STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

MICHAEL F. EASLEY
GOVERNOR

LYNDO TIPPETT
SECRETARY

January 30, 2007

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

ATTENTION: Mr. David Baker
NCDOT Coordinator

SUBJECT: **Nationwide Permit 33 Application** for the proposed replacement of Bridge No. 166 on SR 1331 (Hanging Dog Road) over Bates Creek, in Cherokee County. Federal Aid Project No. BRZ-1331(5), State Project No. 8.2910701 WBS Element 33278.1.1, TIP No. B-3826, in Division 14.

Dear Sir:

Please find enclosed a copy of the Pre-Construction Notification, permit drawings, 1/2 size plans and Categorical Exclusion for the above referenced project. The North Carolina Department of Transportation (NCDOT) proposes to replace Bridge No. 166 on the same alignment with a new 30' single span bridge. There will be 0.02 acre of temporary impacts in surface waters with no permanent impacts. Traffic will be maintained by an onsite single lane signalized detour.

Impacts to Waters of the United States

The water resource impacted for project B-3826 is Bates Creek located in the Hiwassee River Basin, Subbasin 04-05-02. The North Carolina Division of Water Quality (DWQ) classifies Bates Creek as a "Class **C**" stream and is located in Hydrological Cataloguing Unit 06020002. There are no Outstanding Resource Waters (ORW), High Quality Waters (HQW), WS-I, WS-II, or watershed Critical Area (CA), within 1 mile upstream or downstream of the project study area. Bates Creek is not identified as a 303(d) stream by DWQ nor does the project drain to a 303(d) stream within one mile.

The North Carolina Wildlife Resource Commission (WRC) has issued a Construction Moratorium for in-stream or land disturbance work within a 25-foot wide buffer zone of Bates Creek, which will be in effect from October 15 through April 15, to protect trout during spawning. Guidelines for Construction of Highway Improvements Adjacent to or Crossing Trout Water in North Carolina will be adhered, as applicable.

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.NCDOT.ORG

LOCATION:
TRANSPORTATION BUILDING
1 SOUTH WILMINGTON STREET
RALEIGH NC

Permanent Impacts: There will be no permanent impacts to surface waters or wetlands resulting from the construction of this project.

Temporary Impacts: A temporary onsite detour will result in approximately 0.02 acre of temporary stream impacts. An 84" corrugated metal pipe (CMP) with a sand/cement headwall will be installed into Bates Creek to support a temporary detour to the south of the existing bridge. The pipe and headwall will be removed after the new bridge is completed.

There are no impacts to jurisdictional resources due to utilities for this project.

Bridge Demolition

The existing bridge was constructed in 1968 and consists of a timber deck, steel I-beams, timber caps and piles with concrete sills. Bridge No. 166 is structurally unsatisfactory according to federal guidelines and is recommended for replacement before further deterioration occurs. Best Management Practices for Bridge Demolition and Removal will be implemented; however, there is potential for bridge components to drop into Waters of the United States during demolition.

Federally Protected Species

As of April 27, 2006, the United States Fish and Wildlife Service lists six federally protected species for Cherokee County (Table 1). The tan riffleshell mussel was added to endangered species list for Cherokee County since the CE document was signed on November 24, 2004.

Table 1. Federally Protected Species for Cherokee County.

Common Name	Scientific Name	Status	Habitat	Biological Conclusion
Bog turtle	*Clemmys muhlenbergii*	T(S/A)	No	Not Subject
Indiana bat	*Myotis sodalis*	Endangered	No	No Effect
Small-whorled pogonia	*Isotria medeoloides*	Threatened	No	No Effect
Little-wing pearlymussel	*Pegias fabula*	Endangered	No	No Effect
Cumberland bean	*Villosa trabalis*	Endangered	No	No Effect
Tan riffleshell	*Epoiblasma florentina walkerii*	Endangered	No	No Effect

Avoidance and Minimization

NCDOT has minimized impacts to the fullest extent possible. The proposed bridge replacement will span Bates Creek; therefore, totally avoiding permanent surface water impacts. An off site detour was studied, but eliminated from further consideration due to length, safety concerns and school bus routes. The shortest detour was 10.4 miles long through the town of Ebenezer. This project will be constructed utilizing Design Standards for Sensitive Watersheds with any temporary or permanent herbaceous vegetation to be planted on all bare soil as soon as possible and within 15 working days of ground disturbing activities to provide long-term erosion control.

Mitigation

Construction for this project will impose only temporary impacts to jurisdictional waters, therefore, no mitigation is necessary for this project.

Regulatory Approvals

Section 404 Permit: It is anticipated that the temporary construction impacts to Bates Creek can be authorized under Section 404 Nationwide Permit 33 (Temporary Construction Access and Dewatering). We are, therefore, requesting the issuance of a Nationwide Permit 33 authorizing the temporary surface water impacts of Bates Creek.

Section 401 Permit: We anticipate 401 General Certification number 3366 will apply to this project. All general conditions of WQC 3366 will be met. Therefore, we are not requesting written concurrence from DWQ. In accordance with 15A NCAC 2H .0501(a) we are providing two copies of this application to DWQ for their records.

We anticipate that comments from WRC will be requested prior to authorization by the Army Corps of Engineers. By copy of this letter and attachment, NCDOT hereby requests WRC review and that WRC forward their comments to the Corps of Engineers and NCDOT within 15 calendar days of receipt of this application.

Thank you for your assistance with this project. A copy of this permit application will be posted on the NCDOT Website at www.ncdot.org/doh/preconstruct/pe/neu/permit.html. If you have any questions or need additional information, please contact Jeff Hemphill at (919) 715-1458.

Sincerely,

E. R. Rush

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

Cc

W/attachment

Mr. John Hennessy, NCDWQ (2 Copies)
Ms. Marella Buncick, USFWS
Ms. Marla Chambers, NCWRC
Mr. Harold Draper, TVA
Mr. Victor Barbour, Project Services Unit
Dr. David Chang, P.E., Hydraulics
Mr. Greg Perfetti, P.E., Structure Design
Mr. Mark Staley, Roadside Environmental
Mr. J. B. Setzer, P.E. (Div. 14), Division Engineer
Mr. Mark Davis (Div. 14), DEO

W/o attachment

Mr. Jay Bennett, P.E., Roadway Design
Mr. Majed Alghandour, P. E., Programming and TIP
Mr. Art McMillan, P.E., Highway Design
Mr. Scott McLendon, USACE, Wilmington
Ms. Stacy Oberhausen, PDEA Project Planning Engineer

Office Use Only: Form Version March 05

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

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

I. Processing

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

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

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

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

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

II. Applicant Information

1. Owner/Applicant Information
   Name: Gregory J. Thorpe, Ph.D., Environmental Management Director
   Mailing Address: 1598 Mail Service Center
   Raleigh, NC 27699-1598
   Telephone Number: (919) 733-3141 Fax Number: (919) 733-9794
   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:
   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. 166 on SR 1331 (Hanging Dog Road) over Bates Creek

2. T.I.P. Project Number or State Project Number (NCDOT Only): B-3826

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

4. Location
   County: Cherokee Nearest Town: Murphy
   Subdivision name (include phase/lot number): N/A
   Directions to site (include road numbers/names, landmarks, etc.): Take US 19/74 west to Murphy. Follow US 19 through town to the Joe Brown Highway (aka Tennessee Street) an turn right. Proceed northwest on Joe Brown Highway for approximately three and a half miles to Hanging Dog Road (SR 1331) and turn right. Proceed north for approximately a quarter of a mile. Bridge 166 is located on Hanging Dog Road just before the intersection with Bates Creek Road (SR 1348).

5. Site coordinates (For linear projects, such as a road or utility line, attach a sheet that separately lists the coordinates for each crossing of a distinct waterbody.)
   Decimal Degrees (6 digits minimum): 35° 6.79' °N 84° 3.14' °W

6. Property size (acres): N/A

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

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

9. Describe the existing conditions on the site and general land use in the vicinity of the project at the time of this application: The site is located in a rural section of Cherokee County. The site is primarily surrounded by residential/commercial use, roadside shoulder and by rich cove forest.

10. Describe the overall project in detail, including the type of equipment to be used: The project will consist of replacing the existing 25.4 feet wide 26 feet long bridge with a new 30 feet long 21" thick cored slab bridge that will span Bates Creek. Traffic will be maintained through a signalized single lane onsite temporary detour located to the east of the existing bridge. An 84" Corrugated Metal Pipe (CMP) with a sand/cement headwall will be installed into Bates Creek to facilitate the temporary detour. Construction equipment will consist of heavy trucks, earth moving equipment, cranes, etc.

11. Explain the purpose of the proposed work: The existing bridge is structurally deficient and according to federal guidelines is considered functionally obsolete. The replacement of this bridge will result in safer 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. Each impact must be listed separately in the tables below (e.g., culvert installation should be listed separately from riprap dissipater pads). Be sure to indicate if an impact is temporary. All proposed impacts, permanent and temporary, must be listed, and must be labeled and clearly identifiable on an accompanying site plan. All wetlands and waters, and all streams (intermittent and perennial) should be shown on a delineation map, whether or not impacts are proposed to these systems.

Wetland and stream evaluation and delineation forms should be included as appropriate. Photographs may be included at the applicant's discretion. If this proposed impact is strictly for wetland or stream mitigation, list and describe the impact in Section VIII below. If additional space is needed for listing or description, please attach a separate sheet.

1. Provide a written description of the proposed impacts: No permanent impacts to surface waters will result from the replacement of the structurally deficient Bridge No. 166 on SR 1331 on Bates Creek. An 84" Corrugated Metal Pipe (CMP) with a sand/cement headwall will be installed into Bates Creek to facilitate a temporary detour will result in 0.0158 acre of temporary construction impacts.

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

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

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

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

Stream Impact Number (indicate on map)	Stream Name	Type of Impact	Perennial or Intermittent?	Average Stream Width Before Impact	Impact Length (linear feet)	Area of Impact (acres)
Site 2	Bates Creek	Temporary	Perennial	8 feet	27	0.02
Total Stream Impact (by length and acreage)					27	0.02

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

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

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

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

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

_____

_____

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

VII. Impact Justification (Avoidance and Minimization)

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

techniques to be followed during construction to reduce impacts. See Permit Application Cover Letter

VIII. Mitigation

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

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

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

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

2. Mitigation may also be made by payment into the North Carolina Ecosystem Enhancement Program (NCEEP). Please note it is the applicant's responsibility to contact the NCEEP at (919) 715-0476 to determine availability, and written approval from the NCEEP indicating that they are will to accept payment for the mitigation must be attached to this form. For additional information regarding the application process for the NCEEP, check the NCEEP

website at http://h2o.enr.state.nc.us/wrp/index.htm. If use of the NCEEP is proposed, please check the appropriate box on page five and provide the following information:

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

IX. Environmental Documentation (required by DWQ)

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

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

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

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

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

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

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

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

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

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

XI. Stormwater (required by DWQ)

Describe impervious acreage (existing and proposed) versus total acreage on the site. Discuss stormwater controls proposed in order to protect surface waters and wetlands downstream from the property. If percent impervious surface exceeds 20%, please provide calculations demonstrating total proposed impervious level. N/A

XII. Sewage Disposal (required by DWQ)

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

XIII. Violations (required by DWQ)

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

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

XIV. Cumulative Impacts (required by DWQ)

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

XV. Other Circumstances (Optional):

It is the applicant's responsibility to submit the application sufficiently in advance of desired construction dates to allow processing time for these permits. However, an applicant may

choose to list constraints associated with construction or sequencing that may impose limits on work schedules (e.g., draw-down schedules for lakes, dates associated with Endangered and Threatened Species, accessibility problems, or other issues outside of the applicant's control).

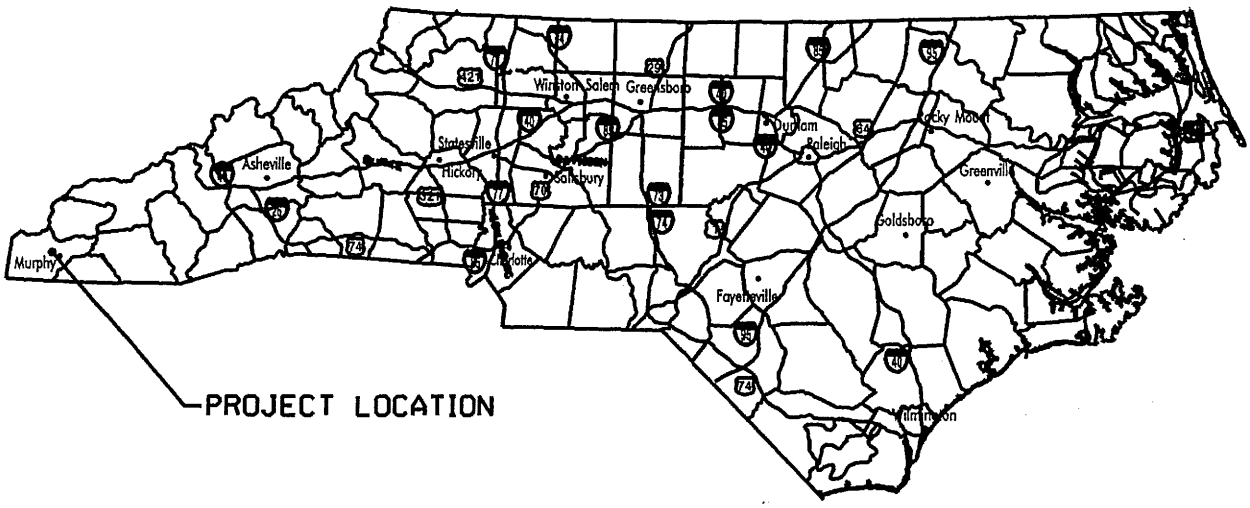
N/A

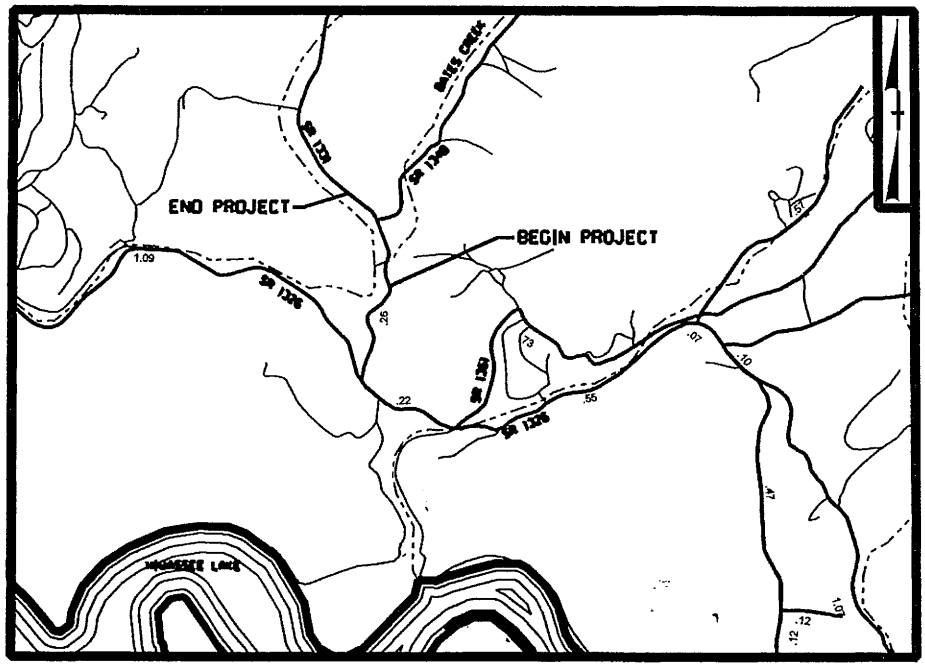
E. L Luck for Gregory J. Thorpe, PhD 2/2/07

Applicant/Agent's Signature **Date**

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

CHEROKEE COUNTY, N.C.





VICINITY MAP

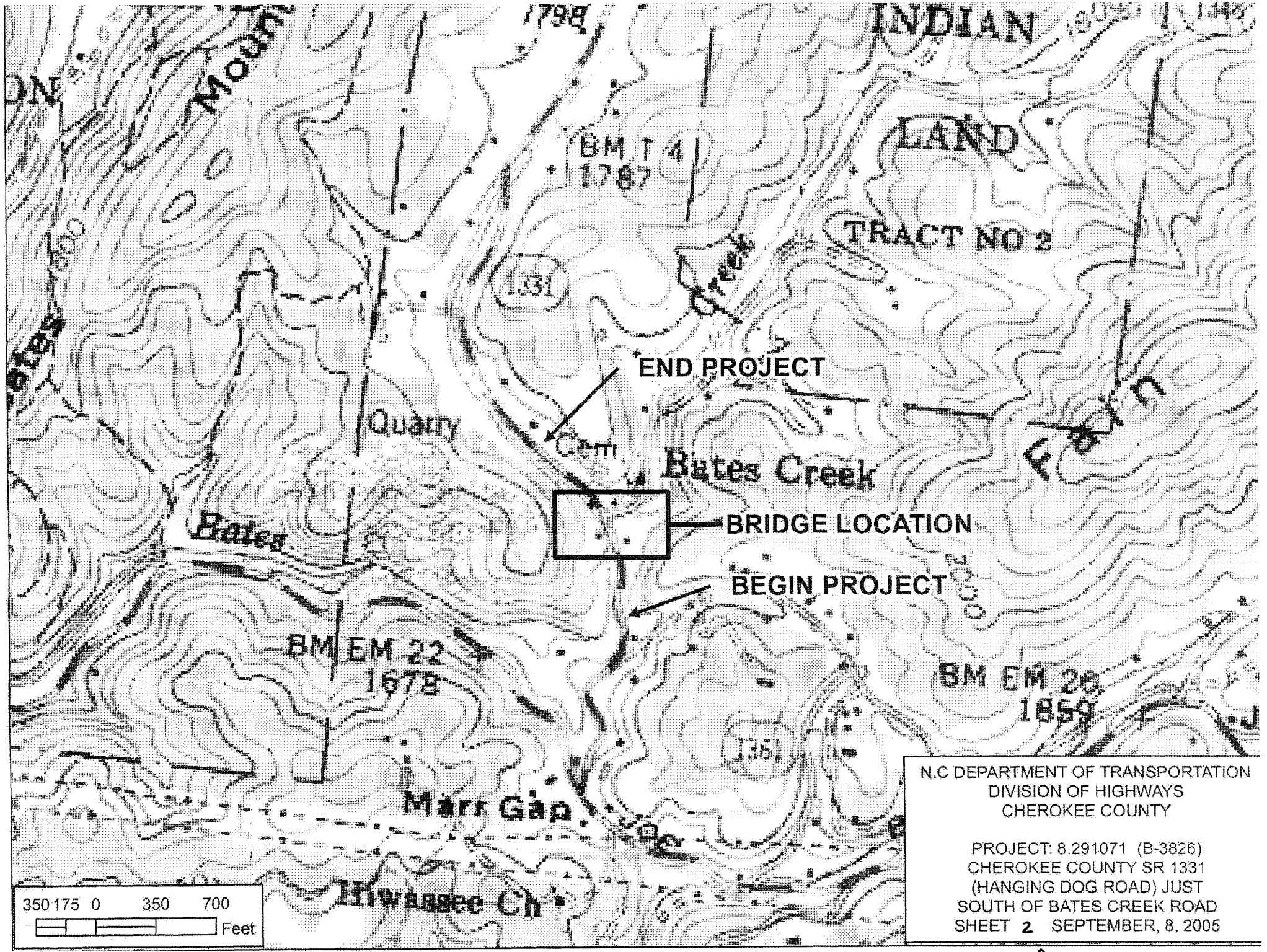
N. C. DEPT. OF TRANSPORTATION

DIVISION OF HIGHWAYS

CHEROKEE COUNTY

PROJECT: 8.2910701 (B-3826)
CHEROKEE COUNTY SR 1331 (HANGING DOG ROAD) JUST SOUTH OF BATES CREEK ROAD

SHEET 1 OF 10 September 8, 2005


INDIAN
LAND
TRACT NO 2
BM T 4
1787
1798
1331
END PROJECT
Quarry
Cem
Bates Creek
BRIDGE LOCATION
BEGIN PROJECT
Bates
BM EM 22
1678
BM EM 20
1859
1361
Marr Gap
Hiwassee Ch
350 175 0 350 700
Feet
N.C DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
CHEROKEE COUNTY
PROJECT: 8.291071 (B-3826)
CHEROKEE COUNTY SR 1331
(HANGING DOG ROAD) JUST
SOUTH OF BATES CREEK ROAD
SHEET 2 SEPTEMBER, 8, 2005

PROPERTY OWNER

NAME AND ADDRESS

PARCEL NO.	OWNER'S NAME & ADDRESS
1	Floyd & Jean Dockery 419 Grape Creek Road Murphy, NC 28906
2	Rollin & Cora Dockery 6150 Kemp Road Acworth, GA 30102
3	Richard Jerome Dockery 5695 Boiling Springs Road Murphy, NC 28906
4	Randy & Connie Curtis 121 Hemlock Drive Murphy, NC 28906
5	Andrew J. Dockery 24 Bates Creek Road Murphy, NC 28906
6	Bates Creek Baptist Church Rt. 5 Murphy, NC 28906
7	Linda Key Seabolt 95 Bates Creek Road Murphy, NC 28906
8	L. B. Adams 764 Midway Creek Rd. Murphy, NC 28906
9	Mildred A. Woody PO Box 353 Murphy, NC 28906

N. C. DEPT. OF TRANSPORTATION

DIVISION OF HIGHWAYS

CHEROKEE COUNTY
PROPERTY OWNERS

PROJECT: 8.2910701 (B-3826)
CHEROKEE COUNTY SR 1331
(HANGING DOG ROAD) JUST
SOUTH OF BATES CREEK ROAD

SHEET 3 OF 10

WETLAND PERMIT IMPACT SUMMARY

Site No.	Station (From/To)	Structure Size / Type	WETLAND IMPACTS: Fill In Wetlands Permanent (ac)	Fill In Wetlands Temporary (ac)	Excavation In Wetlands (ac)	Mechanized Clearing (Method III) (ac)	SURFACE WATER IMPACTS: Fill In SW (Natural) Permanent (ac)	Fill In SW (Natural) Temporary (ac)	Existing Channel Impacted Permanent (ft)	Existing Channel Impacted Temporary (ft)	Natural Stream Design (ft)
1	10+72.86 to	30' High Strength 21" Cored					0.0000	0.0000	0.000	0.000	
	11+02.86 -L-	Slab with Vertical Abutements									
2	10+87.86	84" CMP for Detour					0.0000	0.0158	0.000	27.000	
PROJECT TOTALS:			**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.016**	**0.000**	**27.000**	**0.000**

NC DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

CHEROKEE COUNTY
IMPACT SUMMARY
PROJECT: 8.2910701 (B-3826)
CHEROKEE COUNTY SR 1331
(HANGING DOG ROAD) JUST
SOUTH OF BATES CREEK ROAD

Form Revised 3/22/01

SHEET 4 OF 10 09/08/05

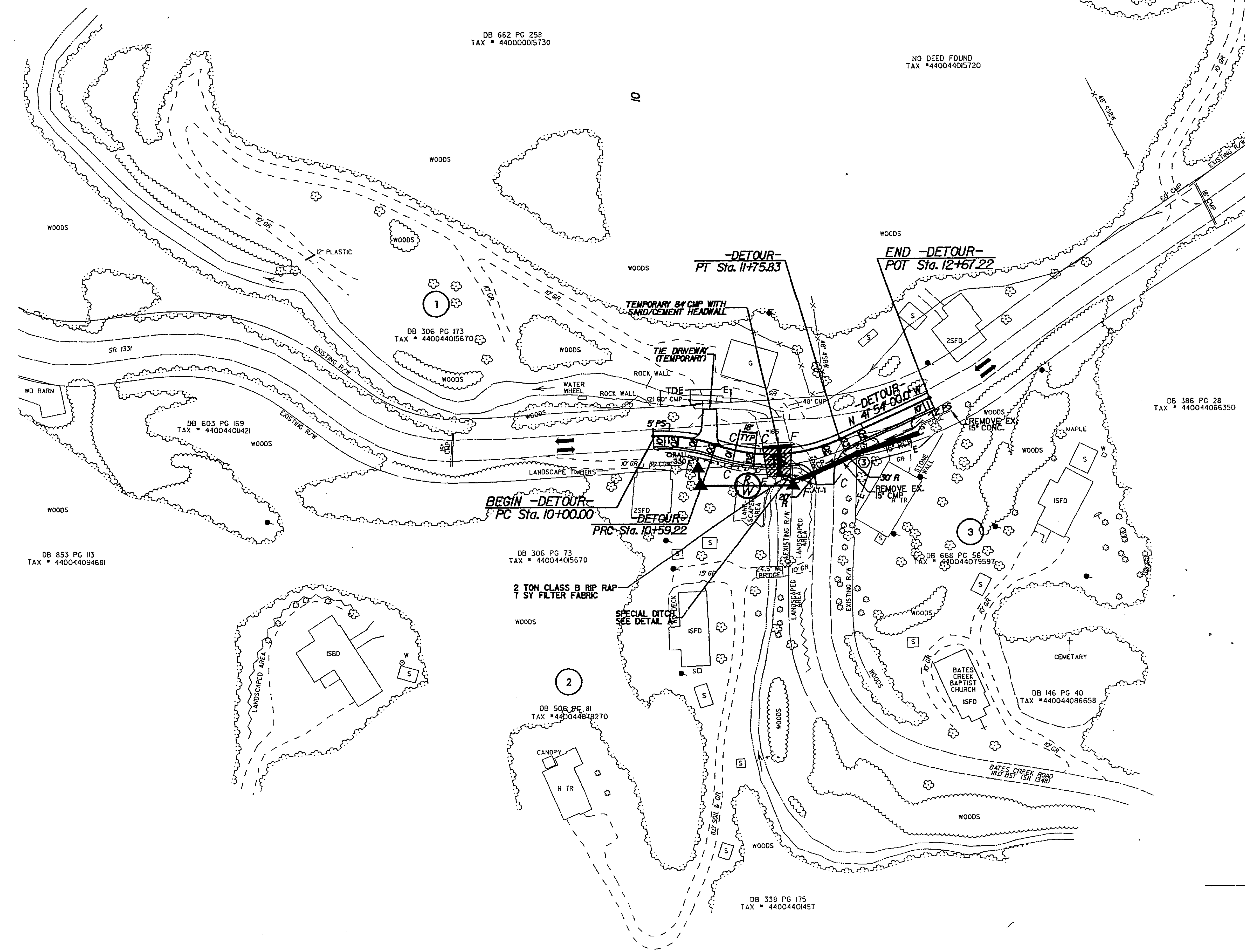
-DETOUR-

B-3826	2-B
R/W SHEET NO.	5 OF 10
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

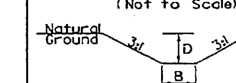
PBSJ 5200 77 CENTER DRIVE, SUITE 500
CHARLOTTE, NORTH CAROLINA 28217
(704) 522-7275

NAD 83
NC GRID



-DETOUR-	
PI Sta 10+30.00	PI Sta 11+20.65
Δ = 22°37'14.8" (RT)	Δ = 44°32'28.4" (LT)
D = 38°11'49.9"	D = 38°11'49.9"
L = 59.22'	L = 116.61'
T = 30.00'	T = 61.43'
R = 150.00'	R = 150.00'
SE = 0.02	SE = 0.02
DS = 20 MPH	DS = 20 MPH

DETAIL A
STANDARD GRASSED SWALE
(Not to Scale)



Min. D = 1.0 Ft.
B = 1.0 Ft.

From Sta. -L- 11+05 Rt.
to Sta. -L- 11+15 Rt.

NOTE: ALL DRAINAGE SHOWN ON THIS SHEET, EXCEPT TEMPORARY 84" CMP WITH SAND/CEMENT HEADWALL, TO REMAIN AFTER REMOVAL OF DETOUR.

50 25 0 50 100

FOR -DETOUR- PROFILE, SEE SHEET NO. 5

TS TEMPORARY SURFACE WATER

REVISIONS

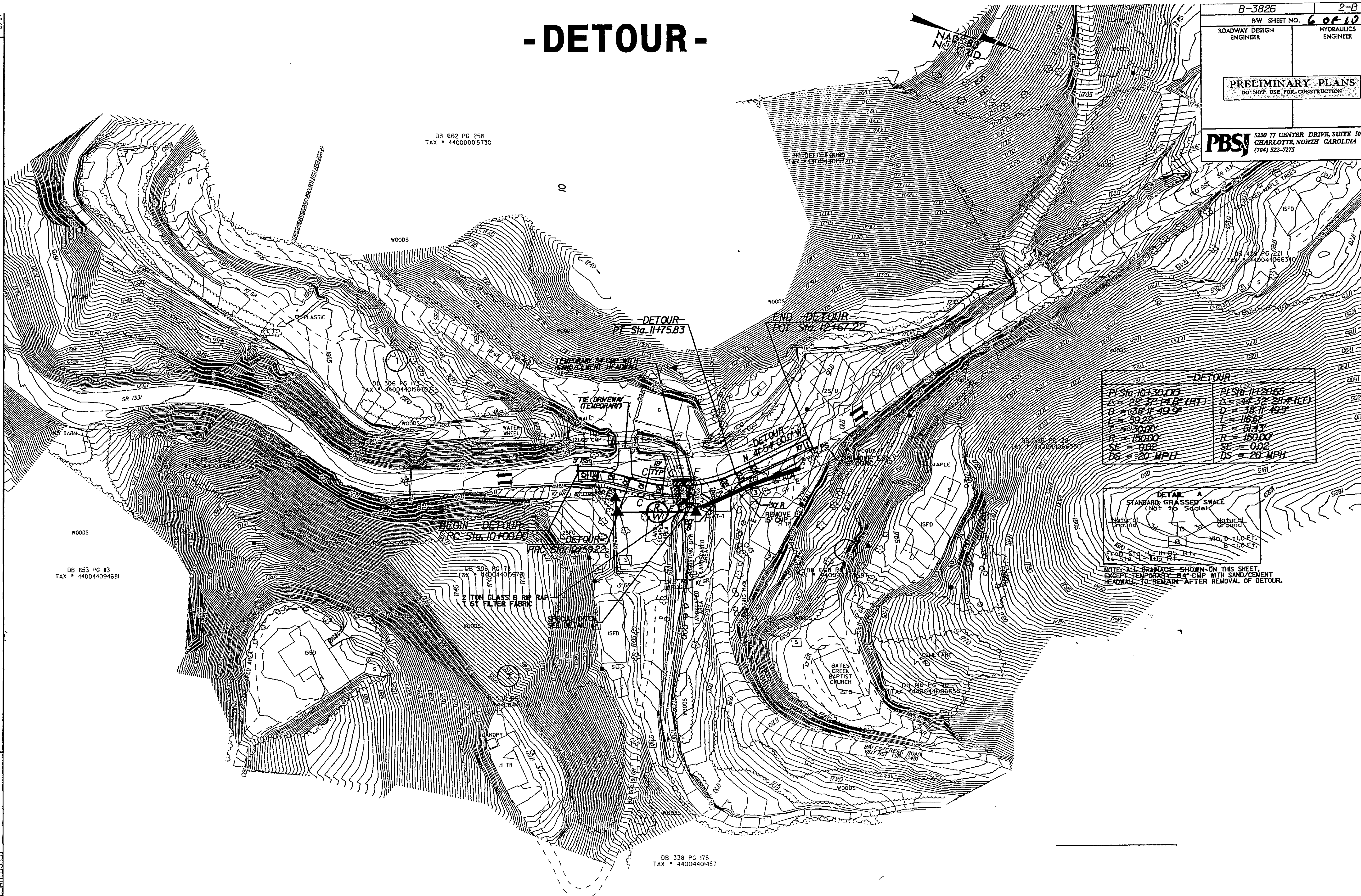
23-JUN-2006 12:25
R:\Drainage\B3826_RDY_DET_PSH.dgn

-DETOUR-

B-3826	2-B
R/W SHEET NO.	6 OF 10
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

PBSJ 5200 77 CENTER DRIVE, SUITE 500
CHARLOTTE, NORTH CAROLINA 282
(704) 522-7275



-DETOUR-	
PI Sta. 10+30.00	PI Sta. 11+20.65
Δ = 22°37'14.8" (RT)	Δ = 44°32'28.4" (LT)
D = 38°11'49.9"	D = 38°11'49.9"
L = 59.22'	L = 116.61'
T = 30.00'	T = 61.43'
R = 150.00'	R = 150.00'
SE = 0.02	SE = 0.02
DS = 20 MPH	DS = 20 MPH

DETAIL A
STANDARD GRASSED SWALE
(Not to Scale)
Natural Ground
Natural Ground
Min. D = 1.0 Ft.
B = 1.0 Ft.
From Sta. L-11+05 Rt.
to Sta. L-11+65 Rt.

NOTE: ALL DRAINAGE SHOWN ON THIS SHEET, EXCEPT TEMPORARY 84" CMP WITH SAND/CEMENT HEADWALL, TO REMAIN AFTER REMOVAL OF DETOUR.

50 25 0 50 100

FOR -DETOUR- PROFILE, SEE SHEET NO. 5

TS TEMPORARY SURFACE WATER

REVISIONS

8/17

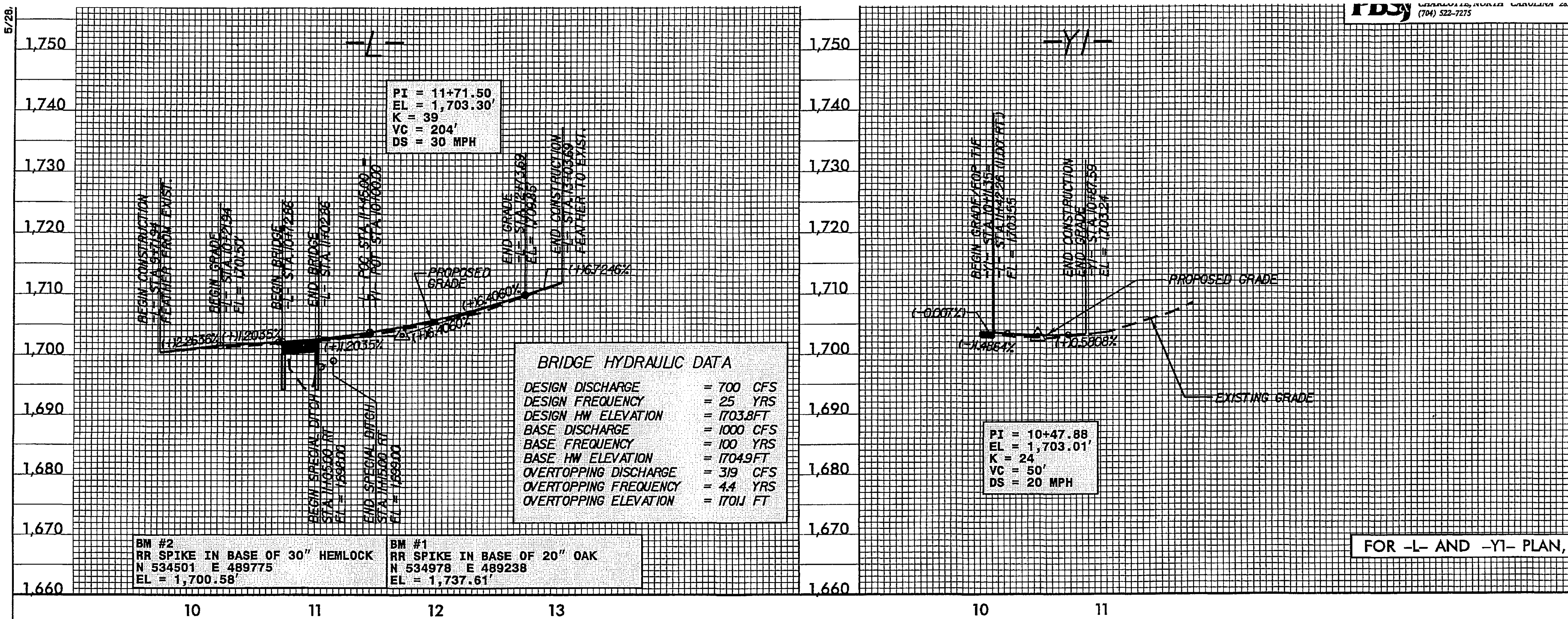
26-JUN-2006 15:16
R:\Drainage\B3826_RDY_DET_PSH.dgn

PBS&J
CHARLOTTE, NORTH CAROLINA 28217
(704) 522-7275

ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER

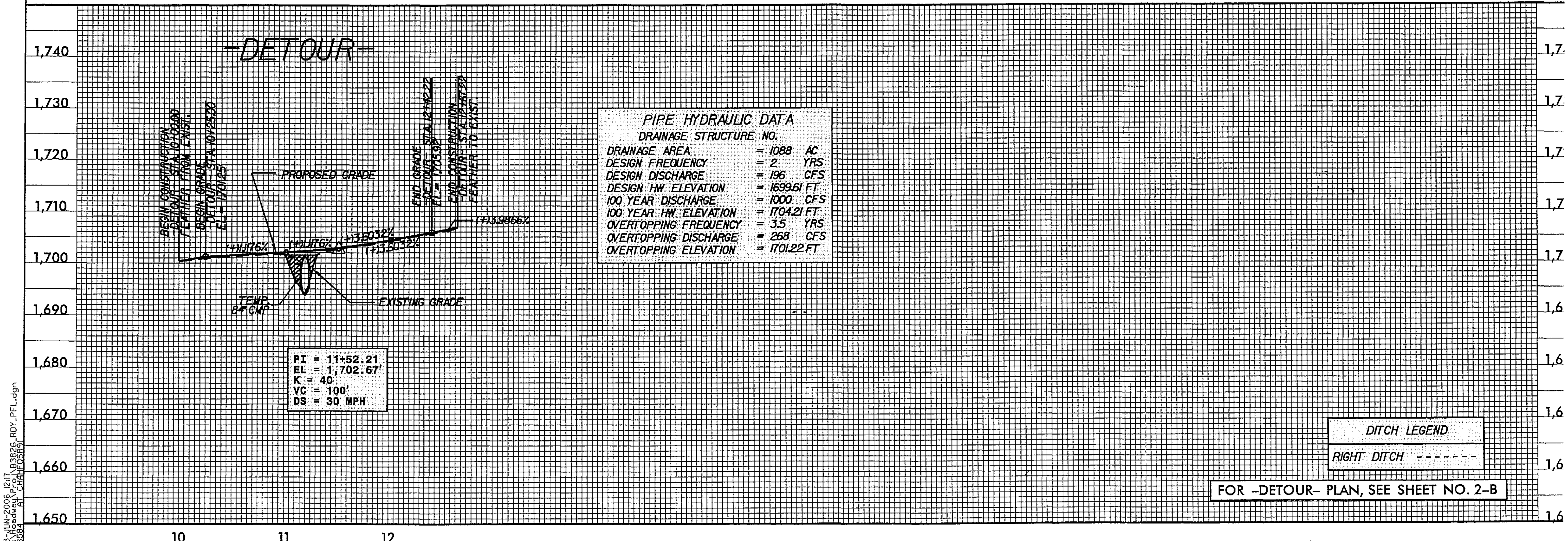
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

SHEET 7 OF 10



BRIDGE HYDRAULIC DATA

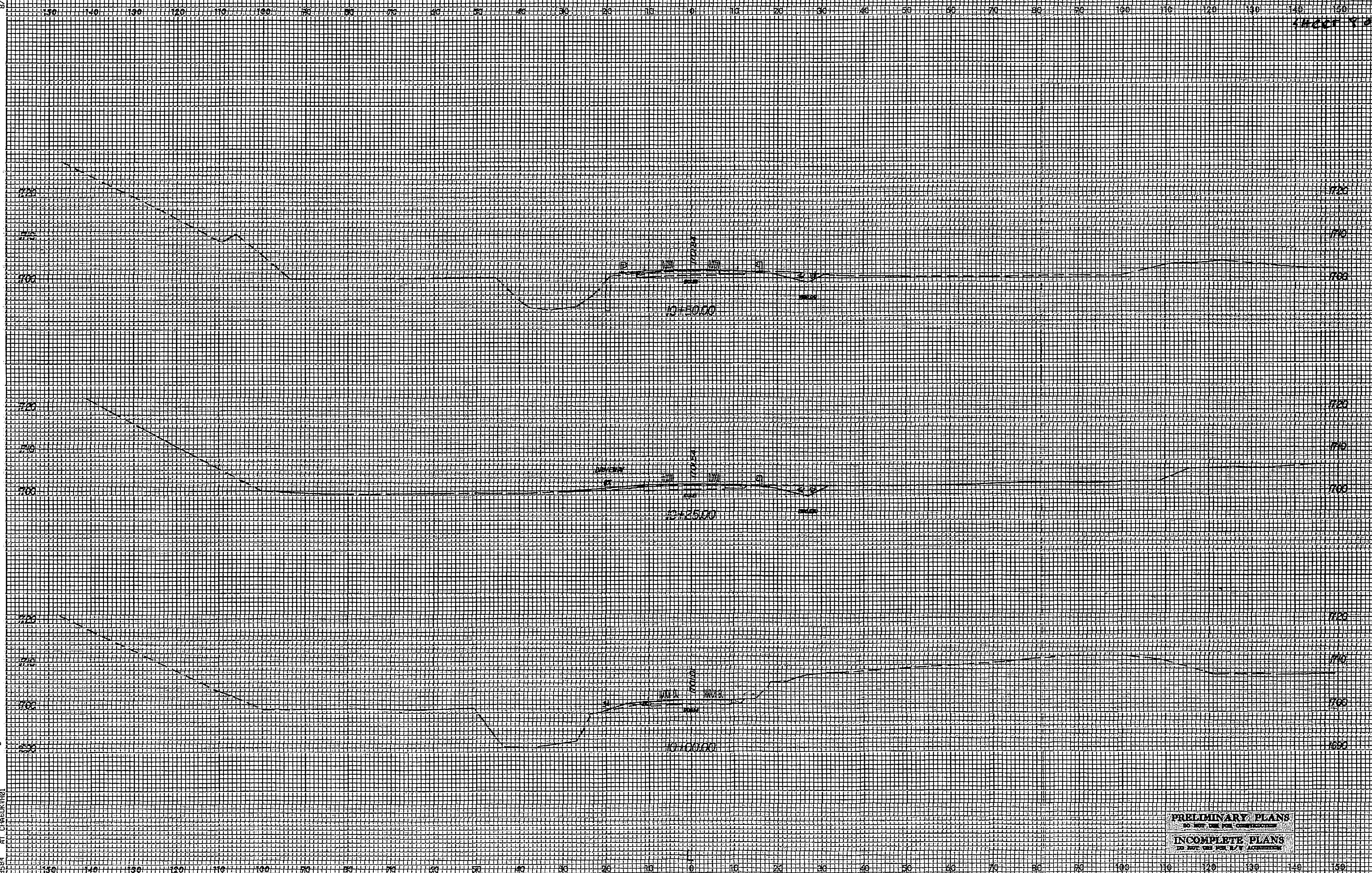
DESIGN DISCHARGE	= 700	CFS
DESIGN FREQUENCY	= 25	YRS
DESIGN HW ELEVATION	= 1703.8	FT
BASE DISCHARGE	= 1000	CFS
BASE FREQUENCY	= 100	YRS
BASE HW ELEVATION	= 1704.9	FT
OVERTOPPING DISCHARGE	= 319	CFS
OVERTOPPING FREQUENCY	= 4.4	YRS
OVERTOPPING ELEVATION	= 1701.1	FT



PIPE HYDRAULIC DATA
DRAINAGE STRUCTURE NO.

DRAINAGE AREA	= 1088	AC
DESIGN FREQUENCY	= 2	YRS
DESIGN DISCHARGE	= 196	CFS
DESIGN HW ELEVATION	= 1699.61	FT
100 YEAR DISCHARGE	= 1000	CFS
100 YEAR HW ELEVATION	= 1704.21	FT
OVERTOPPING FREQUENCY	= 3.5	YRS
OVERTOPPING DISCHARGE	= 268	CFS
OVERTOPPING ELEVATION	= 1701.22	FT

PROJ. REFERENCE NO.	SHEET NO.
B-3826	X-1



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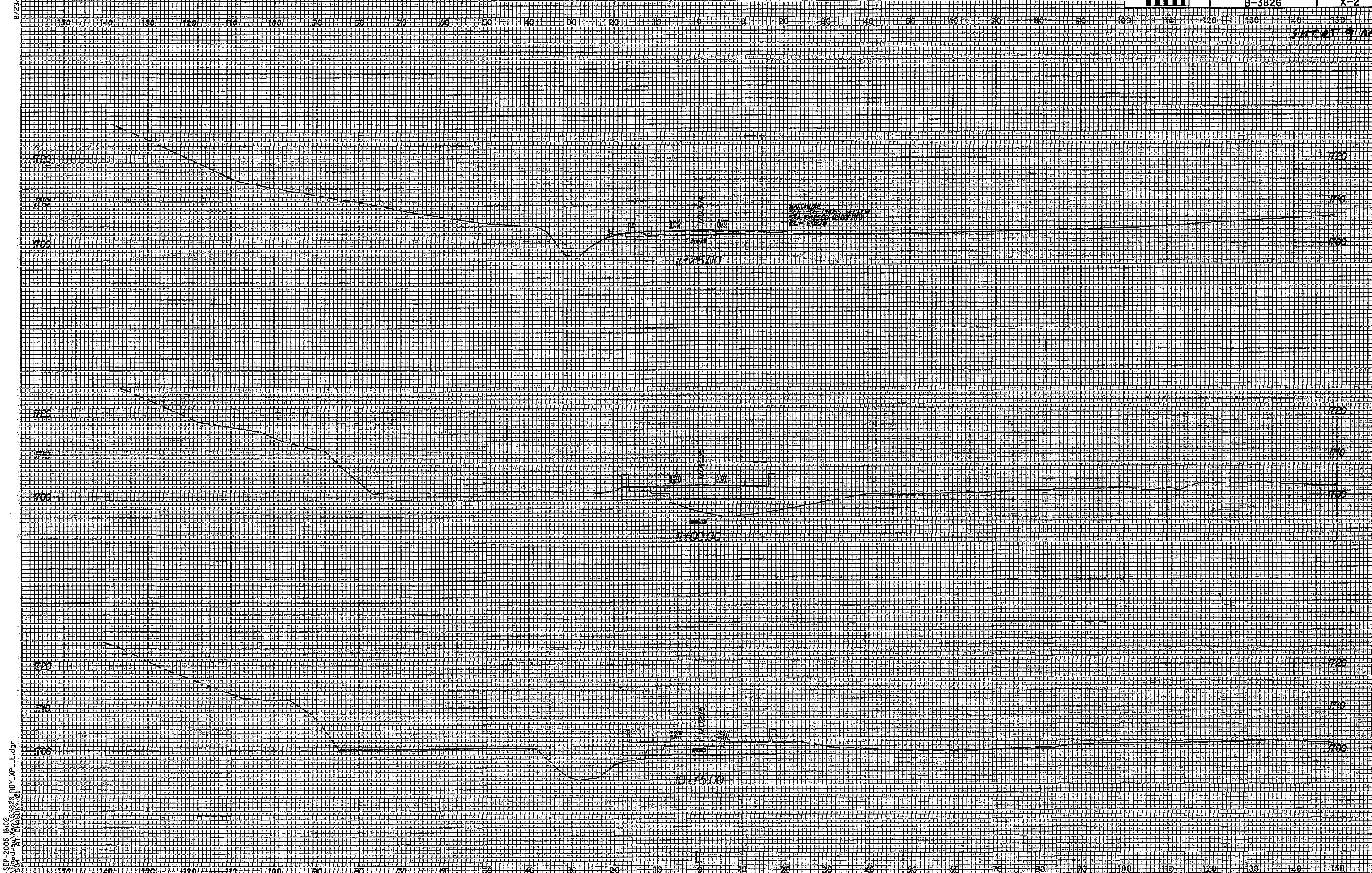
1135584 AT CH460KYH01

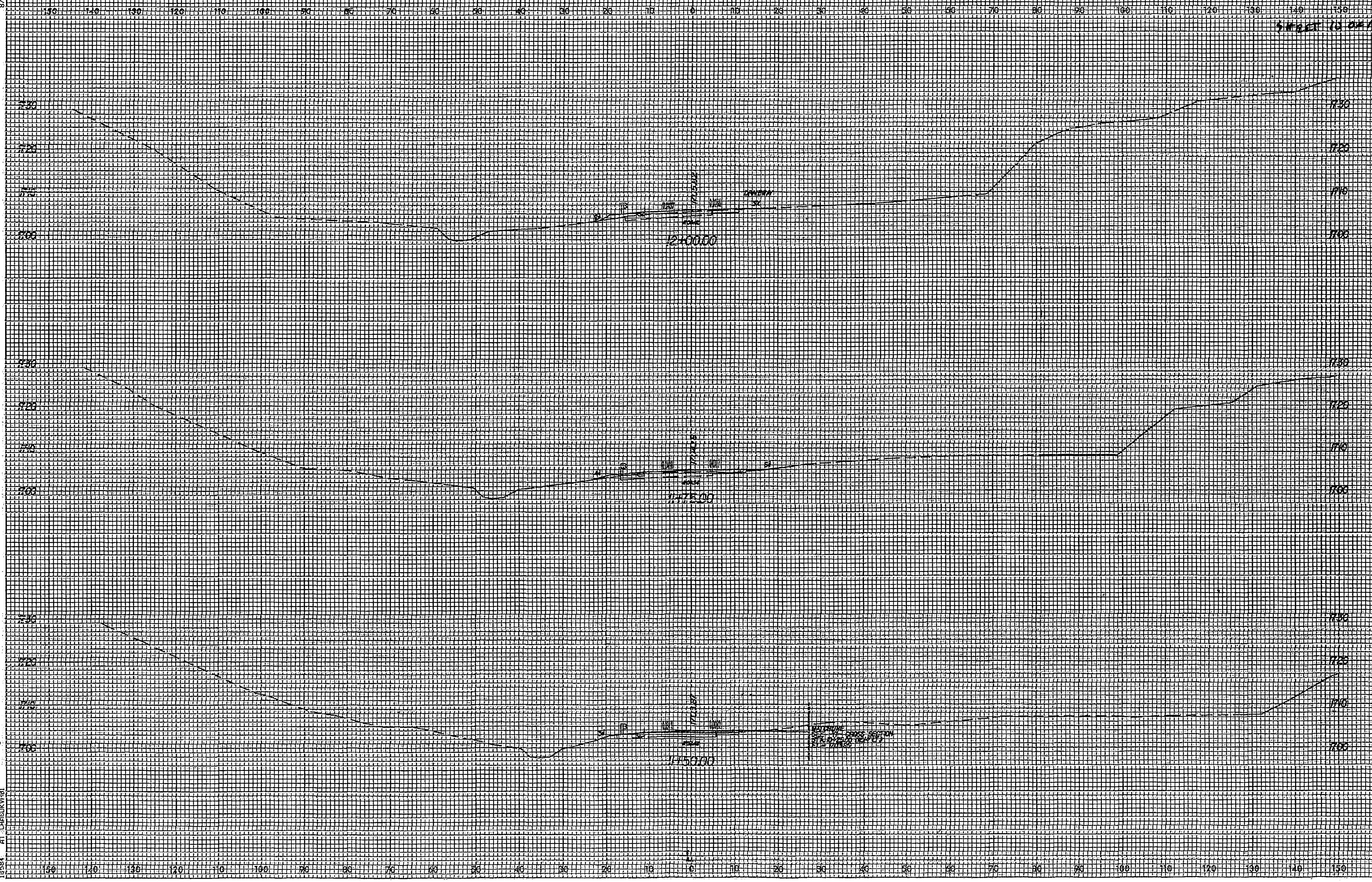
PROJ. REFERENCE NO.	SHEET NO.
B-3826	X-2

SHEET 9 OF 10



PROJ. REFERENCE NO.	SHEET NO.
B-3826	X-3

SHEET 10 OF 10



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STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

CHEROKEE COUNTY

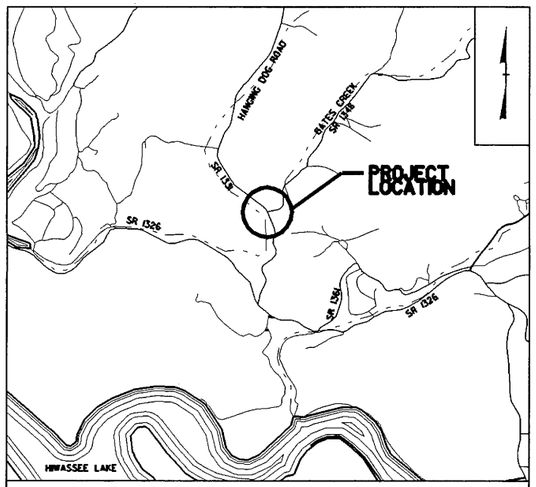
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-3826	1	

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
33278.1.1	BRZ-1331(5)	PE
33278.2.1	BRZ-1331(5)	R/W & UTILITIES

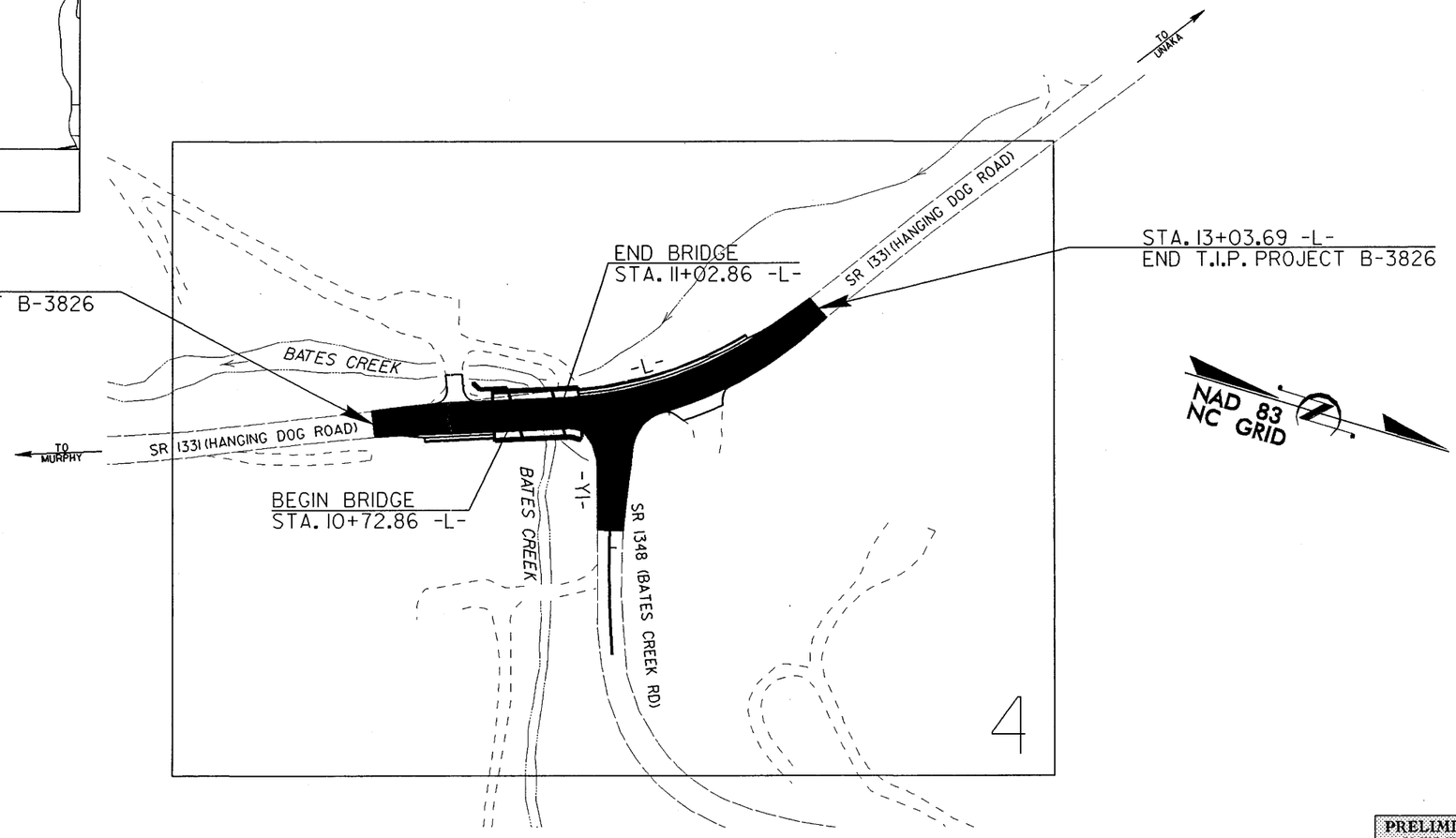
R/W PLANS

LOCATION: BRIDGE NO. 166 OVER BATES CREEK ON SR 1331

TYPE OF WORK: GRADING, PAVING, DRAINAGE, WIDENING, RESURFACING, AND STRUCTURE.



VICINITY MAP



PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

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

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 2006 = 2,520
ADT 2030 = 3,000
DHV = 10 %
D = 60 %
T = 4 % *
V = 30 MPH
* TTST 2% DUAL 2%
FUNC CLASS = RURAL MAJOR COLLECTOR

PROJECT LENGTH

LENGTH ROADWAY F.A. PROJECT BRZ-1331(5)	=	0.057 MILES
LENGTH STRUCTURES F.A. PROJECT BRZ-1331(5)	=	0.006 MILES
TOTAL LENGTH T.I.P. PROJECT B-3826	=	0.063 MILES

* DESIGN EXCEPTION APPROVED FOR DESIGN SPEED (REDUCE FROM 45 MPH TO 30 MPH), SHOULDER WIDTH, BRIDGE WIDTH, HORIZONTAL CURVE RADIUS, AND HORIZONTAL STOPPING SIGHT DISTANCE.

Prepared In the Office of:
PBSJ
PBS&J
5200 77 CENTER DRIVE, SUITE 500
CHARLOTTE, NORTH CAROLINA 28217
PHONE: (704) 522-7275

2002 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE: December 16, 2005

LETTING DATE: December 19, 2006

STEVE DRUM, P.E.
PROJECT ENGINEER

CHRIS CARBUTO, P.E.
PROJECT DESIGN ENGINEER

CATHY S. HOUSER, P.E.
NCDOT CONTACT

HYDRAULICS ENGINEER

SIGNATURE: P.E.

ROADWAY DESIGN ENGINEER

SIGNATURE: P.E.

DIVISION OF HIGHWAYS STATE OF NORTH CAROLINA

P.E.
STATE DESIGN ENGINEER

DEPARTMENT OF TRANSPORTATION FEDERAL HIGHWAY ADMINISTRATION

APPROVED
DIVISION ADMINISTRATOR *DATE*

PROJECT: 33278.2.1

TIP PROJECT: B-3826

12-JUL-2006 09:38
r:\roadway\proj\b3826_rdy_tsh.dgn
rstroup AT RD21420

06/08/06

-DETOUR-

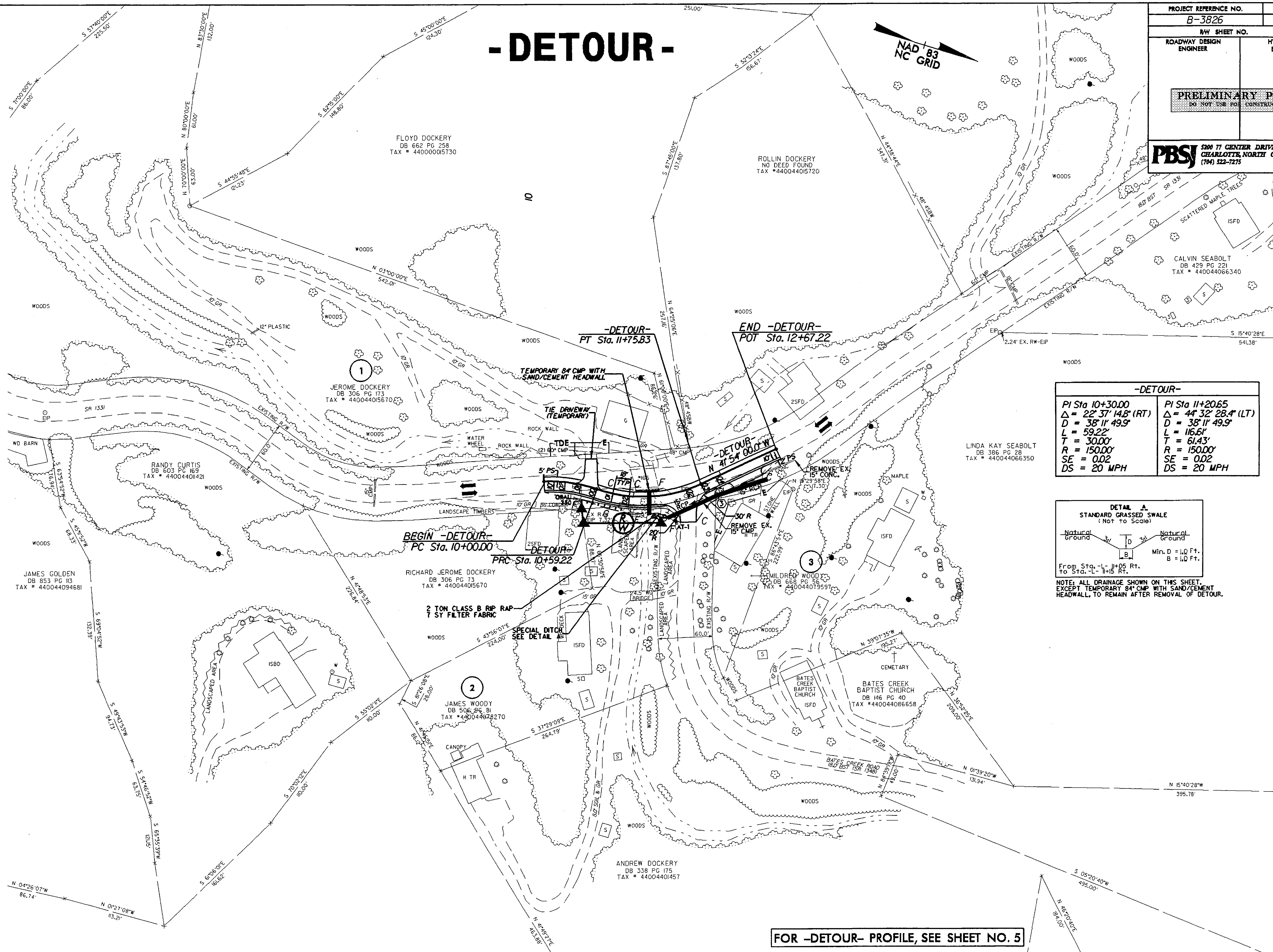
PROJECT REFERENCE NO.	SHEET NO.
B-3826	2-B

R/W SHEET NO.

ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

PBSJ
5200 77 CENTER DRIVE, SUITE 500
CHARLOTTE, NORTH CAROLINA 28217
(704) 522-7275



NAD 83 NC GRID
FLOYD DOCKERY
DB 662 PG 258
TAX # 440000015730
ROLLIN DOCKERY
NO DEED FOUND
TAX #440044015720
JEROME DOCKERY
DB 306 PG 173
TAX # 440044015670
RANDY CURTIS
DB 603 PG 169
TAX # 440044018421
JAMES GOLDEN
DB 853 PG 113
TAX # 440044094681
RICHARD JEROME DOCKERY
DB 306 PG 73
TAX # 440044015670
JAMES WOODY
DB 506 PG 81
CALVIN SEABOLT
DB 429 PG 221
TAX # 440044066340
LINDA KAY SEABOLT
DB 386 PG 28
TAX # 440044066350
MILDRED WOODY
DB 668 PG 56
BATES CREEK BAPTIST CHURCH
DB 146 PG 40
TAX #440044086658
ANDREW DOCKERY
DB 338 PG 175
TAX # 44004401457
-DETOUR-
PT Sta. 11+75.83
END -DETOUR-
POT Sta. 12+67.22
BEGIN -DETOUR-
PC Sta. 10+00.00
-DETOUR-
PRC Sta. 10+59.22
TEMPORARY 84" CMP WITH SAND/CEMENT HEADWALL
TIE DRIVEWAY (TEMPORARY)
2 TON CLASS B RIP RAP
7 SY FILTER FABRIC
SPECIAL DITCH SEE DETAIL A
REMOVE EX. 15" CONC.
REMOVE EX. 15" CMP
SR 1331
BATES CREEK ROAD 18.0' BST (SR 1348)
SCATTERED MAPLE TREES
CEMETARY
WOODS

-DETOUR-	
PI Sta 10+30.00	PI Sta 11+20.65
Δ = 22° 37' 14.8" (RT)	Δ = 44° 32' 28.4" (LT)
D = 38° 11' 49.9"	D = 38° 11' 49.9"
L = 59.22'	L = 116.61'
T = 30.00'	T = 61.43'
R = 150.00'	R = 150.00'
SE = 0.02	SE = 0.02
DS = 20 MPH	DS = 20 MPH

DETAIL A
STANDARD GRASSED SWALE
(Not to Scale)

Natural Ground 3:1 D 3:1 Natural Ground
B
Min. D = 1.0 Ft.
B = 1.0 Ft.

From Sta. -L- 11+05 Rt.
to Sta. -L- 11+15 Rt.

NOTE: ALL DRAINAGE SHOWN ON THIS SHEET, EXCEPT TEMPORARY 84" CMP WITH SAND/CEMENT HEADWALL, TO REMAIN AFTER REMOVAL OF DETOUR.

FOR -DETOUR- PROFILE, SEE SHEET NO. 5

REVISIONS

8/17/99

17-JUL-2006 09:05
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$$$$USERNAME$$$$

8/17/99

REVISIONS

PROJECT REFERENCE NO.	SHEET NO.
B-3826	4

R/W SHEET NO.

ROADWAY DESIGN ENGINEER

HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

PBSJ
5200 77 CENTER DRIVE, SUITE 500
CHARLOTTE, NORTH CAROLINA 28217
(704) 522-7275

DETAIL A
STANDARD GRASSED SWALE
(Not to Scale)

Min. D = 1.0 Ft.
B = 1.0 Ft.

From Sta. -L- 11+05 Rt.
to Sta. -L- 11+15 Rt.

-L-	
PI Sta 9+97.41	PI Sta 12+02.08
Δ = 3° 25' 56.3" (RT)	Δ = 37° 38' 00.2" (LT)
D = 6° 44' 26.4"	D = 20° 27' 46.0"
L = 50.92'	L = 183.91'
T = 25.47'	T = 95.41'
R = 850.00'	R = 280.00'
SE = MATCH EX.	SE = 0.04
DS = 25 MPH	DS = 25 MPH

-Y1-
PI Sta 11+20.98
Δ = 8° 44' 11.7" (LT)
D = 8° 00' 48.2"
L = 109.02'
T = 54.62'
R = 715.00'
SE = 0.04
DS = 30 MPH

SKETCH SHOWING -L- BRIDGE AND APPROACHES
OVER BATES CREEK

ADT 2006/2030

DESIGN EXCEPTION APPROVED FOR DESIGN SPEED (REDUCE FROM 45 MPH TO 30 MPH), SHOULDER WIDTH, BRIDGE WIDTH, HORIZONTAL CURVE RADIUS, AND HORIZONTAL STOPPING SIGHT DISTANCE.

FOR -L- PROFILE, SEE SHEET NO. 5

FOR -Y1- PROFILE, SEE SHEET NO. 5

26-JUL-2006 09:08
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$$$$USERNAME$$$$

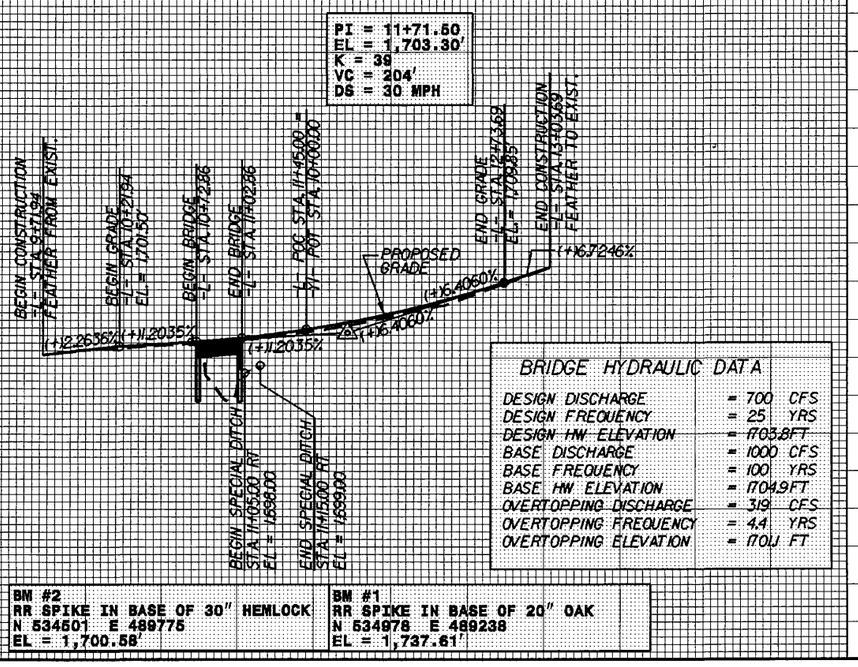
5/28/99

PBSJ 5200 77 CENTER DRIVE, SUITE 500 CHARLOTTE, NORTH CAROLINA 28217 (704) 522-7275

PROJECT REFERENCE NO.	SHEET NO.
B-3826	5
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

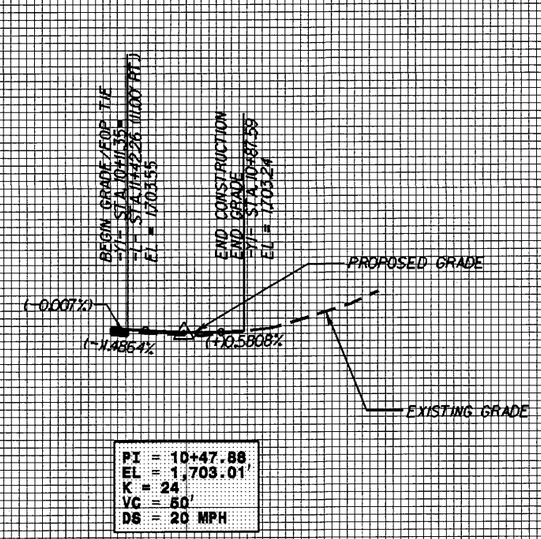
-L-



BRIDGE HYDRAULIC DATA

DESIGN DISCHARGE	= 700	CFS
DESIGN FREQUENCY	= 25	YRS
DESIGN HW ELEVATION	= 1703.8	FT
BASE DISCHARGE	= 1000	CFS
BASE FREQUENCY	= 100	YRS
BASE HW ELEVATION	= 1704.9	FT
OVERTOPPING DISCHARGE	= 319	CFS
OVERTOPPING FREQUENCY	= 44	YRS
OVERTOPPING ELEVATION	= 1701.1	FT

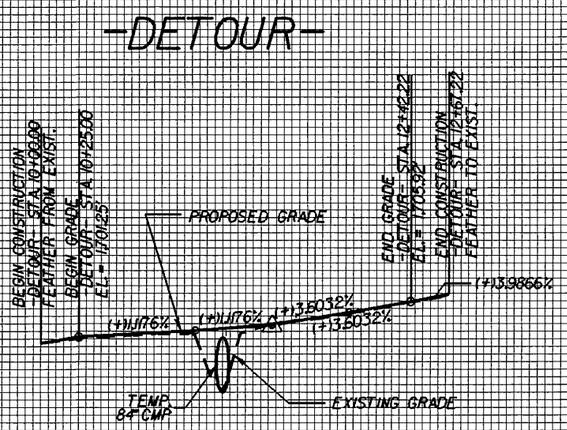
-Y1-



PI = 10+47.88
EL = 1,703.01'
K = 24
VC = 60'
DS = 20 MPH

FOR -L- AND -Y1- PLAN, SEE SHEET NO. 4

-DETOUR-



PI = 11+52.21
EL = 1,702.67'
K = 40
VC = 100'
DS = 30 MPH

PIPE HYDRAULIC DATA

DRAINAGE STRUCTURE NO.

DRAINAGE AREA	= 1088	AC
DESIGN FREQUENCY	= 2	YRS
DESIGN DISCHARGE	= 196	CFS
DESIGN HW ELEVATION	= 1699.61	FT
100 YEAR DISCHARGE	= 1000	CFS
100 YEAR HW ELEVATION	= 1704.21	FT
OVERTOPPING FREQUENCY	= 3.5	YRS
OVERTOPPING DISCHARGE	= 268	CFS
OVERTOPPING ELEVATION	= 1701.22	FT

DITCH LEGEND	
RIGHT DITCH	-------

FOR -DETOUR- PLAN, SEE SHEET NO. 2-B

12-JUL-2006 09:38
I:\roadway\projects\B3826_RDY_PFL.dgn
jstroup AT RD12420

8/23/99

0 10	PROJ. REFERENCE NO.	SHEET NO.
	B-3826	X-1

150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150

1720
1710
1700

10+50.00

1720
1710
1700

10+25.00

1720
1710
1700
1690

10+00.00

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

12-JUL-2006 11:18
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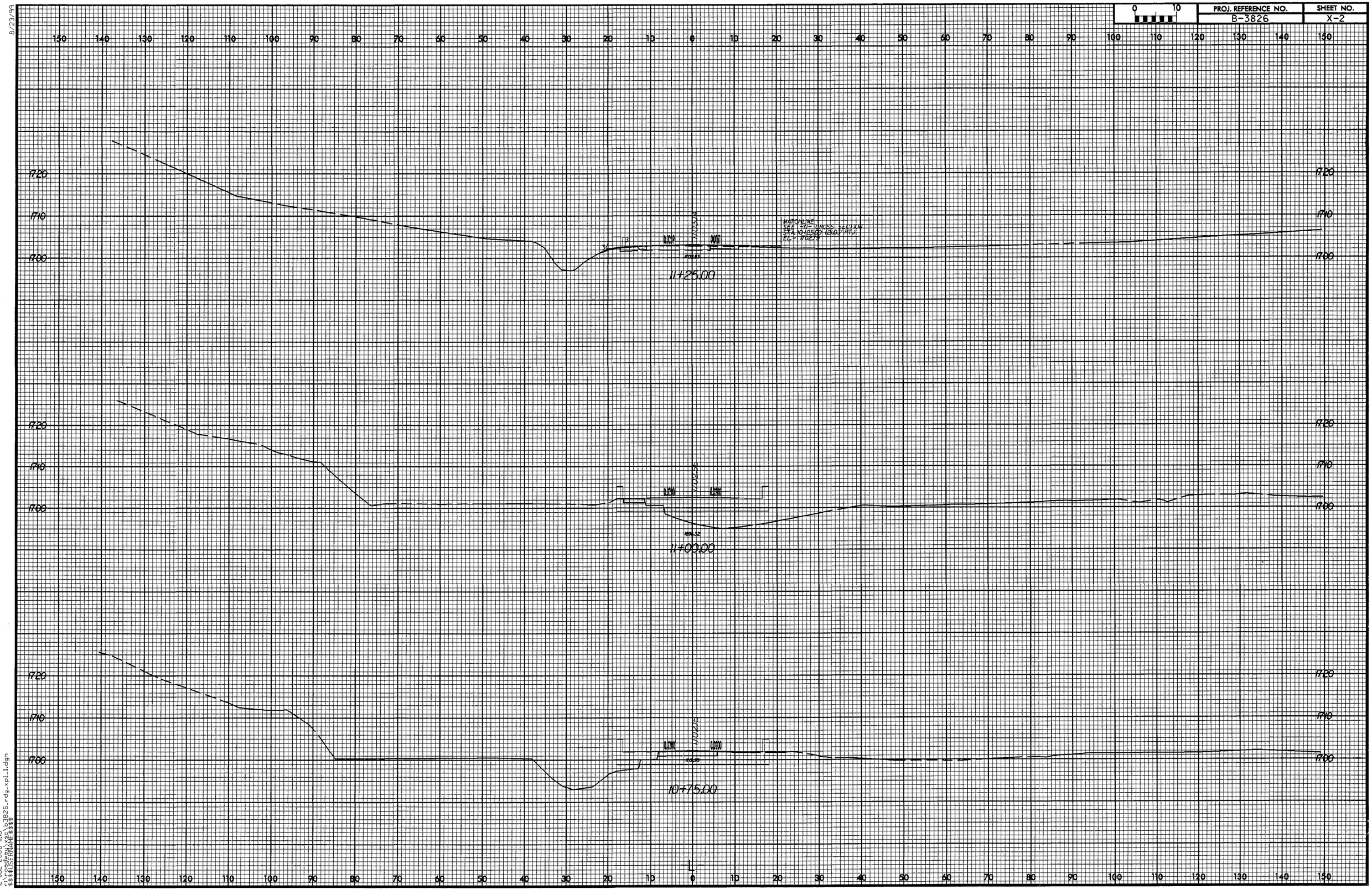
8/23/99

0 10	PROJ. REFERENCE NO.	SHEET NO.
	B-3826	X-2



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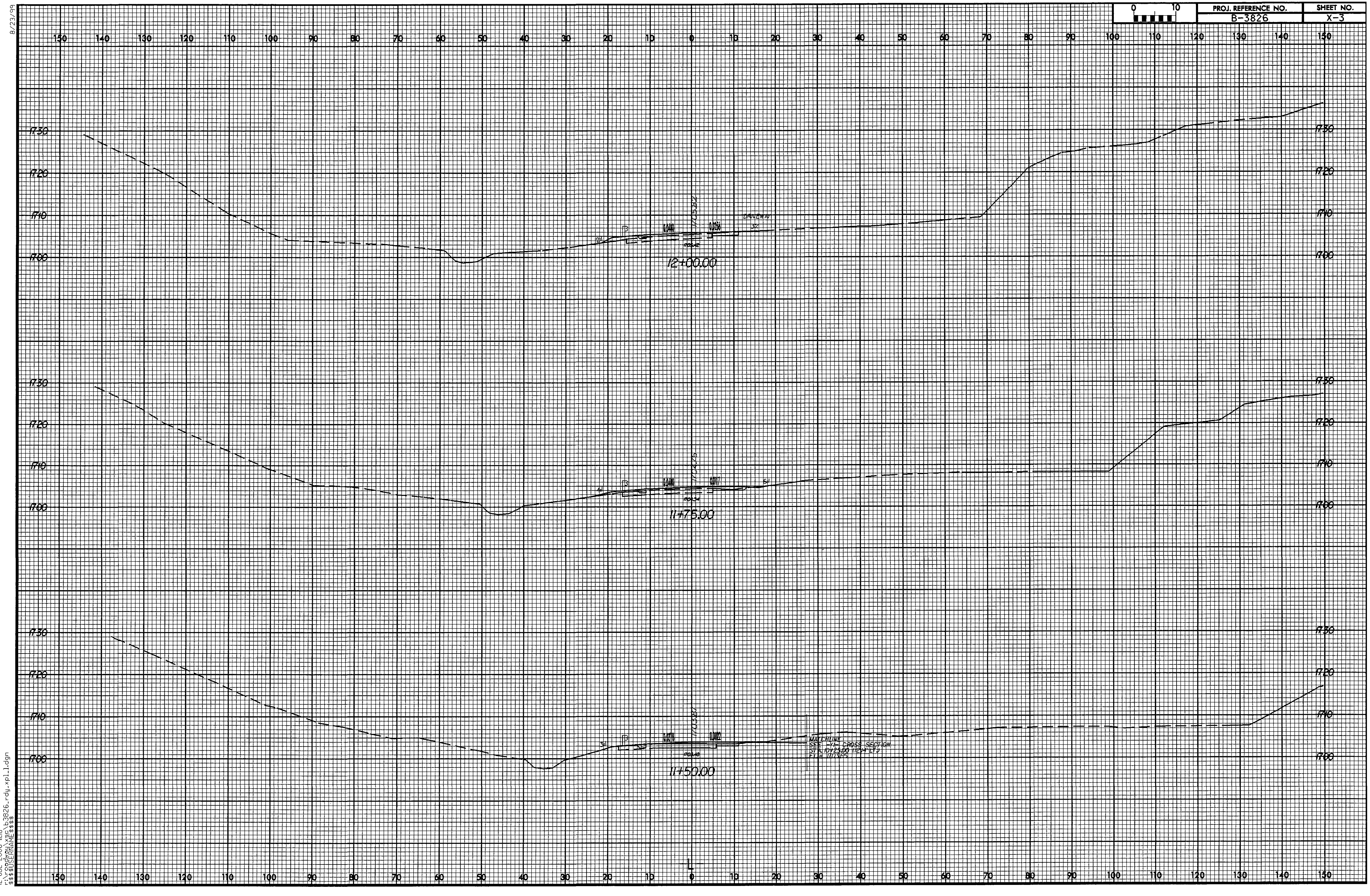
PROJ. REFERENCE NO.	SHEET NO.
B-3826	X-3



8/23/99

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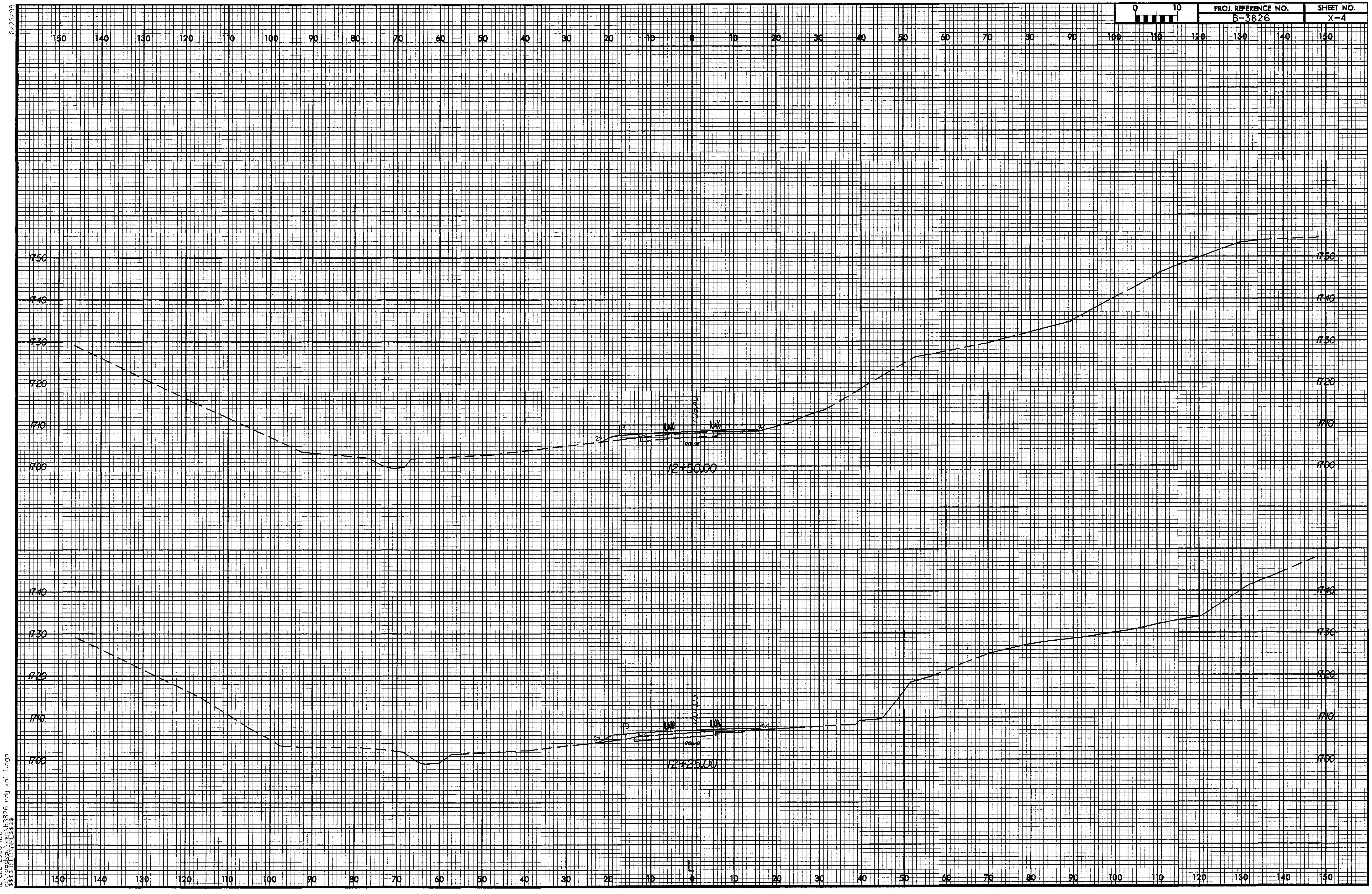
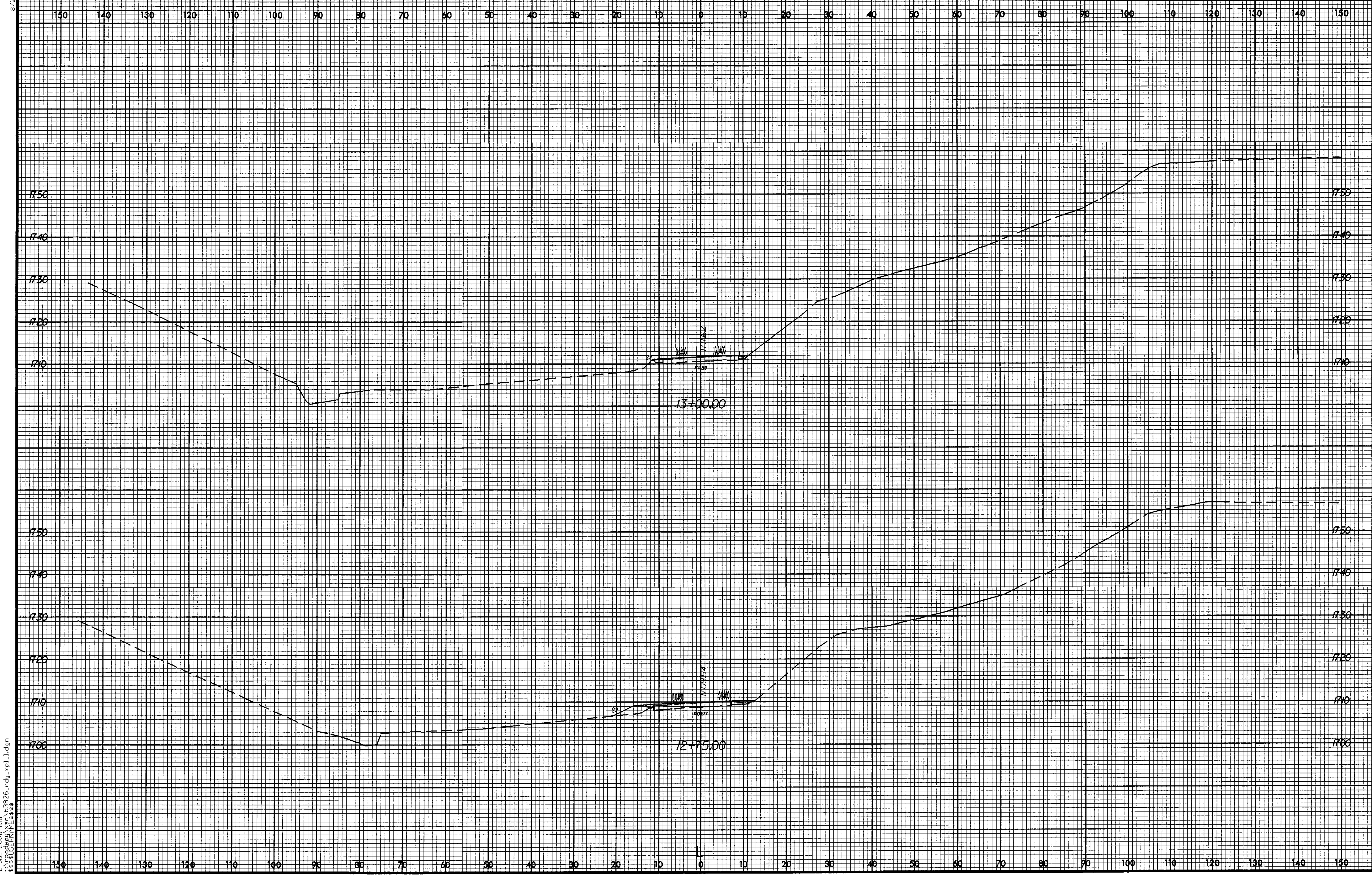
PROJ. REFERENCE NO.	SHEET NO.
B-3826	X-4



PROJ. REFERENCE NO.	SHEET NO.
B-3826	X-5



8/23/99

12-JUL-2006 11:18
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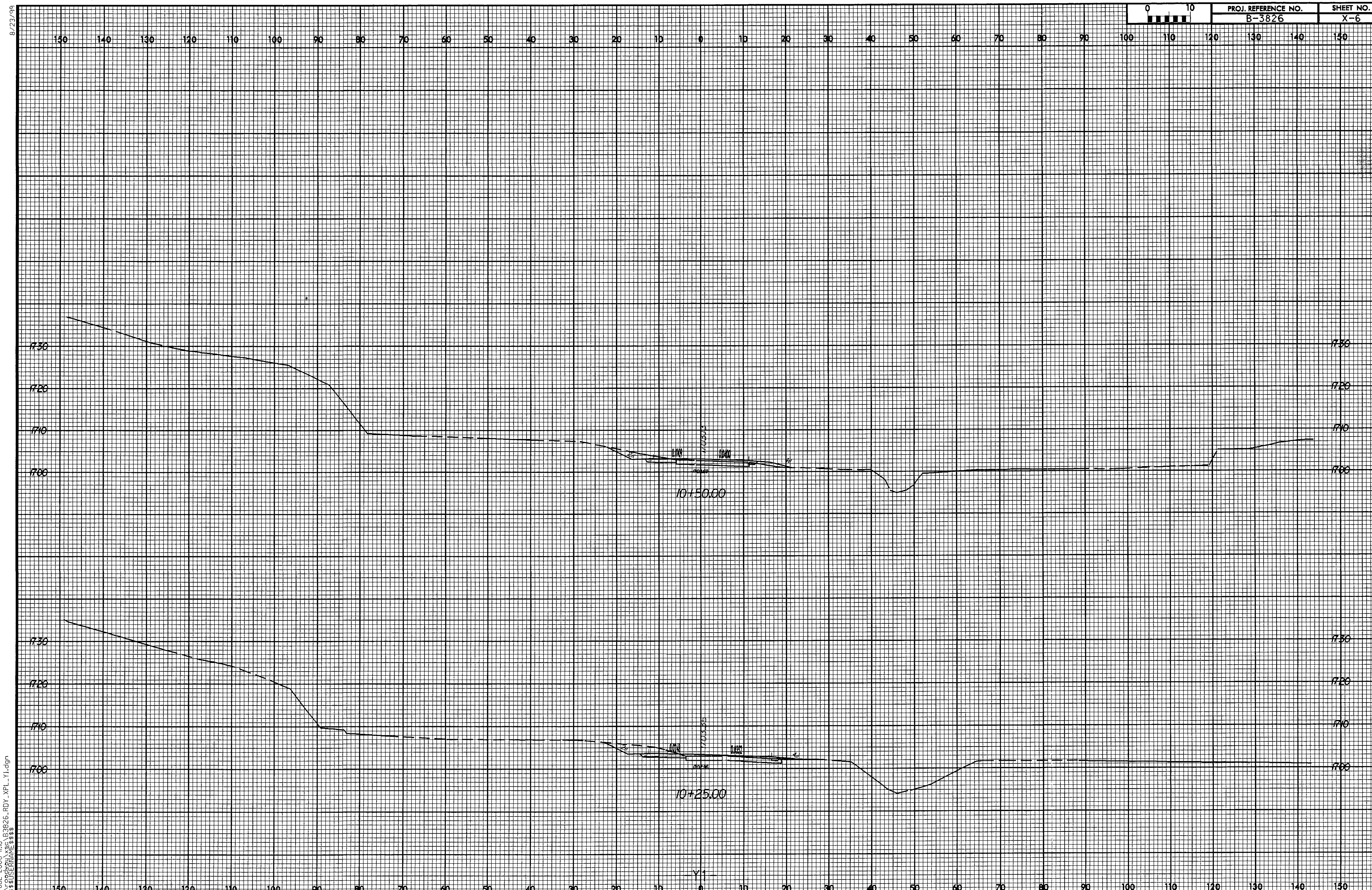
8/23/99

PROJ. REFERENCE NO.	SHEET NO.
B-3826	X-6



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$$$$USERNAME$$$$

8/23/99

0 10	PROJ. REFERENCE NO.	SHEET NO.
	B-3826	X-7

150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150

1740
1730
1720
1710
1700

11+00.00

1740
1730
1720
1710
1700

10+75.00

Y1

150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150

12-JUL-2006 11:18
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$$$$USERNAME$$$$

8/23/99

0 10	PROJ. REFERENCE NO.	SHEET NO.
	B-3826	X-8

150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150

1720
1710
1700

10+50.00

1710
1700
1690

10+25.00

1710
1700
1690

10+00.00

-DETOUR-

12-JUL-2006 14:18
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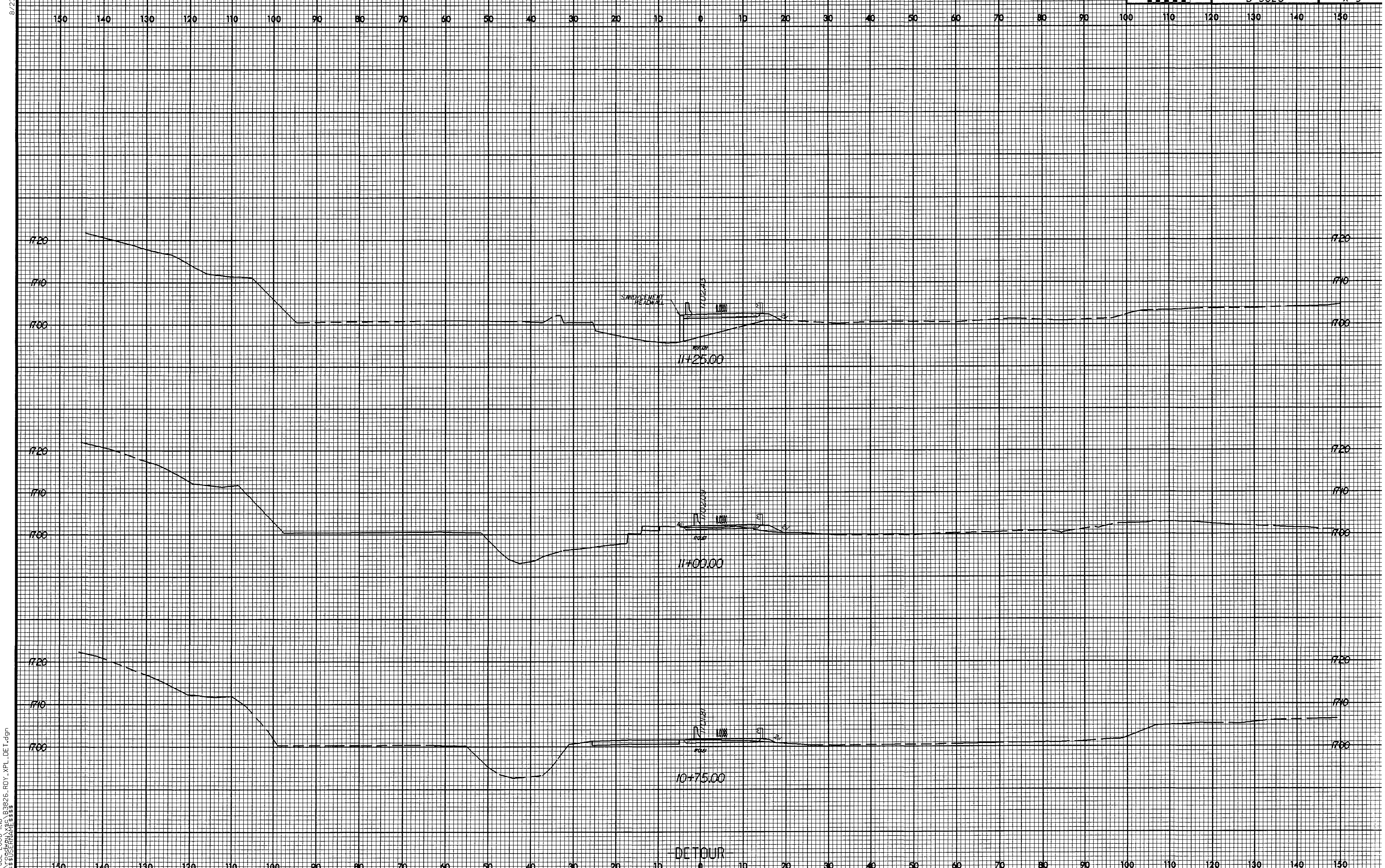
PROJ. REFERENCE NO.	SHEET NO.
B-3826	X-9



8/23/99

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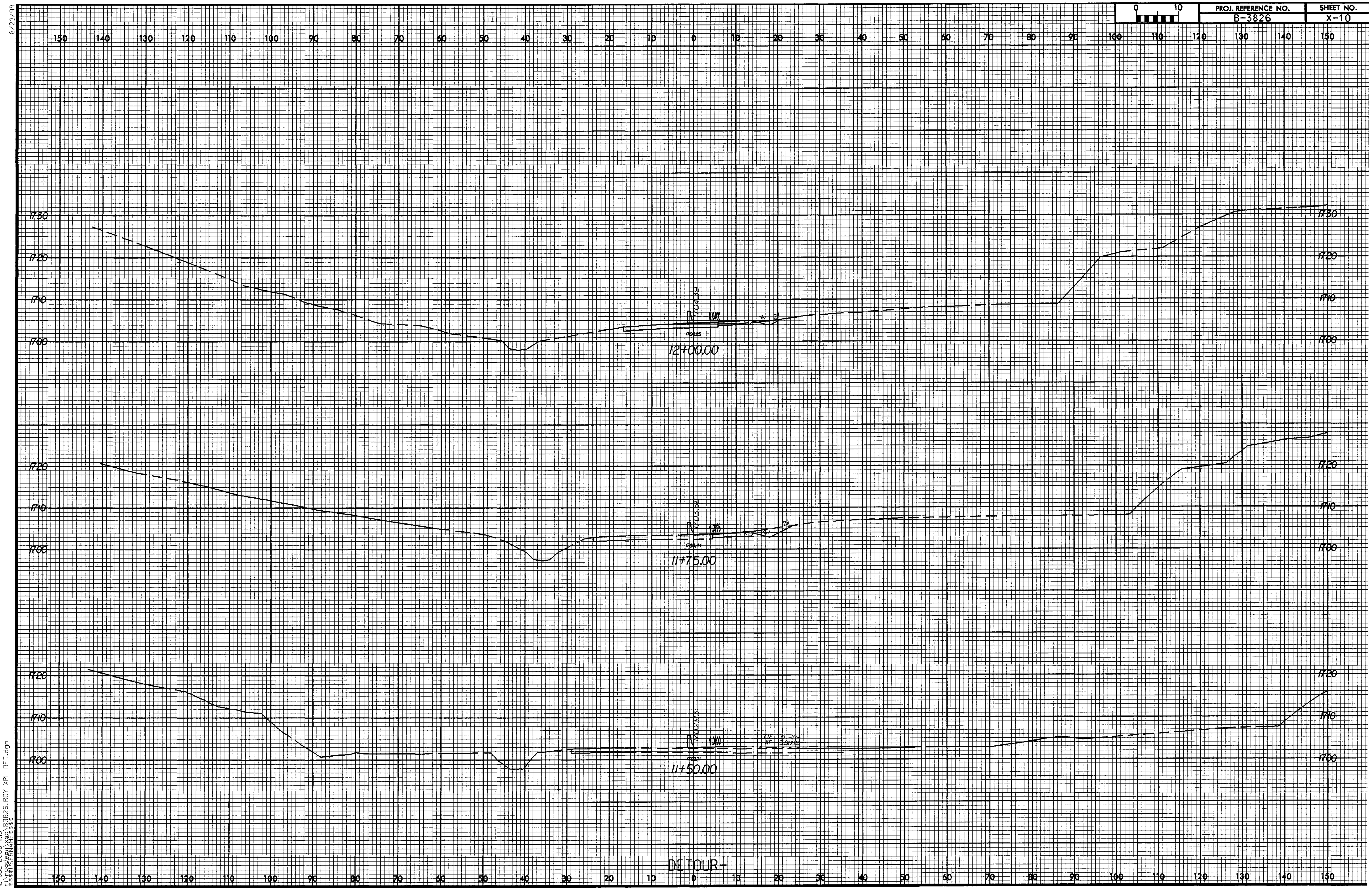
$$$$USERNAME$$$$

PROJ. REFERENCE NO.	SHEET NO.
B-3826	X-10



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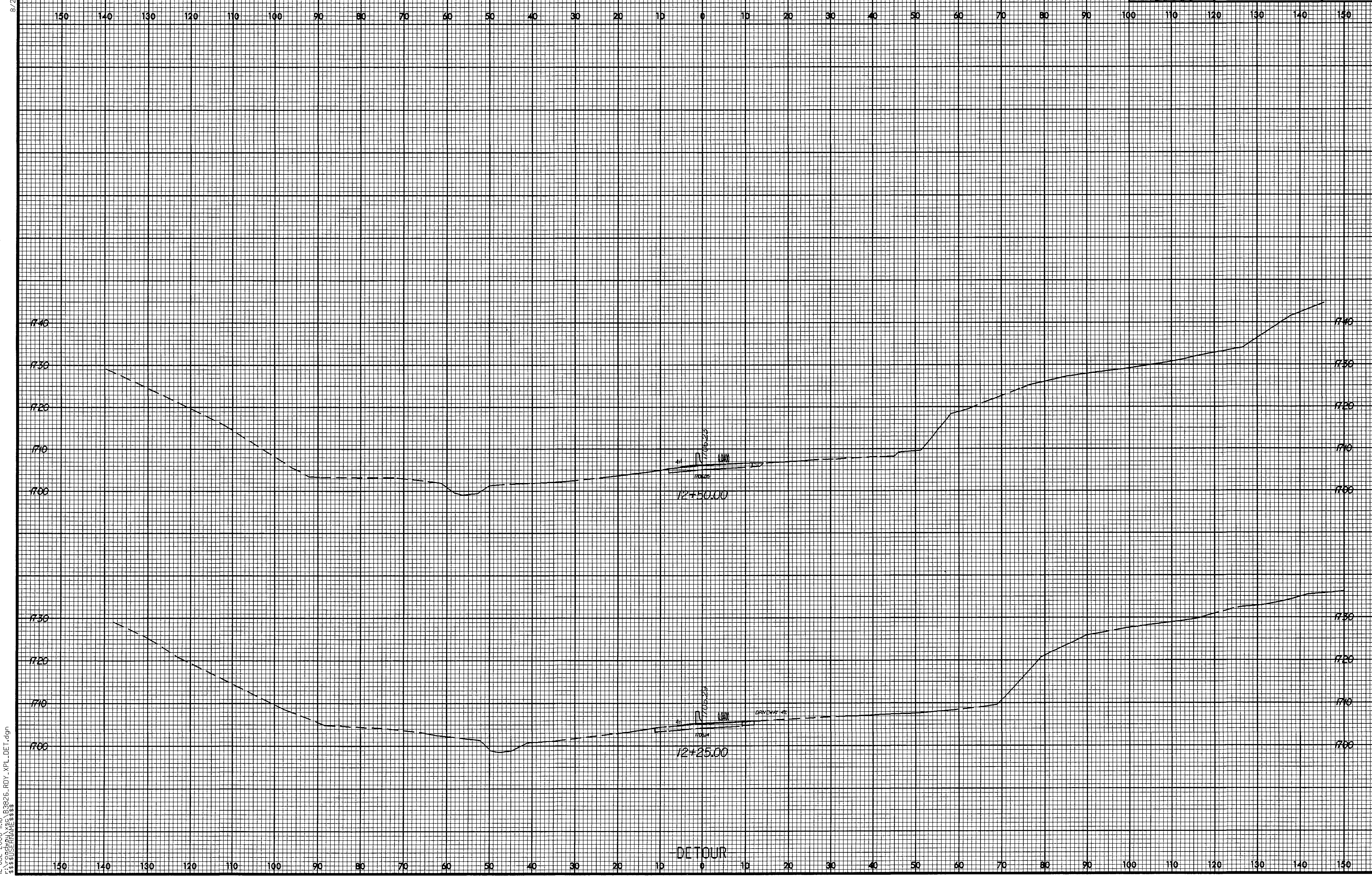
PROJ. REFERENCE NO.	SHEET NO.
B-3826	X-11

8/23/99



12-JUL-2006 11:18
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$$$$USERNAME$$$$

Cherokee County
Bridge No. 166 on SR 1331 (Hanging Dog Road) over Bates Creek
Federal-Aid Project No. BRZ-1331(5)
State Project No. 8.2910701
TIP Project No. B-3826

CATEGORICAL EXCLUSION

UNITED STATES DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
AND
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

APPROVED:

11-17-04 for Stacy Baldwin
DATE
Gregory Thorpe, Ph. D., Environmental Management Director
Project Development and Environmental Analysis Branch, NCDOT

11/24/04 for Clarence W. Coleman, Jr.
DATE
John F. Sullivan, III, PE
Division Administrator, FHWA

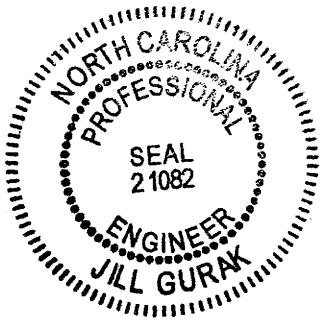
Cherokee County
Bridge No. 166 on SR 1331 (Hanging Dog Road) over Bates Creek
Federal-Aid Project No. BRZ-1331(5)
State Project No. 8.2910701
TIP Project No. B-3826

CATEGORICAL EXCLUSION

NOVEMBER 2004

Documentation Prepared by:

PBS&J



Jill S. Gurak Date: 11/12/04

Jill S. Gurak, P.E., A.I.C.P.
Project Manager - NEPA

Steve Drum Date: 11/12/04

Steve Drum, P.E.
Project Manager – Roadway Design

For the North Carolina Department of Transportation

Khaled Al-Akhdar 11/17/04

Khaled Al-Akhdar
Project Manager
Consultant Engineering Unit

PROJECT COMMITMENTS

Cherokee County
Bridge No. 166 on Bates Creek over SR 1331 (Hanging Dog Road)
Federal-Aid Project No. BRZ-1331(5)
State Project No. 8.2910701
TIP Project No. B-3826

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

Office of Natural Environment:

A sample of Bates Creek in the vicinity of Bridge No. 166 will be conducted prior to project letting for the sicklefin redhorse, a species of federal concern, as requested by the United States Fish and Wildlife Service. However, because the sicklefin redhorse is not a federally protected species, a sample is not required for this Categorical Exclusion.

Division Construction:

1. *Instream work and land disturbance within the 25-foot wide buffer zone are prohibited during the brown, brook, and rainbow trout spawning season of October 15 through April 15.*

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

Project Development and Environmental Analysis Branch:

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

Hydraulics Unit/ Structure Design Unit:

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

Cherokee County
Bridge No. 166 on SR 1331 (Hanging Dog Road) over Bates Creek
Federal-Aid Project No. BRZ-1331(5)
State Project No. 8.2910701
TIP Project No. B-3826

INTRODUCTION: The replacement of Bridge No. 166 is included in the North Carolina Department of Transportation *2004-2010 Transportation Improvement Program* (TIP) and in the Federal-Aid Bridge Replacement Program. The bridge location is shown in **Figure 1**. No substantial environmental impacts are anticipated. The project is classified as a Federal "Categorical Exclusion".

I. PURPOSE AND NEED STATEMENT

NCDOT Bridge Maintenance Unit records indicate Bridge No. 166, a two-lane bridge over Bates Creek, had a sufficiency rating of 48.9 (out of a possible 100 for a new structure) when it was selected for replacement in 1997 and was considered functionally unsatisfactory. In 1997, a timber bent was added to the bridge, which increased its sufficiency rating. Currently, the bridge has a sufficiency rating of 79.3, but still warrants replacement because the timber bent will continue to deteriorate over time. The replacement of this unsatisfactory structure will result in safer and more efficient traffic operations.

II. EXISTING CONDITIONS

Project Setting. **Figure 1** shows the project location in relation to the county and state. The project is located in the mountainous areas of the northwestern part of the state.

SR 1331 (Hanging Dog Road) is classified as a rural major collector (see **Photograph 1**). Land use in the project area is primarily residential, commercial and agricultural. The project is outside of, but near the border of Cherokee Indian Land and the Nantahala National Forest.

Photograph 1: Bridge No. 166.

Overhead electrical lines are in the immediate project vicinity. The utility conflicts for this bridge are considered low.

Existing Bridge Data. The existing bridge was constructed in 1968. The superstructure is a timber deck on I-beams. The substructure is made of timber piles and caps, with concrete sills. The bents are not in the creek (see **Photograph 2**).

Photograph 2: Side view of Bridge No. 166.

The approach roadway width, including shoulders, is 19 feet. Across the bridge, the roadway width is 24.5 feet, and the total deck width is 25.4 feet. The height of the bridge (from crown to bed) is 8 feet. The bridge length is 26 feet.

The bridge carries SR 1331 (Hanging Dog Road) over Bates Creek. The existing right of way is the maintained area and averages 60 feet. The posted weight limits are 30 tons for single vehicles and 37 tons for tractor-trailer semi-trucks. The drainage area for Bates Creek is 1.7 square miles.

Traffic Information. Estimated traffic volumes at the bridge are 2,460 vehicles per day (vpd) for the year 2003 and 3,000 vpd for the design year 2030. The projections estimate two (2) percent truck-tractor semi-trailer (TTST) and two (2) percent dual-tired (DT) vehicles.

The posted speed limit for SR 1331 (Hanging Dog Road) is 45 miles per hour from the north and 25 mph from the south.

No accidents were reported in the vicinity of the bridge during the period from January 1, 2001 to December 31, 2003.

Three Cherokee County school buses cross Bridge No. 166 twice daily.

There are currently no provisions for pedestrians, and no evidence of heavy use by pedestrians. This section of SR 1331 (Hanging Dog Road) is not part of a designated bicycle route nor is it listed in the TIP as needing incidental bicycle accommodations. There is no indication there are an unusual number of bicyclists using this roadway.

III. ALTERNATIVES

A. Project Description

Bridge No. 166 will be replaced with a double barrel (each 8 feet by 7 feet) reinforced concrete box culvert. Each barrel of the reinforced concrete box culvert will be approximately 47 feet in length. The approach roadway for the permanent replacement structure will consist of two 12-foot travel lanes and 11-foot shoulders where guardrail is required and 8-foot shoulders without guardrail. The design speed for the roadway is 30 miles per hour.

The typical section across this structure is a 24-foot two-lane roadway with 11-foot shoulders where guardrail is required and 8-foot shoulders without guardrail (See typical section no. 1 on **Figure 2**).

Based on the preliminary hydraulic analysis, the elevation of the new structure will be approximately the same as the existing structure. The replacement structure is a box culvert with a minimum grade to facilitate drainage. The length and opening of the culvert may increase or decrease as necessary to accommodate peak flows, which will be determined from detailed hydraulic analysis during final design.

B. Build Alternatives

Figures 3a-d shows the three alternatives considered for the replacement of Bridge No. 166. The alternatives are described below.

Alternative 1 – Stage Construct Upstream

Alternative 1 involves building a double barrel reinforced concrete box culvert immediately upstream using staged construction. The length of roadway approach work will be approximately 400 feet south and 550 feet north. A portion of the existing bridge will be removed and traffic will be maintained on the remaining portion of the existing structure in a single lane pattern. A temporary signal may be required during this stage. After the first stage is completed, two-lane, two-way traffic will be allowed to travel on a portion of the new reinforced box culvert. The remaining portion of the existing bridge will then be removed and the remaining portion of the proposed culvert will be constructed. Alternative 1 was not selected as the Preferred Alternative because it requires more earthwork and causes residential relocations.

Alternative 2 (Preferred) – Temporary Realignment Upstream (One-Lane Detour)

This alternative involves building a temporary detour structure upstream and building the reinforced concrete box culvert in place. The detour structure will be an 84-inch corrugated metal pipe with a sand-cement bag headwall. The approach roadway will extend approximately 185 feet south and approximately 140 feet north of the detour structure. The detour structure will be offset approximately 30 feet east of the existing bridge. Traffic on the detour structure (one-lane) will be maintained with temporary signal control. A design exception will be required for the one-lane detour. The typical section for the one-lane detour is shown on **Figure 2** as typical section no. 2.

The length of roadway approach work for the new permanent structure will be approximately 90 feet south and 250 feet north.

Alternative 3 – Temporary Realignment Downstream (Two-Lane Detour)

This alternative involves building a temporary detour structure downstream and building the reinforced concrete box culvert in place. The detour structure will be an 84-inch corrugated metal pipe with a sand-cement bag headwall. A 48-inch corrugated metal pipe will be installed to accommodate the flow from a tributary to Bates Creek. The approach roadway will extend approximately 160 feet south and approximately 370 feet north of the detour structure. The detour structure will be offset approximately 70 feet southwest of the existing bridge. The typical section for the detour is shown on **Figure 2** as typical section no. 3.

The length of roadway approach work for the new permanent structure will be approximately 90 feet south and 250 feet north.

Alternative 3 was not selected as the Preferred Alternative because of the complexity of the overall design.

C. Alternatives Eliminated from Further Study

The "do-nothing" alternative will eventually necessitate removal of the existing structure. This is not desirable due to the service provided by Bridge No. 166.

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

An off-site detour route was studied but eliminated from further consideration due to length, safety concerns, and disrupting school bus routes. The shortest detour was estimated to be approximately 10.4 miles long through the town of Ebenezer.

D. Preferred Alternative

Alternative 2, placing a reinforced concrete box culvert at the existing location, is the Preferred Alternative. Alternative 2 will use a one-lane detour with temporary signal control to maintain traffic during construction.

Alternative 2 was selected as the Preferred Alternative because it requires the least earthwork, it has no residential relocations, and has the fewest impacts to biotic communities.

The Division 14 Engineer concurs with the selection of Alternative 2 as the Preferred Alternative.

E. Anticipated Design Exceptions

A design exception will be required for the one-lane detour on the Preferred Alternative.

IV. ESTIMATED COSTS

The estimated costs, based on current prices, are shown in **Table 1**.

Table 1
Estimated Costs

Cost Item	Alternative 1	Alternative 2 (Preferred)	Alternative 3
Structure Removal (existing)	$5,900	$5,200	$5,200
Structure (proposed)	$80,000	$72,000	$72,000
Detour Structure and Approaches	N/A	$78,400	$81,400
Roadway Approaches	$489,000	$66,500	$66,500
Miscellaneous and Mobilization	$274,000	$110,300	$125,000
Engineering and Contingencies	$126,100	$47,600	$49,900
ROW/Easements/Utilities	$571,000	$71,100	$101,000
Total	**$1,546,000**	**$451,100**	**$501,000**

The estimated cost of the project, as shown in the *2004-2010 NCDOT Transportation Improvement Program* is $550,000; including $150,000 for right of way and $300,000 for construction. Right-of-way acquisition is scheduled for 2005, with construction to follow in 2006.

V. NATURAL RESOURCES

Definitions for area descriptions used in this report are as follows: **Project Study Area** denotes the area bounded by proposed construction limits; and **Project Vicinity** describes an area extending 0.5 mi on all sides of the Project Study Area.

A. Methodology

Background research on soils, water resources, wetlands, protected species and other area features was conducted prior to field investigations. Information sources used in this pre-field investigation of the study area included:

- US Geological Survey (USGS) quadrangle map (Murphy)
- US Fish and Wildlife Service (USFWS) National Wetland Inventory Map (Murphy) website (http://wetlands2.nwi.fws.gov/nwi_mapplet/)
- Natural Resources Conservation Service (NRCS, formerly the Soil Conservation Service) soil maps and
- NCDOT aerial photographs of project area (scale 1" = 100').

Water resource information was obtained from the following source:

- Department of Environment and Natural Resources Division of Water Quality (NCDWQ)

Information concerning the occurrence of federal and state protected species in the study area was gathered from the following sources:

- US Fish and Wildlife Service (USFWS) website list of Murphy County Endangered Species, Threatened Species, and Federal Species of Concern website
- NC Natural Heritage Program (NCNHP) database of rare species and unique habitats.

General field surveys were conducted along the proposed alignment on July 25, 2001 and November 8, 2001. Plant communities and their associated wildlife were identified and recorded. Wildlife identification involved using one or more of the following observation techniques: active searching and capture, visual observations (binoculars), and identifying characteristic signs of wildlife (sounds, scat, tracks and burrows).

Jurisdictional wetland determinations were performed using delineation criteria prescribed in the *Corps of Engineers Wetland Delineation Manual* (Environmental Laboratory, 1987).

Estimated impacts are derived using the construction limits shown on the functional designs for each alternative. The estimated construction limits on the functional designs were developed based on site visits, aerial photography, and USGS topographic mapping.

B. Physiography and Soils

The Project Study Area denotes the area bounded by proposed construction limits. It is within the Mountain Physiographic Province. The topography in this section of Cherokee County is characterized by hilly to mountainous terrain. The Project Study Area is in a slight valley, with the elevation rising 100 feet. The project elevation is approximately 1,680 feet above mean sea level (msl).

Four soil series occur within the Project Study Area: Junaluska-Brasstown complex soils, Junaluska-Tsali complex soils, Nikwasi loam, and Cullowhee fine sandy loam.

Junaluska–Brasstown complex soils are steep, well-drained soils on side slopes on narrow ridges in the low mountains. Surface runoff is slow where forest litter has not been disturbed, and rapid where litter has been removed. Landslides are common with this soil type. The bedrock often contains sulfur-bearing and acidic seams. Exposed bedrock can lead to water quality problems. Any exposed soil should be vegetated as soon as possible to prevent erosion. This complex is generally forested, but steep slopes make the complex poorly suited for woodland management.

Junaluska-Tsali complex soils are moderately steep, well drained soils on side slopes on narrow ridges in the low mountains. Surface runoff is slow where forest litter has not been disturbed, and rapid where litter has been removed. Landslides are common with this soil type. The bedrock is relatively sulfur-bearing and acidic. This complex is generally forested, but steep slopes make the complex poorly suited for woodland

management. This complex tends to be shallower than the Junaluska-Brasstown complex, but otherwise the two complexes are very similar.

Nikwasi loam soils are nearly level, very deep, poorly drained to very poorly drained soils in floodplain depressions of smaller streams. Surface runoff is very slow, and flooding is frequent. The soil type is poorly suited to woodland management due to wetness and flooding. This soil type is on the hydric soils list for the county.

Cullowhee fine sandy loam soils are nearly level to gently sloping, somewhat poorly drained soils on the floodplains of smaller streams. Surface runoff is very slow, and flooding is frequent. This soil type is well suited for woodland management, but it is rarely used as it occurs in small pockets and other agricultural uses are more profitable. This soil type is on the hydric soils list for the county.

A soil sample was not taken at this site because the area is maintained lawns, driveways, or otherwise disturbed.

C. Water Resources

1. Waters Impacted

Bates Creek will be the only surface water resource directly impacted by the proposed project. Bates Creek is located in sub-basin 02 of the Hiwassee River Basin (04-05). Bates Creek flows into Hanging Dog Creek about one mile southwest of the bridge. The drainage area for Bates Creek is 1.7 square miles.

2. Water Resource Characteristics

Bates Creek, at Bridge No. 166, is approximately 8 feet wide and 1.5 feet deep. The surface area of Bates Creek under the existing bridge crossing is approximately 200 square feet. The stream runs parallel to SR 1331 (Hanging Dog Road) for approximately 550 feet in the Project Vicinity. The stream has a Rosgen classification of B 1/2/3 (structural controlled narrow valley with a predominantly bedrock, boulder, and cobble substrate).

3. Best Usage Classification and Water Quality

Best Usage Classification. Streams are assigned a best usage classification by the NCDWQ. The classification of Bates Creek [Index No.1-56] is Class C. Class C uses include aquatic life propagation and survival, fishing, wildlife, secondary recreation, and agriculture.

Neither High Quality Waters (HQW), Water Supplies (WS-I: undeveloped watersheds or WS-II: predominately undeveloped watersheds) nor Outstanding Resource Waters (ORW) occur within one mile of the Project Study Area.

Water Quality Monitoring. The NCDWQ has taken no water quality samples on Bates Creek. Hanging Dog Creek, into which Bates Creek flows, has a Use Support Rating of S, indicating that it is fully supporting its classified rating of C.

NPDES Permitted Dischargers. There are 11 dischargers in this sub-basin (NCDWQ 1997). None of the facilities discharge into Bates Creek. Therefore, the project will not impact any of these facilities.

Non-Point Source Dischargers. Non-point source dischargers contribute to water problems in sub-basin 02 (NCDWQ, 1997). These sources in the basin include agriculture, urban/residential, construction, timber harvesting, mining, onsite wastewater disposal (septic systems), and solid waste disposal.

4. Anticipated Impacts to Water Resources

The use of a box culvert to replace the existing bridge will result in permanent disturbance to the stream. The box culvert will be approximately 47 feet long for Alternative 1, Alternative 2 (Preferred), and Alternative 3. To construct the culvert, the streambed material will be excavated and the culvert placed one foot below the current streambed level. Use of a bottomless culvert will be investigated if solid rock is present. Aquatic organisms will recolonize the area.

The removal of material will cause increased sedimentation and siltation downstream. Siltation adversely affects many aquatic species temporarily, including macroinvertebrates, fish, and mussels. Additionally, equipment working near the stream is likely to erode the streambanks, thus increasing erosion and sedimentation. These impacts are likely to dissipate over time, but adverse affects to water quality can be expected temporarily.

Impacts to water resources can occur during construction. NCDOT, in cooperation with NCDWQ, has developed a sedimentation control program for highway projects titled, *Best Management Practices (BMPs) for the Protection of Surface Waters*. The following are some of the standard methods to reduce sedimentation and water quality impacts:

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

5. Impacts Related to Bridge Demolition and Removal

In order to protect the water quality and aquatic life in the area affected by this project, the NCDOT and all potential contractors will follow appropriate guidelines for bridge demolition and removal. These guidelines are presented in three NCDOT documents, entitled: 1) *Pre-Construction Guidelines for Bridge Demolition and Removal,* 2) *Policy: Bridge Demolition and Removal in Waters of the United States*, and 3) *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. 166 is composed of a timber deck on steel I-beams. The substructure is a combination of timber and concrete. The substructure includes 17 cubic yards of concrete; therefore a maximum of 17 cubic yards of temporary fill could potentially be dropped in the water during removal. Replacement of Bridge No. 166 with a double barrel reinforced concrete box culvert will result in permanent fill to Waters of the United States.

D. Biotic Resources

Biotic resources include aquatic and terrestrial ecosystems. This section describes those ecosystems encountered in the study area, as well as the relationships between fauna and flora within these ecosystems. Composition and distribution of biotic communities throughout the project area are reflective of topography, hydrologic influences and past

and present land uses in the study area. Dominant flora and fauna observed or likely to occur in each community are described.

Descriptions of the terrestrial systems are presented in the context of plant community classifications and follow descriptions presented by Schafale and Weakley (1990) where possible. Scientific nomenclature and common names (when applicable) are provided for each animal and plant species described. Plant taxonomy generally follows Radford, et al. (1968). Animal taxonomy follows Martof, et al. (1980); Menhenick (1991); Potter, et al. (1980); and Webster, et al. (1985). Subsequent references to the same organism will include the common name only. Fauna, or evidence of a particular faunal species observed during the site visit are denoted with an asterisk (*). Published range distributions and habitat analysis are used in estimating fauna expected to be present within the project area.

1. Terrestrial Communities

As shown in **Figure 4**, seven distinct terrestrial communities occur in the Project Vicinity: Montane Alluvial Forest, Montane White Oak Forest, Rich Cove Forest, Successional, Pasture, Agricultural, and Maintained/Disturbed. The boundaries within the Project Study Area are well defined, without a notable transition zone between them.

Montane Alluvial Forest. The Montane Alluvial Forest occurs on floodplains at moderate to high elevations. It receives nutrient input from flood-carried sediment. Forests are often eroded or disturbed by flooding, sometimes frequently enough to cause the system to remain in early succession. This community type is often influenced by beavers (*Castor canadensis*), which create impoundments that develop into early successional forest.

The canopy of the Montane Alluvial Forest is comprised of Japanese maple (*Acer palamatum*), Eastern hemlock (*Tsuga canadensis*), box elder (*Acer negundo*), scarlet oak (*Quercus coccinea*), and black willow (*Salix nigra*).

The shrub layer is composed of sapling eastern hemlock, sapling white pine (*Pinus strobus*), smooth sumac (*Rhus glabra*), multiflora rose (*Rosa multiflora*), and Chinese privet (*Ligustrum sinense*). The herb layer is composed of jewelweed (*Impatiens capensis*), Christmas fern (*Polystichum acrostichoides*), asters (*Aster* sp.), goldenrod (*Solidago* sp.), and bamboo (*Fargesia* sp.) in gaps. The vine layer is quite extensive, with numerous exotics. The layer includes: grape (*Vitis* sp.), hog peanut (*Amphicarpaea*

bracteata), Japanese knotweed (*Reynoutria japonica*), Japanese honeysuckle (*Lonicera japonica*), kudzu (*Pueraria lobata*), and greenbrier (*Smilax* sp.).

Wildlife associated with the alluvial forest includes: beaver, gray squirrel (*Sciurus carolinensis*), white-tailed deer (*Odocoileus virginianus*), opossum (*Didelphis virginiana*) and raccoon (*Procyon lotor*). Amphibians and reptiles likely to inhabit this habitat type include the spring peeper (*Hyla crucifer*), and snake species such as the northern copperhead (*Agkistrodon contortrix mokasen*) and the black rat snake (*Elaphe obsoleta obsoleta*).

Avian species using the alluvial forest include: Carolina chickadee* (*Parus carolinensis*), American crow* (*Corvus brachyrhynchos*), turkey vulture* (*Cathartes aura*), belted kingfisher (*Megaceryle alcyon*), Carolina wren (*Thryomanes bewickii),* song sparrow *(Melospiza melodia*), tufted titmouse (*Parus bicolor*), white breasted nuthatch (*Sitta carolinensis*), wild turkey (*Meleagris galopavo*), ruffed grouse (*Bonasa umbellus*), blue-gray gnatcatcher (*Polioptila caerulea*), and various woodpeckers (*Picoides* sp.).

Montane White Oak Forest. The Montane White Oak Forest community type is generally found on exposed slopes, broad ridges and flats, at moderate to high elevations. They tend to be fairly dry systems. The community is still undergoing a transition since the decline of the American chestnut (*Castanea dentata*). It is unknown what the final forest composition will be.

This community is dominated by white oak (*Quercus alba*), black walnut (*Juglans nigra.*), white pine (*Pinus strobus*), and sassafras (*Sassafras albidum*). The shrub layer consists of mountain laurel (*Kalmia latifolia*), rhododendron (*Rhododendron* sp.), American holly (*Ilex opaca*), and saplings of eastern hemlock, scarlet oak, white pine and red maple (*Acer rubrum*). The herb and vine layer is very sparse, with Christmas fern and greenbrier the major species present.

Wildlife associated with the Montane White Oak Forest includes: gray squirrel, white-tailed deer, opossum, and raccoon. Amphibians and reptiles likely to inhabit this habitat type include the spring peeper, and snake species such as the northern copperhead and the black rat snake.

Avian species using this community type include: Carolina chickadee*, Carolina wren, song sparrow, tufted titmouse, white breasted nuthatch, wild turkey, ruffed grouse, and various woodpeckers.

Rich Cove Forest. The forest area on the slopes surrounding the project is Rich Cove Forest. This community is found in sheltered, mesic, low to moderate elevation sites, generally on broad coves and lower slopes. This forest type reproduces by gaps, which are generally created by windthrow. The forest is naturally uneven aged, but following logging, many shade intolerant trees may be present.

The canopy is dominated by white pine, eastern hemlock and Carolina hemlock (*Tsuga caroliniana*), with sycamore (*Platanus occidentalis*), balsam fir *(Abies fraseri)*, and red maple to a lesser extent.

The shrub layer consists of mountain laurel, American holly, and saplings of white pine, eastern hemlock, and scarlet oak. The herb layer is fairly sparse, probably due to the rocky soils and the prevalence of mountain laurel, which shades the forest floor. The primary species are Christmas fern, a *Hexastylis* species, and bamboo, which occurs in gaps. Greenbrier and Chinese privet are present near the road, but do not extend far into the woods.

Wildlife associated with the Rich Cove Forest includes: white-tailed deer*, gray squirrel, opossum, and raccoon. Amphibians and reptiles likely to inhabit this habitat type include the spring peeper, and snake species such as the northern copperhead and the black rat snake.

Avian species using this community type include: Carolina chickadee*, American crow*, turkey vulture*, Carolina wren, song sparrow, tufted titmouse, white breasted nuthatch, wild turkey, ruffed grouse, and various woodpeckers.

Successional. In the Successional area, the shrub layer is composed of multiflora rose, Chinese privet, smooth sumac, and blackberry bushes (*Rubus* sp.). In addition, there are sapling scarlet oak, white pine, tulip poplar (*Liriodendron tulipifera*), and red cedar (*Juniperus virginiana*). The herb and vine layer consists of a variety of grasses, Queen Anne's Lace (*Daucus carota*), goldenrod, daisies (*Leucanthemum* sp.), and Japanese honeysuckle.

Wildlife associated with the successional area will use the area for food, shelter, and as a corridor between other habitat types. Wildlife expected to use the area include: gray squirrel, white-tailed deer, opossum, groundhog (*Marmota monax),* eastern cottontail (*Sylvilagus floridanus*), and raccoon. Amphibians and reptiles likely to inhabit this

habitat type include the spring peeper, and snake species such as the northern copperhead and the black rat snake.

Avian species using this community type include: Carolina chickadee*, blue jay (*Cyanocitta cristata*), American crow, European starling, Carolina wren, song sparrow, American robin, and tufted titmouse.

Pasture. The pasture area is composed of a variety of grasses. There are some forbs, including Queen Anne's Lace, goldenrod, and daisies.

Wildlife associated with the pasture area will use the area for food, shelter, and as a corridor between other habitat types. Wildlife expected to use the area include: gray squirrel, white-tailed deer, opossum, groundhog, eastern cottontail, and raccoon. Amphibians and reptiles likely to inhabit this habitat type include the spring peeper, and snake species such as the northern copperhead and the black rat snake.

Avian species using this community type include: Carolina chickadee, American crow, European starling, Carolina wren, song sparrow, American robin, blue jay, eastern bluebird (*Sialia sialis*), and tufted titmouse.

Agriculture. There are corn and soybeans planted in the small agricultural area located upstream of the existing bridge.

Wildlife associated with the agricultural area will use the area for food and as a corridor between other habitat types. Wildlife expected to use the area include: gray squirrel, white-tailed deer, opossum, groundhog, eastern cottontail, and raccoon. Amphibians and reptiles likely to inhabit this habitat type include the spring peeper, and snake species such as the northern copperhead and the black rat snake.

Avian species using this community type include: American crow*, European starling (*Sturnus vulgaris*), Carolina chickadee*, Carolina wren, song sparrow, American robin, eastern bluebird, blue jay, and tufted titmouse.

Maintained/Disturbed. The Maintained/Disturbed area includes both residential and commercial land uses. The residential area includes several houses. The yards are primarily vegetated in turf grasses. There are a number of planted shrubs and trees such as black tupelo (*Nyssa sylvatica*).

The commercial area consists of several buildings for some type of machine shop and the Bates Creek Baptist Church. The machine shop is surrounded by a gravel parking area. This area has no habitat for wildlife, although they may use the area as a corridor to move between community types. Mice (*Peromyscus* sp.) may use the buildings for shelter, and avian species such as crows, blue jays, and American robins may occasionally alight on the buildings. The Bates Creek Baptist Church has similar vegetation to the residential areas, with most of the area covered with turf grasses.

The wildlife expected in the Maintained/Disturbed area are species from the nearby communities, including: gray squirrel, white-tailed deer, opossum, groundhog, eastern cottontail, and raccoon. Amphibians and reptiles likely to inhabit this habitat type include the spring peeper and snake species such as the northern copperhead and the black rat snake.

Avian species using this community type include: American crow, European starling (*Sturnus vulgaris*), Carolina chickadee, Carolina wren, song sparrow, American robin, eastern bluebird, blue jay, and tufted titmouse.

2. Aquatic Communities

One aquatic community, Bates Creek, will be impacted by the proposed project. Bates Creek, at Bridge No. 166, is approximately 8 feet wide and 1.5 feet deep. Bates Creek flows to the south. The stream has a Rosgen classification of B 1/2/3 (structural controlled narrow valley with a predominantly bedrock, bolder, and cobble substrate). A 60-inch stormwater pipe drains into Bates Creek just west of Bridge No. 166 (see **Photograph 3**).

Photograph 3: A 60-inch stormwater pipe draining into Bates Creek.

Physical characteristics of the water body and condition of the water resource influence faunal composition of aquatic communities. Terrestrial communities adjacent to a water resource also greatly influence aquatic communities.

Fish were observed in the creek. Fauna likely to be associated with the aquatic community include Minnows (family Cyprinidae) and Blue-gill (*Lepomis macrochirus*).

The upper part of Bates Creek is on game land and is designated for wild trout. The North Carolina Wildlife Resources Commission (NCWRC) will require a trout

moratorium from Oct. 15th-April 15th. No work will be performed during the moratorium period.

3. Anticipated Impacts to Biotic Communities

a. Biotic Communities

Calculated impacts to biotic resources reflect the relative abundance of each community present within the study area. Project construction will result in clearing and degradation of portions of these communities. **Table 2** summarizes potential quantitative losses to these biotic communities resulting from Alternative 1 (stage construction upstream), Alternative 2 (temporary realignment upstream), and Alternative 3 (temporary realignment downstream). Estimated impacts are derived using the construction limits shown on the functional designs for each alternative.

Table 2
Anticipated Impacts to Biotic Communities

Community		Alternative 1	Alternative 2 (Preferred)	Alternative 3
Montane Alluvial Forest (acres)		0.15	0.04	0.07
Rich Cove Forest (acres)		0.65	0.03	0.02
Montane White Oak (acres)		0.43	0	0.11
Successional (acres)		0.47	0.03	0.05
Maintained/Disturbed (acres)		0.77	0.61	0.30
Aquatic Community (acres)		0.01	0.01	0.01
Bates Creek (linear feet)		47	47	47
Total	**acres**	**2.48**	**0.72**	**0.98**
	linear feet	**47**	**47**	**47**

As indicated in **Table 2**, the impacts of Alternative 2 (Preferred) are the least, followed by Alternative 3, with Alternative 1 having the greatest impacts to natural resources. The habitat impacted most will be the Maintained/Disturbed community. Areas modified by construction, but not paved, will become road shoulders and early successional or maintained/disturbed habitat.

Plant communities found within the proposed project area serve as nesting and sheltering habitat for various wildlife species. Due to the size and scope of this project, it is anticipated that impacts to fauna will be minimal.

b. Aquatic Communities

Aquatic communities are sensitive to even small changes in their environment. All three alternatives will result in permanent impacts to the aquatic community as the stream substrate will be removed to place the box culvert. Replacement will result in 0.01 acres of aquatic community impacts (see **Table 2**). Impacts were obtained by measuring the width over the water times the length of the culvert over the water.

Impacts often associated with in-stream construction include increased channelization and scouring of the streambed. In-stream construction alters the stream substrate and may remove streamside vegetation at the site.

The removal of streamside vegetation and placement of fill material at the construction site alters the terrain. Alterations of the streambank increase the likelihood of erosion and sedimentation.

Minimization Techniques. Implementation of the NCDOT's *Best Management Practices for the Protection of Surface Waters* (NCDOT, 1997) will minimize construction-related sedimentation and erosion and the effects on terrestrial and aquatic habitats through the use of erosion and sediment control structures that are designed for the 25-year storm event.

c. Wetland Communities

No jurisdictional wetlands are present within the Project Study Area.

E. Special Topics

1. Waters of the United States

Surface waters and wetlands fall under the broad category of "Waters of the United States" as defined in Section 33 of the Code of Federal Regulations (CFR) Part 328.3 and in accordance with provisions of Section 404 of the Clean Water Act (33 USC 1344). Waters of the United States are regulated by the US Army Corps of Engineers (USACE).

Potential wetland communities were investigated pursuant to the 1987 *Corps of Engineers Wetland Delineation Manual* (USACE, 1987). According to the three-parameter approach outlined in the manual, hydric soils, hydrophytic vegetation and

prescribed hydrologic characteristics must all be present for an area to be considered a wetland.

No jurisdictional wetlands are present within the Project Study Area. Soils within the Project Study Area are disturbed, so a soil sample was not taken. However, there was no hydrology present other than the stream itself. Hydrophytic vegetation made up 50% of the dominant vegetation in the Project Study Area.

Bates Creek is a Jurisdictional Surface Water under Section 404 of the Clean Water Act (33 USC 1344). The biological, physical and water quality aspects of Bates Creek were presented in the Water Resources Section (under the Natural Resources portion) of this report. Forty-seven linear feet of stream will be impacted by Alternative 1, Alternative 2 (Preferred), and Alternative 3 (see **Table 2**). The project cannot be constructed without infringing on jurisdictional surface waters.

2. Permits

a. Section 404 of the Clean Water Act

Permanent impacts to jurisdictional surface waters (Bates Creek) are anticipated. In accordance with provisions of Section 404 of the Clean Water Act (33 U.S.C. 1344), a permit is required from the USACE for the discharge of dredged or fill material into "Waters of the United States."

It is anticipated that this project will fall under Nationwide Permit 23 (33 CFR 330.5(a)), which is a type of general permit. Nationwide Permit 23 is relevant to approved Categorical Exclusions. This permit authorizes activities, work, and discharges undertaken, assisted, authorized, regulated, funded or financed in whole, or 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 human environment. Activities authorized under nationwide permits must satisfy all terms and conditions of the particular permit.

b. Section 401 Water Quality Certification

A Section 401 Water Quality Certification from the North Carolina Division of Water Quality (NCDWQ) is necessary for projects that require Section 404 Permits. If this project qualifies under Nationwide Permit 23, the NCDWQ must be notified, however written concurrence from the NCDWQ is not required.

c. Bridge Demolition and Removal

The bridge superstructure is composed of timber and steel. The bridge substructure is composed of timber and concrete. Since the substructure is made of timber and concrete, there is potential for some of this material to be dropped into Waters of the United States. Permitting will be coordinated such that any permit needed for bridge construction will address issues related to bridge demolition. If the bridge is to be removed in a fashion such that there is a practical alternative to dropping bridge components into the water, that alternative shall be followed.

d. Tennessee Valley Authority

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

3. Avoidance

Bridge No. 166 will be replaced with a double barrel reinforced concrete box culvert. The project purpose necessitates traversing Bates Creek; therefore, totally avoiding surface water impacts is not a practical alternative.

4. Minimization

Best Management Practices will be used in an effort to minimize impacts. No jurisdictional wetlands are present within the Project Study Area.

5. Mitigation

The USACE has adopted, through the CEQ, a wetland mitigation policy which embraces the concepts of "no net loss of wetlands" and sequencing. The purpose of this policy is to restore and maintain the chemical, biological and physical integrity of Waters of the United States, including 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. There are no wetland impacts associated with this project. Mitigation is not expected for any alternative.

The USACE usually requires compensatory mitigation for activities authorized under Section 404 of the Clean Water Act if unavoidable impacts to Waters of the United States total more than 0.10 acre of wetlands or 500 linear feet of perennial and intermittent streams.

The NCDWQ may require compensatory mitigation for activities authorized under Section 401 of the Clean Water Act if unavoidable impacts to waters of the United States total more than 0.10 acre of wetlands and/or 150 linear feet of perennial streams.

A final determination regarding mitigation requirements rests with the USACE.

The project purpose necessitates traversing Bates Creek; therefore, totally avoiding surface water impacts is not a practical alternative.

F. Protected Species

Some populations of fauna and flora have been in, or are in, the process of decline either due to natural forces or their inability to coexist with human activities.

1. Federally Protected Species

Plants and animals with federal classifications of Endangered (E), Threatened (T), Proposed Endangered (PE) and Proposed Threatened (PT) are protected under provisions of Section 7 and Section 9 of the Endangered Species Act (ESA) of 1973, as amended. **Table 3** includes the federally protected species listed by the USFWS for Cherokee County as of August 30, 2004. A brief description of each species' characteristics and habitat follows.

Indiana bat - (*Myotis sodalis*) - Endangered
Family: Vespertilionidae
Date Listed: March 11, 1967
BIOLOGICAL CONCLUSION **NO EFFECT**

The Indiana bat is a medium-sized bat with a dull, chestnut colored back and pink to cinnamon underparts. It is insectivorous, with the males foraging at top tree height, and females and juveniles foraging near the foliage of riparian and floodplain trees. Both sexes forage among streamside and floodplain trees. The males also forage over floodplain ridges and in hillside forests.

Female Indiana bats have summer maternity colonies under loose bark of dead trees near streams. The males' summer habitat is not well known, but they are thought to roost in caves. In late fall, the bats congregate near cave entrances to mate, and then hibernate in those caves throughout the winter. The total population is estimated to be less than 400,000, and 85 percent of the Indiana bats hibernate in only seven caves.

The species' decline is largely attributed to disturbances in the caves where the bats hibernate. These disturbances are often caused by cavers or vandals. Some hibernacula have been blocked off or the climate disrupted through blocking the cave entrance. Bat banding programs and bats as experimental animals may also cause the species' decline.

The bridge was checked for bats on the site visit July 25, 2001. No bats were present. No suitable dead trees were observed near the stream. Therefore, the project will not affect the Indiana bat.

Cumberland bean - (*Villosa trabalis*) - Endangered
Family: Unionidae
Date Listed: June 14, 1976
BIOLOGICAL CONCLUSION **NO EFFECT**

The Cumberland bean is a small to medium-sized (up to 2.2 inches long) freshwater mussel with a relatively thick, elongated oval shell. It has a smooth, shiny, olive green, yellow-black or blackish outer shell and a bluish white inner shell.

Table 3
Federally Protected Species for Cherokee County

Common Name	Scientific Name	Status	Habitat in Project Study Area
Indiana bat	*Myotis sodalis*	Endangered	No
Bog turtle	*Clemmys muhlenbergii*	T(S/A)[1]	No
Cumberland bean	*Villosa trabalis*	Endangered	Yes
Little-wing pearlymussel[#]	*Pegias fibula*	Endangered	Yes
Small-whorled pogonia	*Isotria medeoloides*	Threatened	No

Endangered species are in danger of becoming extinct throughout all or a significant portion of their range.
Threatened species are likely to become endangered within the foreseeable future throughout all or a significant portion of their range.

Obscure record, the date and/or location of this observation is uncertain.

[1] On November 4, 1997, the northern population of bog turtles (from Maryland to New York) was listed as threatened. The southern population was listed as threatened due to similarity of appearance (T(S/A)). This listing bans collection, interstate and international commercial trade in bog turtles, but it has no effect on private landowners.

The Cumberland bean lives in small rivers and streams in fast riffles with gravel or sand and gravel substrate. Impoundments, siltation, channelization, and water pollution are thought to be major causes for the species' decline. The species is known to inhabit streams in the Cumberland and Tennessee river basins. No specimens have been collected in North Carolina, but the habitat is suitable in the Hiwassee River below Appalachia Dam, and scientists believe that the mussel is likely to occur in that system.

No mussels of any species were observed in the creek. Appropriate habitat does not exist in the project area because the stream was too small and too high a gradient. Therefore, the project will not affect the Cumberland bean.

Little-wing pearlymussel - (*Pegias fibula*) - Endangered
Family: Unionidae
Date Listed: November 14, 1988
BIOLOGICAL CONCLUSION **NO EFFECT**

The little-wing pearly mussel is a small (1.5 inch) mussel. The outer shell is usually eroded, making it a chalky or ashy-white color. When it is not eroded, it is light green or dark yellowish brown, with dark rays spreading across the front.

Little-wing pearly mussels inhabit small to medium, cool streams with moderate to high gradient and low turbidity. They are generally found in the transition zone between riffles and pools. Deterioration of water quality, especially from acid mine drainage, is thought to be a major factor in the species' decline. The little-wing appears to be especially sensitive to water quality, and has been extirpated from polluted stretches of stream where the Cumberland-bean (see above) still survives.

No mussels of any species were observed in the creek. Appropriate habitat does not exist in the project area because the stream was too small and too high a gradient. Therefore, the project will not affect the little-wing pearlymussel.

Small-whorled pogonia - (*Isotria medeoloides*) - **Threatened**
Family: Orchid
Date Listed: November 7, 1994
BIOLOGICAL CONCLUSION **NO EFFECT**

Small-whorled pogonia is a 3.7 to 9.8 inch perennial with long, pubescent roots and a smooth, hollow stem ending in five to six drooping pale green leaves up to 3.1 by 1.6 inches. One or occasionally two yellowish green and purple flowers grow at the top of the stem. Flowering occurs from about mid-May to mid-June, with the flowers only lasting a few days to a few weeks. The plant does not always flower annually. If pollination occurs, a 0.8 to 1.4 inch capsule develops.

The plant grows in open, dry deciduous forests, along wooded slopes and along streams. It prefers acid soils.

The soils in the project area are acidic. However, no individuals were observed during the site visits on May 22 or November 8, 2001. Given the extent of disturbance in the Project Study Area, no suitable habitat exists. Therefore, the project will not affect the small-whorled pogonia.

Bog Turtle - *(Clemmys muhlenbergii)* – T(S/A)
Family: Emydidae
Date Listed: November 4, 1997

Table 3 lists the Federal Threatened Species due to Similarity of Appearance (T(S/A)). These are species that are not Threatened or Endangered themselves, but are listed to protect Threatened or Endangered species that may be difficult to differentiate. These species are not subject to Section 7.

There is one Federal Threatened Species Due to Similarity of Appearance (T(S/A)), the bog turtle (*Clemmys muhlenbergii)*, listed for Cherokee County. Directed surveys for the Bog turtle were not conducted during the site visits, nor was this species observed. There is no suitable habitat for this species in the project vicinity. Therefore, the project will not affect the bog turtle.

2. Federal Species of Concern (FSC)

There are fifteen Federal Species of Concern (FSC) listed for Cherokee County. Federal Species of Concern are not afforded federal protection under the ESA and are not subject to any of its provisions, including Section 7, until they are formally proposed or listed as Threatened or Endangered. Federal Species of Concern are defined as those species that may or may not be listed in the future. These species were formally candidate species, or species under consideration for listing for which there was insufficient information to support a listing of Endangered, Threatened, Proposed Endangered or Proposed Threatened.

Table 4 lists Federal Species of Concern, the species state status and the existence of suitable habitat for each species in the study area. This species list is provided for information purposes, as the status of these species may be upgraded in the future.

Surveys for these species were not conducted during the site visits, nor were any of these species observed.

Table 4
Federal Species of Concern (FSC) for Cherokee County

Common Name	Scientific Name	State Status	Habitat
Vertebrates			
Hellbender	*Cryptobranchus muhlenbergii*	T	Yes
Junaluska salamander	*Eurycea junaluska*	SC	Yes
Northern pine snake[+]	*Pituophis melanoleucus melanoleucus*	SC	Yes
Olive darter	*Percina squamata*	SC	Yes
Rafinesque's big-eared bat	*Corynorhinus* (=*Plecotus*) *rafinesquii*	SC	Yes
Sicklefin redhorse	*Moxostoma* sp.	SR	Yes
Invertebrates			
Diana fritillary butterfly	*Speyeria diana*	SR	Yes
Hiwassee crayfish	*Cambarus hiwasseensis*	SR	Yes

Knotty rocksnail	*Lithasia christyi*	NL	-
Parrish crayfish	*Cambarus parrishi*	NL	-
Tennessee clubshell	*Pleurobema oviforme*	SR	Yes
Tennessee Heelsplitter[+]	*Lasmigona holstonia*	E	No
Vascular Plants			
Hairy blueberry	*Vaccinium hirsutum*	C	No
Mountain catchfly	*Silene ovata*	C	Yes
White fringeless orchid[+]	*Platanthera integrilabia*	E	No

C = Candidate – Species which are very rare in North Carolina (NC) and throughout their range. These have a preponderance of their population in NC, and their fate largely depends on conservation here. Also species which have been extirpated from NC.
E = Endangered - A species whose viable continued existence is determined to be in jeopardy.
NL = Not Listed
SC = Special Concern – A species which requires monitoring, but which may be collected under specific regulations.
SR = Significantly Rare – A species which has not been listed as Endangered, Threatened, or Special Concern, but which exists in the state in small numbers and has been determined to need monitoring.
T = Threatened – A species which is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range.

[+] Last observed in the county more than 50 years ago.

VI. CULTURAL RESOURCES

A. Compliance Guidelines

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

B. Historic Architecture

All structures within the Area of Potential Effects (APE) and surroundings were photographed, and later reviewed by NCDOT architectural historians and staff of the State Historic Preservation Office (HPO). In a concurrence form dated October 18, 2001 the State Historic Preservation Officer concurred there are no historic architectural

resources either listed 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 June 7, 2001, stated "there are no known archaeological sites within the project area." Based on the SHPO's knowledge of the study area, "it is unlikely that any archaeological resources... will be affected by the project construction." The SHPO recommends that no archaeological investigation be conducted in connection with this project. A copy of the SHPO letter is included in the Appendix.

VII. ENVIRONMENTAL EFFECTS

Summary. The project is a Federal "Categorical Exclusion" due to its limited scope and lack of substantial environmental consequences. The project is expected to have an overall positive impact. Replacement of an inadequate bridge will result in safer traffic operations. The bridge replacement will not have an adverse effect on the quality of the human or natural environment with the implementation of current NCDOT standards and specifications. On the basis of information included in this document, it is concluded that no substantial adverse environmental effects will result from implementation of the project.

Land Use Planning. Cherokee County does not have any land use plan or zoning regulations. Therefore, 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 construction of the project.

Community Services and Facilities. No adverse effects on public facilities or services are anticipated. The project is not expected to adversely affect social, economic, or religious opportunities in the area.

Relocations. No relocatees or relocations are expected with the implementation of Alternative 2 (Preferred Alternative).

Utilities. Major existing utilities within the immediate project study area include a sanitary sewer line and telephone lines. All utility providers will be contacted and coordinated with to ensure that the proposed design and construction of the project will not disrupt service.

Section 4(f) Resources. There are no publicly owned parks, recreational facilities, or wildlife and waterfowl refuges of national, state, or local significance in the vicinity of the project. This project does not require right-of-way acquisition or easement from any land protected under Section 4(f) of the Department of Transportation Act of 1966.

Air Quality. This project is an air quality "neutral" project. Therefore, it is not required to be included in the regional emission analysis and a project level carbon monoxide analysis is not required.

The project is located in Cherokee 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.

If vegetation is disposed of by burning, all burning shall be done in accordance with applicable local laws and regulations of the North Carolina SIP for air quality in compliance with 15 NCAC 2D.0520.

This evaluation completes the assessment requirements for air quality (1990 CAAA and NEPA) and no additional reports are required.

Noise. Because traffic volumes will not increase or decrease because of this project and there are no noise sensitive receptors located in the immediate area of this project, no noise impacts attributable to this project are expected.

Noise levels can increase during construction, but this increase will be temporary. Heavy construction equipment and blasting operations (if required) will generate noise and vibration.

The NCDOT may also monitor construction noise and require abatement where limits are exceeded.

This evaluation completes the assessment requirements for highway traffic noise (23 CFR Part 772) and no additional reports are required.

Hazardous Materials. A field reconnaissance survey was conducted in the vicinity of the existing bridge. A file search at the North Carolina Department of Environmental and Natural Resources, Division of Environmental Management, Groundwater Section and the NC Dept of Human Resources, Solid Waste Management Section was conducted to identify any known problem sites along the proposed project alignment. No underground storage tank facilities or hazardous waste sites are known to be present in the Project Study Area.

Prime and Important Farmland. The Farmland Protection Policy Act requires all federal agencies or their representatives to consider the potential impacts to prime and important farmland soils by all land acquisition and construction projects. Prime and important farmland soils are defined by the United States Department of Agriculture Natural Resources Conservation Service (USDA NRCS). An assessment was completed using Form AD 1006 to determine if the project's impact on Prime and Important Farmland would require consideration of mitigation. This project was not submitted to NRCS for land evaluation due to the low site assessment criteria score. The completed form is included in the Appendix.

Floodplains. Bates Creek is not included in the Cherokee County Flood Insurance Study.

Geodetic Survey Markers. No geodetic survey markers will be impacted.

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

VIII. AGENCY COORDINATION

Local, state, and federal agencies were contacted to provide technical assistance in identifying the key issues and potential impacts associated with the proposed project with scoping letters mailed on June 1, 2001.

Agency Comments

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

North Carolina Wildlife Resource Commission (NCWRC)
Comment:

> *"The upper portion of Bates Creek is on gamelands and is designated wild trout. Trout are also likely below the bridge replacement. We will require a trout moratorium from Oct. 15th-April 15th. NCDOT should adhere to strict erosion control measures."*

Response: See Green Sheet for commitments.

Comment:

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

Response: The proposed culvert will be buried to allow fish passage. Human passage is not required. The stream is too narrow and shallow for canoeists or boaters to use. This stream crossing is located in a developed area. The double barrel culvert and the shallow nature of the stream will allow for wildlife passage. The culvert will be less than 150 linear feet in length; therefore, mitigation is not expected for this project.

Comment:

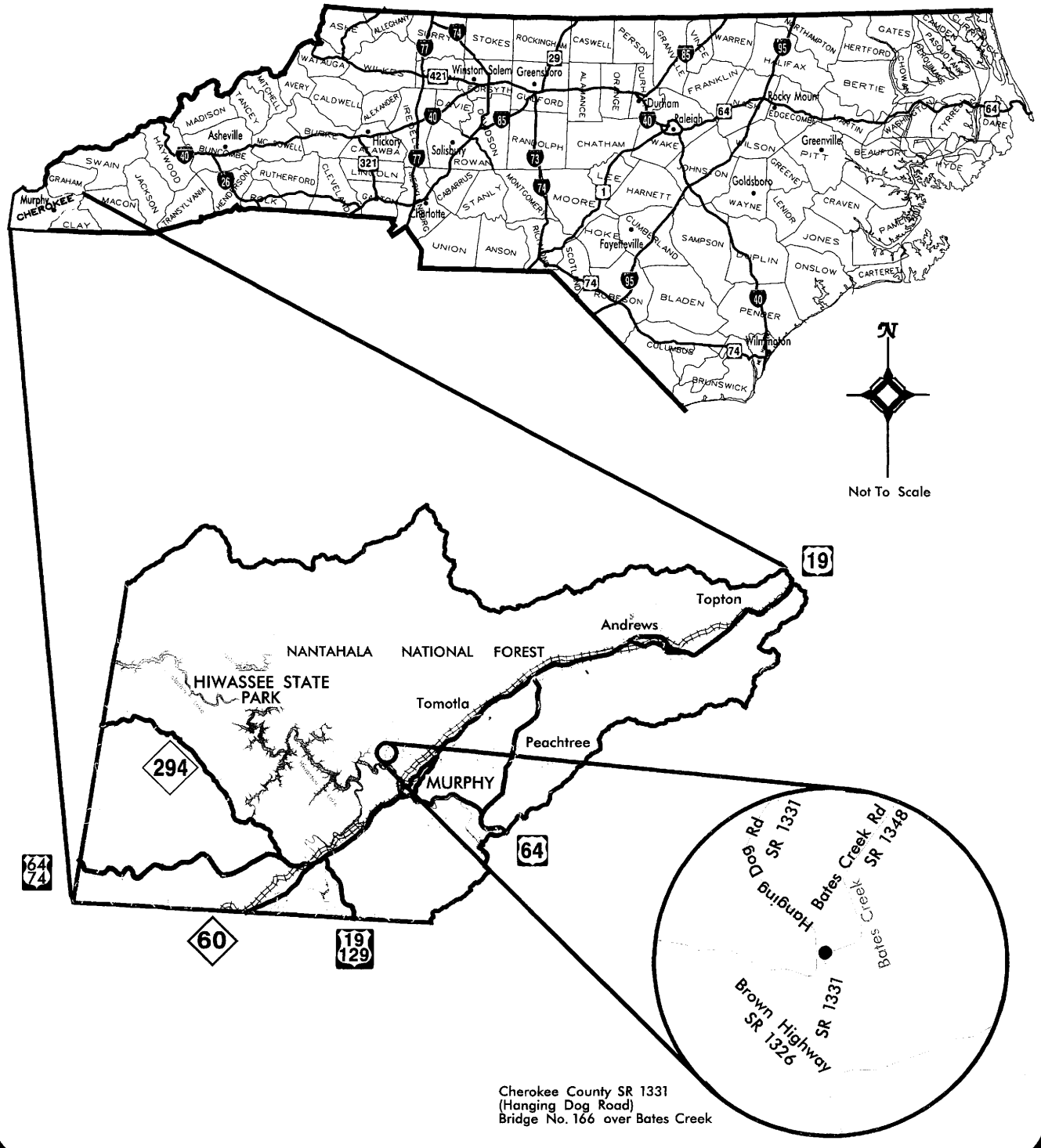
> *"Culverts or pipes should be situated so that no channel realignment or widening is required. Widening of the stream channel at the inlet or outlet of structures usually causes a decrease in water velocity causing sediment deposition that will require future maintenance."*

Response: No channel realignment or widening is expected with this project.

United States Fish and Wildlife Service (USFWS)
Comments:

1. *There are numerous records of sicklefin redhorse, a Species of Federal Concern, in many streams in the vicinity of this bridge. The stream should be sampled for this species and any new bridge should not alter habitat or passage for this species.*

Response: The NCDOT will sample Bates Creek for the sicklefin redhorse before project letting. However, because the sicklefin redhorse is not a federally protected species, a sample is not required for this Categorical Exclusion. This commitment also is listed on the Green Sheet. The proposed culvert will be buried for passage.



NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

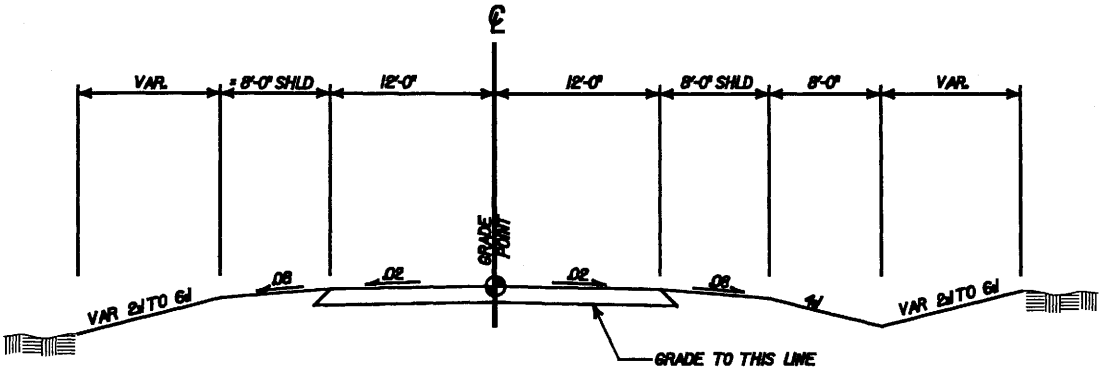
TIP NO. B-3826

CHEROKEE COUNTY SR 1331 (HANGING DOG ROAD) BRIDGE NO. 166 OVER BATES CREEK

PROJECT LOCATION MAP

FIGURE 1

...\NCDOT\28058-BRIDGES\PLANNING\3826.DGN

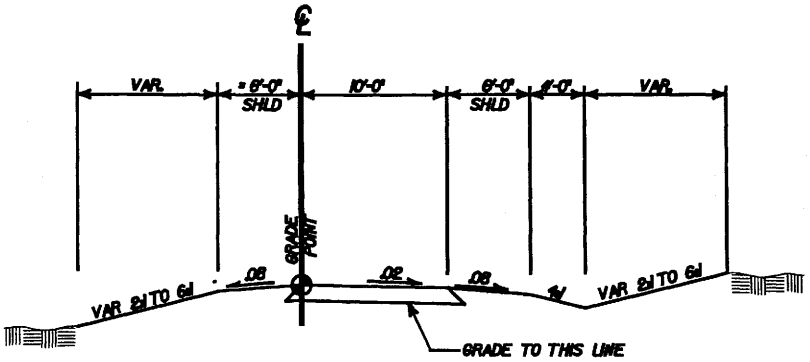


* 11' WHERE GUARDRAIL REQUIRED

TYPICAL SECTION NO.1

ALTERNATES 1, 2, & 3 - Final Roadway

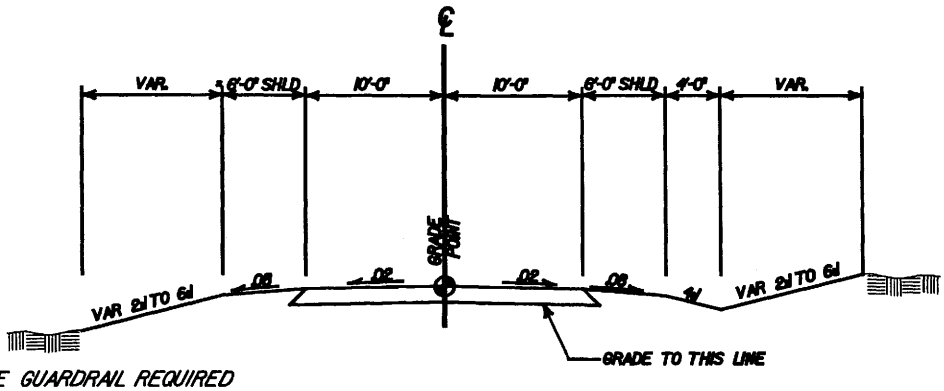
NOTE: Maintain existing shoulder from -L- Sta. 10+00 to 11+50 LT.



* 8' WHERE GUARDRAIL REQUIRED

TYPICAL SECTION NO.2

ONE LANE DETOUR SR 1331
ALT. 2 (Preferred Alternative)



* 8' WHERE GUARDRAIL REQUIRED

TYPICAL SECTION NO.3

DETOUR SR 1331
ALT. 3

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

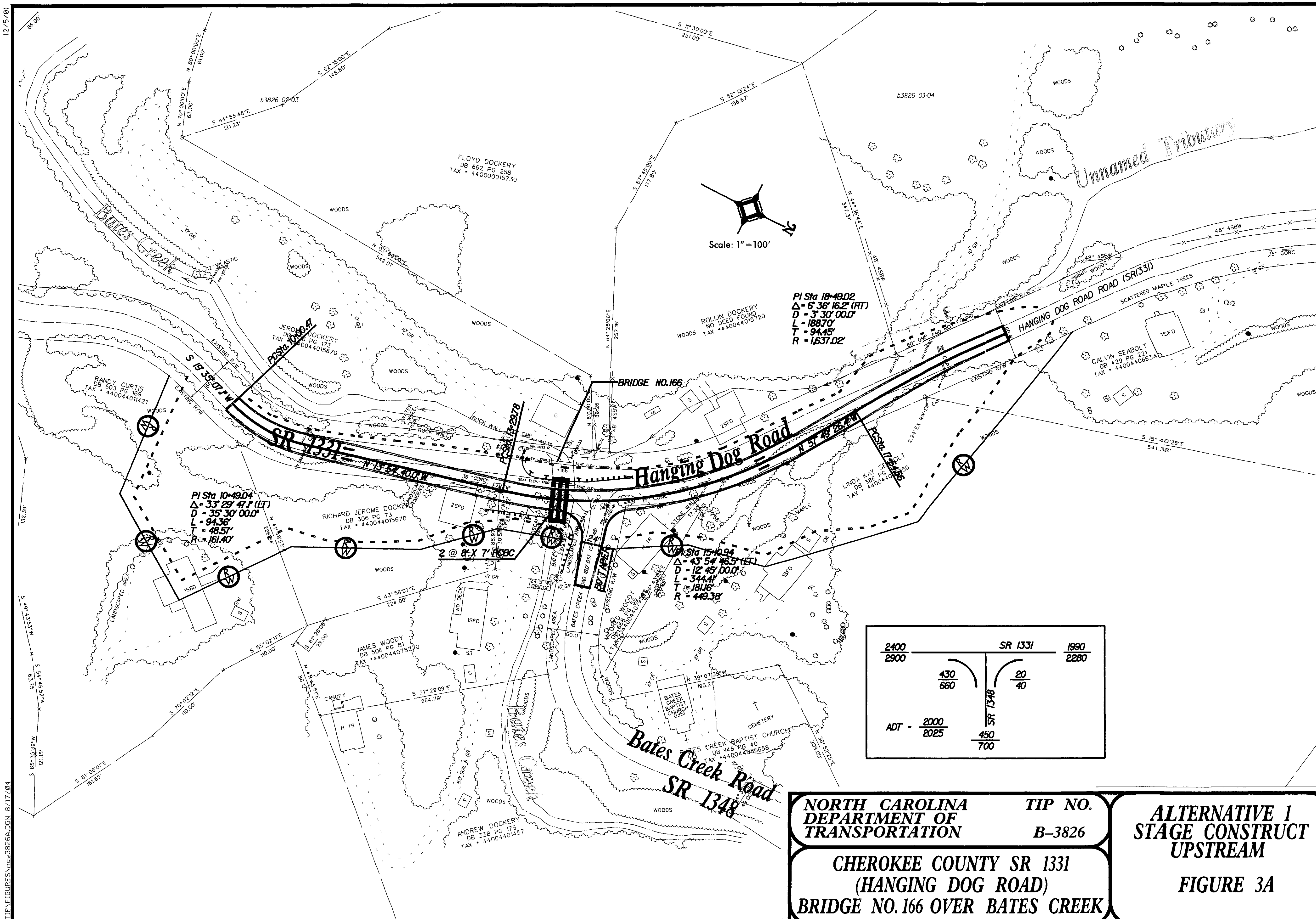
TIP NO. B-3826

CHEROKEE COUNTY SR 1331 (HANGING DOG ROAD) BRIDGE NO. 166 OVER BATES CREEK

TYPICAL SECTIONS

FIGURE 2

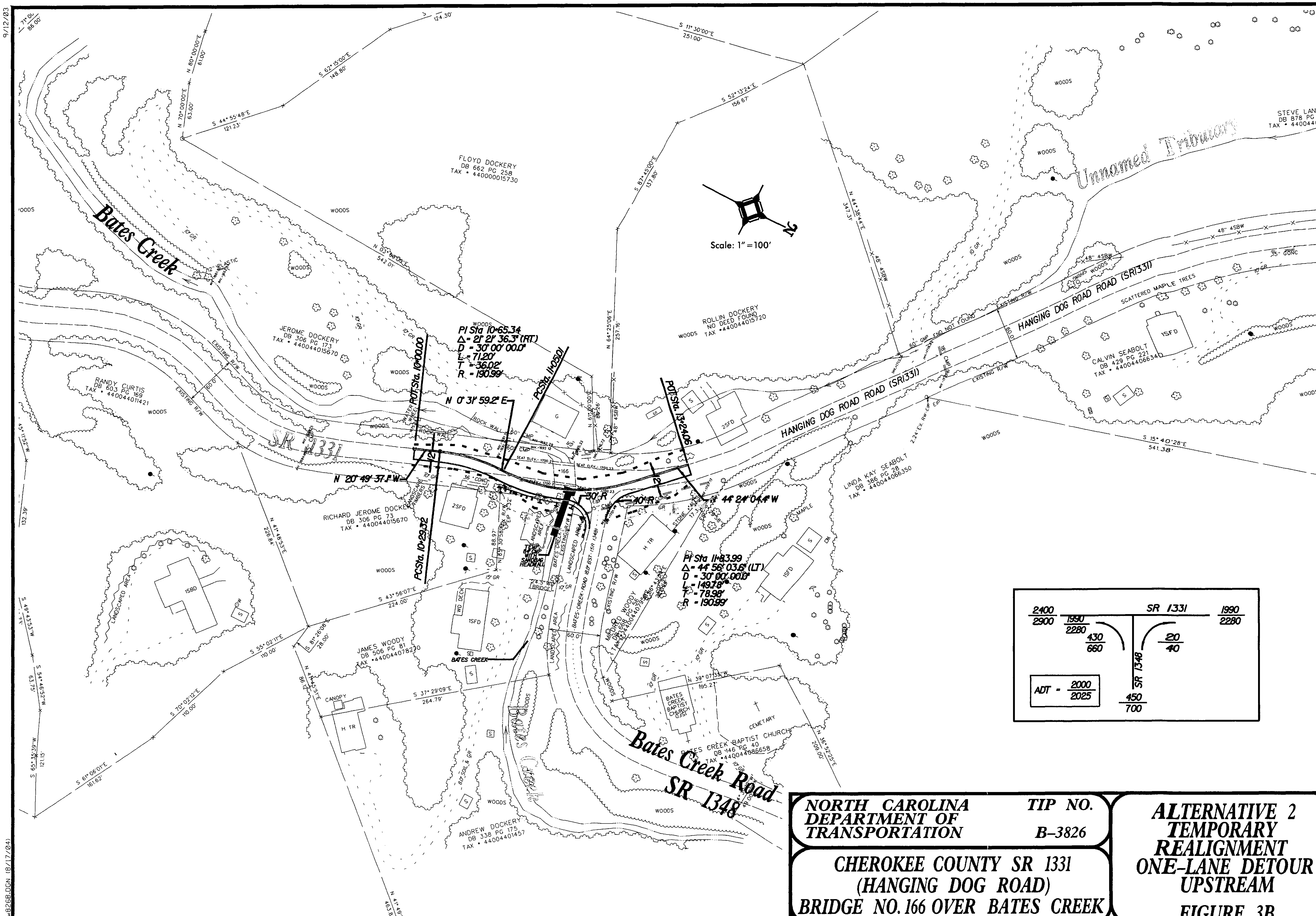
3826TYPNEW.DGN


SR 1331
Hanging Dog Road
HANGING DOG ROAD ROAD (SR1331)
Bates Creek Road
SR 1348
Bates Creek
Unnamed Tributary
BRIDGE NO.166
Scale: 1"=100'
FLOYD DOCKERY
DB 662 PG 258
TAX # 440000015730
ROLLIN DOCKERY
NO DEED FOUND
TAX # 440044015720
RANDY CURTIS
DB 603 PG 169
TAX # 440044011421
RICHARD JEROME DOCKERY
DB 306 PG 73
TAX # 440044015670
JAMES WOODY
DB 506 PG 81
TAX # 440044078230
ANDREW DOCKERY
DB 338 PG 175
TAX # 440044014457
CALVIN SEABOLT
DB 429 PG 221
BATES CREEK BAPTIST CHURCH
CEMETERY
PI Sta 10+49.04
Δ = 33° 29' 47.1" (LT)
D = 35° 30' 00.0"
L = 94.36'
T = 48.57'
R = 161.40'
PI Sta 18+49.02
Δ = 6° 36' 16.2" (RT)
D = 3° 30' 00.0"
L = 188.70'
T = 94.45'
R = 1,637.02'
PI Sta 15+10.94
Δ = 43° 54' 46.5" (LT)
D = 12° 45' 00.0"
L = 344.41'
T = 181.16'
R = 449.38'
2 @ 8' X 7' RCBC
2400
2900
SR 1331
1990
2280
430
660
20
40
SR 1348
ADT = 2000
2025
450
700

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION	TIP NO. B-3826	ALTERNATIVE 1 STAGE CONSTRUCT UPSTREAM
CHEROKEE COUNTY SR 1331 (HANGING DOG ROAD) BRIDGE NO. 166 OVER BATES CREEK		FIGURE 3A

12/5/01

\TIP\FIGURES\new3826A.DGN 8/17/04


Bates Creek
SR 1331
HANGING DOG ROAD ROAD (SR1331)
Unnamed Tributary
Bates Creek Road
SR 1348
Scale: 1" = 100'
FLOYD DOCKERY
DB 662 PG 258
TAX # 440000015730
ROLLIN DOCKERY
NO DEED FOUND
TAX #440044015720
JEROME DOCKERY
DB 306 PG 173
TAX # 440044015670
RANDY CURTIS
DB 603 PG 169
TAX # 440044011421
RICHARD JEROME DOCKERY
DB 306 PG 73
TAX # 440044015670
JAMES WOODY
DB 506 PG 81
LINDA KAY SEABOLT
DB 386 PG 28
TAX # 440044066350
CALVIN SEABOLT
DB 429 PG 221
STEVE LANEY
DB 878 PG 5
BATES CREEK BAPTIST CHURCH
DB 146 PG 40
CEMETARY
ANDREW DOCKERY
DB 338 PG 175
TAX # 440044401457
PI Sta 10+65.34
Δ = 21° 21' 36.3" (RT)
D = 30° 00' 00.0"
L = 71.20'
T = 36.02'
R = 190.99'
PI Sta 11+83.99
Δ = 44° 56' 03.6" (LT)
D = 30° 00' 00.0"
L = 149.78'
T = 78.98'
R = 190.99'
POT Sta. 10+00.00
PC Sta. 11+05.01
POT Sta. 13+24.06
PC Sta. 10+29.32
N 0° 31' 59.2" E
N 20° 49' 37.1" W
N 44° 24' 04.4" W
SR 1331
2400
2900
1990
2280
1990
2280
430
660
20
40
SR 1348
450
700
ADT = 2000
2025

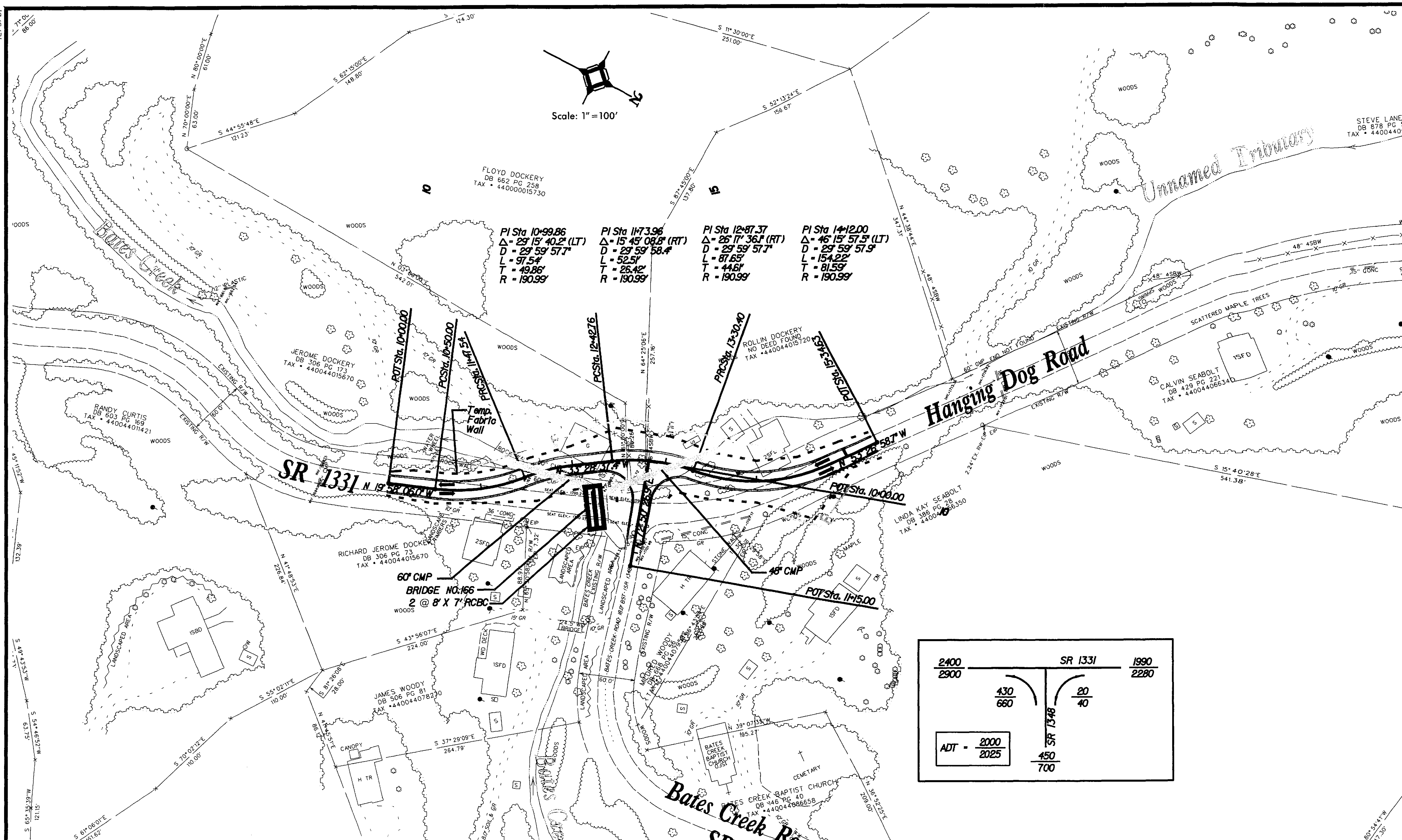
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

TIP NO. B-3826

CHEROKEE COUNTY SR 1331 (HANGING DOG ROAD) BRIDGE NO. 166 OVER BATES CREEK

ALTERNATIVE 2 TEMPORARY REALIGNMENT ONE-LANE DETOUR UPSTREAM

FIGURE 3B



Scale: 1" = 100'
FLOYD DOCKERY
DB 662 PG 258
Unnamed Tributary
Bates Creek
PI Sta 10+99.86
Δ - 29° 15' 40.2" (LT)
D - 29° 59' 57.7"
L - 97.54'
T - 49.86'
R - 190.99'
PI Sta 11+73.96
Δ - 15° 45' 08.8" (RT)
D - 29° 59' 58.4"
L - 52.51'
T - 26.42'
R - 190.99'
PI Sta 12+87.37
Δ - 26° 17' 36.1" (RT)
D - 29° 59' 57.7"
L - 87.65'
T - 44.61'
R - 190.99'
PI Sta 14+12.00
Δ - 46° 15' 57.5" (LT)
D - 29° 59' 57.9"
L - 154.22'
T - 81.59'
R - 190.99'
JEROME DOCKERY
DB 306 PG 173
ROLLIN DOCKERY
NO DEED FOUND
CALVIN SEABOLT
DB 429 PG 221
STEVE LANEY
DB 878 PG 5
RANDY CURTIS
DB 603 PG 169
Hanging Dog Road
SR 1331
Temp. Fabric Wall
POT Sta. 10+00.00
PC Sta. 10+50.00
PRC Sta. 11+47.54
PC Sta. 12+42.76
PRC Sta. 13+30.40
POT Sta. 15+34.63
POT Sta. 10+00.00
POT Sta. 11+15.00
60" CMP
BRIDGE NO. 166
2 @ 8' X 7' RCBC
48" CMP
RICHARD JEROME DOCKERY
DB 306 PG 73
LINDA KAY SEABOLT
DB 386 PG 28
JAMES WOODY
DB 506 PG 81
ANDREW DOCKERY
DB 338 PG 175
BATES CREEK BAPTIST CHURCH
DB 146 PG 40
CEMETARY
Bates Creek Road
SR 1348
2400
2900
SR 1331
1990
2280
430
660
20
40
SR 1348
450
700
ADT - 2000 / 2025

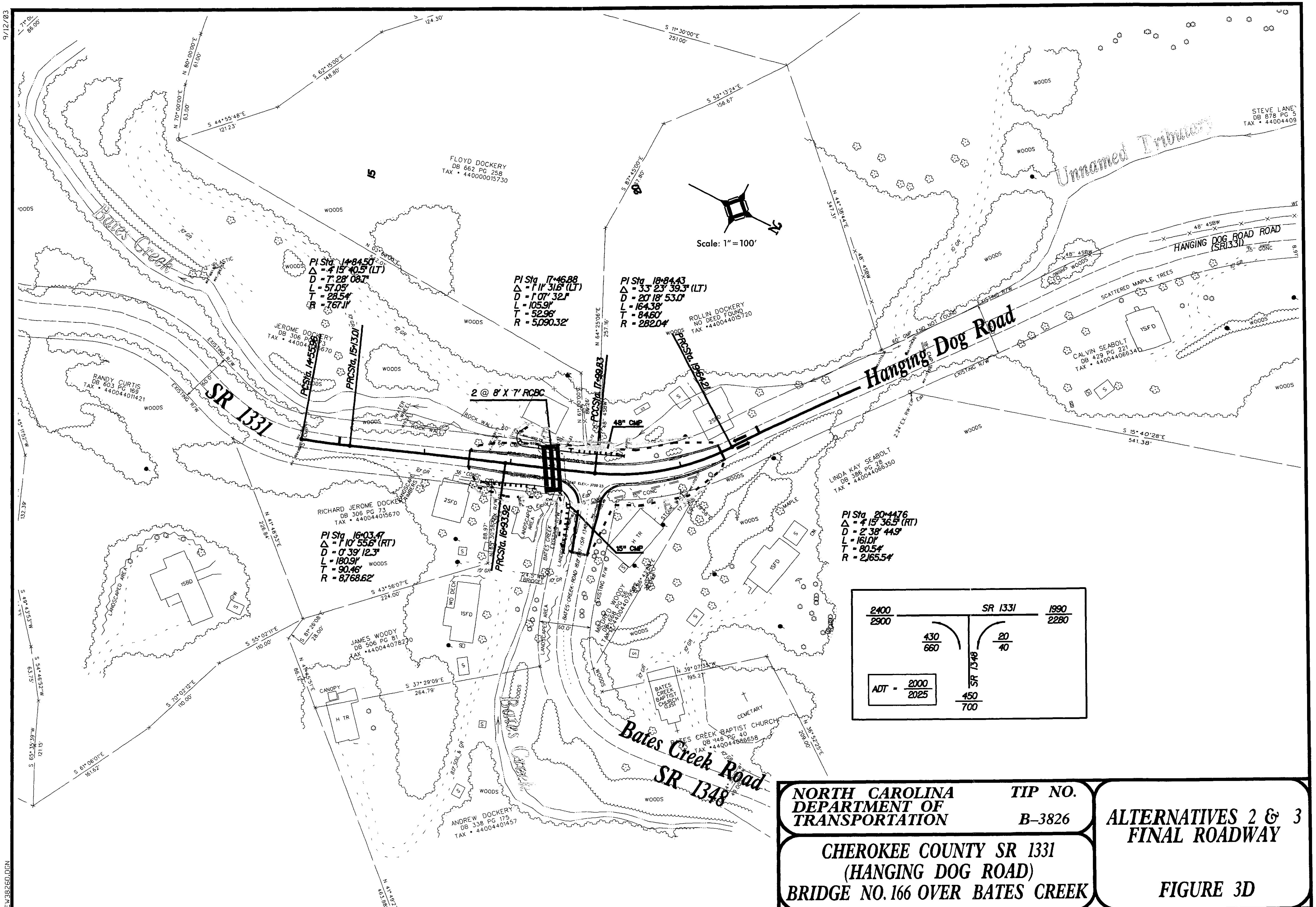
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

TIP NO. B-3826

CHEROKEE COUNTY SR 1331 (HANGING DOG ROAD) BRIDGE NO. 166 OVER BATES CREEK

ALTERNATIVE 3 TEMPORARY REALIGNMENT DETOUR DOWNSTREAM

FIGURE 3C



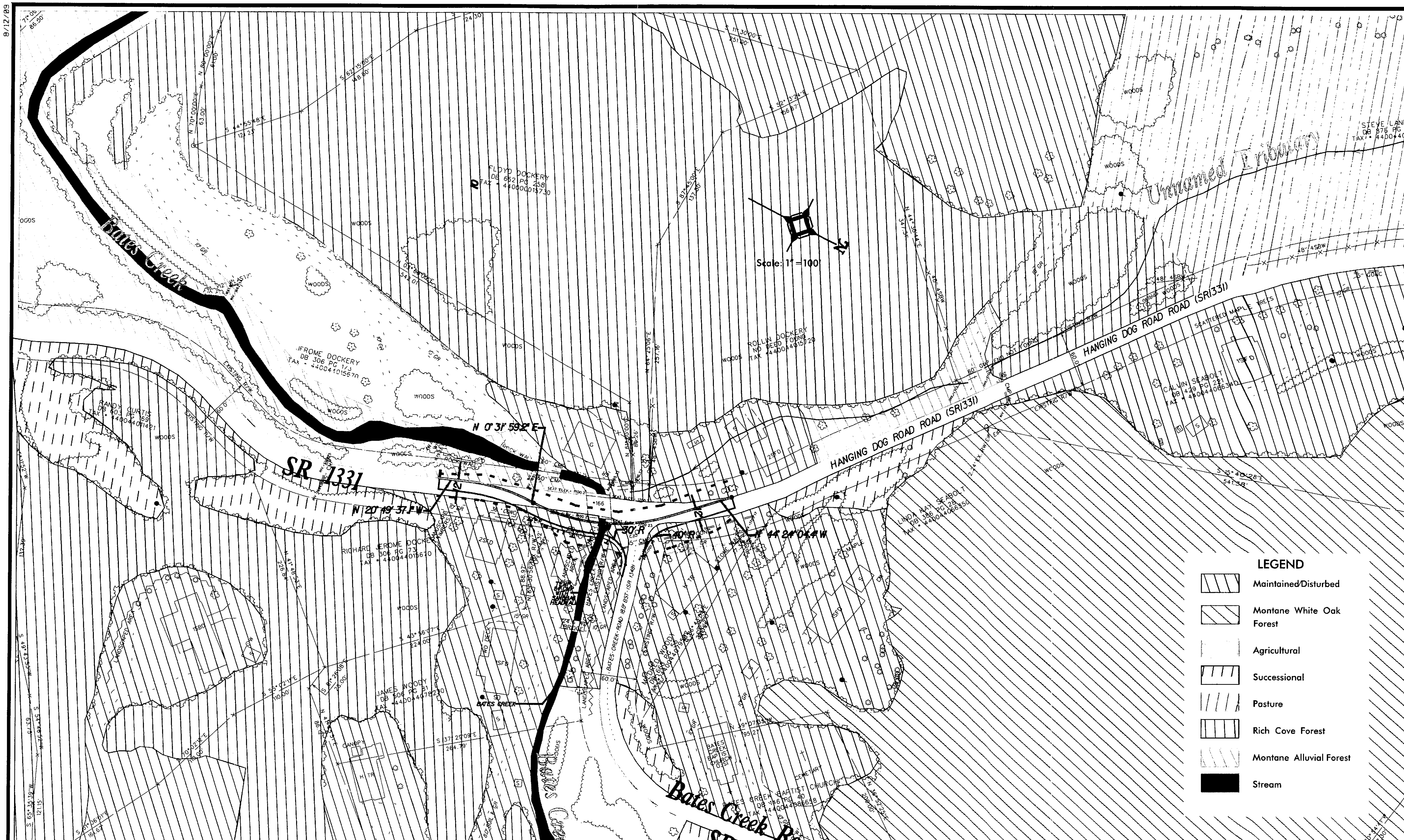
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

TIP NO. B-3826

ALTERNATIVES 2 & 3 FINAL ROADWAY

CHEROKEE COUNTY SR 1331 (HANGING DOG ROAD) BRIDGE NO. 166 OVER BATES CREEK

FIGURE 3D



NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

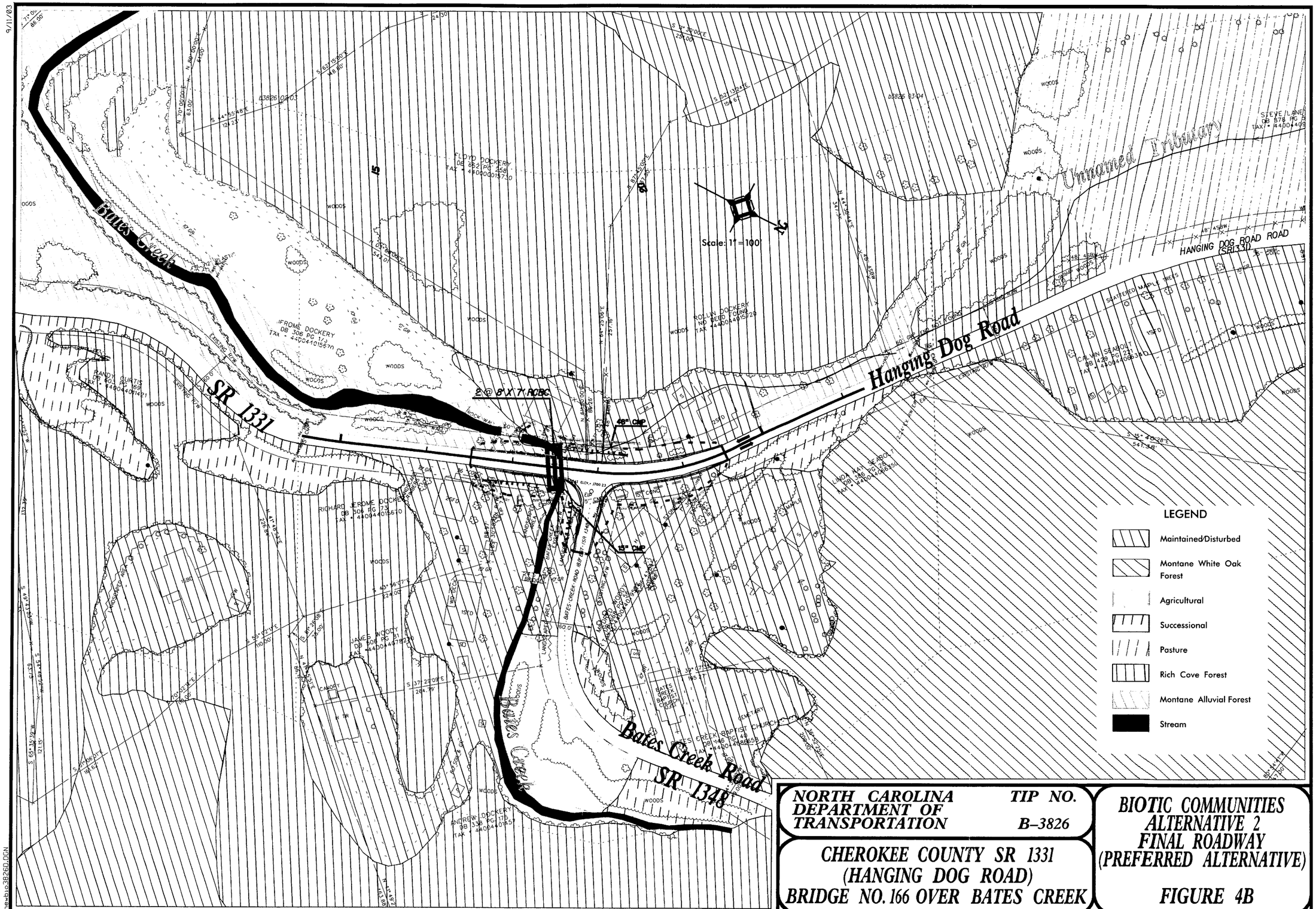
TIP NO. B-3826

CHEROKEE COUNTY SR 1331 (HANGING DOG ROAD) BRIDGE NO. 166 OVER BATES CREEK

BIOTIC COMMUNITIES FOR ALTERNATIVE 2 ONE LANE DETOUR (PREFERRED ALTERNATIVE)

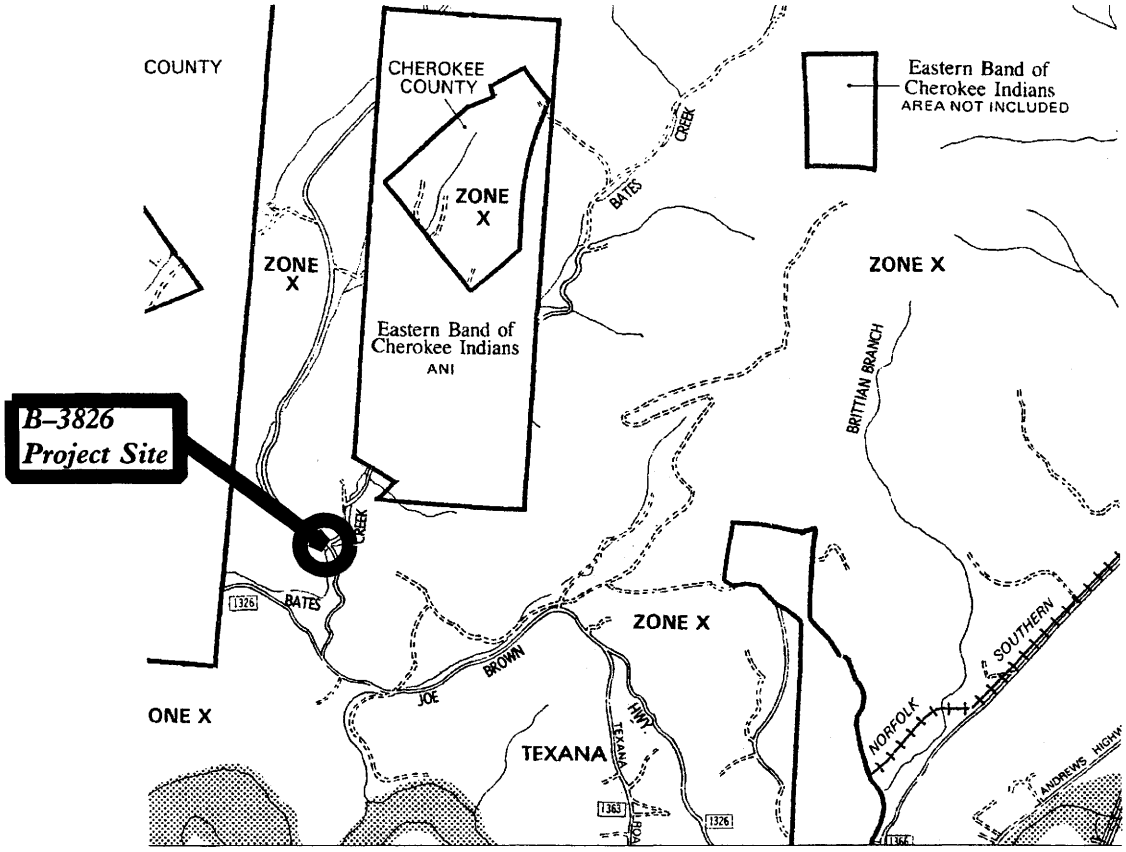
FIGURE 4A

9/11/03



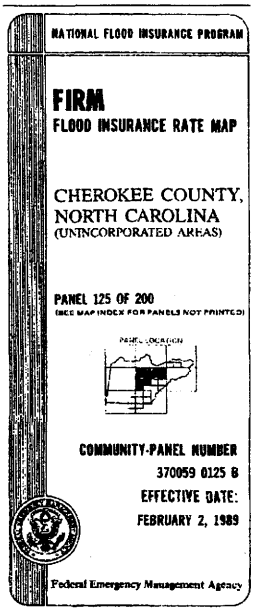
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION	TIP NO. B-3826
CHEROKEE COUNTY SR 1331 (HANGING DOG ROAD) BRIDGE NO. 166 OVER BATES CREEK	BIOTIC COMMUNITIES ALTERNATIVE 2 FINAL ROADWAY (PREFERRED ALTERNATIVE) FIGURE 4B

newbio3826D.DGN



APPROXIMATE SCALE IN FEET

2000 0 2000



NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

TIP NO. B-3826

CHEROKEE COUNTY SR 1331 (HANGING DOG ROAD) BRIDGE NO. 166 OVER BATES CREEK

FEMA FLOOD MAP

FIGURE 5

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

June 7, 2001

Suzanna Spence
PBS&J
3214 Spring Forest Road
Raleigh NC 27616

Re: Bridge replacement, TIP No. B-3826, Cherokee County, ER 01-9490

Dear Ms. Spence:

We have received information about the above project.

In terms of historic architectural resources, we are aware of o structures located within the general project area. We recommend that a historic architecture survey be conducted for this project.

There are no known archaeological sites within the project area. Based on our knowledge of the area, it is unlikely that any archaeological resources, which may be eligible for inclusion 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, contact Renee Gledhill-Earley, Environmental Review Coordinator, at 919/733-4763.

Sincerely,

Renee Gledhill-Earley

David Brook
Deputy State Historic Preservation Officer

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-1331(5)) *TIP* # B-3826 *County*: Cherokee

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

Project Description: Replace Bridge No. 156 on SR 1331 over Bates Creek

On 10/18/01, representatives of the

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

Reviewed the subject project at

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

All parties present agreed

- [ ] There are no properties over fifty years old within the project's area of potential effects.
- [x] There are no properties less than fifty years old which are considered to meet Criteria Consideration G within the project's area of potential effects.
- [x] There are properties over fifty years old within the project's Area of Potential Effects (APE), but based on the historical information available and the photographs of each property, properties identified as Prop 1-4 are considered not eligible for the National Register and no further evaluation of them is necessary.
- [x] There are no National Register-listed or Study Listed properties within the project's area of potential effects.
- [ ] All properties greater than 50 years of age located in the APE have been considered at this consultation, and based upon the above concurrence, all compliance for historic architecture with Section 106 of the National Historic Preservation Act and GS 121-12(a) has been completed for this project.
- [x] There are no historic properties affected by this project. (*Attach any notes or documents as needed*)

Signed:

Mary Pope Furr — 10.18.01
Representative, NCDOT — Date

Michael C. Dawson — 10/18/01
FHWA, for the Division Administrator, or other Federal Agency — Date

Claudia A Brown — 10-18-01
Representative, HPO — Date

David Brook — 10/18/01
State Historic Preservation Officer — Date

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

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

June 7, 2001

Suzanna Spence
PBS&J
3214 Spring Forest Road
Raleigh NC 27616

Re: Bridge replacement, TIP No. B-3826, Cherokee County, ER 01-9490

Dear Ms. Spence:

We have received information about the above project.

In terms of historic architectural resources, we are aware of o structures located within the general project area. We recommend that a historic architecture survey be conducted for this project.

There are no known archaeological sites within the project area. Based on our knowledge of the area, it is unlikely that any archaeological resources, which may be eligible for inclusion 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, contact Renee Gledhill-Earley, Environmental Review Coordinator, at 919/733-4763.

Sincerely,

Renee Gledhill-Earley

David Brook
Deputy State Historic Preservation Officer

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-1331(5)) · *TIP* # B-3826 *County*: Cherokee

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

Project Description: Replace Bridge No. 156 on SR 1331 over Bates Creek

On 10/18/01, representatives of the

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

Reviewed the subject project at

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

All parties present agreed

- [ ] There are no properties over fifty years old within the project's area of potential effects.
- [x] There are no properties less than fifty years old which are considered to meet Criteria Consideration G within the project's area of potential effects.
- [x] There are properties over fifty years old within the project's Area of Potential Effects (APE), but based on the historical information available and the photographs of each property, properties identified as Prop 1-4 are considered not eligible for the National Register and no further evaluation of them is necessary.
- [x] There are no National Register-listed or Study Listed properties within the project's area of potential effects.
- [ ] All properties greater than 50 years of age located in the APE have been considered at this consultation, and based upon the above concurrence, all compliance for historic architecture with Section 106 of the National Historic Preservation Act and GS 121-12(a) has been completed for this project.
- [x] There are no historic properties affected by this project. (*Attach any notes or documents as needed*)

Signed:

Mary Pope Furr — 10.18.01
Representative, NCDOT — Date

Michael C. Dawson — 10/18/01
FHWA, for the Division Administrator, or other Federal Agency — Date

Claudia A Brown — 10-18-01
Representative, HPO — Date

David Brook — 10/18/01
State Historic Preservation Officer — Date

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

U.S. DEPARTMENT OF AGRICULTURE
Natural Resources Conservation Service

NRCS-CPA-106
(Rev. 1-91)

FARMLAND CONVERSION IMPACT RATING FOR CORRIDOR TYPE PROJECTS

PART I *(To be completed by Federal Agency)*	3. Date of Land Evaluation Request	4. Sheet 1 of 1
1. Name of Project **B-3826**	5. Federal Agency Involved **Federal Highway Administration**	
2. Type of Project **Bridge Replacement**	6. County and State **Cherokee, North Carolina**	
PART II *(To be completed by NRCS)*	1. Date Request Received by NRCS	2. Person Completing Form
3. Does the corridor contain prime, unique statewide or local important farmland? (If no, the FPPA does not apply - Do not complete additional parts of this form). YES ☐ NO ☐		4. Acres Irrigated / Average Farm Size
5. Major Crop(s)	6. Farmable Land in Government Jurisdiction Acres: %	7. Amount of Farmland As Defined in FPPA Acres: %
8. Name Of Land Evaluation System Used	9. Name of Local Site Assessment System	10. Date Land Evaluation Returned by NRCS

PART III *(To be completed by Federal Agency)*		Alternative Corridor For Segment			
		Corridor A	Corridor B	Corridor C	Corridor D
A. Total Acres To Be Converted Directly					
B. Total Acres To Be Converted Indirectly, Or To Receive Services					
C. Total Acres In Corridor		0	0	0	0
PART IV *(To be completed by NRCS) Land Evaluation Information*					
A. Total Acres Prime And Unique Farmland					
B. Total Acres Statewide And Local Important Farmland					
C. Percentage Of Farmland In County Or Local Govt. Unit To Be Converted					
D. Percentage Of Farmland In Govt. Jurisdiction With Same Or Higher Relative Value					
PART V *(To be completed by NRCS) Land Evaluation Information Criterion Relative value of Farmland to Be Serviced or Converted (Scale of 0 - 100 Points)*					
PART VI *(To be completed by Federal Agency) Corridor Assessment Criteria (These criteria are explained in 7 CFR 658.5(c))*	Maximum Points				
1. Area in Nonurban Use	15	15			
2. Perimeter in Nonurban Use	10	10			
3. Percent Of Corridor Being Farmed	20				
4. Protection Provided By State And Local Government	20				
5. Size of Present Farm Unit Compared To Average	10				
6. Creation Of Nonfarmable Farmland	25				
7. Availability Of Farm Support Services	5	5			
8. On-Farm Investments	20				
9. Effects Of Conversion On Farm Support Services	25				
10. Compatibility With Existing Agricultural Use	10				
TOTAL CORRIDOR ASSESSMENT POINTS	160	30	0	0	0
PART VII *(To be completed by Federal Agency)*					
Relative Value Of Farmland (From Part V)	100				
Total Corridor Assessment (From Part VI above or a local site assessment)	160	30	0	0	0
TOTAL POINTS *(Total of above 2 lines)*	260	30	0	0	0

1. Corridor Selected:	2. Total Acres of Farmlands to be Converted by Project:	3. Date Of Selection:	4. Was A Local Site Assessment Used? YES ☐ NO ☐

5. Reason For Selection:

Signature of Person Completing this Part: | DATE

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

Spence, Suzanna A.

From: Gurak, Jill S
Sent: Tuesday, July 24, 2001 2:44 PM
To: Galamb, Eric E; Spence, Suzanna A.
Cc: Davis, James C; Drum, Steve A
Subject: USFWS comments: Group 33 Bridge Replacements

-----Original Message-----
From: Marella_Buncick@fws.gov [mailto:Marella_Buncick@fws.gov]
Sent: Tuesday, July 24, 2001 2:26 PM
To: relmore@dot.state.nc.us
Cc: jlwilliams@dot.state.nc.us; Marella_Buncick@fws.gov; Mark_A_Cantrell@fws.gov; haggardme@surry.net
Subject: Group 33 Bridge Replacements

Ron,

I spoke with John Williams yesterday regarding the Group 33 Bridge Replacement Projects and he asked me to e-mail you with any particular concerns. As a part of our changes to the review process for bridge projects, we are soon to start reviewing bridge replacements with the complete environmental/natural systems report in hand. Apparently this group is one of the last to be sent out before the natural systems report
is completed. Rather than submit the standard comments in a formal letter,
I'll provide the specific comments I have via e-mail. I'm assuming that
when all the natural systems work is completed and there is some clue about
replacement structures and alignments, the agencies will have the opportunity to review these again.

I have reviewed all of the projects using GIS information. Of the 10 bridge replacements included in this group, I have specific comments about
4 of them.

B-3814, Burke Co. over Canoe Creek- There are records of dwarf-flowered heartleaf close enough that surveys should be conducted. Additionally, there are populations of freshwater mussels in some larger streams in the
near vicinity. Canoe creek should be evaluated and surveyed if suitable habitat for mussels exists.

B-3818, Caldwell Co. over Lost Cove Creek- This is a trib to Wilson's Creek, a newly designated Wild and Scenic River. Close coordination with
the USFS will be necessary to maintain the qualities for which this river
was designated.

B-3826, Cherokee Co. over Bates Creek - There are numerous records of sicklefin redhorse, a Species of Federal Concern, in many streams in the vicinity of this bridge. The stream should be sampled for this species and
any new bridge should not alter habitat or passage for this species.

B- 3859, Jackson Co. over Pressley Creek - The Tuckasegee river near Cullowhee to west of Sylva is proposed critical habitat for the

Appalachian
elktoe. Tributaries should be evaluated for suitable habitat and disturbance in tributaries should be evaluated for potential effects to this species in the mainstem of the river.

In addition to the specific comments, the consultant will need to evaluate
all species included on the county species list for each project. I believe that they already have the lists for all counties but I can provide
lists, if needed. If you have any questions about these comments, please
let me know and we can talk.

marella buncick
USFWS
160 Zillicoa St.
Asheville, NC 28801
828-258-3939 ext 237

North Carolina Wildlife Resources Commission

Charles R. Fullwood, Executive Director

TO: Ron Elmore
Project Engineer, NCDOT

FROM: Maryellen Haggard, Highway Project Coordinator
Habitat Conservation Program

DATE: June 27, 2001

SUBJECT: NCDOT Bridge Replacements in Buncombe, Burke, Caldwell, Cherokee, Davidson, Haywood, Jackson, and Madison counties of North Carolina. TIP Nos. B-4033, B-3814, B-3818, B-3826, B-3834, B-4095, B-3854, B-3859, B-3860, and B-4184

Biologists with the N. C. Wildlife Resources Commission (NCWRC) have reviewed the information provided and have the following preliminary comments on the subject project. 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).

On bridge replacement projects of this scope our standard recommendations are as follows:

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

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

3. Wet concrete should not be allowed to contact stream water. This will lessen the chance of altering the stream's water chemistry and causing a fish kill.

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

5. If temporary access roads or detours are constructed, they should be removed back to original ground elevations immediately upon the completion of the project. Disturbed

areas should be seeded or mulched to stabilize the soil and native tree species should be planted with a spacing of not more than 10'x10'. If possible, when using temporary structures the area should be cleared but not grubbed. Clearing the area with chain saws, mowers, bush-hogs, or other mechanized equipment and leaving the stumps and root mat intact, allows the area to revegetate naturally and minimizes disturbed soil.

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

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

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

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

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

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

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

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

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

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

16. All mechanized equipment operated near surface waters should be regularly inspected and maintained to prevent contamination of stream waters from fuels, lubricants, hydraulic fluids, or other toxic materials.

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

1. The culvert must be designed to allow for fish passage. The culvert or pipe invert should be buried at least 1 foot below the natural streambed. The installation of the culvert or pipe should insure that all waters flow without freefalling or damming on either end during low flow conditions. If culverts are long, notched baffles should be placed in reinforced concrete box culverts at 15 foot intervals to allow for the collection of sediments in the culvert, to reduce flow velocities, and to provide resting places for fish and other aquatic organisms moving through the structure.

2. When two pipes are installed, only the lower pipe should be buried 12" into the substrate so that all base flows continue uninterrupted in the lower pipe during normal and low flow conditions to maintain aquatic life passage. The bottom of the second pipe should be placed at grade or at bankfull elevation. The second pipe should remain dry during normal flows to allow for wildlife passage. Where disrupted, natural floodplain benching should be restored upstream and downstream of the second, "dry", pipe.

3. Culverts or pipes should be situated so that no channel realignment or widening is required. Widening of the stream channel at the inlet or outlet of structures usually causes a decrease in water velocity causing sediment deposition that will require future maintenance.

4. Riprap should not be placed on the streambed.

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

Project specific comments:

1. B-4033 – Buncombe County – Bridge No. 85 over Hominy Creek. We have no specific comments. We are not aware of any threatened of endangered species in the project vicinity.

2. B-3814 – Burke County – Bridge No. 56 over Canoe Creek. Canoe Creek at the bridge replacement is in a designated water supply watershed. NCDOT should adhere to strict erosion control measures.

3. B-3818 – Caldwell County – Bridge No. 3 over Lost Cove Creek. First class trout waters with wild populations of brown and rainbow trout present in both Lost Cove Creek and downstream in Wilson Creek. The area is designated Public Mountain Trout Water. We will require a trout moratorium from Oct. 15th - April 15th. We request that High Quality

Sedimentation and Erosion Control Measures be used due to the DWQ water quality classification of ORW (Outstanding Resource Waters).

4. B-3826 – Cherokee County – Bridge No. 166 over Bates Creek. The upper portion of Bates Creek is on gamelands and is designated wild trout. Trout are also likely below the bridge replacement. We will require a trout moratorium from Oct. 15th - April 15th. NCDOT should adhere to strict erosion control measures.

5. B-3834 – Davidson County – Bridge No. 156 over Hanks Creek. No comment.

6. B-4095 – Davidson County – Bridge No. 130 over Abbotts Creek. This Creek flows into High Rock Lake. Abbott Creek supports a diverse fishery including Largemouth bass, redbreast sunfish, bluegill, channel catfish, and crappie. White Bass make a seasonal spring run up the creek to spawn. We request that High Quality Sedimentation and Erosion Control Measures be used due to the DWQ water quality classification of WS-III CA.

7. B-3854 – Haywood County – Bridge No. 329 over Jonathon Creek. Jonathon Creek is designated hatchery supported water. Therefore, Brook, Brown and Rainbow Trout will be present. We will require a trout moratorium from Oct. 15th - April 15th. NCDOT should adhere to strict erosion control measures.

8. B-3859 – Jackson County – Bridge No.138 over Pressley Creek. The upper section of a tributary to Pressley Creek is on game lands and supports wild trout. The lower end of Presley also supports wild trout. Hatchery supported water begins at the confluence with Cullowhee Creek. It looks like this bridge is actually over Tilley Creek. Tilley Creek is considered trout waters. We will require a trout moratorium from Oct. 15th - April 15th. NCDOT should adhere to strict erosion control measures.

9. B-3860 – Jackson County – Bridge No. 33 over Buff Creek. Upper sections of the creek support wild trout. The lower section is designated Hatchery Supported. We will require a trout moratorium from Oct. 15th - April 15th. NCDOT should adhere to strict erosion control measures.

10. B-4184 – Madison County – Bridge No. 4 over Ivy River. We have no specific comments. We are not aware of any threatened of endangered species in the project vicinity.

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

If you need further assistance or information on NCWRC concerns regarding bridge replacements, please contact me at (336) 527-1549. Thank you for the opportunity to review and comment on these projects.

CHEROKEE COUNTY

75 Peachtree Street
Murphy, North Carolina 28906

(828) 837-5527 • (828) 837-9684

June 8, 2001

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

Dear Mr. Gilmore:

The Cherokee County Commission does not foresee any negative or adverse impacts that would result from the bridge replacement project for Bridge number 166 located on SR 1331 (Hanging Dog Road over Bates Creek – TIP Number B-3826).

Cherokee County appreciates the continued efforts of DOT to address and improve traffic safety and infrastructure issues in our County.

Sincerely,

Barbara P. Vicknair

Barbara P. Vicknair, Chairman
Cherokee County Commission