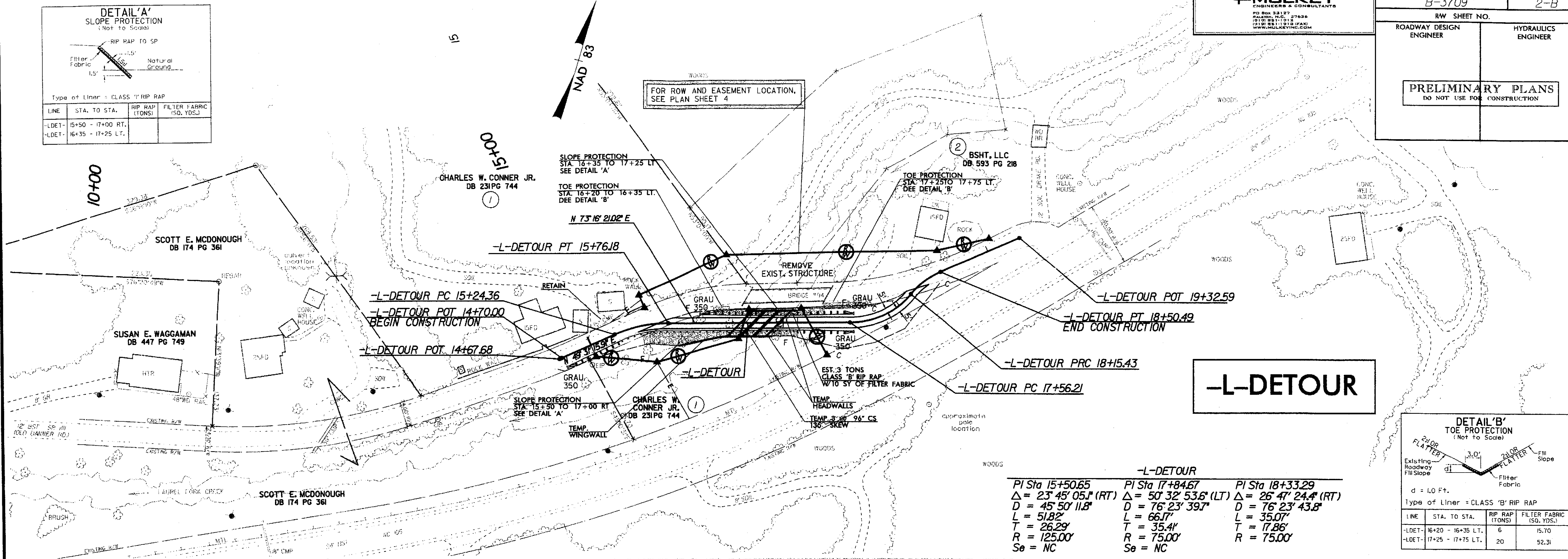
PROJECT REFERENCE NO.	SHEET NO.
B-3709	2-B
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

DETAIL 'A'
SLOPE PROTECTION
(Not to Scale)

Type of Liner = CLASS 'I' RIP RAP

LINE	STA. TO STA.	RIP RAP (TONS)	FILTER FABRIC (SQ. YDS.)
-LDET-	15+50 - 17+00 RT.		
-LDET-	16+35 - 17+25 LT.		



-L-DETOUR

DETAIL 'B'
TOE PROTECTION
(Not to Scale)

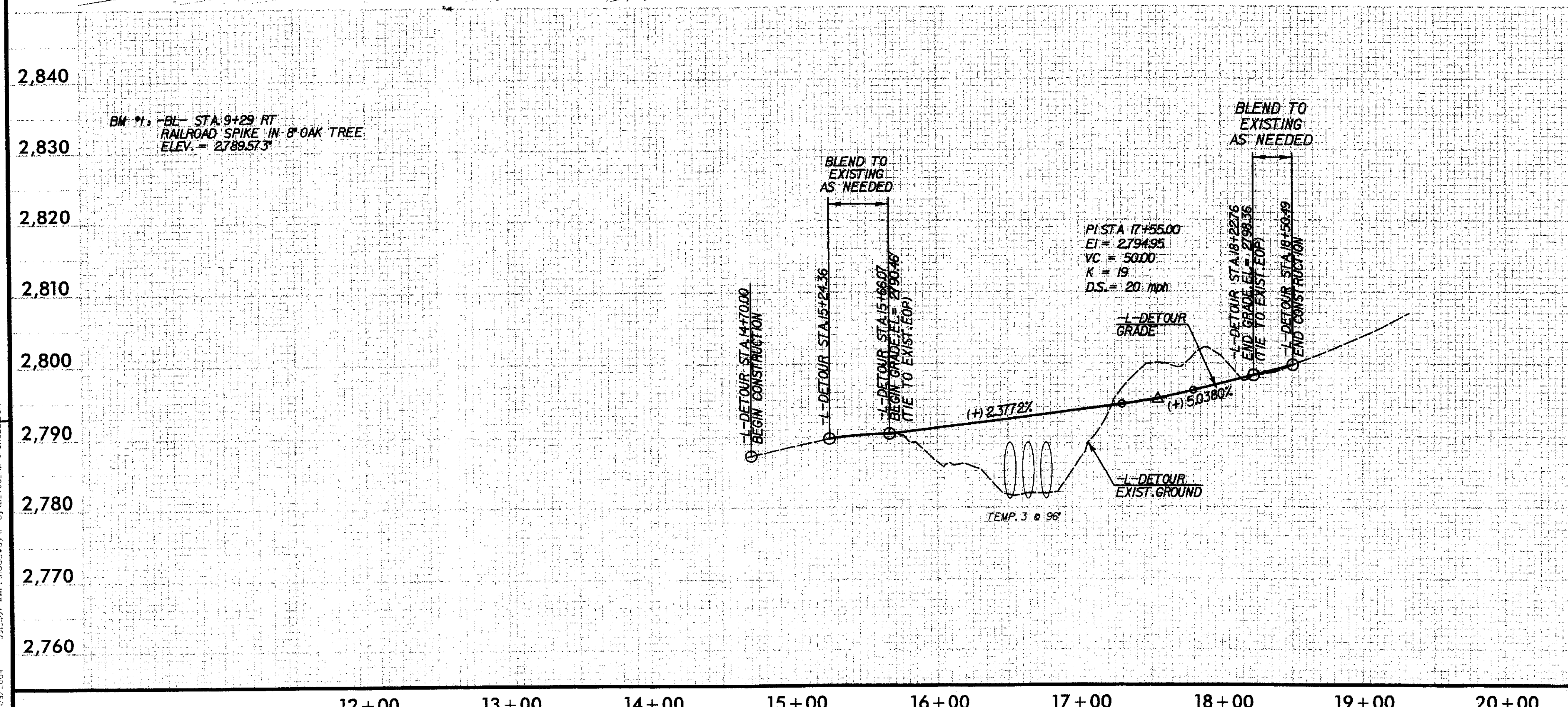
d = 1.0 Ft.

Type of Liner = CLASS 'B' RIP RAP

LINE	STA. TO STA.	RIP RAP (TONS)	FILTER FABRIC (SQ. YDS.)
-LDET-	16+20 - 16+35 LT.	6	15.70
-LDET-	17+25 - 17+75 LT.	20	52.31

-L-DETOUR

PI Sta 15+50.65	PI Sta 17+84.67	PI Sta 18+33.29
Δ = 23° 45' 05.1" (RT)	Δ = 50° 32' 53.6" (LT)	Δ = 26° 47' 24.4" (RT)
D = 45° 50' 11.8"	D = 76° 23' 39.7"	D = 76° 23' 43.8"
L = 51.82'	L = 66.17'	L = 35.07'
T = 26.29'	T = 35.41'	T = 17.86'
R = 125.00'	R = 75.00'	R = 75.00'
Se = NC	Se = NC	



CULVERT HYDRAULIC DATA

DESIGN DISCHARGE	=		CFS
DESIGN FREQUENCY	=	5	YRS
DESIGN HW ELEVATION	=		FT
BASE DISCHARGE	=		CFS
BASE FREQUENCY	=		YRS
BASE HW ELEVATION	=		FT
OVERTOPPING DISCHARGE	=		CFS
OVERTOPPING FREQUENCY	=		YRS
OVERTOPPING ELEVATION	=		FT

REVISIONS

MULKEY ENGINEERS & CONSULTANTS PO Box 33127 Raleigh, N.C. 27636 (919) 851-1912 (919) 851-1918 (FAX) WWW.MULKEYINC.COM	PROJECT REFERENCE NO.	SHEET NO.
	B-3709	3-D
	R/W SHEET NO.	

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

SUMMARY OF EARTHWORK

IN CUBIC YARDS

SURVEY LINE	STATION	STATION	UNCLASSIFIED EXCAVATION	UNDERCUT	EMBANKMENT + %	BORROW	WASTE
-L-	15+25.00	16+44.00	0		71	71	0
BRIDGE							
SUBTOTAL			0		71	71	0
BRIDGE							
-L-	17+54.00	19+00.00	77		48	0	29
SUBTOTAL			77		48	0	29
DETOUR	14+70.00	18+50.49	942		270	0	718
SUBTOTAL			942		270	0	718
PROJECT SUBTOTALS			1,019		389	71	630
EARTH WASTE TO REPLACE BORROW					0	-71	-71
REMOVE DETOUR			270				0
PROJECT TOTALS			1,289		389		559
EST. 5% FOR REPLACING TOP SOIL ON BORROW							
GRAND TOTAL			1,289		389		
SAY			1,350		400		

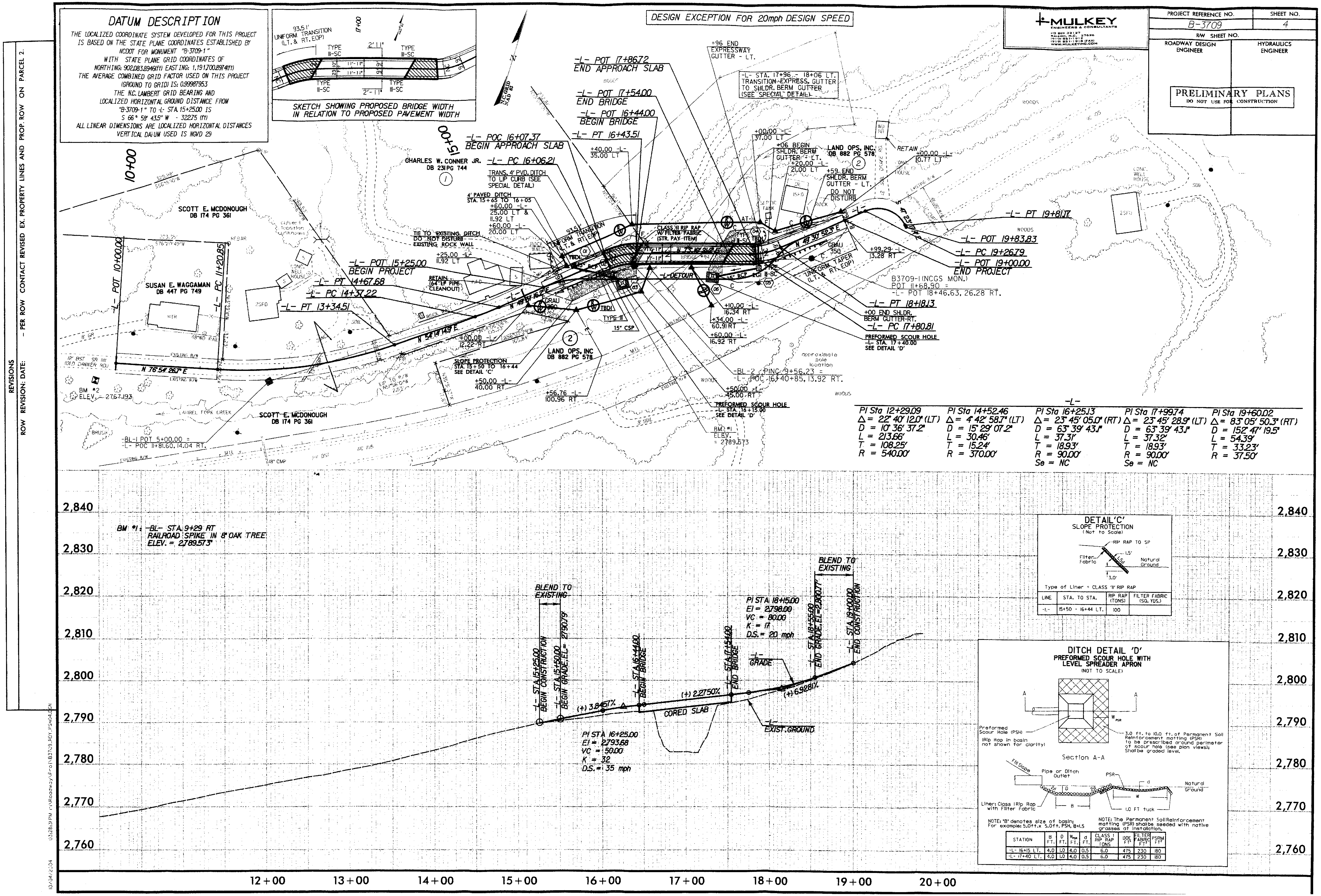
SUMMARY OF PAVEMENT REMOVAL

IN SQUARE YARDS

LOCATION	ASPHALT REMOVAL	ASPHALT BREAK-UP	CONCRETE REMOVAL	CONCRETE BREAK-UP
DETOUR STA. 15+67.06 TO 18+24	307.91 SY			
-L- STA. 16+07.37 TO 16+67.32	73.21 SY			
-L- STA. 17+38.33 TO 17+86.72	79.68 SY			
TOTAL	460.80 SY			
SAY	475 SY			

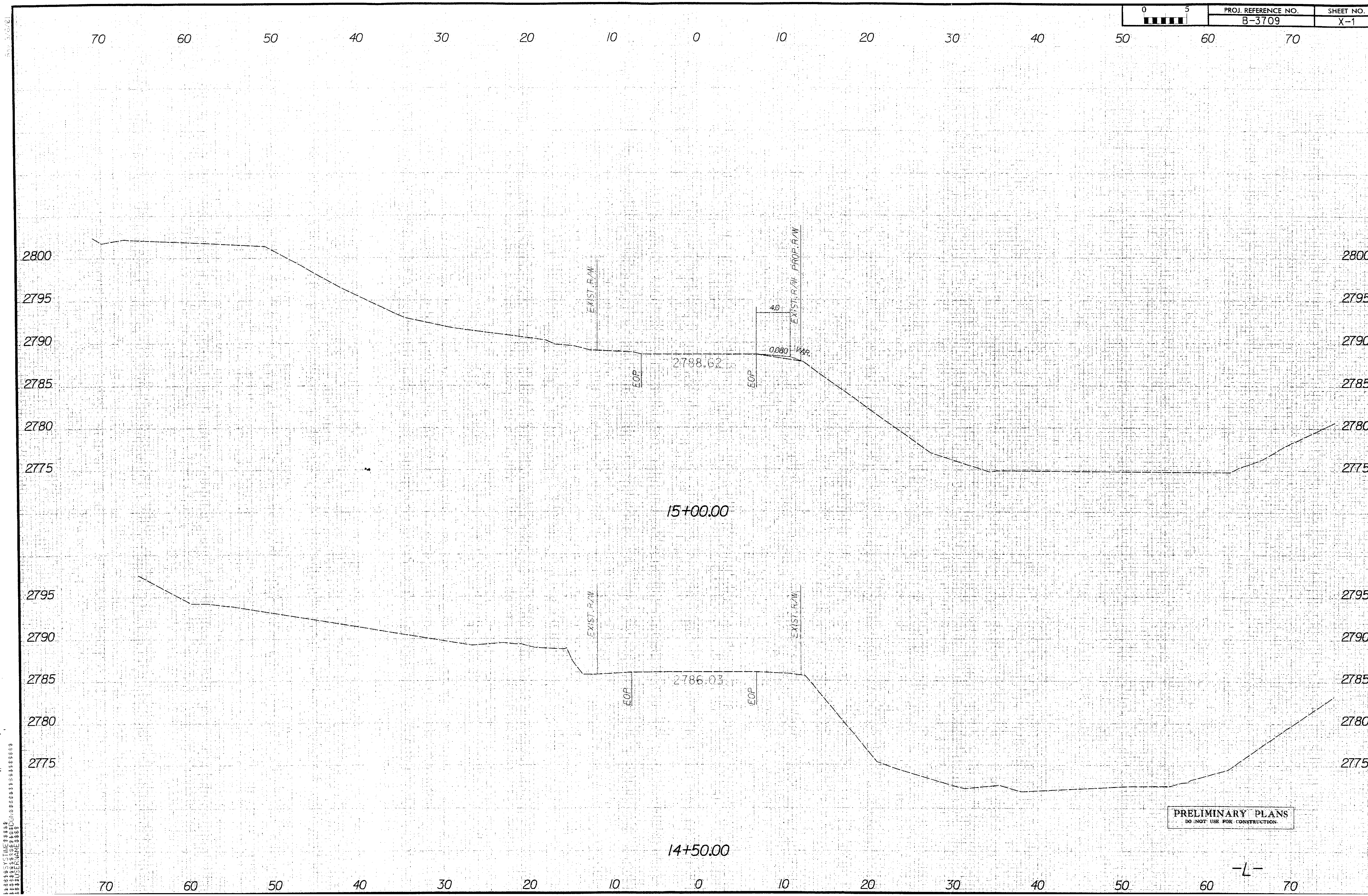
PARCEL INDEX SHEET

PARCEL No.	SHEET No.	PROPERTY OWNERS NAME
1	4	CHARLES W. CONNER JR.
2	4	BSHT, LLC



PROJECT REFERENCE NO. B-3709
SHEET NO. 4
RW SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
MULKEY ENGINEERS & CONSULTANTS
DESIGN EXCEPTION FOR 20mph DESIGN SPEED
DATUM DESCRIPTION
THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCDOT FOR MONUMENT "B-3709-1" WITH STATE PLANE GRID COORDINATES OF NORTHING: 902,083.8946(ft) EASTING: 1,191,700.8974(ft)
THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.99987953
THE NC LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "B-3709-1" TO -L- STA. 15+25.00 IS S 66° 58' 43.5" W - 322.75 (ft)
ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES
VERTICAL DATUM USED IS NGVD 29
SKETCH SHOWING PROPOSED BRIDGE WIDTH IN RELATION TO PROPOSED PAVEMENT WIDTH
REVISIONS
ROW REVISION: DATE: - PER ROW CONTACT REVISED EX. PROPERTY LINES AND PROP. ROW ON PARCEL 2.
-L- POT 17+86.72 END APPROACH SLAB
-L- POT 17+54.00 END BRIDGE
-L- POT 16+44.00 BEGIN BRIDGE
-L- PT 16+43.51
-L- POC 16+07.37 BEGIN APPROACH SLAB
-L- PC 16+06.21
-L- POT 15+25.00 BEGIN PROJECT
-L- PT 14+67.68
-L- PC 14+37.22
-L- PT 13+34.51
-L- POT 10+00.00
-L- PC 11+20.85
-L- PT 19+81.17
-L- POT 19+83.83
-L- PC 19+26.79
-L- POT 19+00.00 END PROJECT
-L- PT 18+18.13
-L- PC 17+80.81
B3709-1 (NCGS MON.) POT 11+68.90 = -L- POT 18+46.63, 26.28 RT.
CHARLES W. CONNER JR. DB 231 PG 744
SCOTT E. MCDONOUGH DB 174 PG 361
SUSAN E. WAGGAMAN DB 447 PG 749
LAND OPS, INC DB 882 PG 578
BM #2 ELEV. = 2767.193
BM #1 ELEV. = 2789.573
-BL-1 POT 5+00.00 = -L- POC 11+81.60, 14.04 RT.
-BL-2 PINC 9+56.23 = -L- POC 16+40.85, 13.92 RT.
PRELIMINARY SCOUR HOLE -L- STA. 16+15.00 SEE DETAIL 'D'
PREFORMED SCOUR HOLE -L- STA. 17+40.00 SEE DETAIL 'D'
SLOPE PROTECTION STA. 15+50 TO 16+44 SEE DETAIL 'C'
-L-
PI Sta 12+29.09 Δ = 22° 40' 12.0" (LT) D = 10° 36' 37.2" L = 213.66' T = 108.25' R = 540.00'
PI Sta 14+52.46 Δ = 4° 42' 58.7" (LT) D = 15° 29' 07.2" L = 30.46' T = 15.24' R = 370.00'
PI Sta 16+25.13 Δ = 23° 45' 05.0" (RT) D = 63° 39' 43.1" L = 37.31' T = 18.93' R = 90.00' Se = NC
PI Sta 17+99.74 Δ = 23° 45' 28.9" (RT) D = 63° 39' 43.1" L = 37.32' T = 18.93' R = 90.00' Se = NC
PI Sta 19+60.02 Δ = 83° 05' 50.3" (RT) D = 152° 47' 19.5" L = 54.39' T = 33.23' R = 37.50'
BM #1: -BL- STA. 9+29 RT RAILROAD SPIKE IN 8" OAK TREE ELEV. = 2789.573'
BLEND TO EXISTING
-L- STA. 15+25.00 BEGIN CONSTRUCTION
-L- STA. 15+50.00 BEGIN GRADE, EL= 2790.79
-L- STA. 16+44.00 BEGIN BRIDGE
-L- STA. 17+54.00 END BRIDGE
-L- STA. 18+55.00 END GRADE, EL= 2800.71
-L- STA. 19+00.00 END CONSTRUCTION
PI STA 16+25.00 EL = 2793.68 VC = 50.00 K = 32 D.S. = 35 mph
PI STA 18+15.00 EL = 2798.00 VC = 80.00 K = 17 D.S. = 20 mph
(+) 3.8457% (+) 2.2750% (+) 6.9281%
CORED SLAB
-L- GRADE
-L- EXIST. GROUND
DETAIL 'C' SLOPE PROTECTION (Not to Scale)
Type of Liner = CLASS 'B' RIP RAP
LINE | STA. TO STA. | RIP RAP (TONS) | FILTER FABRIC (SQ. YDS.)
-L- | 15+50 - 16+44 LT. | 100 |
DITCH DETAIL 'D' PREFORMED SCOUR HOLE WITH LEVEL SPREADER APRON (NOT TO SCALE)
STATION | B FT. | D FT. | W FT. | d FT. | CLASS I RIP RAP TONS | GEO FT² | FILTER FABRIC FT² | PSRM FT²
-L- 16+15 LT. | 4.0 | 1.0 | 4.0 | 0.5 | 6.0 | 475 | 230 | 180
-L- 17+40 LT. | 4.0 | 1.0 | 4.0 | 0.5 | 6.0 | 475 | 230 | 180
2,840 2,830 2,820 2,810 2,800 2,790 2,780 2,770 2,760
12+00 13+00 14+00 15+00 16+00 17+00 18+00 19+00 20+00

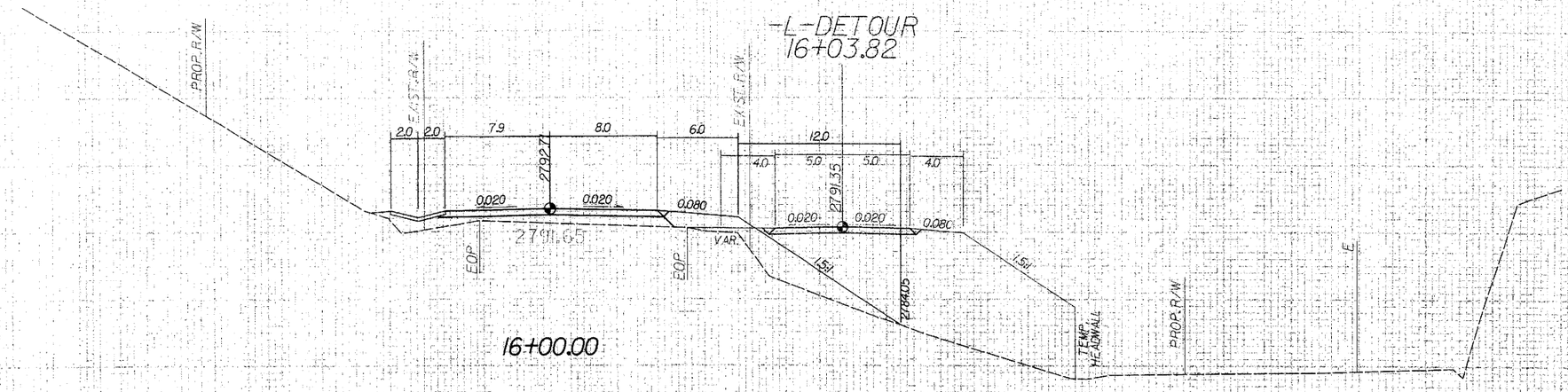
	PROJ. REFERENCE NO.	SHEET NO.
	B-3709	X-1

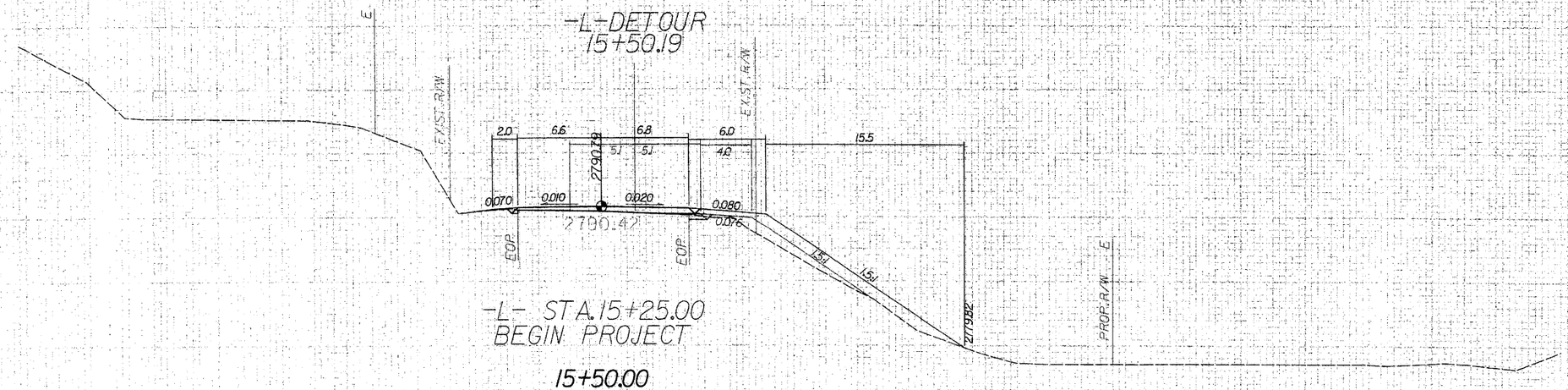


0 5	PROJ. REFERENCE NO.	SHEET NO.
	B-3709	X-2

70 60 50 40 30 20 10 0 10 20 30 40 50 60 70

2805 2800 2795 2790 2785 2780 2775 2770





-L- W/ -L DETOUR-

0 5	PROJ. REFERENCE NO.	SHEET NO.
	B-3709	X-3

70 60 50 40 30 20 10 0 10 20 30 40 50 60 70

2810 2805 2800 2795 2790 2785 2780 2775

PROP. R/W

EXIST. R/W

11'-11" 11'-11"

2795.38

0.020 0.020

2792.75

EOP EOP

EXIST. R/W

TEMP. HEADWALL

-L- DETOUR
16+93.48

4.0 5.0 5.0 4.0

2793.48

0.080 0.020 0.020 0.080

1.5:1 2:1

E

17+00.00

-L- STA. 16+44.00
BEGIN BRIDGE

PROP. R/W

EXIST. R/W

11'-11" 11'-11"

2794.24

0.020 0.020

2792.56

EOP EOP

-L- DETOUR
16+43.48

4.0 5.0 5.0 4.0

2792.30

0.080 0.020 0.020 0.080

2:1 1.5:1

PROP. R/W

PROP. R/W

TEMP. HEADWALL

E

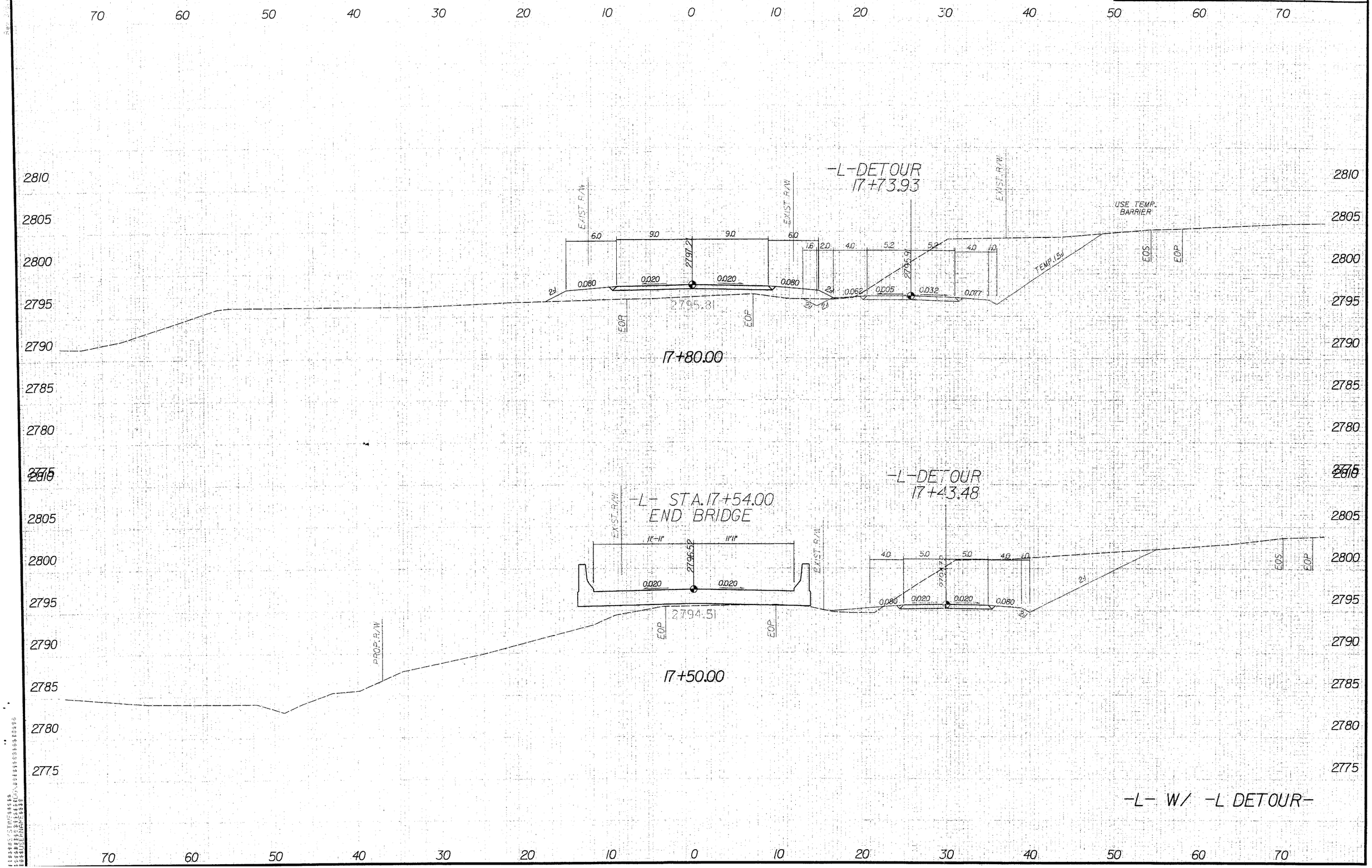
16+50.00

-L- W/ -L DETOUR-

70 60 50 40 30 20 10 0 10 20 30 40 50 60 70

2810 2805 2800 2795 2790 2785 2780 2775

0 5	PROJ. REFERENCE NO.	SHEET NO.
	B-3709	X-4



0 5	PROJ. REFERENCE NO.	SHEET NO.
	B-3709	X-5

70 60 50 40 30 20 10 0 10 20 30 40 50 60 70

2815
2810
2805
2800

PROP. R/W
EXIST. R/W
EXIST. R/W
EXIST. R/W
8.1
8.9
6.0
2800.43
4:1
0.030
0.020
0.080
2800.21
EOP
EOP
2:1
EOS
EOP
EOP
EOS

18+50.00

-L- DETOUR
18+00.53

2815
2810
2805
2800
2795

EXIST. R/W
EXIST. R/W
EXIST. R/W
6.0
9.0
9.0
6.0
2797.24
2797.24
4.0
5.2
5.2
4.0
1.0
2:1
USE TEMP. BARRIER
PROP. R/W
DRIVE
10%
0.080
0.020
0.020
0.080
0.005
0.032
0.077
0.062
2797.00
4R.
2:1
TEMP. 1.5:1
EOP
EOP
EOS
EOP
EOP
EOS

18+00.00

-L- W/ -L DETOUR-

70 60 50 40 30 20 10 0 10 20 30 40 50 60 70

0 5	PROJ. REFERENCE NO.	SHEET NO.
	B-3709	X-6

70 60 50 40 30 20 10 0 10 20 30 40 50 60 70

2820
2815
2810
2805
2800

PROP. R/W
EXIST. R/W
EOP
2809.56
EOP
EOP
EOS

19+50.00

-L- STA. 19+00.00
END CONSTRUCTION

-L- DETOUR
19+05.34
END CONSTRUCTION

EXIST. R/W PROP. R/W
6.6
8.7
2804.25
EOP
EOP
EOS
EOP
EOP
EOS

19+00.00

-L- W/ -L DETOUR-

70 60 50 40 30 20 10 0 10 20 30 40 50 60 70

Watauga County
Bridge No. 94 on SR 1111 Over Laurel Fork Creek
Federal-Aid Project No. BRZ-1111(1)
State Project No. 8.2751801
T.I.P. No. B-3709

CATEGORICAL EXCLUSION

UNITED STATES DEPARTMENT OF TRANSPORTATION

FEDERAL HIGHWAY ADMINISTRATION

AND

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

DIVISION OF HIGHWAYS

APPROVED:

09.10.02
DATE

for Gail Grimes, P.E., Assistant Manager
Project Development and Environmental Analysis Branch,
NCDOT

9/12/02
DATE

for Nicholas L. Graf, P.E.
Division Administrator, FHWA

Watauga County
Bridge No. 94 on SR 1111 Over Laurel Fork Creek
Federal-Aid Project No. BRZ-1111(1)
State Project No. 8.2751801
T.I.P. No. B-3709

CATEGORICAL EXCLUSION

September 2002

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9/5/02
Date

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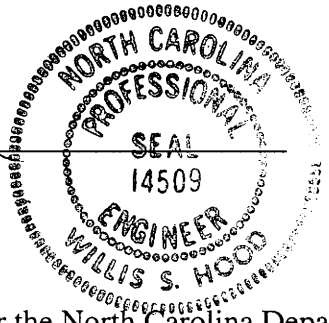

9/5/02
Date

For the North Carolina Department of Transportation

John C. Wadsworth 9.9.02
John C. Wadsworth, PE
Project Manager
Consultant Engineering Unit

PROJECT COMMITMENTS

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

Project Development and Environmental Analysis Branch, Roadway Design, Hydraulics Unit, Roadside Environmental, and Division Engineer:

The following measures will be carried out for the replacement of Bridge No. 94

1. *Instream work and land disturbance within the 25-foot wide buffer zone are prohibited during the brown and brook trout spawning season and during the rainbow trout spawning season of October 15 through April 15 to protect the egg and fry stages of trout from off-site sedimentation during construction.*
2. *Sediment and erosion control measures will adhere to the design standards for sensitive watersheds (15A NCAC 4B.0024).*
3. *Trees and vegetation within the 25-foot stream buffer zone damaged during construction will be replanted with the same mixture of species existing prior to project initiation.*

Project Development and Environmental Analysis Branch:

A copy of the environmental planning document will be submitted to the Tennessee Valley Authority (TVA) and United States Army Corps of Engineers (COE).

Hydraulics Unit / Structure Design Unit:

This project will be reviewed under Section 26a of the Tennessee Valley Authority (TVA) Act. The final bridge plans, hydraulic analysis of the effects of the replacement structure on the 100-year flood elevation, and notice of compliance with the Historic Preservation Act of 1966 will be forwarded to TVA for approval.

Sufficient space for wildlife movement under the bridge will be provided.

Division Construction:

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

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INTRODUCTION: The replacement of Bridge No. 94 is included in the North Carolina Department of Transportation (NCDOT) Draft 2004-2010 Transportation Improvement Program (T.I.P.) and in the Federal-Aid Bridge Replacement Program. The bridge location is shown in Figure 1. No substantial environmental impacts are anticipated. The project is classified as a Federal "Categorical Exclusion".

I. PURPOSE AND NEED

The NCDOT Bridge Maintenance Unit records indicate the bridge has a sufficiency rating of 33.2 out of a possible 100 for a new structure. The bridge is considered functionally obsolete and structurally deficient. The replacement of this inadequate structure will result in safer and more efficient traffic operations.

II. EXISTING CONDITIONS

Bridge No. 94 is located on SR 1111 (Old Danner Road) in Watauga County. SR 1111 is classified as rural local by the statewide functional classification system. Land use in the project area is rural, consisting primarily of light residential development. SR 1111 is a dead end road that serves local residents as a connector to NC 105. The bridge is located in the jurisdiction of the Tennessee Valley Authority (TVA) and will require a TVA Section 26A approval. Watauga County is designated as a trout county by the North Carolina Wildlife Resources Commission.

The existing bridge is a four-span structure with an overall length of 77 feet (23.5 meters) and a clear roadway width of 11.2 feet (3.4 meters). It was constructed in 1959. The bridge consists of a timber deck with an asphalt wearing surface on steel I-beams. The piles, caps, and abutments are timber. Bridge No. 94 currently has posted weight limits of 16 tons (16.25 metric tons) for single vehicle (SV) and 23 tons (23.36 metric tons) for truck-tractor semi trailer (TTST) (Figure 4).

The approach roadway measures 14 feet (4.3 meters) in width. The east approach has a curve with a radius of 218 feet (66 meters) and the west approach has a curve with a radius of 150 feet (76 meters). Both curves are off the end of the bridge. The existing horizontal curve only provides for a safe speed of approximately 20 mph (30 km/h). The speed limit is not posted therefore a statutory speed of 55 miles per hour (mph) applies.

Land use northeast (upstream) and southwest (downstream) of the bridge is mainly a mixture of undeveloped and residential properties. There is a small cabin located in the northeast quadrant of the project . There is a power line located south of the bridge that extends between the stream and NC 105. It is anticipated that the utility impacts will be minimal.

The 2002 estimated average daily traffic (ADT) volume is 22 vehicles per day (vpd). The projected ADT is 40 vpd by the design year 2025. The percentages of truck traffic are 3% dual-tired vehicles (DUALS) and 1% truck-tractor semi-trailer (TTST).

No accidents were reported near Bridge No. 94 during the period from July 1, 1997 to June 30, 2000.

This section of SR 1111 in Watauga County is not part of a designated bicycle route nor is it listed in the T.I.P. as needing incidental bicycle accommodations.

No school busses cross this bridge.

III. ALTERNATIVES

A. Project Description

The proposed replacement structure for Bridge No. 94 is a cored slab bridge approximately 100 feet (30 meters) in length with a minimum grade of 0.3 percent to facilitate deck drainage. The proposed bridge will be at approximately the same elevation as the existing bridge. The proposed bridge will consist of two 9-foot (2.7 meter) travel lanes and 2-foot (0.6 meter) shoulders (See Figure 3).

The proposed approach roadway will consist of two nine-foot (2.7 meter) travel lanes and two-foot (0.6 meter) shoulders (Figure 3). The proposed grade will be approximately the same as the existing roadway.

SR 1111 is a dead end road with a projected design year (2025) volume of 40 vehicles per day (vpd). Per the NCDOT Design Manual Part I 1-1B, minimum design speeds for local rural roads with current average daily traffic volumes of 50 vpd or less, a minimum design speed of 20 miles per hour will be used.

B. Build Alternatives

Alternative A (Preferred) consists of realignment just north of the existing bridge (Figure 2). Adequate distance from the existing bridge will be provided so that traffic can be maintained on the existing structure. In the northeast quadrant of the project, valley gutter will be used. This will facilitate drainage and avoid impact to the cabin. A pile panel retaining wall will be used in the northwest quadrant to minimize environmental impacts. The roadway approach work will extend approximately 200 feet west of Bridge No. 94 and approximately 150 feet east of Bridge No. 94.

Alternative B replaces the bridge in place with a new bridge (Figure 2A). During construction, traffic will be maintained by an on-site detour south of the existing bridge. The roadway approach work will extend approximately 160 feet west of Bridge No. 94 and approximately 120 feet east of Bridge No. 94.

Alternative B was not selected as the preferred alternative due to the confined space and close proximity to NC 105. Construction of an on-site detour would require considerable effort. In addition, use of an on-site detour may increase construction time and is less economical than maintaining traffic on the existing structure.

C. Alternatives Eliminated from Further Study

Alternative C consists of replacing the bridge on new alignment north of the existing bridge. Traffic will be maintained on the existing bridge during construction. The roadway approach work will extend approximately 200 feet west of Bridge No. 94 and approximately 125 feet east of Bridge No. 94. Alternative C was dropped as a preliminary alternative because it will require the removal of the cabin in the northeast quadrant of the project.

Alternative D replaces the bridge on new alignment south of the existing bridge. Traffic will be maintained on the existing bridge during construction. The roadway approach work will extend approximately 145 feet west of Bridge No. 94 and approximately 190 feet east of Bridge No. 94. Alternative D was dropped as a preliminary alternative because of the need for a retaining wall and close proximity to NC 105.

The "do-nothing' alternative will eventually necessitate removal of the existing structure and closure of SR 1111 (Old Danner Road). This is not desirable due to the service provided by SR 1111 (Old Danner Road)

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

D. Preferred Alternative

Alternative A Preferred consists of realignment just north of the existing bridge. Adequate distance from the existing bridge will be provided so that traffic can be maintained on the existing structure. In the northeast quadrant of the project, valley gutter will be used. This will facilitate drainage and avoid impact to the cabin. The roadway approach work will extend approximately 200 feet west of Bridge No. 94 and approximately 150 feet east of Bridge No. 94.

Based on the preliminary hydraulics report, the drainage area at the bridge crossing is approximately 7.0 square miles (18.1 square kilometers). The proposed replacement structure for Bridge No. 94 is a new bridge approximately 100 feet (30 meters) in length. The length and opening size of the proposed structure may increase or decrease as necessary to accommodate peak flows, as determined by a more detailed hydraulic analysis to be performed during the final design phase of the project.

The Division Engineer concurs with Alternative A as the preferred alternative.

E. Anticipated Design Exceptions

The speed limit on SR 1111 is not posted therefore a statutory speed limit of 55 mph (90 km/h) applies. The existing horizontal and vertical geometric design does not meet the design requirements for the statutory speed limit. SR 1111 is a dead end road with a projected design year (2025) volume of 40 vehicles per day (vpd). A design exception for the proposed design speed of 20 mph (30 km/h) will be required.

IV. ESTIMATED COST

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

	ALTERNATIVES	
	A (Preferred)	**B**
Structure Removal (Existing)	$ 7,550	$ 7,550
Structure Proposed	143,000	143,000
Roadway Approaches	76,600	42,700
Temporary Structure	0	33,650
Detour Approaches	0	31,800
Miscellaneous and Mobilization	102,850	116,300
Engineering Contingencies	70,000	75,000
ROW/Const. Easements/Utilities	35,000	55,000
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TOTAL	$435,000	$505,000

The estimated cost of the project as shown in the Draft 2004-2010 Transportation Improvement Program is $470,000, including $35,000 for right-of-way and $350,000 for construction.

V. NATURAL RESOURCES

A. Methodology

Information sources used to prepare this report include but are not limited to: USGS Boone, NC 7.5 minute series topographic map (1978); United States Department of Agriculture, Natural Resources Conservation Service (USDA-NRCS) Soil Survey Field Sheets F-24, E-18, and E-21, Watauga County, NC (mapping completed 1993-1994); United States Fish and Wildlife Service (USFWS) National Wetlands Inventory map (Boone, NC, 1994); USFWS Endangered, Threatened, and Candidate Species and Federal Species of Concern in North Carolina (March 7, 2002); North Carolina Natural Heritage Program (NCNHP) computer database, via the Internet, of rare species and unique habitats and aerial photography of the study area. A field survey was conducted on September 26, 2000.

Impacts to terrestrial communities were calculated by measuring all potentially impacted areas up to 10 feet (3 meters) outside slope stakes. Aquatic impacts were calculated by measuring the length and width of the replacement structure over water. The impact calculations represent the worst-case scenario. Actual construction impacts are expected to be less.

B. Physiography and Soils

The proposed project lies within the Mountain Physiographic Province, which includes all parts of North Carolina west of the foot of the Blue Ridge Escarpment. This province consists of a mixture of igneous, sedimentary, and metamorphic rock that has been squeezed, fractured, faulted and twisted into folds (USGS, 1991). The topography of the project vicinity can be characterized as steeply sloping, with more level areas in valleys between slopes. Elevations in the project vicinity range from approximately 2,800 to 3,520 feet (853 to 1,073 meters) above mean sea level (msl). Elevations in the project area vary from approximately 2,800 to 2,840 feet (853 to 866 meters) above msl. Current land use in the project vicinity is a mixture of rural residential and undeveloped properties, and scattered small businesses. Expansive undeveloped areas are mainly associated with steep topography that is not conducive to development.

Watauga County currently has no published soil survey. Soil Survey Field Sheets were utilized to study the soils within the project area. Soil series descriptions are given below.

Site indices provided within soil series descriptions are a designation of the quality of a forest site. The indices are based on the average height attained by dominant and codominant trees in a fully stocked stand at an arbitrarily chosen age. Soil surveys typically use 50 years as a base age.

Cullasaja very cobbly loam, 8 to 15 percent slopes, extremely bouldery, is located adjacent to the stream in all quadrants of the project study area. This soil is very deep and well drained. A significant amount of gravel, cobbles, and stones are found throughout, as well as occasional surface boulders. Permeability is moderately rapid and shrink-swell potential is low. The seasonal high water table is below a depth of 6 feet (1.8 meters). The site index for yellow-poplar on this soil is 103, indicating a fair suitability for this species. No other site indices were provided.

Ashe-Chestnut complex, very rocky, 50 to 95 percent slopes, is found within the study area adjacent to and on the north side of SR 1111. Chestnut soils are moderately deep and well drained. They consist of a significant amount of gravel and cobbles as well as occasional surface stones. Soft bedrock is within a depth of 20 to 40 inches (51 to 102 centimeters). Permeability is moderately rapid and shrink-swell potential is low. The seasonal high water table is below a depth of 6 feet (1.8 meters). Ashe soils are

moderately deep and somewhat excessively drained. Occasional stones are found on the surface and hard bedrock is within a depth of 20 to 40 inches (51 to 102 centimeters). Permeability is moderately rapid and the shrink-swell potential is low. The seasonal high water table is below a depth of 6 feet (1.8 meters). Site indices for Ashe soils include 56 for pitch pine and scarlet oak, and 78 for northern red oak and eastern white pine. Chestnut soils have site indices of 78 for eastern white pine, 68 for scarlet oak, and 76 for northern red oak. These indices suggest that Ashe-Chestnut complex soils have a good suitability for pitch pine and northern red oak, and a fair suitability for scarlet oak and eastern white pine.

None of the soils described above are listed as hydric or have hydric inclusions.

C. Water Resources

1. Waters Impacted

The proposed project falls within the Watauga River Basin, and has a subbasin designation of 04-02-01 and a federal hydrologic unit designation of 06010103. Characteristics of impacted waters and possible sources of pollution are discussed below. Note that consultation with the Tennessee Valley Authority is required for streams in the project vicinity.

2. Water Resource Characteristics

Laurel Fork Creek flows in a southwest direction in the study area. The drainage area at the bridge crossing is approximately 7.0 square miles (18.1 square kilometers). On the day of the site investigation, the water was a medium brown color and the flow was moderately swift. There was an abundance of rain the day and night prior to the investigation. It is expected that the water would typically have a better level of clarity. Creek depth near the bridge was approximately 1 to 2 feet (0.3 to 0.6 meters), with some deeper pool areas. The stream width at the bridge, from water's edge, was about 35 to 40 feet (10.7 to 12.2 meters). A series of small waterfalls is visible upstream from the bridge. Investigation of the substrate revealed mostly small to medium sized rocks. There was a thin layer of coarse sand either between or on top of the rock in some areas. Bedrock was evident in some areas and scattered boulders were present. Stream banks appeared stable in most locations due to the presence of rock or vegetation along the banks and at the edge of the water. The creek is classified on the Boone, NC NWI map as "riverine, upper perennial, unconsolidated bottom, permanently flooded".

3. Best Usage Classifications and Water Quality

Laurel Fork Creek is classified as "C Tr" by the North Carolina Department of Environment and Natural Resources (NCDENR). Class "C" indicates fresh waters protected for secondary recreation, fishing, aquatic life including propagation and survival, and wildlife. The supplemental classification of "Tr" indicates trout waters, which are suitable for natural trout propagation and maintenance of stocked trout. The classification index number and date for the above data is 8-10, 5/15/63.

Scoping comments received from the North Carolina Division of Water Quality (NCDWQ) (Appendix) note that due to the above classifications, "Design Standards in Sensitive Watersheds" (15A NCAC 04B .0024) should be strictly adhered to throughout the design and construction of the project. Additional scoping comments from this agency note that replacing the bridge with a bridge rather than a culvert is preferable.

Benthic macroinvertebrates or benthos, are organisms that live in and on the bottom substrates of rivers and streams. The NCDWQ uses benthos data as a tool to monitor water quality since benthic macroinvertebrates are sensitive to subtle changes in water quality. Formerly, the NCDWQ used the Benthic Macroinvertebrate Ambient Network (BMAN) as a primary tool for water quality assessment, but

phased this method out several years ago. The DWQ has converted to a basin wide assessment sampling protocol. Each river basin in the state is sampled once every five years and the number of sampling stations has been increased within each basin. Each basin is sampled for biological, chemical and physical data.

The NCDWQ includes the North Carolina Index of Biotic Integrity (NCIBI), as another method to determine general water quality in the basin wide sampling. The NCIBI is a modification of the Index of Biotic Integrity (IBI) initially proposed by Karr (1981) and Karr, et al. (1986). The IBI method was developed for assessing a stream's biological integrity by examining the structure and health of its fish community. The Index incorporates information about species richness and composition, trophic composition, fish abundance, and fish condition. The NCIBI summarizes the effects of all classes of factors influencing aquatic faunal communities (water quality, energy source, habitat quality, flow regime, and biotic interactions).

According to the NCDWQ, sampling for benthic macroinvertebrates was undertaken in September 1994 and July 1999 in Laurel Fork Creek at SR 1111. A rating of Good-Fair was given on both occasions. This is a fairly low rating for the area in general, suggesting that some moderate impacts from non-point source runoff or local industries has occurred. NCDWQ indicated that during low flow, this site has heavy periphyton growths, suggesting some enrichment. NCDWQ does not have fish sampling data for Laurel Fork Creek.

A search within 1 mile (1.6 kilometers) of the project area was conducted for National Pollutant Discharge Elimination System (NPDES) discharges. Point-source discharges throughout North Carolina are permitted through this program. According the NPDES Unit at the NCDWQ, three minor permitted discharges are located within the search distance. The permit numbers are NC0032166, NC0061425, and NC0038041.

Storm water runoff from SR 1111 and an adjacent unpaved road north of the stream may cause water quality degradation in the project study area as non-point source pollutants. Non-point source refers to runoff that enters surface waters through storm water flow or no defined point of discharge. An additional non-point source of pollution could be runoff associated with the steep mountainside adjacent to SR 1111. Portions of this area consist of exposed rock and shallow soils. Although most areas are well vegetated, during heavy rains it could be possible for soil to wash from the rock and eventually into the stream.

4. Anticipated Impacts to Water Resources

a) General Impacts

The Watauga River is less than 0.5 miles (0.8 kilometers) downstream from the study area. It is classified in that area as "B Tr HQW". Class "B" waters are suitable for primary recreation and any other usage specified by the "C" classification. As previously indicated, the supplemental classification of "Tr" denotes trout waters. The supplemental classification of "HQW" indicates high quality waters, which may include any of the following: waters rated as excellent based on biological and physical/chemical characteristics through NCDWQ monitoring or special studies; native and special native trout waters (and their tributaries) designated by the North Carolina Wildlife Resources Commission (NCWRC); primary nursery areas designated by the Marine Fisheries Commission and other functional nursery areas designated by the NCWRC; critical habitat areas designated by the NCWRC or Department of Agriculture; all water supply watersheds which are either classified as WS-I or WS-II or petitioned to be classified as such.

There are no other waters within 1 mile (1.6 kilometers) of the project study area classified as High Quality Waters (HQW), Water Supplies (WS-I: undeveloped watershed, or WS-II: predominately undeveloped watersheds), or Outstanding Resource Waters (ORW).

Impacts to water resources can occur during construction. The NCDOT, in cooperation with the NCDWQ, has developed a sedimentation control program for highway projects, which adopts formal best management practices (BMPs) for the protection of surface waters. The following are some of the standard methods to reduce sedimentation and water quality impacts:

- strict adherence to BMPs for the protection of surface waters during the life of the project;
- reduction and elimination of direct and non-point discharge into the water bodies and minimization of activities conducted in the water;
- placement of temporary ground cover or re-seeding of disturbed sites to reduce runoff and decrease sediment loadings;
- reduction of clearing and grubbing along stream banks.

Due to the distance to high quality waters downstream from the study area, as well as the trout waters within the study area, BMPs particularly relevant to protection of these special waters will be adhered to.

5. Impacts Related to Bridge Demolition and Removal

In order to protect the water quality and aquatic life in the area affected by this project, the NCDOT and all potential contractors will follow appropriate guidelines for bridge demolition and removal. These guidelines are presented in three NCDOT documents entitled "Pre-Construction Guidelines for Bridge Demolition and Removal", "Policy: Bridge Demolition and Removal in Waters of the United States", and "Best Management Practices for Bridge Demolition and Removal" (all documents dated 9/20/99). Guidelines followed for bridge demolition and removal are in addition to those implemented for Best Management Practices for the Protection of Surface Waters.

Dropping any portion of the structure into Waters of the United States will be avoided. The superstructure of Bridge No. 94 consists of a timber deck on steel I-beams. The substructure consists of timber caps, piles, and bulkheads at both abutments. Since the bridge is composed completely of timber and steel, it will be removed without dropping any component into waters of the United States.

If removal of the substructure will create disturbance in the streambed, a turbidity curtain can be utilized. Although most of the substrate consists of rock, there are some areas with a layer of sand. Due to the substrate composition, this project is considered borderline in terms of the effectiveness of a turbidity curtain. Since high quality waters are downstream within the project vicinity, the turbidity curtain would provide an extra level of precaution against transmitting sediment.

Under the guidelines presented in the documents noted in the first paragraph of this section, work done in the water for this project would fall under Case 2, which states that no work shall be performed in the water during moratorium periods associated with fish migration, spawning, and larval recruitment into nursery areas. This conclusion is based upon the classification of the waters within the project area and comments received from the NCWRC.

D. Biotic Resources

1. Plant Communities

Classification of plant communities is based on the 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 plants noted, however subsequent references to the same species include the common name only. Vascular plant names follow nomenclature found in Radford et al. (1968) unless more current information is available. Terrestrial communities found at this site include Montane Oak-Hickory Forest and Man-Dominated Community (Figures 2A-2D). Descriptions are provided below.

a) Montane Oak-Hickory Forest

Shafale and Weakley (1990) note that this community type has a mixed canopy that may vary substantially. Possible reasons include widespread logging and death of American chestnut (*Castanea dentata*). They comment that this community type may be one of the more common in the mountains, partly because the category is broadly defined. Montane Oak-Hickory Forests occur on dry-mesic slopes and somewhat sheltered ridgetops at elevations ranging from approximately 2,500 to 5,000 feet (762 to 1,524 meters).

This community occurs within the project study area north of SR 1111 on a very steep slope. Species observed include chestnut oak (*Quercus prinus*), northern red oak (*Quercus rubra*), southern red oak (*Quercus falcata*), black locust (*Robinia pseudo-acacia*), yellow-poplar (*Liriodendron tulipifera*), American hornbeam (*Carpinus caroliniana*), green ash (*Fraxinus pennsylvanica*), black walnut (*Juglans nigra*), red maple (*Acer rubrum*), buckeye (*Aesculus* sp.), witch-hazel (*Hamamelis virginiana*), elderberry (*Sambucus canadensis*), Joe-pye-weed (*Eupatorium fistulosum*), false Soloman's seal (*Smilacina racemosa*), and aster (*Aster curtisii*). Oaks were the most dominant canopy species. Shrub and herbaceous layers were somewhat thin due to the maturity of the forest.

Species noted above that are usually associated with somewhat less dry sites than this were more abundant along the toe of the slope and near the stream, along with eastern hemlock (*Tsuga canadensis*). Due to the small size of the area where the vegetation changes were noted, the area was not separated into a different community classification.

b) Man-Dominated Community

The remainder of the project study area falls within this community type, which includes maintained yards of private residences, and disturbed roadside areas. Common species include aster, goldenrod (*Solidago* spp.), Chinese privet (*Ligustrum sinense*), scattered saplings of yellow-poplar and red maple, blackberry (*Rubus* sp.), poison ivy (*Toxicodendron radicans*), and a small amount of black willow (*Salix nigra*) along the stream banks.

2. Wildlife

a) Terrestrial

Wildlife species identified in the field are based upon sight, sound, or other characteristic signs. Field guides are also utilized to determine additional species that may find suitable habitat in the project area, but that were not identified during the site investigation.

Although wildlife species were actively searched for, very few were found. A woodchuck (*Marmota monax*) was seen along the roadside just north of SR 1111, and a gray squirrel (*Sciurus carolinensis*) was sighted along the stream.

Species that may find habitat in the Montane Oak-Hickory Forest include eastern chipmunk (*Tamias striatus*), golden mouse (*Ochrotomys nuttalli*), red bat (*Lasiurus borealis*), and timber rattlesnake

(*Crotalus horridus*). Cedar waxwing (*Bombycilla cedrorum*), red-eyed vireo (*Vireo olivaceus*), white-breasted nuthatch (*Sitta carolinensis*), and least flycatcher (*Empidonax mimus*) are among the species of birds that could find habitat within the Montane Oak-Hickory Forest.

The Man-Dominated Community could provide suitable habitat for Virginia opossum (*Didelphis virginiana*), woodland vole (*Microtus pinetorum*), black racer (*Coluber constrictor*), American goldfinch (*Carduelis tristis*), and eastern phoebe (*Sayornis phoebe*), among others.

b) Aquatic

Dipnetting and streamside area searches revealed no aquatic species. Typical species that may utilize Laurel Fork Creek include queen snake (*Regina septemvittata*), eastern garter snake (*Thamnophis sirtalis*), northern water snake (*Nerodia sipedon*), seal salamander (*Desmognathus monticola*), shovelnose salamander (*Leurognathus marmoratus*), and green frog (*Rana clamitans*). Fish species may include rock bass (*Ambloplites rupestris*), rosyside dace (*Clinostomus funduloides*), central stoneroller (*Campostoma anomalum*), and various species of trout, among others.

The NCWRC noted that Laurel Fork Creek contains both rainbow (*Oncorhynchus mykiss*) and brown (*Salmo trutta*) trout and requests a moratorium of October 15 to April 15 to protect eggs and fry of these species. NCWRC commented that a bridge would be preferable to a culvert for replacement.

4. Anticipated Impacts to Biotic Communities

a) Terrestrial Communities

Of the two terrestrial communities present, the Man-Dominated Community will be impacted the most (Table 1). Alternative B has additional temporary impacts associated with it. This community is already highly disturbed and impacts to it are not considered substantial in terms of loss of habitat or diversity.

The Montane Oak-Hickory Forest will be most impacted by Alternative A. Impacts are less than 0.25 acres (0.10 hectares), and occur along somewhat disturbed edges. These minor impacts are not expected to negatively impact wildlife habitat or any rare plant species. Impacts to this community from other alternatives are minimal.

TABLE 1:
ANTICIPATED IMPACTS TO TERRESTRIAL AND AQUATIC COMMUNITIES

Bridge No. 94 Replacement Impacts	Montane Oak-Hickory Forest acre (ha)	Man-Dominated Community acre (ha)	Aquatic Community acre (ha)
Alternative A	0.15 (0.06)	0.29 (0.12)	<0.02 (<0.01)
Alternative B	0.03 (0.01)	0.20 (0.08)	0.02 (<0.01)
Alternative B Temporary Detour	0.00 (0.00)	0.14 (0.06)	<0.01 (<0.01)

Table 1 Notes:
Terrestrial impacts calculated to 10 feet (3 meters) outside slope stakes, aquatic impacts calculated using length and width of structure over water.

Actual construction impacts may be less than those indicated above, calculations were based on the worst-case scenario.

b) Aquatic Communities

The replacement of Bridge No. 94 over the Laurel Fork Creek may result in up to 0.02 acres (<0.01 hectares) of aquatic impacts. This figure is obtained by measuring the width of the bridge over water times the length of the bridge over water. Since the existing bridge will be replaced with a bridge, this figure implies more impact than will realistically take place. Since appropriate guidelines will be followed relevant to trout waters and BMPs, this project will not result in notable losses to aquatic species or habitats.

E. Special Topics

1. Waters of the United States

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 USACE.

Up to 35 linear feet (10.7 linear meters) of jurisdictional surface waters may be impacted by this project. If the on-site detour associated with Alternative B is used, an additional 13 linear feet (4.0 linear meters) of temporary impacts to jurisdictional surface waters could occur. Since the bridge will be replaced with a bridge, impacts are mainly related to the width of the structure over water, and do not reflect actual impacts to the streambed.

Investigation into wetland occurrence in the project study area was conducted using methods of the 1987 USACE Wetlands Delineation Manual. **No wetlands were found within the project study area.**

2. Permits

a) Section 404 of the Clean Water ACT

In accordance with Section 404 of the Clean Water Act (CWA) (33 U.S.C. 1344.), a permit is required from the USACE for projects of this type for the discharge of dredged or fill material into Waters of the United States. The USACE issues two types of permits for these activities. A general permit may be issued on a nationwide or regional basis for a category or categories of activities when: those activities are substantially similar in nature and cause only minimal individual and cumulative environmental impacts, or when the general permit would result in avoiding unnecessary duplication or regulatory control exercised by another Federal, state, or local agency provided that the environmental consequences of the action are individually and cumulatively minimal. If a general permit is not appropriate for a particular activity, then an individual permit must be utilized. Individual permits are authorized on a case-by-case evaluation of a specific project involving the proposed discharges.

It is anticipated that this project will fall under Nationwide Permit 23, which is a type of general permit. Nationwide Permit 23 is relevant to approved Categorical Exclusions. Activities under this permit are categorically excluded from environmental documentation because they are included within a category of activities, which neither individually nor cumulatively have a substantial effect on the human environment. Activities authorized under nationwide permits must satisfy all terms and conditions of the particular permit.

b) Section 401 Water Quality Certification

A Section 401 Water Quality Certification from the state is necessary for projects that require Section 404 Permits. The state has General Certifications that will match the permit type authorized by the USACE. Although a single form is utilized to request both the 404 Permit and the 401 Certification, the state must issue the 401 Certification before the USACE will issue the 404 Permit. Written concurrence/notification is not always required by the state, and varies depending upon the General Certification. If this project qualifies under Nationwide Permit 23, the NCDWQ must be notified, however written concurrence from the NCDWQ is not required.

Since this bridge is within a designated mountain trout county, the NCWRC will be consulted during the permitting process. Guidelines for Construction of Highway Improvements Adjacent to or Crossing Trout Waters in North Carolina (October 27, 1992) will be adhered to for this project.

c) Bridge Demolition and Removal

Permitting will be coordinated such that any permit needed for bridge construction will address issues related to bridge demolition. Since this bridge is of timber and steel construction, removal will be accomplished without dropping portions of the bridge into Waters of the United States.

d) Tennessee Valley Authority

Watauga County is under the jurisdiction of the Tennessee Valley Authority (TVA). This project will be reviewed under Section 26a of the Tennessee Valley Authority Act. The final bridge plans, hydraulic analysis of the effects of the replacement structure on the 100-year flood elevation, and notice of compliance with the Historic Preservation Act of 1966 will be forwarded to TVA for approval at 2611 West Andrew Johnson Hwy Morristown, TN 37814-3295.

3. 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". 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 to wetlands, minimizing impacts, and rectifying impacts (40 CFR 1508.20). Each of these three aspects (avoidance, minimization, and compensatory mitigation) must be considered sequentially. **As previously stated, there are no wetlands associated with this project.**

The USACE usually requires compensatory mitigation for activities authorized under Section 404 of the Clean Water Act if unavoidable impacts to waters of the United States total more than 1 acre (0.45 hectares) of wetlands or 500 linear feet (152.4 linear meters) of perennial and intermittent streams.

The NCDWQ may require compensatory mitigation for activities authorized under Section 401 of the Clean Water Act if unavoidable impacts to waters of the United States total more than 1 acre (0.45 hectares) of wetlands and/or 150 linear feet (45.7 linear meters) of perennial streams.

According to impact estimates in Table 1, USACE and NCDWQ limitations for impacts to jurisdictional waters will not be exceeded by any alternative. However, a final determination regarding mitigation requirements rests with the agencies noted above.

F. Rare and Protected Species

Some populations of plants and animals have been or are in the process of decline due either to natural forces or many other factors such as habitat destruction and introduced species competition. 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.

1. Federal 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 USFWS reports six federally protected species for Watauga County as of the March 7, 2002 listing (Table 2).

TABLE 2
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 (=*Hedyotis purpurea* var. *montana*) (Roan Mountain bluet)	E
Liatris helleri (Heller's blazing star)	T

Table 2 Notes:
E Denotes Endangered (a species that is in danger of extinction throughout all or a significant portion of its range).
T Denotes Threatened (a species likely to become endangered within the foreseeable future throughout all or a significant portion of its range.
T(S/A) Denotes threatened due to similarity of appearance. These species are listed due to resemblance to another protected species but are not biologically endangered or threatened and are not subject to Section 7 consultation.
** The northern population of the bog turtle (from New York south to Maryland) is designated as threatened. The southern population of the bog turtle (from Virginia south to Georgia) is designated as T(S/A). This designation bans the collection and interstate and international commercial trade of the species from the southern population, but has no effect on land management activities by private landowners.

The Virginia big-eared bat (*Corynorhinus townsendii virginianus*) is listed as an obscure record in Watauga County by the NCNHP. **The Virginia big-eared bat is not recognized in this county by the USFWS.**

Species: Bog turtle
Family: Emydidae (Subfamily Emydinae)
Date Listed: 11/4/97

The bog turtle has a light brown to ebony colored carapace and a blackish plastron. Shell size ranges from 3 to 4.5 inches (8 to 11 centimeters). The species is most easily recognized by a yellow, orange, or red blotch on each side of the head.

This turtle inhabits damp, grassy fields, bogs, and marshes. It feeds on insects, worms, snails, amphibians, and seeds. **Since the southern species is not biologically endangered or threatened, no biological conclusion is required.**

Species: Carolina northern flying squirrel
Family: Sciuridae
Date Listed: 7/1/85

This nocturnal squirrel has a broad, flattened tail and folds of skin between the wrist and ankle that are used for gliding. Total length ranges from 10 to 12 inches (25.4 to 30.5 centimeters). Adults are gray with a brown, tan, or reddish coloration on the back, and have gray to white undersides. Juveniles have slate gray backs and whitish undersides.

Carolina northern flying squirrels inhabit mainly the transition zones between coniferous and northern hardwood forests. Hardwood areas are utilized for nesting, and foraging is conducted in both coniferous and hardwood forests. This squirrel has a varied diet, which may include lichens and fungi, seeds, nuts, buds, fruit, and insects. Mating takes place in the spring and the young are born in May or June.

BIOLOGICAL CONCLUSION: NO EFFECT

Habitat is not present within the project study area for this species. There are no coniferous forests, and therefore no transition zones between coniferous and northern hardwood forests. Research conducted at NCNHP indicated that this species has not been documented within the project study area or vicinity. This project will not affect the Carolina northern flying squirrel.

Species: Spruce-fir moss spider
Family: Dipluridae
Date Listed: 2/6/95

The spruce-fir moss spider may range in color from light yellow-brown to reddish-brown. It is very small, measuring about 0.10 to 0.15 inches (0.25 to 0.38 centimeters). The spider has long posterior spinnerets and chelicerae (appendage near the mouth, often used for grasping) that extend well beyond the anterior edge of the carapace.

This species inhabits damp but well-drained moss mats growing on rocks and boulders in well-shaded areas. Tube-shaped webs are constructed by the spider between the moss mat and rock surface. It is known from mature Fraser fir and red spruce forests at high elevations in the southern Appalachian Mountains.

BIOLOGICAL CONCLUSION: NO EFFECT

There are no Fraser fir and red spruce forest communities within the study area that could provide habitat for this species. It is also found at higher elevations than that of the project area. A search of NCNHP records indicated that this species has not been documented within the project area or vicinity. This project will not affect Spruce-fir moss spider.

Species: Spreading avens
Family: Rosaceae
Date Listed: 4/5/90

Spreading avens is a perennial herb with mostly basal leaves that arise from horizontal rhizomes. Stems are from 8 to 20 inches tall (20 to 50 centimeters). Bright yellow flowers are arranged in a cyme and bloom from June through September. Fruits in the form of achenes are produced from August through October.

This species is found on high elevation cliffs, outcrops, and steep slopes that are exposed to full sun. It is also found on thin, gravelly soils of grassy balds near summit outcrops.

BIOLOGICAL CONCLUSION: NO EFFECT

It is expected that this species would be found at higher elevations than that of the study area. Areas of exposed rock exist within the Montane Oak-Hickory Forest, however they are fully shaded and do not provide habitat for spreading avens. NCNHP records indicate that this species has not been documented within the project study area or vicinity. This project will not affect spreading avens.

Species: Roan Mountain bluet
Family: Rubiaceae
Date Listed: 4/5/90

This shallow-rooted perennial herb forms low-growing loose tufts approximately 4 inches (10 centimeters) in height. The leaves have a smooth margin and the small flowers are deep purple. Flowering occurs from late May to August and fruiting occurs from late August to September. Roan Mountain bluet occurs in the same habitat as noted above for spreading avens.

BIOLOGICAL CONCLUSION: NO EFFECT

As indicated above in the biological conclusion for spreading avens, appropriate habitat does not exist within the study area for this species. NCNHP records do not document the occurrence of Roan Mountain bluet within the project study area or vicinity. This project will not affect Roan Mountain bluet.

Species: Heller's blazing star
Family: Asteraceae
Date Listed: 11/19/87

Heller's blazing star is a perennial herb that has erect or arching stems which arise from a tuft of narrow pale green basal leaves. The stems reach approximately 16 inches (40 centimeters) in height and are topped by a spike of lavender flowers. Flowering occurs from July to September and fruiting occurs from September to October. This plant may be distinguished from similar high-elevation plants within the genus by its much shorter pappus (modified calyx lobes), ciliate petioles, and internally pilose (covered with soft trichomes) corolla tubes.

Heller's blazing star grows on high elevation ledges or rock outcrops in full sun. Substrate consists of shallow, acidic soils.

BIOLOGICAL CONCLUSION: NO EFFECT

There are no high elevation ledges or rock outcrops exposed to full sun within the study area, therefore habitat for this species does not exist within the project area. A search of NCNHP records indicated that Heller's blazing star has not been found within the study area or vicinity. This project will not affect Heller's blazing star.

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 or Endangered. Species designated as FSC are defined as taxa, which may or may not be listed in the future. These species were formerly Candidate 2 (C2) species or species 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 3 provides the Federal Species of Concern in Watauga County and their state classifications.

The NCNHP database shows no recorded occurrences of FSCs within the project vicinity.

TABLE 3
NORTH CAROLINA STATUS OF FEDERAL SPECIES OF CONCERN IN WATAUGA COUNTY

Scientific Name (Common Name)	North Carolina Status	Habitat Present
Aegolius acadicus (Southern Appalachian saw-whet owl)	SC	NO
Cryptobranchus alleganiensis (Hellbender)	SC	YES
Dendroica cerulea (Cerulean warbler)	SR	YES
Loxia curvirostra♦ (Southern Appalachian red crossbill)	NT	NO
*Neotoma magister**⊗ (Alleghany woodrat)	SC	YES
Parus atricapillus practicus♦ (Southern Appalachian black-capped chickadee)	NT	NO
Phenacobius teretulus (Kanawha minnow)	SC	NO
*Sorex palustris punctulatus**⊗ (Southern water shrew)	SC	YES
Sphyrapicus varius appalachiensis (Southern Appalachian yellow-bellied sapsucker)	SR	YES
Sylvilagus obscurus•*Δ (Appalachian cottontail)	NL	NO
Lasmigona subviridus (Green floater)	E	NO+
Speyeria diana (Diana fritillary butterfly)	SR	NO
Abies fraseri♦ (Fraser fir)	NT	NO
Cardamine clematitis (Mountain bittercress)	C	YES
Delphinium exaltatum (Tall larkspur)	E-SC	NO
*Euphorbia purpurea***⊗ (Glade spurge)	C	NO
Geum geniculatum (Bent avens)	T	NO
Juglans cinerea♦ (Butternut)	NT	YES
Lilium grayi (Gray's lily)	T-SC	NO
*Poa paludigena**Δ (Bog bluegrass)	E	NO
Saxifraga caroliniana♦♦ (Carolina saxifrage)	C	YES

Table 3 Notes:
Historic record from USFWS. The species was last observed in the county more than 50 years ago.
NL Not listed for this county by NCNHP.
• Listed as *Sylvilagus transitionalis* (New England cottontail) by NCNHP.
** Obscure record from USFWS. The date and/or location of observation is uncertain.
♦♦ Not listed in this county by USFWS, only by NCNHP.
⊗ Obscure record at NCNHP. The date the element was last observed in the county is uncertain.
Historic record at NCNHP. The species was last observed in the county more than 20 years ago.

T Threatened (a native or once native species that is likely to become endangered within the foreseeable future.
E Endangered (a species whose continued existence as a viable component of the State's flora or fauna is determined to be in jeopardy).
C Candidate (species which are considered by the state to be rare and in need of population monitoring.
SR Significantly Rare (a species in need of population monitoring and conservation action.
SC Special Concern (a species of plant or animal which requires monitoring but which may be collected and sold or taken under certain regulations).
NT Not tracked by the NCNHP in this county.
NL Not listed by the State.
E-SC Propagated material only of plant species listed as both "endangered" and "special concern" may be traded or sold under specific regulations.
T-SC Propagated material only of plant species listed as both "threatened" and "special concern" may be traded or sold under specific regulations.
+ This species has been found within the project region in the Watauga River. Since the stream bed is mostly rock within the project section of Laurel Fork Creek, it is not expected that the green floater would be found within the study area.

VI. Cultural Resources

A. Compliance Guidelines

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

B. Historic Architecture

A field survey of the Area of Potential Effects (APE) was conducted on October 10, 2000. All structures within the APE were photographed, and later reviewed by the North Carolina State Historic Preservation Office (HPO). They requested more information on two properties and a report was prepared and submitted to FHWA and HPO. In a memorandum dated June 13, 2001, the State Historic Preservation Officer (SHPO) concurred with the report's findings "that there are no historic properties in the project's area of potential effect". A copy of the memorandum is included in the Appendix.

C. Archaeology

The State Historic Preservation Officer (SHPO), in a memorandum dated February 5, 2001 stated, "We have conducted a search of our files and are aware of no structures of historical or architectural importance within the planning area... There are no recorded archaeological sites within the proposed project area...If, however, the replacement is to be on new location, please forward a map to this office indicating the location of the new alignment so we may evaluate the potential effect of the replacement upon archeological resources". A map was forwarded to HPO indicating the location of the new alignment. In a memorandum dated September 4, 2002 SHPO stated "We have conducted a review of the proposed undertaking and are aware of no historical resources which would be affected by the project." A copy of the SHPO memorandums are included in the Appendix.

VII. Environmental Effects

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

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

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

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

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

In compliance with Executive Order 12898 (Federal Actions to Address Environmental Justice in Minority Populations and Low Income Populations) a review was conducted to determine whether minority or low-income populations were receiving disproportionately high and adverse human health or environmental impacts as a result of this project. The investigation determined the project would not disproportionately impact any minority or low-income populations.

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

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

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

The project is located in Watauga County, which has been determined to be in compliance with the National Ambient Air Quality Standards. 40 CFR Parts 51 and 93 is not applicable, because the proposed project is located in an attainment area. This project is not anticipated to create any adverse effects on the air quality of this attainment area.

The traffic volumes will not increase or decrease because of this project. There are no receptors located in the immediate project area. The project's impact on noise and air quality will not be significant.

Noise levels could increase during construction but will be temporary. If vegetation is disposed of by burning, all burning shall be done in accordance with applicable local laws and regulations of the North Carolina SIP for air quality in compliance with 15 NCAC 2D.0520. This evaluation completes the assessment requirements for highway traffic noise (23 CFR Part 772) and for air quality (1990 CAAA and NEPA) and no additional reports are required.

An examination of records at the North Carolina Department of Environment and Natural Resources, Division of Water Quality, Groundwater Section and the North Carolina Department of Human Resources, Solid Waste Management Section revealed no hazardous waste sites in the project area

Watauga County is a participant in the National Flood Insurance Regular Program. The project site on Laurel Fork Creek is located in a designated flood hazard zone and is included in a detailed F.E.M.A. Flood Study. The proposed replacement will not adversely affect the existing flood plain or modify flow characteristics. Attached is a copy of the Flood Insurance Rate Map, Figure 5, on which are shown the approximate limits of the 100-year flood plain in the vicinity of the project.

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

VIII. PUBLIC INVOLVEMENT

Efforts were undertaken early in the planning process to contact local officials to involve them in the project development with scoping letters. A newsletter was also mailed to local residents explaining the planning process and the selected Alternative.

IX. AGENCIES COMMENTS

North Carolina Wildlife Resource Commission (NCWRC)
Comment:

1. *Instream work and land disturbance within the 25-foot wide buffer zone are prohibited during the brown and brook trout spawning season of October 15 through March 31 to protect the egg and fry stages of trout from off-site sedimentation during construction.*
2. *Instream work and land disturbance within the 25-foot wide buffer zone are prohibited during the rainbow trout spawning season of January 1 through April 15 to protect the egg and fry stages of trout.*
3. *Spanning or bottomless structures are preferred over pipes and culverts. Bridge replacements should be planned and installed so as not to interfere with aquatic life passage and so as not to disrupt the natural geomorphology of the stream channel and floodplain. Whenever possible, new structures should rectify any conditions that preclude either of these processes.*
4. *Concerning culverts or barrels in trout waters, whenever the receiving barrel is wider than the naturally occurring stream or slopes approach 4% or flow approaches 2 fps, baffles should be located in the receiving barrel in a manner that will mimic existing natural stream dimensions, patterns and profiles. Please note that receiving barrels of culverts or pipes buried 1 foot below normal streambed level that mimic natural conditions should not interfere with aquatic or fish migration. The barrels should parallel or follow the alignment as the existing channel. The length of barrels should be kept to the absolute minimum unless increased slope would negatively impact aquatic life migration and fish passage. Again, the natural geomorphology of the stream and floodplain should not be permanently affected and should be fully restored upon project completion.*
5. *If concrete will be used, work must be accomplished so that wet concrete does not contact stream water. This will lessen the chance of altering the stream's water chemistry and causing a fish kill.*
6. *Sediment and erosion control measures should adhere to the design standards for sensitive watersheds (15A NCAC 4B.0024).*
7. *Heavy equipment should be operated from the bank rather than in the stream channel in order to minimize sedimentation and reduce the likelihood of introducing other pollutants into the stream.*
8. *Trees and vegetation within the 25-foot stream buffer zone damaged during construction should be replanted within 5 days of project completion with the same mixture of species existing prior to project initiation.*

Response: See Green Sheet for commitments.

Tennessee Valley Authority (TVA):
Comment:

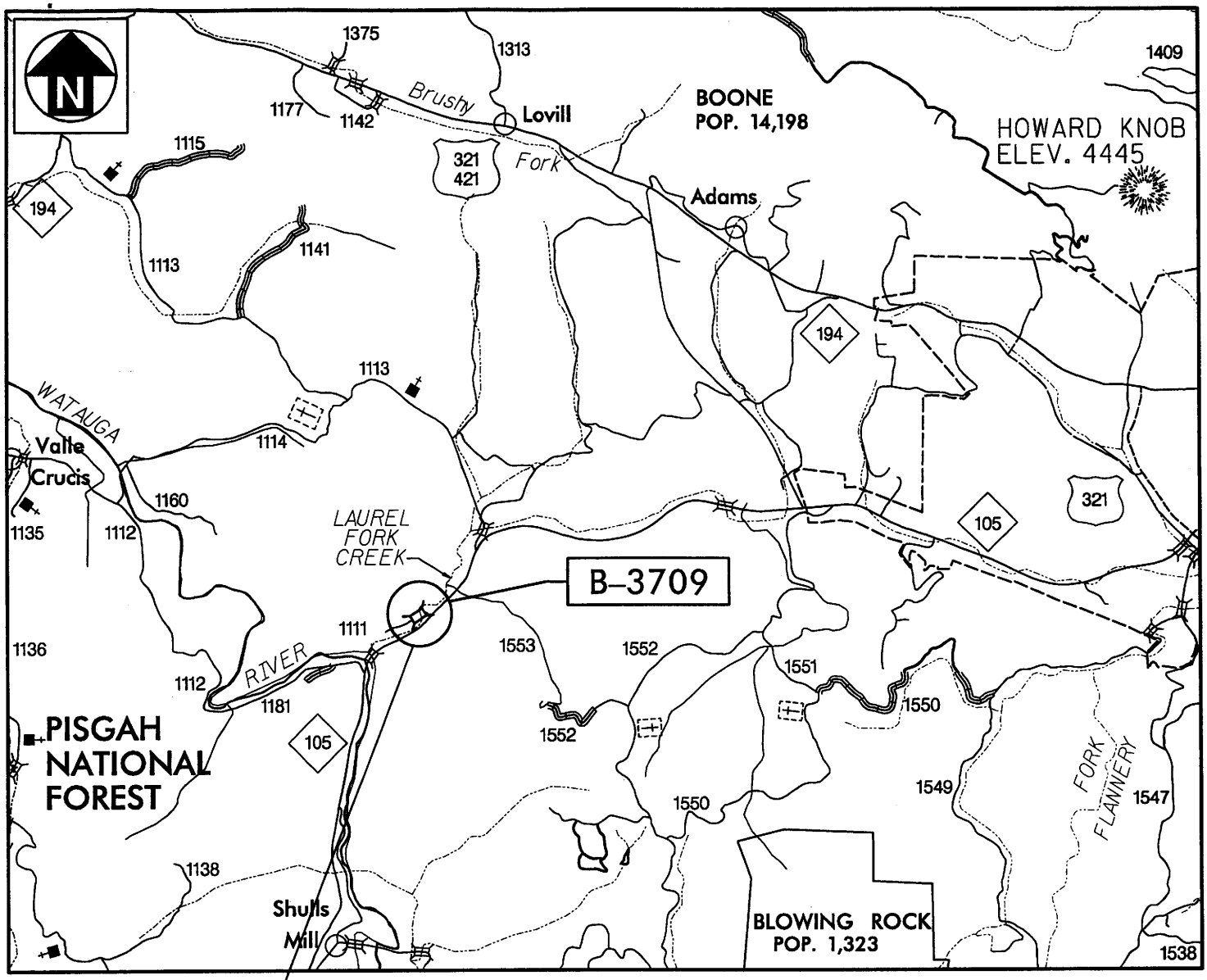
This project will be reviewed under Section 26a of the Tennessee Valley Authority (TVA) Act. The final bridge plans, hydraulic analysis of the effects of the replacement structure on the 100-year flood elevation, and notice of compliance with the Historic Preservation Act of 1966 will be forwarded to TVA for approval.

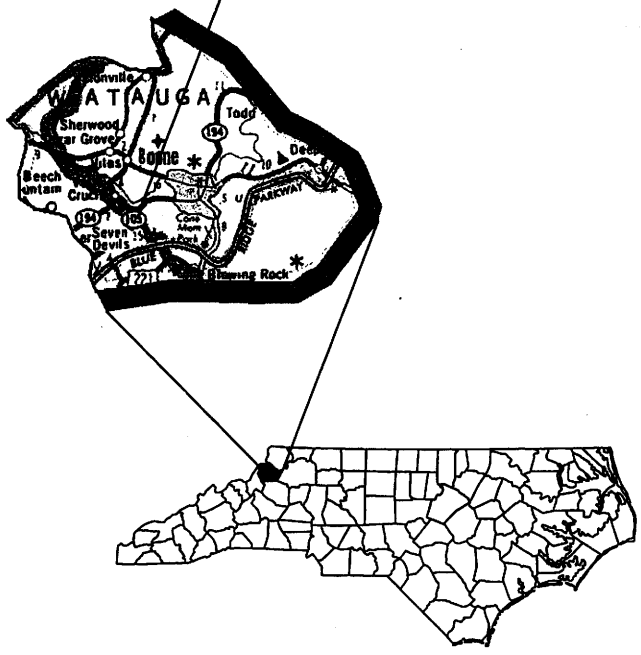
Response: The planning document and roadway and hydraulic plans will be submitted to the TVA. See Green Sheet for commitments.

North Carolina Department of Cultural Resources State Historic Preservation Office (HPO):
Comment:

> *"If, however, the replacement is to be on new location, please forward a map to this office indicating the location of the new alignment so we may evaluate the potential effect of the replacement upon archeological resources".*

Response: A copy of the preliminary plans were forwarded to HPO. In a memorandum dated September 4, 2002 HPO stated "We have conducted a review of the proposed undertaking and are aware of no historical resources which would be affected by the project." A copy of the SHPO memorandum is included in the Appendix.





North Carolina Department Of Transportation
Project Development & Environmental Analysis

WATAUGA COUNTY

BRIDGE NO. 94 ON SR 1111 OVER LAUREL FORK CREEK

B-3709

0	kilometers	1.6	kilometers	3.2
0	miles	1.0	miles	2.0

FIGURE 1


B-3709
ALTERNATE A
(Preferred)
BRIDGE # 94
PILE RETAINING WALL
SHOULDER BREAK GUTTER
EXPRESSWAY GUTTER
EXPRESSWAY GUTTER
SHOULDER BREAK GUTTER
END BRIDGE
-L- POT 17+62
BEGIN BRIDGE
PROJECT
19+25.00
NC 105
NC 105
DANNER ROAD
Laural Fork Creek
50' 0 50'
15.24 m 0 15.24 m
SCALE
North Carolina Department Of Transportation
Project Development & Environmental Analysis
WATAUGA COUNTY
BRIDGE NO. 94 ON SR 1111 (OLD DANNER ROAD)
OVER LAURAL FORK CREEK
B-3709
FIGURE 2

B-3709
ALTERNATE B

BEGIN BRIDGE
-L- POT 16+00+/-

END BRIDGE
-L- POT 16+88+/-

BRIDGE # 94

NC 105

Laural Fork Creek

END CONSTRUCTION
-L- POC 18+10.00

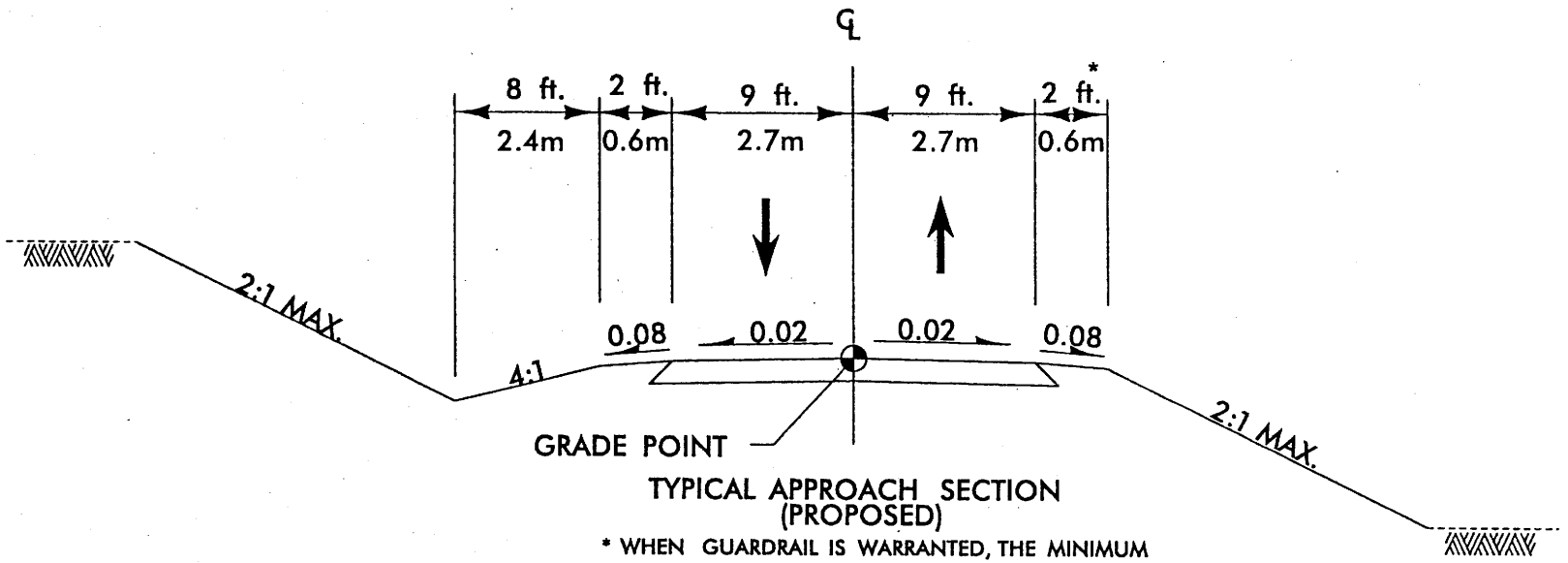
18+01.70
-L- POT

50' 0 50'
15.24 m 0 15.24 m
SCALE

North Carolina Department Of Transportation
Project Development & Environmental Analysis

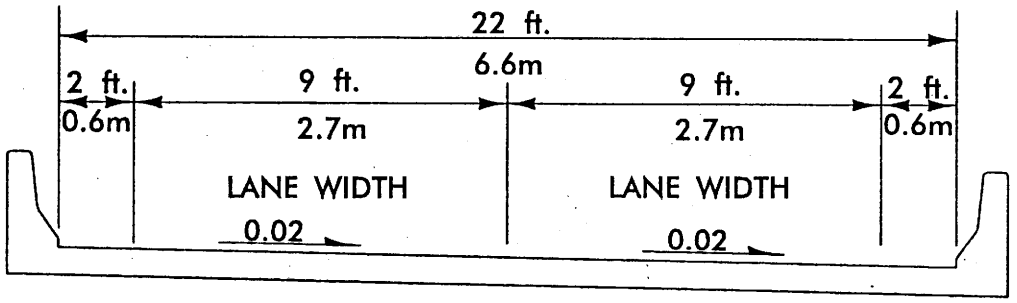
WATAUGA COUNTY
BRIDGE NO. 94 ON SR 1111 (OLD DANNER ROAD)
OVER LAURAL FORK CREEK
B-3709

FIGURE 2A



TYPICAL APPROACH SECTION
(PROPOSED)

* WHEN GUARDRAIL IS WARRANTED, THE MINIMUM OFFSET FROM THE EDGE OF THE TRAVEL LANE TO THE FACE OF THE GUARDRAIL IS 4'–0" (1.2 m).



TYPICAL BRIDGE SECTION

DESIGN DATA

(EXISTING) 2002 ADT = 22 LOS A
(CONST. YR.) 2003 ADT = 24 LOS A
(DESIGN YR.) 2025 ADT = 40 LOS A
DUAL 3%
TTST 1%

FUNCTIONAL CLASSIFICATION : RURAL LOCAL

DESIGN SPEED 20 MPH (30 km/h)
POSTED SPEED LIMIT NOT POSTED
MIN. RADIUS OF CURVE 115 ft. (30 m)
MAX. GRADE 16%
MIN. DES. K FAC.: Ksag=17 Kcrest=7
MIN. DES. K FAC.(Metric): Ksag=6 Kcrest=2
emax = .06
terrain = mountainous

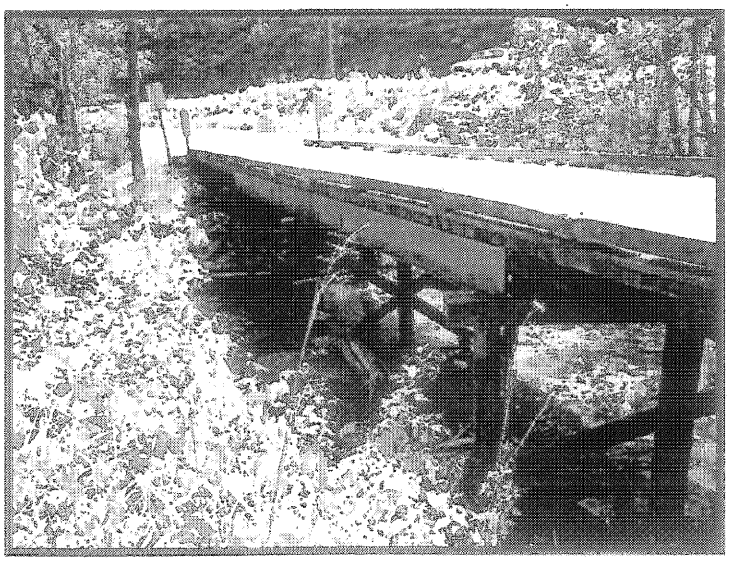
North Carolina Department
Of Transportation
Project Development &
Environmental Analysis

WATAUGA COUNTY
BRIDGE NO. 94 ON SR 1111
OLD DANNER ROAD
OVER LAUREL FORK CREEK
TIP NO: B-3709

FIGURE 3

Looking southwest along SR 1111 across Bridge No. 94.

Looking northeast along SR 1111 across Bridge No. 94.



Side view of Bridge No. 94.

Figure 4

FEMA Flood Map
Watauga County

B-3709

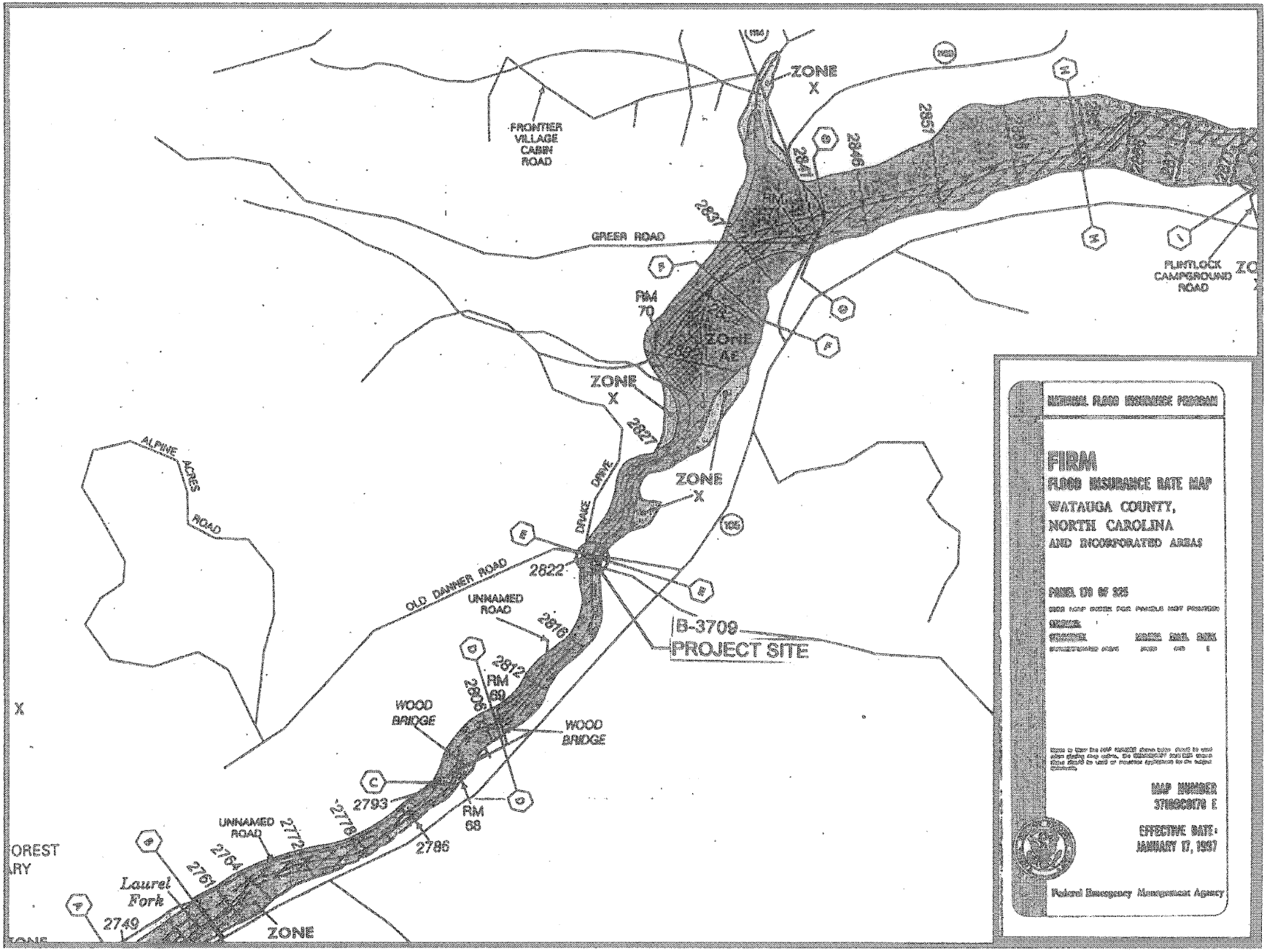


Figure 5

APPENDIX

United States Department of the Interior

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

February 7, 2001

Mr. William D. Gilmore, P.E., Manager
Project Development and Environmental Analysis Branch
North Carolina Department of Transportation
1548 Mail Service Center
Raleigh, North Carolina 27699-1548

Dear Mr. Gilmore:

Subject: Bridge Replacements - Avery County (B-3808); Henderson County (B-3475, B-3662, B-3663, B-3664, B-3665, B-3666, and B-3857); McDowell County (B-3673); and Watauga County (B-3709 and B-3710)

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

The information we received for these 11 projects does not include descriptions of the structures that will replace the existing bridges, and it does not include any environmental information regarding the streams or whether habitat assessments or surveys for rare species have been conducted for any of the projects. Therefore, our comments are limited primarily to the known locations of listed species and species of Federal concern. When the categorical exclusions are prepared and more information is available regarding environmental effects, we can then offer more substantive comments.

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

Henderson County

Project B-3475. Known locations of the federally endangered bunched arrowhead (*Sagittaria fasciculata*) and the federally threatened small-whorled pogonia (*Isotria medeoloides*) occur near this project. We recommend surveying the project area for these species prior to any further planning or on-the-ground activities. If these species occur in the project area, further consultation will be required.

Project B-3665. Known locations of the federally endangered bunched arrowhead (*Sagittaria fasciculata*) and mountain sweet pitcher plant (*Sarracenia jonesii*) occur in the vicinity of this project. We recommend surveying the project area for these species prior to any further planning or on-the-ground activities. If these species occur in the project area, further consultation will be required.

Projects B-3662 and B-3664. These projects occur in the general vicinity of Mud Creek, an area with several occurrences of bunched arrowhead (*Sagittaria fasciculata*) and mountain sweet pitcher plant (*Sarracenia jonesii*). Currently there are no known locations of these species in the immediate project area. However, a lack of any systematic surveys throughout the Mud Creek drainage may account for the apparent absence of these species. In the areas affected by these projects, we recommend conducting habitat assessments and surveying any suitable habitat for these species.

Projects B-3666, B-3663, and B-3857. Our records for Henderson County indicate no known locations of listed species in the project areas. However, we recommend conducting habitat assessments and surveying any suitable habitat in the project areas for these species prior to any further planning or on-the-ground activities to ensure that no adverse impacts occur.

McDowell County

Project B-3673. Our records indicate known locations for the bog turtle (*Clemmys muhlenbergii*) near this project. Habitat assessments and surveys of suitable habitat should be conducted in the project area for this species. If the bog turtle occurs in the project area, it should be protected from impacts.

Watauga and Avery Counties

Projects B-3709, B-3710, and B-3808. Although our records for Watauga and Avery Counties indicate no known locations of listed species in the project areas, we recommend conducting habitat assessments in the affected area of each project. Any suitable habitat should be surveyed for these species prior to any further planning or on-the-ground activities to ensure that no adverse impacts occur.

We are interested in the types of structures that will replace these existing bridges and would recommend spanning structures, preferably bridges, in all cases. We look forward to reviewing the completed categorical exclusion documents.

If you have questions about these comments, please contact Ms. Marella Buncick of our staff at 828/258-3939, Ext. 237. In any future correspondence concerning this project, please reference our Log Number 4-2-01-278.

Sincerely,

for Brian P. Cole
State Supervisor

Enclosure

cc:
Ms. Stacy Harris, Project Development and Environmental Analysis Branch, North Carolina Department of Transportation, 1548 Mail Service Center, Raleigh, NC 27699-1548
Mr. Owen Anderson, Mountain Region Coordinator, North Carolina Wildlife Resources Commission, 20830 Great Smoky Mtn. Expressway, Waynesville, NC 28786
Ms. Cynthia Van Der Wiele, North Carolina Department of Environment and Natural Resources, Division of Water Quality, Wetlands Section, 1621 Mail Service Center, Raleigh, NC 27699-1621

Updated: 05/31/2002

U.S. Fish & Wildlife Service

WATAUGA COUNTY

Critical Habitat Designation:

Spruce-fir moss spider, *Microhexura montivaga* - Critical Habitat designation in Federal Register 66:35547-35566.

Common Name	Scientific Name	Status
Vertebrates		
Alleghany woodrat	*Neotoma magister*	FSC*
Appalachian cottontail	*Sylvilagus obscurus*	FSC*
Bog turtle	*Clemmys muhlenbergii*	T(S/A)[1]
Carolina northern flying squirrel	*Glaucomys sabrinus coloratus*	Endangered
Cerulean warbler	*Dendroica cerulea*	FSC
Hellbender	*Cryptobranchus alleganiensis*	FSC
Kanawha minnow	*Phenacobius teretulus*	FSC
Southern Appalachian black-capped chickadee	*Parus atricapillus practicus*	FSC
Southern Appalachian red crossbill	*Loxia curvirostra*	FSC
Southern Appalachian saw-whet owl	*Aegolius acadicus*	FSC
Southern Appalachian yellow-bellied sapsucker	*Sphyrapicus varius appalaciensis*	FSC
Southern water shrew	*Sorex palustris punctulatus*	FSC*
Invertebrates		
Diana fritillary butterfly	*Speyeria diana*	FSC
Green floater	*Lasmigona subviridus*	FSC
Spruce-fir moss spider	*Microhexura montivaga*	Endangered
Vascular Plants		
Bent avens	*Geum geniculatum*	FSC
Bog bluegrass	*Poa paludigena*	FSC*
Butternut	*Juglans cinerea*	FSC

Fraser fir	*Abies fraseri*	FSC
Glade spurge	*Euphorbia purpurea*	FSC**
Gray's lily	*Lilium grayi*	FSC
Heller's blazing star	*Liatris helleri*	Threatened
Mountain bittercress	*Cardamine clematitis*	FSC
Spreading avens	*Geum radiatum*	Endangered
Tall larkspur	*Delphinium exaltatum*	FSC
Roan Mountain bluet	*Houstonia montana (=Hedyotis purpurea var. montana)*	Endangered

KEY:

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

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

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

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

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

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

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

U.S. DEPARTMENT OF AGRICULTURE
SOIL CONVERSION SERVICE

SCS-CPA-106

FARMLAND CONVERSION IMPACT RATING FOR CORRIDOR TYPE PROJECTS

P. (*To be Completed by Federal Agency*)	3. Date of Land Evaluation Request 12/17/01	4. Sheet 1 of 1
1. Names of Project B-3709	5. Federal Agency Involved NCDOT, FHWA	
2. Type of Project BRIDGE REPLACEMENT	6. County and State Watauga, NC	
PART II (*To be completed by SCS*)	1. Date Request Received by SCS. 2/14/02	2. Person Completing Form Coy McKenzie
3. Does the corridor contain prime unique statewide or local important farmland? Yes ____ (If no the FPPA does not apply – Do not complete additional parts of this form) No X	4. Acres Irrigated	Average Farm Size
5. Major Crop(s)	6. Farmable Land in Government Jurisdiction:	7. Amount of Farmland As Defined in FPPA
8. Name of Land Evaluation System Used	9. Name of Local Site Assessment System	10. Date Land Evaluation Returned by SCS

PART III (*To be completed by Federal Agency*)	Alternative Corridor for Segment			
	Corridor A	Corridor B	Corridor C	Corridor D
A. Total Acres to be Converted Directly	0.23	0.16		
B. Total Acres to be Converted Indirectly or to Receive Services				
C. Total Acres in Corridor	0.23	0.16		
PART IV (*To be completed by SCS*) Land Evaluation Information				
A. Total Acres Prime and Unique Farmland				
B. Total Acres Statewide and Local Important Farmland				
C. Percentage of Farmland in County or Local Govt. Unit to be Converted				
D. Percentage of Farmland in Govt. Jurisdiction with Same or Higher Relative Value				
PART V (*To be completed by SCS*) Land Evaluation Criterion Relative Value of Farmland to be Serviced or Converted (Scale of 0-100 Points)				
PART VI (*To be completed by Federal Agency*) Corridor Assessment Criteria (These criteria are explained in 7 CFR 658.5(c)) — Maximum Points				
1. Area in Nonurban Use — 15				
2. Perimeter in Nonurban Use — 10				
3. Percent of Corridor Being Farmed — 20				
4. Protection Provided by State and Local Government — 20				
5. Size of Present Farm Unit Compared to Average — 10				
6. Creation of Nonfarmable Farmland — 25				
7. Availability of Farm Support Services — 5				
8. On-Farm Investments — 20				
9. Effects of Conversion On Farm Support Services — 25				
10. Compatibility with Existing Agricultural Use — 10				
TOTAL CORRIDOR ASSESSMENT POINTS — 160				
PART VII (*To be completed by Federal Agency*)				
Relative Value of Farmland (From Part V) — 100				
Total Corridor Assessment (Form Part VI above or a local site assessment) — 160				
TOTAL POINTS (Total of above 2 lines) — 260				

1. Corridor Selected:	2. Total Acres of Farmlands to be Converted by Project:	3. Date of Selection:	4. Was a Local Site Assessment Used? Yes_____ No _____

5. Reason for Selection:

Signature of Person Completing this Part: | Date

NOTE: Complete a form for each segment with more than one Alternative Corridor

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

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

Division of Historical Resources
David J. Olson, Director

September 4, 2002

MEMORANDUM

TO: Gail Grimes
Project Development and Environmental Analysis Branch
NCDOT Division of Highways

FROM: David Brook RGC for David Brook

SUBJECT: Bridge No. 94 on SR 1111, over Laurel Creek, B-3709, Watauga County, ER01-8271

Thank you for your letter of July 15, 2002 forwarding the New Alignment map for the above referenced project.

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

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

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

cc: Mary Pope Furr, NCDOT

	Location	Mailing Address	Telephone/Fax
Administration	507 N. Blount St. Raleigh, NC	4617 Mail Service Center, Raleigh 27699-4617	(919) 733-4763 •733-8653
Restoration	515 N. Blount St. Raleigh , NC	4613 Mail Service Center, Raleigh 27699-4613	(919) 733-6547 •715-4801

Harris

North Carolina Department of Cultural Resources

State Historic Preservation Office

David L. S. Brook, Administrator

Michael F. Easley, Governor
Lisbeth C. Evans, Secretary

Division of Archives and History
Jeffrey J. Crow, Director

February 5, 2001

MEMORANDUM

To: William D. Gilmore, P.E., Manager
Project Development and Environmental Analysis Branch

From: David Brook DB for David Brook
Deputy State Historic Preservation Officer

Re: Replace Bridge #94 on SR 1111 over Laurel Fork Creek, B-3709, Watauga County, ER 01-8271

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

We have conducted a search of our files and are aware of no structures of historical or architectural importance located within the planning area. However, since a survey has not been conducted in over a decade, there may be structures of which we are unaware located within the planning area.

If there are any structures more than fifty years old on or adjacent to the project site, please send us photographs (Polaroid type snapshots are fine) of each structure. These photographs should be keyed to a map that clearly shows the site location. If there are no building over fifty years old on or adjacent to the project, please notify us of this in writing.

There are no recorded archaeological sites within the proposed project area. If the replacement is to be located along the existing alignment, it is unlikely that significant archaeological resources would be affected and no investigations would be recommended. If, however, the replacement is to be in a new location, please forward a map to this office indicating the location of the new alignment so we may evaluate the potential effects of the replacement upon archaeological resources.

The above comments are made pursuant to Section 106 of National Historic Preservation Act and 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.

cc: Mary Pope Furr, NCDOT
Tom Padgett, NCDOT

	Location	Mailing Address	Telephone/Fax
Administration	507 N. Blount St, Raleigh, NC	4617 Mail Service Center, Raleigh 27699-4617	(919) 733-4763 •715-8653
Restoration	515 N. Blount St, Raleigh , NC	4613 Mail Service Center, Raleigh 27699-4613	(919) 733-6547 •715-4801
Survey & Planning	515 N. Blount St, Raleigh, NC	4618 Mail Service Center, Raleigh 27699-4618	(919) 733-4763 •715-4801

North Carolina Wildlife Resources Commission

Charles R. Fullwood, Executive Director

MEMORANDUM

TO: William D. Gilmore, PE, Manager
NCDOT Project Development and Environmental Analysis Branch

FROM: Ron Linville, Regional Coordinator
Habitat Conservation Program

DATE: December 13, 2000

SUBJECT: Preliminary comments for Bridge Replacement Projects B-3709 (Laurel Fork), B-3710 (Brushy Fork), Watauga County and B-3808 (Henson), Avery County

This correspondence responds to a request by you for our preliminary review and comments on the referenced proposed bridge projects. Biological staff of the North Carolina Wildlife Resources Commission has generally reviewed the sites and has not identified any special concerns regarding them. Records indicate brown and rainbow trout at both bridges in Watauga County. Henson Creek is a tributary to the North Toe that contains wild rainbow trout populations. As a formal scoping response does not appear to be forthcoming, the following recommendations should be considered during your planning process:

1. Instream work and land disturbance within the 25-foot wide buffer zone are prohibited during the brown and brook trout spawning season of October 15 through March 31 to protect the egg and fry stages of trout from off-site sedimentation during construction.
2. Instream work and land disturbance within the 25-foot wide buffer zone are prohibited during the rainbow trout spawning season of January 1 through April 15 to protect the egg and fry stages of trout.
3. Spanning or bottomless structures are preferred over pipes and culverts. Bridge replacements should be planned and installed so as not to interfere with aquatic life passage and so as not to disrupt the natural geomorphology of the stream channel and floodplain. Whenever possible, new structures should rectify any conditions that preclude either of these processes.
4. Concerning culverts or barrels in trout waters, whenever the receiving barrel is wider than the naturally occurring stream or slopes approach 4 % or flow approaches 2 fps, baffles should be located in the receiving barrel in a manner that will mimic existing natural stream dimensions, patterns and profiles. Please note that receiving barrels of culverts or pipes buried 1 foot below normal streambed

Mailing Address: Division of Inland Fisheries • 1721 Mail Service Center • Raleigh, NC 27699-1721
Telephone: (919) 733-3633 ext. 291 • Fax: (919) 715-7643

level that mimic natural conditions should not interfere with aquatic or fish migration. The barrels should parallel or follow the alignment as the existing channel. The length of barrels should be kept to the absolute minimum unless increased slope would negatively impact aquatic life migration and fish passage. Again, the natural geomorphology of the stream and floodplain should not be permanently affected and should be fully restored upon project completion.

5. If concrete will be used, work must be accomplished so that wet concrete does not contact stream water. This will lessen the chance of altering the stream's water chemistry and causing a fish kill.
6. Sediment and erosion control measures should adhere to the design standards for sensitive watersheds (15A NCAC 4B .0024).
7. Heavy equipment should be operated from the bank rather than in the stream channel in order to minimize sedimentation and reduce the likelihood of introducing other pollutants into the stream.
8. Trees and vegetation within the 25-foot stream buffer zone damaged during construction should be replanted within 5 days of project completion with the same mixture of species existing prior to project initiation.

We are not aware of any Threatened or Endangered species in the immediate vicinity of these bridges; however, we are concerned about potential impacts to listed species downstream in the Toe. Thank you for the opportunity to review and comment during the early stages of this project. If you have any questions regarding these comments, please contact me at 336/366-2982.

Cc: Steve Lund, USACOE

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

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

NCDENR

December 11, 2000

MEMORANDUM

To: William D. Gilmore, P.E., Manager
NCDOT, Project Development & Environmental Analysis

Through: John Dorney, NC Division of Water Quality

From: Cynthia F. Van Der Wiele cvdw

Subject: Scoping comments on the proposed replacement of Bridge No. 94 on SR 1111 over Laurel Fork in Watauga County, T.I.P. Project B-3709.

This memo is in reference to your correspondence dated December 6, 2000, in which you requested scoping comments for the above project. The DWQ index number for the stream is 8-10 and is classified as C Trout waters. The Division of Water Quality requests that NCDOT consider the following environmental issues for the proposed project:

A. DWQ prefers replacement of bridges with bridges, particularly in higher quality waters (i.e. trout streams, water supply watersheds, high quality and outstanding resource waters). However, if the new structure is to be a culvert, it should be countersunk to allow unimpeded fish and other aquatic organisms passage through the crossing. Please be aware that floodplain culverts are required.

B. The document should provide a detailed and itemized presentation of the proposed impacts to wetlands and streams with corresponding mapping.

C. There should be a discussion on mitigation plans for unavoidable impacts. If mitigation is required, it is preferable to present a conceptual (if not finalized) mitigation plan with the environmental documentation. While the NCDWQ realizes that this may not always be practical, it should be noted that for projects requiring mitigation, appropriate mitigation plans will be required prior to issuance of a 401 Water Quality Certification.

D. Since the impacted water is classified as trout waters, the DWQ requests that DOT strictly adhere to North Carolina regulations entitled, "Design Standards in Sensitive Watersheds" (15A NCAC 04B .0024) throughout design and construction of the project. This would apply for any area that drains to streams having WS (Water Supply), ORW (Outstanding Resource Water), HQW (High Quality Water), SA (Shellfish Water) or Tr (Trout Water) classifications. Please be aware that trout moratoriums set by the NC Wildlife Resource Commission may apply.

E. When practical, the DWQ requests that bridges be replaced on the existing location with road closure. If a detour proves necessary, remediation measures in accordance with the NCDWQ requirements for General 401 Certification 2726/Nationwide Permit No. 33 (Temporary Construction, Access and Dewatering) must be followed.

F. If applicable, DOT should not install the bridge bents in the creek, to the maximum extent practicable.

G. Wetland and stream impacts should be avoided (including sediment and erosion control structures/measures) to the maximum extent practical. If this is not possible, alternatives that minimize wetland impacts should be chosen. Mitigation for unavoidable impacts will be required by DWQ for impacts to wetlands in excess of one acre and/or to streams in excess of 150 linear feet.

H. Borrow/waste areas should not be located in wetlands. It is likely that compensatory mitigation will be required if wetlands are impacted by waste or borrow.

I. If foundation test borings are necessary; it should be noted in the document. Geotechnical work is approved under General 401 Certification Number 3027/Nationwide Permit No. 6 for Survey Activities.

J. In accordance with the NCDWQ Wetlands Rules {15A NCAC 2H.0506(b)(6)}, mitigation will be required for impacts of greater than 150 linear feet to any single perennial stream. In the event that mitigation becomes required, the mitigation plan should be designed to replace appropriate lost functions and values. In accordance with the NCDWQ Wetlands Rules {15A NCAC 2H.0506 (h)(3)}, the Wetland Restoration Program may be available for use as stream mitigation.

K. Sediment and erosion control measures should not be placed in wetlands.

L. The 401 Water Quality Certification application will need to specifically address the proposed methods for stormwater management. More specifically, stormwater should not be permitted to discharge directly into the creek. Instead, stormwater should be designed to drain to a properly designed stormwater detention facility/apparatus.

M. While the use of National Wetland Inventory (NWI) maps and soil surveys is a useful office tool, their inherent inaccuracies require that qualified personnel perform onsite wetland delineations prior to permit approval.

Thank you for requesting our input at this time. The DOT is reminded that issuance of a 401 Water Quality Certification requires that appropriate measures be instituted to ensure that water quality standards are met and designated uses are not degraded or lost. If you have any questions or require additional information, please contact Cynthia Van Der Wiele at (919) 733.5715.

Pc: Steve Lund, USACE Asheville Field Office
Marella Buncick, USFWS
David Cox, NCWRC
File Copy
Central Files

J. Harris

Watauga County Board of Education

OFFICE OF THE SUPERINTENDENT
MARGARET E. GRAGG EDUCATION CENTER
P.O. BOX 1790 BOONE N.C. 28607

TEL: (828) 264-7190
FAX: (828) 264-7196

December 15, 2000

NC Department of Transportation
Project Development and Environmental Analysis
1548 Mail Service Center
Raleigh, NC 27669-1548

To Whom It May Concern:

In response to your correspondence concerning projects B-3709 and B-3710, I would like to provide the following information.

Bridge 94 on SR 1111 (Old Danner Rd) is on a road that is not traveled by buses in Watauga County. Closure would have no impact on school operations.

Bridge 106 on SR 1117 (Mast Gap Rd) is crossed five times per day by three buses. Closing this bridge during school operating months would mean that approximately 70 students would have to be re-routed to provide bus service, resulting in significantly longer bus ride times and increased transportation costs. It would be better if this project could be scheduled during non-school months.

If I can provide any further information, please call.

Sincerely,

Toni Parlier

Toni Parlier
Transportation Director

RELOCATION REPORT

North Carolina Department of Transportation
DIVISION RIGHT OF WAY OFFICE

[ ] E.I.S. ☐ CORRIDOR ☐ DESIGN

PROJECT:	8.2751801	COUNTY	WATAUGA	Alternate A of 2 Alternate	
I.D. NO.:	B-3709	F.A. PROJECT	BRZ-1111(1)		
DESCRIPTION OF PROJECT:	Replace bridge #94 over Laurel Fork Creek on SR-1111				

ESTIMATED DISPLACEES

Type of Displacee	Owner	Tenant	Total	Minority
Residential	0	0	0	0
Businesses	0	0	0	0
Farms	0	0	0	0
Non-Profit	0	0	0	0

INCOME LEVEL

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

VALUE OF DWELLING				DSS DWELLING AVAILABLE			
Owners		Tenants		For Sale		For Rent	
0-20M	0	$ 0-150	0	0-20M	0	$ 0-150	0
20-40M	0	150-250	0	20-40M	3	150-250	0
40-70M	0	250-400	0	40-70M	11	250-400	13
70-100M	0	400-600	0	70-100M	19	400-600	15
100 UP	0	600 UP	0	100 UP	31	600 UP	9
TOTAL	0				61		37

ANSWER ALL QUESTIONS

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

REMARKS (Respond by Number)

There are no relocatees on this project.

Comments: (A) Available housing list was compiled from a Partial list and does not indicate the total available housing in Surry County.

A. A Adams A. A. Adams — Right of Way Agent — 6-14-2002 — Date

Approved by Am Simpson — 6-18-02 — Date

Form 15.4 Revised 02/95 d

Original & 1 Copy: State Relocation Agent
2 Copy Area Relocation Office

RELOCATION REPORT

North Carolina Department of Transportation
DIVISION RIGHT OF WAY OFFICE

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

PROJECT:	8.2751801	COUNTY	WATAUGA	Alternate B of 2 Alternate	
I.D. NO.:	B-3709	F.A. PROJECT	BRZ-1111(1)		
DESCRIPTION OF PROJECT:	Replace bridge #94 over Laurel Fork Creek on SR-1111				

ESTIMATED DISPLACEES

Type of Displacee	Owner	Tenant	Total	Minority
Residential	0	0	0	0
Businesses	0	0	0	0
Farms	0	0	0	0
Non-Profit	0	0	0	0

ANSWER ALL QUESTIONS

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

INCOME LEVEL

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

VALUE OF DWELLING

Owners		Tenants	
0-20M	0	$ 0-150	0
20-40M	0	150-250	0
40-70M	0	250-400	0
70-100M	0	400-600	0
100 UP	0	600 UP	0
TOTAL	0		

DSS DWELLING AVAILABLE

For Sale		For Rent	
0-20M	0	$ 0-150	0
20-40M	3	150-250	0
40-70M	11	250-400	13
70-100M	19	400-600	15
100 UP	31	600 UP	9
	61		37

REMARKS (Respond by Number)

There are no relocatees on this project.

Comments: (A) Available housing list was compiled from a Partial list and does not indicate the total available housing in Surry County.

A. Adams — Right of Way Agent — 6-14-2002 — Date

Am Simpson — Approved by — 6-18-02 — Date

Form 15.4 Revised 02/95 d

Original & 1 Copy: State Relocation Agent
2 Copy Area Relocation Office

Watauga County
Bridge No. 94 on SR 1111
Over Laurel Fork Creek
Federal Project BRZ-1111(1)
State Project 8.2751801
TIP No. B-3709

ADDENDUM TO

CATEGORICAL EXCLUSION

U. S. DEPARTMENT OF TRANSPORTATION

FEDERAL HIGHWAY ADMINISTRATION

AND

N. C. DEPARTMENT OF TRANSPORTATION

DIVISION OF HIGHWAYS

APPROVED:

5-27-03
Date

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

5/29/03
Date

for John F. Sullivan, III
Division Administrator, FHWA

Watauga County
Bridge No. 94 on SR 1111
Over Laurel Fork Creek
Federal Project BRZ-1111(1)
State Project 8.2751801
TIP No. B-3709

ADDENDUM TO

CATEGORICAL EXCLUSION

May 2003

Documentation Prepared by
And
For the North Carolina Department of Transportation

5.27.2003
Date

John C. Wadsworth, PE
Project Manager

PROJECT COMMITMENTS

Watauga County
Bridge No. 94 on SR 1111 Over Laurel Fork Creek
Federal-Aid Project No. BRZ-1111(1)
State Project No. 8.2751801
T.I.P. No. B-3709

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

Project Development and Environmental Analysis Branch, Roadway Design, Hydraulics Unit, Roadside Environmental, and Division Engineer:

The following measures will be carried out for the replacement of Bridge No. 94

1. *Instream work and land disturbance within the 25-foot wide buffer zone are prohibited during the brown and brook trout spawning season and during the rainbow trout spawning season of October 15 through April 15 to protect the egg and fry stages of trout from off-site sedimentation during construction.*
2. *Sediment and erosion control measures will adhere to the design standards for sensitive watersheds (15A NCAC 4B.0024).*
3. *Trees and vegetation within the 25-foot stream buffer zone damaged during construction will be replanted with the same mixture of species existing prior to project initiation.*

Project Development and Environmental Analysis Branch:

A copy of the environmental planning document will be submitted to the Tennessee Valley Authority (TVA) and United States Army Corps of Engineers (COE).

Hydraulics Unit / Structure Design Unit:

This project will be reviewed under Section 26a of the Tennessee Valley Authority (TVA) Act. The final bridge plans, hydraulic analysis of the effects of the replacement structure on the 100-year flood elevation, and notice of compliance with the Historic Preservation Act of 1966 will be forwarded to TVA for approval.

Sufficient space for wildlife movement under the bridge will be provided.

Division Construction:

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

Watauga County
Bridge No. 94 on SR 1111
Over Laurel Fork Creek
Federal Project BRZ-1111(1)
State Project 8.2751801

TIP No. B-3709

I. BACKGROUND

A Categorical Exclusion for the subject project was approved September 12, 2002. Figure 1 identifies the vicinity and location of the proposed project. Alternate A, the recommended alternative, provided for the replacement of Bridge No. 94 with a new bridge on a new alignment just north of the existing bridge (Figure 2). During construction, traffic is to be maintained on the existing bridge. A pile panel wall will be used to in the northwest quadrant to minimize environmental impacts. Roadway work for Alternative A extends approximately 200 feet west of and 150 feet east of Bridge No. 94. A second build alternative evaluated in the CE, Alternative B, replaced the bridge in place with a new bridge as shown in Figure 2A. During construction, traffic will be maintained by an on-site detour south of the existing bridge. Roadway work will extend approximately 160 feet west of and approximately 120 east of Bridge No. 94.

At the February 2003 field inspection for the project it was determined that the structural capacity of the existing bridge was inadequate for construction equipment to reach the west side of Laurel Fork Creek. This Addendum documents revising the preferred alternative to Alternative B (Preferred) due to constructability problems associated with Alternative A.

II. SUMMARY OF ENVIRONMENTAL COMMITMENTS

See the attached Green Sheet for a list of environmental commitments made by the North Carolina Department of Transportation to avoid and minimize environmental impacts of the project.

III. DISCUSSION

Four (4) preliminary alternatives were initially evaluated for this project. Two alternatives were subsequently eliminated from additional study and two (2) build alternatives were selected for this project: Alternative A and Alternative B.

A. PROJECT DESCRIPTION

The proposed approach roadway will consist of two nine-foot (2.7-meter) travel lanes and two-foot (0.6 meter) shoulders (Figure 3). The proposed grade will be approximately the same as the existing roadway.

The proposed replacement structure for Bridge No. 94 is a cored slab bridge approximately 100 feet (30 meters) in length with a minimum grade of 0.3 percent to facilitate deck drainage. The proposed bridge will be at approximately the same elevation as the existing bridge. The proposed bridge will consist of two 9-foot (2.7-meter) travel lanes and 2-foot (0.6 meter) shoulders (See Figure 3).

SR 1111 is a dead end road with a projected design year (2025) volume of 40 vehicles per day (vpd). In accordance with the NCDOT Design Manual Part I 1-1B, minimum design speeds for local rural roads with current average daily traffic volumes of 50 vpd or less, a minimum design speed of 20 miles per hour will be used.

B. BUILD ALTERNATIVES

Alternative A consists of realignment just north of the existing bridge (Figure 2). Adequate distance from the existing bridge will be provided so that traffic can be maintained on the existing structure. In the northeast quadrant of the project, valley gutter will be used. This will facilitate drainage and avoid impact to the cabin. A pile panel retaining wall will be used in the northwest quadrant to minimize environmental impacts. The roadway approach work will extend approximately 200 feet west of Bridge No. 94 and approximately 150 feet east of Bridge No. 94.

Alternative B replaces the bridge in place with a new bridge (Figure 2A). During construction, traffic will be maintained by an on-site detour south of the existing bridge. The roadway approach work will extend approximately 160 feet west of Bridge No. 94 and approximately 120 feet east of Bridge No. 94.

C. REVISED PREFERRED ALTERNATIVE

A Combined Field Inspection was held on the project on February 19, 2003. At the inspection it was determined that the existing bridge was inadequate for passage of construction equipment, particularly a crane, necessary to construct the new structure and remove the existing bridge. This effectively eliminates Alternative A as a build alternative for the project. In addition it was determined that an on-site detour as evaluated in Alternative B was feasible. **Due to the constructability problems associated with Alternative A (Preferred), it was agreed to revise the preferred alternative to Alternative B.**

The Division Engineer concurs with Alternative B as the preferred alternative.

D. ANTICIPATED DESIGN EXCEPTIONS

The speed limit on SR 1111 is not posted therefore a statutory speed limit of 55 mph (90 km/h) applies. The existing horizontal and vertical geometric design does not meet the design requirements for the statutory speed limit. SR 1111 is a dead end road with a projected design year (2025) volume of 40 vehicles per day (vpd). A design exception for the proposed design speed of 20 mph (30 km/h) will be required.

IV. ESTIMATED COST.

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

	ALTERNATIVES	
	A	**B (Preferred)**
Structure Removal (Existing)	$ 9,440	$ 9,440
Structure Proposed	142,800	176,000
Roadway Approaches	84,520	75,245
Temporary Structure	0	33,600
Pile Panel Wall	18,000	0
Miscellaneous and Mobilization	63,570	66,715
Engineering Contingencies	56,670	64,000
ROW/Const. Easements/Utilities	35,000	55,000
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	$410,000	$480,000

The estimated cost of the project as shown in the Draft 2004-2010 Transportation Improvement Program is $470,000, including $35,000 for right-of-way and $350,000 for construction.

V. NATURAL RESOURCES

A. POTENTIAL IMPACTS

The description of project area natural resources and impacts for both of the alternatives remain the same as reported in the original Categorical Exclusion. Anticipated impacts to terrestrial and aquatic communities are shown in Table 1. **There are no wetlands in the project area.**

TABLE 1: ANTICIPATED IMPACTS TO TERRESTRIAL AND AQUATIC COMMUNITIES			
Bridge No. 94 Replacement Impacts	Montane Oak-Hickory Forest acre (ha)	Man-Dominated Community acre (ha)	Aquatic Community acre (ha)
Alternative A	0.15 (0.06)	0.29 (0.12)	<0.02 (<0.01)
Alternative B (Preferred)	0.03 (0.01)	0.20 (0.08)	0.02 (<0.01)
Alternative B Temporary Detour	0.00 (0.00)	0.14 (0.06)	<0.01 (<0.01)

Table 1 Notes:
Terrestrial impacts calculated to 10 feet (3 meters) outside slope stakes, aquatic impacts calculated using length and width of structure over water.
Actual construction impacts may be less than those indicated above, calculations were based on the worst-case scenario

The revision of the Preferred Alternative from Alternative A to Alternative B will result in an increase to aquatic resources of less than 0.01 acres (0.1 ha).

B. FEDERAL 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 USFWS reports six federally protected species for Watauga County as of the February 25, 2003 listing (Table 2).

There have been no additions to the federally protected species list for Watauga County since completion of the Categorical Exclusion. The Biological Conclusion for all six species in the Categorical Exclusion was "No Effect" due to lack of suitable habitat in the project area.

TABLE 2 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 (=*Hedyotis purpurea* var. *montana*) (Roan Mountain bluet)	E
Liatris helleri (Heller's blazing star)	T

Table 2 Notes:
E Denotes Endangered (a species that is in danger of extinction throughout all or a significant portion of its range).
T Denotes Threatened (a species likely to become endangered within the foreseeable future throughout all or a significant portion of its range.
T(S/A) Denotes threatened due to similarity of appearance. These species are listed due to resemblance to another protected species but are not biologically endangered or threatened and are not subject to Section 7 consultation.
** The northern population of the bog turtle (from New York south to Maryland) is designated as threatened. The southern population of the bog turtle (from Virginia south to Georgia) is designated as T(S/A). This designation bans the collection and interstate and international commercial trade of the species from the southern population, but has no effect on land management activities by private landowners.

C. Cultural Resources

There are no architectural resources in the area of potential effect (APE) of the project that are eligible for inclusion in the National Register of Historic Places. This is documented in the State Historic Preservation Office's (HPO) memorandum dated September 4, 2002 included in the Appendix.

In a memorandum dated December 30, 2002 and included in the Appendix, the HPO stated "Because of the location and topography of the proposed project area, it is unlikely that any archaeological sites which may be eligible for listing in the National Register of Historic Places will be affected by the proposed construction."

D. Special Topics

Permits

(1) Section 404 of the Clean Water ACT

In accordance with Section 404 of the Clean Water Act (CWA) (33 U.S.C. 1344.), a permit is required from the USACE for projects of this type for the discharge of dredged or fill material into Waters of the United States. The USACE issues two types of permits for these activities. A general permit may be issued on a nationwide or regional basis for a category or categories of activities when: those activities are substantially similar in nature and cause only minimal individual and cumulative environmental impacts, or when the general permit would result in avoiding unnecessary duplication of regulatory control exercised by another Federal, state, or local agency provided that the environmental consequences of the action are individually and cumulatively minimal. If a general permit is not appropriate for a particular activity, then an individual permit must be utilized. Individual permits are authorized on a case-by-case evaluation of a specific project involving the proposed discharges.

It is anticipated that this project will fall under Nationwide Permit 23, which is a type of general permit. Nationwide Permit 23 is relevant to approved Categorical Exclusions. Activities under this permit are categorically excluded from environmental documentation because they are included within a category of activities, which neither individually nor cumulatively have a substantial effect on the human environment. Activities authorized under nationwide permits must satisfy all terms and conditions of the particular permit.

A 401 Water Quality Certification, administered through the N.C. Department of Environment, Health and Natural Resources, will also be required. This certificate is issued for any activity that may result in a discharge into waters for which a federal permit is required.

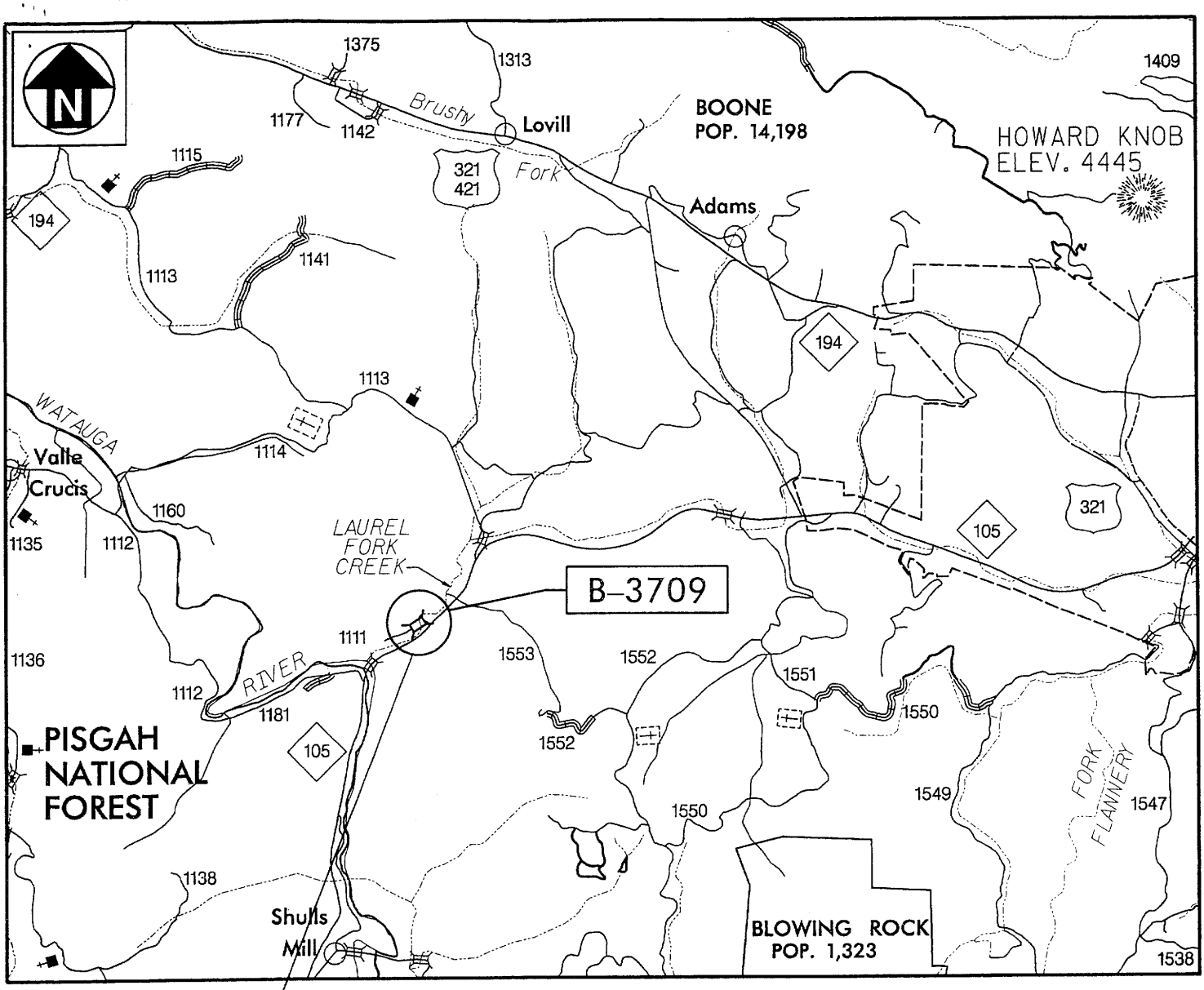
(2) Tennessee Valley Authority

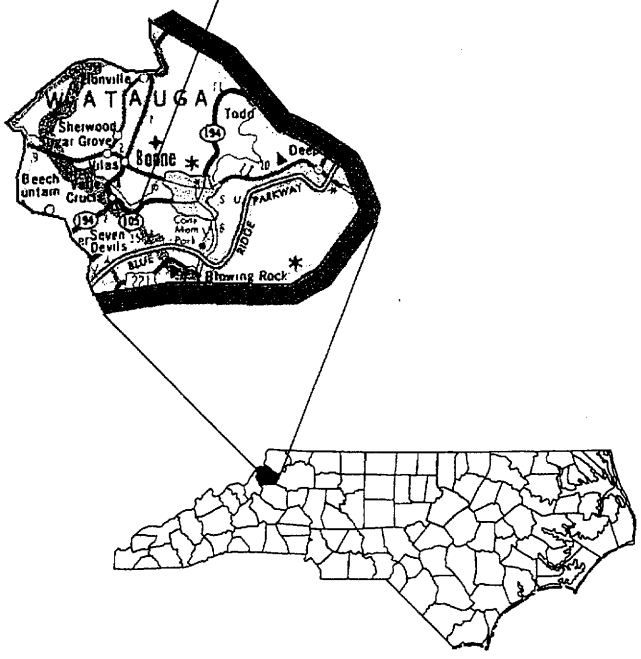
Watauga County is under the jurisdiction of the Tennessee Valley Authority (TVA). This project will be reviewed under Section 26a of the Tennessee Valley Authority Act. The final bridge plans, hydraulic analysis of the effects of the replacement structure on the 100-year flood elevation, and notice of compliance with the Historic Preservation Act of 1966 will be forwarded to TVA for approval at 2611 West Andrew Johnson Hwy Morristown, TN 37814-3295.

VI. ENVIRONMENTAL EFFECTS

This project is expected to have an overall positive impact. Replacement of an inadequate bridge will result in safer traffic operations. All environmental impacts identified and evaluated in the original CE for the two build alternatives remain valid

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





North Carolina Department Of Transportation
Project Development & Environmental Analysis

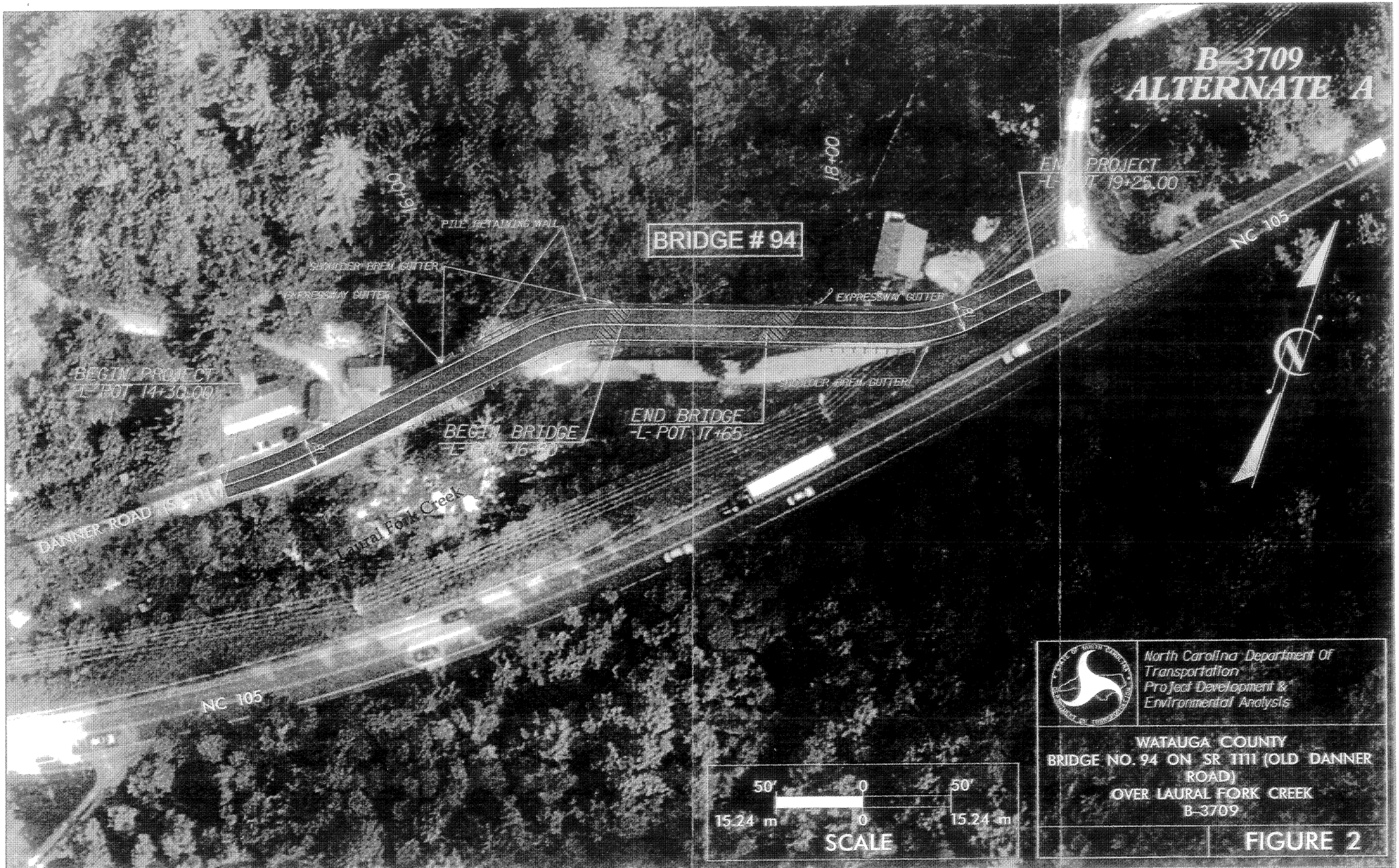
WATAUGA COUNTY

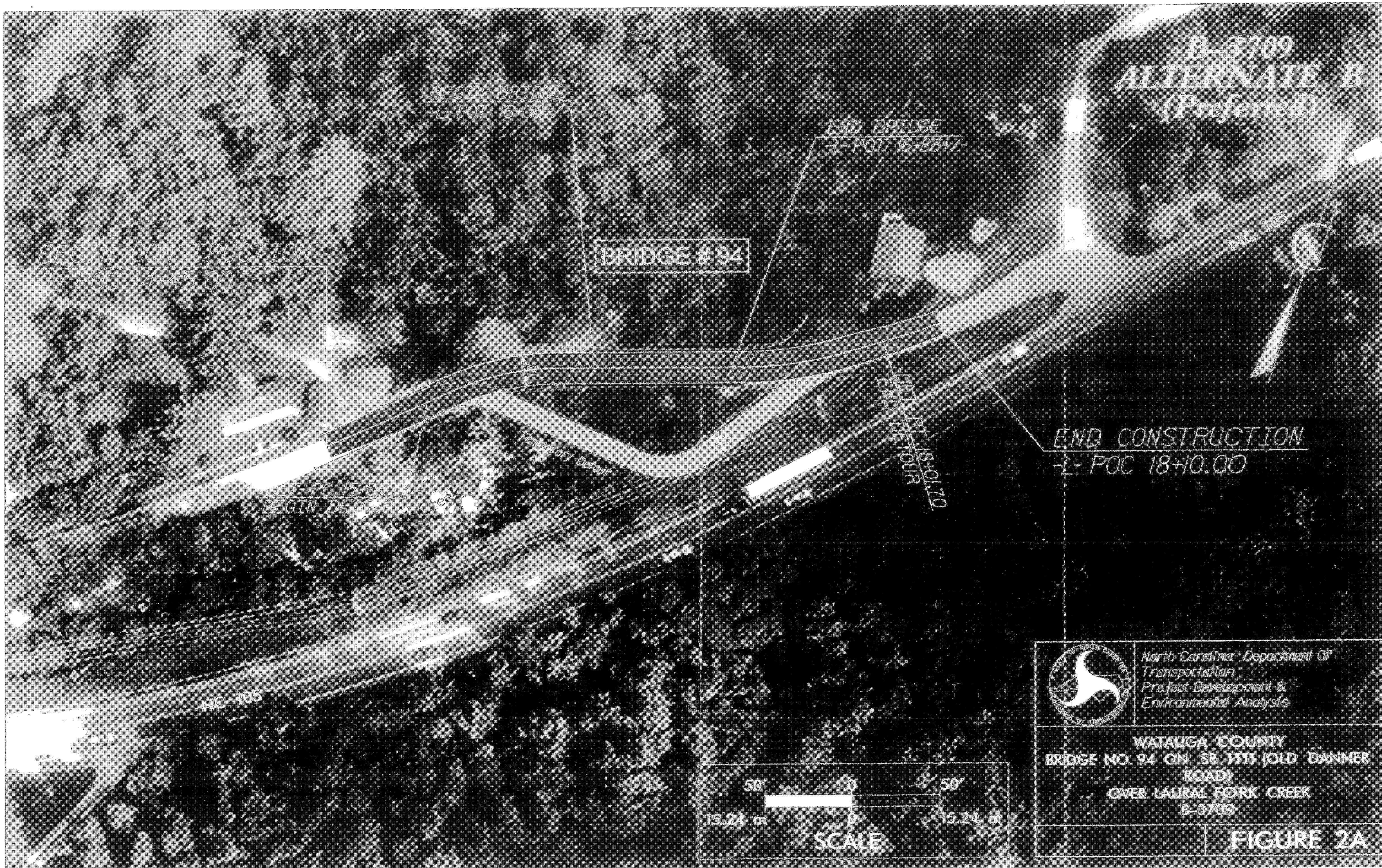
BRIDGE NO. 94 ON SR 1111 OVER LAUREL FORK CREEK

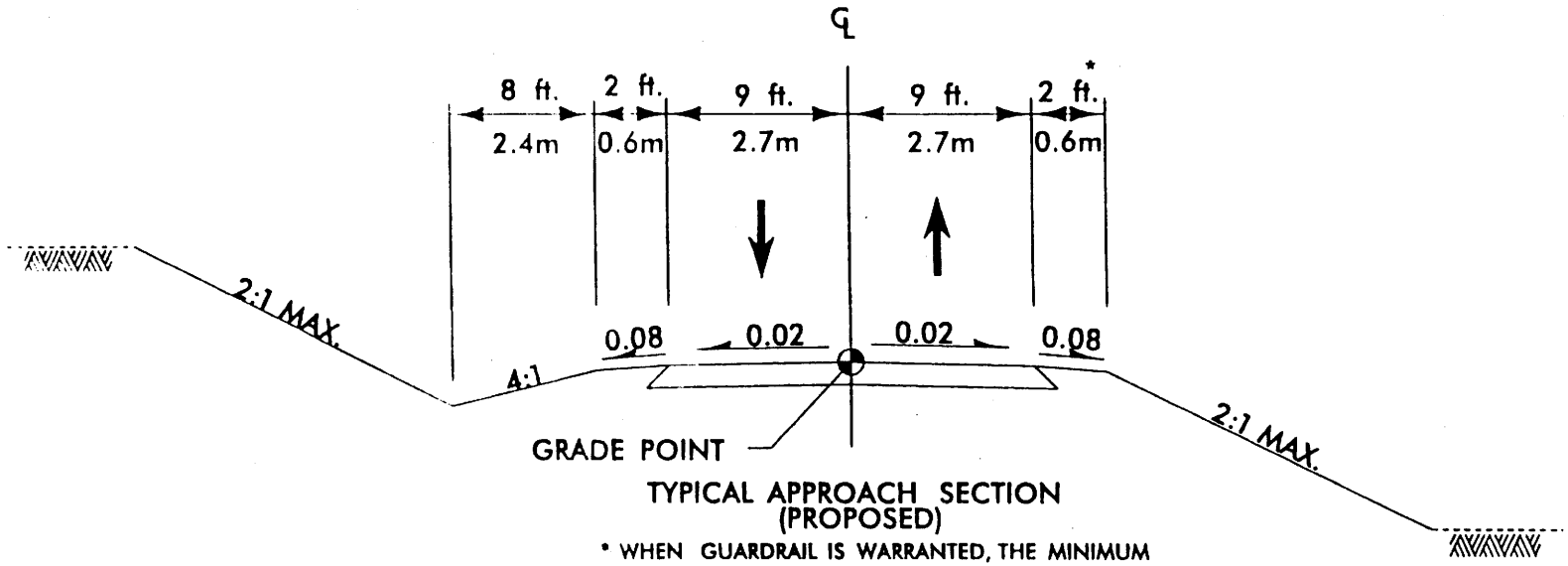
B-3709

0 kilometers 1.6 kilometers 3.2
0 miles 1.0 miles 2.0

FIGURE 1

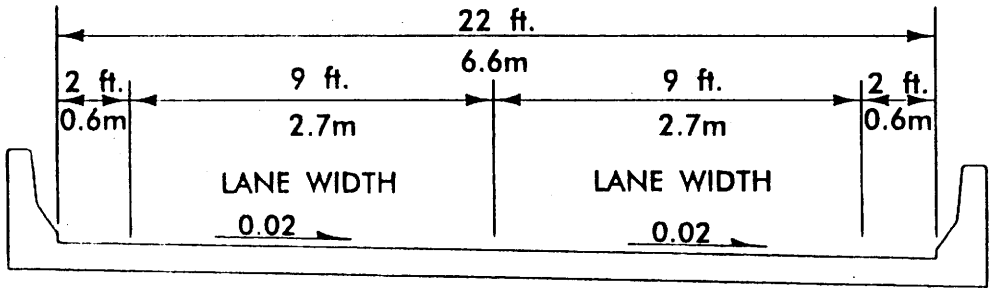

B-3709
ALTERNATE A
BRIDGE # 94
PILE RETAINING WALL
SHOULDER BREM GUTTER
EXPRESSWAY GUTTER
BEGIN PROJECT
-L- POT 14+36.00
BEGIN BRIDGE
-L- POT 16+80
END BRIDGE
-L- POT 17+65
END PROJECT
-L- POT 19+25.00
18+00
NC 105
DANNER ROAD (SR 1111)
Laural Fork Creek
50' 0 50'
15.24 m 0 15.24 m
SCALE
North Carolina Department Of Transportation
Project Development & Environmental Analysis
WATAUGA COUNTY
BRIDGE NO. 94 ON SR 1111 (OLD DANNER ROAD)
OVER LAURAL FORK CREEK
B-3709
FIGURE 2


B-3709
ALTERNATE B
(Preferred)
BEGIN BRIDGE
-L- POT 16+08+/-
END BRIDGE
-L- POT 16+88+/-
BEGIN CONSTRUCTION
BRIDGE # 94
NC 105
Temporary Detour
BEGIN DETOUR
END DETOUR
END CONSTRUCTION
-L- POC 18+10.00
NC 105
50'
0
50'
15.24 m
0
15.24 m
SCALE
North Carolina Department Of Transportation
Project Development & Environmental Analysis
WATAUGA COUNTY
BRIDGE NO. 94 ON SR 1111 (OLD DANNER ROAD)
OVER LAURAL FORK CREEK
B-3709
FIGURE 2A



TYPICAL APPROACH SECTION
(PROPOSED)

* WHEN GUARDRAIL IS WARRANTED, THE MINIMUM OFFSET FROM THE EDGE OF THE TRAVEL LANE TO THE FACE OF THE GUARDRAIL IS 4'-0" (1.2 m).



TYPICAL BRIDGE SECTION

DESIGN DATA

(EXISTING) 2002 ADT = 22 LOS A
(CONST. YR.) 2003 ADT = 24 LOS A
(DESIGN YR.) 2025 ADT = 40 LOS A
DUAL 3%
TTST 1%

FUNCTIONAL CLASSIFICATION : RURAL LOCAL

DESIGN SPEED 20 MPH (30 km/h)
POSTED SPEED LIMIT NOT POSTED
MIN. RADIUS OF CURVE 115 ft. (30 m)
MAX. GRADE 16%
MIN. DES. K FAC.: Ksag = 17 Kcrest = 7
MIN. DES. K FAC.(Metric): Ksag = 6 Kcrest = 2
emax = .06
terrain = mountainous

North Carolina Department
Of Transportation
Project Development &
Environmental Analysis

WATAUGA COUNTY
BRIDGE NO. 94 ON SR 1111
OLD DANNER ROAD
OVER LAUREL FORK CREEK
TIP NO: B-3709

FIGURE 3

APPENDIX

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

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

Division of Historical Resources
David J. Olson, Director

September 4, 2002

MEMORANDUM

TO: Gail Grimes
Project Development and Environmental Analysis Branch
NCDOT Division of Highways

FROM: David Brook RGE for David Brook

SUBJECT: Bridge No. 94 on SR 1111, over Laurel Creek, B-3709, Watauga County, ER01-8271

Thank you for your letter of July 15, 2002 forwarding the New Alignment map for the above referenced project.

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

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

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

cc: Mary Pope Furr, NCDOT

	Location	Mailing Address	Telephone/Fax
Administration	507 N. Blount St, Raleigh, NC	4617 Mail Service Center, Raleigh 27699-4617	(919) 733-4763 •733-8653
Restoration	515 N. Blount St, Raleigh , NC	4613 Mail Service Center, Raleigh 27699-4613	(919) 733-6547 •715-4801
Survey & Planning	515 N. Blount St, Raleigh, NC	4618 Mail Service Center, Raleigh 27699-4618	(919) 733-4763 •715-4801