STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

MICHAEL F. EASLEY
GOVERNOR

LYNDO TIPPETT
SECRETARY

March 14, 2007

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

ATTENTION: Mr. Steve Lund
NCDOT Coordinator

SUBJECT: **Nationwide Permit 23 and 33 Applications** for the proposed replacement of Bridge No. 70 on SR 1331 (Little River Church Road) over Grassy Creek, in Alexander County. Federal Aid Project No. BRZ-1331(9), State Project No. 8.2780801, WBS Element 33373.1.1, TIP No. B-4005, in Division 12.

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. 70 on the same alignment with a new 122 feet long single span bridge. The construction of the new bridge will result in 0.10 acre of permanent impacts and 0.04 acre of temporary impacts to surface waters for construction of temporary causeways. Traffic will be maintained on an offsite detour until the new bridge is constructed. *The bridge is currently closed after NCDOT personnel determined further deterioration had weakened the structure to an unsafe condition.*

Impacts to Waters of the United States

The water resource impacted for project B-4005 is Grassy Creek, which is located in the Catawba River Basin, Subbasin 03-07-32. The North Carolina Division of Water Quality (DWQ) classifies Grassy Creek as "Class **C**" stream and is located in Hydrological Cataloging Unit 03050101. 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. Grassy Creek is not included on

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

DWQ's 303d list of impaired waters nor does the project drain to a 303(d) stream within a mile from the project. There are no jurisdictional wetlands in the project area.

Permanent Impacts: There will be 0.01 acre of permanent impacts to surface waters resulting from bank stabilization of a drainage ditch entering Grassy Creek to the north of the bridge and the filling of a scourhole at the base of the ditch with riprap.

Temporary Impacts: Temporary causeways will utilized for the removal of two interior bents located at the waters edge on both banks resulting in 0.04 acre of temporary construction impacts. The permit drawings depict the temporary surface water impacts as extending from the left bank across to the right bank; however, Grassy Creek will never be obstructed more than half its width during the bent removal process.

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

Bridge Demolition

The existing bridge is a three-span structure with an overall length of 106 feet, and a clear roadway width of 24.5 feet. It was constructed in 1949. The bridge consists of a timber deck with an asphalt surface on a steel girder/stringer/floor beam system. The end bents consist of timber caps and piles while the interior bents are timber caps and posts with concrete sills. Bridge No. 70 is structurally deficient and according to federal guidelines is considered to be functionally obsolete. 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. Any bridge components that fall into the water during demolition will be removed according to Best Management Practices.

Federally Protected Species

As of January 8, 2007, the United States Fish and Wildlife Service lists three federally protected species for Alexander County (Table 1). The bog turtle was the only federal listed species for Alexander County at the time the Categorical Exclusion (CE) document was issued December 21, 2004. The bald eagle (*Haliaeetus leucocephalus*) and dwarf-flowered heartleaf (*Hexastylis naniflora*) were added to the endangered species list for Alexander County on March 8, 2006 though no habitat for either is present in the project area.

Table 1. Federally Protected Species for Alexander County.

Common Name	Scientific Name	Status	Habitat	Biological Conclusion
Bog turtle	*Clemmys muhlenbergii*	T(S/A)	No	Not Required
Bald Eagle	*Haliaeetus leucocephalus*	Threatened	No	No Effect
Dwarf-flowered heartleaf	*Hexastylis naniflora*	Threatened	No	No Effect

Avoidance and Minimization

NCDOT has minimized impacts to the fullest extent possible. The proposed bridge replacement will span Grassy Creek; therefore, avoiding permanent surface water impacts from the actual bridge construction. An offsite detour will be utilized negating the need for an onsite temporary detour thereby reducing temporary impacts.

Mitigation

Construction for this project will impose temporary impacts and minimal permanent impacts to jurisdictional waters, therefore, no mitigation is proposed for this project.

Project Schedule

The project is currently scheduled for review on August 28, 2007 and to Let on October 16, 2007 with construction to begin shortly thereafter.

Regulatory Approvals

Section 404 Permit: It is anticipated that the temporary dewatering of Grassy Creek 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 dewatering of Jackson Creek. All other aspects of this project are being processed by the Federal Highway Administration as a "Categorical Exclusion" in accordance with 23 CFR § 771.115(b). The NCDOT requests that these activities be authorized by a Nationwide Permit 23 (FR number 10, pages 2020-2095; January 15, 2002).

Section 401 Permit: We anticipate 401 General Certification numbers 3403 and 3366 will apply to this project. The NCDOT will adhere to all Water Quality Certification general conditions. Therefore, we are not requesting written concurrence. In accordance with 15A NCAC 2H .0501(a) we are providing two copies of this application to the North Carolina Department of Environmental and Natural Resources, Division of Water Quality, for their records.

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. L. Fluke

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
Dr. David Chang, P.E., Hydraulics
Mr. Greg Perfetti, P.E., Structure Design
Mr. Victor Barbour, Project Services Unit
Mr. Mark Staley, Roadside Environmental
Mr. M.L. Holder, P.E., Division 12 Engineer
Ms. Trish Simon, 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
Mr. Bryan Kluchar, 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. 70 on SR 1331 (Little River Church Rd) over Grassyy Creek

2. T.I.P. Project Number or State Project Number (NCDOT Only): B-4005

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

4. Location
   County: Alexander Nearest Town: Kilby
   Subdivision name (include phase/lot number): N/A
   Directions to site (include road numbers/names, landmarks, etc.): Take I-40 west to Exit 131 in Conover and turn right on NC 16. Proceed north on NC 16 for approximately eighteen miles through Taylorsville to SR 1331 (Little River Church Road) and turn left. Proceed approximately a quarter of a mile to Bridge 70.

5. Site coordinates (For linear projects, such as a road or utility line, attach a sheet that separately lists the coordinates for each crossing of a distinct waterbody.)
   Decimal Degrees (6 digits minimum): 36° 1.83' °N 81° 3.41' °W

6. Property size (acres): N/A

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

8. River Basin: Catawba 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 Alexander County.

The site is primarily surrounded and by mixed hardwoods, bottomland forest by maintained/ disturbed land.

10. Describe the overall project in detail, including the type of equipment to be used:
The project will consist of replacing the existing 24.5 feet wide 106 feet long bridge with a new 122 feet long bridge that will span Grassy Creek. Traffic will be maintained on an offsite 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. 70 on SR 1331 on Grassy Creek. Temporary causeways to remove interior bents and an access point for workers laying riprap may result in 0.049 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 1	Grassy Creek	Temporary	Perennial	27 feet		0.02
Total Stream Impact (by length and acreage)						0.049

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:

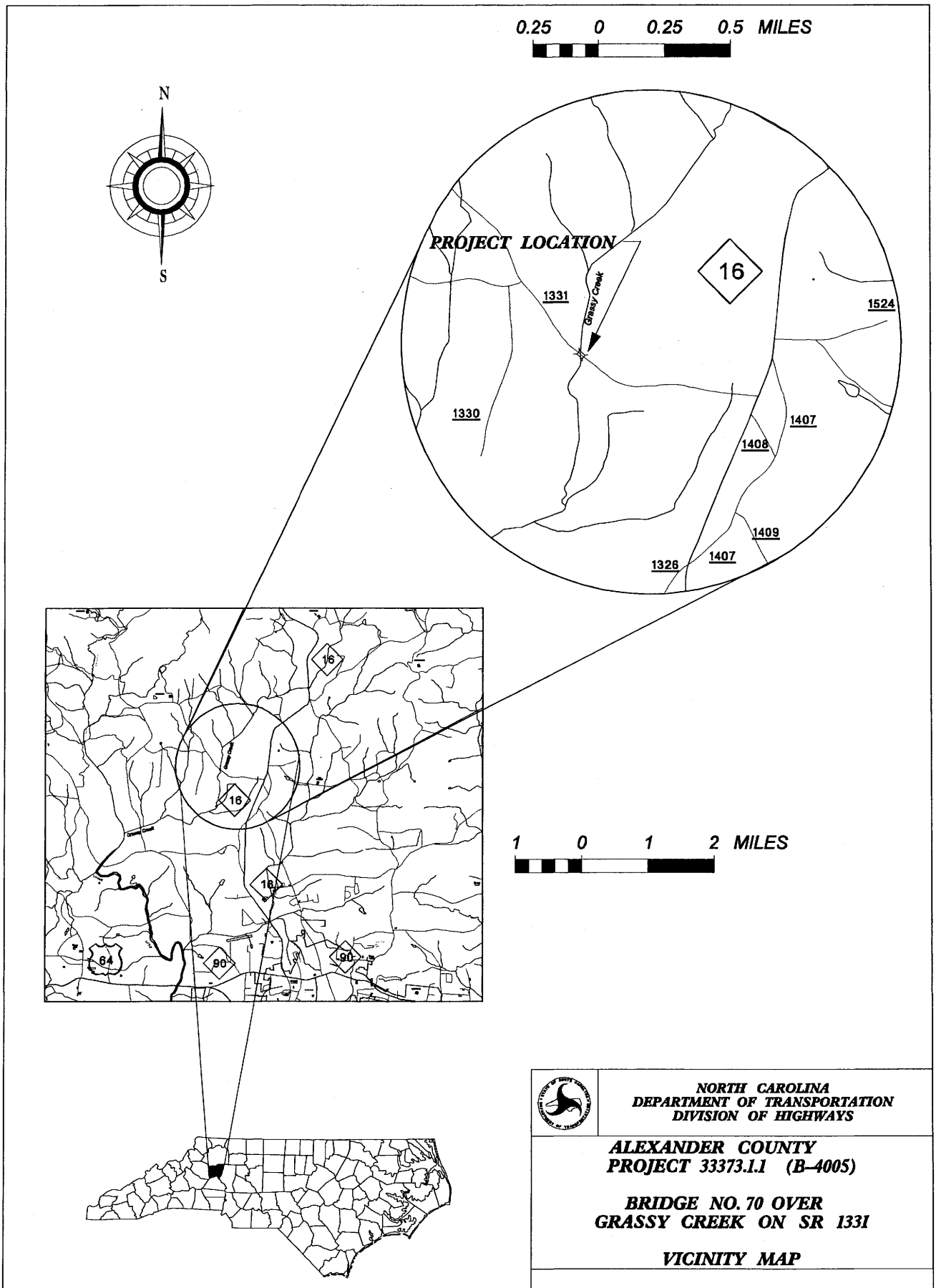
XV. Other Circumstances (Optional):

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. Lusk 3-14-07

Applicant/Agent's Signature **Date**

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



NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

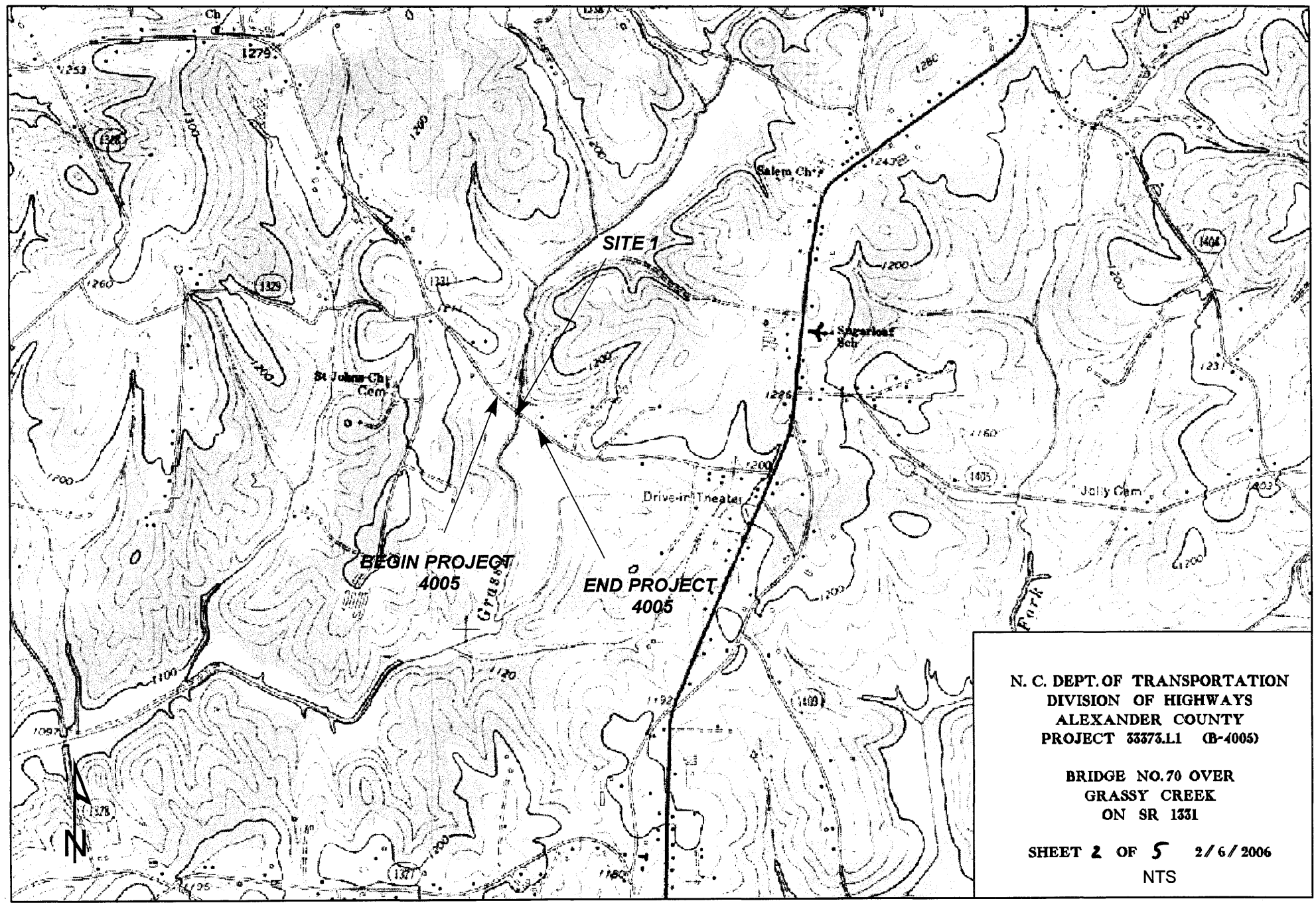
ALEXANDER COUNTY
PROJECT 33373.1.1 (B-4005)

BRIDGE NO. 70 OVER
GRASSY CREEK ON SR 1331

VICINITY MAP

FIGURE 1

SHEET 1 OF 5



N. C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
ALEXANDER COUNTY
PROJECT 33373.1.1 (B-4005)

BRIDGE NO. 70 OVER
GRASSY CREEK
ON SR 1331

SHEET 2 OF 5 2/6/2006
NTS

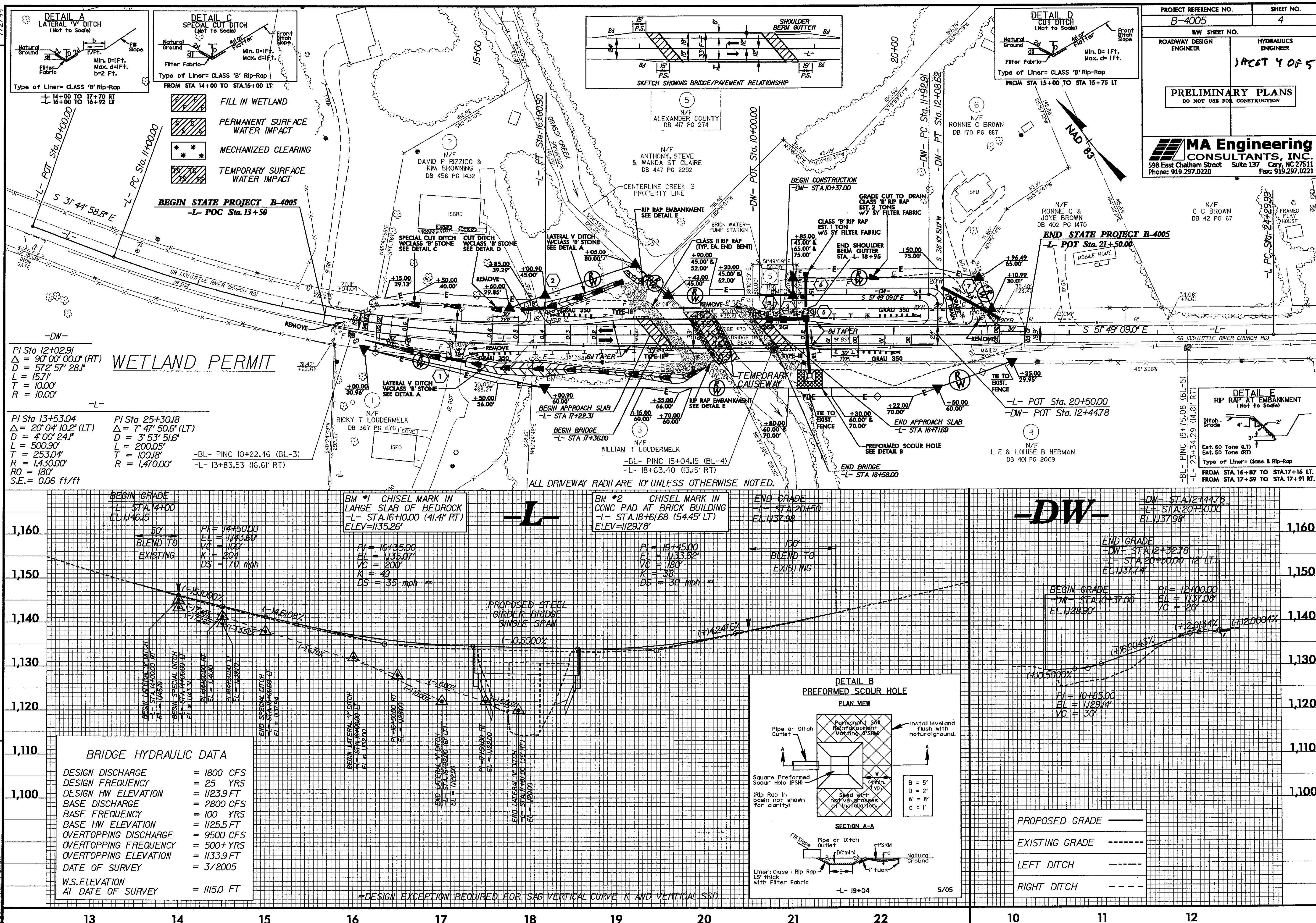
WETLAND PERMIT IMPACT SUMMARY

Site No.	Station (From/To)	Structure Size / Type	WETLAND IMPACTS: Permanent Fill In Wetlands (ac)	Temp. Fill In Wetlands (ac)	Excavation in Wetlands (ac)	Mechanized Clearing in Wetlands (ac)	Hand Clearing in Wetlands (ac)	SURFACE WATER IMPACTS: Permanent SW impacts (ac)	Temp. SW impacts (ac)	Existing Channel Impacts Permanent (ft)	Natural Stream Design (ft)
1	-L- 17+00 to 18+20	BRIDGE, SINGLE SPAN (LENGTH = 122') NO DECK DRAINAGE						0.010	0.040		
TOTALS:								0.010	0.040		

NC DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

ALEXANDER COUNTY
WBS - 33373.1.1 (B-4005)
BRIDGE NO. 70 OVER GRASSY CREEK
SHEET 3 OF 5 2/13/2007

JMD Revised 2/03/05



BRIDGE HYDRAULIC DATA

DESIGN DISCHARGE	= 1800 CFS
DESIGN FREQUENCY	= 25 YRS
DESIGN HW ELEVATION	= 1123.9 FT
BASE DISCHARGE	= 2800 CFS
BASE FREQUENCY	= 100 YRS
BASE HW ELEVATION	= 1125.5 FT
OVERTOPPING DISCHARGE	= 9500 CFS
OVERTOPPING FREQUENCY	= 500+ YRS
OVERTOPPING ELEVATION	= 1133.9 FT
DATE OF SURVEY	= 3/2005
W.S. ELEVATION AT DATE OF SURVEY	= 1115.0 FT

PROJECT REFERENCE NO.	SHEET NO.
B-4005	4

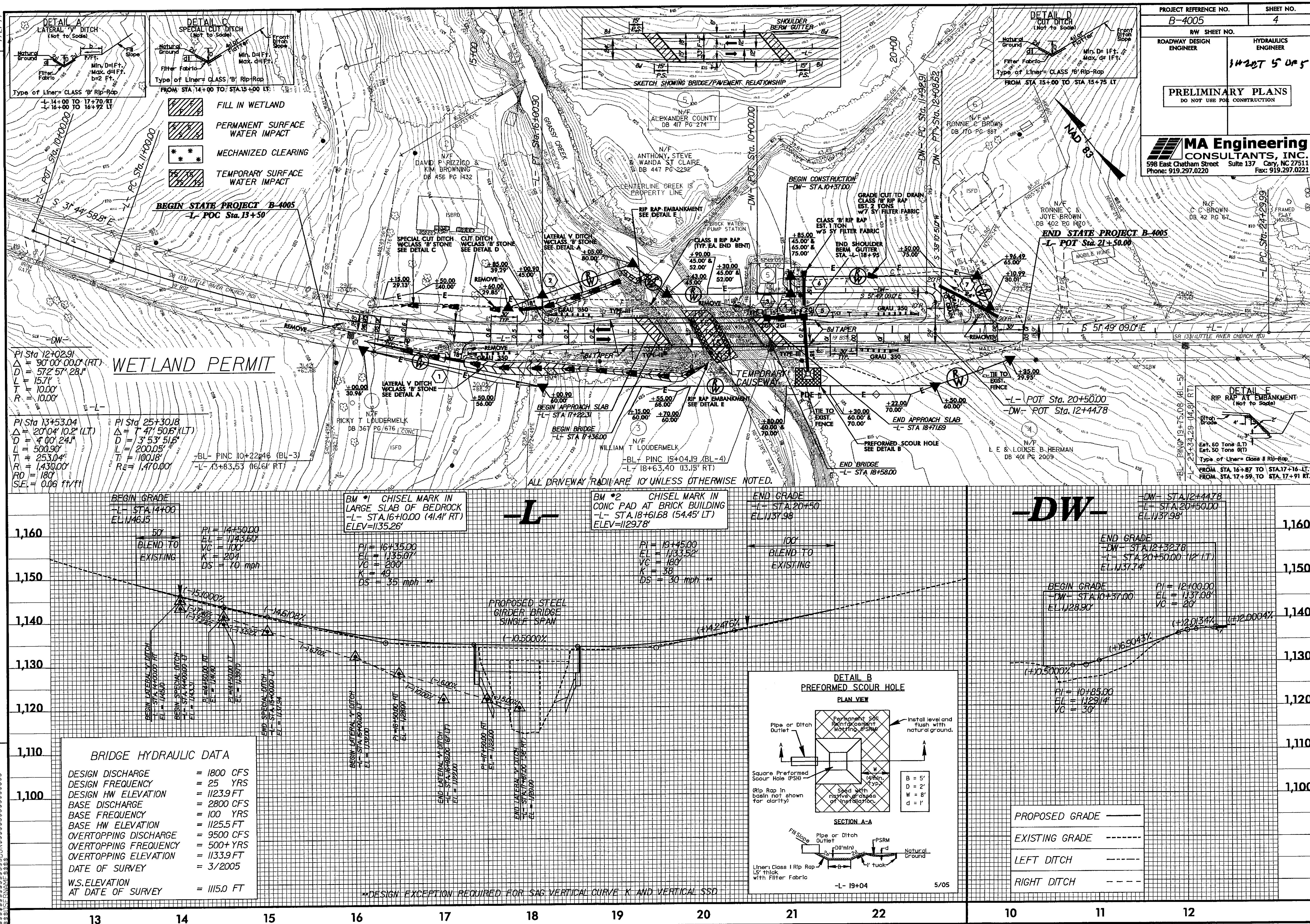
R/W SHEET NO.

ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER

1HZDT 5 OF 5

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

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



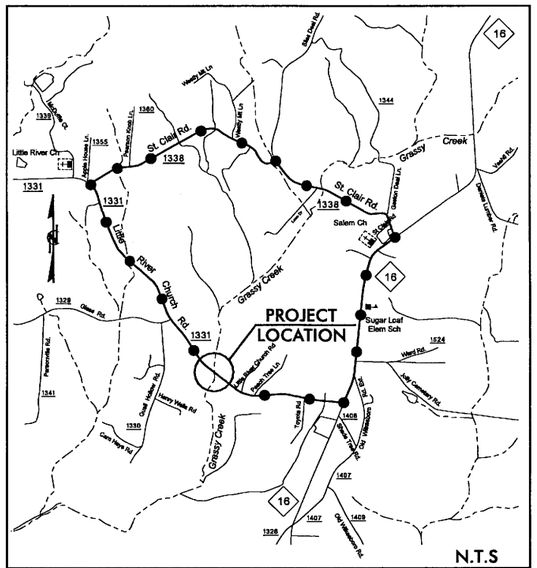
BRIDGE HYDRAULIC DATA

DESIGN DISCHARGE	= 1800 CFS
DESIGN FREQUENCY	= 25 YRS
DESIGN HW ELEVATION	= 1123.9 FT
BASE DISCHARGE	= 2800 CFS
BASE FREQUENCY	= 100 YRS
BASE HW ELEVATION	= 1125.5 FT
OVERTOPPING DISCHARGE	= 9500 CFS
OVERTOPPING FREQUENCY	= 500+ YRS
OVERTOPPING ELEVATION	= 1133.9 FT
DATE OF SURVEY	= 3/2005
W.S. ELEVATION AT DATE OF SURVEY	= 1115.0 FT

7/2/99

TIP PROJECT: B-4005

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



VICINITY MAP —●— DETOUR ROUTE

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

ALEXANDER COUNTY

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-4005	1	

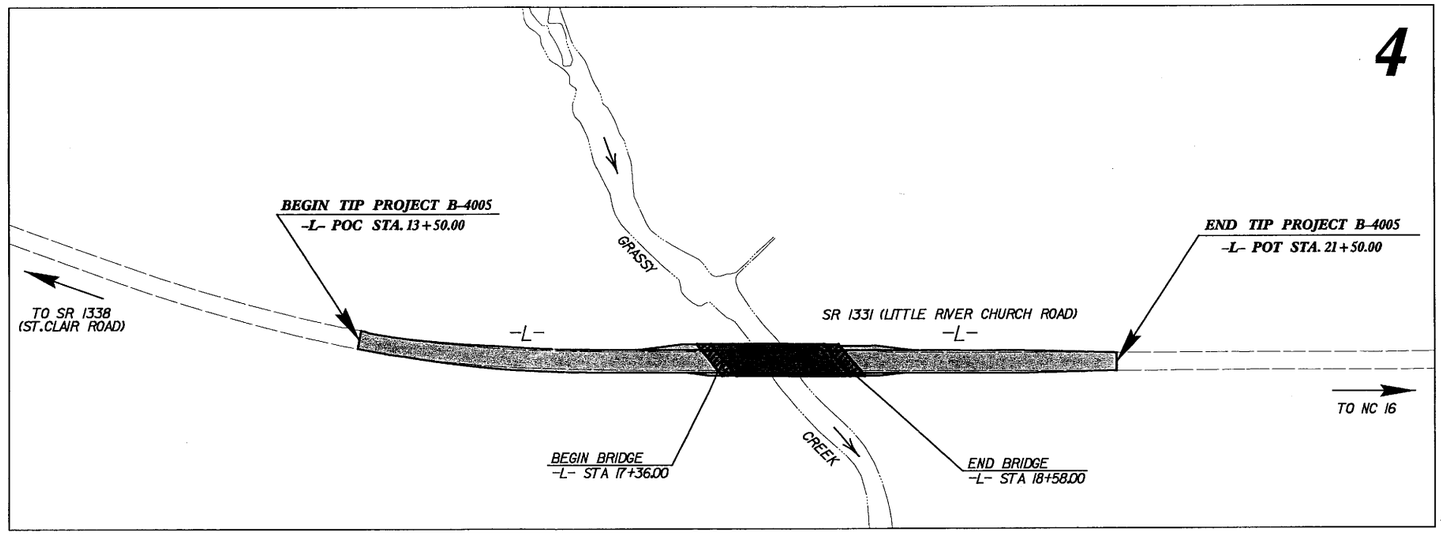
STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
33373.1.1	BRZ-1331 (9)	PE
33373.2.1	BRZ-1331 (9)	R/W, UTILITIES

LOCATION: BRIDGE NO. 70 AND APPROACHES OVER GRASSY CREEK ON SR 1331 (LITTLE RIVER CHURCH ROAD)

TYPE OF WORK: GRADING, DRAINAGE, PAVING, STRUCTURES, AND GUARDRAIL.

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

NC GRID
NAD 83



**DESIGN EXCEPTIONS
SAG VERTICAL CURVE K
VERTICAL STOPPING SIGHT DISTANCE

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

NCDOT CONTACT:

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

CONTRACT:

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 2007 = 1,640
ADT 2027 = 2,650
DHV = 10 %
D = 60 %
T = 3 % *
V = 60 MPH **
* (TTST 1% + DUAL 2%)
FUNCT CLASS = RURAL MINOR COLLECTOR

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT B-4005	=	*0.129 mile*
LENGTH STRUCTURES TIP PROJECT B-4005	=	*0.023 mile*
TOTAL LENGTH TIP PROJECT B-4042	=	*0.152 mile*

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

2006 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE: JANUARY 20, 2006

LETTING DATE: MAY 15, 2007

R.W. PORTER JR., PE
PROJECT ENGINEER

D.M. WAINWRIGHT, PE
PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER

SIGNATURE: _____ P.E.

ROADWAY DESIGN ENGINEER

SIGNATURE: _____ P.E.

DIVISION OF HIGHWAYS STATE OF NORTH CAROLINA

STATE OF NORTH CAROLINA · DEPARTMENT OF TRANSPORTATION

_____ P.E.
STATE HIGHWAY DESIGN ENGINEER

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PROJECT REFERENCE NO.	SHEET NO.
B-4005	1-B

Note: Not to Scale

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

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

CONVENTIONAL PLAN SHEET SYMBOLS

BOUNDARIES AND PROPERTY:

- State Line
- County Line
- Township Line
- City Line
- Reservation Line
- Property Line
- Existing Iron Pin — EIP
- Property Corner
- Property Monument — ECM
- Parcel/Sequence Number — 123
- Existing Fence Line
- Proposed Woven Wire Fence
- Proposed Chain Link Fence
- Proposed Barbed Wire Fence
- Existing Wetland Boundary — WLB
- Proposed Wetland Boundary — WLB
- Existing Endangered Animal Boundary — EAB
- Existing Endangered Plant Boundary — EPB

BUILDINGS AND OTHER CULTURE:

- Gas Pump Vent or U/G Tank Cap
- Sign — S
- Well — W
- Small Mine
- Foundation
- Area Outline
- Cemetery
- Building
- School
- Church
- Dam

HYDROLOGY:

- Stream or Body of Water
- Hydro, Pool or Reservoir
- Jurisdictional Stream — JS
- Buffer Zone 1
- Buffer Zone 2
- Flow Arrow
- Disappearing Stream
- Spring
- Swamp Marsh
- Proposed Lateral, Tail, Head Ditch — FLOW
- False Sump

RAILROADS:

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

RIGHT OF WAY:

- Baseline Control Point
- Existing Right of Way Marker
- Existing Right of Way Line
- Proposed Right of Way Line — RW
- Proposed Right of Way Line with Iron Pin and Cap Marker — RW
- Proposed Right of Way Line with Concrete or Granite Marker — RW
- Existing Control of Access — CA
- Proposed Control of Access — CA
- Existing Easement Line — E
- Proposed Temporary Construction Easement — E
- Proposed Temporary Drainage Easement — TDE
- Proposed Permanent Drainage Easement — PDE
- Proposed Permanent Utility Easement — PUE

ROADS AND RELATED FEATURES:

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

VEGETATION:

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

EXISTING STRUCTURES:

MAJOR:

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

MINOR:

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

UTILITIES:

POWER:

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

TELEPHONE:

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

WATER:

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

TV:

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

GAS:

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

SANITARY SEWER:

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

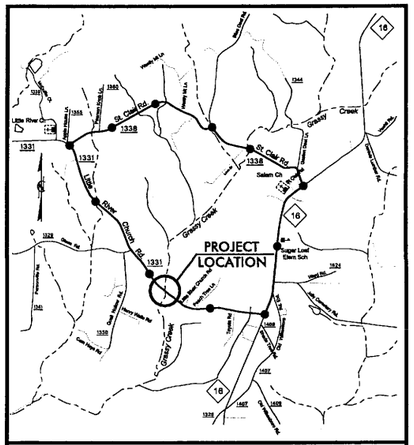
MISCELLANEOUS:

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

7622999

PROJECT REFERENCE NO.	SHEET NO.
B-4005	1C
Location and Surveys	

SURVEY CONTROL SHEET B-4005



VICINITY MAP

NC GRID

NAD 83

NC DOT GPS STATION B4005-2

LOCALIZED PROJECT COORDINATES
N = 814812.6030
E = 1346689.4590

NC DOT GPS STATION B4005-1
LOCALIZED PROJECT COORDINATES

N = 815724.1760
E = 1346007.3220

-L- POC STA. 13+50
BEGIN TIP PROJECT B-4005
N = 814418.4682
E = 1346975.3789

-L- POT STA. 21+50
END TIP PROJECT B-4005
N = 813907.4889
E = 1347589.6486

GRASSY CREEK

SR 1331
(LITTLE RIVER CHURCH ROAD)

-L-

TO SR 1338
(ST.CLAIR ROAD)

TO NC 16

BL

POINT	DESC.	NORTH	EAST	ELEVATION	L STATION	OFFSET
BL2	GPS B4005-2	814812.6030	1346689.4590	1177.27'	OUTSIDE PROJECT LIMITS	
BL3	BL-3	814382.3655	1346985.8777	1146.75'	13+83.53	16.61 RT
BL4	BL-4	814074.3124	1347356.2313	1132.35'	18+63.40	13.15 RT
BL5	BL-5	813781.9290	1347725.3553	1149.80'	23+34.29	14.81 RT
BL6	BL-6	813576.2271	1348024.3211	1162.50'	26+94.69	16.50 RT

BM#1 ELEVATION=1135.26'
N 814209 E 1347140
L STATION 16+10 41' RIGHT
CHISEL MARK IN LARGE SLAB OF BEDROCK

BM#2 ELEVATION=1129.78'
N 814129 E 1347397
L STATION 18+62 54' LEFT
CHISEL MARK IN CONC PAD AT BRICK BUILDING

DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCDOT FOR MONUMENT "B-4005-1" WITH NAD 83 STATE PLANE GRID COORDINATES OF NORTHING: 815724.176(ft) EASTING: 1346007.322(ft) THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.99989904 THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "B-4005-1" TO -L- STATION 13+50.00 IS S 36°33'12" E 1625.43' ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES VERTICAL DATUM USED IS NAVD 88

NOTES:

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

   THE FILES TO BE FOUND ARE AS FOLLOWS: TIP B4005_LS_CONTROL_050915.TXT

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

◎ *INDICATES GEODETIC CONTROL MONUMENTS USED OR SET FOR HORIZONTAL PROJECT CONTROL BY THE NCDOT LOCATION AND SURVEYS UNIT.*

PROJECT CONTROL ESTABLISHED USING GLOBAL POSITIONING SYSTEM.

NOTE: DRAWING NOT TO SCALE

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PROJECT REFERENCE NO.	SHEET NO.
B-4005	2
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

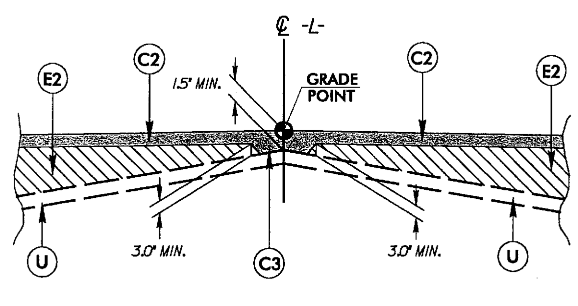
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

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

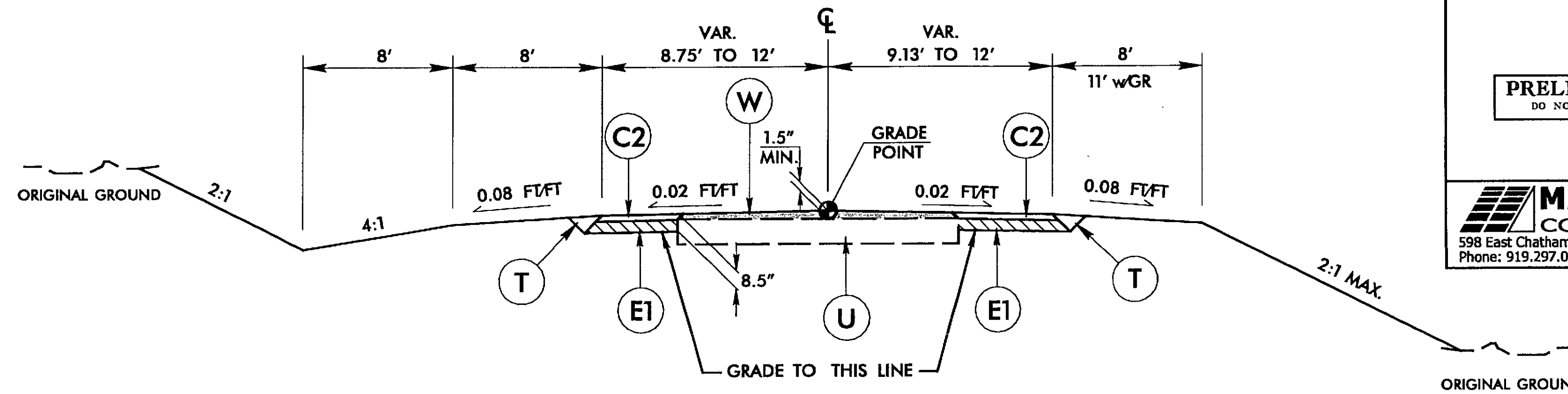
PAVEMENT SCHEDULE

C1	PROP. APPROX. 2.00" ASPHALT CONCRETE SURFACE COURSE, TYPE SF9.5A, AT AN AVERAGE RATE OF 110 Lbs PER SQUARE YARD IN EACH OF TWO LAYERS.
C2	PROP. APPROX. 3.00" ASPHALT CONCRETE SURFACE COURSE, TYPE SF9.5A, AT AN AVERAGE RATE OF 165 Lbs PER SQUARE YARD IN EACH OF TWO LAYERS.
C3	PROP. VARIABLE DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE SF9.5A, AT AN AVERAGE RATE OF 110 Lbs PER SQUARE YARD PER 1" DEPTH, TO BE PLACED IN LAYERS NOT LESS THAN 1.0" OR GREATER THAN 1.5" IN DEPTH.
E1	PROP. APPROX. 5.5" ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 627 Lbs PER SQUARE YARD.
E2	PROP. VARIABLE DEPTH ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 114 Lbs PER SQUARE YARD PER 1" DEPTH, TO BE PLACED IN LAYERS NOT LESS THAN 3.0" OR GREATER THAN 5.5" IN DEPTH.
J	PROP. 6" AGGREGATE BASE COURSE
T	EARTH MATERIAL
U	EXISTING PAVEMENT
W	VARIABLE DEPTH ASPHALT PAVEMENT (SEE STANDARD WEDGING DETAIL THIS SHEET)

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



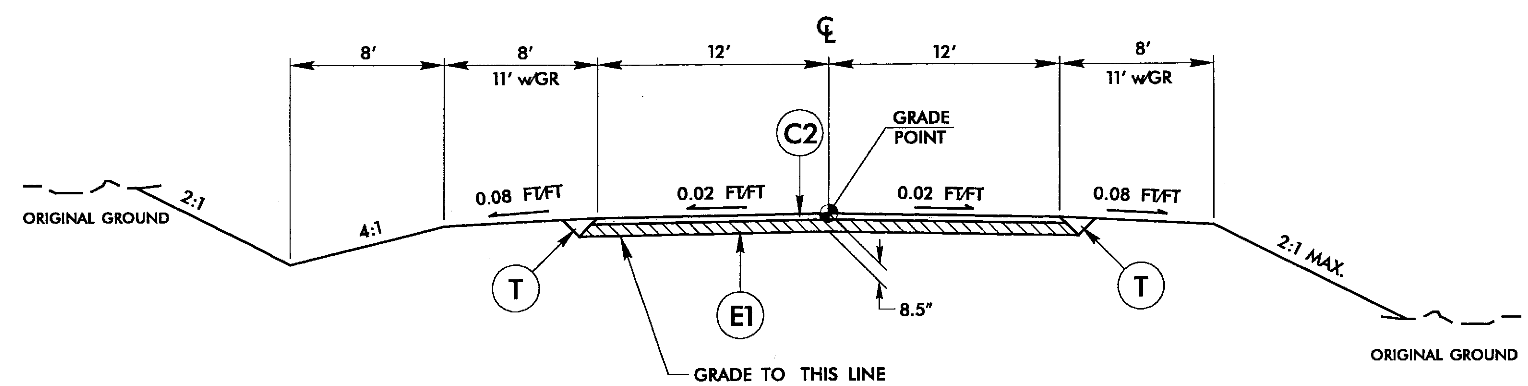
DETAIL SHOWING METHOD OF WEDGING



TYPICAL SECTION NO. 1

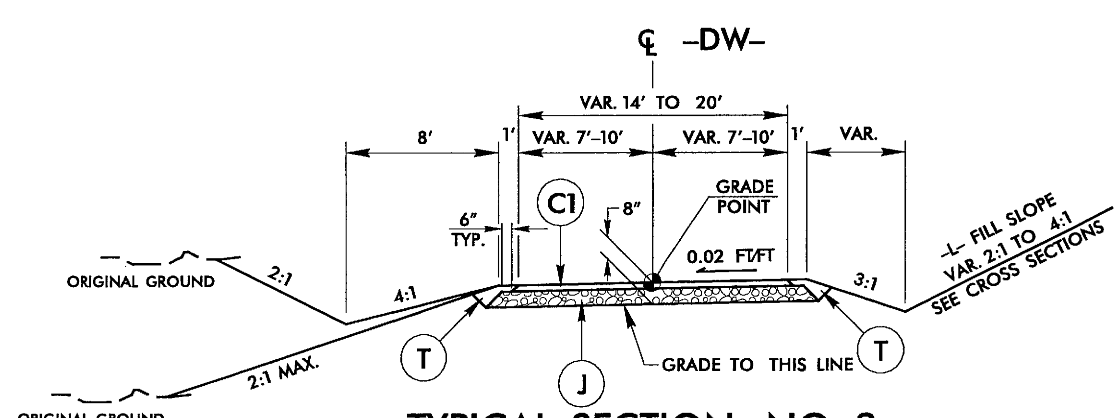
FROM -L- STA. 14+00.00 TO STA. 16+00.00
FROM -L- STA. 19+50.00 TO STA. 20+50.00

BLEND TO EXISTING (SEE CROSS SECTIONS):
FROM -L- STA. 13+50.00 TO STA. 14+00.00
FROM -L- STA. 20+50.00 TO STA. 21+50.00



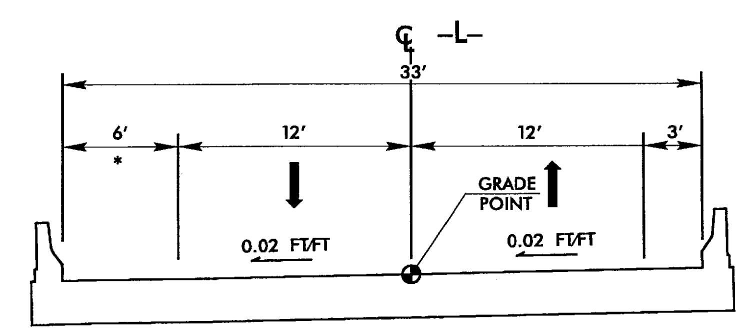
TYPICAL SECTION NO. 2

FROM -L- STA. 16+00.00 TO STA. 17+36.00 (BEGIN BRIDGE)
FROM -L- STA. 18+58.00 (END BRIDGE) TO STA. 19+50.00



TYPICAL SECTION NO. 3

FROM -DW- STA. 10+37 TO STA. 12+32.78



TYPICAL SECTION ON STRUCTURE

FROM -L- STA. 17+36.00 TO STA. 18+58.00
* BRIDGE WIDENED DUE TO SPREAD

8/2/99

12/20/2006
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4/04/06

COMPUTED BY: ______________ DATE: ______________
CHECKED BY: ______________ DATE: ______________

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

PROJECT REFERENCE NO.	SHEET NO.
B-4005	3-A

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

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

SUMMARY OF EARTHWORK
IN CUBIC YARDS

LOCATION	UNCLASSIFIED EXCAVATION	UNDERCUT	EMBT+15%	BORROW	WASTE
-L- 14+00.00 TO 17+70.00	38		992	954	
-L- 18+18.00 TO 21+50.00	198		1,514	1,316	
TOTAL	236		2,506	2,270	
LOSS DUE TO CLEARING & GRUBBING	-100			100	
PROJECT TOTAL	136		2,506	2,370	
ESTIMATE 5% TO REPLACE TOPSOIL ON BORROW PIT				121	
GRAND TOTAL (CUBIC YARDS)	136		2,506	2,491	
SAY (CUBIC YARDS)	200		2,600	2,500	
SELECT GRANULAR MATERIAL (CL II or III) = 500 CY ESTIMATED UNDERCUT = 500 CY ESTIMATED GRADE POINTS UNDERCUT = 100 CY	(CONTINGENCY ITEMS PER 'GEOTECHNICAL REPORT - DESIGN RECOMMENDATIONS' LETTER DATED SEPTEMBER, 2005)				

APPROXIMATE QUANTITIES ONLY. UNCLASSIFIED EXCAVATION, FINE GRADING, CLEARING AND GRUBBING, BREAKING OF EXISTING PAVEMENT, AND REMOVAL OF EXISTING PAVEMENT WILL BE PAID FOR AT THE CONTRACT LUMP SUM PRICE FOR "GRADING".

SUMMARY OF PAVEMENT REMOVAL
IN SQUARE YARDS

LOCATION	ASPHALT REMOVAL	ASPHALT BREAK-UP	CONCRETE REMOVAL	CONCRETE BREAK-UP
-L- 16+50.00 TO 17+41.00	200			
-L- 18+46.00 TO 19+50.00	233			
TOTAL	433			
SAY	440			

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

STATION (SIZE / THICKNESS OR GAUGE)	LOCATION (LT,RT, OR CL)	STRUCTURE NO. FROM	STRUCTURE NO. TO	TOP ELEVATION	INVERT ELEVATION	INVERT ELEVATION	SLOPE CRITICAL	CLASS III R.C. PIPE (UNLESS NOTED OTHERWISE) 12"	15"	18"	24"	30"	36"	42"	48"
-L- 13+88	CL														
-L- 15+02	RT		1												
-L- 15+87	LT		2												
-L- 18+59	LT		3	1138.6											
-L- 18+66	LT	3	4		1130.9	1130.2			16						
-L- 18+73.96	LT		4	1133.6											
-L- 18+87	LT	4	5		1130.2	1128.5			24						
-L- 19+00	LT		5	1133.6											
-L- 19+02	CL	5	OUT		1127.0	1125.0				60					
-DW- 10+53	LT		6												
-L- 20+87	LT		7												
TOTALS									40	60					

STATION	BITUMINOUS COATED C.S. PIPE TYPE B (UNLESS NOTED OTHRWISE) 12" .064	15" .064	18" .064	24" .064	30" .079	36" .079	42" .109	48" .109	CLASS III R.C. PIPE OR C.S. PIPE, TYPE IR ALUMINIZED OR HDPE PIPE, TYPE S OR D 12"	15"	18"	24"	30"	36"	42"	48"	15" SIDE DRAIN PIPE	18" SIDE DRAIN PIPE	24" SIDE DRAIN PIPE	ENDWALLS STD. 838.01, STD. 838.11 OR STD. 838.80 (UNLESS NOTED OTHERWISE) CU. YDS. R.C.P.	C.S.P.
-L- 13+88																					
-L- 15+02																		20			
-L- 15+87																		24			
-L- 18+59																					
-L- 18+66																					
-L- 18+73.96																					
-L- 18+87																					
-L- 19+00																					
-L- 19+02																					
-DW- 10+53																	28				
-L- 20+87																			72		
TOTALS																	28	44	72		

STATION	QUANTITIES FOR DRAINAGE STRUCTURES PER EACH (0' THRU 5.0')	* TOTAL L.F. FOR PAY QUANTITY SHALL BE COL 'A' + (1.3 X COL.'B') LIN. *FT. A 5.0' THRU 10.0'	B 10.0' AND ABOVE	D.I. STD. 840.14 OR STD. 840.15	D.I. FRAME & GRATE STD. 840.16	G.D.I. TYPE "A" STD. 840.17 OR 840.26	G.D.I. TYPE "B" STD. 840.18 OR 840.27	G.D.I. TYPE "D" STD. 840.19 OR 840.28	G.D.I. FRAME WITH GRATE STD. 840.22	G.D.I. FRAME WITH TWO GRATES STD. 840.22	G.D.I. (N.S.) FRAME WITH GRATE STD. 840.24	G.D.I. (N.S.) FRAME WITH TWO GRATES STD. 840.24	J.B. STD. 840.31 OR 840.32	G.D.I. (N.S.) FRAME WITH TWO GRATES STD. 840.29	CORR. STEEL ELBOWS NO. & SIZE	CONC. COLLARS CL. "B" C.Y. STD 840.72	CONC. & BRICK PIPE PLUG, C.Y. STD. 840.71	PIPE REMOVAL LIN.FT.	REMARKS
-L- 13+88																		62	
-L- 15+02																		26	
-L- 15+87																		52	
-L- 18+59	1						1							1					
-L- 18+66																		70	
-L- 18+73.96	1						1							1					
-L- 18+87																			
-L- 19+00	1	1.63					1							1					
-L- 19+02																			
-DW- 10+53																			
-L- 20+87																		20	
TOTALS	3	1.63					3							3				230	

ABBREVIATIONS

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

"N" = DISTANCE FROM EDGE OF LANE TO FACE OF GUARDRAIL.
TOTAL SHOULDER WIDTH = DISTANCE FROM EDGE OF TRAVEL LANE TO SHOULDER BREAK POINT.
FLARE LENGTH = DISTANCE FROM LAST SECTION OF PARALLEL GUARDRAIL TO END OF GUARDRAIL.

GUARDRAIL SUMMARY

W = TOTAL WIDTH OF FLARE FROM BEGINNING OF TAPER TO END OF GUARDRAIL.
G = GATING IMPACT ATTENUATOR TYPE 350
NG = NON-GATING IMPACT ATTENUATOR TYPE 350

SURVEY LINE	BEG. STA.	END STA.	LOCATION	LENGTH STRAIGHT	LENGTH SHOP CURVED	LENGTH DOUBLE FACED	WARRANT POINT APPROACH END	WARRANT POINT TRAILING END	"N" DIST. FROM E.O.L.	TOTAL SHOULDER WIDTH	FLARE LENGTH APPROACH END	FLARE LENGTH TRAILING END	W APPROACH END	W TRAILING END	ANCHORS	IMPACT ATTENUATOR TYPE 350 NO.	PERMITTED G	PERMITTED NG	REMARKS

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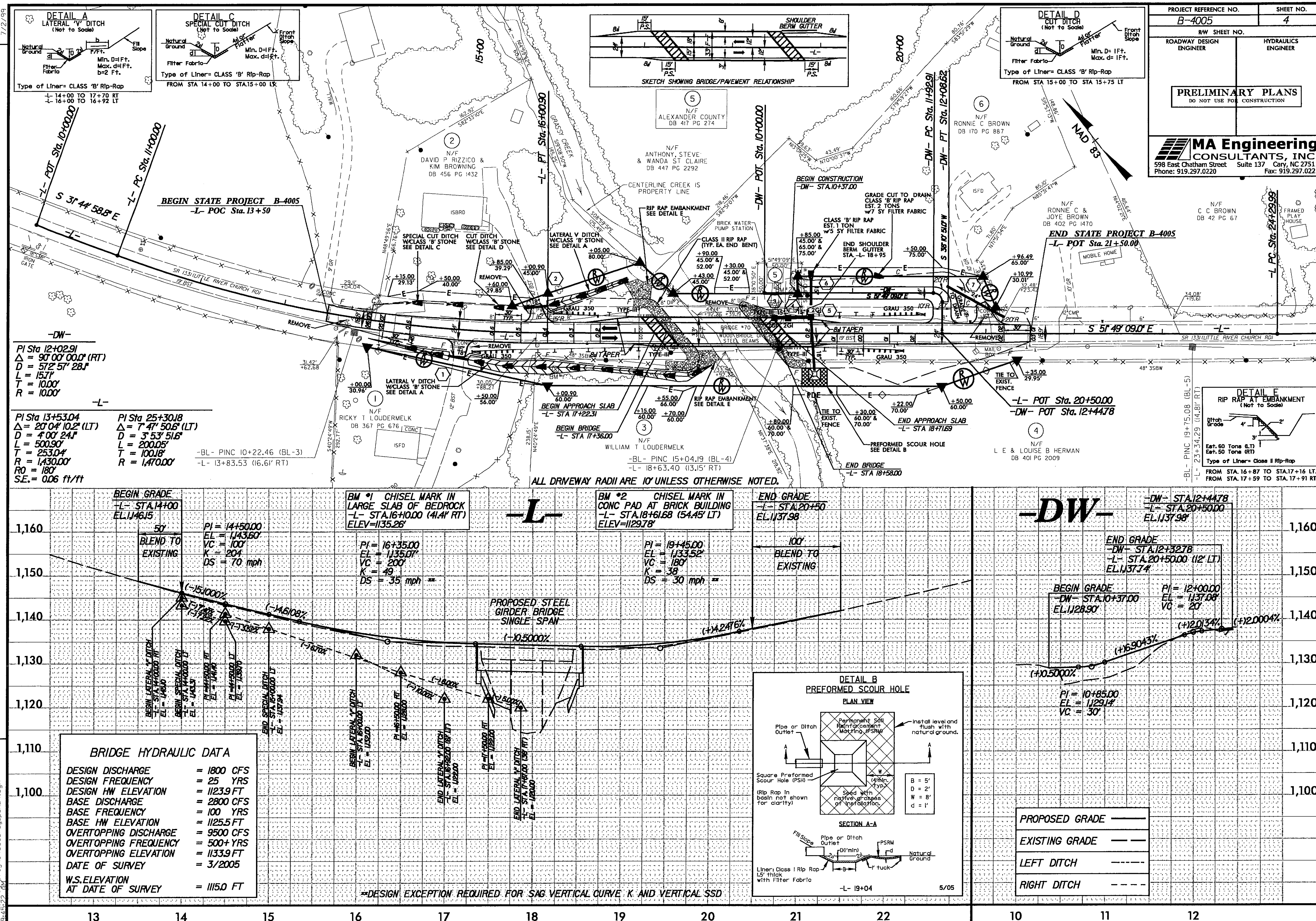
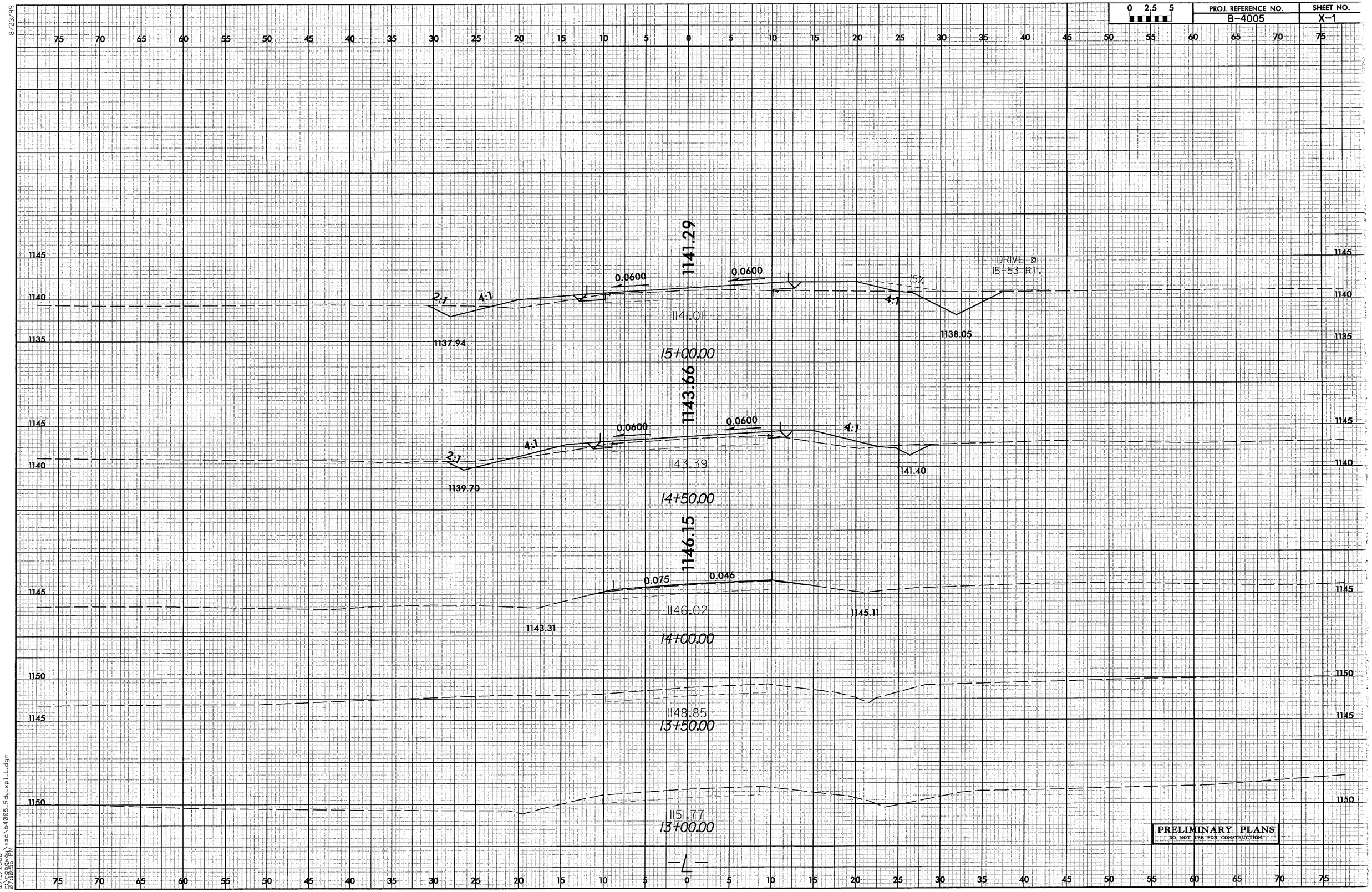


BRIDGE HYDRAULIC DATA

DESIGN DISCHARGE	= 1800 CFS
DESIGN FREQUENCY	= 25 YRS
DESIGN HW ELEVATION	= 1123.9 FT
BASE DISCHARGE	= 2800 CFS
BASE FREQUENCY	= 100 YRS
BASE HW ELEVATION	= 1125.5 FT
OVERTOPPING DISCHARGE	= 9500 CFS
OVERTOPPING FREQUENCY	= 500+ YRS
OVERTOPPING ELEVATION	= 1133.9 FT
DATE OF SURVEY	= 3/2005
W.S. ELEVATION AT DATE OF SURVEY	= 1115.0 FT

8/23/99

0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	B-4005	X-1



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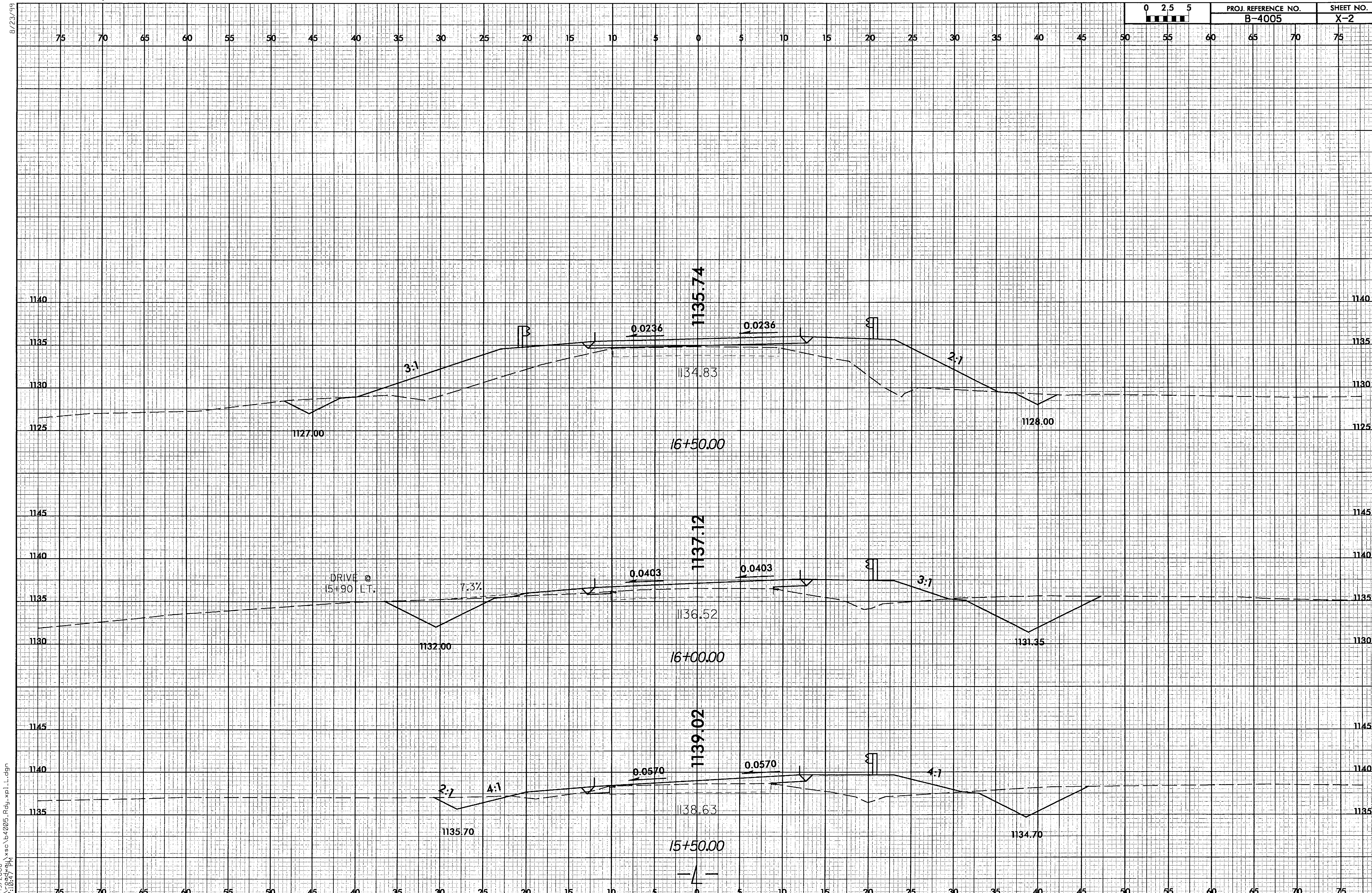
0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	B-4005	X-2



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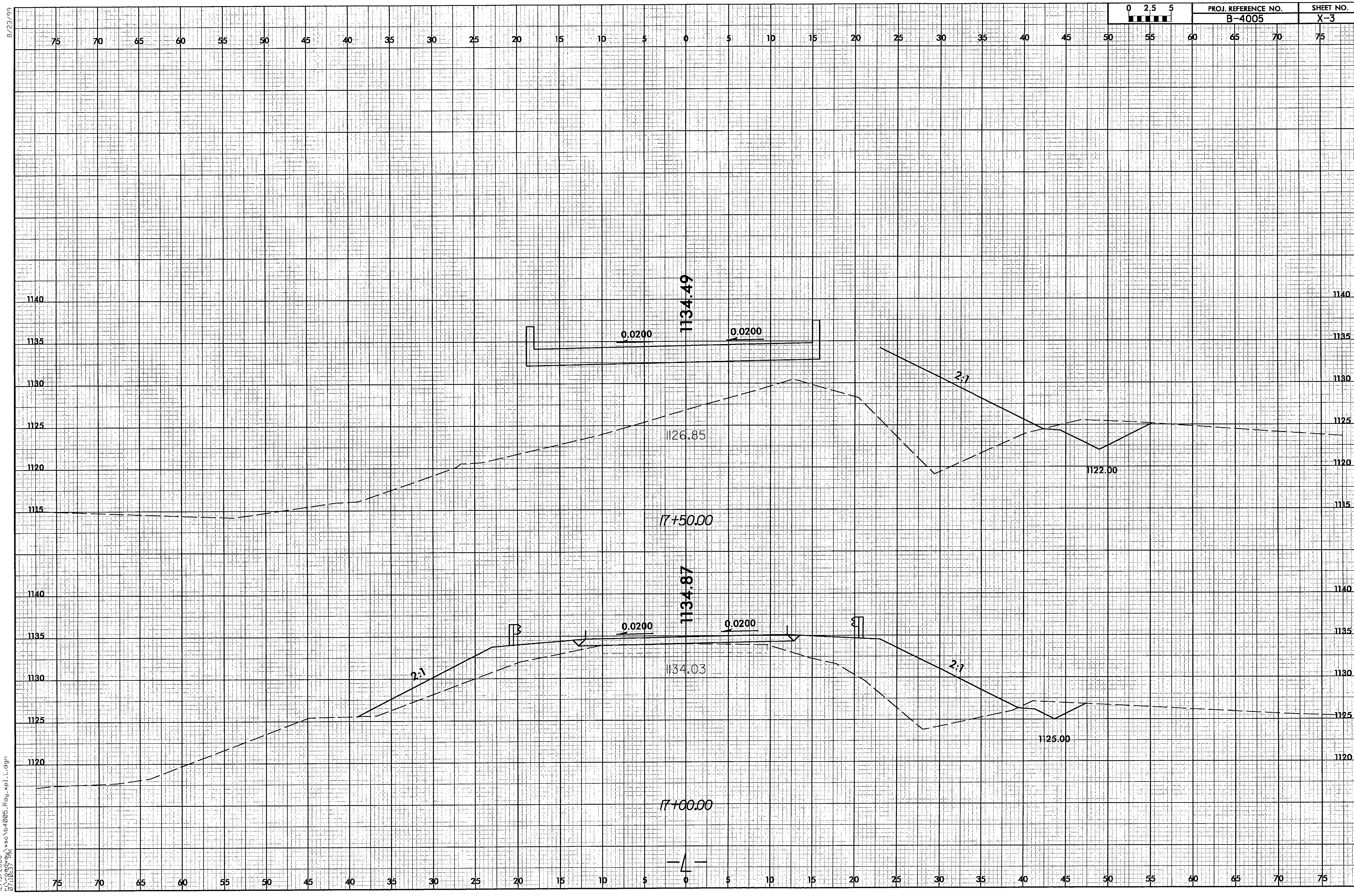

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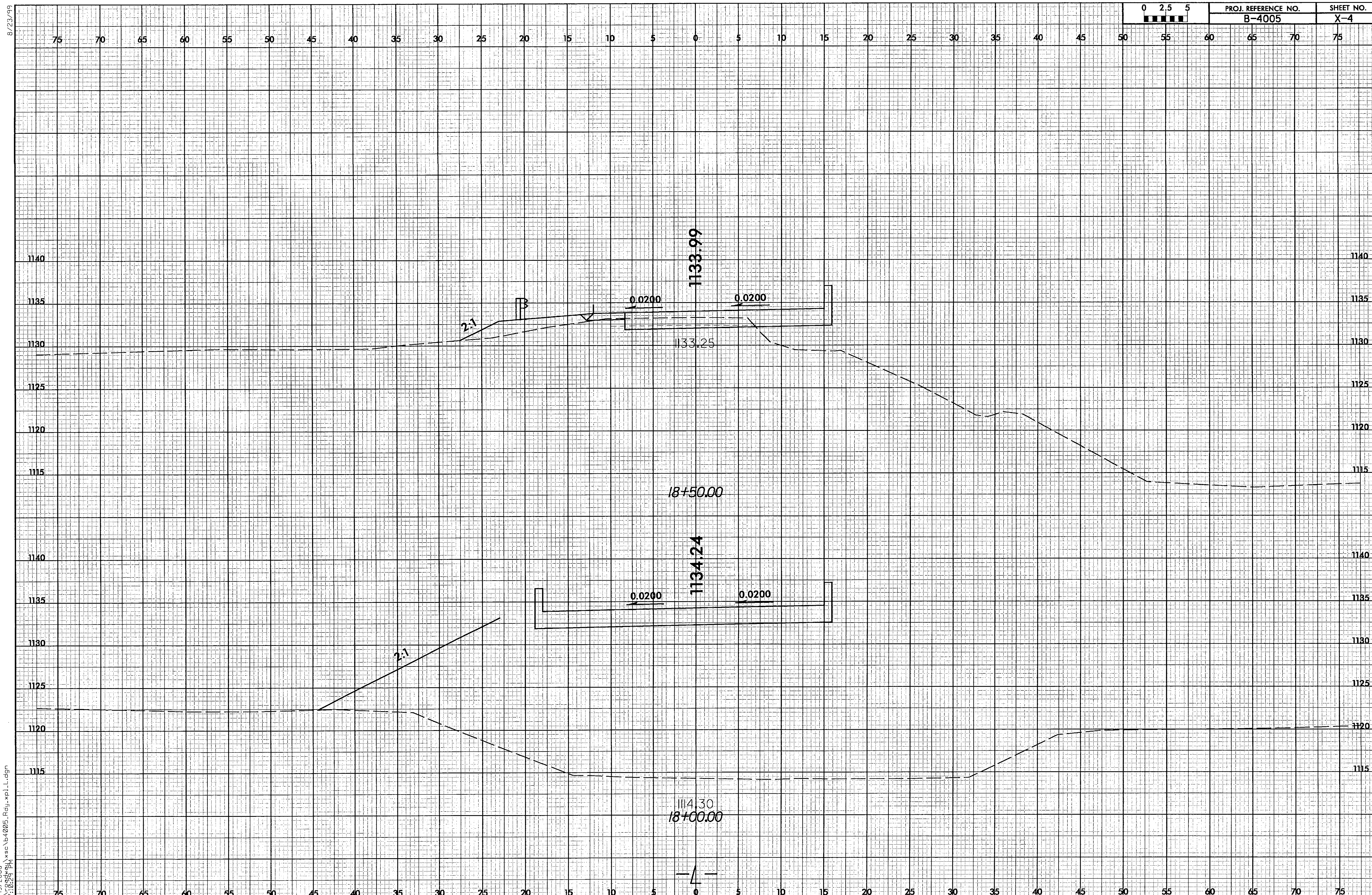

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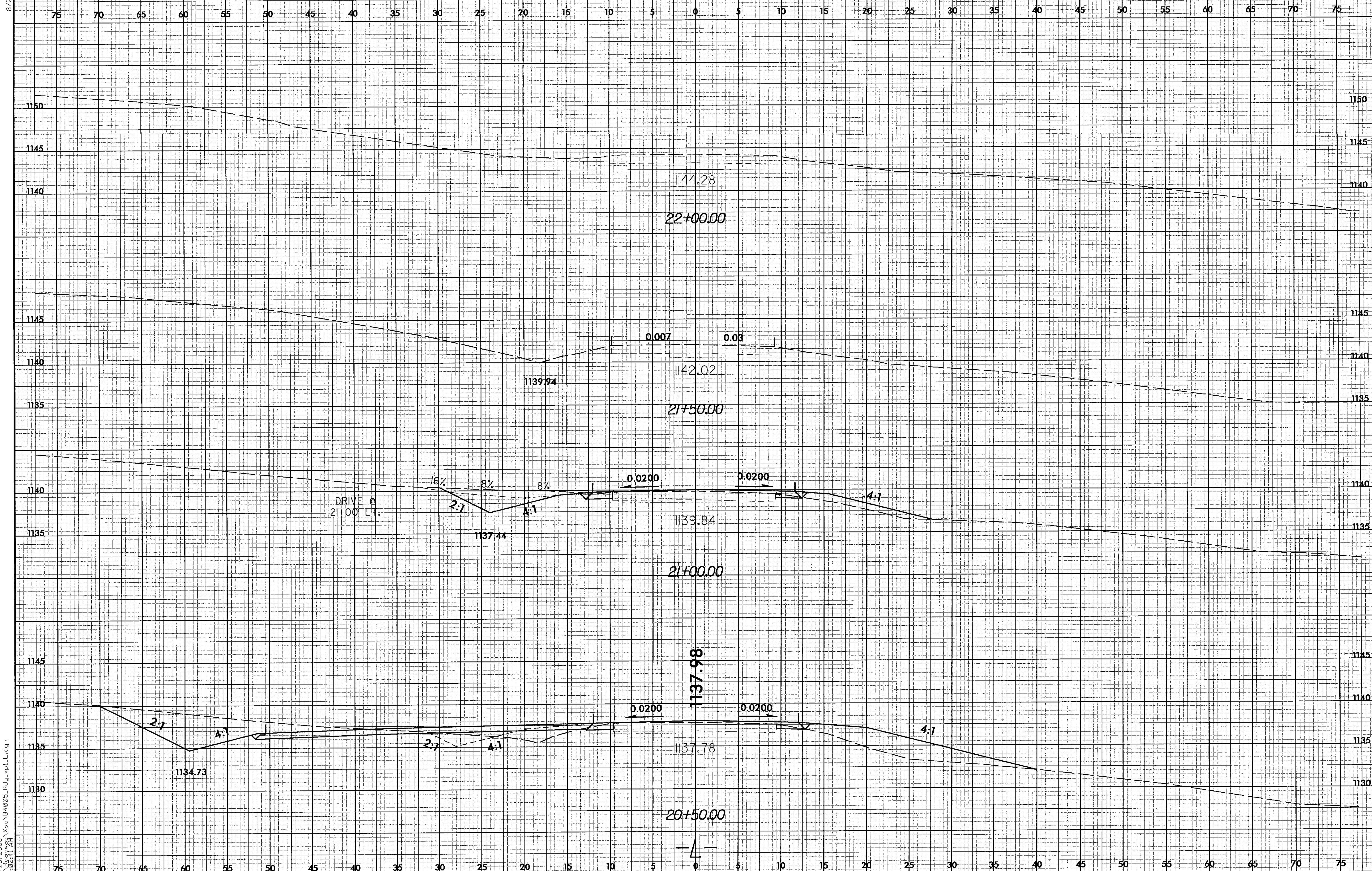

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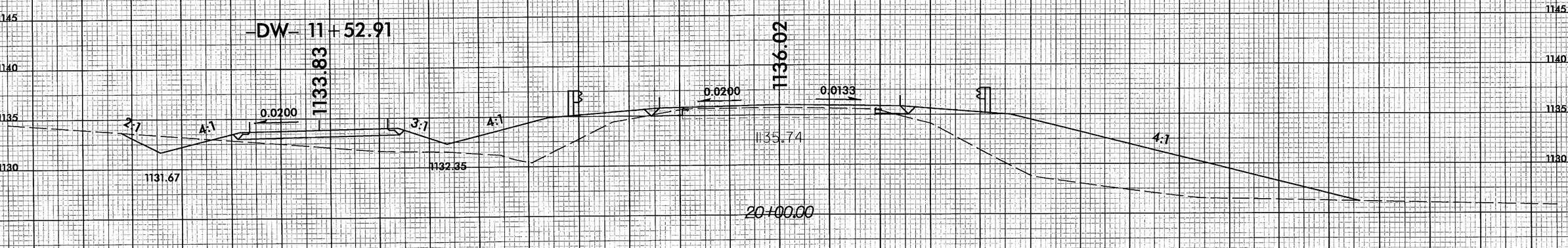

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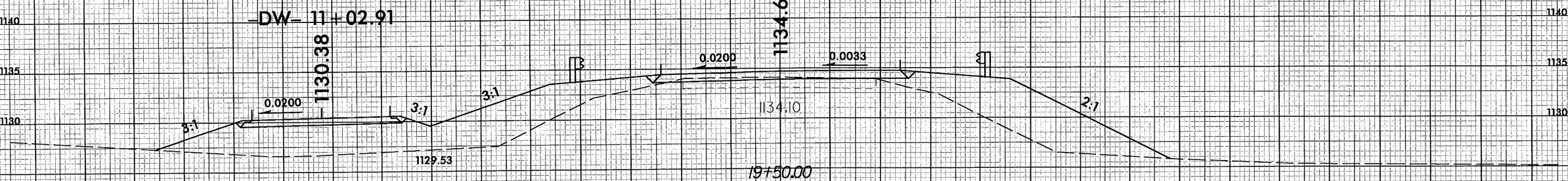

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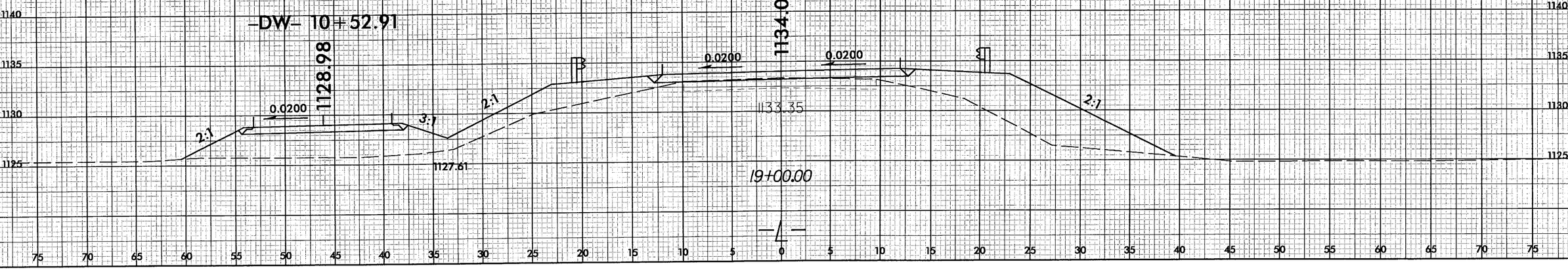

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Alexander County

Bridge No. 70 on SR 1331 (Little River Church Road)

over Grassy Creek

Federal-Aid Project No. BRZ-1331 (9)

State Project No. 8.2780801

W.B.S. No. 33373.1.1

T.I.P. Project No. B-4005

CATEGORICAL EXCLUSION

UNITED STATES DEPARTMENT OF TRANSPORTATION

FEDERAL HIGHWAY ADMINISTRATION

AND

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

DIVISION OF HIGHWAYS

APPROVED:

12/22/04
DATE

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

12/22/04
DATE

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

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CATEGORICAL EXCLUSION

December 2004

Document Prepared By:
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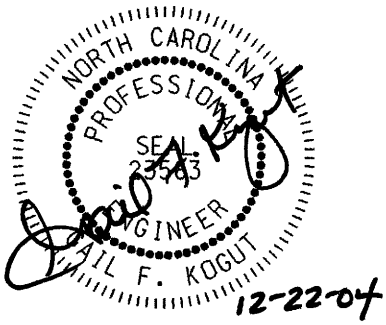

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Alexander County
Bridge No. 70 on SR 1331 (Little River Church Road)
over Grassy Creek
Federal-Aid Project No. BRZ-1331 (9)
State Project No. 8.2780801
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T.I.P. Project No. B-4005

PROJECT COMMITMENTS

No special commitments are required for this project other than those set forth under the standard Nationwide Permit No. 23 and potentially No. 33 Conditions, the General Nationwide Permit Conditions, Section 404 Only Conditions, Regional Conditions, State Consistency Conditions, NCDOT's Guidelines for Best Management Practices for the Protection of Surface Waters, NCDOT's Guidelines for Best Management Practices for Bridge Demolition and Removal, General Certification Conditions, and Section 401 Conditions of Certification.

Alexander County
Bridge No. 70 on SR 1331 (Little River Church Road)
over Grassy Creek
Federal-Aid Project No. BRZ-1331 (9)
State Project No. 8.2780801
W.B.S. No. 33373.1.1
T.I.P. Project No. B-4005

INTRODUCTION: The replacement of Bridge No. 70 is included in the 2004-2010 North Carolina Department of Transportation (NCDOT) Transportation Improvement Program and in the Federal-Aid Bridge Replacement Program. The location is shown in Figure 1. No substantial environmental impacts are anticipated. The project is classified as a Federal "Categorical Exclusion".

I. PURPOSE AND NEED STATEMENT

The NCDOT Bridge Maintenance Unit records indicated the bridge has a sufficiency rating of 22.1 out of a possible 100 for a new structure. The bridge is considered structurally deficient. The replacement of this inadequate structure will result in safer and more efficient traffic operations.

II. EXISTING CONDITIONS

Bridge No. 70 is located on SR 1331 (Little River Church Road) in Alexander County over Grassy Creek (Figure 2-1). SR 1331 is classified as Rural Minor Collector in the Statewide Functional Classification System.

Bridge No. 70 was constructed in 1949. The existing structure is a two-lane, three-span bridge with an overall length of 106.0 ft. (32.3m) and a clear roadway width of 24.5 ft. (7.5m). The bridge superstructure consists of timber deck with a 4 inch (10.16cm) asphalt wearing surface on a steel girder/stringer/floor beam system. The end bents consist of timber caps and piles while the interior bents are timber caps and posts with concrete sills. Bridge No. 70 currently has posted weight limits of 17 tons (15.4 metric tons) for single vehicle (SV) and 24 tons (21.8 metric tons) for truck-tractor semi-trailer (TTST). There is no posted speed limit in the vicinity of this bridge; therefore the statutory speed limit of 55 mph (90 km/hr) applies. The approach roadway for Bridge No. 70 is a two-lane, 19.0-ft. (5.8m) wide road with 4.0-ft. (1.2m) grassed shoulders (Figure 2-1).

The creek bed to roadway crown point height is 20.0 ft. (6.1m) and the normal depth of Grassy Creek is 1.0 ft. (0.3m).

Aerial power and telephone lines run along the southwest side of the bridge. Buried telephone lines continue along the southwest side of the road on both sides of the creek. An aerial power service line crosses SR 1331 just southeast of the bridge. An

underground water line can be found along the northeast side of the road with a treated water pump station in the east quadrant.

The 2002 estimated average daily traffic (ADT) volume is 1400 vehicles per day (vpd). The projected ADT is 2500 vpd by the design year 2025. The percentages of truck traffic are 2% dual-tired vehicles and 1% TTST.

SR 1331 is not a part of a designated bicycle route nor is it listed in the Transportation Improvement Program (TIP) as needing bicycle accommodations. There is no indication that an unusual number of bicyclists use this roadway.

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

Three school buses cross Bridge No. 70 twice daily for a total of 6 trips per day.

Land use in the vicinity of the bridge is mostly agricultural with some scattered large-parcel residential use.

There are no survey markers in the project vicinity.

III. ALTERNATIVES

A. Project Description

The proposed structure will provide a 30-foot (9.1-meter) clear roadway width to allow for two 12-foot (3.6-meter) travel lanes and 3-foot (0.9-meter) shoulders on each side. The approach roadway will consist of two 12-foot (3.6-meter) travel lanes with 8-foot (2.4-meter) unpaved shoulders. Refer to Figure 3. The design speed will be 60 mph (95 km/hr).

The estimated structure requirements are based on the historic performances of the existing structure and field observations of the site. Based on field reconnaissance of the site and a preliminary hydraulic analysis, the existing structure will be replaced with a bridge. The existing roadway elevation would be maintained. Two alternatives are considered (See Figure 4A and 4B).

B. Build Alternatives

Alternative 1
Alternative 1 proposes to construct the bridge on the downstream (southwest) side and maintain traffic on the existing bridge during construction. It is anticipated that the bridge length would be approximately 125 ft. (38.1m). The skew angle of the proposed structure would be 60 degrees. The final bridge length and skew angle will be determined during final design.

Alternative 2 (Preferred)
Alternative 2 proposes to replace the bridge at the existing location using an off-site detour for traffic during construction. It is anticipated that the bridge length would be approximately 125 ft. (38.1m). The skew angle of the proposed bridge would be approximately 60 degrees. The final bridge length and skew angle will be determined during final design.

The off-site detour route is SR 1331 to SR 1338 (St. Clair Road) to NC 16 (See Figure 5). This detour is acceptable to local emergency services. A slight increase in response time would occur. Assuming a twelve-month construction period and a 35 mph (55 km/hr) driving speed, the off-site detour would add no more than five minutes to the detour user's drive time. This is considered an acceptable delay.

C. Alternatives Eliminated from Further Study

The "do-nothing" alternative will eventually necessitate closure and/or removal of the bridge, effectively removing this section of SR 1331 from traffic service.

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

D. Preferred Alternative

Alternative 2, constructing the bridge at the existing location utilizing an off-site detour during construction, is the preferred alternative.

Although the bridge length is the same for both alternatives, the total project length (including approaches) for Alternative 1 is much longer which will result in higher construction costs and greater environmental impacts. Alternative 1 will require the existing roadway embankment to be excavated to match the natural ground.

The roadway alignment would not be improved by Alternative 1 since the existing alignment is on a tangent. Since acceptable detours exist, closing SR 1331 during construction is not considered objectionable.

As evidenced by field observations, the existing crossing is hydraulically and environmentally adequate. Therefore, there is no benefit to relocating the bridge downstream. Alternative 2 is more hydraulically efficient since it has a larger bridge waterway opening than either Alternative 1 or the existing bridge. Based on above findings, Alternative 2 should be the preferred alternative.

IV. ESTIMATED COSTS

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

Table 1: Estimated Costs

	Alternative 1	Alternative 2 (Preferred)
Structure Removal (existing)	20,800	20,800
Structure (proposed)	281,250	281,250
Roadway Approaches	250,579	92,316
Miscellaneous and Mobilization	158,371	87,634
Engineering and Contingencies	114,000	93,000
ROW/Const. Easements/Utilities	43,000	43,000
TOTAL	$ 868,000	$ 618,000

The total estimated cost of the project, as shown in the 2004-2010 Transportation Improvement Program, is $865,000 including $65,000 for right-of-way and $650,000 for construction.

V. NATURAL RESOURCES

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

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

A. Methodology

A general field survey was conducted within the project study area on July 23, 2003. Pedestrian surveys were undertaken to determine natural resource conditions and to document natural communities, wildlife, and the potential presence of protected species or their habitats.

Information regarding the project area and region was derived from a number of resources including: U.S. Geological Survey (USGS) Taylorsville 7.5-minute quadrangle map (1970), Soil Survey Sheets of Alexander County, North Carolina (1995), United States Fish and Wildlife Service (USFWS) National Wetlands Inventory (NWI) Mapping (1999), USFWS list of protected species (February 25, 2003), North Carolina Department of Environmental and Natural Resources (NCDENR) Basinwide Information Management System, North Carolina Center for Geographical Information and Analysis (NCCGIA) BasinPro GIS Million-Acre Edition Data (June 2002), North Carolina Natural Heritage Program (NCNHP) list of rare animal species (January 2001), NCNHP list of rare plant

species (January 2002); NCNHP County status database (accessed June 2003), NCDOT aerial photography of the project study area (1:100), and North Carolina Division of Water Quality (DWQ) water resource data (2003).

B. Physiography and Soils

The project lies within the western Piedmont Physiographic Province. This region consists of higher elevations, more rugged topography, and more monadnocks or mountain outliers than other areas of the Piedmont. The project study area lies within the Inner Piedmont geologic belt, the most intensely deformed and metamorphosed segment of the Piedmont (North Carolina Geological Survey, 1991). The metamorphic rocks range in age from 500 million to 700 million years old. They include gneiss and schist that have been intruded by younger granitic rock. The project study area is found within a metamorphic rock area classified as Mica Schist. Mica Schist is characterized as containing garnet, staurolite, kyanite, or sillimanite. It includes lenses and layers of quartz schist, micaceous quartzite, biotite gneiss, amphibolite, and phyllite. Elevations in the project vicinity range from approximately 1,000 to 1,300 feet (305 to 396 meters) above mean sea level (msl) while elevations in the project study area vary from approximately 1,000 to 1,140 feet (305 to 347 meters) above msl.

According to the general soil map for Alexander County (USDA, 1995), the project study area is composed of soil series allied within the Pacolet-Cecil soil association. The soil types in this association are described as gently sloping to moderately steep, well-drained soils that have predominantly clayey subsoil. Soil series found within the project study area are Riverview fine sandy loam, 0 to 2 percent slopes, frequently flooded, Pacolet sandy loam, 15 to 25 percent slopes, Pacolet sandy clay loam, 8 to 15 percent slopes, eroded, and Masanda sandy clay loam, 8 to 15 percent slopes, eroded. There are no soils classified as hydric by the North Carolina Natural Resource Conservation Service within the project study area.

C. Water Resources

C.1. Water Impacted

The proposed project lies in the Catawba River Basin, within the DWQ subbasin designated 03-08-32 and the USGS 8-digit Hydrologic Unit Code (HUC) 03050101. Waters within the project vicinity include Grassy Creek [11-69-2, 3/1/1962] and an unnamed tributary to Grassy Creek (UT1). Grassy Creek is a major tributary to the Lower Little River [11-69-(0.5), 4/1/1999, "C"] (NCDENR, 2003). Both streams appear on either the Taylorsville USGS 7.5-minute quadrangle map or the County Soil Survey map therefore, they can be classified as perennial streams.

C.2. Water Resources Characteristics

Grassy Creek and its tributary in the project vicinity are classified as "C" waters. Class "C" denotes waters suitable for all general uses including aquatic life propagation and survival, fishing, wildlife, secondary recreation, and agriculture. Grassy Creek and its tributary have a use support rating of Fully Supporting, based on the evaluated method.

Grassy Creek width was approximately 27.0 feet (8.2 meters) upstream of the bridge and 30.0 feet (9.1 meters) below the bridge. Water depth upstream of the bridge ranged from 1.0 to 1.6 feet (0.3 to 0.6 meters) in depth. The substrate consisted of silt, sand, pebbles, cobbles, and bedrock. Water clarity was clear. Grassy Creek can be classified as a Rosgen Stream Classification Type C-channel (Rosgen, 1996).

UT1 appeared to have very few meanders in its approximate 260 feet of length (80 meters). UT1 had a rapid flow rate and measured 3.0 feet (0.7 meters) in width upstream of its confluence with Grassy Creek. Average water depth recorded was 0.5 feet (0.1 meters). Water clarity was clear. The stream appears to be incised in the valley and moving towards a new equilibrium. Based on the observations UT1 was not given a Rosgen classification.

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

The Basinwide Monitoring Program, managed by the DWQ, is part of an ongoing ambient water quality monitoring program that addresses long-term trends in water quality. The program monitors ambient water quality by sampling at fixed sites for selected benthic macroinvertebrates, which are sensitive to water quality conditions. DWQ has a sampling station on the Lower Little River at All Healing Springs downstream from the project study area. This site has been sampled since 1987 and was last sampled in 1997 receiving a rating of 'Good'.

Point sources, such as wastewater discharges, located throughout North Carolina are permitted through the National Pollutant Discharge Elimination System (NPDES) program through the NCDENR. No active NPDES permits are located in, directly upstream, or within a mile from the project study area (NCCGIA 2001).

C.3. Anticipated Impacts to Water Resources

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

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

NCDOT will ensure that preventative and control Best Management Practices (BMP's) are employed to prevent or reduce water pollution as described in the NCDOT handbook *Best Management Practices for the Protection of Surface Waters* (NCDOT 1997).

There are no trout or anadromous fish moratoriums applicable to Bridge No. 70. Moratoria on in-stream construction and stream crossing may be required if natural occurring populations of smallmouth bass or protected species hosts are known to exist. The NCWRC will evaluate each project based on current fisheries data and make recommendations to the USACE. Limiting in-stream activities and revegetating stream banks immediately following the completion of grading can further reduce impacts.

C.4. Impacts Related to Bridge Demolition and Removal

BMP's for Bridge Demolition and Removal may be categorized as one of three cases: Case 1, Case 2, or Case 3. The replacement of Bridge No. 70 may classify as a Case 2 or Case 3. Case 2 categories allow no work at all in the water during moratorium periods. Case 3 categories have no special restrictions beyond those outlined in the *Best Management Practices for the Protection of Surface Waters* handbook. There are no trout or anadromous fish moratoriums applicable to Bridge No. 70. Moratoria on in-stream construction and stream crossing may be required if natural occurring populations of smallmouth bass or protected species hosts are known to exist. The NCWRC will evaluate each project based on current fisheries data and make recommendations to the USACE. Limiting in-stream activities and revegetating stream banks immediately following the completion of grading can further reduce impacts.

The existing structure consists of a timber deck with an asphalt wearing surface on a steel girder/stringer/floor beam system. The end bents consist of timber caps and piles while the interior bents are timber caps and posts with concrete sills. The timber will be removed without dropping components into Waters of the United States.

D. Biotic Resources

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

D.1. Plant Communities

Three highly disturbed plant communities in the project study area: Mesic Mixed Hardwood Forest, Piedmont/Mountain Bottomland Forest, and Urban/Disturbed

Community. These communities are described in detail below and presented in Figure 5.

Mesic Mixed Hardwood Forest – Piedmont Subtype
A small remnant portion of this community occurs west of Bridge No. 70. This community characteristically has a moderately closed canopy and open understory. The dominant canopy species observed included eastern white pine (*Pinus strobus*), yellow-poplar, and red maple. Additional woody and herbaceous species present included tag alder, greenbrier, poison ivy, blackberry, and honeysuckle. Elevations within this community range from approximately 1,040 to 1,120 feet msl (320 to 340 meters). Within the project study area, approximately 1.2 acres (0.5 hectares) of this community exist.

Piedmont/Mountain Bottomland Forest
Within the project study area, this community has been identified by the NWI as Palustrine-Forested-Broad-leaved Deciduous-Temporary Water Regime (PFO1A). The dominant canopy species observed included red maple, river birch, and white pine. The understory consisted of poison ivy, greenbrier, and an unidentified panicum (*Panicum* sp.). Elevations within this community range from approximately 980 to 1,040 feet msl (300 to 320 meters). Within the project study area, approximately 0.9 acres (0.4 hectares) of this community exist.

Urban/Disturbed Community
The Urban/Disturbed community includes the road shoulders, power line right-of-way, residential, urban, and agricultural areas. Many plant species are adapted to these disturbed and regularly maintained areas. Within the project study area, approximately 4.1 acres (1.6 hectares) of this community exist

D.2. Wildlife

Wildlife associated with these vegetative community include ubiquitous mammals such as raccoon (*Procyon lotor*), white-tailed deer (*Odocoileus virginianus*), Virginia opossum (*Didelphis virginiana*), mink (*Mustela vison*), striped skunk (*Mephitis mephitis*), beaver (*Castor canadensis*), eastern cottontail (*Sylvilagus floridanus*), and gray squirrel (*Sciurus carolinensis*).

Avian species which may utilize this community include red-eyed vireo (*Vireo olivaceus*), northern cardinal (*Cardinalis cardinalis*), tufted titmouse (*Baeolophus bicolor*), mourning dove (*Zenaida macroura*), ovenbird (*Seiurus aurocapillus*), eastern phoebe (*Sayornis phoebe*)*, Carolina chickadee (*Poecile carolinensis*), gray catbird (*Dumetella carolinensis*), downy woodpecker (*Picoides pubescens*), blue jay (*Cyanocitta cristata*), northern mockingbird (*Mimus polyglottos*), Acadian flycatcher (*Epidonax virescens*), blue-gray gnatcatcher (*Polioptila caerulea*), Louisiana waterthrush (*Seiurus motacilla*), and northern parula (*Parula americana*).

Other wildlife which may reside or forage in this community include the two-lined salamander (*Eurycea bislineata*), slimy salamander (*Plethodon glutinosus*), Fowler's toad (*Bufo woodhousei*), spring peeper (*Hyla crucifer*), pickerel frog (*Rana palustris*), American toad (*Bufo americanus*), eastern box turtle (*Terrapene carolina*), five-lined

skink (*Eumeces fasciatus*), Queen snake (*Regina septemvittata*), and the ringneck snake (*Diadophis punctatus*).

D.3. Aquatic Communities

Aquatic systems in the project study area include Grassy Creek and an unnamed tributary to Grassy Creek (UT1). Grassy Creek appears to be a moderate groundwater-moderate runoff driven medium size stream. In addition, it appears to have a confined valley form with a medium (0.002 - 0.02) gradient. The channel appeared to be only slightly entrenched in the project study area. The banks were well vegetated with no sign of erosion. UT1 appeared to be a low groundwater-high runoff driven small stream. It lies within a confined valley with a medium gradient. The drainage basin for this stream is approximately 50 acres (20 hectares). The stream banks were well vegetated with no evidence of erosion. Wildlife observed included mayflies, caddisflies, snails, and fish. These stream systems should hold common fish species such as rosyside dace (*Clinostomus funduloides*), bluehead chub (*Nocomis leptocephalus*), sandbar shiner (*Notropis scepticus*), marginated madtom (*Noturus insignis*), and fantail darter (*Etheostoma flabellare*).

D.4. Anticipated Impacts to Biotic Communities

The project study area consists of approximately 1.5 acres (0.6 hectares) of Mesic-Mixed Hardwood Forest, 0.8 acres (0.3 hectares) of Piedmont/Mountain Bottomland Forest, and 11.5 acres (4.7 hectares) of Urban/Disturbed Community. The preferred alternative, Alternative 2, has the potential to encroach into these natural vegetative communities. Based on a preliminary analysis the total acreage that may be affected within each natural vegetative community is shown in Table 2.

Table 2: Anticipated Impacts to Vegetative Communities

	Alternative 1	Alternative 2 (Preferred)
Mesic Mixed Hardwoods	0.69 A (0.28 ha)	0.17 A (0.07 ha)
Piedmont Mountain Bottomland	0.01 A (0.01 ha)	0 A (0 ha)
Urban/Disturbed	0.74 A (0.30 ha)	0.52 A (0.21 ha)
Total	1.44 A (0.59 ha)	0.69 A (0.29 ha)

Loss of wildlife is an unavoidable aspect of development. Temporary fluctuations in populations of animal species, which utilize these communities, are anticipated during the course of construction. Slow-moving, burrowing, and/or subterranean organisms will be directly impacted by construction activities, while mobile organisms will be displaced to adjacent communities.

Aquatic organisms are acutely sensitive to changes in their environment. Environmental impacts from construction activities may result in long term or irreversible effects. Impacts usually associated with in-stream construction include increased channelization and scouring of the streambed. In-stream construction alters the substrate and affects adjacent streamside vegetation. Such disturbances within the substrate lead to increased siltation, which can clog the gills and/or feeding mechanisms of benthic organisms, fish, and amphibian species. Siltation may also cover benthic

macroinvertebrates with excessive amounts of sediment that inhibit their ability to respire. These organisms are slow to recover and usually do not, once the stream has been severely impacted.

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

E. Special Topic

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

Section 404 of the Clean Water Act requires regulation of discharges into "Waters of the United States." The U.S. Environmental Protection Agency (USEPA) is the principal administrative agency of the Clean Water Act; however, the U.S. Army Corps of Engineers (USACE) has the responsibility for implementation, permitting, and enforcement of the provisions of the Act. The USACE regulatory program is defined in 33 CFR 320-330.

Water bodies, including lakes, rivers, and streams, are subject to jurisdictional consideration under the Section 404 program. Wetlands are also identified as "Waters of the United States." Wetlands, defined in 33 CFR 328.3, are those areas that are inundated or saturated by surface water or groundwater at a frequency and duration sufficient to support, and under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Any action that proposes to place fill into these areas falls under the jurisdiction of the USACE under Section 404 of the Clean Water Act (33 U.S.C. 1344).

Surface Waters

The NCDWQ defines a perennial stream as a clearly defined channel that contains water for the majority of the year. These channels usually have some or all of the following characteristics: distinctive streambed and bank, aquatic life, and groundwater flow or discharge. Since both Grassy Creek and UT1 appear on either the Taylorsville USGS 7.5-minute quadrangle map or the County Soil Survey map they can be classified as perennial streams. Detailed stream characteristics, including specific water-quality designations, are presented in Section C: Water Resources.

Jurisdictional Wetlands

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

E.2. Permits

In accordance with Section 404 of the Clean Water Act (33 U.S.C. 1344), a permit is required from the USACE for projects of this type for the discharge of dredged or fill material into "Waters of the United States". The specific permit(s) will be determined once alternatives have been chosen and potential impacts have been calculated. A Nationwide Permit No. 23 (Approved Categorical Exclusion) is likely to be applicable for all impacts to Waters of the United States resulting from the proposed project. A Nationwide Permit No. 33 (Temporary Construction, Access or Dewatering) may be required if an on-site work bridge or causeway is needed during construction of Bridge No. 70. A Regional General Permit No. 198200031 may be required if the discharge of dredged or fill material in "Waters of the United States" is unavoidable.

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

Impacts to the aquatic community of Grassy Creek may result from the replacement of Bridge No. 70. The removal of the substructure may create some disturbance in the streambed. Conditions in the stream may raise sediment concerns since the substrate contains silt; therefore, a turbidity curtain is recommended.

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

Moratoria on in-stream construction and stream crossing may be required if natural occurring populations of smallmouth bass or protected species hosts are known to exist. The NCWRC will evaluate each project based on current fisheries data and make recommendations to the USACE.

E.3. Buffer Rules

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

E.4. Mitigation

The USACE has adopted, through the Council on Environmental Quality (CEQ), a mitigation policy which embraces the concepts of "no net loss of wetlands" and sequencing. The purpose of this policy is to restore and maintain the chemical, biological, and physical integrity of "Waters of the United States," specifically wetlands. Mitigation of wetland impacts has been defined by the CEQ to include avoiding impacts,

minimizing impacts, and compensating for impacts (40 CFR 1508.20). Avoidance, minimization, and compensatory mitigation must be considered sequentially.

Avoidance

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

Minimization

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

1. Strictly enforce Best Management Practices (BMPs) to control sedimentation during project construction;
2. Minimize clearing and grubbing activity;
3. Decrease or eliminate discharges into the North Pacolet River's tributary;
4. Reestablish vegetation on exposed areas, employing judicious pesticide and herbicide management;
5. Minimize "in-stream" activity; and
6. Use responsible litter control practices.

Compensatory Mitigation

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

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

compensatory mitigation for all unavoidable adverse impacts to the mountain trout waters must be included in the information sent to the NCWRC.

F. Rare and Protected Species

Some populations of fauna and flora have been, or are, in the process of decline due to either natural forces or impacts from humans. Federal law (under the provisions of Section 7 of the Endangered Species Act of 1973, as amended) requires that any action likely to adversely affect a species classified as federally-protected be subject to review by the USFWS. Other species may receive additional protection under separate laws.

F.1. Federally Protected Species

Plants and animals with a federal designation of Endangered (E), Threatened (T), Proposed Endangered (PE), and Proposed Threatened (PT) are protected under provisions of Section 7 and Section 9 of the Endangered Species Act of 1973, as amended. The USFWS lists only one federally-protected species for Alexander County as of the February 3, 2003 listing.

Bog turtle (*Clemmys muhlenbergii*)
Federal Status: Threatened (S/A)
State Status: Threatened
Date Listed: May 1, 1997

The **bog turtle** is North Carolina's smallest turtle, measuring 3 to 4 in (7 to 10 cm) in length. It has a dark brown carapace and a black plastron. The bright orange or yellow blotch on each side of the head and neck is a readily identifiable characteristic. The bog turtle inhabits damp grass fields, bogs, and marshes in the mountains and western Piedmont.

The bog turtle is shy and secretive, and will burrow rapidly in mud or debris when disturbed. The bog turtle forages on insects, worms, snails, amphibians, and seeds. In June or July, three to five eggs are laid in a shallow nest in moss or loose soil. The eggs hatch in about 55 days.

The bog turtle is listed as Threatened due to similarity of appearance [T (S/A)]. This is due to its similarity of appearance to another rare species that is listed for protection. T (S/A) species are not subject to Section 7 consultation and a biological conclusion for this species is not required.

Bog turtles inhabit damp grassy fields, bogs, and marshes. These areas generally have minimal woody material and a soft substrate. Suitable habitat as described did not exist within the project study area.

F.2. Federal Species of Concern

There are three federal species of concern listed by the USFWS for Alexander County (USFWS 2003). These species are not protected under the provisions of Section 7 of the

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

Table 3: Federal species of concern species for Alexander County, NC.

Common Name	Scientific Name	Federal Status	State Status	Habitat Requirements	Available Habitat
Vertebrates					
Rafinesque's big-eared bat	*Corynorhinus rafinesquii*	FSC	T	Hollow trees, caves, mines and beneath bridges	Yes
Vascular Plants					
Torrey's mountain-mint	*Pycnanthemum torrei*	FSC	SR-T	Dry uplands and woodlands over Mafic rock	No
Nonvascular Plants					
Keever's bristle-moss	*Orthotrichum keeverae*	FSC	E	On trees around low elevation granitic domes	No

NOTES:
Notes: E - Endangered; T - Threatened; SR - Significantly Rare; S/A - Similarity of Appearance; na - not available.

VI. CULTURAL RESOURCES

A. Compliance Guidelines

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

B. Historic Architecture

A field study of the area of potential effect (APE) was conducted on June 10, 2003. The APE is defined as the geographic area or areas within which an undertaking or project may directly or indirectly cause alterations in the character or use of historic properties. All structures within the APE were photographed and later reviewed by the State Historic Preservation Office (HPO). In a concurrence form dated September 30, 2003, the State Historic Preservation Officer (SHPO) stated that there were no structures of historical or

architectural importance located within the planning area, based on historical information available. Upon the review of the photographs, the SHPO concluded that although there are properties over fifty years old, they are not eligible for the National Registry. Bridge #70 was further evaluated in a report. It was determined that it is also ineligible for inclusion in the National Registry of Historic Places. Therefore, no further compliance with Section 106 is required. A copy of the SHPO concurrence form and memorandums are included in the Appendix.

C. Archaeology

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

VII. ENVIRONMENTAL EFFECTS

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

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

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

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

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

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

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

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

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

directly impact minority or low-income residences, segment existing minority communities, or separate residential areas from nearby services such as schools.

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

No geodetic monuments will be impacted during construction of this project.

The Farmland Protection Policy Act requires all federal agencies or their representatives to consider the potential impacts to prime and important farmland soils by all land acquisition and construction projects. Prime and important farmlands are defined by the Natural Resources Conservation Service (NRCS). Candidate prime farmland is found in the project limits, but since it is not protected from flooding, it is not considered prime farmland.

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

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

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

A field investigation and an examination of records of DENR's Division of Waste Management, Underground Storage Tank Section, revealed that no regulated underground storage tanks exist in the project study area.

Alexander County is a participant in the National Flood Insurance Program. This site on Grassy Creek is not included in a detailed FEMA flood study. Attached is a copy of the Flood Insurance Rate Map, on which are shown the approximate limits of the 100-year flood plain in the vicinity of the project (Figure 7).

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

VIII. PUBLIC INVOLVEMENT

Efforts were undertaken early in the planning process to contact local officials to involve them in the project development with scoping letters. A Citizens Informational Workshop was held at the Taylorsville Town Hall in the Council Chambers on July 13, 2004 from 4:00 p.m. to 7:00 p.m. At this workshop, preliminary alternatives were reviewed and discussed with concerned citizens and local officials.

Eight (8) local citizens attended the Citizens Informational Workshop. All of the citizens agreed with the preferred alternative (Alternative 2).

IX. AGENCY COMMENTS

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

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

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

   Response: No suitable habitats occur within the project study area for any federally listed endangered or threatened species.

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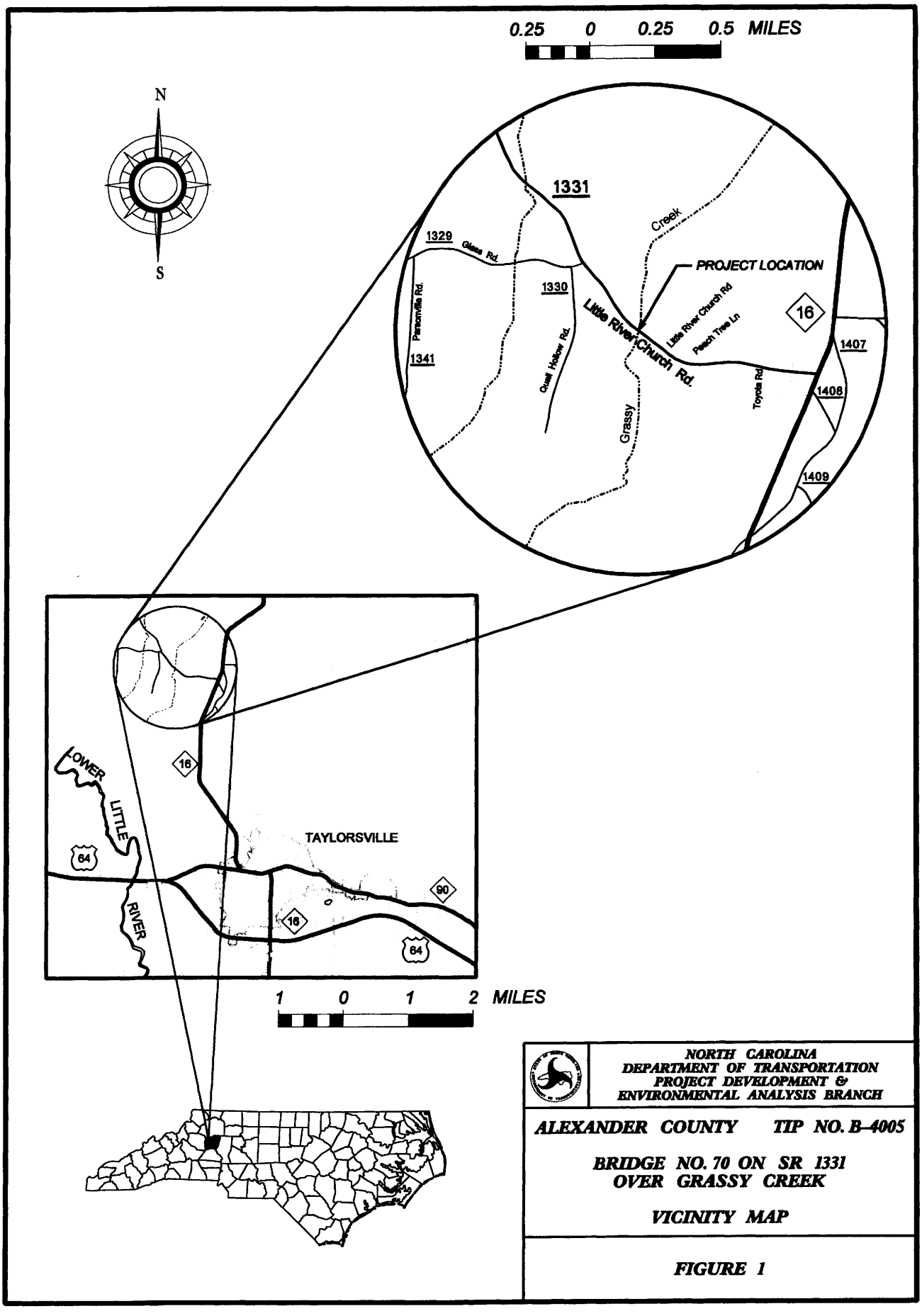
FIGURES



NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
PROJECT DEVELOPMENT &
ENVIRONMENTAL ANALYSIS BRANCH

ALEXANDER COUNTY TIP NO. B-4005

BRIDGE NO. 70 ON SR 1331 OVER GRASSY CREEK

VICINITY MAP

FIGURE 1

VIEW OF SOUTHEAST-ERN APPROACH

VIEW OF NORTH-WESTERN APPROACH

NORTH CAROLINA
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ENVIRONMENTAL ANALYSIS

ALEXANDER COUNTY TIP NO. B-4005

BRIDGE NO. 70 ON SR 1331
OVER GRASSY CREEK

PHOTOGRAPHS

Figure 2-1

VIEW UPSTREAM (LOOKING NORTH-EAST)

VIEW DOWNSTREAM (LOOKING SOUTH-WEST)

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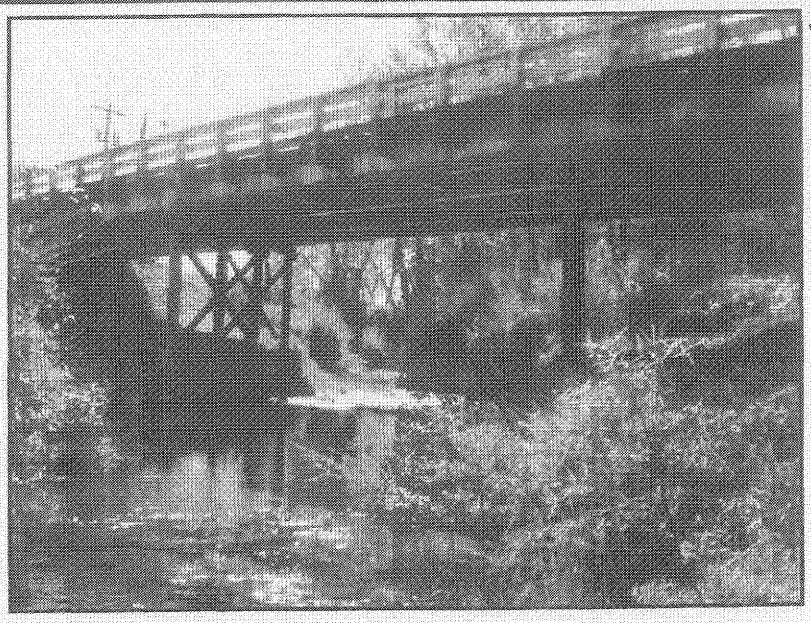
ENVIRONMENTAL ANALYSIS

ALEXANDER COUNTY TIP NO. B-4005

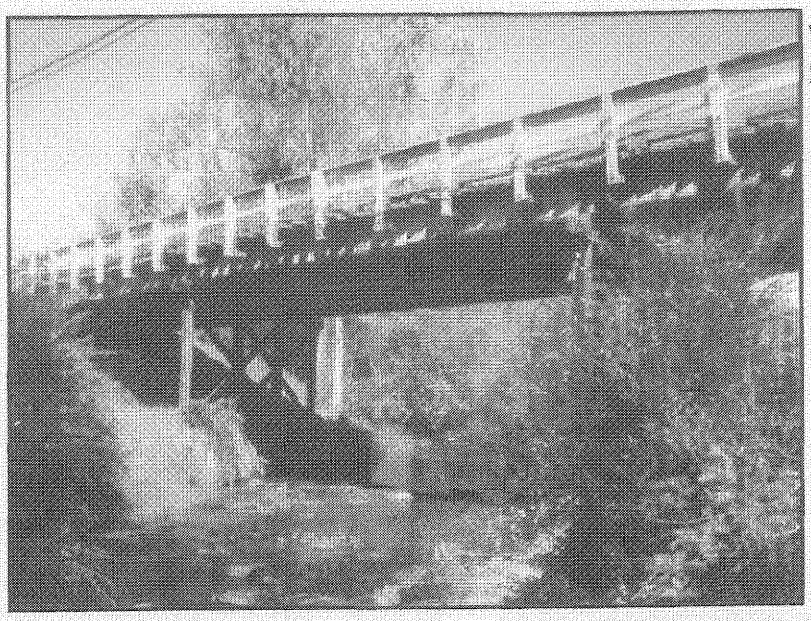
BRIDGE NO. 70 ON SR 1331
OVER GRASSY CREEK

PHOTOGRAPHS

Figure 2-2



VIEW OF UPSTREAM FACE



VIEW OF DOWN-STREAM FACE

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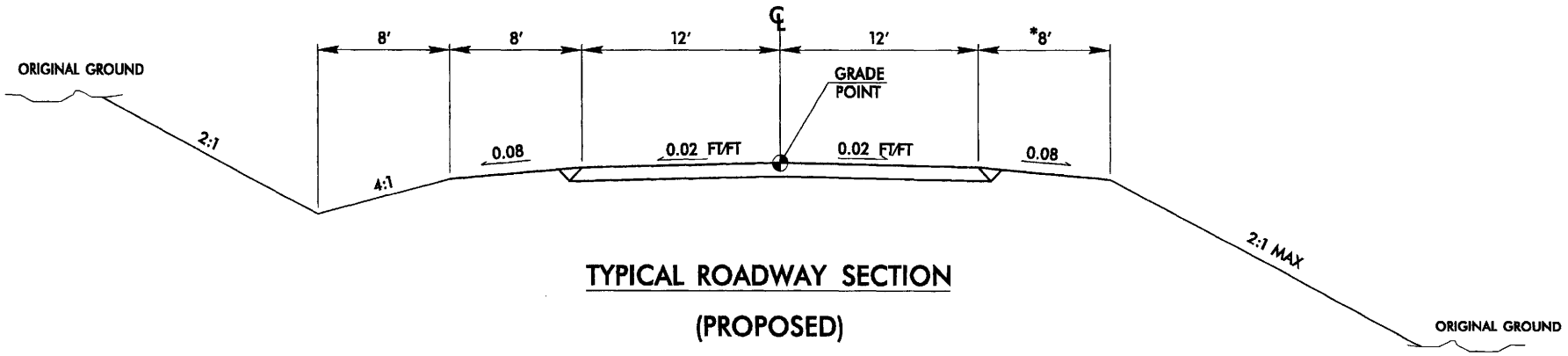
ENVIRONMENTAL ANALYSIS

ALEXANDER COUNTY TIP NO. B-4005

BRIDGE NO. 70 ON SR 1331
OVER GRASSY CREEK

PHOTOGRAPHS

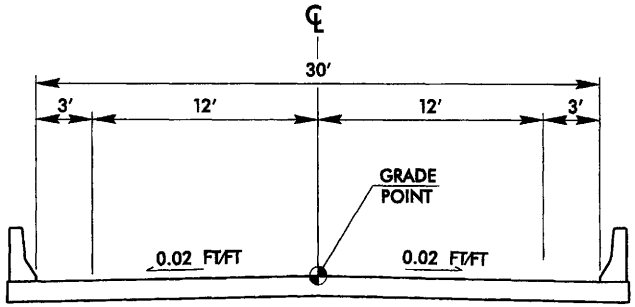
Figure 2-3



TYPICAL ROADWAY SECTION

(PROPOSED)

*ADD 3' FOR GUARDRAIL



TYPICAL SECTION ON PROPOSED BRIDGE

TRAFFIC DATA

ADT 2002 = 1400
ADT 2025 = 2500
DUAL 2%
TTST 1%
FUNCTIONAL CLASSIFICATION: RURAL MINOR COLLECTOR
LOS = A

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ALEXANDER COUNTY TIP NO. B-4005

BRIDGE NO. 70 ON SR 1331
OVER GRASSY CREEK

TYPICAL SECTION

FIGURE 3

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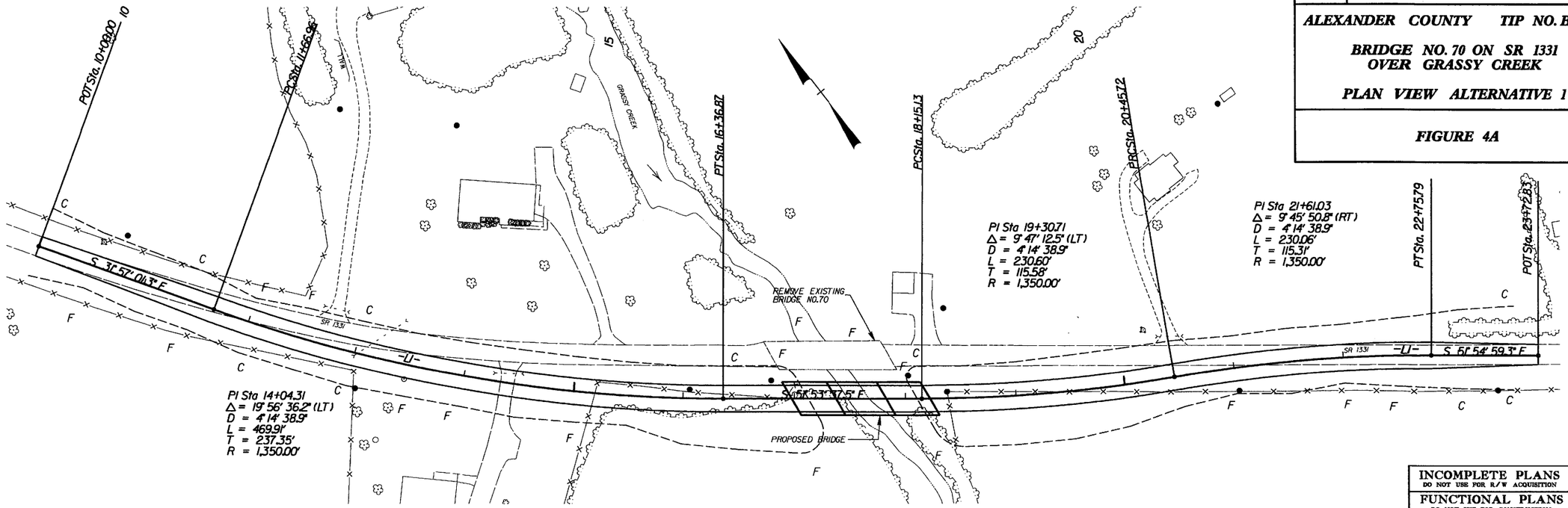
ALEXANDER COUNTY TIP NO. B-4005

BRIDGE NO. 70 ON SR 1331 OVER GRASSY CREEK

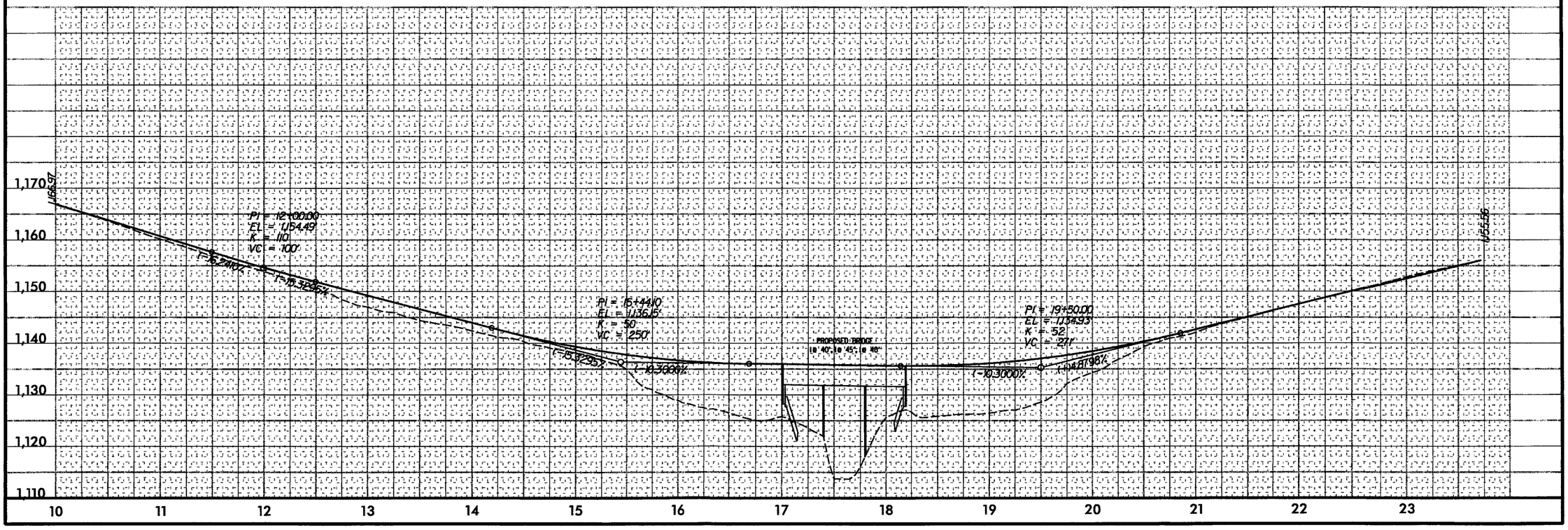
PLAN VIEW ALTERNATIVE 1

FIGURE 4A



INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

FUNCTIONAL PLANS
DO NOT USE FOR CONSTRUCTION



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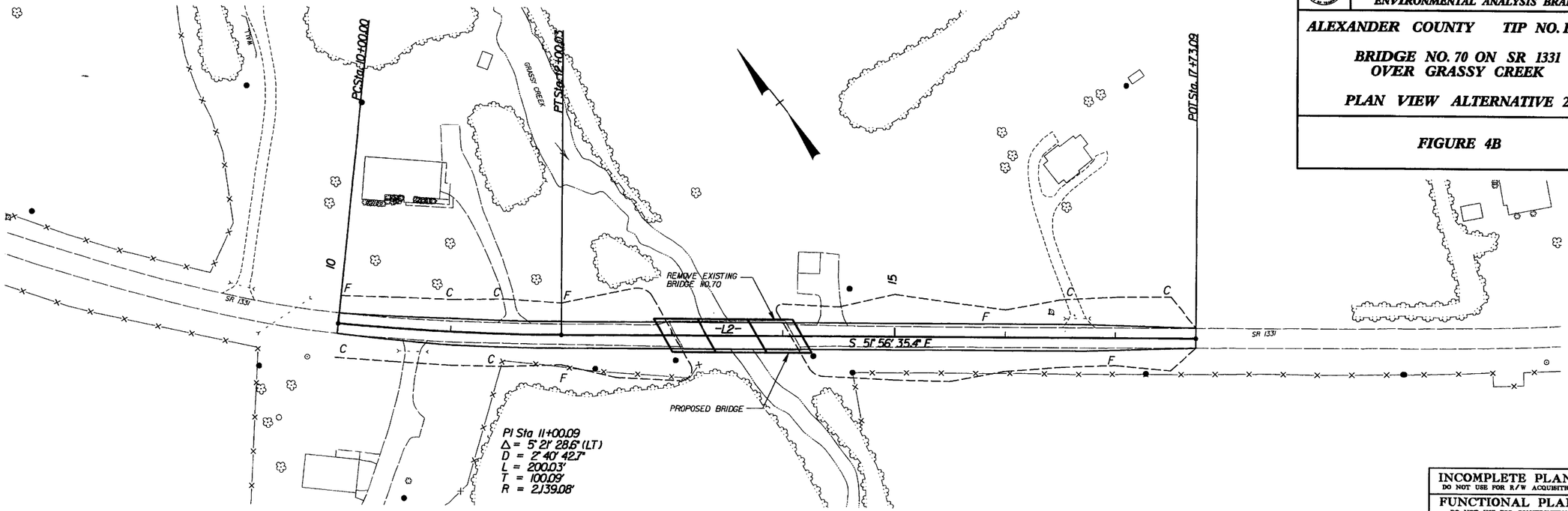
ENVIRONMENTAL ANALYSIS BRANCH

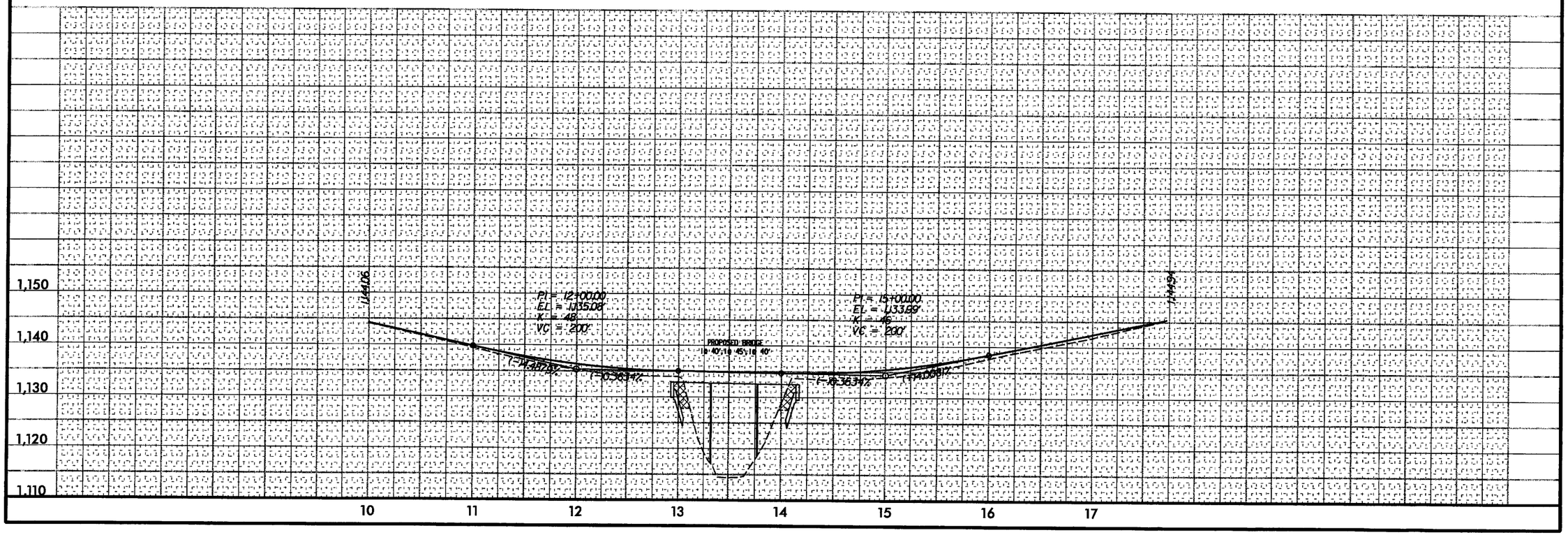
ALEXANDER COUNTY **TIP NO. B-4005**

BRIDGE NO. 70 ON SR 1331
OVER GRASSY CREEK

PLAN VIEW ALTERNATIVE 2

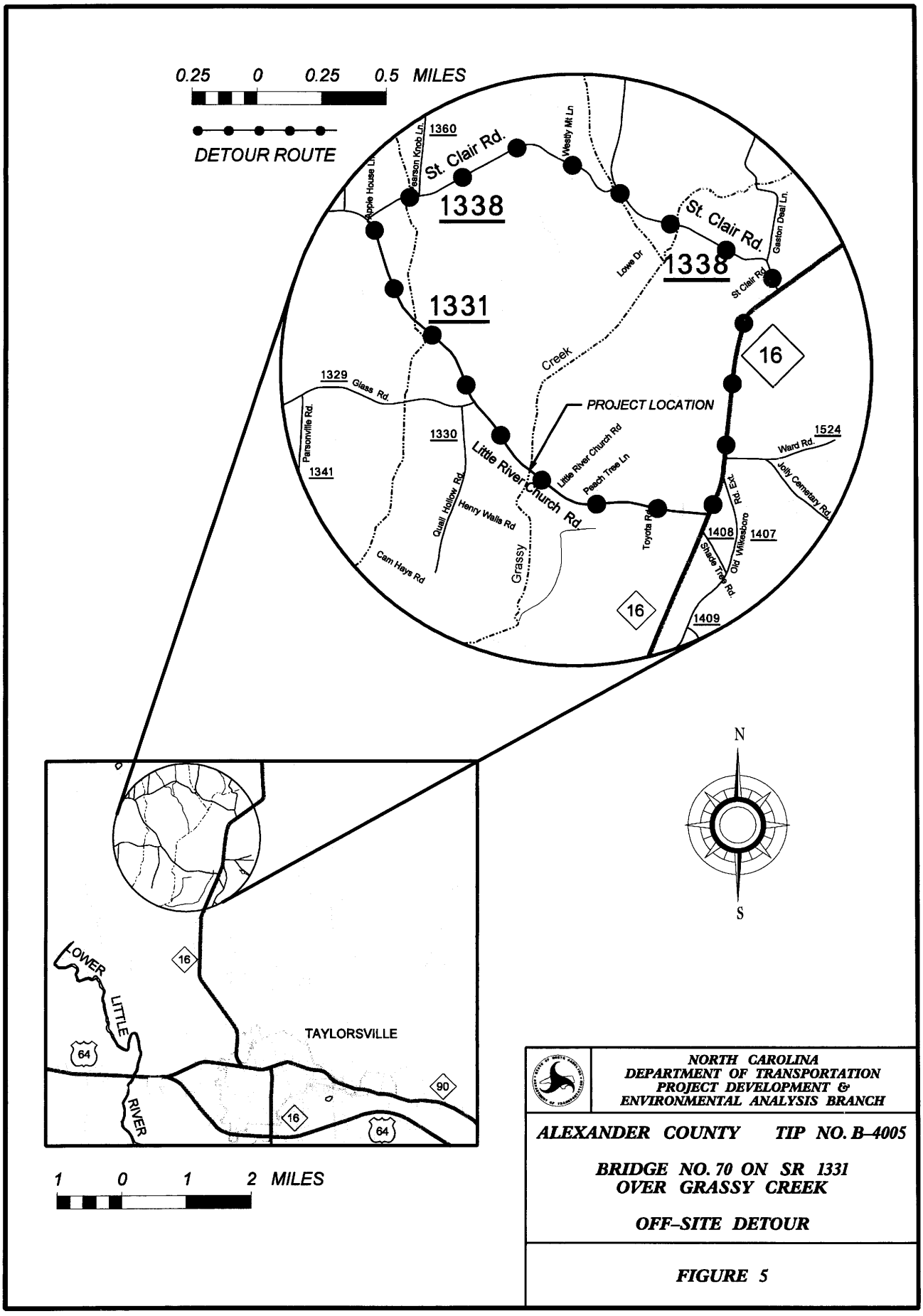
FIGURE 4B





INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

FUNCTIONAL PLANS
DO NOT USE FOR CONSTRUCTION



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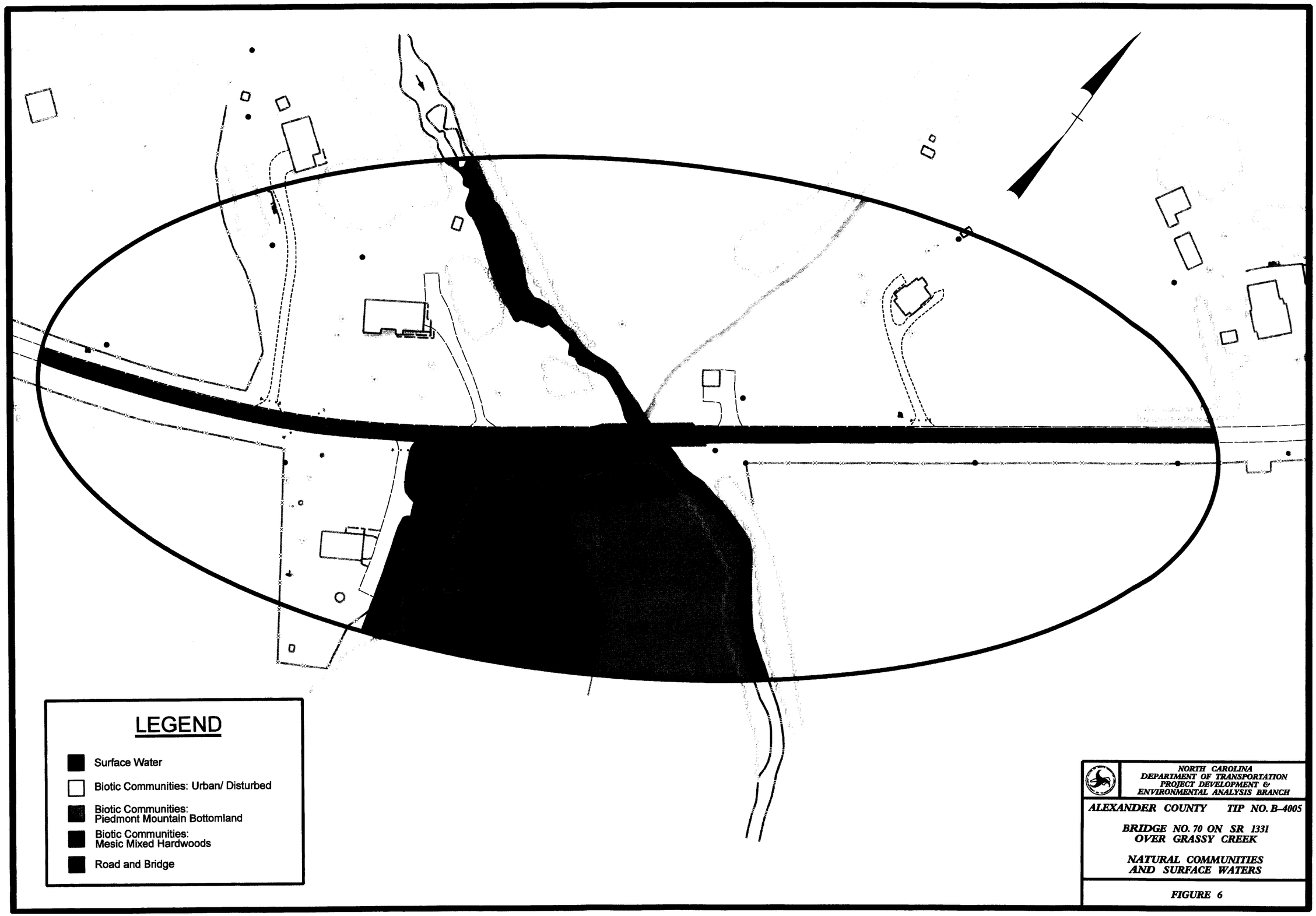
ENVIRONMENTAL ANALYSIS BRANCH

ALEXANDER COUNTY TIP NO. B-4005

BRIDGE NO. 70 ON SR 1331
OVER GRASSY CREEK

OFF-SITE DETOUR

FIGURE 5



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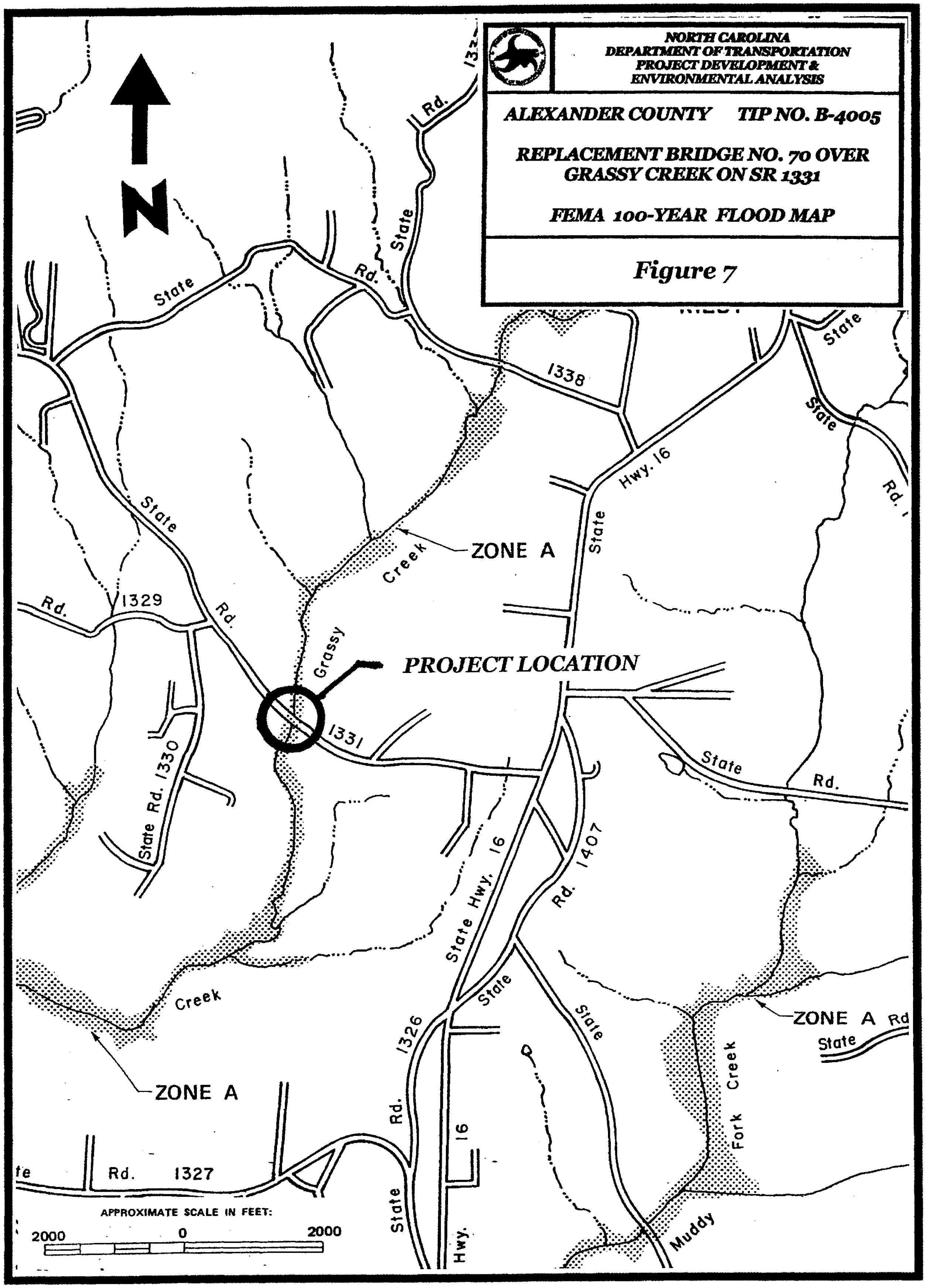
ENVIRONMENTAL ANALYSIS BRANCH

ALEXANDER COUNTY TIP NO. B-4005

BRIDGE NO. 70 ON SR 1331
OVER GRASSY CREEK

NATURAL COMMUNITIES
AND SURFACE WATERS

FIGURE 6



NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
PROJECT DEVELOPMENT &
ENVIRONMENTAL ANALYSIS
ALEXANDER COUNTY TIP NO. B-4005
REPLACEMENT BRIDGE NO. 70 OVER
GRASSY CREEK ON SR 1331
FEMA 100-YEAR FLOOD MAP
Figure 7
N
PROJECT LOCATION
ZONE A
ZONE A
ZONE A
Grassy
Creek
Creek
Fork Creek
Muddy
State Rd. 1331
State Rd. 1329
State Rd. 1330
State Rd. 1338
State Hwy. 16
State Rd. 1407
State Rd. 1326
Rd. 1327
APPROXIMATE SCALE IN FEET:
2000
0
2000

APPENDIX

United States Department of the Interior

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

October 3, 2003

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

Dear Dr. Thorpe:

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

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

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

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

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

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

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

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

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

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

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

Sincerely,

Brian P. Cole
Field Supervisor

Enclosure

cc:
Mr. Steve Lund, U.S. Army Corps of Engineers, Asheville Regulatory Field Office, 151 Patton Avenue, Room 208, Asheville, NC 28801-5006
Ms. Marla J. Chambers, Highway Projects Coordinator, North Carolina Wildlife Resources Commission, 12275 Swift Road, Oakboro, NC 28129
Ms. Cynthia Van Der Wiele, North Carolina Department of Environment and Natural Resources, Division of Water Quality, Wetlands Section, 1621 Mail Service Center, Raleigh, NC 27699-1621

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

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

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

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

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

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

AVERY COUNTY

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

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

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

BURKE COUNTY

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

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

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

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

KEY:

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

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

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

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

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

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

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

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

U.S. Department of Agriculture

FARMLAND CONVERSION IMPACT RATING

PART I (To be completed by Federal Agency)	Date Of Land Evaluation Request 6/3/04
Name Of Project Bridge Replacement - TIP No. B-4005	Federal Agency Involved FHW - NCDOT
Proposed Land Use Bridge	County And State Alexander County, NC
PART II (To be completed by SCS)	Date Request Received By SCS 6/11/2004

Does the site contain prime, unique, statewide or local important farmland? (If no, the FPPA does not apply – do not complete additional parts of this form).	Yes ☑ No ☐	Acres Irrigated 0	Average Farm Size 106
Major Crop(s) Silage Corn, Soybeans, Pasture/Hay	Farmable Land In Govt. Jurisdiction Acres: 0 0%	Amount Of Farmland As Defined in FPPA Acres: 1 %	
Name Of Land Evaluation System Used LESA	Name Of Local Site Assessment System Local Version LESA	Date Land Evaluation Returned By SCS 8-10-2004	

PART III (To be completed by Federal Agency)	Alternative Site Rating Site A	Site B	Site C	Site D
A. Total Acres To Be Converted Directly	0			
B. Total Acres To Be Converted Indirectly	0			
C. Total Acres In Site	6.5 ac			
PART IV (To be completed by SCS) Land Evaluation Information				
A. Total Acres Prime And Unique Farmland	*3.5			
B. Total Acres Statewide And Local Important Farmland	2.1			
C. Percentage Of Farmland In County Or Local Govt. Unit To Be Converted	.0001			
D. Percentage Of Farmland In Govt. Jurisdiction With Same Or Higher Relative Value	10			
PART V (To be completed by SCS) Land Evaluation Criterion Relative Value Of Farmland To Be Converted (Scale of 0 to 100 Points)	50			

PART VI (To be completed by Federal Agency) Site Assessment Criteria (These criteria are explained in 7 CFR 658.5(b))	Maximum Points	Site A	Site B	Site C	Site D
1. Area In Nonurban Use		2.1 ac			
2. Perimeter In Nonurban Use					
3. Percent Of Site Being Farmed		15 pasture			
4. Protection Provided By State And Local Government					
5. Distance From Urban Builtup Area					
6. Distance To Urban Support Services					
7. Size Of Present Farm Unit Compared To Average					
8. Creation Of Nonfarmable Farmland					
9. Availability Of Farm Support Services					
10. On-Farm Investments					
11. Effects Of Conversion On Farm Support Services					
12. Compatibility With Existing Agricultural Use					
TOTAL SITE ASSESSMENT POINTS	160				
PART VII (To be completed by Federal Agency)					
Relative Value Of Farmland (From Part V)	100				
Total Site Assessment (From Part VI above or a local site assessment)	160				
TOTAL POINTS (Total of above 2 lines)	260				

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

Reason For Selection:

* 3.5 AC. RHA IS ONLY CONSIDERED PRIME IF PROTECTED FROM FLOODING. CODE IS P3

North Carolina Wildlife Resources Commission

Charles R. Fullwood, Executive Director

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

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

DATE: November 5, 2003

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

North Carolina Department of Transportation (NCDOT) has requested comments from the North Carolina Wildlife Resources Commission (NCWRC) regarding impacts to fish and wildlife resources resulting from the subject projects. Staff biologists have reviewed the information provided and have the following preliminary comments. These comments are provided in accordance with the provisions of the National Environmental Policy Act (42 U.S.C. 4332(2)(c)) and the Fish and Wildlife Coordination Act (48 Stat. 401, as amended; 16 U.S.C. 661-667d).

Our standard recommendations for bridge replacement projects of this scope are as follows:

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

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

3. Live concrete should not be allowed to contact the water in or entering into the stream.

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

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

5. If temporary access roads or detours are constructed, they should be removed back to original ground elevations immediately upon the completion of the project. Disturbed areas should be seeded or mulched to stabilize the soil and native tree species should be planted with a spacing of not more than 10'x10'. If possible, when using temporary structures the area should be cleared but not grubbed. Clearing the area with chain saws, mowers, bush-hogs, or other mechanized equipment and leaving the stumps and root mat intact, allows the area to revegetate naturally and minimizes disturbed soil.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

was previously wetlands, NCDOT should restore the area to wetlands. If successful, the site may be used as wetland mitigation for the subject project or other projects in the watershed.

Project specific comments:

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

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

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

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

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

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

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

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

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

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

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

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

Spanning structures allow wildlife passage along streambanks, reducing habitat fragmentation and vehicle related mortality at highway crossings.

If you need further assistance or information on NCWRC concerns regarding bridge replacements, please contact me at (704) 485-2384. Thank you for the opportunity to review and comment on these projects.

cc: Cynthia Van Der Wiele, NC DWQ
Marella Buncick, USFWS
Sarah McRae, NC NHP

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

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

October 16, 2003

MEMORANDUM

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

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

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

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

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

I. General Comments Regarding Bridge Replacement Projects

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

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

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

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

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

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

7. If temporary access roads or detours are constructed, they should be removed back to original ground elevations immediately upon the completion of the project. Disturbed areas should be seeded or mulched to stabilize the soil and native tree species should be planted with a spacing of not more than 10'x10'. If possible, when using temporary structures the area should be cleared but not grubbed. Clearing the area with chain saws, mowers, bush-hogs, or other mechanized equipment and leaving the stumps and root mat intact, allows the area to re-vegetate naturally and minimizes disturbed soil.

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

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

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

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

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

II. General Comments if Replacing the Bridge with a Culvert

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

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

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

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

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

III. Project-Specific Comments

B-4008, Bridge 39, Little River, Alleghany County
The Little River is classified as C Trout. A moratorium prohibiting in-stream work and land disturbance within the 25-foot trout buffer is recommended from October 15 to April 15 to protect the egg and fry stages of trout. DWQ would prefer this bridge to be replaced with a bridge and the use of BMPs (particularly for sediment and erosion control) to be maximized.

B-3608, Bridge 44, North Toe River, Avery County
The North Toe River is classified as WS-IV Trout. A moratorium prohibiting in-stream work and land disturbance within the 25-foot trout buffer is recommended from October 15 to April 15 to protect the egg and fry stages of trout. DWQ would prefer this bridge to be replaced with a bridge and the use of BMPs (particularly for sediment and erosion control) to be maximized. There are 30-foot vegetated buffer requirements in WS waters in addition to the requirements to minimize storm water runoff and maximize use of BMPs. Refer to 15A NCAC 2B .0216(3)(b)(i)(F) and (G).

B-4054, Bridge 334, Yadkin River, Caldwell County
This part of the Yadkin River is classified as WS-IV Trout. A moratorium prohibiting in-stream work and land disturbance within the 25-foot trout buffer is recommended from October 15 to April 15 to protect the egg and fry stages of trout. DWQ would prefer this bridge to be replaced with a bridge and the use of BMPs (particularly for sediment and erosion control) to be maximized. There are 30-foot vegetated buffer requirements in WS waters in addition to the requirements to minimize storm water runoff and maximize use of BMPs. Refer to 15A NCAC 2B .0216(3)(b)(i)(F) and (G).

B-4315, Bridge 62, Bairds Creek, Watauga County
Bairds Creek is classified as C. DWQ does not have any special concerns. Please refer to general recommendations listed above.

B-4325, Bridge 718, Middle Fork Reddies River, Wilkes County
The Middle Fork of Reddies River is classified as WS-II, HQW, Trout. As this is a High Quality Water classification, DWQ would hope that a spanning structure is planned for this crossing. In addition, we would stress that NCDOT should use the highest possible BMPs for protecting this resource. There are 30-foot vegetated buffer requirements in WS waters in addition to the requirements to minimize storm water runoff and maximize use of BMPs. Refer to 15A NCAC 2B .0216(3)(b)(i)(F) and (G). A moratorium prohibiting in-stream work and land disturbance within the 25-foot trout buffer is recommended from October 15 to April 15 to protect the egg and fry stages of trout. DWQ would prefer this bridge to be replaced with a bridge and the use of BMPs (particularly for sediment and erosion control) to be maximized.

B-4190, Bridge 37, Hopper Creek, McDowell County
Hopper Creek is classified as C. DWQ does not have any special concerns. Please refer to general recommendations listed above.

B-4189, Bridge 49, South Muddy Creek, McDowell County
South Muddy Creek is classified as C. DWQ does not have any special concerns. Please refer to general recommendations listed above.

B-4191, Bridge 82, Jacktown Creek, McDowell County
Jacktown Creek is classified as C. DWQ does not have any special concerns. Please refer to general recommendations listed above.

B-4042, Bridge 274, Canoe Creek, Burke County

Canoe Creek is classified as WS-IV. There are 30-foot vegetated buffer requirements in WS waters in addition to the requirements to minimize storm water runoff and maximize use of BMPs. Refer to 15A NCAC 2B .0216(3)(b)(i)(F) and (G).

B-4005, Bridge 70, Grassy Creek, Alexander County

Grassy Creek is classified as C. DWQ does not have any special concerns. Please refer to general recommendations listed above.

Thank you for requesting our input at this time. The DOT is reminded that issuance of a 401 Water Quality Certification requires that appropriate measures be instituted to ensure that water quality standards are met and designated uses are not degraded or lost. If you have any questions or require additional information, please contact Robert Ridings at (919) 733-9817 or Cynthia Van Der Wiele at (919) 733.5715.

pc: John Hendrix, USACE Asheville Field Office
File Copy

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

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

Division of Historical Resources

CITIZENS PARTICIPATION
RECEIVED
JAN 28 2004

RECEIVED
JAN 27 2004
DIVISION OF HIGHWAYS
PROJECT DEVELOPMENT AND ENVIRONMENTAL ANALYSIS BRANCH

January 21, 2004

MEMORANDUM

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

FROM: David Brook David Brook by BJS

SUBJECT: Replace Bridge 70 on SR 1331 over Grassy Creek, B-4005, Alexander County, ER03-2338

Thank you for your memorandum of January 7, 2004, concerning the above project.

We checked our files and sent you a letter on December 8, 2004, concurring that Bridge No. 70 is not eligible for the National Register of Historic Places. Therefore, we have no further comment on the undertaking as proposed.

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

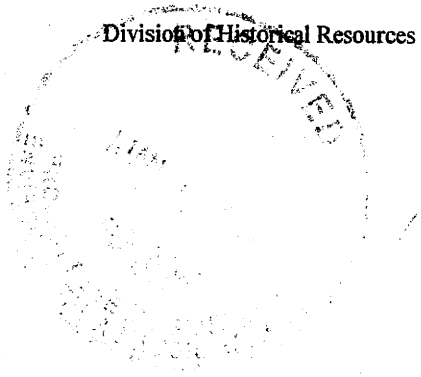
Thank you for your cooperation and consideration. If you have questions concerning the above comment, contact Renee Gledhill-Earley, environmental review coordinator, at 919/733-4763. In all future communication concerning this project, please cite the above referenced tracking number.

cc: Mary Pope Furr, NCDOT

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

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

Division of Historical Resources



January 5, 2004

MEMORANDUM

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

FROM: David Brook

SUBJECT: Replace Bridge No. 70 on SR 1331 over Grassy Creek, B-4005, Alexander County, ER03-2338

Thank you for your letter of December 8, 2003, concerning the above project.

For purposes of compliance with Section 106 of the National Historic Preservation act, we concur that the following property is not eligible for listing in the National Register of Historic Places.

Bridge No. 70 on SR 1331 over Grassy Creek, is an undistinguished example of a common bridge design (steel girder-floorbeam).

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

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

cc: Mary Pope Furr, NCDOT

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

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

Division of Historical Resources

October 22, 2003

MEMORANDUM

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

FROM: David Brook for David Brook

SUBJECT: Replace Bridge No. 70 on SR 1331 over Grassy Creek, B-4005, Alexander County, ER03-2338

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

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

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

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

cc: Mary Pope Furr, NCDOT

Federal Aid # BRZ-1331(9) *TIP* # B-4005 *County*: Alexander

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

Project Description: Replace Bridge No. 70 on SR 1331 over Grassy Creek

On 09/30/2003, representatives of the

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

Reviewed the subject project at

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

All parties present agreed

- [ ] There are no properties over fifty years old within the project's area of potential effects.
- [ ] There are no properties less than fifty years old which are considered to meet Criteria Consideration G within the project's area of potential effects.
- [x] There are properties over fifty years old within the project's Area of Potential Effects (APE), but based on the historical information available and the photographs of each property, the property identified as 1-4 is considered not eligible for the National Register and no further evaluation of it is necessary.
- [ ] 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.
- [ ] There are no historic properties affected by this project. (*Attach any notes or documents as needed*)

Signed:

Mary Pope Furr — Sept. 30, 2003
Representative, NCDOT — Date

[illegible] — 9/30/03
FHWA, for the Division Administrator, or other Federal Agency — Date

[illegible] — 9/30/03
Representative, HPO — Date

David Brook — 9/30/03
State Historic Preservation Officer — Date

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

Bridge #70 will be evaluated in a report.

Public Schools of North Carolina

NC Department of Public Instruction
School Planning, Division of School Support
6322 Mail Service Center
Raleigh, NC 27699-6322

Phone: (919) 807-3554
Fax: (919) 807-3558
Www.schoolclearinghouse.org

September 11, 2003

MEMORANDUM

TO: Gregory J. Thorpe, P.E.
Department of Transportation

FROM: David Edwards, Section Chief, School Planning de

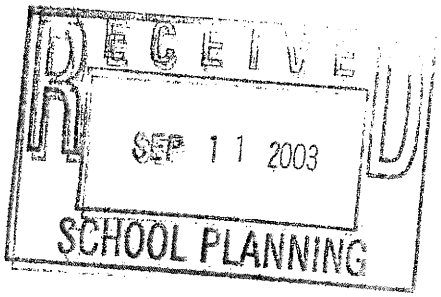
SUBJECT: Alexander County, Bridge #70 on SR 1331 over Grassy Creek, Federal Aid Project No. BRZ-1331(9), State Project No. 8.2780801, TIP Project No. B-4005

Enclosed is a response from Alexander County Schools in regard to the Bridge Replacement Inquiry.

/ed
Enclosure

Alexander County Schools

P.O. BOX 128
TAYLORSVILLE, NORTH CAROLINA 28681



September 9, 2003

Dr. J. David Edwards
Section Chief, School Planning
6322 Mail Service Center
Raleigh, NC 27699-6322

Dear Dr. Edwards,

Please find enclosed the information you requested regarding information about the bridge project over Grassy Creek in Alexander County. Dee Watts, our TIMS coordinator has researched this, and has determined the level of impact per your request.

If I can assist you further, do not hesitate to contact our office. Thank you for your work in support of public schools.

Sincerely,

Barry S. Redmond

Dr. Barry Redmond
Associate Superintendent

Alexander County Schools
www.alexander.k12.nc.us

700 Liledoun Road
Taylorsville, NC 28681
Phone: 828.632.7001
Fax: 828.632.8862

MEMORANDUM

To: Dr. Barry Redmond, Associate Superintendent
From: Dee Watts, TIMS Coordinator

Date: September 8, 2003

Re: DOT Memorandum – Bridge #70 on SR 1331(Little River Church Road)

The following information was gathered from the Edulog NT program that is currently being used to route buses in Alexander County Schools.

This project, slated to start construction in fiscal year 2006, will impact 3 of our 10 schools: Alexander Central High School, East Alexander Middle School, and Sugar Loaf Elementary. It would be impossible to determine how many students may be affected by this project at this time. Currently, we have approximately 13 students who live directly on Little River Church Road or are on a road that is accessible only by traveling the Little River Church Road.

ACHS 5 Students:

Rita Crouch - 10th Grade
Heather Minnick – 10th Grade
Lacy Fortner – 9th Grade
Cody Williams – 10th Grade
Hannah Friday – 9th Grade

EAMS 5 Students:

Cody James – 8th Grade
Candra Chapman – 6th Grade
Christopher Kidd – 7th Grade
Cherrish Schroeder – 8th Grade
Samantha Bentley – 6th Grade

Sugar Loaf 3 Students:

Hunter Berry – Kindergarten
Christina Fortner – 1st Grade

At this time I foresee no problems with the routing of the buses to accommodate this project. There are several roads we can utilize to access both ends of Little River Church Road. Glass Road, Kirby Lackey Road, and Bebber Road are some of the main roads we can use to accommodate the buses during construction.

Attached is a map showing the area that will be involved in this project.

Sincerely,

Dee Watts
TIMS Coordinator