STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

MICHAEL F. EASLEY
GOVERNOR

LYNDO TIPPETT
SECRETARY

March 25, 2004

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

ATTN: Mr. Steve Lund
NCDOT Coordinator

Dear Sir:

SUBJECT: **Nationwide 23 and 33 Permit Applications.** Replacement of Bridge No. 112 Over Allens Creek on SR 1147 (Allens Creek Road), Haywood County. Federal Aid Project No. BRZ-1147(4), State Project No. 8.2941701, TIP Project No. B-3659.

The NC Department of Transportation (NCDOT) proposes to replace existing Bridge No. 112 over Allens Creek on SR 1147 (Allens Creek Road). The project involves replacing Bridge No. 112 with a 56-foot long, single span bridge over Allens Creek (DWQ Index # 5-16-7-(8.5), Class "C Tr"). The roadway work will extend from approximately 215 feet north of the existing bridge to 40-feet south.

As Bridge No. 112 will be replaced in-place, traffic will be maintained with an approximately 1.6 mile long off-site detour along SR 1144, SR 1146, and SR 1147.

IMPACTS TO WATERS OF THE UNITED STATES

No jurisdictional wetlands will be affected by the proposed project. Bridge No. 112 will be a 56-foot long, single span, steel I-beam structure. The construction of the bridge will not require the placement of support structures in the creek channel. However, construction around the bridge site will result in 0.0007 acres of temporary surface water fill due to the construction of temporary impervious dikes.

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

TELEPHONE: 919-733-3141
FAX: 919-733-9794

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

LOCATION:
TRANSPORTATION BUILDING
1 SOUTH WILMINGTON STREET
RALEIGH NC

BRIDGE DEMOLITION

Bridge No. 112 is currently 41.0-feet long and located on SR 1147 over Allens Creek in Haywood County. The superstructure is composed of a timber floor on steel I-beams. The substructure is Yount masonry abutments. Removal of the bridge substructure will involve cutting and removing materials down to the existing bridge footings and leaving the footings in place to avoid severely disturbing the stream channel. In this way, Bridge No. 112 can be removed without dropping any components into Waters of the United States. Conditions in the creek will not raise sediment concerns, as the substrate consists of bedrock with sand, gravel, cobbles, and boulders.

According to comments received through the North Carolina Wildlife Resources Commission (NCWRC), Allens Creek is considered trout waters by the NCWRC. Therefore, NCWRC stated that instream construction is prohibited during the trout spawning period of November 1 to April 15 to avoid impacts on trout reproduction.

BRIDGE CONSTRUCTION

Bridge No. 112 will be a 56-foot long, single span, steel I-beam superstructure. The substructure will consist of two pile end bents. Construction of the bridge will require temporary dewatering due to the placement of impervious dikes in the stream channel, described below.

TEMPORARY DEWATERING

There will be 0.0007 acres of temporary fill in Allens Creek due to the construction of impervious dikes in small sections on each side of Bridge No. 112. Impervious dikes are necessary as special wing structures designed to keep fill and rip-rap materials out of the stream channel during construction. Class II rip-rap will be used as bridge abutment protection along the stream bank on both sides of Bridge No. 112. Neither temporary nor permanent fill impacts are expected from the Class II rip-rap, however.

No permanent fill will result from the subject activity. The materials used as temporary fill in the construction of the impervious dikes will be removed. The temporary fill areas will be graded back to their original contours. Elevations and contours in the vicinity of the proposed impervious dikes are available from the field survey notes.

It is assumed that the contractor will begin construction of the temporary impervious dikes shortly after the date of availability for this project. The Let date is September 21, 2004 with a date of availability of October 18, 2004.

FEDERALLY-PROTECTED SPECIES

Plants and animals with federal classifications of Endangered, Threatened, Proposed Endangered, and Proposed Threatened are protected under Endangered Species Act §§7 and 9. As of February 5, 2004, the US Fish and Wildlife Service (USFWS) lists nine

federally protected species for Haywood County (Table 1). Biological conclusions of "No Effect" were reached for all listed.

Table 1. Federally Protected Species for Haywood County

SCIENTIFIC NAME	COMMON NAME	STATUS
Clemys muhlenbergii	Bog turtle	T(S/A)
Felis concolor cougar	Eastern cougar	E
Myotis grisescens	Gray bat	E
Glaucomys sabrinus coloratus	Carolina northern flying squirrel	E
Haliaeetus leucocephalus	Bald eagle	T
Alasmidonta raveneliana	Appalachian elktoe	E
Microhexura montivaga	Spruce-fir moss spider	E
Gymnoderma lineare	Rock gnome lichen	E
Isotria medeoloides	Small-whorled pogonia	T

KEY:

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

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

REGULATORY APPROVALS

Section 404 Permit: Aspects of this project are being processed by the Federal Highway Administration as a "Categorical Exclusion" in accordance with 23 CFR 771.115(b). Therefore, we do not anticipate requesting an individual permit, but propose to proceed under a Nationwide 23 and 33 as authorized by a Nationwide Permit 23 and 33 (FR number 10, pages 2020-2095; January 15, 2002).

Section 401 Permit: We anticipate 401 General Certifications number 3361 and 3366 will apply to this project. In accordance with 15A NCAC 2H .0501(a) we are providing two copies of this application to the North Carolina Department of Environment and Natural Resources, Division of Water Quality, for their records.

We anticipate that comments from the North Carolina Wildlife Resources Commission (NCWRC) will be requested prior to authorization by the Corps of Engineers. By copy of this letter and attachment, NCDOT hereby requests NCWRC review. NCDOT requests that NCWRC forward their comments to the Corps of Engineers.

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

If you have any questions or need additional information, please contact Mr. Chris Underwood at (919) 715-1451 or csunderwood@dot.state.nc.us.

Sincerely,

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

cc: w/attachment
Mr. John Hennessy, Division of Water Quality (2 copies)
Ms. Marella Buncick, USFWS
Ms. Marla Chambers, NCWRC
Mr. Greg Perfetti, P.E., Structure Design
Mr. Harold Draper, TVA

cc: w/o attachment
Mr. David Franklin, P.E., USACE, Wilmington
Mr. Jay Bennett, P.E., Roadway Design
Mr. Omar Sultan, Programming and TIP
Mr. Art McMillan, P.E., Highway Design
Mr. David Chang, P.E., Hydraulics
Mr. Mark Staley, Roadside Environmental
Mr. John F. Sullivan III, P.E., FHWA
Mr. Ron Watson, P.E., Division Engineer
Mr. Mark Davis, DEO
Mr. John Wadsworth, P.E.

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: Nationwide 23 and 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: North Carolina Department of Transportation
   Mailing Address: 1548 Mail Service Center, Raleigh, NC 27699
   Telephone Number: 919-733-7844 Fax Number: 919-715-1501
   E-mail Address:

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

III. Project Information

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

1. Name of project: Replacement of Bridge No. 112 Over Allens Creek on SR 1147 (Allens Creek Road), Haywood County.

2. T.I.P. Project Number or State Project Number (NCDOT Only): B-3659

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

4. Location
   County: Haywood Nearest Town: Micadale
   Subdivision name (include phase/lot number):
   Directions to site (include road numbers, landmarks, etc.): Located on SR 1147 between intersections with SR 1146 and SR 1144, south of Micadale over Allens Creek

5. Site coordinates, if available (UTM or Lat/Long): N35° 26.103' , W83° 00.561'
   (Note – If project is linear, such as a road or utility line, attach a sheet that separately lists the coordinates for each crossing of a distinct waterbody.)

6. Property size (acres): N/A

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

8. River Basin: French Broad
   (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 Rural local, with low density residential and agricultural land dominant.

10. Describe the overall project in detail, including the type of equipment to be used:
Single span bridge replacement using mechanical highway construction equipment.

11. Explain the purpose of the proposed work: Investigations by the Bridge Maintenance Unit indicate that rehabilitation of the existing structures is not feasible due to age and deteriorated conditions. Bridge No. 112 carries a sufficiency rating of 49.0 out of a possible 100. This structure is considered functionally obsolete. Replacement of the bridge 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.

Provide a written description of the proposed impacts: There will be no impacts to jurisdictional wetlands from the replacement of Bridge No. 112. However, construction around the bridge site will result in a small amount of temporary surface water fill due to the construction of temporary impervious dikes.

1. Individually list wetland impacts below:

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

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

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

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

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

Total area of wetland impact proposed: 0

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

Stream Impact Site Number (indicate on map)	Type of Impact*	Length of Impact (linear feet)	Stream Name**	Average Width of Stream Before Impact	Perennial or Intermittent? (please specify)
1 (-L- STA 14+42)	Temporary	64.0 feet	Allens Creek	20.0 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: 64.0 feet of temporary surface water impact.

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

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

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

4. Pond Creation
   If construction of a pond is proposed, associated wetland and stream impacts should be included above in the wetland and stream impact sections. Also, the proposed pond should be described here and illustrated on any maps included with this application.
   Pond to be created in (check all that apply): ☐ uplands ☐ stream ☐ wetlands
   Describe the method of construction (e.g., dam/embankment, excavation, installation of draw-down valve or spillway, etc.): N/A

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

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

VII. Impact Justification (Avoidance and Minimization)

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

The selected design was chosen because the existing alignment is on a tangent, a good off-site detour is available, it has the lowest construction cost, and it will create comparatively lower environmental impacts.

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): N/A
   Amount of buffer mitigation requested (square feet): _____
   Amount of Riparian wetland mitigation requested (acres): _____
   Amount of Non-riparian wetland mitigation requested (acres): _____
   Amount of Coastal wetland mitigation requested (acres): _____

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 ☐

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

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

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

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

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

Zone*	Impact (square feet)	Multiplier	Required Mitigation
Total			

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

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

X. 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.

XI. 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.

XII. 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 ☒

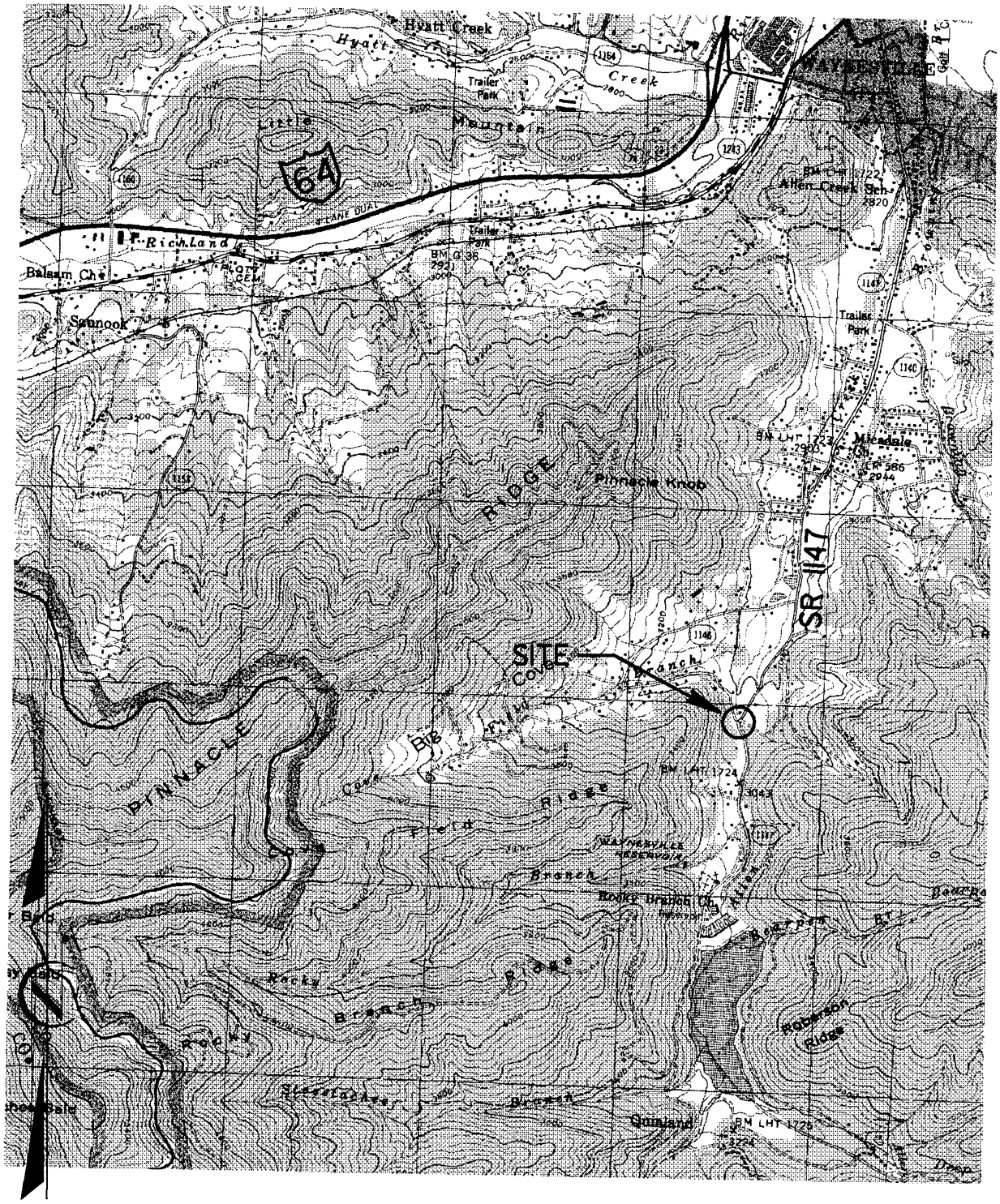
XIII. Other Circumstances (Optional):

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).

3/29/04

Applicant/Agent's Signature **Date**

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



LOCATION MAPS

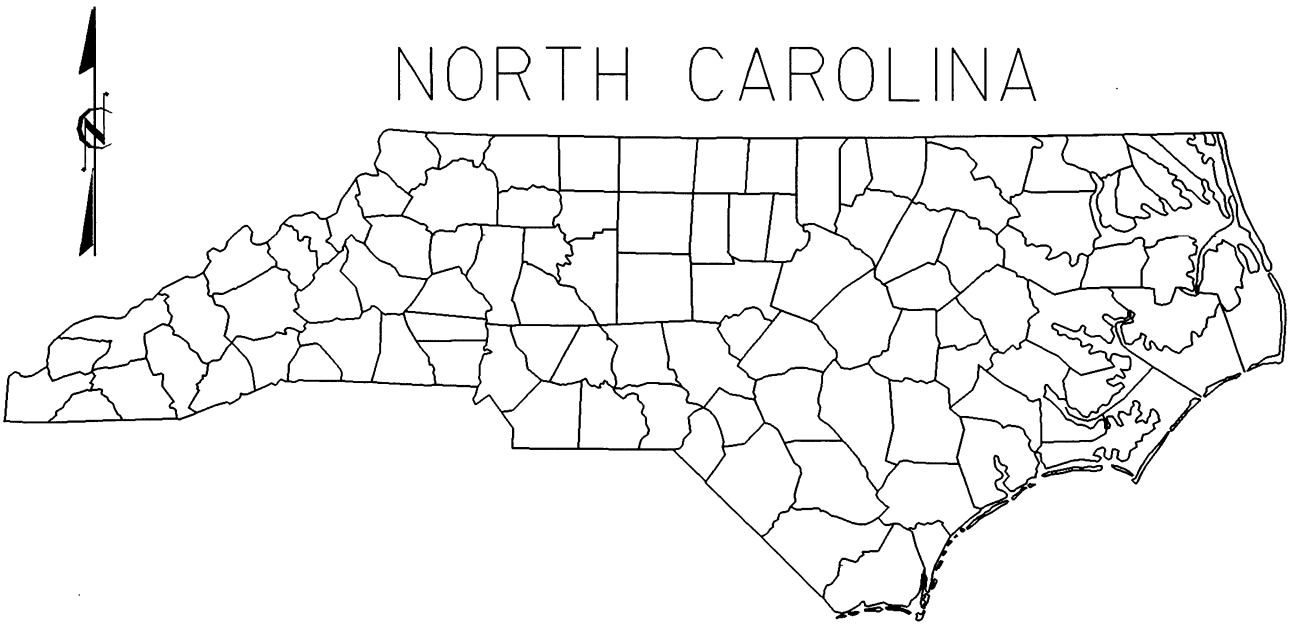
NCDOT

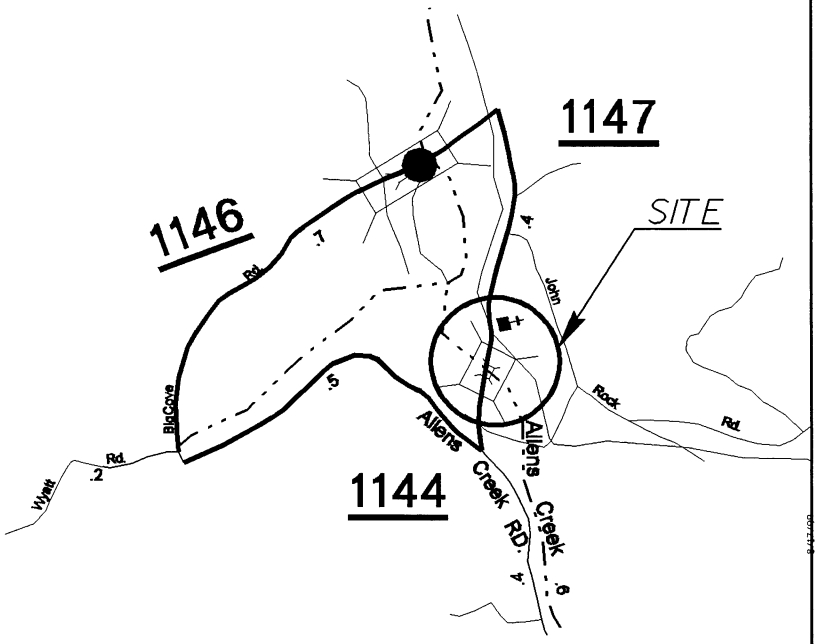
DIVISION OF HIGHWAYS
HAYWOOD COUNTY
PROJECT: 8.2951701 (B-3659)

BRIDGE NO 112 OVER ALLENS CREEK OVER SR 1147

2 of 8

3/3/2004





VICINITY MAPS

NCDOT

DIVISION OF HIGHWAYS
HAYWOOD COUNTY
PROJECT: 8.2951701 (B-3659)

BRIDGE NO 112 OVER ALLENS CREEK OVER SR 1147

1 of 8

3/3/2003

PROJECT REFERENCE NO.	SHEET NO.
B-3659	3 of 8
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

REVISIONS

8/17/9

NAD 83

1

OBERIA WYATT BRYSON and LYNNE BRYSON

2

OBERIA BRYSON

3

WILLIAM B. WIGGINS

TO PINEY MOUNTAIN ROAD

TO WAYNESVILLE

TO QUINLAND

ALLENS CREEK ROAD

SR 1442 20' BST

ALLENS CREEK

EXISTING R/W

WOODS

TO FENCE

IMPERVIOUS DIKE (SANDBAG)

CLASS II RIPRAP

-L- +25.00 110.00'

-DRI- +75.00 15.00'

-L- +50.00 35.00'

+00.00 35.00'

+40.00 EX. R/W

+50.00 40.00

+60.00 60.00

+75.00 45.00

+59.00 EX. R/W

+25.71 EX. R/W & 30.00'

+25.71 EX. R/W & 35.00'

+00.67 EX. R/W 40.00'

+01.67 EX. R/W 45.00'

+25.00 15.00'

F 24" CMP

ISWFD

G

DK

S

TS TS TS TS TS

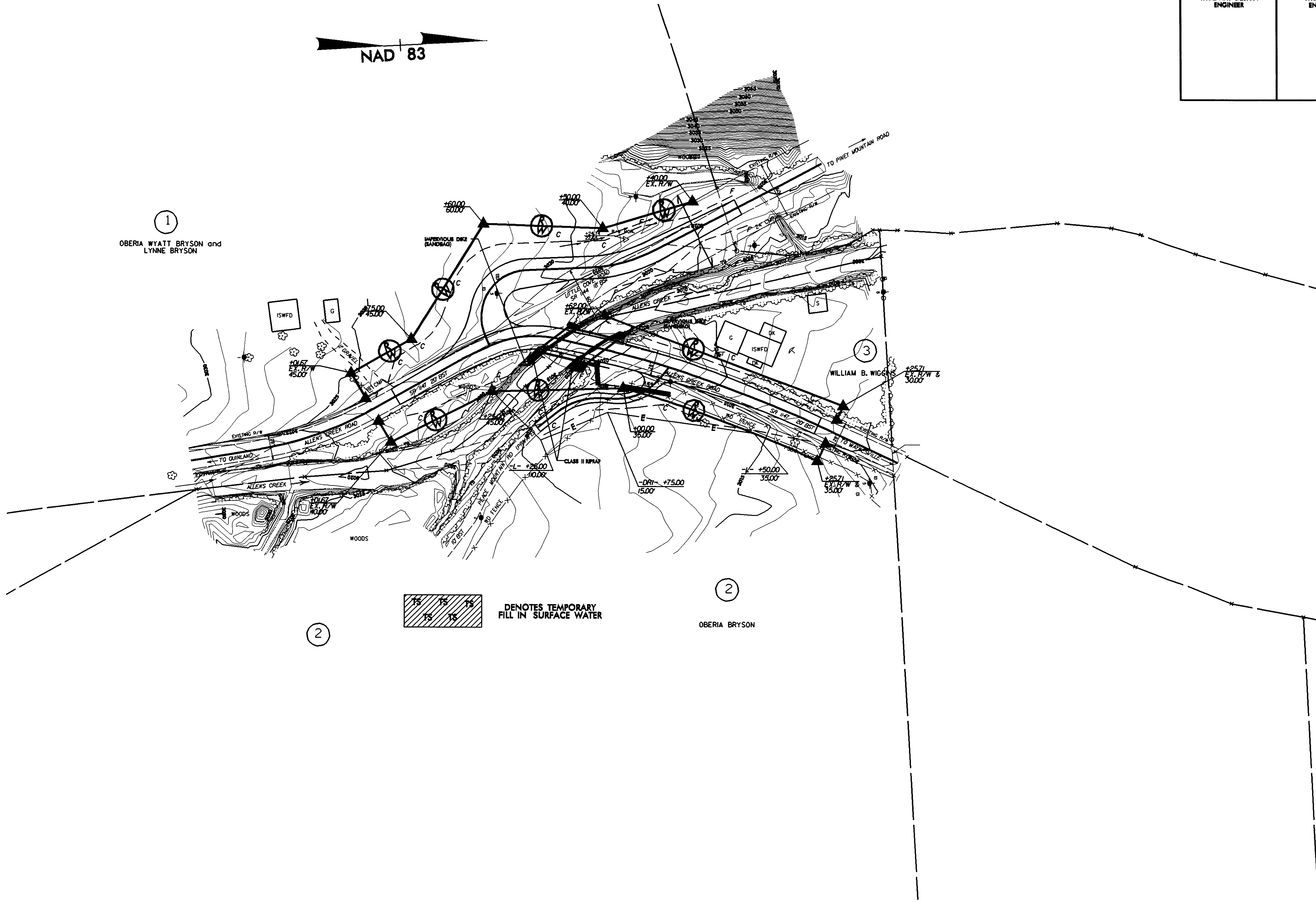
DENOTES TEMPORARY FILL IN SURFACE WATER

$$$$$SYSTIME$$$$$

$$$$$FILENAME$$$$$

PROJECT REFERENCE NO.	SHEET NO.
B-3659	4 of 8
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

REVISIONS



NAD 83
1
OBERIA WYATT BRYSON and
LYNNE BRYSON
2
OBERIA BRYSON
3
WILLIAM B. WIGGINS
ISWFD
ALLENS CREEK ROAD
ALLENS CREEK
TO PINEY MOUNTAIN ROAD
TO QUINLAND
TO WAYNESVILLE
SR 1141 20' BST
LITTLE COVE ROAD
SR 1144 18' BST
IMPERVIOUS DIKE (SANDBAG)
CLASS II RIPRAP
WOODS
EXISTING R/W
NO FENCE
+60.00
60.00'
+50.00
40.00'
+40.00
EX. R/W
+75.00
45.00'
+10.57
EX. R/W
45.00'
+62.00
EX. R/W
+25.71
EX. R/W &
30.00'
+25.71
EX. R/W &
35.00'
+00.00
35.00'
-L- +50.00
35.00'
-DR1- +75.00
15.00'
-L- +25.00
110.00'
+10.57
EX. R/W
40.00'
TS
DENOTES TEMPORARY
FILL IN SURFACE WATER

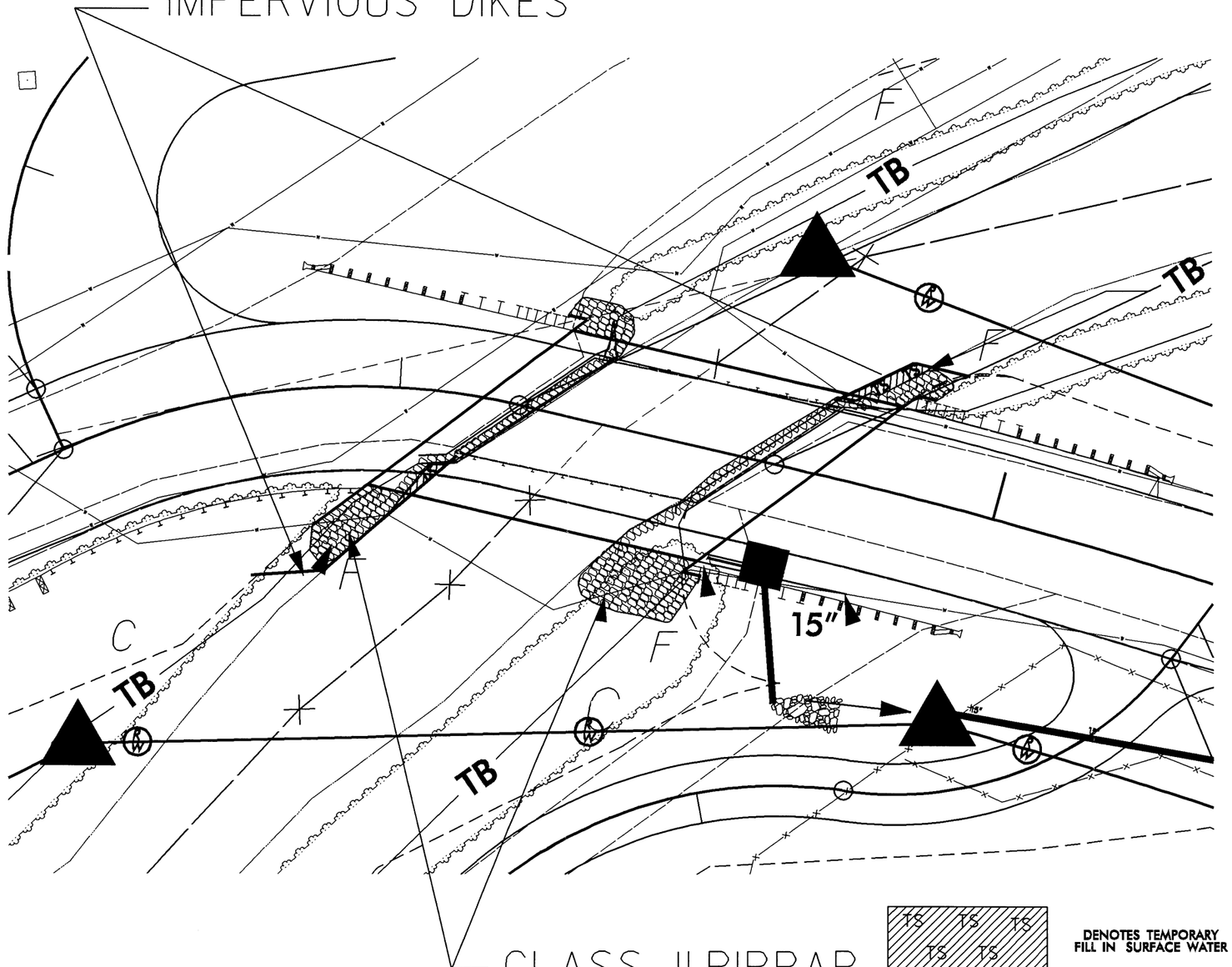
8/17/99
$$$$$$SYSTIME$$$$$
$$$$$$$$$$DGN$$$$$$$$$$$$$$$$$$$$
$$$$USERNAME$$$$

PROJECT REFERENCE NO.	SHEET NO.
B-3659	5 of 8
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

8/17/99

REVISIONS

IMPERVIOUS DIKES



INSERT A - (NOT TO SCALE)

$$$$$$SYSTIME$$$$
$$$$$$USERNAME$$$$

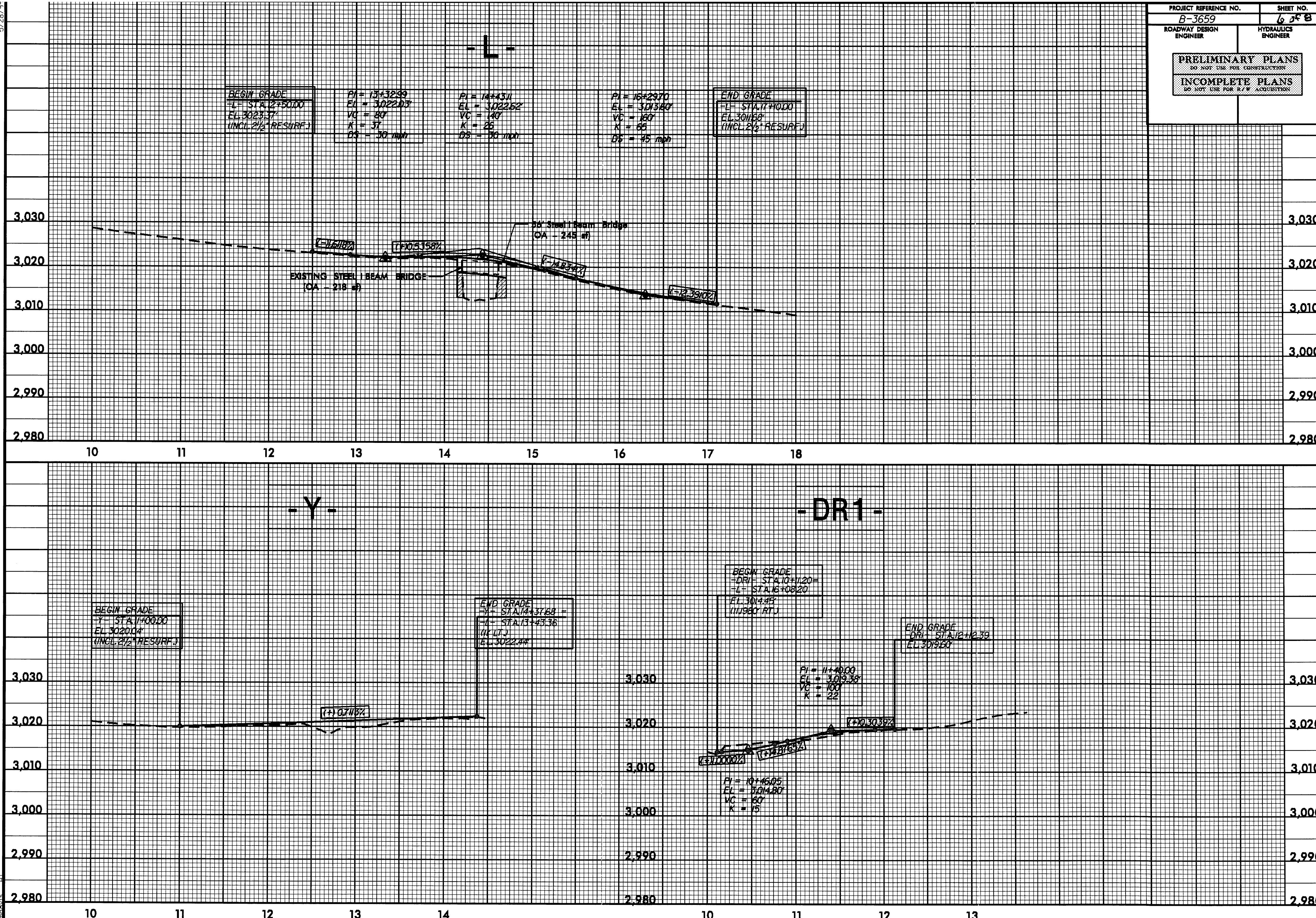
PROJECT REFERENCE NO.	SHEET NO.
B-3659	6 of 8

ROADWAY DESIGN ENGINEER

HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION



-L-
BEGIN GRADE
-L- STA.12+50.00
EL.3023.37'
(INCL.2½" RESURF.)
PI = 13+32.99
EL = 3,022.03'
VC = 80'
K = 37
DS = 30 mph
PI = 14+43.11
EL = 3,022.62'
VC = 140'
K = 26
DS = 30 mph
PI = 16+29.70
EL = 3,013.60'
VC = 160'
K = 65
DS = 45 mph
END GRADE
-L- STA.17+10.00
EL.3011.68'
(INCL.2½" RESURF.)
(-)1.6118%
(+)0.5358%
36' Steel I Beam Bridge
(OA - 245 sf)
EXISTING STEEL I BEAM BRIDGE
(OA - 218 sf)
(-)4.8234%
(-)2.3910%
3,030
3,020
3,010
3,000
2,990
2,980
10
11
12
13
14
15
16
17
18
-Y-
BEGIN GRADE
-Y- STA.11+00.00
EL.3020.04'
(INCL.2½" RESURF.)
(+) 0.7113%
END GRADE
-Y- STA.14+37.68 =
-L- STA.13+43.36
(11' LT.)
EL.3022.44'
-DR1-
BEGIN GRADE
-DR1- STA.10+11.20=
-L- STA.16+08.20
EL.3014.45'
(11.980' RT.)
PI = 11+40.00
EL = 3,019.38'
VC = 100'
K = 22
END GRADE
-DR1- STA.12+12.39
EL.3019.60'
(+)0.3039%
(+)4.8765%
(+)1.0000%
PI = 10+46.05
EL = 3,014.80'
VC = 60'
K = 15

03-MAR-2004 08:13
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jmdavis AT

WETLAND PERMIT IMPACT 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	-L- STA 14+42	BRIDGE							0.0007		
TOTALS:									0.0007		

NCDOT

HAYWOOD COUNTY
PROJECT 8.2941701 (B-3659)
BRIDGE NO. 112 ON SR 1147
OVER ALLENS CRREK

3/3/2004

PROPERTY OWNERS

NAMES AND ADDRESSES

PARCEL NO.	NAMES	ADDRESSES
(1)	OBERIA WYATT BRYSON and LYNNE BRYSON	P. O. BOX 445 HAZELWOOD, NC 28738
(2)	OBERIA BRYSON	P. O. BOX 445 HAZELWOOD, NC 28738
(3)	WILLIAM B. WIGGINS	600 SHERRIL LN. CANTON, NC 28716

NCDOT

DIVISION OF HIGHWAYS

HAYWOOD COUNTY

PROJECT: 8.2951701 (B-3659)

BRIDGE NO 112 OVER ALLENS CREEK OVER SR 1147

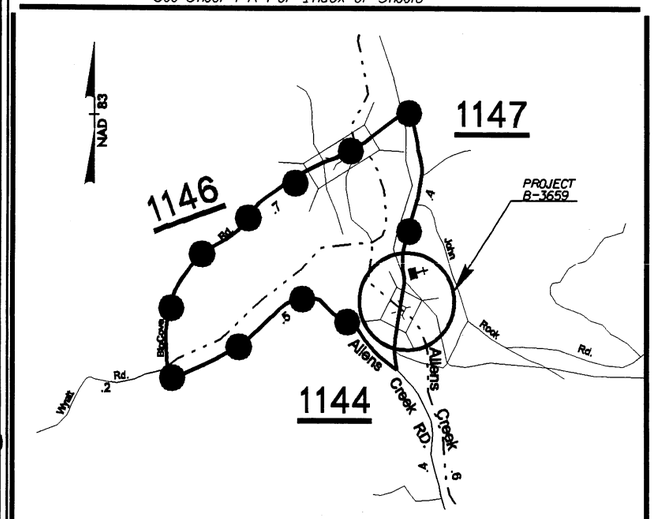
3/3/2003

09/08/99

TIP PROJECT: B-3659

CONTRACT: C200862 TIP PROJECT: B-3659

See Sheet 1-A For Index of Sheets



DETOUR ROUTE

PROJECT VICINITY MAP

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

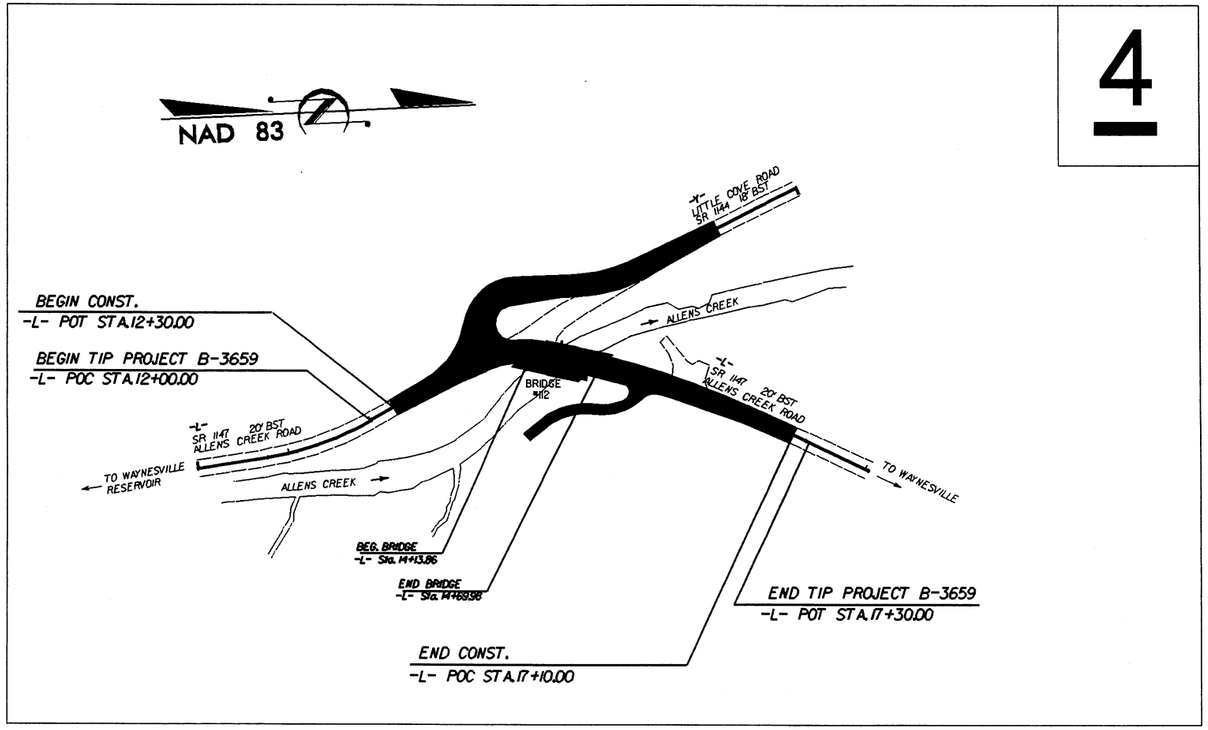
HAYWOOD COUNTY

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-3659	1	

STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION
33204.1.1	BRZ-1147(4)	P.E., PE FOR UTILITIES
33204.2.2	BRZ-1147(4)	R/W & UTIL

LOCATION: BRIDGE NO. 112 OVER ALLENS CREEK ON SR 1147 (ALLENS CREEK ROAD)

TYPE OF WORK: GRADING, PAVING, DRAINAGE AND STRUCTURE



4
1

THIS PROJECT IS NOT WITHIN ANY MUNICIPAL BOUNDARIES
CLEARING ON THIS PROJECT SHALL BE TO THE LIMITS ESTABLISHED BY METHOD II.
** REQUIRES DESIGN EXCEPTION AS IT RELATES TO HORIZONTAL AND VERTICAL ALIGNMENTS.

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

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 2004 = 338
ADT 2024 = 492
DHV = 10 %
D = 60 %
T = 3 % *
** V = 15 MPH

* TTST 1 % DUAL 2 %

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT B-3659 = 0.089 MILES
LENGTH STRUCTURE TIP PROJECT B-3659 = 0.011 MILES
TOTAL LENGTH TIP PROJECT B-3659 = 0.100 MILES

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

2002 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE: OCTOBER 1, 2003

LETTING DATE: SEPTEMBER 21, 2004

GARY LOVERING, P.E.
PROJECT ENGINEER

R. A. SHILLINGLAW, P.E.
PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER

SIGNATURE: P.E.

ROADWAY DESIGN ENGINEER

SIGNATURE: P.E.

DIVISION OF HIGHWAYS STATE OF NORTH CAROLINA

STATE DESIGN ENGINEER P.E.

DEPARTMENT OF TRANSPORTATION FEDERAL HIGHWAY ADMINISTRATION

APPROVED
DIVISION ADMINISTRATOR DATE

04-DEC-2003 09:41
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Shillinglaw at RD193475

*S.U.E = SUBSURFACE UTILITY ENGINEER

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

CONVENTIONAL SYMBOLS

ROADS & RELATED ITEMS

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

RIGHT OF WAY

- Baseline Control Point
- Existing Right of Way Marker
- Exist. Right of Way Line w/Marker
- Prop. Right of Way Line with Proposed R/W Marker (Iron Pin & Cap)
- Prop. Right of Way Line with Proposed (Concrete or Granite) R/W Marker
- Exist. Control of Access Line — 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 — RBB
- 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
- U/G Telephone Cable Hand Hold
- Cable TV Pedestal
- U/G TV Cable Hand Hold
- U/G Power Cable Hand Hold
- Hydrant
- Satellite Dish
- Exist. Water Valve
- Sewer Clean Out
- Power Manhole
- Telephone Booth
- Cellular Telephone Tower
- Water Manhole
- Light Pole
- H-Frame Pole
- Power Line Tower
- Pole with Base
- Gas Valve
- Gas Meter
- Telephone Manhole
- Power Transformer
- Sanitary Sewer Manhole
- Storm Sewer Manhole
- Tank; Water, Gas, Oil
- Water Tank With Legs
- Traffic Signal Junction Box
- Fiber Optic Splice Box
- 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 — WW & ISBW
- Existing Wetland Boundaries — WLB
- High Quality Wetland Boundary — WLB
- Medium Quality Wetland Boundaries — WLB
- Low Quality Wetland Boundaries — 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

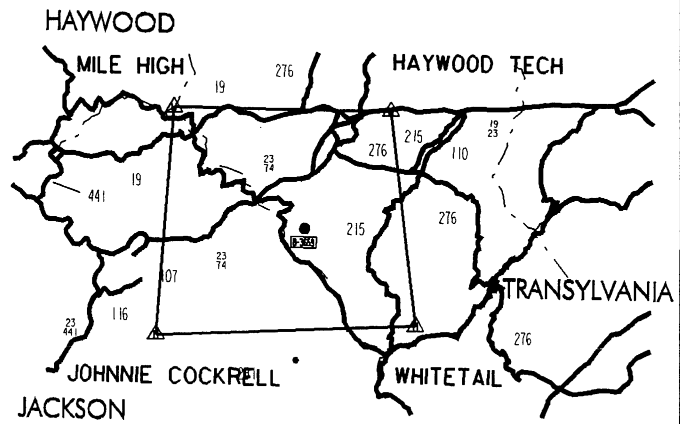
- Standard Gauge — CSX TRANSPORTATION
- RR Signal Milepost — MILEPOST 35
- Switch — SWITCH

revised 02/02/00

PROJECT REFERENCE NO.	SHEET NO.
8.2941701	1 C
LOCATION AND SURVEYS	

8/17/99

B3659 SURVEY CONTROL SHEET



GPS HARN NETWORK

NOT TO SCALE

BM-1 ELEVATION = 3031.63
N 636964 E 806136
L STATION 11+08 15 RIGHT
RAILROAD SPIKE SET IN 30" SYCAMORE

BM-2 ELEVATION = 3021.24
N 637205 E 806055
L STATION 13+67 33 RIGHT
RAILROAD SPIKE SET IN 36" MAPLE

BM-3 ELEVATION = 3024.96
N 637518 E 805869
Y STATION 10+26 4 LEFT
RAILROAD SPIKE SET IN 12" LOCUST

BM-4 ELEVATION = 3011.67
N 637587 E 806226
L STATION 18+04
S 72° 20' 57.0" E DIST 51.21
RAILROAD SPIKE SET IN HEMLOCK STUMP

BL

POINT	DESC.	NORTH	EAST	ELEVATION	L STATION	OFFSET
1	BL-1	636898.4500	806142.6100	3027.38	10+43.53	12.95 RT
2	BL-2	637218.5110	806037.2430	3020.97	13+86.12	16.49 RT
3	BL-3-B3659-102	637618.0410	806202.9510	3008.44	OUTSIDE PROJECT LIMITS	

BY

POINT	DESC.	NORTH	EAST	ELEVATION	Y STATION	OFFSET
4	BY-4	637513.4740	805853.7860	3020.49	10+23.67	11.83 RT
5	BY-5	637218.5110	806037.2430	3020.97	OUTSIDE PROJECT LIMITS	

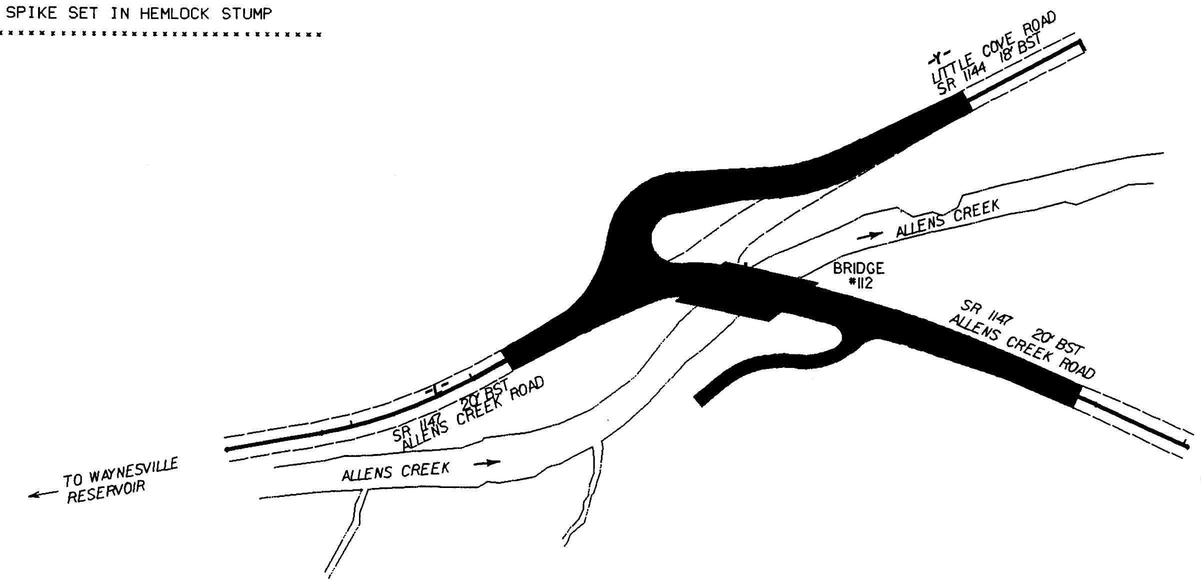
NOTES

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

THE FILES TO BE FOUND ARE AS FOLLOWS:

B3659_LS_CONTROL_030917.TXT

NAD 83



NCDOT GPS STATION B3659-102
LOCALIZED PROJECT COORDINATES
N = 637618.0410
E = 806202.9510

NCDOT GPS STATION B3659-101
LOCALIZED PROJECT COORDINATES
N = 638088.2080
E = 806453.5380

DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCDOT FOR MONUMENT "B3656-102"
WITH NAD 1983/95 STATE PLANE GRID COORDINATES OF
NORTHING: 637618.041(ft) EASTING: 806202.951(ft)
THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.99973836
THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "B3656-102" TO -L- STATION 10+00.00 IS
S 5°06'04" W 767.36'
ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES
VERTICAL DATUM USED IS NAVD 88

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

NOTE: DRAWING NOT TO SCALE

04-DEC-2003 09:42
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RShillinglaw AT RO193475

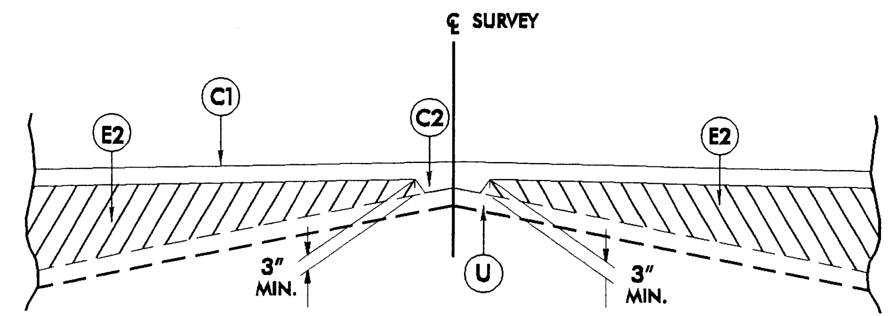
PROJECT REFERENCE NO.	SHEET NO.
B-3659	2
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

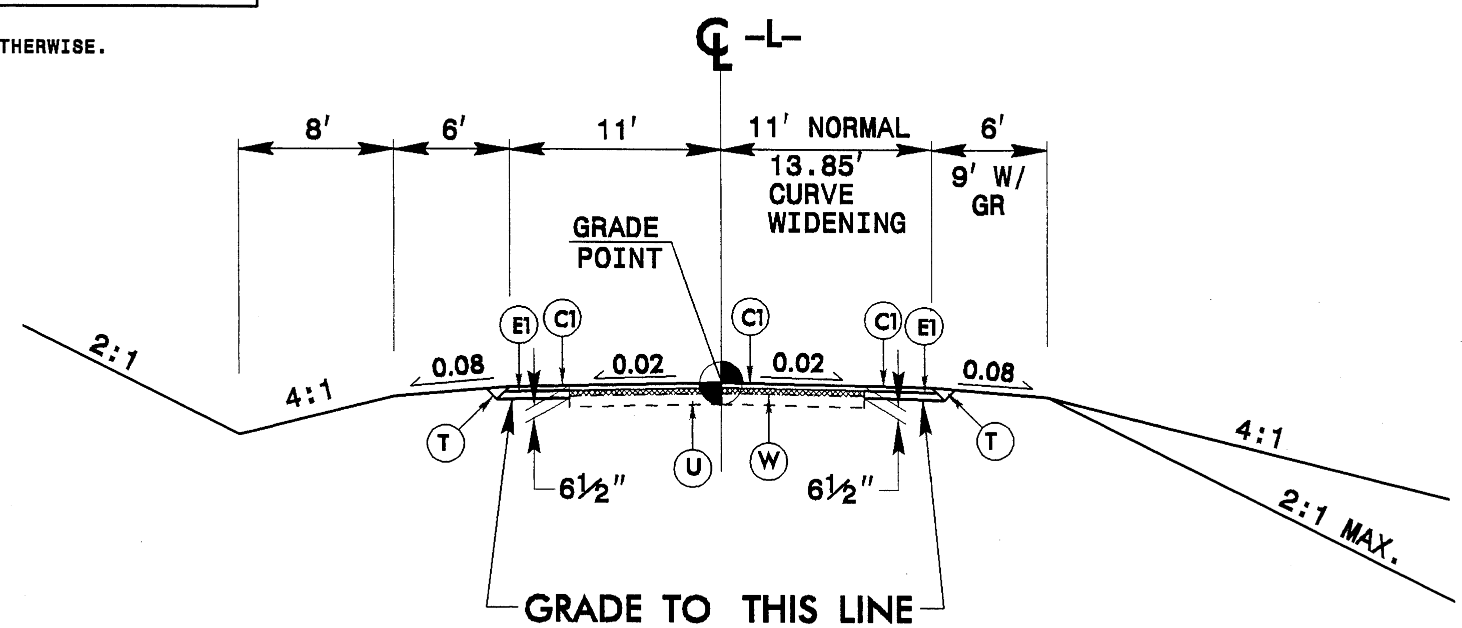
PAVEMENT SCHEDULE FINAL DESIGN

C1	PROP. APPROX. 2½" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5A, AT AN AVERAGE RATE OF 140 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.
C2	PROP. VAR. DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 112 LBS. PER SQ. YD. PER 1" DEPTH TO BE PLACED IN LAYERS NOT TO EXCEED 1½" IN DEPTH.
E1	PROP. APPROX. 4" ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YARD.
E2	PROP. VAR. DEPTH ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NOT LESS THAN 3" IN DEPTH OR GREATER THAN 5½" IN DEPTH.
T	EARTH MATERIAL.
U	EXISTING PAVEMENT.
W	VARIABLE DEPTH ASPHALT PAVEMENT. (SEE WEDGING DETAIL)

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



Detail Showing Method of Wedging



TYPICAL SECTION NO. 1

USE TYPICAL SECTION NO. 1

-L- STA.12+30.00 TO BEG. BRIDGE STA. 14+13.46

END BRIDGE STA. 14+69.98 TO -L- STA. 17+10.00

6/2/99

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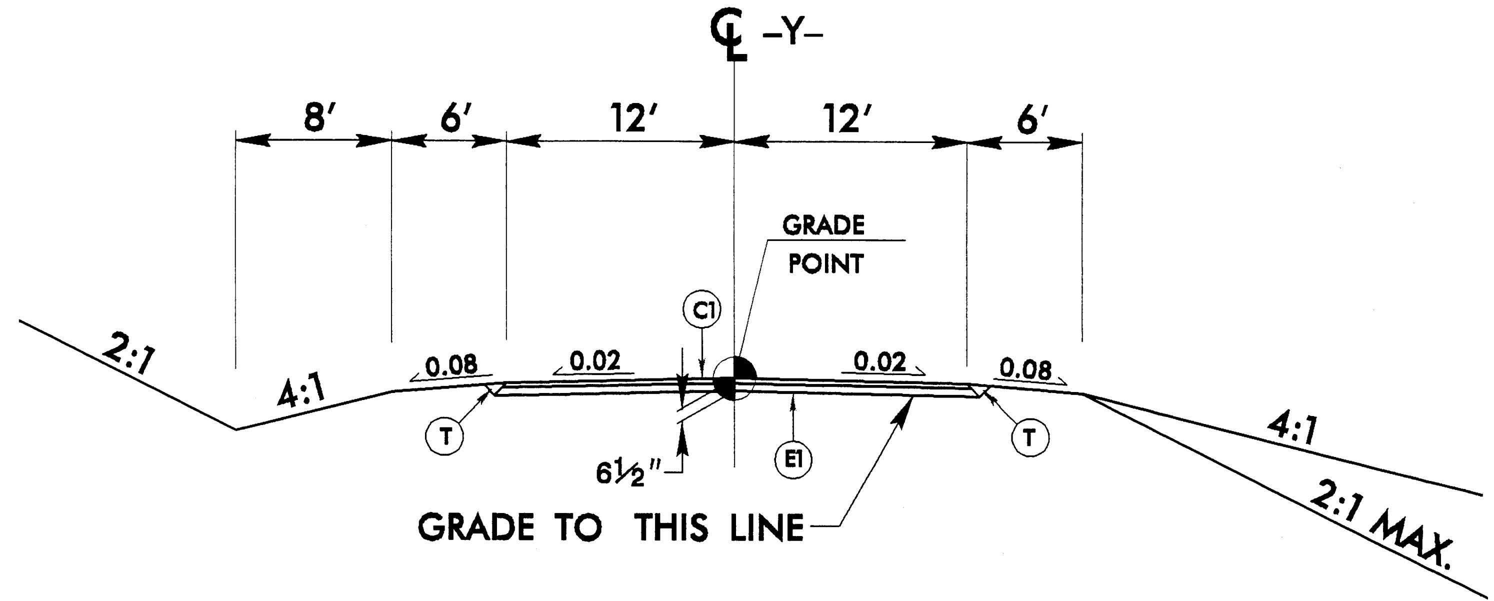
RSullivan AT RD193475

PAVEMENT SCHEDULE (FINAL)	
C1	2½", TYPE S9.5A
C2	VAR. DEPTH, TYPE S9.5A
E1	4", TYPE B25.0B
E2	VAR. DEPTH, TYPE B25.0B
T	EARTH MATERIAL
U	EXISTING PAVEMENT
W	WEDGING

PROJECT REFERENCE NO.	SHEET NO.
B-3659	2-A
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER

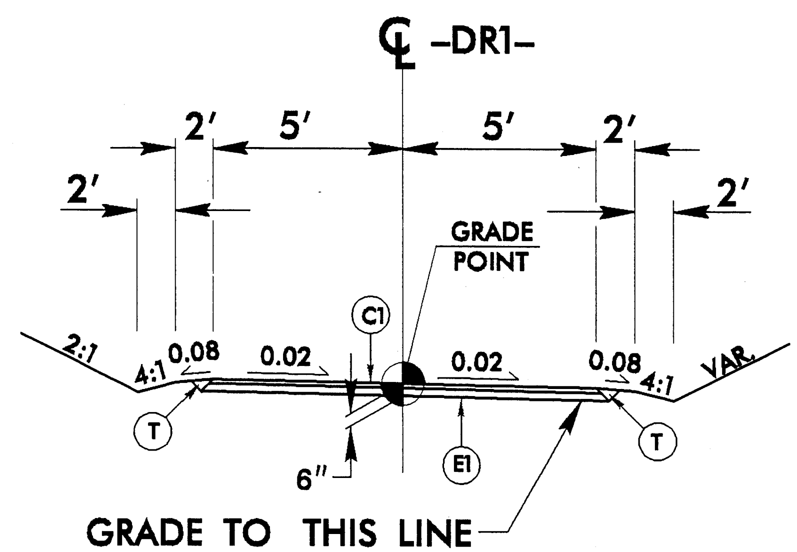
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



WIDEN AND RESURFACE
-Y- STA 11+00.00 TO 12+73.14

TYPICAL SECTION NO. 2

-Y- STA. 12+73.14 TO -Y- STA. 14+37.68

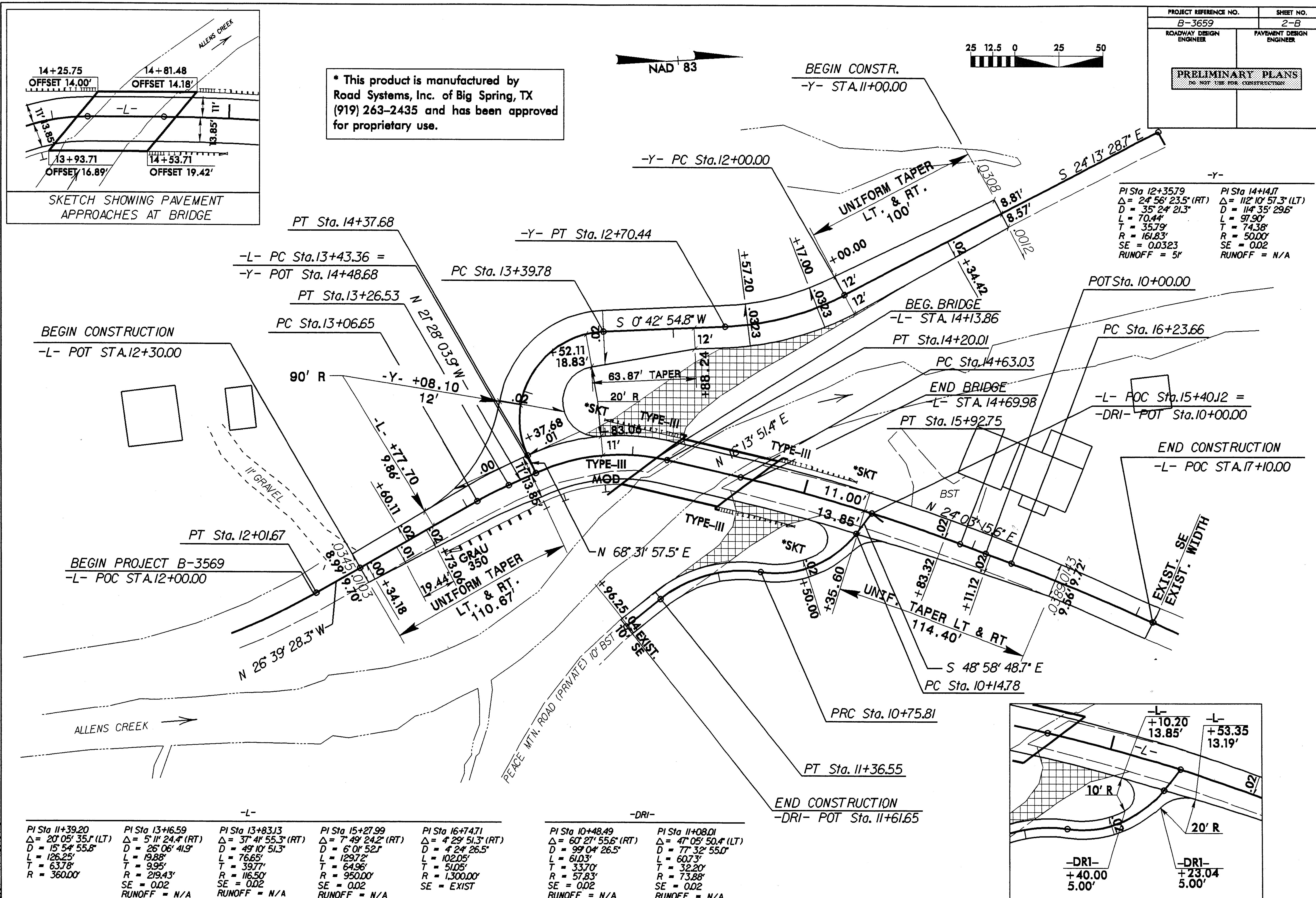


TYPICAL SECTION NO. 3

-DR1- STA. 10+14.77 TO -DR1- STA. 11+61.65

PROJECT REFERENCE NO.	SHEET NO.
B-3659	2-B
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



14+25.75
OFFSET 14.00'
14+81.48
OFFSET 14.18'
ALLENS CREEK
-L-
13+93.71
OFFSET 16.89'
14+53.71
OFFSET 19.42'
SKETCH SHOWING PAVEMENT APPROACHES AT BRIDGE
* This product is manufactured by Road Systems, Inc. of Big Spring, TX (919) 263-2435 and has been approved for proprietary use.
NAD 83
25 12.5 0 25 50
BEGIN CONSTR. -Y- STA.11+00.00
-Y- PC Sta.12+00.00
UNIFORM TAPER LT. & RT. 100'
S 24°13' 28.7" E
-Y- PT Sta. 12+70.44
PT Sta. 14+37.68
-L- PC Sta.13+43.36 = -Y- POT Sta. 14+48.68
PC Sta. 13+39.78
PT Sta.13+26.53
N 21°28' 03.9" W
PC Sta.13+06.65
S 0°42' 54.8" W
BEGIN CONSTRUCTION -L- POT STA.12+30.00
90' R
-Y- +08.10 12'
63.87' TAPER
20' R
*SKT
TYPE-III
TYPE-III MOD
N 15°13' 51.4" E
BEG. BRIDGE -L- STA. 14+13.86
PT Sta.14+20.01
PC Sta.14+63.03
END BRIDGE -L- STA. 14+69.98
PT Sta. 15+92.75
POT Sta. 10+00.00
PC Sta. 16+23.66
-L- POC Sta.15+40.12 = -DRI- POT Sta.10+00.00
END CONSTRUCTION -L- POC STA.17+10.00
BST
N 24°03' 15.6" E
11' GRAVEL
PT Sta. 12+01.67
BEGIN PROJECT B-3569 -L- POC STA.12+00.00
GRAU 350
UNIFORM TAPER LT. & RT. 110.67'
N 68°31' 57.5" E
N 26°39' 28.3" W
UNIF. TAPER LT & RT 114.40'
S 48°58' 48.7" E
PC Sta. 10+14.78
EXIST. SE EXIST. WIDTH
PRC Sta. 10+75.81
PT Sta. 11+36.55
END CONSTRUCTION -DRI- POT Sta. 11+61.65
PEACE MTN. ROAD (PRIVATE) 10' BST
ALLENS CREEK
-L- +10.20 13.85'
-L- +53.35 13.19'
10' R
20' R
-DR1- +40.00 5.00'
-DR1- +23.04 5.00'

-DRI- RADIUS DETAIL

-Y-

PI Sta 12+35.79	PI Sta 14+14.17
Δ = 24°56' 23.5" (RT)	Δ = 112°10' 57.3" (LT)
D = 35°24' 21.3"	D = 114°35' 29.6"
L = 70.44'	L = 97.90'
T = 35.79'	T = 74.38'
R = 161.83'	R = 50.00'
SE = 0.0323	SE = 0.02
RUNOFF = 51'	RUNOFF = N/A

-L-

PI Sta 11+39.20	PI Sta 13+16.59	PI Sta 13+83.13	PI Sta 15+27.99	PI Sta 16+74.71
Δ = 20°05' 35.1" (LT)	Δ = 5°11' 24.4" (RT)	Δ = 37°41' 55.3" (RT)	Δ = 7°49' 24.2" (RT)	Δ = 4°29' 51.3" (RT)
D = 15°54' 55.8"	D = 26°06' 41.9"	D = 49°10' 51.3"	D = 6°01' 52.1"	D = 4°24' 26.5"
L = 126.25'	L = 19.88'	L = 76.65'	L = 129.72'	L = 102.05'
T = 63.78'	T = 9.95'	T = 39.77'	T = 64.96'	T = 51.05'
R = 360.00'	R = 219.43'	R = 116.50'	R = 950.00'	R = 1,300.00'
	SE = 0.02	SE = 0.02	SE = 0.02	SE = EXIST
	RUNOFF = N/A	RUNOFF = N/A	RUNOFF = N/A	

DESIGN EXCEPTION FOR DESIGN SPEED DS = 15 mph

-DRI-

PI Sta 10+48.49	PI Sta 11+08.01
Δ = 60°27' 55.6" (RT)	Δ = 47°05' 50.4" (LT)
D = 99°04' 26.5"	D = 77°32' 55.0"
L = 61.03'	L = 60.73'
T = 33.70'	T = 32.20'
R = 57.83'	R = 73.88'
SE = 0.02	SE = 0.02
RUNOFF = N/A	RUNOFF = N/A

6/2/99

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RShillinglaw AT RD193475

COMPUTED BY:	DATE:
CHECKED BY:	DATE:

PROJECT REFERENCE NO.	SHEET NO.
B-3659	3-A

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

SUMMARY OF QUANTITIES

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

SUMMARY OF REMOVAL OF EXISTING ASPHALT PAVEMENT

LINE	STATION TO STATION	LOCATION	AREA S.Y.
-Y-	11+59.53 TO 14+37.68	LEFT	284
-DR1-	10+39.98 TO 11+25.67	RIGHT	120
		TOTAL	404
		SAY	410

SUMMARY OF EARTHWORK

LOCATION	TOTAL UNCLASS. EXCAV.	UNDERCUT	EMBANKMENT + 1.15%	BORROW	TOTAL WASTE
-L- (LT) 12+30.00 TO 14+25.75 (BEG. BRIDGE)	123		17	0	106
-L- (RT) 12+30.00 TO 13+93.716 (BEG. BRIDGE)	115		13	0	102
-Y- (LT) 11+00.00 TO 12+73.14	0		25	25	0
-Y- (RT) 11+00.00 TO 12+73.14	2		137	135	0
-Y- (FULL) 12+73.14 TO 14+37.68	188		104	0	84
SUBTOTAL	428		296	160	292
-L- (LT) (END BRIDGE) 14+81.48 TO 17+10.00	16		18	2	0
-L- (RT) (END BRIDGE) 14+53.71 TO 17+10.00	218		29	0	189
-DR1- (FULL) 10+14.77 TO 11+61.65	63		1	0	62
SUBTOTAL	297		48	2	251
PROJECT SUBTOTAL	725		344	162	543
WASTE AVAILABLE IN LIEU OF BORROW				-162	-162
PROJECT TOTAL	725		344	0	381
SAY	750			0	

LIST OF PIPES, ENDWALLS, ETC. (FOR PIPES 48" & UNDER)

STATION / SIZE / THICKNESS OR GAUGE	LOCATION (LT,RT, OR CL)	STRUCTURE NO. FROM	STRUCTURE NO. TO	TOP ELEVATION	INVERT ELEVATION	INVERT ELEVATION	SLOPE CRITICAL	CLASS III R.C. PIPE (UNLESS NOTED OTHERWISE) 12"	15"	18"	24"	30"	36"	42"	48"	BITUMINOUS COATED C.S. PIPE TYPE B (UNLESS NOTED OTHRWISE) 12" .064	15" .064	18" .064	24" .064	30" .079	36" .079	42" .109	48" .109	15" SIDE DRAIN PIPE	18" SIDE DRAIN PIPE	24" SIDE DRAIN PIPE	ENDWALLS STD. 838.01 OR STD. 838.11 (UNLESS NOTED OTHERWISE) CU. YDS. R.C.P.	C.S.P.	QUANTITIES FOR DRAINAGE STRUCTURES PER EACH (0' THRU 5.0')	LIN. FT. A 5.0' THRU 10.0'	B 10.0' AND ABOVE	C.B. STD. 840.01 OR STD. 840.02	FRAME & NARROW SLOT FLAT GRATES, STD. 840.29	TRAFFIC BEARING DROP INLET, STD. 840.35	M.D.I., TYPE "D", STD. 840.19 OR STD 840.28	FLOWABLE FILL MATERIAL C.Y.	CORR. STEEL ELBOWS NO. & SIZE	CONC. COLLARS CL "B" C.Y. STD 840.72	CONC. & BRICK PIPE PLUG, C.Y. STD. 840.71	PIPE REMOVAL LIN.FT.	REMARKS
-L- 14+66	RT	1							20'																				1				1		1						ALSO SEE STD 820.04
-DR1- 10+34	CL	2							48'																																
PROJECT TOTALS									68'																				1				1		1						

* TOTAL L.F. FOR PAY QUANTITY SHALL BE COL. 'A' + (1.3 X COL.'B')

ABBREVIATIONS

C.B.	CATCH BASIN
N.D.I.	NARROW DROP INLET
D.I.	DROP INLET
M.D.I.	MEDIAN DROP INLET
M.D.I. (N.S.)	MEDIAN DROP INLET (NARROW SLOT)
J.B.	JUNCTION BOX
M.H.	MANHOLE
T.B.D.I.	TRAFFIC BEARING DROP INLET
T.B.J.B.	TRAFFIC BEARING JUCTION BOX

"N" = DISTANCE FROM EDGE OF LANE TO FACE OF GUARDRAIL.
TOTAL SHOULDER WIDTH = DISTANCE FROM EDGE OF TRAVEL LANE TO SHOULDER BREAK POINT.
FLARE LENGTH = DISTANCE FROM LAST SECTION OF PARALLEL GUARDRAIL TO END OF GUARDRAIL.
W = TOTAL WIDTH OF FLARE FROM BEGINNING OF TAPER TO END OF GUARDRAIL.
G = GATING IMPACT ATTENUATOR TYPE 350
NG = NON-GATING IMPACT ATTENUATOR TYPE 350

GUARDRAIL SUMMARY

SURVEY LINE	BEG. STA.	END STA.	LOCATION	LENGTH STRAIGHT	LENGTH SHOP CURVED	LENGTH DOUBLE FACED	WARRANT POINT APPROACH END	WARRANT POINT TRAILING END	"N" DIST. FROM E.O.L.	TOTAL SHOUL. WIDTH	FLARE LENGTH APPROACH END	FLARE LENGTH TRAILING END	W APPROACH END	W TRAILING END	ANCHORS XI MOD	III	GRAU 350	III MOD	TEMP GRAU 350	TERMINAL SECTIONS	VI MOD	*SKT	AT-1	IMPACT ATTENUATOR TYPE 350 EA	G	NG	SINGLE FACED GUARDRAIL	REMOVE EXISTING GUARDRAIL	REMOVE AND STOCKPILE EXISTING GUARDRAIL	REMARKS
-L-	13+82.00	14+25.75	LEFT	43.75'			14+25.75		3.00'	6.00'						1						1								* PROPRIETARY ITEM
-L-	14+81.48	15+25.23	LEFT	43.75'			14+81.48		3.15'	6.00'						1						1								* PROPRIETARY ITEM
-L-	12+78.21	13+93.71	RIGHT	112.50'			13+93.71		3.96'	6.00'	43.75'		0.88				1	1												
-L-	14+53.71	14+97.46	RIGHT	43.75'			14+53.71		5.57'	8.57'						1						1								* PROPRIETARY ITEM
	LESS ANCHOR	DEDUCTIONS																												
		GRAU-350	1 @ 50.00' =	-50.00'																										
		TYPE III	3 @ 18.75' =	-56.25'																										
		*SKT	3 @ 25.00' =	-75.00'																										
		TYPE III MOD	1 @ 18.75' =	-18.75'																										
			PROJECT TOTAL	43.75'												3	1	1				3								
			SAY	50.00'																										
	(5 ADDITIONAL	GUARDRAIL POST)																												

5/28/99

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PROJECT REFERENCE NO.	SHEET NO.
B-3659	4
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

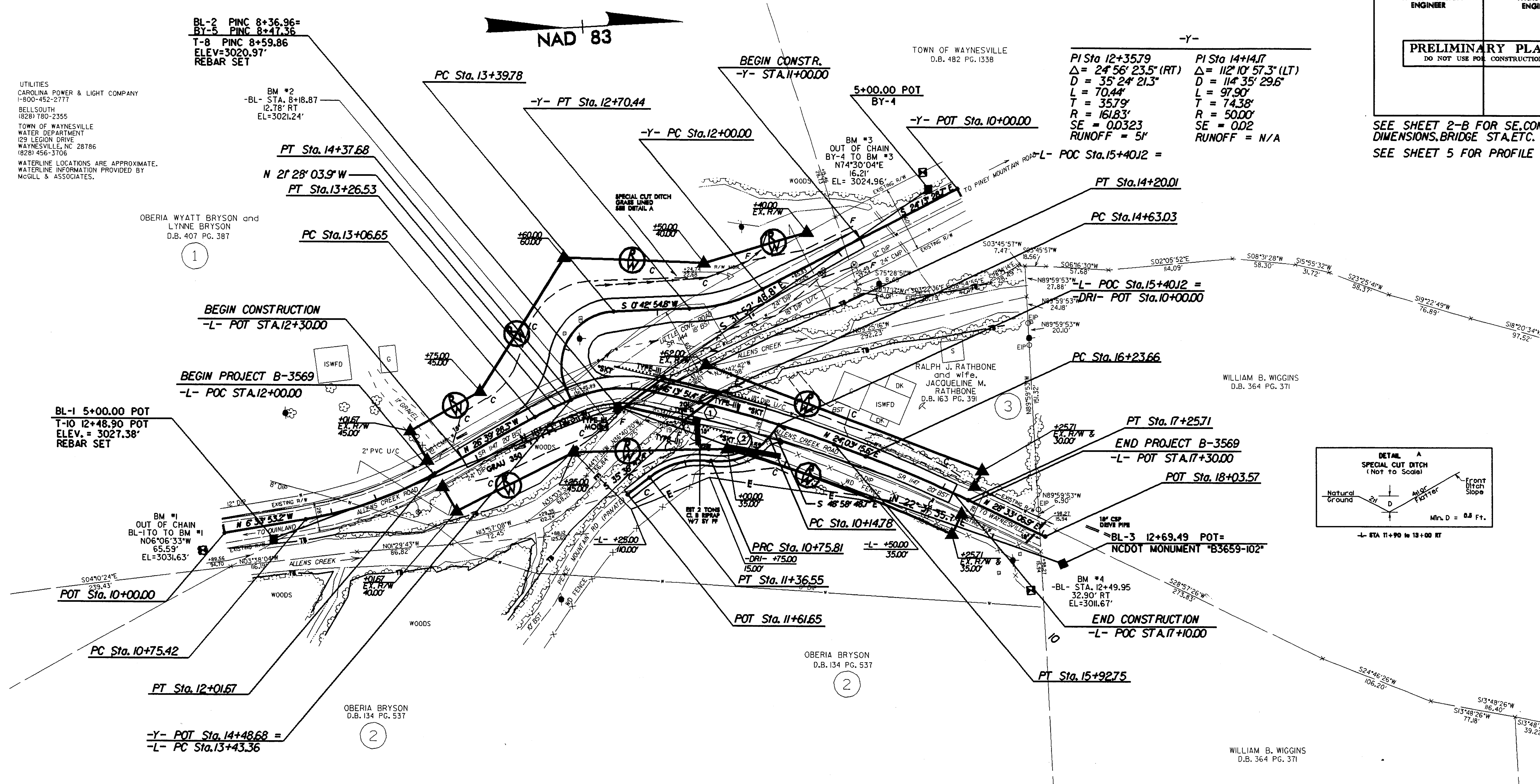
SEE SHEET 2-B FOR SE,CONST. DIMENSIONS,BRIDGE STA,ETC.

SEE SHEET 5 FOR PROFILE

-Y-

PI Sta 12+35.79	PI Sta 14+14.17
Δ = 24° 56' 23.5" (RT)	Δ = 112° 10' 57.3" (LT)
D = 35° 24' 21.3"	D = 114° 35' 29.6"
L = 70.44'	L = 97.90'
T = 35.79'	T = 74.38'
R = 161.83'	R = 50.00'
SE = 0.0323	SE = 0.02
RUNOFF = 51'	RUNOFF = N/A

UTILITIES
CAROLINA POWER & LIGHT COMPANY
1-800-452-2777
BELLSOUTH
(828) 780-2355
TOWN OF WAYNESVILLE
WATER DEPARTMENT
129 LEGION DRIVE
WAYNESVILLE, NC 28786
(828) 456-3706
WATERLINE LOCATIONS ARE APPROXIMATE.
WATERLINE INFORMATION PROVIDED BY
McGILL & ASSOCIATES.



REMOVE EXISTING BRDG. NO. 112
SEE STRUCTURE PLANS

-L-

PI Sta 11+39.20	PI Sta 13+16.59	PI Sta 13+83.13	PI Sta 15+27.99	PI Sta 16+74.71
Δ = 20° 05' 35.1" (LT)	Δ = 5° 11' 24.4" (RT)	Δ = 37° 41' 55.3" (RT)	Δ = 7° 49' 24.2" (RT)	Δ = 4° 29' 51.3" (RT)
D = 15° 54' 55.8"	D = 26° 06' 41.9"	D = 49° 10' 51.3"	D = 6° 01' 52.1"	D = 4° 24' 26.5"
L = 126.25'	L = 19.88'	L = 76.65'	L = 129.72'	L = 102.05'
T = 63.78'	T = 9.95'	T = 39.77'	T = 64.96'	T = 51.05'
R = 360.00'	R = 219.43'	R = 116.50'	R = 950.00'	R = 1,300.00'
	SE = 0.04	SE = 0.04	SE = 0.04	SE = EXIST
	RUNOFF = N/A	RUNOFF = N/A	RUNOFF = N/A	

DESIGN EXCEPTION
FOR DESIGN SPEED
DS = 15 mph

-DRI-

PI Sta 10+48.49	PI Sta 11+08.01
Δ = 60° 27' 55.6" (RT)	Δ = 47° 05' 50.4" (LT)
D = 99° 04' 26.5"	D = 77° 32' 55.0"
L = 61.03'	L = 60.73'
T = 33.70'	T = 32.20'
R = 57.83'	R = 73.88'
SE = 0.02	SE = 0.02
RUNOFF = N/A	RUNOFF = N/A

DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY OTHERS FOR MONUMENT "B3659-102"
WITH HARN-NAD 83/95 STATE PLANE GRID COORDINATES OF NORTHING: 637618.041(ft) EASTING: 806202.951(ft)
THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.99973846
THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "B3659-102" TO -L- STATION 12+00.00 IS
S 11° 06' 28.6" W 581.42 FEET
ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES
VERTICAL DATUM USED IS NAVD 88

REVISIONS

8/17/99

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5/28/99

PROJECT REFERENCE NO.	SHEET NO.
B-3659	5
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

-L-

BM # 1 R/R SPIKE SET IN 30" SYCAMORE BL-1 TO BM # 1
N 6°06'33"W DIST. 65.59'
EL 3031.63'

BEGIN GRADE
-L- STA. 12+50.00
EL. 3023.37'
(INCL. 2½" RESURF.)

PI = 13+32.99
EL = 3,022.03'
VC = 80'
K = 37
DS = 30 mph

PI = 14+43.11
EL = 3,022.62'
VC = 140'
K = 26
DS = 30 mph

PI = 16+29.70
EL = 3,013.60'
VC = 160'
K = 65
DS = 45 mph

END GRADE
-L- STA. 17+10.00
EL. 3011.68'
(INCL. 2½" RESURF.)

(-) 1.611%
(+) 0.535%
(-) 4.834%
(-) 2.391%

BEG. BRIDGE -L- STA 14+13.86
END BRIDGE -L- STA 14+69.98

BM # 2 R/R SPIKE SET IN BASE 36" MAPLE 12.78' RT OF -BL- STA 8+18.87 EL 3021.24'

BM # 4 R/R SPIKE SET IN HEMLOCK STUMP 32.90' RT OF -BL- STA 12+49.95 EL 3011.67'

BRIDGE HYDRAULIC DATA

BRIDGE # 112 OVER ALLENS CREEK
SR 1147

DESIGN DISCHARGE	= 1500 CFS
DESIGN FREQUENCY	= 10 YRS
DESIGN HW ELEVATION	= 3019.36 FT
BASE DISCHARGE	= 2900 CFS
BASE FREQUENCY	= 100 YRS
BASE HW ELEVATION	= 3021.91 FT
OVERTOPPING DISCHARGE	= 1794 CFS
OVERTOPPING FREQUENCY	= 10 (+) YRS
OVERTOPPING ELEVATION	= 3021.55 FT
EST. NORM. W.S. ELEV.	= 3013.73 FT
DATE OF SURVEY	= 8/02
W.S. ELEVATION AT DATE OF SURVEY	= 3013.73 FT

3,030 / 3,020 / 3,010 / 3,000 / 2,990 / 2,980

10 11 12 13 14 15 16 17 18

-Y-

BM # 3 R/R SPIKE SET IN 12" LOCUST BL-4 TO BM # 3
N 74°30'04"E DIST. 16.21'
EL 3024.96'

BEGIN GRADE
-Y- STA. 11+00.00
EL. 3020.04'
(INCL. 2½" RESURF.)

END GRADE
-Y- STA. 14+37.68 =
-L- STA. 13+43.36
(11' LT.)
EL. 3022.44'

(+) 0.705%
(+) 1.818%

END SPECIAL CUT DITCH RT
-Y- STA. 11+90.00
ELEVATION 3011.00

BEG. SPECIAL CUT DITCH RT
-Y- STA. 13+00.00
ELEVATION 3015.00

-DR1-

BEGIN GRADE
-DR1- STA. 10+14.77 =
-L- STA. 15+34.96
EL. 3017.90'
(13.85' RT.)

END GRADE
-DR1- STA. 11+61.65
EL. 3019.71'

PI = 11+02.00
EL = 3,019.65'
VC = 50'
K = 13

PI = 10+46.00
EL = 3,017.49'
VC = 30'
K = 6

(-) 1.318%
(+) 3.855%
(+) 0.097%

3,030 / 3,020 / 3,010 / 3,000 / 2,990 / 2,980

10 11 12 13 14

10 11 12

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Bassett

Haywood County
Bridge No. 112 on SR 1147 (Allens Creek Road)
over Allens Creek
Federal Aid Project No. BRZ-1147(4)
State Project No. 8.2941701
TIP No. B-3659

CATEGORICAL EXCLUSION

UNITED STATES DEPARTMENT OF TRANSPORTATION

FEDERAL HIGHWAY ADMINISTRATION

AND

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

DIVISION OF HIGHWAYS

APPROVED:

5·16·02
DATE

for [signature]
William D. Gilmore, PE, Manager
Project Development and Environmental Analysis Branch, NCDOT

5/16/02
DATE

for Clarence W. Coleman, Jr.
Nicholas L. Graf, PE
Division Administrator, FHWA

Bassett

Haywood County
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UNITED STATES DEPARTMENT OF TRANSPORTATION

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AND

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APPROVED:

5·16·02
DATE

for _____
William D. Gilmore, PE, Manager
Project Development and Environmental Analysis Branch, NCDOT

5/16/02
DATE

Clarence W. Coleman, Jr.
for Nicholas L. Graf, PE
Division Administrator, FHWA

Haywood County
Bridge No. 112 on SR 1147 (Allens Creek Road)
over Allens Creek
Federal Aid Project No. BRZ-1147(4)
State Project No. 8.2941701
TIP No. B-3659

CATEGORICAL EXCLUSION

May, 2002

Documentation Prepared by:
Stantec Consulting Services, Inc.

Paul R. Koch, PE
Project Manager

5-17-02
Date

For the North Carolina Department of Transportation

Stacy B. Harris, PE
Project Manager
Consultant Engineering Unit

Haywood County
Bridge No. 112 on SR 1147 (Allens Creek Road)
over Allens Creek
Federal Aid Project No. BRZ-1147(4)
State Project No. 8.2941701
TIP No. B-3659

PROJECT COMMITMENTS

In addition to the Nationwide Permit No. 3, No. 14, and No. 23 Conditions, the General Nationwide Permit Conditions, Section 404 Only Conditions, Regional Conditions, State Consistency Conditions, Best Management Practices for the Protection of Surface Waters, NCDOT's Guidelines for Best Management Practices for Bridge Demolition and Removal, General Certification Conditions, and Section 401 Conditions of Certification, the following special commitments have been agreed to by NCDOT:

Division
Instream construction is prohibited during the trout spawning period of November 1 to April 15 to avoid impacts on trout reproduction.

An approval under Section 26a of the TVA Act will be required.

Haywood County
Bridge No. 112 on SR 1147 (Allens Creek Road)
over Allens Creek
Federal Aid Project No. BRZ-1147(4)
State Project No. 8.2941701
TIP No. B-3659

INTRODUCTION: The replacement of Bridge No. 112 is included in the 2002-2008 North Carolina Department of Transportation (NCDOT) Transportation Improvement Program and in the Federal-Aid Bridge Replacement Program. The location is shown in Exhibit 1. No substantial environmental impacts are anticipated. The project is classified as a Federal "Categorical Exclusion".

I. PURPOSE AND NEED STATEMENT

NCDOT Bridge Maintenance Unit records indicate that Bridge No. 112 has a sufficiency rating of 49.0 out of a possible 100 for a new structure. The bridge is considered functionally obsolete and structurally deficient. Replacement of this inadequate structure will result in safer and more efficient traffic operations.

II. EXISTING CONDITIONS

The functional classification of SR 1147 is rural local. Land use immediately adjacent to the existing bridge is low density residential and agricultural.

Bridge No. 112 was built in 1960. The structure includes one span totaling 41 feet (12.5 meters) in length. The superstructure for Bridge No. 112 is composed of a timber floor on steel I-beams. The substructure is Yount masonry abutments. The depth from crown to bed is nine feet (2.7 meters). The existing bridge deck width is 20 feet (6.1 meters). The posted weight limit is SV 25 / TTST 29 tons (22/26 metric tons).

The drainage area at Bridge No. 112 is 14.5 square miles (37.7 square kilometers).

The southbound approach is in a curve and there is a T-intersection immediately south of the existing bridge. The existing structure is on a short tangent. The posted speed limit is 35 mph (56 km/h). The existing roadway has a two–lane, 19-foot (5.8-meter) wide cross-section with two-foot (0.6-meter) unpaved shoulders.

The 2002 estimated average daily traffic volume (ADT) is 300 vehicles per day (vpd). The projected traffic volume is expected to increase to 340 vpd by the construction year 2004 and to 500 vpd by the design year 2025.

Aerial power lines and telephone lines cross the bridge from the northeast to the southwest. Utility conflicts are considered low.

There was no accidents reported in the vicinity of the bridge during the period from January 1, 1999 to December 31, 2001.

Four school buses cross Bridge No. 112 twice daily {*phone contact – Haywood County Schools, 2/21/02*}.

This section of SR 1147 is not part of a designated bicycle route nor is it listed in the TIP as needing incidental bicycle accommodations. There is no indication that there are an unusual number of bicyclists using this roadway.

III. ALTERNATIVES

A. Project Description

The approach roadway will consist of two 11-foot (3.3 meter) travel lanes with six-foot (1.8 meter) grassed shoulders. Based on a preliminary hydraulic analysis, the new structure will have a length of approximately 65 feet (19.2 meters) for Alternatives A and B. For Alternative C (Preferred), the south approach of the structure is at the intersection with SR 1141. Therefore, a vertical abutment is recommended which will shorten the bridge length to 51 feet (15.5 meters). The proposed structure will provide a 28-foot (8.4 meter) clear roadway width to allow for two 11-foot (3.3 meter) travel lanes and three-foot (0.9 meter) shoulders on each side (Exhibit 6).

The elevation of the new structure will be approximately the same as the existing structure. The length and opening size of the bridge may increase or decrease as necessary to accommodate peak flows as determined from a more detailed hydraulic analysis, to be performed during the final design phase of the project.

B. Build Alternatives

Three (3) build alternatives for replacing the existing bridge are described below:

Alternative A replaces the bridge on new location alignment (east) of the existing bridge (Exhibit 2). During construction, traffic will be maintained on the existing bridge. The structure will be on tangent. The roadway approach work will extend from approximately 265 feet (80.8 meters) north of the existing bridge on SR 1147 to 325 feet (99.1 meters) east on SR 2247. This alternative was not selected due to the higher costs and impacts associated with a new alignment. This alternative would require a bridge pier in the creek which would further increase impacts to the environment.

Alternative B replaces the bridge on new location upstream (west) of the existing bridge (Exhibit 3). During construction, traffic will be maintained on the existing bridge. The structure will be on tangent. The roadway approach work will extend from approximately 480 feet (146.3 meters) north of the existing bridge on SR 1147 to 325 feet (99.1 meters) west on SR 1144. This alternative was not selected because it changes the main movement at the intersection and introduces a less desirable traffic pattern.

Alternative C (Preferred) replaces the bridge at its existing location (Exhibit 4). During construction, traffic will be maintained using an off-site detour along SR 1144, SR 1146, and SR 1147. The length of the detour is approximately 1.6 miles (2.6 kilometers). The roadway approach work will extend from approximately 215 feet (65.5 meters) north of the existing bridge to 40 feet (12.2 meters) south. Because of the proximity of the creek to SR 1144, a vertical abutment may be required at the south end of the bridge.

Due to these existing conditions, the replacement structure for this alternative was evaluated with both a 51-foot (15.5-meter) long bridge and a 42 x 8 feet (12.8 x 2.4 meters) Con-Span culvert. Because the costs are approximately equal, the bridge is recommended.

C. Alternatives Eliminated from Further Study

The "Do-Nothing" alternative will eventually necessitate closure of the bridge. This is not desirable due to the service provided by Bridge Number 112.

Rehabilitation of the existing bridge is not feasible due to its age and deteriorated condition.

D. Preferred Alternative

Alternative C, replacing the bridge at its existing location, was selected as the Preferred Alternative. It was recommended because the existing alignment is on a tangent, a good off-site detour is available, it has the lowest construction cost, and it has less impacts to the natural environment.

The roadway approach work will extend from approximately 215 feet (65.5 meters) north of the existing bridge to 40 feet (12.2 meters) south. Because of the proximity of the creek to SR 1144, a vertical abutment may be required at the south end of the bridge. The recommended replacement structure is a 51-foot (15.5-meter) long bridge.

Traffic will be maintained with an approximately 1.6 mile (2.6 kilometers) long off-site detour along SR 1144, SR 1146, and SR 1147 (see Exhibit 5).

IV. ESTIMATED COSTS

The estimated costs based on current prices are listed in Table 1.

The estimated cost of the project listed in the 2002-2008 Transportation Improvement Program (TIP), is $410,000 including $30,000 for right-of-way and $300,000 for construction.

V. NATURAL RESOURCES

A. Methodology

Information sources used to prepare this report include: U.S. Geological Survey (USGS) Hazelwood quadrangle map (1941/photorevised 1990); Natural Resources Conservation Service

TABLE 1
ESTIMATED COSTS

	Alt. A	Alt. B	Alt. C w/ bridge (Preferred)	Alt. C w/ culvert
Structure Removal (existing)	$ 7,680	$ 7,680	$ 7,680	$ 7,680
Structure (Proposed)	136,500	136,500	107,300	105,600
Detour Structure and Approaches	---	---	---	---
Roadway Approaches	116,220	92,420	58,720	58,720
Miscellaneous and mobilization	119,600	108,400	76,300	78,000
Engineering Contingencies	70,000	55,000	50,000	50,000
ROW/Const. Easements/Utilities	40,000	135,500	34,000	34,000
TOTAL	$ 490,000	$ 535,500	$ 334,000	$ 334,000

(NRCS) Soil Survey of Haywood County (1997); United States Fish and Wildlife Service (USFWS) National Wetlands Inventory Map (Hazelwood 1994); USFWS list of protected and candidate species (March 22, 2001); North Carolina Natural Heritage Program (NCNHP) database of rare species and unique habitats (July 1, 2000); NCDOT aerial photography of the project area; and North Carolina Division of Water Quality (DWQ) water resource data. Research using these resources was conducted prior to the field investigation.

A general field survey was conducted along the proposed project corridor on June 7, 2000. Plant communities and their associated wildlife were identified using a variety of observation techniques including active searching, visual observations with binoculars, and identifying characteristic signs of wildlife (sounds, tracks, scats, and burrows).

Investigation into wetland occurrence in the project impact area was conducted using methods of the 1987 Corps of Engineers Wetlands Delineation Manual. Impact calculations were based on the worst-case scenario using 100-foot (30-meter) right of way limits (minus the existing right of way), the width and length of the replacement structure, the width of the stream for aquatic impacts, and the length of the project approaches. The actual construction impacts should be less as the worst case was assumed for the impact calculations.

B. Physiography and Soils

The project site lies within the Blue Ridge Mountain Physiographic Province. The topography of the project vicinity is characterized as rolling hills with moderate to steeply sloping banks along the major streams. Elevations in the project vicinity range from approximately 3,040 to 4,000 feet (927 to 1219 meters) above mean sea level (msl). The elevation in the project area is approximately 3,040 feet (927 meters) above msl. Current land use in the project vicinity is a mixture of residential, commercial, and agricultural properties.

According to the soil map for Haywood County (NRCS, 1997), the project area is found within

the Saunook soil association. Soils in this association are generally found in drainageways and coves. The soils are described as gently sloping to steep, very deep, well-drained loamy soils that are underlain by loamy alluvium and colluvium. Field conditions generally conform to the soil survey maps. Soil series found within the project area are described below.

Dellwood cobbly sandy loam, 0 to 3 percent slopes, occasionally flooded, is found throughout the project area. This soil unit is a nearly level, moderately well drained soil found on flood plains of fast-flowing streams. Permeability is moderate to rapid and surface runoff is slow. Dellwood loam is not listed on the hydric soils list.

Udorthents-Urban land complex, 0 to 3 percent slopes, rarely flooded is located in the northeastern end of the project area adjacent to the Dellwood loam. This map unit is found on manmade landscapes. Udorthents consist of areas where fill material has been placed on part of the flood plain to prevent flooding. Urban land consists of areas covered by streets, buildings, parking lots, and other urban structures. The original landscape, topography, and drainage pattern have been changed.

C. Water Resources

1. Waters Impacted

The proposed project falls within the French Broad River Basin, with a subbasin designation of 04-03-05. Waters within the project study area include Allens Creek.

2. Water Resource Characteristics

Allens Creek flows north through the proposed project area with a width of approximately 20 feet (6.1 meters). The drainage area at Bridge No. 112 is 14.5 square miles (37.7 square kilometers). The flow was swift on the day of the field investigation. The substrate consisted of bedrock with sand, gravel, cobbles, and boulders. The water was clear and contained many riffle areas. The depth of the water ranged from 0.3 to over two feet (0.1 to 0.6 meters).

Within the project area, Allens Creek is classified as "C Tr" by the North Carolina Department of Environment and Natural Resources (NCDENR). Class "C" waters are suitable for secondary recreation, fishing, wildlife, fish and aquatic life propagation and survival, and agriculture. The supplemental classification of "Tr" indicates Trout Waters which are freshwaters protected for natural trout propagation and survival of stocked trout. The classification date and index number for this portion of the creek is 8/3/92, 5-16-7-(8.5).

Point source dischargers located throughout North Carolina are permitted through the National Pollutant Discharge Elimination System (NPDES) program. A search within one mile (1.6 kilometers) of the project revealed one NPDES permitted discharger. The Town of Waynesville Wastewater Treatment Plant (NC0049409) is located upstream of the project study area within the search distance.

Non-point source refers to runoff that enters surface waters through stormwater flow or no

defined point of discharge. Storm water runoff from SR 1147 may cause water quality degradation through the addition of oil or gas residuals, particulate rubber, or other sources of contamination.

Benthic macroinvertebrates, or benthos, are organisms that live in and on the bottom substrates of rivers and streams. The North Carolina Division of Water Quality (DWQ) uses benthos data as a tool to monitor water quality as benthic macroinvertebrates are sensitive to subtle changes in water quality. Formerly, the DWQ used the Benthic Macroinvertebrate Ambient Network (BMAN) as a primary tool for water quality assessment but phased this method out several years ago and has converted to a basinwide 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 DWQ includes the North Carolina Index of Biotic Integrity (NCIBI) as another method to determine general water quality in basinwide sampling. The NCIBI is a modification of the Index of Biotic Integrity (IBI) initially proposed by Karr (1981) and Karr, et al. (1986). The 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 information obtained from the French Broad Basinwide Water Quality Plan (2000), the DWQ does not have a sampling station on Allens Creek. However, there is a sampling station located on Rocky Branch at SR 1219, which is approximately 1,600 feet (488 meters) upstream of the project area. This station was last sampled in December 1991 and was rated Excellent.

3. Anticipated Impacts to Water Resources

a) General Impacts - Neither High Quality Waters (HWQ), Water Supplies (WS-I: undeveloped watershed, or WS-II: predominately undeveloped watersheds), nor Outstanding Resource Waters (ORW) occur within one mile (1.6 kilometers) of the project study area.

Impacts to the water resources will result due to the placement of support structures or a culvert in the creek channel. In the short term, construction of the bridge and approach work will increase sediment loads. Sediment loading can reduce flow and result in a decrease in oxygen levels. The removal of trees that provide shade along stream banks could result in an increase in water temperature and a decrease in oxygen levels as well.

The NCDOT, in cooperation with DWQ 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 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 creek;

- placement of temporary ground cover or re-seeding of disturbed sites to reduce runoff and decrease sediment loadings;

- reduction of clearing and grubbing along the creek.

b) 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". Guidelines followed for bridge demolition and removal are in addition to those implemented for Best Management Practices for the Protection of Surface Waters.

The superstructure for Bridge No. 112 is composed of a timber floor on steel I-beams. The substructure is Yount masonry abutments. Since the bridge can be removed without dropping any components into the water, neither the superstructure nor the substructure will create any temporary fill in the creek. However, the removal of the substructure may create some disturbance in the streambed. Conditions in the creek will not raise sediment concerns since the substrate consists of bedrock with sand, gravel, cobbles, and boulders.

According to comments received from the North Carolina Wildlife Resources Commission (NCWRC), Allens Creek is considered trout waters by the NCWRC. Therefore, NCWRC stated that instream construction is prohibited during the trout spawning period of November 1 to April 15 to avoid impacts on trout reproduction.

D. Biotic Resources

Living systems described in the following sections include communities of associated plants and animals. These descriptions refer to the dominant flora and fauna in each community and the relationship of these biotic components. Classification of plant communities is based on a system used by the NCNHP (Schafale and Weakley, 1990). If a community is modified or otherwise disturbed such that it does not fit into an NCNHP classification, it is given a name that best describes current characteristics. Scientific nomenclature and common names (when applicable) are used for the plant and animal species described. Subsequent references to the same species include the common name only. Vascular plant names follow nomenclature found in Radford et al. (1968) unless more current information is available. Terrestrial and aquatic wildlife were determined through field observations, evaluation of habitat, and review of field guides and other documentation (Conant, 1958; Farrand, 1993; Robbins et al., 1966; and Whitaker, 1980).

1. Plant Communities

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

a) Maintained/Disturbed Community - The maintained/disturbed community includes the residential and commercial properties in the northeastern quadrant, the horse pasture in the southeastern quadrant, and the road shoulders. Many plant species are adapted to these disturbed and regularly maintained areas. The dominant species within the project area include fescue (*Festuca spp.*), ryegrass (*Lolium spp.*), white clover (*Trifolium repens*), wild onion (*Allium cernuum*), dandelion (*Taraxacum officinale*), blackberry (*Rubus spp.*), and plantain (*Plantago spp.*).

b) Montane Alluvial Forest Community - This community is found bordering the creek in the project area. The canopy layer includes Eastern white pine (*Pinus strobus*), sycamore (*Platanus occidentalis*), ironwood (*Carpinus caroliniana*), yellow birch (*Betula lutea*), tulip poplar (*Liriodendron tulipifera*), red maple (*Acer rubrum*), black cherry (*Prunus serotina*), and black locust (*Robinia pseudoacacia*). The understory is dense and consists of ironwood, tag alder (*Alnus serrulata*), dogwood (*Cornus florida*), witch-hazel (*Hamamelis virginiana*), and mountain laurel (*Kalmia latifolia*). The herbaceous layer is sparse and includes common greenbrier (*Smilax rotundifolia*), poison ivy (*Toxicodendron radicans*), and blackberry (*Rubus spp.*).

2. Wildlife

The animal species present in the maintained/disturbed community are opportunistic and capable of surviving on a variety of resources, ranging from vegetation (flowers, leaves, fruits, and seeds) to both living and dead faunal components. An American goldfinch (*Carduelis tristis*), American robin (*Turdus migratorius*), and Northern mockingbird (*Mimus polyglottos*) were observed during the site visit in these areas. Other species such as Eastern chipmunk (*Tamias striatus*), woodchuck (*Marmota monax*), skunk (*Mephitis mephitis*), house sparrow (*Passer domesticus)*, common grackle (*Quiscalus quiscula*), mourning dove (*Zenaida macroura*), and black racer (*Coluber constrictor constrictor*) are often attracted to these disturbed habitats.

On the day of the site visit, grey squirrels (*Sciurus carolinensis*) and a tufted titmouse (*Parus bicolor*) were observed in the Rich Cove Forest community. Other species which may reside or forage in these areas include downy woodpeckers (*Picoides pubescens*), white-breasted nuthatch (*Sitta carolinensis*), Eastern phoebe (*Sayornis phoebe*), white-throated sparrow (*Zonotrichia albicollis*), American toad (*Bufo americanus*), rat snake (*Elaphe obsoleta*), Southern flying squirrel (*Glaucomys volans*), and red fox (*Vulpes vulpes*).

3. Aquatic Communities

The aquatic community in the project area includes Allens Creek. The creek flows north through

the proposed project area with a width of approximately 20 (6.1 meters) feet. The flow was swift on the day of the field investigation. The substrate consisted of bedrock with sand, gravel, cobbles, and boulders. The water was clear at the time of the site visit and contained many riffle areas. The depth of the water ranged from 0.3 to over two feet (0.1 to 0.6 meters).

The vegetation along the banks is described above in the montane alluvial forest community. The banks were well vegetated with no signs of erosion. The banks were well defined and averaged six feet (1.8 meters) in height above the top of the creek. The bank along the southwestern side of the bridge sloped gently down to the water. Raccoon (*Procyon lotor*) tracks were observed along the bank on the day of the site visit. Species such as the Northern water snake (*Natrix sipedon sipedon*), gray treefrog (*Hyla versicolor*), and spring salamander (*Gyrinophilus porphyriticus)* may reside or forage within this aquatic community or along the waters edge.

According to the NCWRC, species that are likely to be found in Allens Creek include rainbow trout (*Salmo gairdneri*), brown trout (*Salmo trutta*), possibly brook trout (*Salvelinus fontinalis*), northern hog sucker (*Hypentelium nigricans*), stoneroller (*Campostoma anomalum*), shiner (*Notropis spp.*), creek chub (*Semotilus atromaculatus*), and blacknose dace (*Rhinichthys atratulus*).

4. Anticipated Impacts to Biotic Communities

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

Calculated impacts to terrestrial resources reflect the relative abundance of each community present in the study area. Project construction will result in clearing and degradation of portions of these communities. Often, project construction does not require the entire right of way, therefore, actual impacts may be considerably less. Alternative A will result in the greatest amount of impact to the montane alluvial forest.

b) Wetland Communities – No jurisdictional wetlands were found within the study area.

c) Aquatic Communities - The replacement of Bridge No. 112 over Allens Creek will result in up to 0.01 acres (0.004 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.

Activities such as the removal of trees, as well as the construction of the bridge and approach work will likely result in an increase in sediment loads and water temperatures and a decrease in dissolved oxygen in the short term. Construction activities can also increase the possibility of toxins, such as engine fluids and particulate rubber, entering the waterways. The combination of these factors can potentially cause the displacement and mortality of fish and local populations of invertebrates which inhabit these areas.

E. Special Topics

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

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

TABLE 2
ANTICIPATED IMPACTS TO
TERRESTRIAL AND AQUATIC COMMUNITIES

Bridge No. 112 Replacement Alternatives	Maintained/ Disturbed Community [ac (Ha)]	Montane Alluvial Forest Community [ac (Ha)]	Aquatic Community [ac (Ha)]	Stream Impacts [ft (m)]	Combined Total [ac (Ha)]
Alternative A	0.23 (0.09)	0.43 (0.17)	0.01 (0.004)	28 (8.4)	0.67 (0.27)
Alternative B	0.31 (0.13)	0.37 (0.15)	0.01 (0.004)	28 (8.4)	0.69 (0.28)
Alternative C (Preferred)	-	-	0.01 (0.004)	28 (8.4)	0.01 (0.004)

NOTES:

- Impacts are based on a 100-foot (30 meters) right of way (minus the existing right of way for SR 1147) for each alternative.
- Actual construction impacts may be less than those indicated above; calculations were based on the worst-case scenario.

Investigation into wetland occurrence in the project impact area was conducted using methods of the 1987 Corps of Engineers Wetlands Delineation Manual. No jurisdictional wetlands were found within the project area.

Project construction cannot be accomplished without infringing on jurisdictional surface waters. The creek boundaries were flagged and surveyed and up to 28 linear feet of jurisdictional surface waters may be impacted by this project. Anticipated surface water impacts fall under the jurisdiction of the USACE.

2. Permits

a) Section 404 of the Clean Water Act - In accordance with Section 404 of the Clean Water Act (33 U.S.C. 1344), a permit is required from the USACE for projects of this type for the discharge of dredged or fill material into "Waters of the United States". The 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 a minimal individual or 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. This permit authorizes any activities, work and discharges undertaken, assisted, authorized, regulated, funded or financed, in whole or in part, by another federal agency and that the activity is "categorically excluded" from environmental documentation because it is included within a category of actions which neither individually nor cumulatively have a significant effect on the environment. Activities authorized under nationwide permits must satisfy all terms and conditions of the particular permit.

b) Section 401 Water Quality Certification - A 401 Water Quality Certification, administered through the DWQ, will also be required. This certification is issued for any activity which may result in a discharge into waters for which a federal permit is required. According to the DWQ, one condition of the permit is that the appropriate sediment and erosion control practices must be utilized to prevent exceedances of the appropriate turbidity water quality standard (50 NTUs in streams and rivers not designated as trout by DWQ and 10 NTUs in trout waters).

c) Section 26a of the TVA Act - This project is located within the jurisdiction of the Tennessee Valley Authority (TVA). Therefore, an approval under Section 26a of the TVA Act will be required.

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" and sequencing. The purpose of this policy is to restore and maintain the chemical, biological, and physical integrity of waters of the United States, specifically wetlands. Mitigation of wetland impacts has been defined by the CEQ to include: avoiding impacts, minimizing impacts, rectifying impacts, reducing impacts over time, and compensating for impacts (40 CFR 1508.20). Each of these three aspects (avoidance, minimization, and compensatory mitigation) must be considered sequentially.

Avoidance - Avoidance examines all appropriate and practicable possibilities of averting impacts to waters of the United States. According to a 1990 Memorandum of Agreement (MOA) between the Environmental Protection Agency (EPA) and the USACOE, in determining "appropriate and practicable" measures to offset unavoidable impacts, such measures should be appropriate to the scope and degree of those impacts and practicable in terms of cost, existing technology, and logistics in light of overall project purposes.

The project purpose necessitates traversing Allens Creek; therefore, totally avoiding surface water impacts is impossible.

Minimization - Minimization includes examination of appropriate and practicable steps to reduce adverse impacts to waters of the United States. Implementation of these steps will be required through project modifications and permit conditions. Minimization typically focuses on decreasing the footprint of the proposed project through reduction of median widths, right-of-way widths and/or fill slopes. No measures are proposed for this project. There are no jurisdictional wetlands within the project area.

Other practical mechanisms to minimize impacts to waters of the United States include strict enforcement of sedimentation control BMPs for protection of surface waters during the entire life of the project; reduction of clearing and grubbing activity; reduction/elimination of direct discharge into streams; reduction of runoff velocity; reestablishment of vegetation on exposed areas, with judicious pesticide and herbicide management; minimization of instream activity; and litter/debris control.

Because this project will replace the bridge at its existing location, no new alignment construction or temporary on-site detours are required, thus minimizing potential construction impacts.

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

Compensatory mitigation is not expected to be required for this project. A final determination regarding mitigation requirements rests with the USACE.

F. Rare and Protected Species

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

1. Federally Protected Species

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

The United States Fish and Wildlife Service (USFWS) lists seven federally protected species for Haywood County as of the March 22, 2001 listing (Table 3).

TABLE 3
FEDERALLY-PROTECTED SPECIES
FOR HAYWOOD COUNTY

Scientific Name (Common Name)	Status
Clemmys muhlenbergii Bog turtle	T(S/A)
Felis concolor cougar Eastern cougar	E
Glaucomys sabrinus coloratus Carolina northern flying squirrel	E
Haliaeetus leucocephalus Bald eagle	T
Alasmidonta raveneliana Appalachian elktoe	E
Microhexura montivaga Spruce-fir moss spider	E
Gymnoderma lineare Rock gnome lichen	E
Isotria medeoloides Small-whorled pogonia	T

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 that is 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 (a species that is threatened due to similarity of appearance with other rare species and is listed for its protection).

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

Bog turtles are small [3 to 4.5 inches (76 to 114 millimeters)] semiaquatic turtles that have a

dark brown carapace and black plastrons. They usually exhibit distinctive orange or yellow blotches on each side of the head and neck.

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

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

Felis concolor cougar	(Eastern cougar)	E
Family:	Felidae	
Date Listed:	June 4, 1973	

The **Eastern cougar** is a large, unspotted, long-tailed cat. The body and legs are a uniform tawny color. Its belly is pale reddish to reddish white. The inside of the cat's ears are light-colored with blackish color behind the ears. They feed primarily on deer, but their diet may also include small mammals, wild turkeys, and domestic livestock.

No preference for specific habitat has been noted. The primary need is for a large wilderness area with an adequate food supply. Male cougars of other subspecies have been observed to occupy a range of 25 or more square miles (64 square kilometers), and females from 5 to 20 square miles (13 to 52 square kilometers).

BIOLOGICAL CONCLUSION: NO EFFECT

The project vicinity is residentially and commercially developed; since the cougar requires a large wilderness area, it is unlikely that this species would be found here. A search of the NCNHP database showed no recorded occurrences of this species within the project vicinity. It can be concluded that the construction of the proposed project will not impact the Eastern cougar.

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

Carolina northern flying squirrels are small nocturnal mammals that are 3 to 5 ounces in weight and 10 to 12 inches (25 to 30 centimeters) in length. They possess a long, broad, flattened tail, prominent eyes, and dense fur. The northern flying squirrels closely resemble southern flying squirrels but are larger and have richer colors. Adults are gray with a brownish, tan, or reddish wash on the back, and grayish white or buffy white undersides. The northern flying squirrel can apparently subsist on lichens and certain fungi, but also eats certain seeds, buds, fruit, staminate cones, insects, and other animal material.

They typically live at elevations above 5,000 feet (1,524 meters) in spruce-fir forests and forests

of mixed conifers and hardwoods. They use both areas to search for food, while the hardwood areas are needed for nesting sites. Research suggests that the more aggressive southern flying squirrel has begun to force the northern species out of the hardwood forests, which reduces favorable nesting sites and, therefore, reproduction by the northern flying squirrel.

BIOLOGICAL CONCLUSION: NO EFFECT

Habitat is not present in the project area; the project area is located at approximately 3,000 feet (914 meters) above msl, which is well below the elevation for suitable habitat. A search of the NCNHP database showed no recorded occurrences of this species within the project vicinity. It can be concluded that the construction of the proposed project will not impact the Carolina northern flying squirrel.

Haliaeetus leucocephalus	(Bald eagle)	T
Family:	Accipitridae	
Date Listed:	2/14/78	

Adult **bald eagles** have white heads and tails, a brownish body, and yellow bills, eyes and feet. The juvenile birds have a dark brown body, tail, and head irregularly blotched with white. The overall length of the bald eagle ranges from 34-43 inches (78-109 centimeters), and the wing span averages approximately 21 inches (53 centimeters). Bald eagles usually lay eggs between mid-January and mid-March. The bluish-white eggs are laid, usually two to a clutch and incubation lasts approximately 36 days.

The bald eagle forages along the coast, rivers, and large lakes. Nests are located in the forks of tall trees and are usually remote from human activity. Nesting sites are usually less than 1.0 mile (1.6 kilometers) from feeding areas and are located adjacent to a clear flight path and open view of the surrounding area. The bald eagle typically feeds on fish; however, waterfowl, muskrats, rabbits, and squirrels are not uncommon items of their diet.

BIOLOGICAL CONCLUSION: NO EFFECT

The project vicinity does not provide typical nesting or foraging bald eagle habitat. No nesting trees are present in the area. Additionally, no medium to large bodies of water for use as foraging areas are located within 1.0 mile (1.6 kilometers) of the project. A search of the NCNHP database showed no recorded occurrences of this species within the project vicinity. It can be concluded that the construction of the proposed project will not impact the bald eagle.

Alasmidonta raveneliana	(Appalachian elktoe)	E
Family:	Unionidae	
Date Listed:	November 23, 1994	

The **Appalachian elktoe** has a thin, but not fragile, kidney-shaped shell reaching up to 3 inches (7.6 centimeters) in length, 1.5 inches (3.8 centimeters) in height, and 1 inch (2.5 centimeters) in width. Juveniles generally have a yellowish-brown outer shell, while the outer shell of adults is usually dark brown to greenish-black in color. Although rays are prominent on some shells,

many individuals have only obscure greenish rays. The shell nacre is shiny, often white to bluish-white, changing to a salmon, pinkish, or brownish color in the central and beak cavity portions of the shell.

The Appalachian elktoe has been reported from relatively shallow, medium-sized creeks and rivers with cool, moderate to fast flowing water. It has also been observed in gravelly substrates often mixed with cobble and boulders, in cracks in bedrock, and occasionally in relatively silt-free, coarse sandy substrates.

BIOLOGICAL CONCLUSION: NO EFFECT

A survey by NCDOT biologists was conducted on November 28, 2001 to evaluate potential habitat for this species. The survey determined that the site is too small to support habitat for the Appalachian elktoe. Visual observations were conducted and no mussels were found. Based on these results, it can be concluded that project construction will not impact this species.

Microhexura montivaga	(Spruce-fir moss spider)	E
Family:	Dipluridae	
Date Listed:	March 8, 1995	

The **Spruce-fir moss spider** measures 0.10 to 0.15 inches (2.5 to 3.8 millimeters). Coloration ranges from light brown to a darker reddish brown, and there are no markings on the abdomen. The carapace is generally yellowish brown. The most reliable field identification characteristics for the spruce-fir moss spider are chelicerae that project forward well beyond the anterior edge of the carapace, a pair of very long posterior spinnerets, and the presence of a second pair of book lungs, which appear as light patches posterior to the genital furrow.

The typical habitat of the spruce-fir moss spider is found in damp but well-drained moss (and liverwort) mats growing on rocks or boulders, in well-shaded situations in the mature, high-elevation Fraser fir (Abies fraseri) and red spruce (Picea rubens) forests. The forest stands at the sites where the species has been observed are composed primarily of Fraser fir with only scattered spruce being present. The moss mats found to contain the spider have all been found under fir trees.

BIOLOGICAL CONCLUSION: NO EFFECT

Habitat is not present in the project area; the project area is located at approximately 3,000 feet (914 meters) above msl, which is well below the elevation for suitable habitat. In addition, no Fraser Fir or Red Spruce trees were observed in the forest community within the project area. It can be concluded that the construction of the proposed project will not impact the Spruce-fir moss spider.

Gymnoderma lineare	(Rock gnome lichen)	E
Family:	Cladoniaceae	
Date Listed:	January 18, 1995	

Rock gnome lichen is a squamulose lichen in the reindeer moss family. It occurs in dense colonies of narrow straps (squamules) that are blue-grey on the upper surface and generally shiny-white on the lower surface; near the base they grade to black. The squamules are nearly parallel to the rock surface, but the tips curl away from the rock, approaching or reaching a perpendicular orientation to the rock surface. The fruiting bodies (found from July through September) are borne at the tips of the squamules and are black.

Rock gnome lichen occurs only in areas of high humidity, either at high elevations, where it is frequently bathed in fog, or in deep river gorges at lower elevations. It is primarily limited to vertical rock faces where seepage water from forest soils above the cliffs flows at (and only at) very wet times. Most populations occur above an elevation of 5,000 feet (1,524 meters).

BIOLOGICAL CONCLUSION: NO EFFECT

Habitat (vertical rock faces) does not exist in the project study area for this species; the project area is approximately 3,000 feet (914 meters) above msl, which is located well below the elevation for suitable habitat. A search of the NCNHP database showed no recorded occurrences of this species within the project vicinity. It can be concluded that the construction of the proposed project will not impact the rock gnome lichen.

Isotria medeoloides	(Small whorled pogonia)	T
Family:	Orchidaceae	
Date Listed:	October 6, 1994	

Small whorled pogonia is a perennial with long, pubescent roots and a smooth, hollow stem 4 to 10 inches (10 to 25 centimeters) tall terminating in a whorl of 5 to 6 light green, elliptical leaves that are somewhat pointed and measure up to 3 by 1.5 inches (7.6 by 3.8 centimeters). One flower (occasionally two flowers) is produced at the top of the stem. Flowering occurs from mid-May to mid-June, with the flowers apparently lasting only a few days to a week or so. This plant does not necessarily flower every year. If pollination occurs, a capsule may be formed which can contain several thousand minute seeds. No evidence of insect pollination has been observed. This plant is believed to be self-pollinating by mechanical processes.

Small whorled pogonia is generally found in open, dry, deciduous woods with acidic soil. If it occurs in habitat where there is relatively high shrub coverage or high sapling density, flowering appears to be inhibited.

BIOLOGICAL CONCLUSION: NO EFFECT

Potential habitat does exist in the project study area for this species; the fringe of woods along the creek is semi-open. A survey for small whorled pogonia was conducted on June 7, 2000; no specimens were observed in the project area. A search of the NCNHP database showed no recorded occurrences of this species within the project vicinity. It can be concluded that the construction of the proposed project will not impact small whorled pogonia.

2. Federal Species of Concern

Federal Species of Concern (FSC) are not legally protected under the Endangered Species Act and are not subject to any of its provisions, including Section 7, until they are formally proposed or listed as Threatened of Endangered. 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 4 includes listed FSC species for Haywood County and their state classifications (March 22, 2001).

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

3. Summary of Anticipated Impacts

Habitat is present for one federally protected species, the Appalachian elktoe, and several FSCs. A survey for the Appalachian elktoe was conducted and the result was a biological conclusion of No Effect. Also according to the NCNHP, there have been no recorded occurrences for any rare or protected species. Based on these results, this project is not anticipated to have any impacts on rare and protected species.

TABLE 4
FEDERAL SPECIES OF CONCERN
HAYWOOD COUNTY

Scientific Name (Common Name)	North Carolina Status	Habitat Present
Abies fraseri ♦ (Fraser fir)	C	No
Aegolius acadicus (Southern Appalachian saw-whet owl)	SC	No
Buckleya disticophylla (Piratebush)	E	Yes
Cardamine clematitis (Mountain bittercress)	C	Yes
Carex manhartii ♦ (Manhart's sedge)	PE	No
Contopus borealis (Olive-sided flycatcher)	SC	No

Scientific Name (Common Name)	North Carolina Status	Habitat Present
Cryptobranchus alleganiensis (Hellbender)	SC	Yes
Delphinium exaltatum (Tall larkspur)	E-SC	No
Dendroica cerulea (Cerulean warbler)	SR	Yes
Euphorbia purpurea (Glade spurge)	C	Yes
Glyceria nubigena (Smoky Mountain manna grass)	T	No
Juglans cinerea ♦ (Butternut)	W5	No
Loxia curvirostra (Southern Appalachian red crossbill)	SR	No
Lysimachia fraseri (Fraser's loosestrife)	E	Yes
Microtus chrotorrhinus carolinensis (Southern rock vole)	SC	No
Neotoma floridana haematoreia (Southern Appalachian woodrat)	SC	Yes
Neotoma magister ♦ (Alleghany woodrat)	SC	Yes
Parus atricapillus practicus (Southern Appalachian black-capped chickadee)	SC	No
Phyciodes batesii maconensis (Tawny crescent butterfly)	SR	Yes
Plagiochila sharpii (A liverwort)	C	No
Plagiochila sullivantii var. sullivantii (A liverwort)	C	No
Rugelia nudicaulis (Rugel's ragwort)	T	No
Saxifraga caroliniana (Carolina saxifrage)	C	No
Silene ovata (Mountain catchfly)	C	Yes
Sorex palustris puctulatus (Southern water shrew)	SC	Yes

Scientific Name (Common Name)	North Carolina Status	Habitat Present
Spenolobopsis pearsonii (A liverwort)	PE	No
Speyeria diana (Diana fritillary butterfly)	SR	Yes
Sphyrapicus varius appalaciensis (Southern Appalachian yellow-bellied sapsucker)	SR	No
Sylvilagus obscurus (Appalachian cottontail)	SR	Yes
Thryomanes bewickii altus (Appalachian Bewick's wren)	E	No
Trillium pusillum var. 1 (Alabama least trillium)	E	Yes

NOTES:

- C — Candidate (species for which population monitoring and conservation action is recommended).
- E — Endangered (species which are afforded protection by state laws).
- T — Threatened (species which are afforded protection by state laws).
- SR — Significantly Rare (species for which population monitoring and conservation action is recommended).
- W — Watch list (any other species believed to be rare and of conservation concern in the state but not warranting active monitoring at this time)
- * — Historic record, the species was last observed in the county more than 50 years ago (USFWS)
- ◆ — Listed by the USFWS but not by the NCNHP.

VI. CULTURAL RESOURCES

A. Compliance Guidelines

This project is subject to compliance with Section 106 of the National Historic Preservation Act of 1966, as amended, implemented by the Advisory Council on Historic Preservation's Regulations for Compliance with Section 106, codified at 36 CFR Part 800. Section 106 requires that for federally funded, licensed, or permitted projects having an effect on properties listed in or eligible for the National Register of Historic Places, the Advisory Council on Historic Preservation be given the opportunity to comment.

B. Historic Architecture

A field survey of the Area of Potential Effects (APE) was conducted on January 10, 2000. All structures within the APE were photographed, and later reviewed by the State Historic Preservation Office (HPO). In a concurrence form dated April 19, 2000, the HPO concurred that

there are no historic architectural resources either listed in or eligible for listing in the National Register of Historic Places within the APE. A copy of the concurrence form is included in the Appendix.

C. Archaeology

The State Historic Preservation Officer (SHPO), in a memorandum dated October 29, 2001, recommended that "no archaeological investigation be conducted in connection with this project". A copy of the SHPO memorandum is included in the Appendix.

VII. ENVIRONMENTAL EFFECTS

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

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

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

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

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

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

This project has been coordinated with the United States Natural Resources Conservation Service. The Farmland Protection Policy Act requires all federal agencies or their representatives to consider the potential impact to prime farmland of all land acquisition and construction projects. Because the Preferred Alternative involves replacing the bridge in its existing location, no impacts to prime or locally important farmland are anticipated.

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

This project is located in Haywood County, which has been determined to be in compliance with the National Ambient Air Quality standards. 40 CFR Part 51 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. Therefore, 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 State Implementation Plan (SIP) for air quality in compliance with 15 NCAC 2D.0520. This evaluation completes the assessment requirements for highway traffic noise of Title 23, Code of Federal Regulations (CFR), Part 772 and for air quality (1990 Clean Air Act Amendments and the National Environmental Policy Act) and no additional reports are required.

Based on a field reconnaissance and public record review conducted by the NCDOT Geotechnical Unit, no underground storage tanks or hazardous waste sites are known to be present in the study area.

Haywood County is a current participant in the National Flood Insurance Program. However Bridge No. 112 is not located within the 100-year floodplain. Therefore no impacts to the floodplain are anticipated.

The project will not increase the upstream limits of the 100-year floodplain.

This project is located within the jurisdiction of the Tennessee Valley Authority (TVA). Therefore, an approval under Section 26a of the TVA Act will be required.

Based on the above statements, it is concluded that no substantial adverse environmental impacts will result from implementation of the project.

VIII. PUBLIC INVOLVEMENT

A newsletter was mailed to residents in the vicinity of the project. The newsletter described the alternatives and solicited comments from the public. After receiving the newsletter, some residents requested a meeting. An informational meeting was held on March 25, 2002 from 4:30 PM to 6:30 PM in the Bethel Elementary School Library in Waynesville.

The following general comment(s) were heard:

- Property owners just south of the bridge expressed concern that an existing line of trees would be cut down. These trees serve as a visual/dust barrier between residences and a nearby quarry.
- The citizens were in agreement with the Preferred Alternative (Alternative C) because it replaces the structure in its existing location and would not require cutting the trees down.
- Citizens opposed both Alternative A and Alternative B due to property impacts and the impacts to trees. {*Alternative C, the Preferred Alternative, replaces the structure at its*

existing location and uses an off-site detour. It would not have a substantial impact on the line of trees located between the residences and the quarry.}

No written comments were submitted.

IX. AGENCY COMMENTS

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

United States Fish and Wildlife Service (USFWS)– USFWS recommends that temporary fill be minimized, that no heavy equipment operates in the stream channel, and removal of woody vegetation along the stream banks be avoided to the extent possible. USFWS also recommends removing any fill in the floodplain associated with the existing structures to restore the natural floodplain elevation and function.

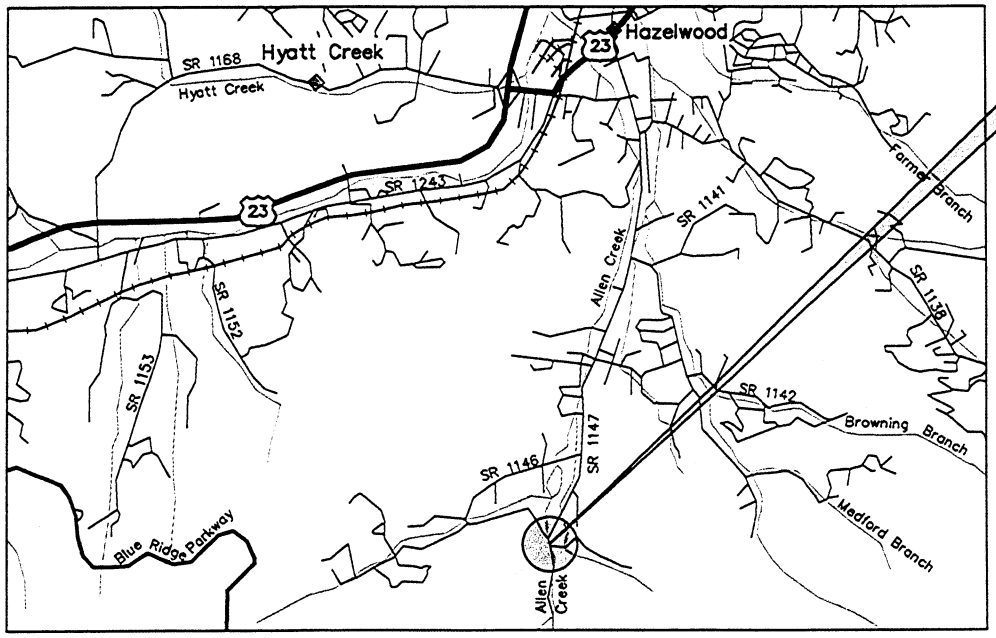
USFWS recommends that the existing structure be replaced with a bridge and the design should include provisions for roadbed and deck drainage to flow through a vegetated buffer. Bridge design should not alter natural stream form or morphology or impede fish passage and piers or bents should be placed outside the bankfull width. Bridge and approaches should be designed to avoid damming the channel or floodplain. USFWS recommends erosion and sedimentation controls to be in place prior to construction. No wet concrete should come into contact with the stream.

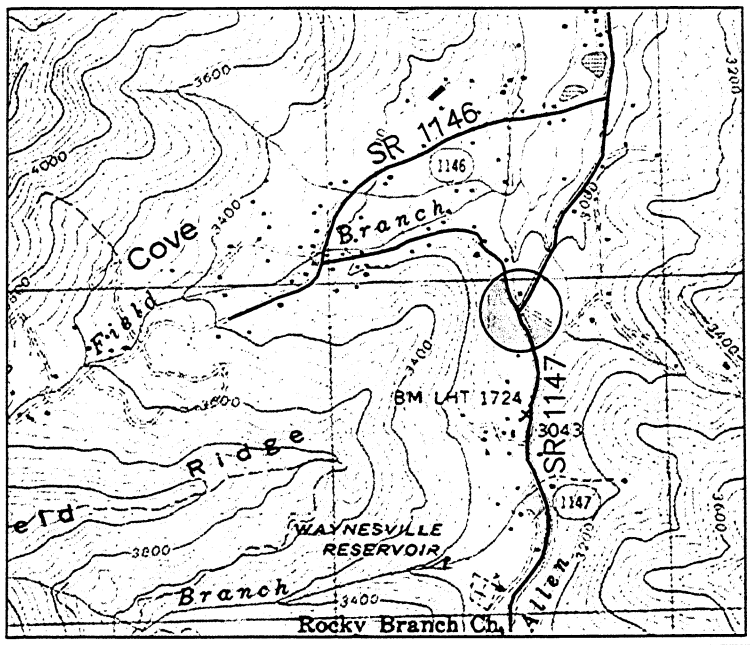
Response: In order to minimize construction impacts, the construction will be conducted in accordance with "Best Management Practices for the Protection of Surface Waters", "Pre-Construction Guidelines for Bridge Demolition and Removal", "Policy: Bridge Demolition and Removal in Waters of the United States", and "Best Management Practices for Bridge Demolition and Removal".

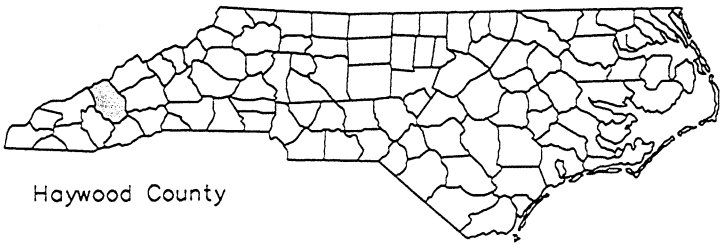
The project involves replacing the existing structure in-place with a new bridge and utilizing an off-site detour to minimize impacts to the environment.

North Carolina Wildlife Resources Commission (NCWRC) – NCWRC stated that Allens Creek is considered trout waters. Therefore a moratorium is requested between November 1 and April 15 to minimize impacts to trout reproduction.

Response: The trout moratorium has been incorporated in the Project Commitments.





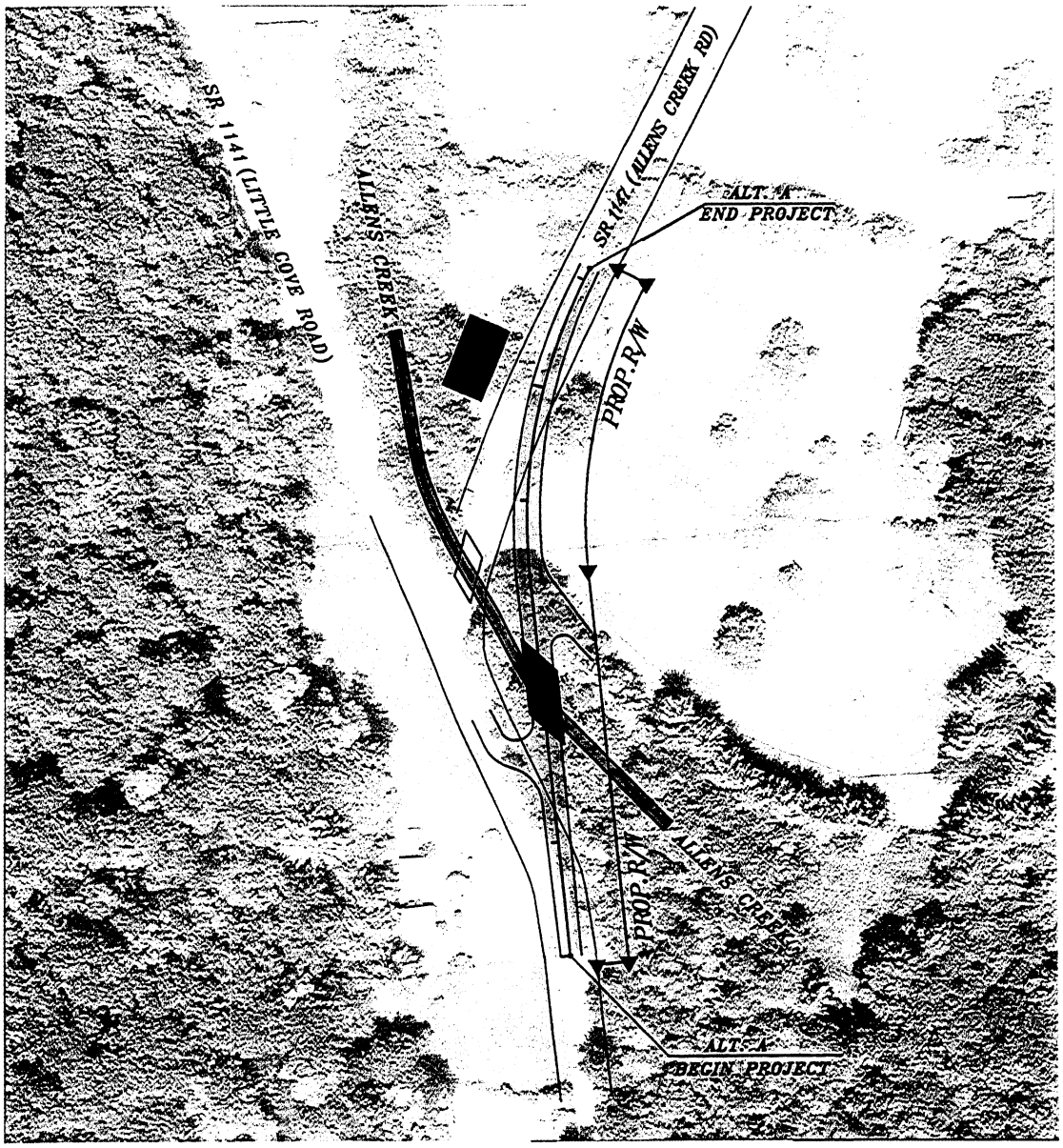


North Carolina
Department of Transportation

SR 1147
Replace Bridge No. 112 over Allens Creek
Haywood County
North Carolina
B-3659
Project Vicinity

Not to Scale

Exhibit 1



BRIDGE NO. 112, L=41 FT (12.5 M)
PROP. BRIDGE LENGTH = 65 FT (19.2 M), W= 28 FT (8.5 M)

Legend

Proposed Roadway Improvements

Proposed Bridge

Allens Creek

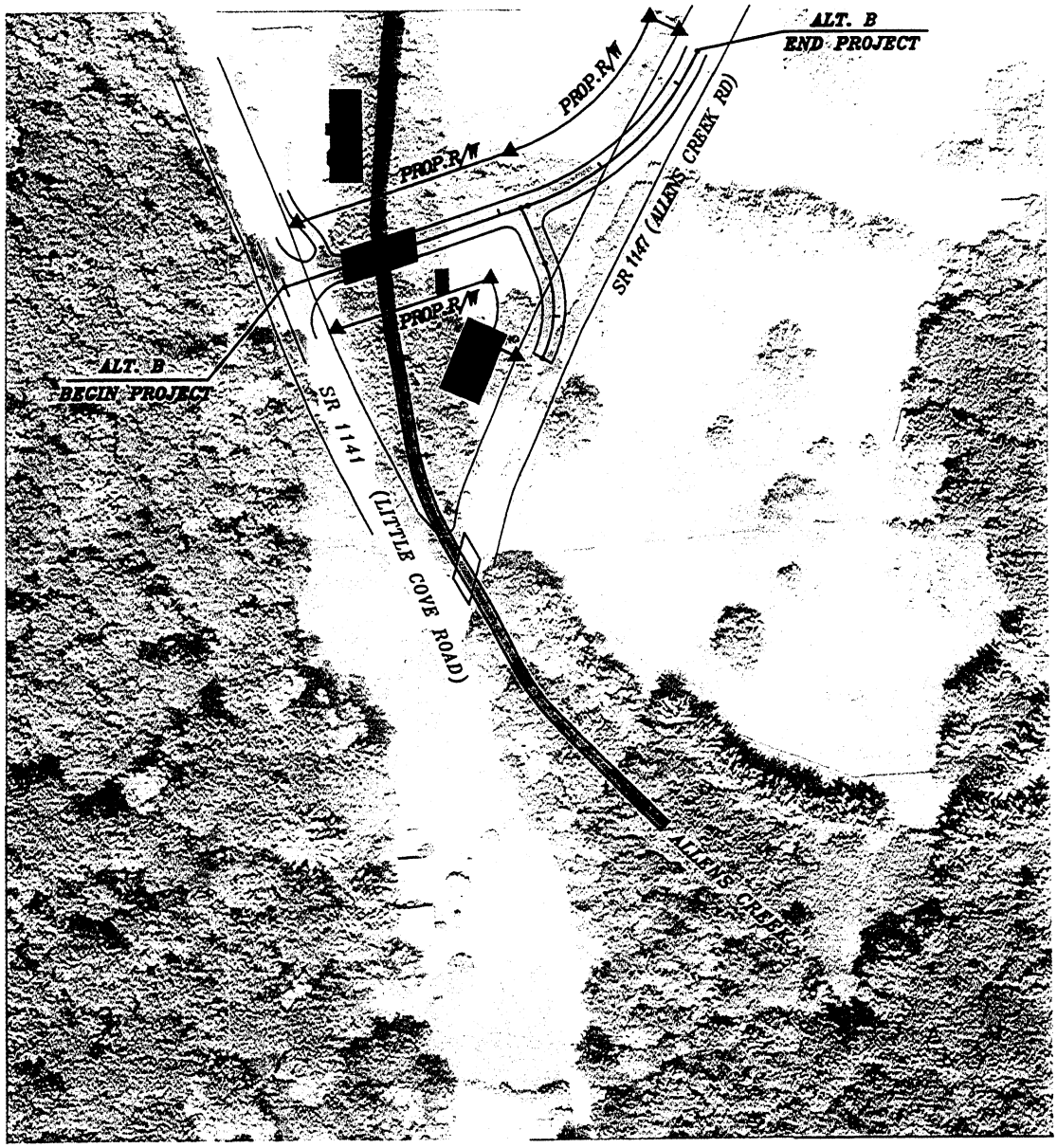
Note:
Bridge is not located within the 100 Year Floodplain.

North Carolina Department of Transportation

SR 1147
Replace Bridge No. 112 over Allens Creek
Haywood County
North Carolina
B-3659
Alternative A

Not to Scale

Exhibit 2



BRIDGE NO. 112, L=41 FT (12.5 M)
PROP. BRIDGE LENGTH = 65 FT (19.2 M), W= 28 FT (8.5 M)

Legend

Proposed Roadway Improvements

Proposed Bridge

Allens Creek

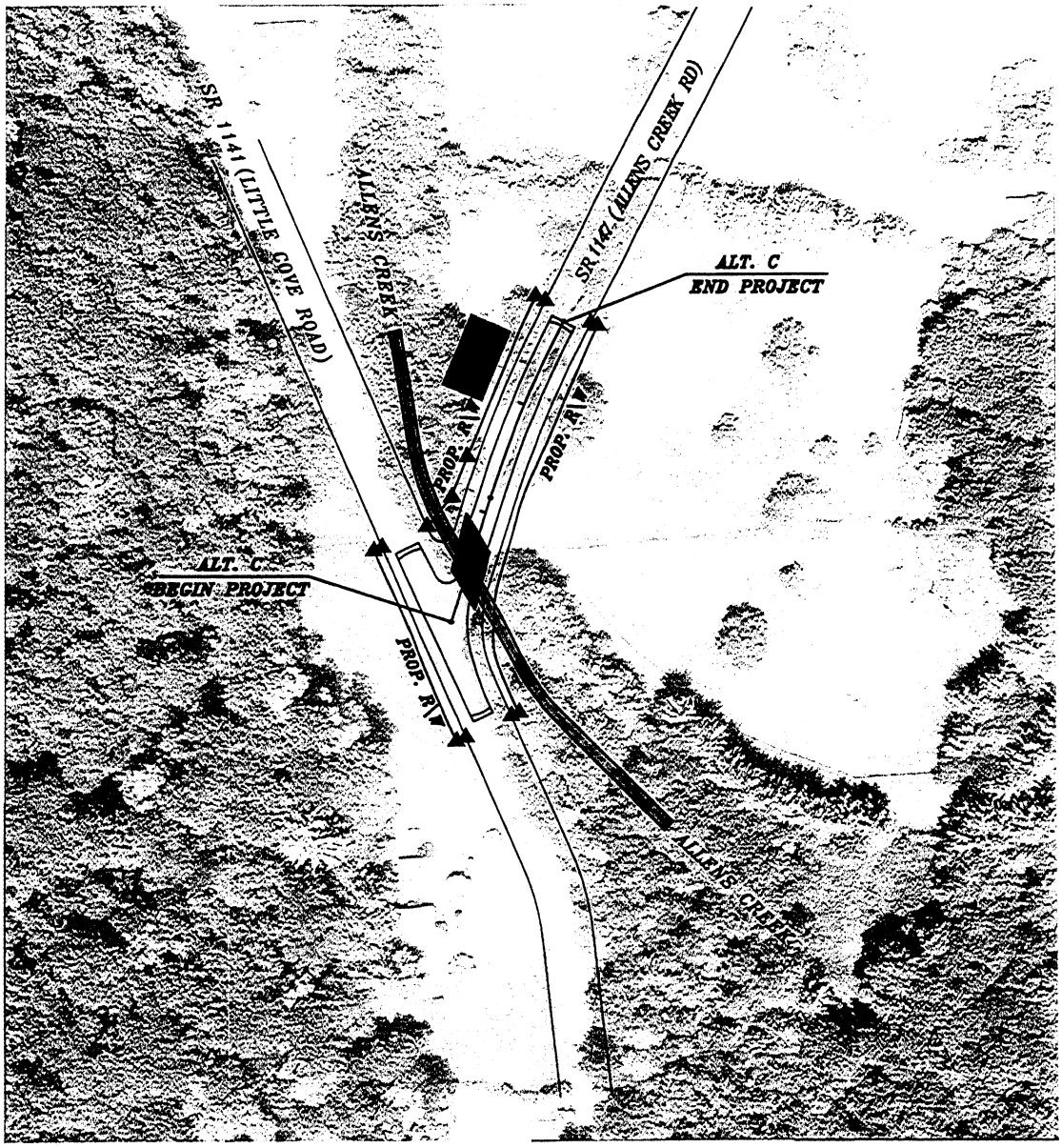
Note:
Bridge is not located within the 100 Year Floodplain.

North Carolina
Department of Transportation

SR 1147
Replace Bridge No. 112 over Allens Creek
Haywood County
North Carolina
B-3659
Alternative B

Not to Scale

Exhibit 3



BRIDGE NO. 112, L=41 FT (12.5 M)
PROP. BRIDGE LENGTH = 51 FT (15.5 M), W= 28 FT (8.5 M)

Legend

Proposed Roadway Improvements

Proposed Bridge

Allens Creek

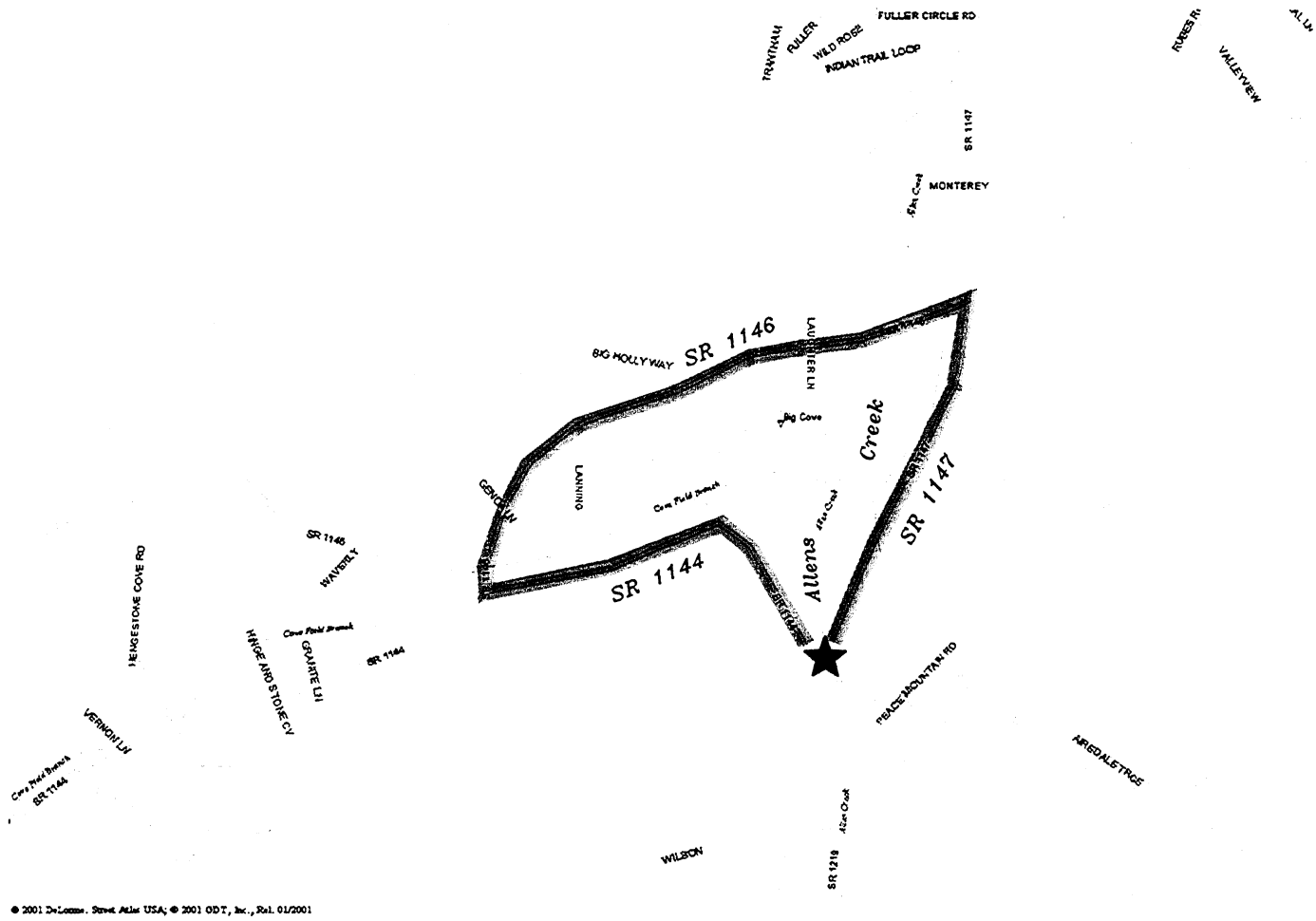
Note:
Bridge is not located within the 100 Year Floodplain.

North Carolina Department of Transportation

SR 1147
Replace Bridge No. 112 over Allens Creek
Haywood County
North Carolina
B-3659
Alternative C (Preferred)

Not to Scale

Exhibit 4



Legend

Detour Option

North Carolina
Department of Transportation

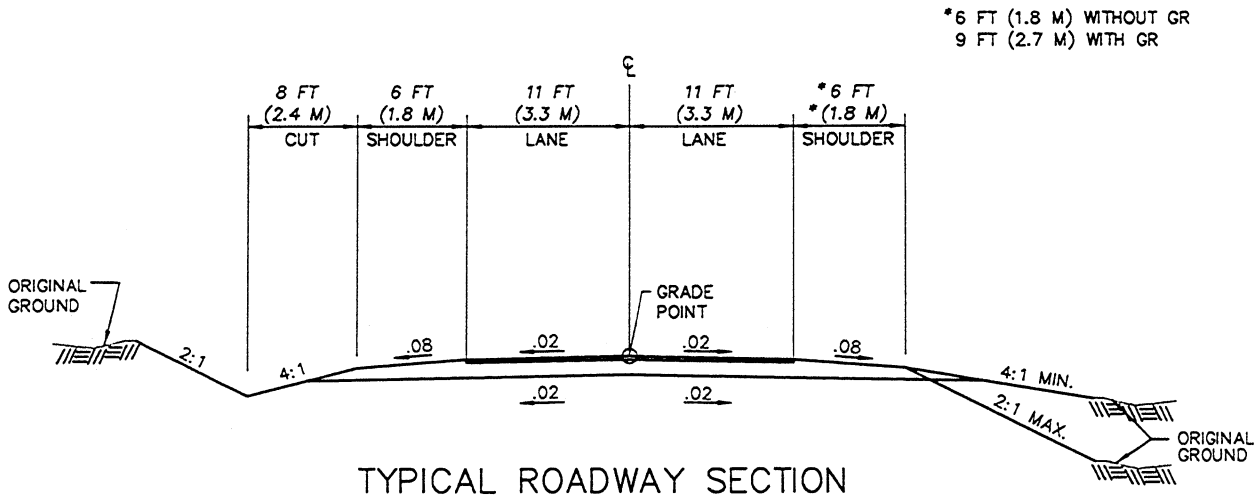
SR 1147
Replace Bridge No. 112
over Allens Creek
Haywood County
North Carolina

B-3659

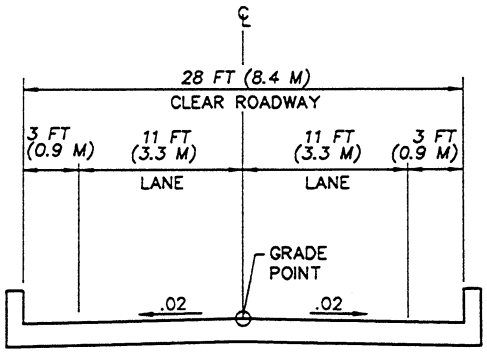
Alternative C Offsite Detour

Not to Scale

Exhibit 5



TYPICAL ROADWAY SECTION



TYPICAL BRIDGE SECTION

Design Data

ADT 2001	315	LOS A
ADT 2004	338	LOS A
ADT 2025	500	LOS A
DUAL		2%
TTST		1%
DESIGN SPEED		40 mph (70 Km/h)
POSTED SPEED		35 mph (60 Km/h)
FUNCTIONAL CLASSIFICATION		Rural Local
MIN RADIUS (Se = .06)		510 Ft. (155 M)
MAX GRADE		12%
MIN DES. K FACTORS	SAG	64 (23)
	CREST	44 (17)

North Carolina Department of Transportation

SR 1147
Replace Bridge No. 112 over Allens Creek
Haywood County
North Carolina
B-3659
Typical Section

Not to Scale

Exhibit 6

Northbound Approach

Southbound Approach

Looking Upstream

North Carolina
Department of Transportation

SR 1147
Replace Bridge No. 112
over Allens Creek
Haywood County
North Carolina

B-3659
Photos

Not to Scale

Exhibit 7

APPENDIX

United States Department of the Interior

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

August 9, 2000

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:

According to your letter of June 7, 2000, the North Carolina Department of Transportation is proposing 12 bridge replacement projects in Buncombe, Burke, Haywood, Jackson, and Madison Counties, North Carolina. These are Group XXXII Bridge Replacement Projects, listed as follows:

Buncombe County
1. B-3614, Replace Bridge No. 300 on SR 1141 over Hominy Creek
2. B-3616, Replace Bridge No. 740 on SR 1319 over Mill Creek
3. B-3619, Replace Bridge No. 56 on SR 3439 over Bill Moore Creek

Burke County
1. B-3620, Replace Bridge No. 292 on SR 1001 over the Henry Fork River
2. B-3621, Replace Bridge No. 148 on SR 1547 over Micol Creek
3. B-3622, Replace Bridge No. 334 on SR 1900 over an unnamed creek

Haywood County
1. B-3470, Replace Bridge No. 163 on US 276 over the Pigeon River Overflow
2. B-3656, Replace Bridge No. 419 on US 19-23 over the Pigeon River
3. B-3659, Replace Bridge No. 112 on SR 1147 over Allens Creek
4. B-3661, Replace Bridge No. 36 on SR 1503 over Crabtree Creek

Jackson County
1. B-3667, Replace Bridge No. 47 on SR 1131 over Trout Creek

Madison County
1. B-3869, Replace Bridge No. 146 on SR 1151 over Big Pine Creek

As requested, we have reviewed the proposed projects and are providing the following comments in accordance with the provisions of Section 7 of the Endangered Species Act of 1973, as amended (16 U.S.C. 1531-1543) (Act), and the Fish and Wildlife Coordination Act, as amended (16 U.S.C. 661-667e). The legal responsibilities of a Federal agency or its designated non-Federal representative under Section 7 of the Act are on file with the Federal Highway Administration. In addition to general comments applicable to all of the projects, specific concerns for listed species are provided with the individual bridge description.

Enclosed is a list of species from Buncombe, Burke, Haywood, Jackson, and Madison Counties that are on the Federal List of Endangered and Threatened Wildlife and Plants, as well as species of Federal concern. Although our records indicate no known locations of these species in the project areas for Buncombe County projects B-3614, B-3616, and B-3619; Haywood County projects B-3659 and B-3661; Jackson County project B-3667; and Madison County project B-386, we recommend surveying each of the project areas for these species prior to any further planning or on-the-ground activities to ensure no adverse impacts occur to these species.

Our records for Burke County indicate there is a known location of the federally threatened dwarf-flowered heartleaf (*Hexastylis naniflora*) near projects B-3620 and B-3621. If this species occurs in the area of either of these projects, additional consultation will be required. Additionally, there is a record for a species of Federal concern--sweet pinesap (*Monotropis odorata*)--from a site near project B-3622. The project areas for these bridges should be surveyed for these species to ensure they are protected from impacts.

Our records for Haywood County indicate that there are known locations for the federally endangered Appalachian elktoe mussel (*Alasmidonta raveneliana*) near projects B-3470 and B-3656. The effects to the Appalachian elktoe must be assessed prior to implementation of these projects.

Species of Federal concern are not legally protected under the Act and are not subject to any of its provisions, including Section 7, unless they are formally proposed or listed as endangered or threatened. We are including these species in our response to give you advance notification and to request your assistance in protecting them if any are found in the vicinity of these projects.

The information that accompanied your letter concerning these projects related only to the removal of the existing bridges. According to this information, there will be temporary fill associated with several of the projects. We recommend that this fill be minimized, to the extent possible, and that no heavy equipment be operated in the stream channel. To maintain bank stability, any cutting or removal of woody vegetation along the stream banks should be avoided to the maximum extent possible. We also recommend removing any fill in the flood plain associated with the existing structures in order to restore the natural elevation of the flood plain and its function. This will minimize the potential for stream-bank and channel scouring that may

occur during storm flows as a result of any constriction of the flood plain or stream channel associated with the existing structures.

As stated above, the information you provided addressed only the removal of the existing bridges; no information was provided concerning the types of structures that will replace the existing bridges or what measures will be implemented to minimize the potential effects associated with the new structures and their construction. We recommend that the existing structures be replaced with bridges and that each new bridge design include provisions for the roadbed and deck drainage to flow through a vegetated buffer prior to reaching the affected stream. This buffer should be large enough to alleviate any potential effects from the run-off of storm water and pollutants. The bridge designs should not alter the natural stream and stream-bank morphology or impede fish passage. Any piers or bents should be placed outside the bank-full width of the streams. The bridges and approaches should be designed to avoid any fill that will result in the damming or constriction of the channel or flood plain. If spanning the flood plain is not feasible, culverts should be installed in the flood plain portion of the approaches in order to restore some of the hydrological functions of the flood plain and reduce high velocities of flood waters within the affected areas. We recommend that erosion- and sedimentation-control measures be in place prior to any ground-disturbing activities. Wet concrete should never be allowed to come into contact with the stream.

We appreciate the opportunity to provide these comments. If you have any questions or concerns, please contact Ms. Marella Buncick of our staff at 828/258-3939, Ext. 237. Please reference our Log Number 4-2-00-280 in any future correspondence concerning these projects.

Sincerely,

Brian P. Cole
State Supervisor

Enclosure

cc:
Mr. Mark Davis, Environmental Compliance Officer, North Carolina Department of Transportation, P.O. Box 37, Sylva, NC 28779
Mr. Steve Lund, U.S. Army Corps of Engineers, Asheville Regulatory Field Office, 151 Patton Avenue, Room 143, Asheville, NC 28801-5006
Mr. Tim Savidge, Environmental Biologist, Project Development and Environmental Analysis Branch, North Carolina Department of Transportation, 1548 Mail Service Center, Raleigh, NC 27699-1548
Ms. Cynthia Van Der Wiele, North Carolina Department of Environment and Natural Resources, Division of Water Quality, Wetlands Section, 1621 Mail Service Center, Raleigh, NC 27699-1621

ENDANGERED, THREATENED, AND CANDIDATE SPECIES AND FEDERAL SPECIES OF CONCERN BUNCOMBE, BURKE, HAYWOOD, JACKSON, AND MADISON COUNTIES, NORTH CAROLINA

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

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

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

COMMON NAME	SCIENTIFIC NAME	STATUS
BUNCOMBE COUNTY		
Vertebrates		
Southern Appalachian saw-whet owl	*Aegolius acadicus*	FSC
Bachman's sparrow	*Aimophila aestivalis*	FSC*
Bog turtle	*Clemmys muhlenbergii*	T(S/A)[1]
Rafinesque's big-eared bat	*Corynorhinus (=Plecotus) rafinesquii*	FSC*
Hellbender	*Cryptobranchus alleganiensis*	FSC
Cerulean warbler	*Dendroica cerulea*	FSC
Eastern cougar	*Felis concolor couguar*	Endangered*
Carolina northern flying squirrel	*Glaucomys sabrinus coloratus*	Endangered
Spotfin chub	*Hybopsis monacha*	Threatened*
Southern Appalachian red crossbill	*Loxia curvirostra*	FSC
Gray bat	*Myotis grisescens*	Endangered***
Eastern small-footed myotis	*Myotis leibii*	FSC
Southern Appalachian woodrat	*Neotoma floridana haematoreia*	FSC
Southern Appalachian black-capped chickadee	*Parus atricapillus practicus*	FSC
Longhead darter	*Percina macrocephala*	FSC*
Paddlefish	*Polyodon spathula*	FSC*
Southern water shrew	*Sorex palustris punctulatus*	FSC
Southern Appalachian yellow-bellied sapsucker	*Sphyrapicus varius appalaciensis*	FSC
Appalachian Bewick's wren	*Thryomanes bewickii altus*	FSC*
Invertebrates		
Appalachian elktoe	*Alasmidonta raveneliana*	Endangered
French Broad crayfish	*Cambarus reburrus*	FSC

COMMON NAME	SCIENTIFIC NAME	STATUS
Oyster mussel	*Epioblasma capsaeformis*	Endangered
Tawny crescent butterfly	*Phycoides batesii*	FSC*
Diana fritillary butterfly	*Speyeria diana*	FSC*
Vascular Plants		
Fraser fir	*Abies fraseri*	FSC
Piratebush	*Buckleya distichophylla*	FSC
Cain's reedgrass	*Calamagrostis cainii*	FSC
Glade spurge	*Euphorbia purpurea*	FSC
Spreading avens	*Geum radiatum*	Endangered
Mountain heartleaf	*Hexastylis contracta*	FSC
French Broad heartleaf	*Hexastylis rhombiformis*	FSC
Butternut	*Juglans cinerea*	FSC
Gray's lily	*Lilium grayi*	FSC
Fraser's loosestrife	*Lysimachia fraseri*	FSC*
Sweet pinesap	*Monotropsis odorata*	FSC
Pinnate-lobed black-eyed susan	*Rudbeckia triloba* var. *pinnatoloba*	FSC
Bunched arrowhead	*Sagittaria fasciculata*	Endangered*
Mountain sweet pitcher plant	*Sarracenia jonesii*	Endangered*
Carolina saxifrage	*Saxifraga caroliniana*	FSC
Divided-leaf ragwort	*Senecio millefolium*	FSC
Mountain catchfly	*Silene ovata*	FSC
Virginia spiraea	*Spiraea virginiana*	Threatened
Nonvascular Plants		
Rock gnome lichen	*Gymnoderma lineare*	Endangered

BURKE COUNTY

Critical Habitat Designation:

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

Vertebrates		
Bald eagle	*Haliaeetus leucocephalus*	Threatened (proposed for delisting)
Alleghany woodrat	*Neotoma magister*	FSC
Invertebrates		
Brook floater	*Alasmidonta varicosa*	FSC
Edmund's snaketail dragonfly	*Ophiogomphus edmundo*	FSC*

COMMON NAME	SCIENTIFIC NAME	STATUS
Pygmy snaketail dragonfly	*Ophiogomphus howei*	FSC
Diana fritillary butterfly	*Speyeria diana*	FSC
Vascular Plants		
Spreading avens	*Geum radiatum*	Endangered
Dwarf-flowered heartleaf	*Hexastylis naniflora*	Threatened
Mountain golden heather	*Hudsonia montana*	Threatened
Small-whorled pogonia	*Isotria medeoloides*	Threatened
Butternut	*Juglans cinerea*	FSC
Heller's blazing star	*Liatris helleri*	Threatened
Sweet pinesap	*Monotropsis odorata*	FSC
Carolina saxifrage	*Saxifraga caroliniana*	FSC
Nonvascular Plants		
A liverwort	*Cephaloziella obtusilobula*	FSC*
A liverwort	*Plagiochila sullivantii* var. *spinigera*	FSC
A liverwort	*Plagiochila sullivantii* var. *sullivantii*	FSC

HAYWOOD COUNTY

Vertebrates		
Southern Appalachian saw-whet owl	*Aegolius acadicus*	FSC
Bog turtle	*Clemmys muhlenbergii*	T(S/A)[1]
Olive-sided flycatcher	*Contopus borealis*	FSC
Hellbender	*Cryptobranchus alleganiensis*	FSC
Cerulean warbler	*Dendroica cerulea*	FSC
Eastern cougar	*Felis concolor couguar*	Endangered*
Carolina northern flying squirrel	*Glaucomys sabrinus coloratus*	Endangered
Bald eagle	*Haliaeetus leucocephalus*	Threatened (proposed for delisting)
Southern Appalachian red crossbill	*Loxia curvirostra*	FSC
Southern rock vole	*Microtus chrotorrhinus carolinensis*	FSC
Southern Appalachian woodrat	*Neotoma floridana haematoreia*	FSC
Alleghany woodrat	*Neotoma magister*	FSC
Southern Appalachian black-capped chickadee	*Parus atricapillus practicus*	FSC
Southern water shrew	*Sorex palustris punctulatus*	FSC
Southern Appalachian yellow-bellied sapsucker	*Sphyrapicus varius appalaciensis*	FSC
Appalachian cottontail	*Sylvilagus obscurus*	FSC
Appalachian Bewick's wren	*Thryomanes bewickii altus*	FSC
Invertebrates		
Appalachian elktoe	*Alasmidonta raveneliana*	Endangered
Tawny crescent butterfly	*Phyciodes batesii maconensis*	FSC*
Diana fritillary butterfly	*Speyeria diana*	FSC

COMMON NAME	SCIENTIFIC NAME	STATUS
Vascular Plants		
Fraser fir	*Abies fraseri*	FSC
Piratebush	*Buckleya disticophylla*	FSC
Mountain bittercress	*Cardamine clematitis*	FSC
Manhart's sedge	*Carex manhartii*	FSC
Tall larkspur	*Delphinium exaltatum*	FSC*
Glade spurge	*Euphorbia purpurea*	FSC
Smoky Mountain manna grass	*Glyceria nubigena*	FSC
Small-whorled pogonia	*Isotria medeoloides*	Threatened
Butternut	*Juglans cinerea*	FSC
Fraser's loosestrife	*Lysimachia fraseri*	FSC
Rugel's ragwort	*Rugelia nudicaulis*	FSC
Carolina saxifrage	*Saxifraga caroliniana*	FSC
Mountain catchfly	*Silene ovata*	FSC
Alabama least trillium	*Trillium pusillum* var. *1*	FSC
Nonvascular Plants		
Rock gnome lichen	*Gymnoderma lineare*	Endangered
A liverwort	*Plagiochila sharpii*	FSC
A liverwort	*Plagiochila sullivantii* var. *sullivantii*	FSC
A liverwort	*Sphenolobopsis pearsonii*	FSC

JACKSON COUNTY

Vertebrates		
Southern Appalachian saw-whet owl	*Aegolius acadicus*	FSC
Green salamander	*Aneides aeneus*	FSC
Hellbender	*Cryptobranchus alleganiensis*	FSC
Carolina northern flying squirrel	*Glaucomys sabrinus coloratus*	Endangered
Southern Appalachian red crossbill	*Loxia curvirostra*	FSC
Sicklefin redhorse	*Moxostoma* sp.	FSC
Indiana bat	*Myotis sodalis*	Endangered (winter records)
Southern Appalachian black-capped chickadee	*Parus atricapillus practicus*	FSC
Olive darter	*Percina squamata*	FSC
Northern pine snake	*Pituophis melanoleucus melanoleucus*	FSC
Southern Appalachian yellow-bellied sapsucker	*Sphyrapicus varius appalaciensis*	FSC
Invertebrates		
Appalachian elktoe	*Alasmidonta raveneliana*	Endangered
French Broad crayfish	*Cambarus reburrus*	FSC
Whitewater crayfish ostracod	*Dactyloctythere prinsi*	FSC
Tawny crescent butterfly	*Phycoides batesii maconensis*	FSC
Diana fritillary butterfly	*Speyeria diana*	FSC
Southern Appalachian yellow-bellied sapsucker	*Sphyrapicus varius appalaciensis*	FSC

COMMON NAME	SCIENTIFIC NAME	STATUS
Vascular Plants		
Fraser fir	*Abies fraseri*	FSC
Mountain bittercress	*Cardamine clematitis*	FSC
Manhart's sedge	*Carex manhartii*	FSC
Tall larkspur	*Delphinium exaltatum*	FSC
Glade spurge	*Euphorbia purpurea*	FSC
Swamp pink	*Helonias bullata*	Threatened
Small-whorled pogonia	*Isotria medeoloides*	Threatened
Butternut	*Juglans cinerea*	FSC
Fraser's loosestrife	*Lysimachia fraseri*	FSC
Sweet pinesap	*Monotropsis odorata*	FSC
Carolina saxifrage	*Saxifraga caroliniana*	FSC
Divided-leaf ragwort	*Senecio millefolium*	FSC
Mountain catchfly	*Silene ovata*	FSC
Nonvascular Plants		
Gorge moss	*Bryocrumia vivicolor*	FSC
Rock gnome lichen	*Gymnoderma lineare*	Endangered
A liverwort	*Plagiochila sullivantii* var. *spinigera*	FSC
A liverwort	*Plagiochila sullivantii* var. *sullivantii*	FSC
A liverwort	*Plagiochila virginica* var. *caroliniana*	FSC
A liverwort	*Sphenolobopsis pearsonii*	FSC
A liverwort	*Cephaloziella obtusilobula*	FSC*
A liverwort	*Plagiochila sullivantii* var. *spinigera*	FSC
A liverwort	*Plagiochila sullivantii* var. *sullivantii*	FSC

MADISON COUNTY

Vertebrates		
Lake sturgeon	*Acipenser fulvescens*	FSC*
Rafinesque's big-eared bat	*Corynorhinus (=Plecotus) rafinesquii*	FSC*
Hellbender	*Cryptobranchus alleganiensis*	FSC
Spotfin chub	*Hybopsis monacha*	Threatened*
Olive darter	*Percina squamata*	FSC
Paddlefish	*Polyodon spathula*	FSC
Invertebrates		
Oyster mussel	*Epioblasma capsaeformis*	Endangered*
Sculpted supercoil	*Paravitrea ternaria*	FSC
Vascular Plants		
Piratebush	*Buckleya distichophylla*	FSC
Glade spurge	*Euphorbia purpurea*	FSC
Butternut	*Juglans cinerea*	FSC
Carolina saxifrage	*Saxifraga caroliniana*	FSC
Mountain catchfly	*Silene ovata*	FSC

KEY:

Status	Definition
Endangered	A taxon "in danger of extinction throughout all or a significant portion of its range."
Threatened	A taxon "likely to become endangered within the foreseeable future throughout all or a significant portion of its range."
FSC	A Federal species of concern--a species that may or may not be listed in the future (formerly C2 candidate species or species under consideration for listing for which there is insufficient information to support listing).
T(S/A)	Threatened due to similarity of appearance (e.g., American alligator)--a species that is threatened due to similarity of appearance with other rare species and is listed for its protection. These species are not biologically endangered or threatened and are not subject to Section 7 consultation.

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

*Historic record - the species was last observed in the county more than 50 years ago.
**Obscure record - the date and/or location of observation is uncertain.
***Incidental/migrant record - the species was observed outside of its normal range or habitat.
****Historic record - obscure and incidental record.

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

North Carolina Wildlife Resources Commission

Charles R. Fullwood, Executive Director

MEMORANDUM

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

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

Copy - Clean Cuts 9/25/2001

DATE: August 21, 2000

SUBJECT: Scoping for Group XXXII Bridge Replacement Projects in Buncombe, Haywood, Jackson, Madison and Bladen/Sampson Counties

This memorandum responds to your request for our concerns regarding impacts on fish and wildlife resources resulting from the subject projects. We apologize for the delay in our response but a staff shortage has put us behind in our reviews. The North Carolina Wildlife Resources Commission (NCWRC) has reviewed the proposed projects, and our comments are provided in accordance with provisions of the National Environmental Policy Act (42 U.S.C. 4332(2)(c)) and the Fish and Wildlife Coordination Act (48 Stat. 401, as amended; 16 U.S.C. 661-667d).

The proposed work involves nine bridge replacement projects in western North Carolina and one project in Bladen/Sampson Counties. Construction impacts on wildlife and fisheries resources will depend on the extent of disturbance in the streambed and surrounding floodplain areas. We prefer bridge designs that do not alter the natural stream morphology or impede fish passage. Bridge designs should also include provisions for the deck drainage to flow through a vegetated upland buffer prior to reaching the subject surface waters. We are also concerned about impacts to designated Public Mountain Trout Waters (PMTW) and environmental documentation for these projects should include description of any streams or wetlands on the project site and surveys for any threatened or endangered species that may be affected by construction.

B-3615 - Bladen/Sampson County Bridge No. 44 on NC 41 over the South River

There is a record of the broad-tailed madtom near the bridge. Additionally, there appear to be significant wetlands associated with this area. This reach is also considered anadromous fish spawning area An in-water work moratorium is requested between February 1-July 1 to minimize impacts to anadromous fish and other spawning fish. We prefer that debris not be discharged to the river during demolition activities to prevent obstructions to navigation and impacts to potential habitat for the broad-tailed madtom.

B-3614 – Buncombe County, Bridge No. 300 on SR 1141 over Hominy Creek

Hominy Creek is considered a spawning stream for trout. We request an instream construction moratorium between November 1-April 15 to minimize impacts to spawning trout.

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

B-3616 – Buncombe County, Bridge No 740 on SR 1319 over Mill Creek

This creek is not considered to be trout waters. We have no concerns other than minimization of impacts to water quality and habitat.

B-3619 – Buncombe County, Bridge No. 10056 on SR 3449 over Bill Moore Creek

This stream reach is used by trout for spawning. Baldwin Field Branch, which drains off of nearby National Forest Land, is a designated trout stream. The confluence of this stream is in close proximity of the bridge structure. We would prefer the existing bridge be replaced with a spanning structure due to the importance of this area for trout movement. We request an instream construction moratorium between November 1 and April 15 to minimize impacts to trout reproduction.

B-3470 - Haywood County, Bridge No 163 on US 276 over Pigeon River Overflow

This reach of the Pigeon River supports trout. We request a moratorium on in-water construction between November 1 and April 15. Additionally, there are records for the Appalachian Elktoe upstream of this site. If suitable habitat exists, the animal may be found downstream of this project. Therefore, we request that you consult with the US Fish and Wildlife on this project concerning impacts to this species.

B-3656 - Haywood County Bridge No. 419 on US 19-23 over the Pigeon River

The reach of the Pigeon does not support trout. We do not anticipate a moratorium would be required.

B-3659 – Haywood County, Bridge No. 112 on SR 1147 over Allens Creek

Allens Creek is considered trout waters. We prefer that the old bridge be replaced with a spanning structure. We request a moratorium between November 1 and April 15 to minimize impacts to trout reproduction.

B-3661 - Haywood County, Bridge No. 36 on SR 1503 over Crabtree Creek

This section of Crabtree Creek is not considered trout waters. We do not anticipate a moratorium would be required.

B-3667 – Jackson County, Bridge No. 47 on SR 1131 over Trout Creek

Trout creek is considered trout waters. We request a moratorium on in-water construction between November 1 and April 15.

B-3869 - Madison County, Bridge No. 146 on SR 1151 over Big Pine Creek

Big Pine in this reach is not known to support trout. We do not anticipate a moratorium would be required.

Because the Corps of Engineers (COE) recognizes all of the above counties as "trout water counties", the NCWRC will review any nationwide or general 404 permits for the proposed projects. The following conditions are likely to be placed on the subject 404 permits:

1. Adequate sedimentation and erosion control measures must be implemented and maintained on the project site to avoid impacts to downstream aquatic resources. Structures should be inspected and maintained regularly, especially following rainfall events.

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

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

4. If concrete is used during construction, a dry work area must be maintained to prevent direct contact between curing concrete and stream water. Uncured concrete affects water quality and is highly toxic to fish and other aquatic organisms.

5. Grading and backfilling should be minimized, and tree and shrub growth should be retained if possible to ensure long term availability of shoreline cover for gamefish and wildlife.

6. **In trout waters, instream construction is prohibited during the trout-spawning period of November 1 to April 15 to avoid impacts on trout reproduction.**

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

8. If multi-celled reinforced concrete box culverts are utilized, they should be designed so that all water flows through a single cell (or two if necessary) during low flow conditions. This could be accomplished by constructing a low sill on the upstream end of the other cells that will divert low flows to another cell. This will facilitate fish passage at low flows.

9. Notched baffles should be placed in reinforced concrete box culverts at 15-foot intervals to allow for the collection of sediments in the culvert, reduce flow velocities, and to provide resting places for fish moving through the structure.

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

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

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

cc Mr. Steven Lund, NCDOT Coordinator, COE, Asheville
Ms. Stacy Harris, P.E., PD & EA Branch, NCDOT, Raleigh
Mr. Mark Cantrell, Biologist, USFWS Asheville
Mr. David Timpy, NCDOT Coordinator, COE Wilmington

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

October 29, 2001

NOV 1 2001

MEMORANDUM

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

From: David Brook DB for David Brook

Re: Replace Bridge No. 112, SR 1147 over Allens Creek, B-3659, Haywood County, ER 00-10125
Replace Bridge No. 36, SR 1503 over Crabtree Creek, B-3661, Haywood County, ER 00-10126

Thank you for your letter of September 10, 2001, concerning the above project.

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

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

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

DB:kgc

	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

Federal Aid =BRZ-1147(4) *TIP* =B-3659 *County*: Haywood

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

Project Description: Replace Bridge No. 112 on SR 1147 over Allens Creek

On March 27, 2000, representatives of the

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

Reviewed the subject project at

- [ ] a scoping meeting
- [x] photograph review session/consultation
- [ ] other

All parties present agreed

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

Signed:

Mary Pope Furr — 3.27.00

Representative, NCDOT — Date

Michael C Dawson — 4/13/00

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

[signature] — 3/27/00

Representative, SHPO — Date

[signature] — 4/19/00

State Historic Preservation Officer — Date