STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

MICHAEL F. EASLEY
GOVERNOR

LYNDO TIPPETT
SECRETARY

March 21, 2007

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

ATTENTION: Mr. Andy Williams
NCDOT Coordinator

Dear Sir:

Subject: **Application for Regional General Permit 31 and Section 401 Water Quality Certification 3404** for the replacement of Bridge No. 45 on SR 1002 over Jordan Creek, Alamance County. Federal Project No. BRZ-1002(11), WBS No. 33368.1.1, State Project No. 8.2473401, T.I.P. B-4000, Division 7.

Please see the enclosed Programmatic Categorical Exclusion, Natural Resource Technical Report, Pre-Construction Notification, Ecosystem Enhancement Program acceptance letter, permit drawings, and design plans for the subject project. The North Carolina Department of Transportation (NCDOT) proposes to replace Bridge No. 45 over Jordan Creek. The project involves replacing the current bridge on its existing location. The proposed structure will be a 235 foot, 27 inch box beam bridge. The bridge will consist of three spans at 83 feet, 82 feet, and 70 feet. The bridge will provide a clear roadway width of 39-feet 10-inches and an out to out superstructure width of 42 feet. During construction, traffic will be detoured onto existing secondary roads.

IMPACTS TO WATERS OF THE UNITED STATES

The project is located in the Cape Fear River Basin (sub-basin 03-06-02). This area is part of Hydrologic Cataloging Unit 03030002 of the South Atlantic-Gulf Coast Region. The section of Jordan Creek crossed by the subject bridge has been assigned Stream Index Number 16-14-6-(0.5) (8/3/92) by the N.C Division of Water Quality. Jordan Creek has a best usage classification of WS-II, HQW, NSW. Jordan Creek is the only jurisdictional stream within the project area.

No designated Outstanding Resource Waters (ORW) occur within one-mile of the project area. Jordan Creek is not listed on the 2004 List of impaired waters [Section 303(d)] for the Cape Fear River Basin nor does it drain into any 303(d) waters within 1-mile of the project area.

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

TELEPHONE: 919-715-1334 or
919-715-1335

FAX: 919-715-5501

LOCATION:
2728 CAPITAL BLVD. SUITE 240
RALEIGH NC 27604

WEBSITE: WWW.NCDOT.ORG

Temporary Impacts

There will be 0.03 acre (54 linear feet) of temporary impacts to Jordan Creek resulting from the construction of a causeway (Site 2). The causeway will be used for removal of existing Bent Number 3.

Permanent Impacts

There will be less than 24 linear feet (0.01 acre) of permanent impacts to Jordan Creek resulting from the placement of fill in the channel (Site 3). The fill is necessary to protect the stream bank from eroding where two standard base ditches enter the stream. Due to the topography of the project area, it is not possible to outlet the ditches prior to entering Jordan Creek.

There will be less than 0.01 acre of permanent riverine wetland impacts resulting from mechanized clearing in the wetland located in the southwest of the existing bridge (Site 1). Mechanized clearing is necessary to provide access for equipment and for construction of the bridge and the new fill slopes.

Utility Impacts

Construction of the new bridge will require the relocation of power and phone utilities. Power lines located on the south side of the project area will be relocated south of the existing location. A wetland, composed of emergent and forested portions, is located within this area. The lines will cross the emergent portion. The poles will be located outside the wetland boundary. Hand clearing will be performed, if necessary, to maintain the 50-foot utility corridor. No jurisdictional impacts will result from the relocation of the power lines.

Phone lines located south of the bridge will be abandoned and new phone cables will be relocated to the north side of the bridge. The lines will be relocated underground and under Jordan Creek using directional bore. No jurisdictional impacts will result from the relocation of the phone lines.

Moratorium

In a letter dated February 19, 2003, the North Carolina Wildlife Resources Commission requested a moratorium on in-stream work from April 1 to June 15 due to a diverse sunfish population within Jordan Creek. The project site was sampled by NCDWQ biologists in November 1993 as part of the Stream Fish Community Assessment Program. The site does support a diverse sunfish population, however, the species identified are common and found throughout the state; no state or federally listed species were identified. Furthermore, several of the sunfish species identified are tolerant of reduced water quality.

NCDOT Best Management Practices and Design Standards in Sensitive Watersheds will be implemented for this project. These protocols mandate the use of stringent erosion and sediment control measures.

Therefore, due to the lack of statutory regulations requiring this moratorium, as well as the stringent erosion and sediment control measures, NCDOT does not believe that this moratorium is warranted.

Bridge Demolition

Existing Bridge No. 45 is approximately 201-feet long with a deck width of 21-feet. The superstructure is composed of a timber floor with an asphalt wearing surface on steel I-beams, channels, and timber joist. The substructure consists of mass concrete abutments, bents, and steel pile crutch bents. One bent is located within the water.

All components of the bridge, except the mass concrete piers, will be removed without dropping any of their components into Waters of the United States. However, there is potential for components of the mass concrete piers to drop into the Waters of the United States during construction. The resulting potential temporary fill associated with the mass concrete piers is approximately 60 cubic yards. If field conditions permit, a turbidity curtain will be used during the removal of the bent located within the stream.

Best Management Practices for Bridge Demolition and Removal and Protection of Surface Waters will be followed.

Restoration Plan

Following construction of the bridge, all material used in the construction of the structure will be removed. The impact area associated with the bridge is expected to recover naturally, since the natural streambed and plant material will not be removed. NCDOT does not propose any additional planting in this area. Class II riprap and filter fabric will be used for bank stabilization. Pre-project elevations will be restored. NCDOT will restore stream to its pre-project contours.

Schedule: The project calls for a letting of July 17, 2007 with a date of availability of August 28, 2007. It is expected that contractor will choose to start construction in August 2007.

Removal and Disposal Plan: Removal and Disposal Plan: The contractor will be required to submit a reclamation plan for the removal and disposal of all material off-site at an upland location. The contractor will use excavation equipment for removal of any earthen material. Heavy-duty trucks, dozers, cranes, and various other pieces of mechanical equipment necessary for construction of roadways and bridges will be used on site. The contractor will have the option of reusing any of the materials that the engineer deems suitable in the construction of the project. After the erosion control devices are no longer needed, all temporary materials will become property of the contractor.

Following construction of the bridge, all temporary fills will be completely removed from wetlands and streams. Restoring natural hydrology and native vegetation will restore wetlands. Stream contours and vegetation will be reestablished upon the removal of the temporary causeway. Class II riprap and filter fabric will be used for bank stabilization.

MITIGATION OPTIONS

Avoidance and Minimization and Compensatory Mitigation: The NCDOT is committed to incorporating all reasonable and practicable design features to avoid and minimize jurisdictional impacts, and to provide full compensatory mitigation of all remaining, unavoidable jurisdictional impacts. Avoidance measures were taken during the planning and NEPA compliance stages; minimization measures were incorporated as part of the project design.

According to the Clean Water Act (CWA) §404(b)(1) guidelines, NCDOT must avoid, minimize, and mitigate, in sequential order, impacts to waters of the US. The following is a list of the project's jurisdictional stream avoidance/minimization activities proposed or completed by NCDOT:

Avoidance/Minimization

- Design Standards in Sensitive Watersheds will be used
- The new bridge will be 34 feet longer than the existing bridge, increasing the floodplain under the bridge.
- The proposed bridge will be replaced on its existing location.
- The proposed project will completely span Jordan Creek, allowing for pre-project stream flows to maintain the current water quality, aquatic habitat, and flow regime.
- Fill slopes will not be located within the wetlands.
- An off-site detour will be utilized during construction.
- Temporary construction impacts due to erosion and sedimentation will be minimized through implementation of stringent erosion control schedule and use of Best Management Practices (BMPs).
- The contractor will follow contract specifications pertaining to erosion control measures as outlined in 23 CFR 650 Subpart B and Article 107-13 entitled "Control of Erosion, Siltation, and Pollution" (NCDOT, Specifications for Roads and Structures).

Compensatory Mitigation:

An acceptance letter dated November 27, 2006 from the EEP is attached. NCDOT has avoided and minimized impacts to jurisdictional resources to the greatest extent possible as described above. Unavoidable, permanent impacts to 24 feet of jurisdictional stream will be offset by compensatory mitigation provided by the EEP program. NCDOT is not proposing mitigation for the less than 0.01 acre of riverine wetland impacts because the impacts are minimal.

FEDERALLY PROTECTED SPECIES

Plants and animals with federal classifications of Endangered (E), Threatened (T), Proposed Endangered (PE), and Proposed Threatened (PT) are protected under provisions of Section 7 and Section 9 of the Endangered Species Act of 1973, as amended. As January 29, 2007 the United States Fish and Wildlife Service (USFWS) website does not list any federally protected species

for Alamance County. North Carolina Natural Heritage Program (NCNHP) documents no occurrences of federally protected species within 1.0 miles of the project area.

REGULATORY APPROVALS

Section 404 Permit: Application is hereby made for the Department of Army Section 404 Regional General Permit 31 authorizing for the above-described activities associated with the replacement of Bridge No. 45.

Section 401 Permit: The NCDOT will adhere to all General Water Quality Certifications (WQC) 3404. Written concurrence from the NCDWQ is required. We are providing five copies of this application to the North Carolina Department of Environment and Natural Resources, Division of Water Quality, for review.

A copy of this permit application will be posted on the NCDOT website at: http://www.ncdot.org/doh/preconstruct/pe/. If you have any questions or need additional information, please call Erica McLamb at 715-1521.

Sincerely,

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

w/attachment

Mr. John Hennessy, NCDWQ (5 Copies)
Mr. Travis Wilson, NCWRC
Mr. Gary Jordan, USFWS
Dr. David Chang, P.E., Hydraulics
Mr. Greg Perfetti, P.E., Structure Design
Mr. Mark Staley, Roadside Environmental
Mr. J. M. Mills, P.E., Division 7 Engineer
Mr. Jerry Parker, Division 7 Environmental Officer

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. William Goodwin, PDEA
Mr. Scott McLendon, USACE, Wilmington
Ms. Beth Harmon, EEP
Mr. Todd Jones, NCDOT External Audit Branch

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: GP 31

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 27699-1548
   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: N/A
   Company Affiliation:
   Mailing Address:
   Telephone Number: Fax Number:
   E-mail Address:

III. Project Information

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

1. Name of project: Replacement of Bridge No.45 over Jordan Creek on SR 1002

2. T.I.P. Project Number or State Project Number (NCDOT Only): B-4000

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

4. Location
   County: Alamance Nearest Town: Burlington
   Subdivision name (include phase/lot number):
   Directions to site (include road numbers/names, landmarks, etc.): see map in permit drawings

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): 36.2054 °N 79.3830 °W

6. Property size (acres): N/A

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

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

9. Describe the existing conditions on the site and general land use in the vicinity of the project at the time of this application: Land use within the project area consists of forested land, agricultural fields, and some residential development.

10. Describe the overall project in detail, including the type of equipment to be used: Bridge No. 45 will be replaced on existing location with a offsite detour. Heavy duty excavation equipment will be used such as trucks, dozers, cranes and other various equipment necessary for roadway construction.

11. Explain the purpose of the proposed work: To replace a deteriorating bridge

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: Temporary stream impacts resulting for construction of a causeway for bridge demolition; permanent fill in stream; mechanized clearing in wetlands for construction access. (Refer to cover letter for details)

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)
1	Mechanized clearing	Emergent	Yes	50	<0.01
Total Wetland Impact (acres)					<0.01

3. List the total acreage (estimated) of all existing wetlands on the property: 1.05 acres

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)
2	Jordan Creek	Temporary fill	Perennial	22	54	0.03
3	Jordan Creek	Permanent Fill	Perennial	22	24	<0.01
Total Stream Impact (by length and acreage)					78	0.03

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)
NA				
Total Open Water Impact (acres)				

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

Stream Impact (acres):	0.03
Wetland Impact (acres):	<0.01
Open Water Impact (acres):	0
Total Impact to Waters of the U.S. (acres)	0.04
Total Stream Impact (linear feet):	78

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. Please refer to the attached 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.
   Mitigation will be conducted through the North Carolina Ecosystem Enhancement Program

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): 24
   Amount of buffer mitigation requested (square feet): 0
   Amount of Riparian wetland mitigation requested (acres): .0
   Amount of Non-riparian wetland mitigation requested (acres): 0
   Amount of Coastal wetland mitigation requested (acres): 0

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)	0.0
2		1.5	0.0
Total			0.0

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

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

XI. Stormwater (required by DWQ)

Describe impervious acreage (existing and proposed) versus total acreage on the site. Discuss stormwater controls proposed in order to protect surface waters and wetlands downstream from the property. If percent impervious surface exceeds 20%, please provide calculations demonstrating total proposed impervious level. 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).
None

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.)

mclamb

Ecosystem Enhancement PROGRAM

November 27, 2006

Mr. Gregory J. Thorpe, Ph.D.
Environmental Management Director
Project Development and Environmental Analysis Branch
North Carolina Department of Transportation
1548 Mail Service Center
Raleigh, North Carolina 27699-1548

Dear Dr. Thorpe:

Subject: EEP Mitigation Acceptance Letter:

B-4000, Replace Bridge Number 255 over Jordan Creek on SR 1002, Alamance County

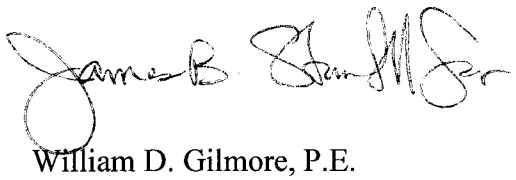
The purpose of this letter is to notify you that the Ecosystem Enhancement Program (EEP) will provide the compensatory stream mitigation for the subject project. Based on the information supplied by you in a letter dated November 8, 2006 (received November 14, 2006), the impacts are located in CU 03030002 of the Cape Fear River Basin in the Central Piedmont (CP) Eco-Region, and are as follows:

Stream: 24 feet

During the review of this request, it was noted that the 2006 Impact Projection Database listed no wetland or stream impacts for this project; however, EEP will provide the requested stream mitigation. If additional stream mitigation in this cataloging unit is required due to this previously unreported mitigation need, EEP will include it in the 2007-2008 biennial budget. Mitigation for this project will be provided in accordance with the Memorandum of Agreement between the N. C. Department of Environment and Natural Resources, the N. C. Department of Transportation, and the U. S. Army Corps of Engineers signed on July 22, 2003. EEP will commit to implementing sufficient compensatory stream mitigation to offset the impacts associated with this project by the end of the MOA year in which this project is permitted. If the above referenced impacts amounts are revised, then this mitigation acceptance letter will no longer be valid and a new mitigation acceptance letter will be required from EEP.

If you have any questions or need additional information, please contact Ms. Beth Harmon at 919-715-1929.

Sincerely,



William D. Gilmore, P.E.
EEP Director

cc: Mr. Monty Matthews, USACE – Raleigh
Mr. John Hennessy, Division of Water Quality, Wetlands/401 Unit
File: B-4000

Ecosystem Enhancement PROGRAM

November 27, 2006

Mr. Monty Matthews
U. S. Army Corps of Engineers
Raleigh Regulatory Field Office
6508 Falls of the Neuse Road, Suite 120
Raleigh, North Carolina 27815

Dear Mr. Matthews:

Subject: EEP Mitigation Acceptance Letter:

B-4000, Replace Bridge Number 255 over Jordan Creek on SR 1002, Alamance County; Cape Fear River Basin (Cataloging Unit 03030002); Central Piedmont (CP) Eco-Region

The purpose of this letter is to notify you that the Ecosystem Enhancement Program (EEP) will provide the compensatory stream mitigation for the unavoidable impact associated with the above referenced project. As indicated in the NCDOT's mitigation request letter dated November 8, 2006, compensatory stream mitigation from EEP is required for approximately 24 feet of stream impacts.

Mitigation for this project will be provided in accordance with Section X of the Memorandum of Agreement between the N. C. Department of Environment and Natural Resources, the N. C. Department of Transportation, and the U. S. Army Corps of Engineers signed on July 22, 2003. EEP commits to implement sufficient compensatory stream mitigation up to 48 stream credits to offset the impacts associated with this project by the end of the MOA year in which this project is permitted. If the impacts change from the above listed amount, then this mitigation strategy letter will no longer be valid and a new mitigation strategy letter will be required from EEP.

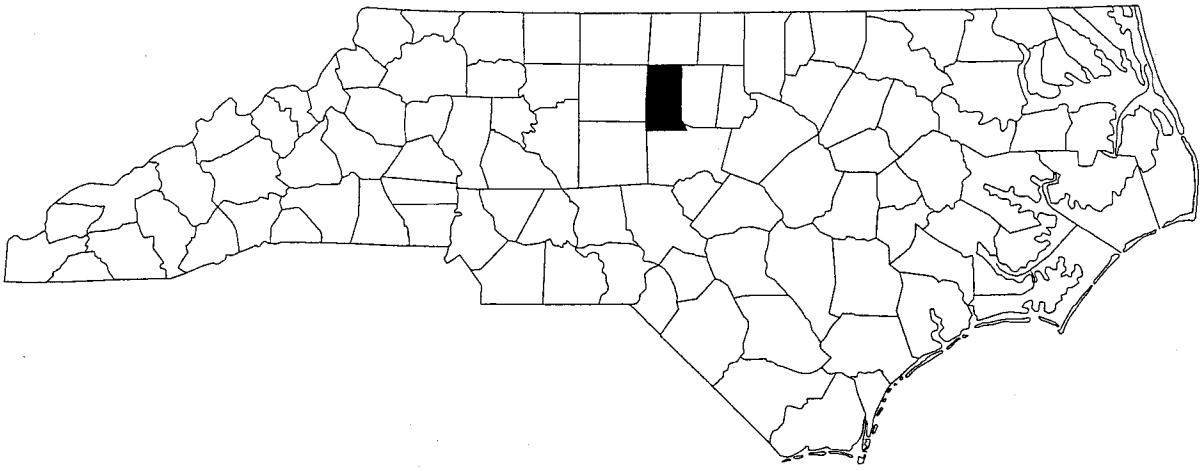
If you have any questions or need additional information, please contact Ms. Beth Harmon at 919-715-1929.

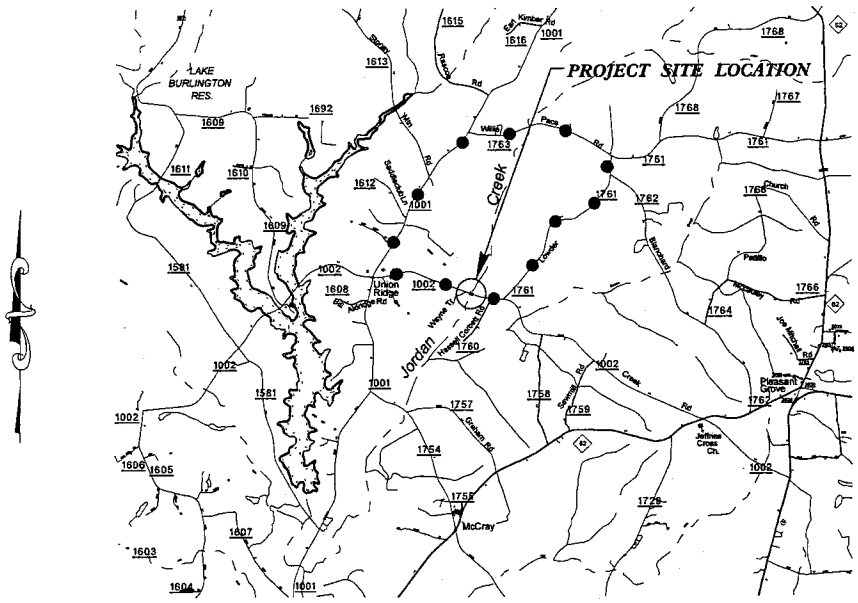
Sincerely,

William D. Gilmore, P.E.
EEP Director

cc: Mr. Gregory J. Thorpe, Ph.D., NCDOT-PDEA
Mr. John Hennessy, Division of Water Quality, Wetlands/401 Unit
File: B-4000

NORTH CAROLINA





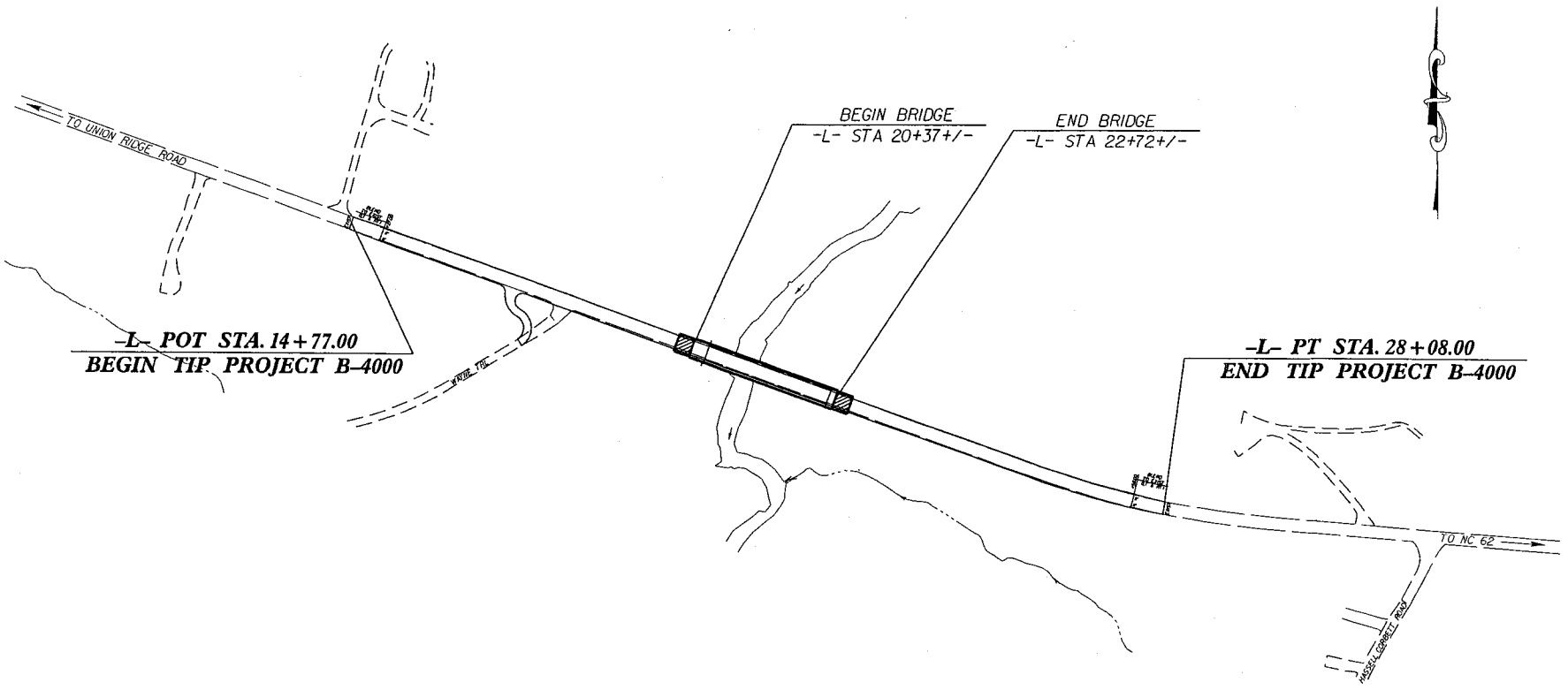
(NOT TO SCALE)

VICINITY MAPS

NCDOT

DIVISION OF HIGHWAYS
ALAMANCE COUNTY
PROJECT: 33368.1.1 (B-4000)
BRIDGE NO. 45 OVER
JORDAN CREEK
ON SR 1002

SHEET 1 OF 9 01/09/2006



SITE MAP

NOT TO SCALE

NCDOT

DIVISION OF HIGHWAYS

ALAMANCE COUNTY

PROJECT: 33368.1.1 (B-4000)

BRIDGE NO. 45 OVER

JORDAN CREEK

ON SR 1002

SHEET 2 OF 9 01/09/2006

PROPERTY OWNERS

NAMES AND ADDRESSES

	NAMES	ADDRESSES
1	Timothy Neal Bristow	3615 Stoney Creek Church Road Elon, NC 27244
2	Bobby Perry Corbett	4666 Hassell Corbett Road Burlington, NC 27217
3	Hassell A. Corbett, Jr.	712 Jeffries Cross Roads Burlington, NC 27217
4	William Boyce Davis	578 Jeffries Cross Roads Burlington, NC 27217
5	Henry F. Hilliard, Jr.	808 Myrtle Drive Graham, NC 27253
6	Mitchell Todd Kindley	500 Elva Drive Burlington, NC 27217
7	Clyde J O'Ferrell, Jr.	201 Brighton Drive Elon, NC 27244
8	Dale E. Truitt	503 Wayne Trail Burlington, NC 27217
9	Donald E. Wilson	516 Jeffries Cross Roads Burlington, NC 27217

NCDOT

DIVISION OF HIGHWAYS

ALAMANCE COUNTY

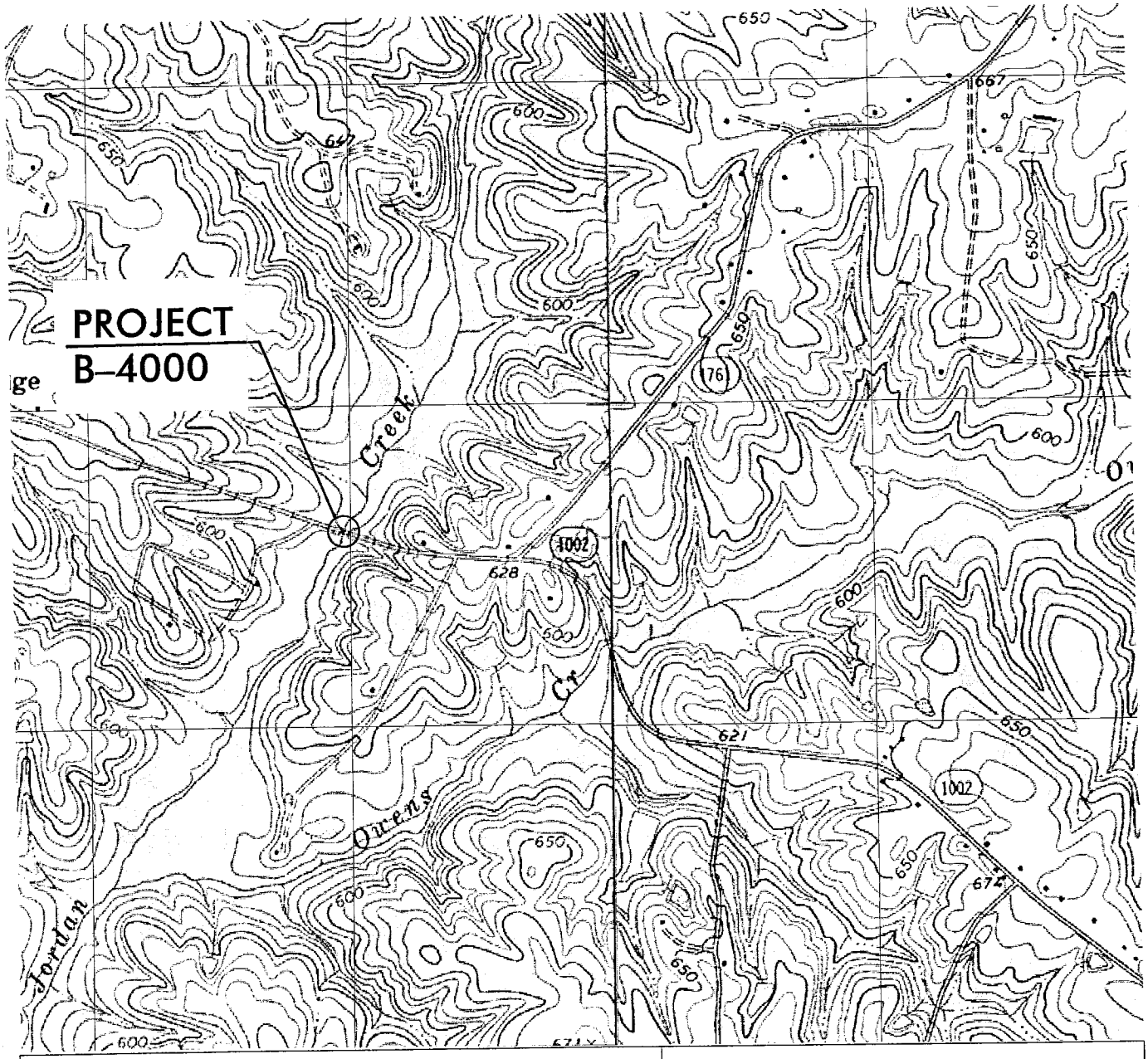
PROJECT: 33368.1.1 (B-4000)

BRIDGE NO. 45 OVER

JORDAN CREEK

ON SR 1002

SHEET 2 OF 2 01/09/2006



TOPO MAP

SCALE: 1" : 1500'

NCDOT

DIVISION OF HIGHWAYS

ALAMANCE COUNTY

PROJECT: 33368.1.1 (B-4000)

BRIDGE NO. 45 OVER

JORDAN CREEK

ON SR 1002

SHEET 4 OF 9 11/1/05

WETLAND PERMIT IMPACT SUMMARY

			WETLAND IMPACTS					SURFACE WATER IMPACTS				
Site No.	Station (From/To)	Structure Size / Type	Permanent Fill In Wetlands (ac)	Temp. Fill In Wetlands (ac)	Excavation in Wetlands (ac)	Mechanized Clearing in Wetlands (ac)	Hand Clearing in Wetlands (ac)*	Permanent SW impacts (ac)	Temp. SW impacts (ac)	Existing Channel Impacts Permanent (ft)	Existing Channel Impacts Temp. (ft)	Natural Stream Design (ft)
1	19+47 to 20+12					<0.01						
2	21+03 to 21+31								0.03		54	
3	21+32 to 21+51							<0.01		24		
TOTALS:						<0.01		<0.01	0.030	24		

* Hand clearing may be performed as necessary for relocation of power lines.

NC DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

ALAMANCE COUNTY
WBS - 33368.1.1 (B-4000)

SHEET 5 OF 9 3/9/2007

ATN Revised 3/31/05

CH ENGINEERING

B-4000 | 4
R/W SHEET NO.

ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

Permit Drawing Sheet 9 of 9

ALAMANCE COUNTY, NC
BRIDGE 45 ON SR 1002
OVER JORDAN CREEK
8/29/05

ENGLISH

NAD 83

DENOTES MECHANIZED CLEARING

DENOTES TEMPORARY FILL IN SURFACE WATERS

DENOTES PERMANENT FILL IN SURFACE WATERS

DETAIL 3
RIP RAP AT EMBANKMENT
(Not to Scale)

Ditch Grade, 1.5, 2, 3.5

Est. 10 Tons

Type of Liner = CLASS B w/ FILTER FABRIC

-L- 21+45 (LT)
-L- 21+48 (RT)

DETAIL 4
STANDARD BASE DITCH
(Not to Scale)

Natural Ground, 2d, D, 2d, Natural Ground, B

Min. D = 1.5 Ft.
B = 2 Ft.

-L- 21+45 TO 22+10 (LT)
-L- 21+48 TO 22+10 (RT)

DETAIL 5
LATERAL BASE DITCH
(Not to Scale)

Natural Ground, 2d, D, 2d, Fill Slope, 1':1', B

Min. D = 1.5 Ft.
B = 2 Ft.
D = 5 Ft.

-L- 22+10 TO 24+00 (LT)
-L- 22+10 TO 25+00 (RT)

CAUSEWAY QUANTITIES

VOLUME OF CLASS II RIP RAP BELOW ORDINARY HIGH WATER= 170 YD³

DONALD E. WILSON

WILLIAM BOYCE DAVIS

HASSELL A. CORBETT, JR.

CLYDE J O'FERRELL, JR.

MITCHELL TODD KINDLEY

TIMOTHY NEAL BRISTOW

DALE E. TRUITT

BOBBY PERRY CORBETT

HAUL ROAD

TO UNION RIDGE ROAD

JEFFRIES CROSS ROAD SR 1002

-L- PI = 10+00.00

-L- PI = 11+25.00

-L- PI = 11+74.50

PDE

PI -Y- Sta 10+56.93
Δ = 63° 29' 18.9" (LT)
D = 114° 35' 29.6"
L = 55.40'
T = 30.93'
R = 50.00'

PI -Y- Sta 11+48.58
Δ = 106° 40' 28.2" (RT)
D = 114° 35' 29.6"
L = 93.09'
T = 67.17'
R = 50.00'

SP. "Y" DITCH SEE DETAIL 2

SPECIAL "V" DITCH SEE DETAIL 2

TAIL DITCH

END PAVEMENT IN R/W CENTER

2 TONS CLASS B RIPRAP W/7 SY FF

TWO 2GI W/NARROW SLOT FLAT GRATE

ALL 2' GIS ARE NARROW SLOT FLAT GRATES

CL B RIPRAP W/FF

STANDARD BASE DITCH SEE DETAIL 4 DDE=17 CY

DDE=16 CY

STD BASE DITCH SEE DETAIL 4

RIPRAP @ EMBANKMENT SEE DETAIL

15" CSP W/2 ELBOWS AND ROD & LUG CONNECTIONS

HIGH VIS FENCE

SITE 1

SITE 2

SITE 3

WOODS

WLB

WLS

EXISTING R/W

EIP

CIP

MATCHLINE TO SHEET 5 STATION 23+00

DETAIL 1
STANDARD "V" DITCH
DITCH CLEANOUT
(Not to Scale)

Natural Ground, EXCAVATE, Natural Ground, 2:1, 2:1

DAYLIGHT DITCH

-L- 14+82 TO 15+26 (RT)

DETAIL 2
SPECIAL "V" DITCH
(Not To Scale)

Natural Ground, 2d, D, 2d or 6'-0", Fill Slope

Min. D = 2 Ft.

-L- 17+20 TO 18+45 (RT)

80' DITCH CLEAN OUT
DDE = 24 CYD (SEE DETAIL 1)

-L- STA 19+80.94
BEGIN APPROACH SLAB

-L- STA 22+41.00
END APPROACH SLAB

TYPE III

-L- STA 19+91.94
BEGIN BRIDGE

-L- STA 22+27.00
END BRIDGE

BRIDGE / ROADWAY RELATIONSHIP SKETCH

DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCDOT FOR MONUMENT "B4000-1" WITH NAD 1983/95 STATE PLANE GRID COORDINATES OF NORTHING: 893565.9271(ft) EASTING: 1887627.646(ft)
THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.99998579
THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "B4000-1" TO -L- STATION 14+30.00 IS N 70° 45' 13.11" W 1494.778 FT
ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES
VERTICAL DATUM USED IS NAVD 88

BM #1 (RR SPIKE IN 20" PINE)
-BL- STA 14+24.42 425.58' RT =
-L- STA 20+47.05 436.95' RT
ELEVATION = 565.42'

BRIDGE HYDRAULIC DATA
BOX GIRDER BRIDGE

DESIGN DISCHARGE	= 2600	CFS
DESIGN FREQUENCY	= 25	YRS
DESIGN HW ELEVATION	= 569.2	FT
100 YEAR DISCHARGE	= 3800	CFS
100 YEAR HW ELEVATION	= 570.7	FT
OVERTOPPING DISCHARGE	= 4600	CFS
OVERTOPPING FREQUENCY	= 200	YRS
OVERTOPPING ELEVATION	= 571.5	FT
DATE OF SURVEY	= 12/7/04	
W.S. ELEVATION AT DATE OF SURVEY	= 561.1	FT

DITCH LEGEND

LEFT DITCH

RIGHT DITCH

PIPE HYDRAULIC DATA
DRAINAGE STRUCTURE NO. 1

DRAINAGE AREA	= 1.9	AC
DESIGN FREQUENCY	= 25	YRS
DESIGN DISCHARGE	= 3.8	CFS
DESIGN HW ELEVATION	= 585.6	FT
100 YEAR DISCHARGE	= 4.9	CFS
100 YEAR HW ELEVATION	= 585.77	FT
OVERTOPPING FREQUENCY	= 500+++	YRS
OVERTOPPING DISCHARGE	= 19	CFS
OVERTOPPING ELEVATION	= 589	FT

* DESIGN EXCEPTION REQUIRED FOR VERTICAL CURVATURE AND MAXIMUM GRADE.

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

-Y-

-L-

630 620 610 600 590 580 570 560 550

10 11 12 13 14 15 16 17 18 19 20 21 22 23

CH ENGINEERING

PROJECT REFERENCE NO.	SHEET NO.
B-4000	4
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

Permit Drawing Sheet 7 of

ALAMANCE COUNTY, NC
BRIDGE 45 ON SR 1002
OVER JORDAN CREEK
8/29/05

ENGLISH

DENOTES MECHANIZED CLEARING

DENOTES TEMPORARY FILL IN SURFACE WATERS

DENOTES PERMANENT FILL IN SURFACE WATERS

DETAIL 3
RIP RAP AT EMBANKMENT
(Not to Scale)

Ditch Grade
Est. 10 Tons
Type of Liner = CLASS B W/ FILTER FABRIC
-L- 21+45 (LT)
-L- 21+48 (RT)

DETAIL 4
STANDARD BASE DITCH
(Not to Scale)

Natural Ground, 2:1, D, B
Min. D = 1.5 Ft.
B = 2 Ft.
-L- 21+45 TO 22+10 (LT)
-L- 21+48 TO 22+10 (RT)

DETAIL 5
LATERAL BASE DITCH
(Not to Scale)

Natural Ground, 2:1, D, B, 1'/Ft., b, Fill Slope
Min. B = 1.5 Ft.
B = 2 Ft.
b = 5 Ft.
-L- 22+10 TO 24+00 (LT)
-L- 22+10 TO 23+00 (RT)

CAUSEWAY QUANTITIES
VOLUME OF CLASS II RIP RAP BELOW ORDINARY HIGH WATER = 170 YD³

BLEND TO EXIST (LT & RT)

DONALD E. WILSON

WILLIAM BOYCE DAVIS

HASSELL A. CORBETT, JR.

CLYDE J O'FERRELL, JR.

HAUL ROAD

ALL 2 GIs ARE NARROW SLOT FLAT GRATES

2 TONS CLASS B RIPRAP W/ 7 SY FF

CL B RIPRAP W/FF

TWO 2GI W/NARROW SLOT FLAT GRATE

STANDARD BASE DITCH (SEE DETAIL 4) DDE = 17 CY

DDE = 16 CY

RIPRAP @ EMBANKMENT SEE DETAIL 2

15" CSP W/2 ELBOWS AND 2 LOCK CONNECTORS

SITE 1

SITE 2

SITE 3

TIMOTHY NEAL BRISTOW

MITCHELL TODD KINDLEY

DALE E. TRUITT

ROBERT PERRY CORBETT

80' DITCH CLEAN OUT
DDE = 24 CYD (SEE DETAIL 1)

PI -Y- Sta 10+56.93
Δ = 63° 29' 18.9" (LT)
D = 114° 35' 29.6"
L = 55.40'
T = 30.93'
R = 50.00'

PI -Y- Sta 11+48.58
Δ = 106° 40' 28.2" (RT)
D = 114° 35' 29.6"
L = 93.09'
T = 67.11'
R = 50.00'

SP. 'V' DITCH SEE DETAIL 2

SPECIAL 'V' DITCH SEE DETAIL 2

TAIL DITCH

END PAVEMENT IN R/W CENTER

TO UNION RIDGE ROAD

JEFFRIES CROSS ROAD SR 1002

EXISTING R/W

EIP

PDE

WELL

WOODS

DETAIL 1
STANDARD 'V' DITCH
DITCH CLEANOUT
(Not to Scale)

Natural Ground, Excavate, 2:1, 2:1, Natural Ground
DAYLIGHT DITCH
-L- 14+82 TO 15+26 (RT)

DETAIL 2
SPECIAL 'V' DITCH
(Not to Scale)

Natural Ground, 2:1, D, 2.0' Flat Bar, Fill Slope
Min. D = 2 Ft.
-L- 17+20 TO 18+45 (RT)

DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCDOT FOR MONUMENT "B4000-1"
WITH NAD 1983/95 STATE PLANE GRID COORDINATES OF NORTHING: 893565.927(m) EASTING: 1887627.646(m)
THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.99998579
THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "B4000-1" TO -L- STATION 14+30.00 IS N 70° 45' 13.11" W 14949.778 FT
ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES
VERTICAL DATUM USED IS NAVD 88

BM #1 (RR SPIKE IN 20" PINE)
-BL- STA 14+24.42 425.68' RT =
-L- STA 20+47.05 436.95' RT
ELEVATION = 565.42'

BRIDGE HYDRAULIC DATA
BOX GIRDER BRIDGE

DESIGN DISCHARGE	=	2600 CFS
DESIGN FREQUENCY	=	25 YRS
DESIGN HW ELEVATION	=	569.2 FT
100 YEAR DISCHARGE	=	3800 CFS
100 YEAR HW ELEVATION	=	570.7 FT
OVERTOPPING DISCHARGE	=	4600 CFS
OVERTOPPING FREQUENCY	=	200 YRS
OVERTOPPING ELEVATION	=	571.5 FT
DATE OF SURVEY	=	12/7/04
W.S. ELEVATION AT DATE OF SURVEY	=	561.1 FT

DITCH LEGEND

LEFT DITCH ——— - - ———

RIGHT DITCH ——— ———

PIPE HYDRAULIC DATA
DRAINAGE STRUCTURE NO. 1

DRAINAGE AREA	= 1.9	AC
DESIGN FREQUENCY	= 25	YRS
DESIGN DISCHARGE	= 3.8	CFS
DESIGN HW ELEVATION	= 585.6	FT
100 YEAR DISCHARGE	= 4.9	CFS
100 YEAR HW ELEVATION	= 585.77	FT
OVERTOPPING FREQUENCY	= 500+++	YRS
OVERTOPPING DISCHARGE	= 19	CFS
OVERTOPPING ELEVATION	= 589	FT

* DESIGN EXCEPTION REQUIRED FOR VERTICAL CURVATURE AND MAXIMUM GRADE.

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

BRIDGE / ROADWAY RELATIONSHIP SKETCH

-L- STA 19+80.94 BEGIN APPROACH SLAB
-L- STA 22+41.00 END APPROACH SLAB
TYPE III
-L- STA 19+91.94 BEGIN BRIDGE
-L- STA 22+27.00 END BRIDGE

MATCHLINE TO SHEET 5 STATION 23+00

-Y-

PI = 10+51.00 EL = 575.05' VC = 50' K = 18
PI = 11+25.00 EL = 568.91' VC = 98' K = 14
BEGIN GRADE -Y- 10+11.60 EL = 575.86
VPC -Y- 10+25.00 EL = 575.56
VPI -Y- 11+24.00 EL = 568.16
END GRADE -Y- 11+74.50 EL = 568.15
VPC -Y- 10+76.00 EL = 570.98
PROPOSED
EXISTING
18"
BEGIN GRADE -L- 15+27.00 EL = 583.72
VPC -L- 15+33.00 EL = 583.90
BLEND TO EXISTING
PROPOSED
EXISTING
BEGIN SPECIAL 'V' DITCH -L- 18+00 (RT) ELEV = 567.1
END SPECIAL 'V' DITCH -L- 18+45 (RT) ELEV = 567.0
LOW POINT -L- 19+76.50 EL = 571.38
BEGIN BRIDGE -L- 19+91.94
END STD BASE DITCH BEG (RT) BASE DITCH -L- 22+18 (RT) ELEV = 563.80'
BEGIN STD BASE DITCH -L- 21+45 (LT) ELEV = 563.20
APPROX. TOP ELEV. = 564.30
EXCAVATE TO EL = 563.5 FT
BEGIN STD BASE DITCH -L- 21+18 (RT) ELEV = 561.04
END STD BASE DITCH BEG (LT) BASE DITCH -L- 22+18 (LT) ELEV = 562.90'
PI = 21+23.00 EL = 551.44' VC = 110.00' K = 82 -VU- = 45.1000
END BRIDGE -L- 22+27.00
OHW = 562.10
MWS = 561.10
(12-7-04)
N73°57'18"W

10 11 12 13 14 15 16 17 18 19 20 21 22 23

630 620 610 600 590 580 570 560 550

CH ENGINEERING

PROJECT REFERENCE NO.	SHEET NO.
B-4000	5
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

Permit Drawing
Sheet B of 9

ALAMANCE COUNTY, NC
BRIDGE 45 ON SR 1002
OVER JORDAN CREEK
8/29/05

ENGLISH

NO IMPACTS ON THIS SHEET

MATCHLINE TO SHEET 4
STATION 23+00

HENRY F. HILLIARD, JR.

HASSELL A. CORBETT, JR.

BOBBY PERRY CORBETT

WOODS

TO NC 62

JEFFRIES CROSS ROAD SR 1002

HASSELL CORBETT ROAD SR 1002

LATERAL BASE DITCH SEE DETAIL 5 DDE=68 CY

LATERAL BASE DITCH SEE DETAIL 6 DDE=139 CY

SPECIAL BASE DITCH TYPICAL SEE DETAIL 8

SPECIAL CUT BASE DITCH SEE DETAIL 7

LATERAL BASE DITCH SEE DETAIL 5 DDE=151 CY

397.65' N59°16'05"W

N89°46'55"E 157.30'

882.54' S89°51'55"W

S89°09'35"E 1193.35'

16.36' EIP-R/W

24.55' +42.73

1950' BST

17.5' BST

2800.00' S28°18'42"W

955.38' N73°17'18"W

15' CONC

11' GRAVEL

POOL

ALUMINUM SHELTER

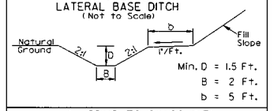
IS B D

EXISTING R/W

8d +43.64

+70.08 END SBG

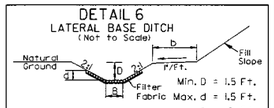
DETAIL 5
LATERAL BASE DITCH
(Not to Scale)



Min. D = 1.5 Ft.
B = 2 Ft.
b = 5 Ft.

-L- 22+10 TO 24+00 (LT)
-L- 22+10 TO 25+00 (RT)

DETAIL 6
LATERAL BASE DITCH
(Not to Scale)

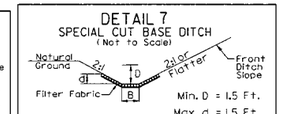


Min. D = 1.5 Ft.
Max. d = 1.5 Ft.
B = 2 Ft.
b = 5 Ft.

Type of Liner = CLASS B

-L- 24+00 TO 25+50 (LT)

DETAIL 7
SPECIAL CUT BASE DITCH
(Not to Scale)

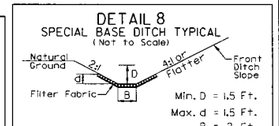


Min. D = 1.5 Ft.
Max. d = 1.5 Ft.
B = 2 Ft.

Type of Liner = CLASS B

-L- 25+00 TO 26+50 (RT)

DETAIL 8
SPECIAL BASE DITCH TYPICAL
(Not to Scale)

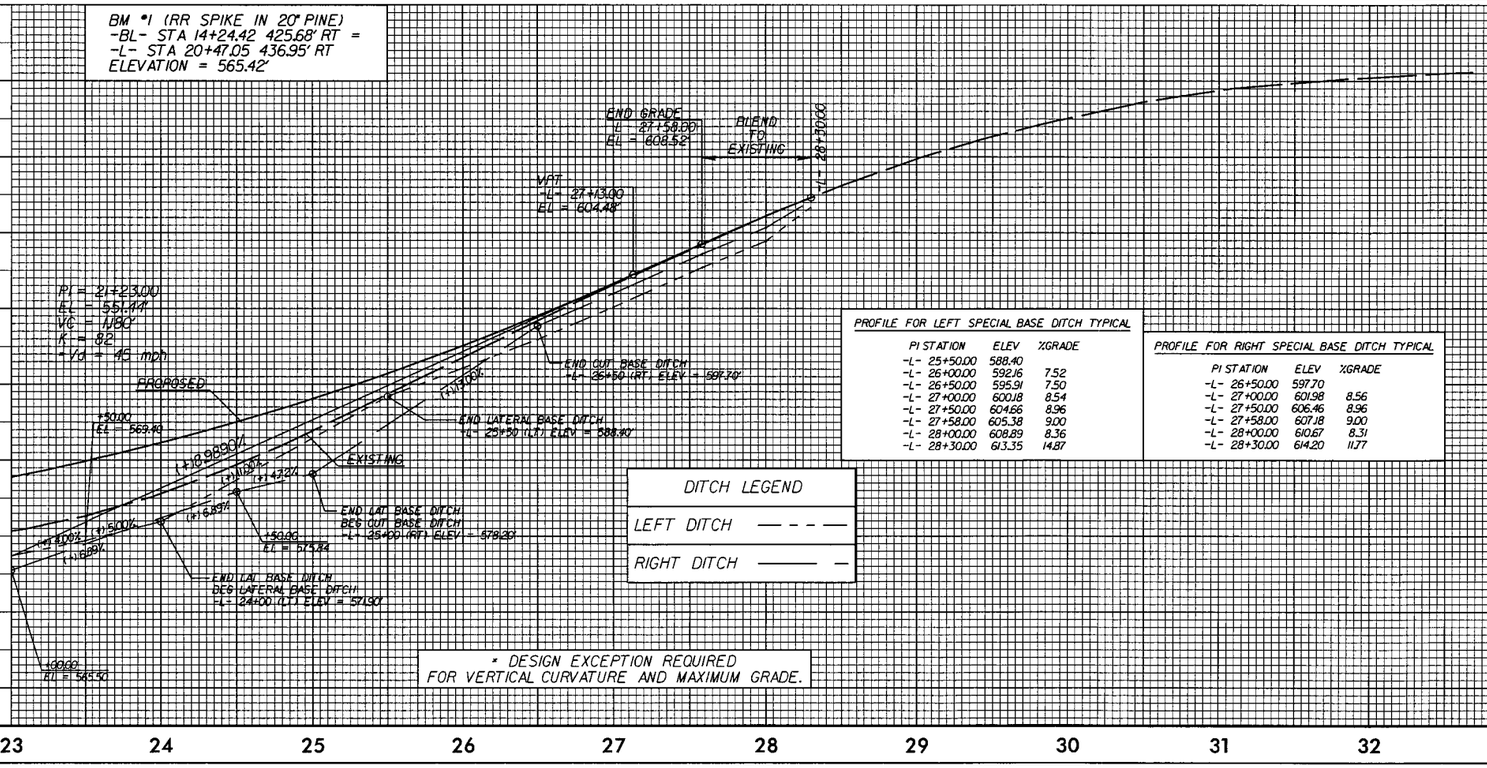


Min. D = 1.5 Ft.
Max. d = 1.5 Ft.
B = 2 Ft.

Type of Liner = CLASS A

-L- 25+50 TO 28+30 (LT)
-L- 26+50 TO 28+30 (RT)

BM #1 (RR SPIKE IN 20" PINE)
-BL- STA 14+24.42 425.68' RT =
-L- STA 20+47.05 436.95' RT
ELEVATION = 565.42'



PROFILE FOR LEFT SPECIAL BASE DITCH TYPICAL

PI STATION	ELEV	%GRADE
-L- 25+50.00	588.40	
-L- 26+00.00	592.16	7.52
-L- 26+50.00	595.91	7.50
-L- 27+00.00	600.18	8.54
-L- 27+50.00	604.66	8.96
-L- 27+58.00	605.38	9.00
-L- 28+00.00	608.89	8.36
-L- 28+30.00	613.35	14.87

PROFILE FOR RIGHT SPECIAL BASE DITCH TYPICAL

PI STATION	ELEV	%GRADE
-L- 26+50.00	597.70	
-L- 27+00.00	601.98	8.56
-L- 27+50.00	606.46	8.96
-L- 27+58.00	607.18	9.00
-L- 28+00.00	610.67	8.31
-L- 28+30.00	614.20	11.77

DITCH LEGEND

LEFT DITCH — - - —

RIGHT DITCH ——— —

* DESIGN EXCEPTION REQUIRED FOR VERTICAL CURVATURE AND MAXIMUM GRADE.

CH ENGINEERING

PROJECT REFERENCE NO.	SHEET NO.
B-4000	5
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

Permit Drawing Sheet 9 of 9

ALAMANCE COUNTY, NC
BRIDGE 45 ON SR 1002
OVER JORDAN CREEK
8/29/05

ENGLISH

NO IMPACTS ON THIS SHEET

MATCHLINE TO SHEET 4 STATION 23+00

HENRY F. HILLIARD, JR.

HASSELL A. CORBETT, JR.

BOBBY PERRY CORBETT

LATERAL BASE DITCH SEE/DETAIL 5 DDE=68 CY

LATERAL BASE DITCH SEE DETAIL 6 DDE=139 CY

SPECIAL BASE DITCH TYPICAL SEE DETAIL 8

SPECIAL CUT BASE DITCH SEE DETAIL 7

SPECIAL BASE DITCH TYPICAL C SEE DETAIL 8

LATERAL BASE DITCH SEE DETAIL 5 DDE=151 CY

JEFFERIES CROSS ROAD SR1002

TO NC 62

ALUMINUM SHELTER

POOL

IS B D

WOODS

397.65' N59°16'05"W

882.54' S89°51'55"W

955.38' N73°17'18"W

185.46' S89°09'35"E

16.36' EIP-R/W

24.55' +42.73

38 DMH

DETAIL 5
LATERAL BASE DITCH
(Not to Scale)

Min. D = 1.5 Ft.
B = 2 Ft.
b = 5 Ft.

-L- 22+10 TO 24+00 (LT)
-L- 22+10 TO 25+00 (RT)

DETAIL 6
LATERAL BASE DITCH
(Not to Scale)

Min. D = 1.5 Ft.
Max. d = 1.5 Ft.
B = 2 Ft.
b = 5 Ft.

Type of Liner = CLASS B

-L- 24+00 TO 25+50 (LT)

DETAIL 7
SPECIAL CUT BASE DITCH
(Not to Scale)

Min. D = 1.5 Ft.
Max. d = 1.5 Ft.
B = 2 Ft.

Type of Liner = CLASS B

-L- 25+00 TO 26+50 (RT)

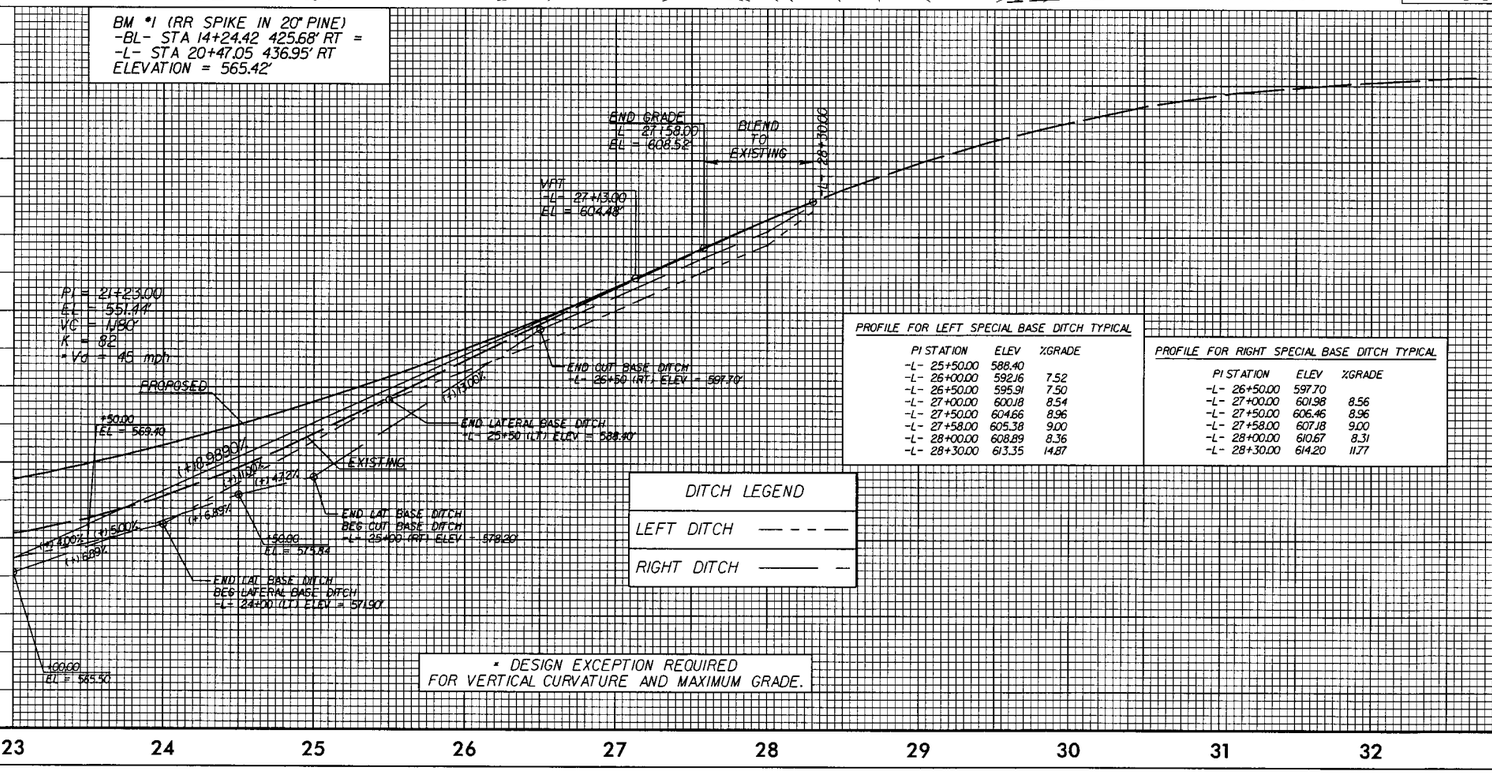
DETAIL 8
SPECIAL BASE DITCH TYPICAL
(Not to Scale)

Min. D = 1.5 Ft.
Max. d = 1.5 Ft.
B = 2 Ft.

Type of Liner = CLASS A

-L- 25+50 TO 28+30 (LT)
-L- 26+50 TO 28+30 (RT)

BM #1 (RR SPIKE IN 20" PINE)
-BL- STA 14+24.42 425.68' RT =
-L- STA 20+47.05 436.95' RT
ELEVATION = 565.42'



DITCH LEGEND

LEFT DITCH	— - - —
RIGHT DITCH	——— --

PROFILE FOR LEFT SPECIAL BASE DITCH TYPICAL

PI STATION	ELEV	%GRADE
-L- 25+50.00	588.40	
-L- 26+00.00	592.16	7.52
-L- 26+50.00	595.91	7.50
-L- 27+00.00	600.18	8.54
-L- 27+50.00	604.66	8.96
-L- 27+58.00	605.38	9.00
-L- 28+00.00	608.89	8.36
-L- 28+30.00	613.35	14.87

PROFILE FOR RIGHT SPECIAL BASE DITCH TYPICAL

PI STATION	ELEV	%GRADE
-L- 26+50.00	597.70	
-L- 27+00.00	601.98	8.56
-L- 27+50.00	606.46	8.96
-L- 27+58.00	607.18	9.00
-L- 28+00.00	610.67	8.31
-L- 28+30.00	614.20	11.77

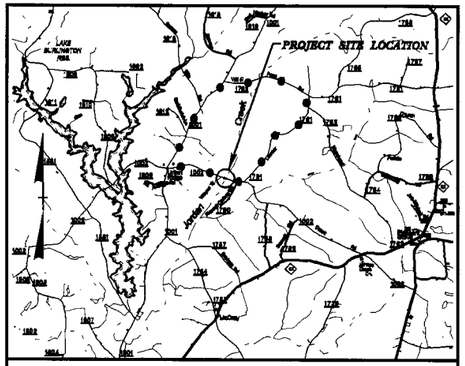
* DESIGN EXCEPTION REQUIRED FOR VERTICAL CURVATURE AND MAXIMUM GRADE.

09/28/99

TIP PROJECT: B-4000

PROJECT: 33368.2.1

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



VICINITY MAP
DETOUR ROUTE

THIS PROJECT IS NOT WITHIN ANY MUNICIPAL BOUNDARIES.

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

ALAMANCE COUNTY

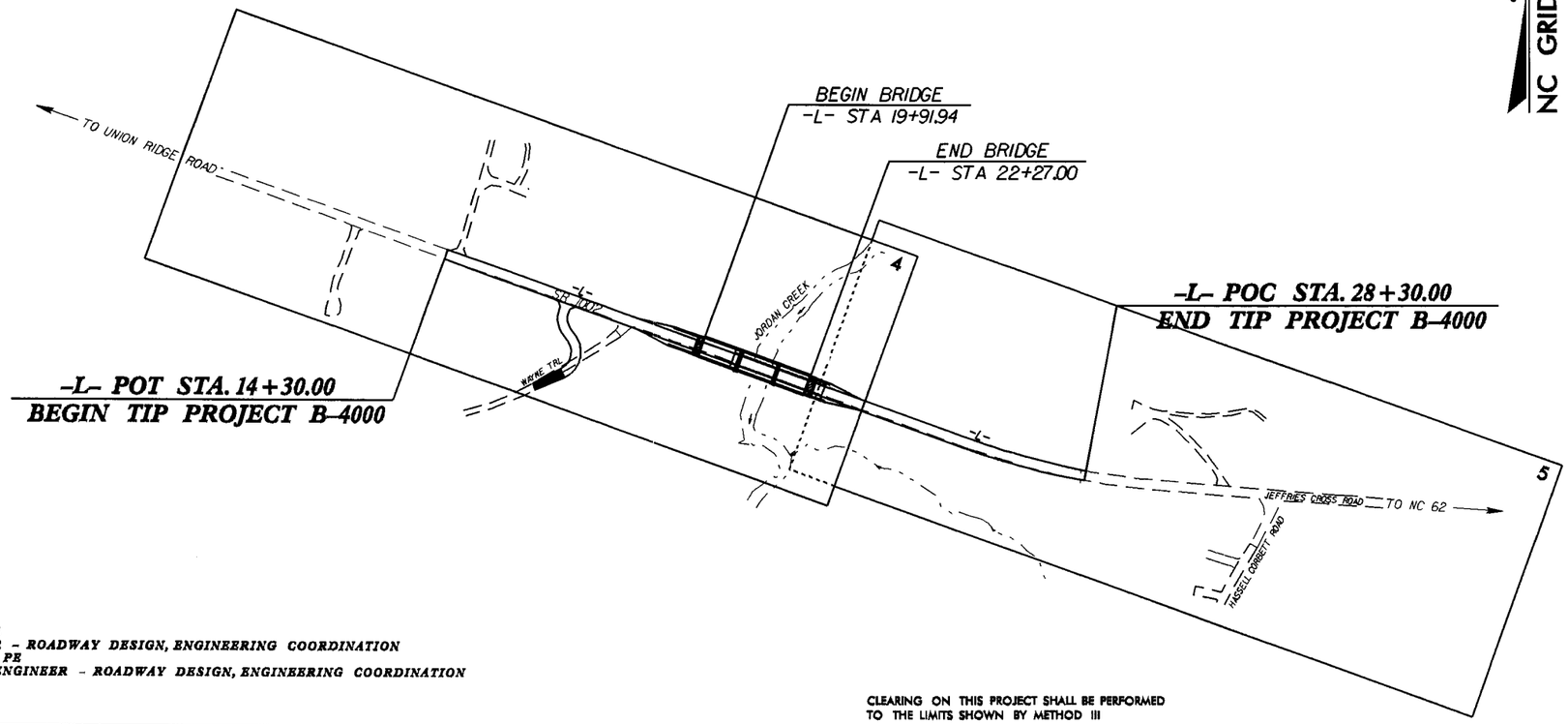
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-4000	1	

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
33368.1.1	BRZ-1002(11)	P.E.
33368.2.1	BRZ-1002(11)	R/W & UTIL

LOCATION: BRIDGE NO. 45 OVER JORDAN CREEK ON SR 1002 (JEFFRIES CROSS ROAD)

TYPE OF WORK: GRADING, DRAINAGE, PAVING AND STRUCTURE

NC GRID · NAD 83



NCDOT CONTACT: CATHY HOUSER, PE
PROJECT ENGINEER – ROADWAY DESIGN, ENGINEERING COORDINATION
ROBERT J. STROUP, PE
PROJECT DESIGN ENGINEER – ROADWAY DESIGN, ENGINEERING COORDINATION

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

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

GRAPHIC SCALES

PLANS: 50 25 0 50 100
PROFILE (HORIZONTAL): 50 25 0 50 100
PROFILE (VERTICAL): 10 5 0 10 20

DESIGN DATA

ADT 2006 = 767
ADT 2026 = 1434
DHV = 10 %
D = 55 %
T = 7 % *
V = 55 MPH
* (TTST 1% + DUAL 6%)

FUNCTIONAL CLASSIFICATION: RURAL MINOR COLLECTOR

DESIGN EXCEPTION REQUIRED FOR VERTICAL CURVATURE AND MAXIMUM GRADE.

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT B-4000 = 0.221 mi
LENGTH STRUCTURE TIP PROJECT B-4000 = 0.045 mi
TOTAL LENGTH OF TIP PROJECT B-4000 = 0.265 mi

PLANS PREPARED BY:
CH ENGINEERING
PO BOX 30026 RALEIGH, NC 27622 TELE 919.788.0224 FAX 919.788.0232

2002 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE: MARCH 30, 2006

LETTING DATE: JULY 17, 2007

PLANS PREPARED FOR:
DIVISION OF HIGHWAYS
1000 Birch Ridge Dr.
Raleigh, NC 27610

THOMAS R. HEPLER, PE PLS
PROJECT ENGINEER

KEVIN W. BISBY, PE
PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER
MULKEY, INC.
SIGNATURE: P.E.

ROADWAY DESIGN ENGINEER
SIGNATURE: P.E.

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA
STATE DESIGN ENGINEER P.E.

DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
APPROVED
DIVISION ADMINISTRATOR DATE

PROJECT REFERENCE NO.	SHEET NO.
B-4000	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 — EPM
- 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 High Quality Wetland Boundary — HQ 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
- River Basin Buffer — RBB
- Flow Arrow
- Disappearing Stream
- Spring
- Swamp Marsh
- Proposed Lateral, Tail, Head Ditch — FLOW
- False Sump

RAILROADS:

- Standard Guage — 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
- Proposed Right of Way Line with Iron Pin and Cap Marker
- Proposed Right of Way Line with Concrete or Granite Marker
- Existing Control of Access
- Proposed Control of Access
- 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
- Equaility 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 — T
- 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

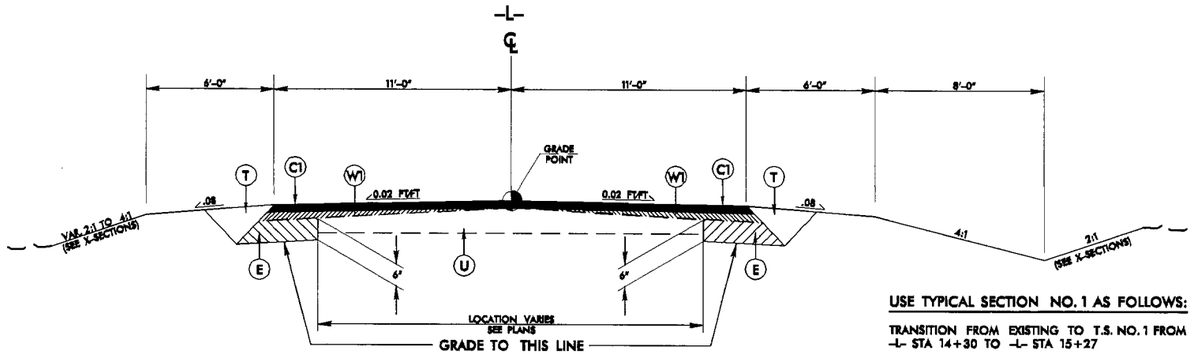
MISCELLANEOUS:

- 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.

6/2/99

CH ENGINEERING	PROJECT REFERENCE NO.	SHEET NO.
	B-4000	2
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER	

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



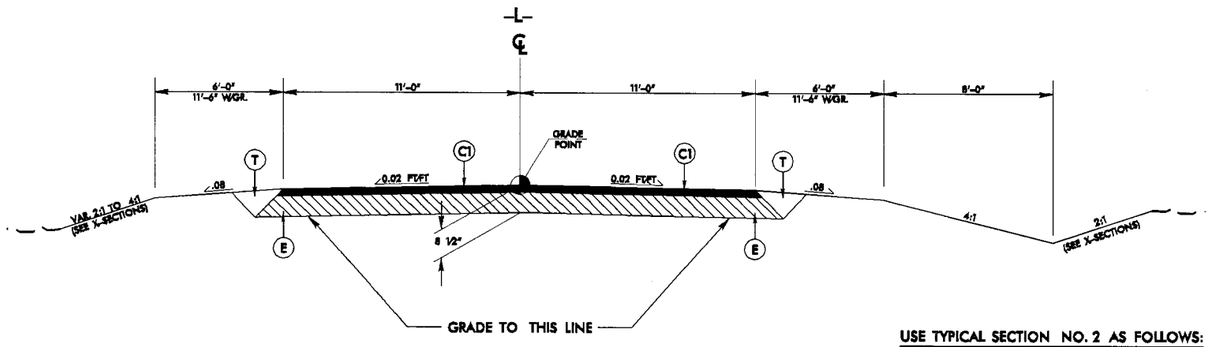
TYPICAL SECTION NO. 1

USE TYPICAL SECTION NO. 1 AS FOLLOWS:

TRANSITION FROM EXISTING TO T.S. NO. 1 FROM
-L- STA 14+30 TO -L- STA 15+27

-L- STA 15+27 TO -L- STA 18+00
-L- STA 26+50 TO -L- STA 27+58

TRANSITION FROM T.S. NO. 1 TO EXISTING FROM
-L- STA 27+58 TO -L- STA 28+30



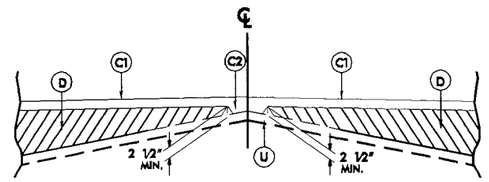
TYPICAL SECTION NO. 2

USE TYPICAL SECTION NO. 2 AS FOLLOWS:

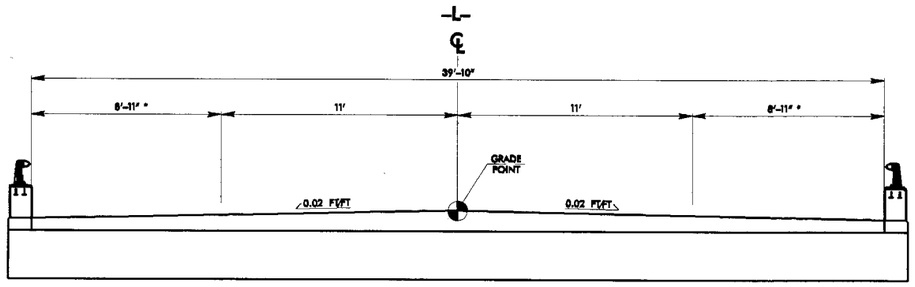
-L- STA 18+00 TO -L- STA 19+91.94 (BEG BRIDGE)
-L- STA 22+27.00 (END BRIDGE) TO -L- 26+50

PAVEMENT SCHEDULE	
C1	PROP. APPROX. 2½" ASPHALT CONCRETE SURFACE COURSE, TYPE SF9.5A, AT AN AVERAGE RATE OF 137.5 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.
C2	PROP. VARIABLE DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE SF9.5A, AT AN AVERAGE RATE OF 110 LBS. PER SQ. YD. PER 1" DEPTH TO BE PLACED IN LAYERS NOT LESS THAN 1¼" OR GREATER THAN 1½" IN DEPTH.
D	PROP. VAR. DEPTH ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0B, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1" DEPTH, TO BE PLACED IN LAYERS NOT LESS THAN 2¼" IN DEPTH OR GREATER THAN 4" IN DEPTH.
E	PROP. APPROX. 6" ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 342 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.
J	PROP. 6" AGGREGATE BASE COURSE.
T	EARTH MATERIAL.
U	EXISTING PAVEMENT.
W1	VARIABLE DEPTH ASPHALT PAVEMENT (SEE STANDARD WEDGING DETAIL)

NOTE : PAVEMENT EDGE SLOPE ARE 1:1 UNLESS SHOWN OTHERWISE



Detail Showing Method of Wedging (W1)

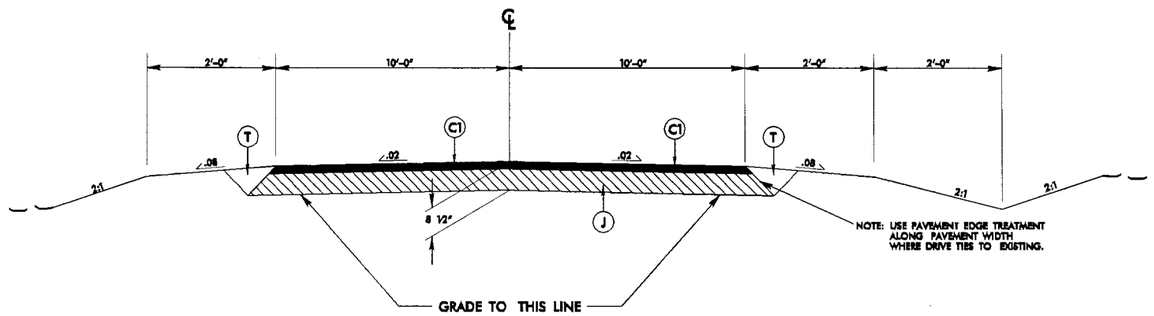


TYPICAL SECTION NO. 3

USE TYPICAL SECTION NO. 3 AS FOLLOWS:

-L- STA 19+91.94 (BEG BRIDGE) TO -L- STA 22+27.00 (END BRIDGE)

* ADDITIONAL 5'-11" ADDED TO BRIDGE OFFSET (ON EACH SIDE) FOR HYDRAULIC SPREAD



TYPICAL SECTION NO. 4

USE TYPICAL SECTION No. 4 FOR DRIVEWAY AT -L- 17+00± RT

PROJECT REFERENCE NO.	SHEET NO.
B-4000	4
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

CH ENGINEERING

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

REVISIONS
8/17/99
R/W REVISION; ADDED PARCEL 54 MODIFIED PARCEL 5. 9/11/06 RBE

DETAIL 3
RIP RAP AT EMBANKMENT
(Not to Scale)

Ditch Grade
Est. 10 Tons
Type of Liner = CLASS B w/ FILTER FABRIC
-L- 21+45 (LT)
-L- 21+48 (RT)

DETAIL 4
STANDARD BASE DITCH
(Not to Scale)

Natural Ground, 2:1, D, 2:1, Natural Ground, B
Min. D = 1.5 Ft.
B = 2 Ft.
-L- 21+45 TO 22+10 (LT)
-L- 21+48 TO 22+10 (RT)

DETAIL 5
LATERAL BASE DITCH
(Not to Scale)

Natural Ground, 2:1, D, 2:1, B, b, Fill Slope, F/Ft.
Min. D = 1.5 Ft.
B = 2 Ft.
b = 5 Ft.
-L- 22+10 TO 24+00 (LT)
-L- 22+10 TO 25+00 (RT)

DETAIL 1
STANDARD 'V' DITCH
DITCH CLEANOUT
(Not to Scale)

EXCAVATE
Natural Ground, 2:1, 2:1, Natural Ground
DAYLIGHT DITCH
-L- 14+82 TO 15+26 (RT)

DETAIL 2
SPECIAL 'V' DITCH
(Not to Scale)

Natural Ground, 2:1, D, 24.0F, FLAT 6F, Fill Slope
Min. D = 2 Ft.
-L- 18+00 TO 18+72 (RT)

DONALD E. WILSON
DB 391 PG 635

WILLIAM BOYCE DAVIS
DB 499 PG 1222

TIMOTHY NEAL BRISTOW
DB 1663 PG 423
PB 66 PG 276

MITCHELL TODD KINDLEY
DB 1638 PG 625
PB 66 PG 276

CLYDE J O'FERRELL JR.
DB 96 PG 439
PB 12 PG 11

DALE E. TRUITT
DB 1325 PG 71
PB 12 PG 11

HENRY F. HILLIARD, JR.
DB 396 PG 175
DB 2078 PG 849
PB 68 PG 384

BOBBY PERRY CORBETT
DB 386 PG 422

-L- POT 10+00.00
BEGIN TIP PROJECT B-4000
-L- POT 14+30.00
-Y- POT 10+00.00 =
-L- POT 16+99.24
-L- STA 19+94.94 BEGIN BRIDGE
-L- STA 19+80.94 BEGIN APPROACH SLAB
-L- STA 22+41.00 END APPROACH SLAB
-L- STA 22+27.00 END BRIDGE
-BL-4 POT 5+00.00
-L- STA 11+21.56 (13.59' RT)
-Y- PC 10+26.00
-Y- PRC 10+81.40
-Y- PT 11+74.50
-BL- 3 PINC 14+34.25 =
-T1- PINC 9+44.72
STA 20+55.81 (11.24' RT)
ELEV = 568.46'
MATCHLINE TO SHEET 5
STATION 23+00

PI -Y- Sta 10+56.93
Δ = 63° 29' 18.9" (LT)
D = 114° 35' 29.6"
L = 55.40'
T = 30.93'
R = 50.00'

PI -Y- Sta 11+48.58
Δ = 106° 40' 28.2" (RT)
D = 114° 35' 29.6"
L = 93.09'
T = 67.11'
R = 50.00'

S 70° 10' 33.5" E
-L-

BRIDGE #45
WOODS CREEK
STEEL

ALL 2'-0"x15" ABE NARROW SLOT FLAT GRATES

TWO 2GI W/NARROW SLOT FLAT GRATE

CL B RIPRAP W/FF

RIPRAP @ EMBANKMENT SEE DETAIL 3

STD BASE DITCH SEE DETAIL 4

DDE=17 CY

DDE=14 CY

80' DITCH CLEAN OUT DDE = 24 CYD (SEE DETAIL 1)

SPECIAL 'V' DITCH SEE DETAIL 2

TIE TO EXISTING OUTFALL

END PAVEMENT IN R/W CENTER

HIGH VIS FENCE

15" CMP

15" CSP W/2 ELBOWS AND ROD & LUG CONNECTORS

TO UNION RIDGE ROAD

TO GEORGES CREEK ROAD SR 1002

WOODS CREEK

PROPERTY LINE CL CREEK

ORDAY CREEK

WELL

GRAVEL

WOODS

EXISTING R/W

45' R/W

WLB

BRIDGE / ROADWAY RELATIONSHIP SKETCH

-L- STA 19+80.94 BEGIN APPROACH SLAB
-L- STA 22+41.00 END APPROACH SLAB
-L- STA 19+94.94 BEGIN BRIDGE
-L- STA 22+27.00 END BRIDGE
TYPE III
34'-0" OUT TO OUT
30'-0" CLR
30'-0" CLR

DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCDOT FOR MONUMENT "B4000-1" WITH NAD 1983/95 STATE PLANE GRID COORDINATES OF NORTHING: 893565.927(m) EASTING: 188762.746(ft)
THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.99998579
THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "B4000-1" TO -L- STATION 14+30.00 IS N 70° 45' 13.11" W 1494.978 FT
ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES
VERTICAL DATUM USED IS NAVD 88

DETAIL 9
SPECIAL 'V' DITCH
(Not to Scale)

Natural Ground, 2d, D, 2d or Flatter, Fill Slope, Filter Fabric
Min. D= 2 Ft.
Max. d= 2 Ft.
Type of Liner= Class B Rip-Rap
-L- 17+20 TO 18+00 (RT)

DETAIL 10
TAIL DITCH
(Not to Scale)

Natural Ground, 2d, D, 2d, Natural Ground
Min. D= 2 Ft.
-Y- 11+05 (LT)

DITCH LEGEND

LEFT DITCH — · — · —
RIGHT DITCH - - - - - - -

BRIDGE HYDRAULIC DATA
BOX GIRDER BRIDGE

DESIGN DISCHARGE	=	2500 CFS
DESIGN FREQUENCY	=	25 YRS
DESIGN HW ELEVATION	=	569.2 FT
100 YEAR DISCHARGE	=	3800 CFS
100 YEAR HW ELEVATION	=	570.7 FT
OVERTOPPING DISCHARGE	=	4600 CFS
OVERTOPPING FREQUENCY	=	200 YRS
OVERTOPPING ELEVATION	=	571.5 FT
DATE OF SURVEY	=	12/7/04
W.S. ELEVATION AT DATE OF SURVEY	=	561.1 FT

PIPE HYDRAULIC DATA
DRAINAGE STRUCTURE NO. 1

DRAINAGE AREA	=	1.9 AC
DESIGN FREQUENCY	=	25 YRS
DESIGN DISCHARGE	=	3.8 CFS
DESIGN HW ELEVATION	=	585.6 FT
100 YEAR DISCHARGE	=	4.9 CFS
100 YEAR HW ELEVATION	=	585.77 FT
OVERTOPPING FREQUENCY	=	500+++ YRS
OVERTOPPING DISCHARGE	=	19 CFS
OVERTOPPING ELEVATION	=	589 FT

BM #1 (RR SPIKE IN 20" PINE)
-BL- STA 14+24.42 425.68' RT =
-L- STA 20+47.05 436.95' RT
ELEVATION = 565.42'

PI = 10+51.00
EL = 575.05'
VC = 50'
K = 8
BEGIN GRADE
-Y- 10+11.00 =
-L- 16+99.24 (11.00' RT)
EL = 575.86'
VPC
-Y- 10+26.00
EL = 575.56'
VPI
-Y- 11+14.00
EL = 568.16'
VPC
-Y- 10+76.00
EL = 572.96'
END GRADE
-Y- 11+74.50
EL = 568.15'
-L- 20+20.35
PROPOSED
EXISTING
-Y- 2.5325%

PI = 11+25.00
EL = 565.91'
VC = 98'
K = 14

BLEND TO EXISTING
-L- 14+50.00
18'

BEGIN GRADE
-L- 15+27.00
EL = 583.72'
VPC
-L- 15+33.00
EL = 583.40'

PROPOSED
EXISTING
BEGIN SPECIAL 'V' DITCH
-L- 17+20 (RT) ELEV = 570.07'
+88.42'
EL = 566.35'
+40.00
EL = 568.79'
+100.00
EL = 565.92'
END SPECIAL 'V' DITCH
-L- 18+72 (RT) ELEV = 566.0'

PI = 21+23.00
EL = 551.49'
VC = 110.00'
K = 62
-V- = 45 mph

LOW POINT
-L- 19+76.66
EL = 571.38'
BEGIN BRIDGE
-L- 19+94.94
END STD BASE DITCH
REG'LN' BASE DITCH
-L- 22+40 (RT) ELEV = 563.80'
BEGIN STD BASE DITCH
-L- 21+45 (LT) ELEV = 561.39'
EXCAVATE TO
EL = 560.57'
BEGIN STD BASE DITCH
-L- 21+48 (RT) ELEV = 561.04'
END STD BASE DITCH
REG'LN' BASE DITCH
-L- 22+40 (RT) ELEV = 562.90'
END BRIDGE
-L- 22+27.00

* DESIGN EXCEPTION REQUIRED FOR VERTICAL CURVATURE AND MAXIMUM GRADE.

-Y-
-L-

10 11 12 13 14 15 16 17 18 19 20 21 22 23

630 620 610 600 590 580 570 560 550

28-SEP-2006 09:56
FILE=pdgen01_B-4000_rdy_psh04.dgn
$$$$USERNAME$$$$

PROJECT REFERENCE NO.	SHEET NO.
B-4000	5
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

CH ENGINEERING

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

8/17/99

REVISIONS

R/W REVISION; ADDED PARCEL 5A MODIFIED PARCEL 5, 9/11/06 RBE

MATCHLINE TO SHEET 4
STATION 23+00

-L-
PI Sta 27+87.64
Δ = 15°05'11.0" (LT)
D = 3°56'18.9"
L = 383.04'
T = 192.64'
R = 1,454.73'
e = 0.06
Vd = 55 mph

-T- 7 POT 5+00.00
ELEV=561.59' NAIL SET
N 5°54'54" 52.3' W 444.72'

END TIP PROJECT B-4000
-L- POC 28+30.00

-L- POT 32+68.04

-L- PT 29+78.04

-L- PC 25+95.00

HENRY F. HILLIARD, JR.
DB 96 PG 175
DB 2078 PG 849
PB 68 PG 384

HASSELL A. CORBETT, JR.
DB 445 PG 907
DB 2078 PG 846
PB 68 PG 374

BOBBY PERRY CORBETT
DB 386 PG 422

LATERAL BASE DITCH SEE DETAIL 5 DDE=68 CY

LATERAL BASE DITCH SEE DETAIL 6 DDE=139 CY

LATERAL BASE DITCH SEE DETAIL 5 DDE=151 CY

SPECIAL BASE DITCH TYPICAL SEE DETAIL 8

SPECIAL CUT BASE DITCH SEE DETAIL 8

BLEND TO EXIST (LT & RT)

+95.00 50' LT 65' LT

+30.00 22.50' LT 50.00' LT

+95.00 50' RT 65' RT

+30.00 22.50' RT 50.00' RT

GRAU 350

JEFFRIES CROSS ROAD SR 1002

70.00 END 386

S 71° 54' 37.7" E

"GPS" B4000-1 PINC 23+03.74
-L- STA 29+22.70 (22.24' RT)

"GPS" B4000-2 POT 29+19.55

S 85° 15' 44.5" E

S 86° 02' 55.1" E

NAD 83

TO NC 62

ISBD

POOL

ALUMINUM SHELTER

HASSELL CORBETT ROAD SR 1002

WOODS

EXISTING R/W

16.36' EIP-R/W

S 09°09'25" E 205.71' EIP

S 28°16'43" W 280.00

N 73°17'18" W

955.58'

DETAIL 5
LATERAL BASE DITCH
(Not to Scale)

Min. D = 1.5 Ft.
B = 2 Ft.
b = 5 Ft.

-L- 22+10 TO 24+00 (LT)
-L- 22+10 TO 25+00 (RT)

DETAIL 6
LATERAL BASE DITCH
(Not to Scale)

Min. D = 1.5 Ft.
Max. d = 1.5 Ft.
B = 2 Ft.
b = 5 Ft.

Type of Liner = CLASS B

-L- 24+00 TO 25+50 (LT)

DETAIL 7
SPECIAL CUT BASE DITCH
(Not to Scale)

Min. D = 1.5 Ft.
Max. d = 1.5 Ft.
B = 2 Ft.

Type of Liner = CLASS B

-L- 25+00 TO 26+50 (RT)

DETAIL 8
SPECIAL BASE DITCH TYPICAL
(Not to Scale)

Min. D = 1.5 Ft.
Max. d = 1.5 Ft.
B = 2 Ft.

Type of Liner = CLASS A

-L- 25+50 TO 28+30 (LT)
-L- 26+50 TO 28+30 (RT)

BM #1 (RR SPIKE IN 20" PINE)
-BL- STA 14+24.42 425.68' RT
-L- STA 20+47.05 436.95' RT
ELEVATION = 565.42'

PROFILE FOR LEFT SPECIAL BASE DITCH TYPICAL

PI STATION	ELEV	%GRADE
-L- 25+50.00	588.40	
-L- 26+00.00	592.16	7.52
-L- 26+50.00	595.91	7.50
-L- 27+00.00	600.18	8.54
-L- 27+50.00	604.66	8.96
-L- 27+58.00	605.38	9.00
-L- 28+00.00	608.89	8.36
-L- 29+30.00	613.35	14.87

PROFILE FOR RIGHT SPECIAL BASE DITCH TYPICAL

PI STATION	ELEV	%GRADE
-L- 26+50.00	597.70	
-L- 27+00.00	600.98	8.56
-L- 27+50.00	606.46	8.96
-L- 27+58.00	607.18	9.00
-L- 28+00.00	610.67	8.31
-L- 28+30.00	614.20	11.77

END GRADE
PI = 27+58.00
EL = 608.52

BLEND TO EXISTING

VPT
PI = 27+13.00
EL = 604.48'

PI = 21+23.00
EL = 551.44'
VC = 1,180'
K = 82
Vd = 45 mph

PROPOSED

EXISTING

+50.00
EL = 559.90

+00.00
EL = 573.24

+88.00
EL = 565.50

END CUT BASE DITCH
-L- 25+50 (RT) ELEV = 591.70'

END LATERAL BASE DITCH
-L- 25+50 (LT) ELEV = 588.40'

END LAT BASE DITCH
BEG CUT BASE DITCH
-L- 38+00 (RT) ELEV = 576.80'

END LAT BASE DITCH
BEG LATERAL BASE DITCH
-L- 24+00 (LT) ELEV = 571.90'

DITCH LEGEND

LEFT DITCH

RIGHT DITCH

* DESIGN EXCEPTION REQUIRED
FOR VERTICAL CURVATURE AND MAXIMUM GRADE.

630 620 610 600 590 580 570 560 550

23 24 25 26 27 28 29 30 31 32 33

28-SEP-2006 09:57
\\ss1\USERDATA\$$$$$$$$\B-4000_rdy_psh05.dgn

8/23/99

0 5	PROJ. REFERENCE NO.	SHEET NO.
	B-4000	X-1

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

590
585

585.28

15+00.00

590
585

582.79

14+50.00

590
585

EXISTING 0.005%

EXISTING 0.034%

588.85

14+30.00

595
590
585

590.48

14+00.00

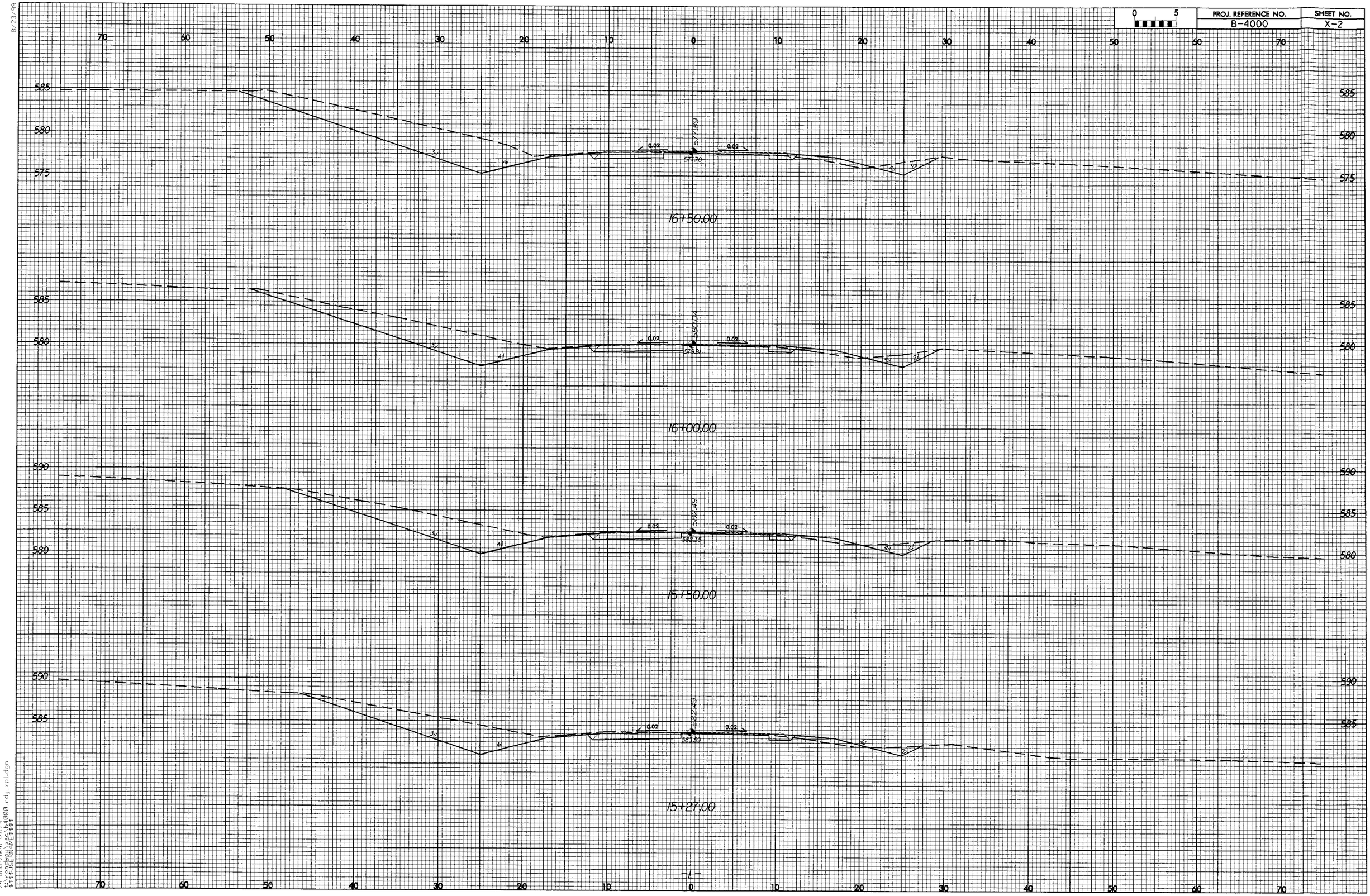
Note: Approximate quantities only. Unclassified Excavation, Borrow Excavation, Shoulder Borrow, Fine Grading, Clearing and Grubbing, Breaking of Existing Pavement, and Removal of Existing Pavement will be paid for at the contract lump sum price for "Grading."

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

24-AUG-2006 07:28
i:\roddata\pdd\b4000_rdy_xpl.dgn
$$$$USERNAME$$$$

8/23/99

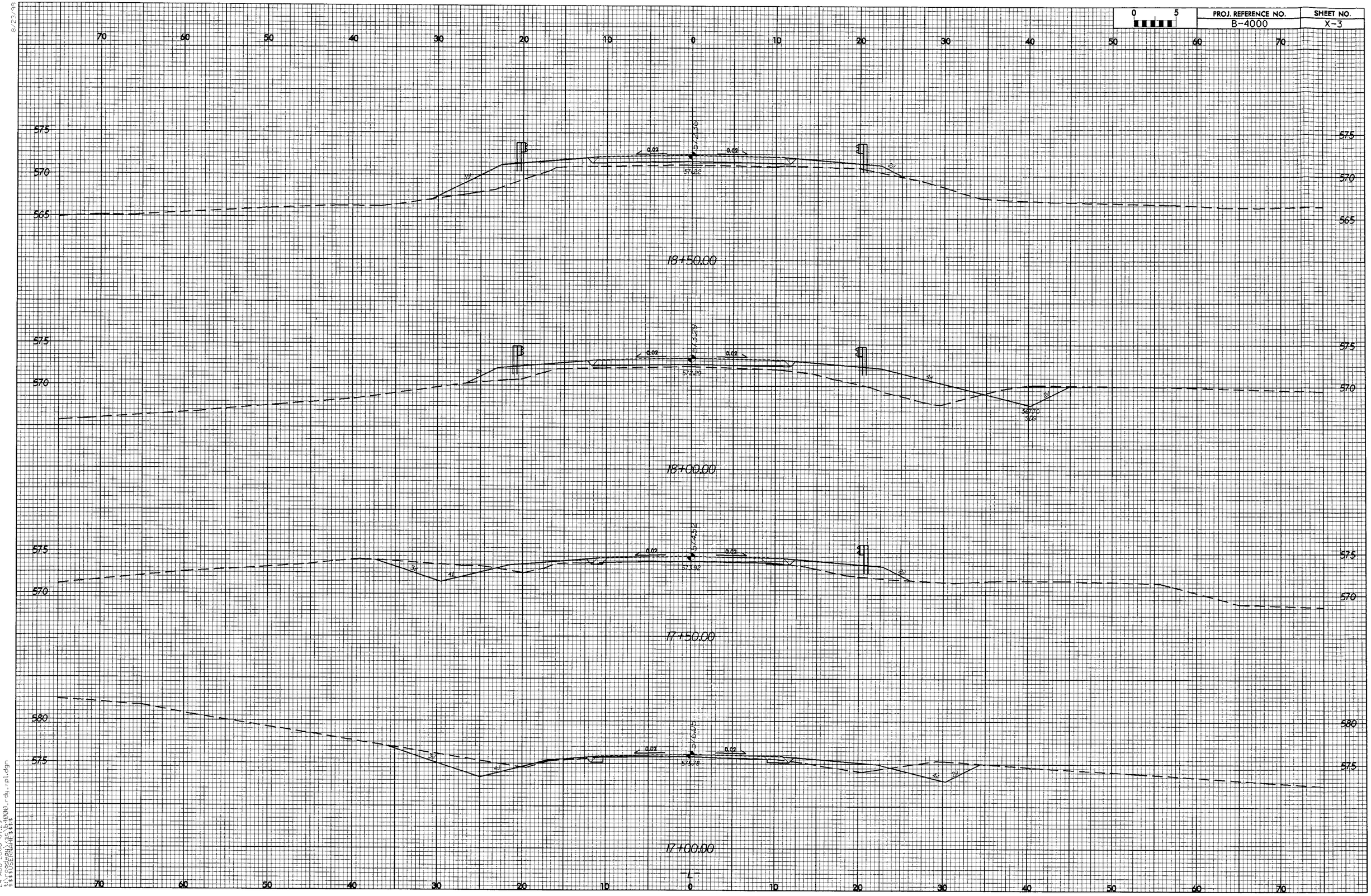
0 5	PROJ. REFERENCE NO.	SHEET NO.
	B-4000	X-2



24-AUG-2006 07:29
$$$USERNAME$$$
i:\roadway\c\b4000_rdy_xpl.dgn

8/23/99

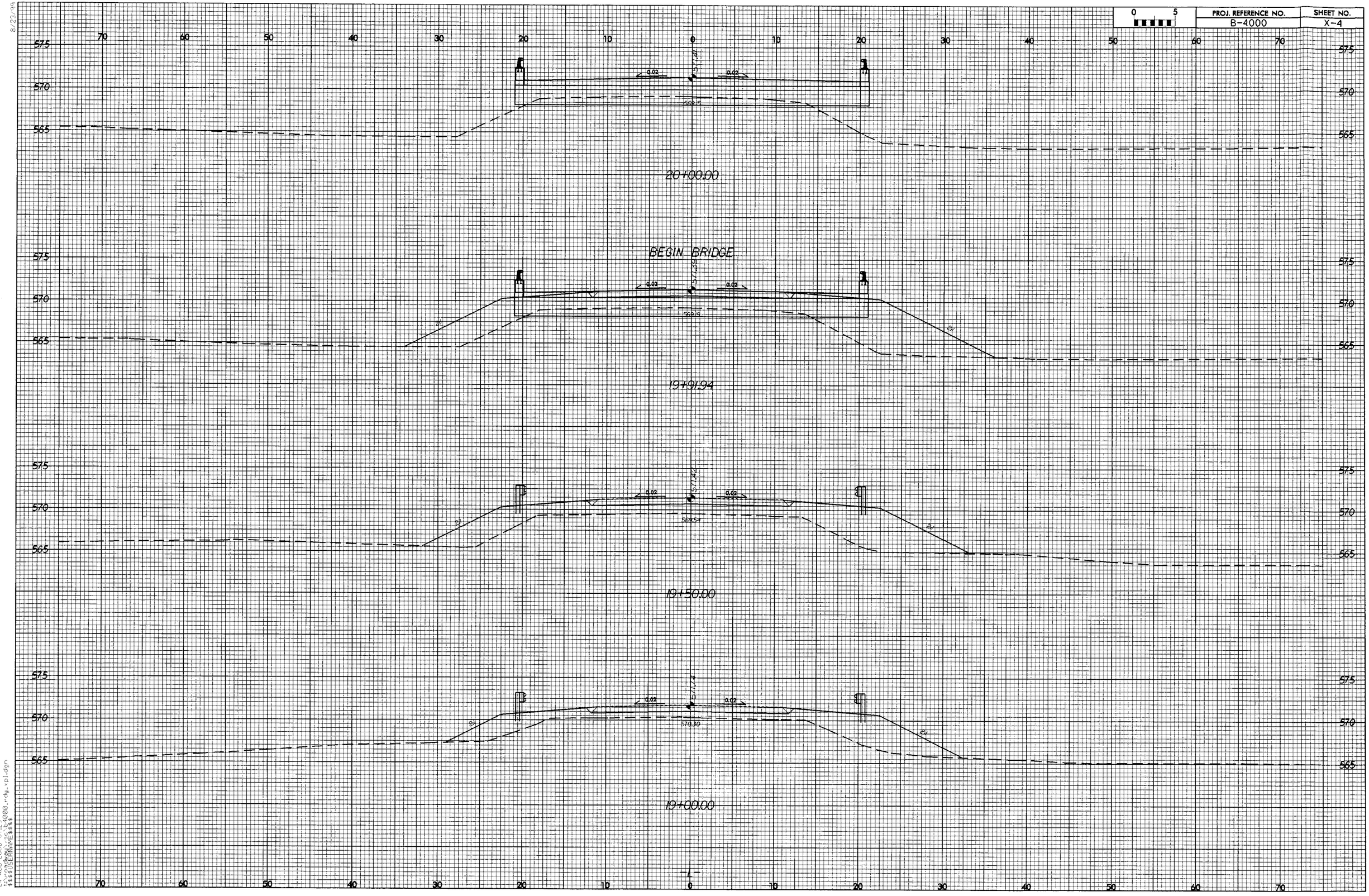
0 5	PROJ. REFERENCE NO.	SHEET NO.
	B-4000	X-3



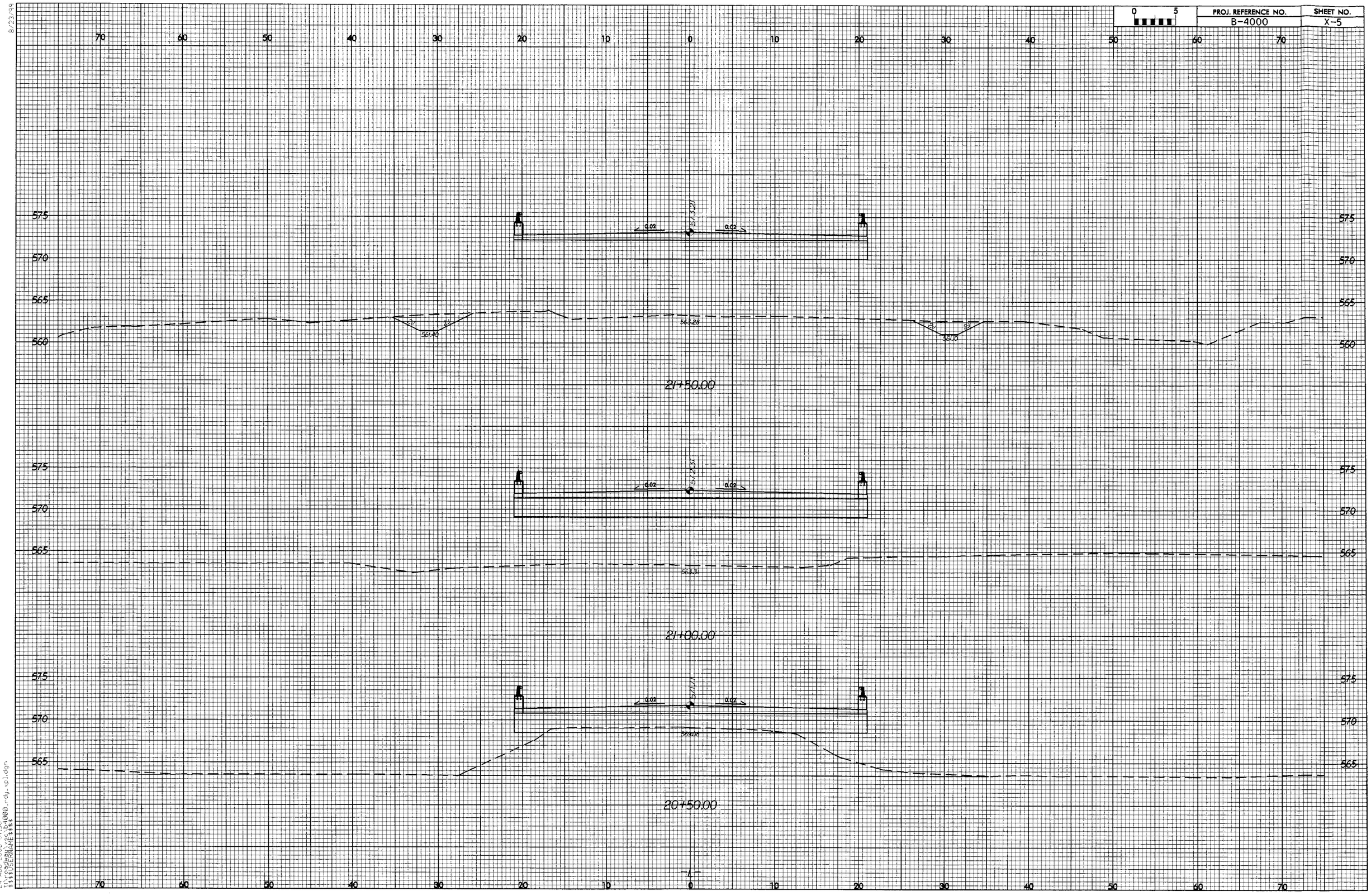
24-AUG-2006 07:29
\\vrodata\...\c1b4000_rdy_rpl.dgn
$$$$USERNAME$$$$

8/23/99

0 5	PROJ. REFERENCE NO.	SHEET NO.
	B-4000	X-4



0 5	PROJ. REFERENCE NO.	SHEET NO.
	B-4000	X-5



0 5	PROJ. REFERENCE NO.	SHEET NO.
	B-4000	X-6

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

580 575 570 565

0.02 0.02 575.534 2% 2% 2% 2% 565.48 567.50 564.40

22+50.00

END BRIDGE

0.02 0.02 575.27 2% 2% 2% 2% 564.48 564.47 563.04

22+27.00

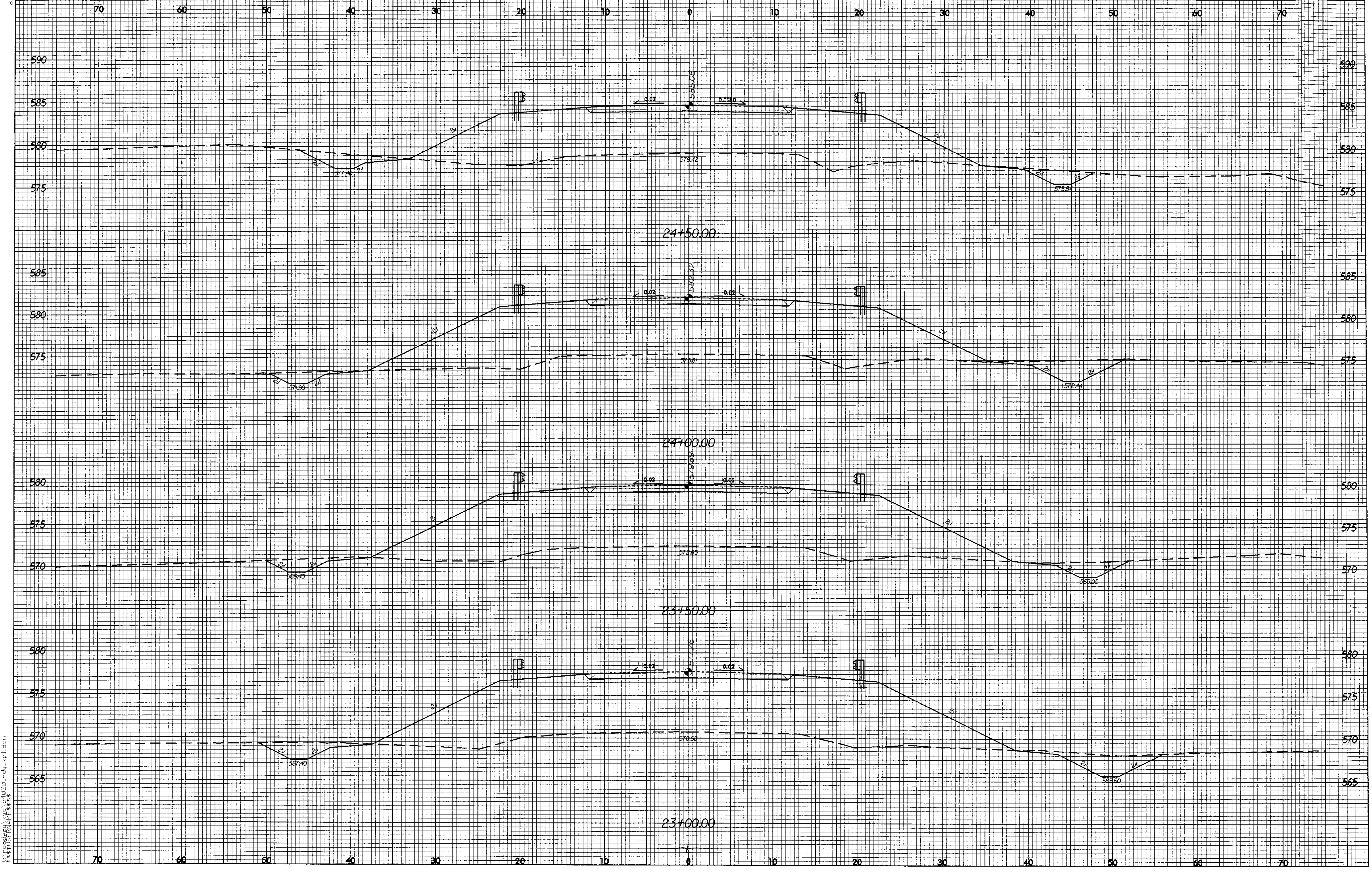
0.02 0.02 575.442

2% 2% 2% 2% 565.40 565.58 562.80

22+00.00

0 5	PROJ. REFERENCE NO.	SHEET NO.
	B-4000	X-7

8/23/99

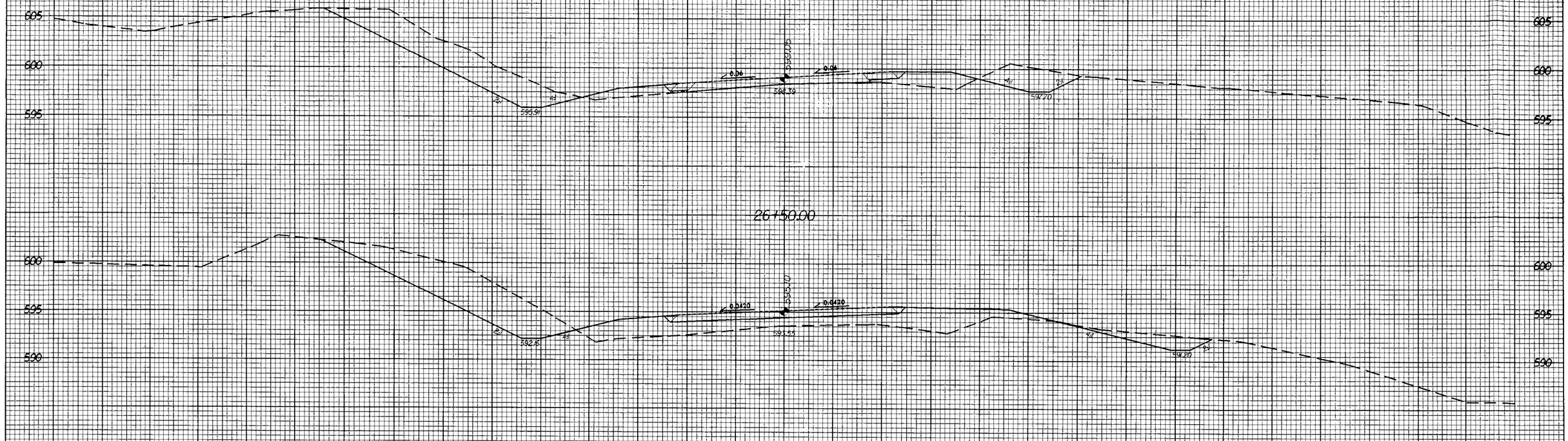


24-AUG-2006 07:30
t:\roadway\xsc\b4000_rdy_xpl.dgn
$$$$USERNAME$$$$

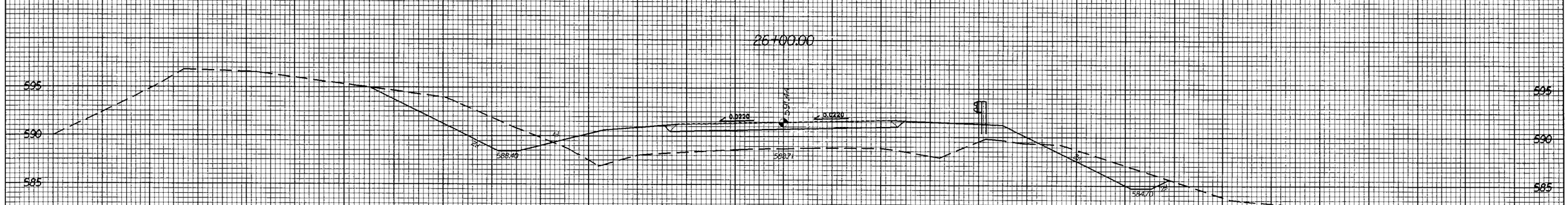
8/23/99

0 5	PROJ. REFERENCE NO.	SHEET NO.
	B-4000	X-8

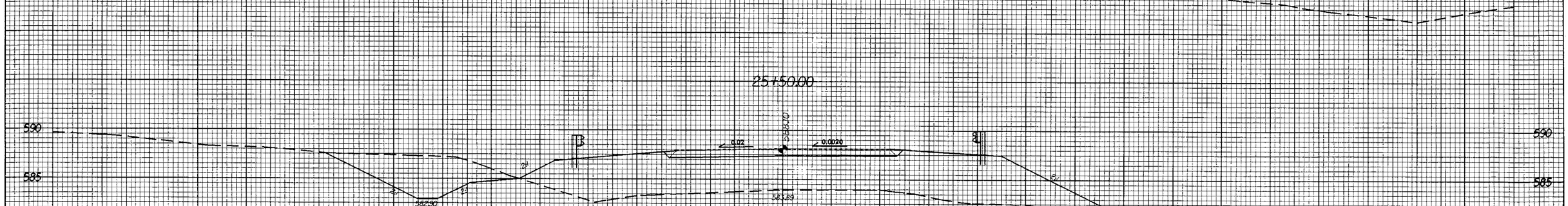
26+50.00



26+00.00



25+50.00



25+00.00

8/23/99

0 5	PROJ. REFERENCE NO.	SHEET NO.
	B-4000	X-9

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

620 615 610 605 600

EXISTING 0.0805

EXISTING 0.0527

614.51

28+30.00

612.16

608.89

607.27

28+00.00

606.32

605.38

607.18

27+58.00

607.20

607.47

604.56

606.46

27+50.00

605.32

600.75

601.98

27+00.00

24-AUG-2006 07:31
f:\projects\b4000\rdwg\b4000_rdwy_pl.dgn
$$$$USERNAME$$$$

8/23/99

0 5	PROJ. REFERENCE NO.	SHEET NO.
	B-4000	X-10

625
620
615
625
620
615
28+50.00
24-AUG-2006 07:31
I:\roadway\B4000_rdy_vpl.dgn
USER NAME = bsa

8/23/99

0 5	PROJ. REFERENCE NO.	SHEET NO.
	B-4000	X-11

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

575 570 565

11+74.49 — 0.02 — 0.02 — 2% — 2% — 2%

575 570 565

11+50.00 — 0.02 — 0.02 — 2% — 2% — 2%

575 570 565

11+00.00 — 0.02 — 0.02 — 2% — 2% — 2%

580 575 570

10+50.00 — 0.02 — 0.02 — 2% — 2% — 2%

580 575 570

10+26.00 — 0.02 — 0.02 — 2% — 2% — 2%

-Y-

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

24-AUG-2006 07:19
\\roscvnlxrs1\b4000_rdy_xpl.dgn
$$$$USERNAME$$$$

CATEGORICAL EXCLUSION ACTION CLASSIFICATION FORM

TIP Project No. **B-4000**
State Project No. **8.2473401**
Federal Project No. **BRZ-1002(11)**

A. Project Description:

NCDOT will replace Bridge No. 45 on SR 1002 (Jeffries Cross Road) over Jordan Creek in Alamance County. The bridge will be replaced with a new bridge measuring 220 feet in length and 28 feet in width at approximately the same location as the existing bridge. This bridge will provide for a 22 foot travelway and 3 foot offsets on each side. The new approach roadway will be a 22 foot travelway with 5 foot grassed shoulders. The approach work will consist of 800 feet to the west and 900 feet to the east of the existing bridge. The bridge will be raised approximately 10 feet to meet the Statutory speed limit of 55-mph. Traffic will be detoured on existing secondary roads during construction.

B. Purpose and Need:

Bridge Maintenance records indicate the bridge has a sufficiency rating of 18.5 out of 100. The bridge's eleven span superstructure is composed of a timber deck on steel beams and channels and timber joist. The substructure is composed of mass concrete abutments and piers with steel pile crutch bents. The bridge's deck width (21 feet wide), low structural evaluation, and low superstructure and substructure condition ratings qualify the bridge as both functionally obsolete and structurally deficient according to Federal Highway Administration (FHWA) standards and therefore eligible for FHWA's Highway Bridge Replacement and Rehabilitation Program. The replacement of this inadequate structure will result in safer traffic operations.

C. Proposed Improvements:

The following Type II improvements which apply to the project are circled:

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

    a. Restoring, Resurfacing, Rehabilitating, and Reconstructing pavement (3R and 4R improvements)
    b. Widening roadway and shoulders without adding through lanes
    c. Modernizing gore treatments
    d. Constructing lane improvements (merge, auxiliary, and turn lanes)

e. Adding shoulder drains
f. Replacing and rehabilitating culverts, inlets, and drainage pipes, including safety treatments
g. Providing driveway pipes
h. Performing minor bridge widening (less than one through lane)
i. Slide Stabilization
j. Structural BMP's for water quality improvement

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

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

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

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

4. Transportation corridor fringe parking facilities.

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

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

7. Approvals for changes in access control.

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

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

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

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

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

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

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

D. Special Project Information:

Estimated Cost:

Construction	$ 1,400,000
Right of Way	$ 57,000
Total	**$ 1,457,000**

Estimated Traffic:

Current	-	700 VPD
Year 2025	-	1400 VPD
TTST	-	1%
Dual	-	6%

Proposed Typical Roadway Section:

The approach roadway will be 22 feet wide with 5-foot shoulders. Shoulder width will be increased by three feet where guardrail is warranted.

Design Speed: 55 mph

Design exceptions: It is anticipated that no design exceptions will be required.

Functional Classification: Rural Minor Collector Route

Division Office Comments:

The Division 7 Construction Engineer concurs with the recommendation of replacing the bridge in place and detouring traffic on local roads during construction.

Bridge Demolition:

Bridge No. 45 has 11 spans totaling 201 feet in length. The bridge superstructure is composed of a timber floor with an asphalt wearing surface on steel I-beams, channels and timber joist. The substructure is composed of mass concrete abutments and piers and steel pile crutch bents. All components of the bridge, except the mass concrete piers, will be removed without dropping any of their components into Waters of the United States. However, there is the potential for components of the mass concrete piers to drop into the Waters of the United States during construction. The resulting temporary fill associated with the mass concrete piers is approximately 60 cubic yards.

Alternatives Studied and Rejected:

The "do-nothing" alternative will eventually necessitate closure of the bridge. This is not acceptable due to the traffic service provided by SR 1002.

Due to the short detour (5.2 miles) and the low traffic (700 vehicles per day), no other alternatives were studied.

Environmental Commitments:

Please see attached Green Sheet for Project Commitments.

E. Threshold Criteria

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

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

		YES	NO
(9)	Does the project involve any known underground storage tanks (UST's) or hazardous materials sites?	☐	X

PERMITS AND COORDINATION

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

SOCIAL, ECONOMIC, AND CULTURAL RESOURCES

		YES	NO
(15)	Will the project induce substantial impacts to planned growth or land use for the area?	☐	X
(16)	Will the project require the relocation of any family or business?	☐	X
(17)	Will the project have a disproportionately high and adverse human health and environmental effect on any minority or low-income population?	☐	X
(18)	If the project involves the acquisition of right of way, is the amount of right of way acquisition considered minor?	X	☐
(19)	Will the project involve any changes in access control?	☐	X
(20)	Will the project substantially alter the usefulness and/or land use of adjacent property?	☐	X

(21)	Will the project have an adverse effect on permanent local traffic patterns or community cohesiveness?	☐	X
(22)	Is the project included in an approved thoroughfare plan and/ or Transportation Improvement Program (and is, therefore, in conformance with the Clean Air Act of 1990)?	X	☐
(23)	Is the project anticipated to cause an increase in traffic volumes?	☐	X
(24)	Will traffic be maintained during construction using existing roads, staged construction, or on-site detours?	X	☐
(25)	If the project is a bridge replacement project, will the bridge be replaced at its existing location (along the existing facility) and will all construction proposed in association with the bridge replacement project be contained on the existing facility?	X	☐
(26)	Is there substantial controversy on social, economic and environmental grounds concerning aspects of the action?	☐	X
(27)	Is the project consistent with all Federal, State, and local laws relating to the environmental aspects of the project?	X	☐
(28)	Will the project have an "effect" on structures/properties eligible for or listed on the National Register of Historic Places?	☐	X
(29)	Will the project affect any archaeological remains which are important to history or pre-history?	☐	X
(30)	Will the project require the use of Section 4(f) resources (public parks, recreation lands, wildlife and waterfowl refuges, historic sites or historic bridges, as defined in Section 4(f) of the U. S. Department of Transportation Act of 1966)?	☐	X
(31)	Will the project result in any conversion of assisted public recreation sites or facilities to non-recreation uses, as defined by Section 6(f) of the Land and Water Conservation Act of 1965, as amended?	☐	X

(32) Will the project involve construction in, across, or adjacent to a river designated as a component of or proposed for inclusion in the natural Wild and Scenic Rivers? ☐ X

F. **Additional Documentation Required for Unfavorable Responses in Part E**
(Discussion regarding all unfavorable responses in Part E should be provided below. Additional supporting documentation may be attached, as necessary.)

G. CE Approval

TIP Project No. **B-4000**
State Project No. **8.2473401**
Federal-Aid Project No. **BRZ-1002(11)**

Project Description:

NCDOT will replace Bridge No. 45 on SR 1002 (Jeffries Cross Road) over Jordan Creek in Alamance County. The bridge will be replaced with a new bridge measuring 220 feet in length and 28 feet in width at approximately the same location as the existing bridge. This bridge will provide for a 22 foot travelway and 3 foot offsets on each side. The new approach roadway will be a 22 foot travelway with 5 foot grassed shoulders. The approach work will consist of 800 feet to the west and 900 feet to the east of the existing bridge. The bridge will be raised approximately 10 feet to meet the Statutory speed limit of 55-mph. Traffic will be detoured on existing secondary roads during construction.

Categorical Exclusion Action Classification:

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

Approved:

5-17-04 Teresa Hart
Date — Teresa Hart, PE, CPM, Assistant Manager
Project Development and Environmental Analysis Branch

5-17-04 William T. Goodwin Jr.
Date — William T. Goodwin Jr., P.E., Unit Head
Bridge Replacement Planning Unit

5-17-04 Joel A Johnson
Date — Joel A. Johnson, Project Development Engineer
Bridge Replacement Planning Unit

PROJECT COMMITMENTS

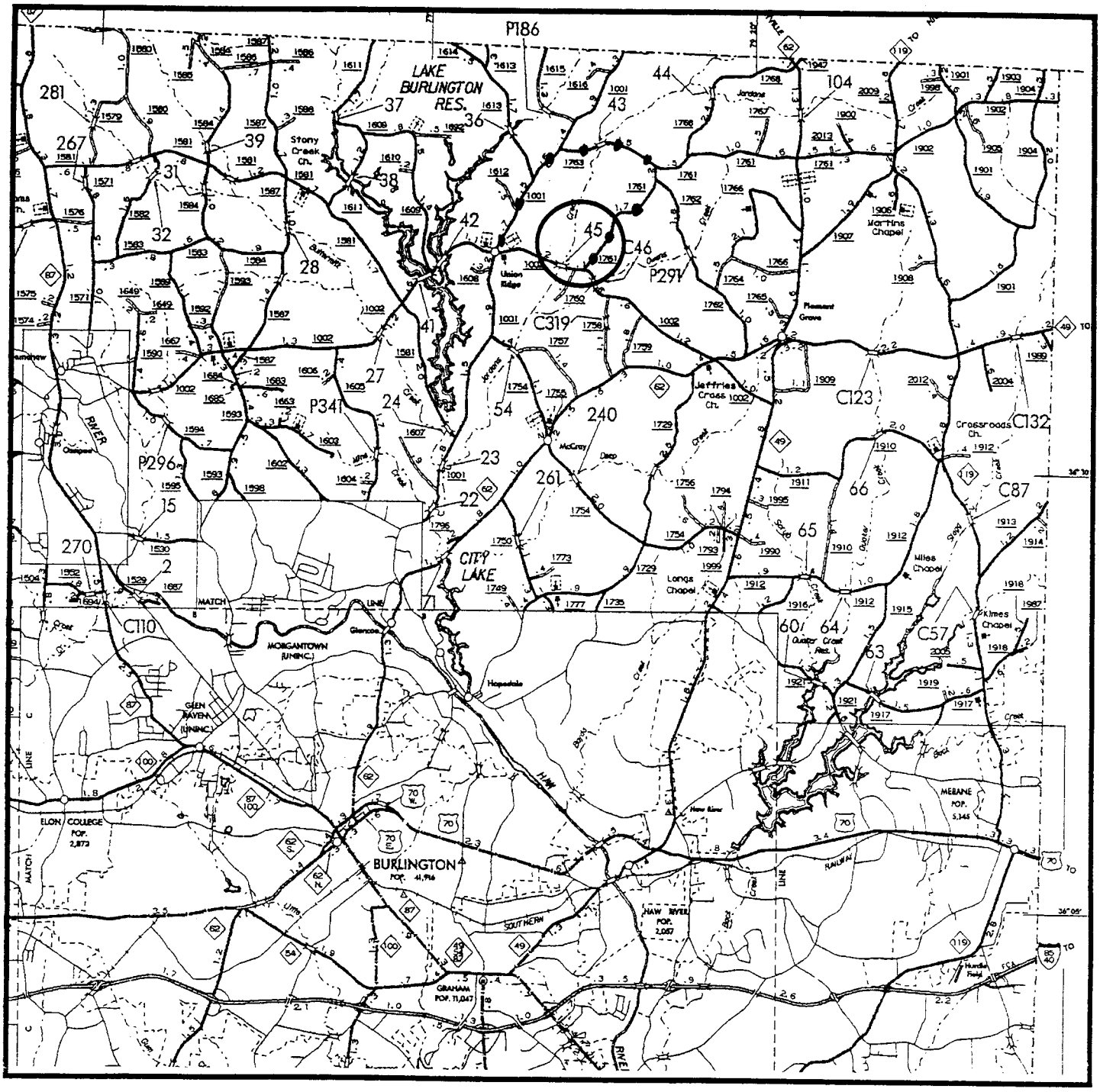
Replacement of Bridge No. 45
On SR 1002 over Jordan Creek
Alamance County
Federal-Aid No. BRZ-1002(11)
State Project No. 8.2473401
T.I.P. No. B-4000

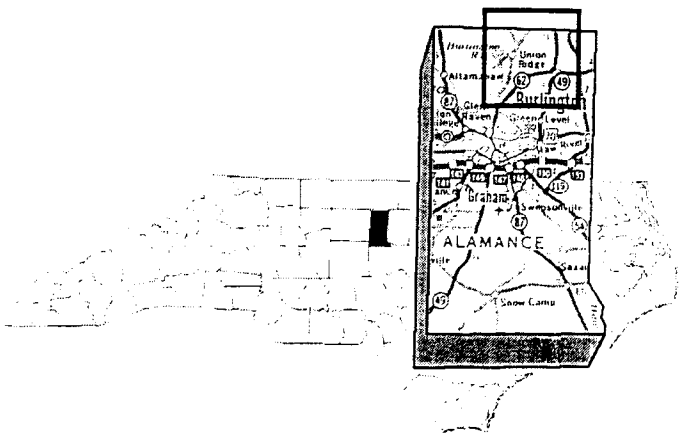
Commitments Developed Through Project Development and Design

Hydraulics Unit, Roadside Environmental Unit, Division Seven Construction Office, Structure Design Unit

NCDOT will adhere to the Best Management Practices (BMPs) for "Bridge Demolition and Removal" during the removal of Bridge No. 45.

A significant fishery for sunfish exists at this site; therefore an in-water moratorium for sunfish will be in effect from April 1 to June 30.





DETOUR ROUTE

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

ALAMANCE COUNTY
REPLACE BRIDGE NO. 45 ON SR 1002
OVER JORDAN CREEK
B-4000

Figure 1

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 28, 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: Replacement of Bridge No. 45 on SR 1002 over Jordon Creek, B-4000, Alamance County, ER03-0913

On September 4, 2003, Sarah McBride, our preservation specialist for transportation projects met with the North Carolina Department of Transportation (NCDOT) staff for a meeting of the minds concerning the above project. We reported on our available information on historic architectural and archaeological surveys and resources along with our recommendations. DOT provided project area photographs and aerial photographs at the meeting.

Based on our review of the photographs and the information discussed at the meeting, we offer our preliminary comments regarding this project.

In terms of historic architectural resources, we are aware of no historic structures located within the areas of potential effect. We recommend that no historic architectural survey be conducted for this project.

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

Having provided this information, we look forward to receipt of either a Categorical Exclusion or Environmental Assessment which indicates how NCDOT addressed our comments.

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.

Natural Resources Technical Report

Replacement of Bridge No. 45 on SR 1002
Over Jordan Creek
Alamance County, North Carolina

State Project No. 8.2473401
TIP Project No. B-4000

North Carolina Department of Transportation
Project Development and Environmental Analysis Branch

February 2003

TABLE OF CONTENTS

1.0 Introduction

Kimley-Horn and Associates, Inc. (KHA) has been retained by the North Carolina Department of Transportation (NCDOT) to complete natural resources investigations associated with the replacement of Bridge No. 45 over Jordan Creek in Alamance County, North Carolina. The following Natural Resources Technical Report is submitted to assist in the preparation of the Categorical Exclusion (CE) for the proposed project.

1.1 Project Description

The proposed project, Transportation Improvement Project (TIP) No. B-4000, will replace Bridge No. 45 on Jeffries Cross Road (SR 1002) over Jordan Creek in Alamance County, North Carolina (Figure 1). The bridge, constructed in 1950, is currently in poor condition and in need of replacement. The replacement is intended to provide a safer bridge structure consistent with federal and state bridge standards. Photographs of the project study area are included in Appendix A.

For the purposes of this report, the following terminology is used define the limits of the natural resource investigations.

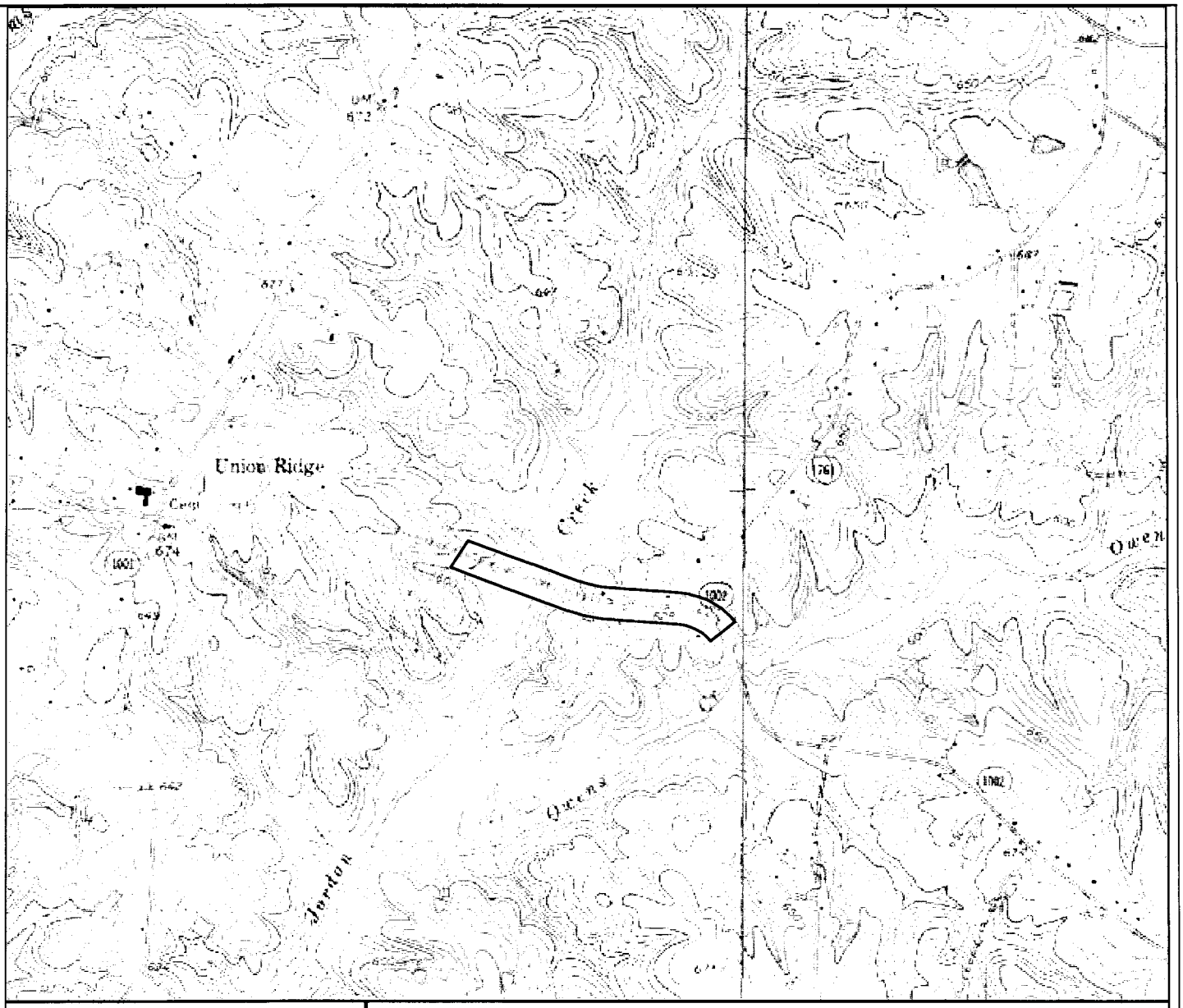
Project study area – denotes the area bound by the proposed right-of-way limits along the full length of the project alignment. No alternatives for the proposed project have been defined, therefore, the project study area is comprised of an area approximately 3,500 feet (1,067 meters) long and 400 feet (122 meters) wide consisting of nearly 32 acres (13 hectares). Approximately 480 linear feet of Jordan Creek is located within the project study area.

Project vicinity- denotes an area extending 0.5 miles (0.8 kilometers) on all sides of the project study area.

Project region – is equivalent to an area represented by a 7.5 minute USGS quadrangle map with the project study area occupying the central portion.

1.2 Purpose

The purpose of this technical report is to inventory, catalog, describe, and quantify the natural systems within the project study area. Specifically, the evaluations conducted for this study include: 1) an assessment of physical resources, including geology, soils, and water resources; 2) an assessment of biotic resources including plant communities, aquatic habitats, terrestrial wildlife and aquatic species; 3) an evaluation of waters of the U.S. including surface waters and wetlands, along with a preliminary

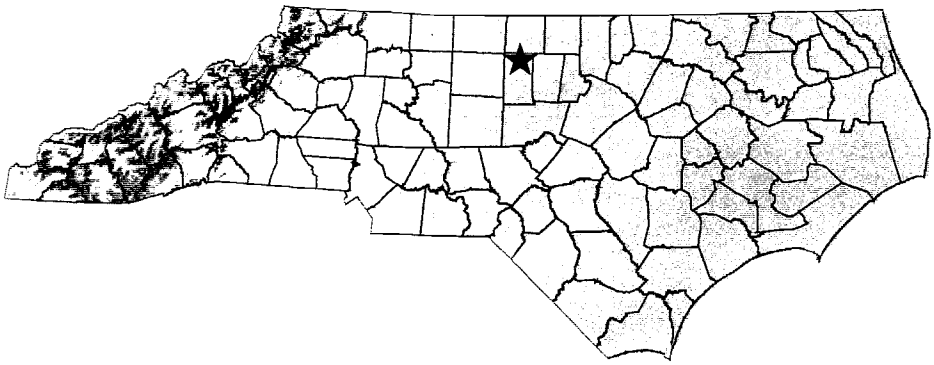


Legend

Project Study Area

N
W E
S

0 2,000 4,000
Feet



Title	Vicinity Map (USGS Quad Lake Burlington, North Carolina 1969)

Kimley-Horn and Associates, Inc.

Prepared For:

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

Project	Project Study Area T.I.P. No. B-4000 Replacement of Bridge #45 on SR 1002 Alamance County, North Carolina

Date:	**Scale:**	**Project No.**	**Figure:**
2/25/03	1 in. = 2,000 ft.	011700019	1

discussion of Section 404/401 permit requirements and conceptual mitigation needs; 4) an assessment of rare and protected species habitat; 5) mapping of natural resource features, including plant communities, jurisdictional surface waters and wetlands, and potential habitat for federally protected species; and 6) an evaluation of potential impacts resulting from construction, as well as recommendations for measure which may minimize resource impacts.

These descriptions and estimates are based on the existing project study area. If the criteria change, additional field investigations may be necessary.

1.3 Methodology

Qualified biologists from KHA and Edwards-Pitman Environmental, Inc. conducted field investigations along the project study area during the month of January 2003. Pedestrian surveys were undertaken to determine natural resource conditions and to document natural communities, wildlife, and the presence of protected species or their habitats.

Published information regarding the project study area and region was derived from a number of sources including: USGS 7.5-minute topographical quadrangle map (Lake Burlington, North Carolina), United States Fish and Wildlife Service (USFW) database reviews, National Wetland Inventory (NWI) Map, NCDOT aerial photography (1" = 200'), and Natural Resources Conservation Service (NRCS) soil survey mapping of Alamance County.

Surface waters within the project study area were evaluated in the field to document their physical characteristics and jurisdictional status. The top of bank and/or centerline of streams, depending on channel widths, were surveyed and recorded in the field using Global Positioning Satellite (GPS) survey methods. Water resources information was obtained from publications of the North Carolina Department of Environment and Natural Resources Division of Water Quality (DENR-DWQ). Approximate boundaries of plant communities were mapped in the field utilizing aerial photography of the project study area. Dominant plant species were identified in each strata for each plant community. Plant community descriptions are based on the classifications utilized by Schafale and Weakly (1990). Plant names follow the nomenclature found in Radford *et al.* (1968).

Wildlife occurrences were determined through visual field observations, evaluation of habitat-types within the project study area, secondary indicators of species (tracks, scat, and burrows), as well as a review of supporting literature (Coe, 1994, Martof, *et al* 1980, and Webster, 1985). Field observations and literature reviews (Bogan, 2002, Jenkins and Burkhead, 1993) were utilized to assess aquatic life.

Information concerning the potential occurrence of federal and state protected species within the project study area and project vicinity was obtained from the U.S. Fish and Wildlife Service (USFWS) list of protected species (updated January 29, 2003) and the North Carolina Natural Heritage Program (NCNHP) database of rare species and unique habitats (updated July, 2002). Field evaluations of the project study area were conducted to identify suitable habitat for protected species. If suitable habitat was identified, field surveys were conducted for Federally listed endangered or threatened species if the field investigation corresponded to the appropriate survey season for the species.

Jurisdictional wetlands were identified and delineated based upon the methodology outlined in the *1987 Corps of Engineers Wetlands Delineation Manual* (Environmental Laboratory, 1987). Wetland systems were classified based upon the U.S. Fish and Wildlife Service *Classification of Wetlands and Deepwater Habitats of the United States* (Cowardin, et al., 1979). Wetland boundaries were located in the field using Global Positioning System (GPS) methods with sub-meter accuracy.

1.4 Qualifications of Principal Investigators

Investigator:	Andrew Kiley, Environmental Scientist
Education:	BS, Biology, University of Notre Dame du Lac
Experience:	Kimley-Horn and Associates, Inc. 2000 to present
	St. John's River Water Management District 1998 to 2000
Expertise:	Wetland/Stream Delineation, Geographic Information Systems, Stream Restoration

Investigator:	Rick Filer, Project Ecologist
Education:	BS, Biology, Kennesaw State University
Experience:	Edwards-Pitman Environmental, March 2001 to present
	Environmental Scientist, Environmental Aspecs of Georgia
	September 1999 to March 2001
Expertise:	Wetland/Stream Delineation, Permitting, Threatened and Endangered Species Surveys

2.0 Physical Resources

Alamance County is situated in the northwestern portion of the Piedmont physiographic province. The geography of the county consists predominantly of gently sloping uplands and broad, nearly level floodplains along most streams. The elevation of the project study area is approximately 550 feet (168 meters) above Mean Sea Level (MSL) as depicted on the Lake Burlington, North Carolina, USGS topographic quadrangle map (Figure 1). The land uses surrounding and within the project study area

are mainly agriculture and forestry with some residential development. An old gas station is located in the northwest quadrant of the SR 1002 and Lowder Road intersection.

2.1 Geology

The geologic features underlying the project study area are associated with the Carolina slate belt, specifically, metamorphosed granitic rock (late Proterozoic to Late Cambrian). The granitic rock is megacrystic, well foliated, and locally may contain hornblende, Vance county suite, and Buckhorn granite (North Carolina Geological Society, 1985).

2.2 Soils

Soil associations are classified as a group of defined and named taxonomic soil units occurring together in an individual and characteristic pattern over a general region. The soils within an association generally vary in depth, slope, stoniness, drainage, and other characteristics. Based on information contained in the soil survey data for Alamance County, the soils within the project study area are composed of two soil series and two unclassified soil groups.

Helena clay loam (HaC3) 6-10 % slopes

In many areas, this soil has lost most of its original surface soil and part of its subsoil through erosion. This association consists of moderately well-drained, strongly acidic soils found on the smooth uplands of the Piedmont Plateau. Helena clay loam soils are typically a gray to grayish brown clay loam. Surface runoff is rapid on bare and unprotected areas. The shrink-swell potential of the soil is moderate to high. The depth to bedrock is greater than 5 feet and the high water table is below 4 feet. The permeability of the subsoil is slow.

Helena coarse sandy loam (HbB and HbC) 2-10% slopes

This association consists of somewhat poorly and moderately well-drained, acidic soils found on smooth uplands or on side slopes and near the top of slopes. Helena coarse sandy loam soils are typically a dark grayish brown sandy loam at the surface. The subsoil is typically mottled brownish yellow and gray sandy clay. This soil has a friable, very permeable surface soil that has a low capacity to hold available water. The shrink-swell potential of the soil is moderate to high. The depth to bedrock is greater than 5 feet and the high water table is below 4 feet.

Wilkes soils, sloping phase (WbC and WbD2) 6-15 % slopes

This association consists of excessively drained, strongly acidic soils found on the steeper side of slopes. Wilkes soils are typically a gray or yellowish gray sandy loam with yellowish brown mottles found in the subsoil. This soil has a thinner surface soil due to loss through erosion The shrink-swell

potential of the soil is low and has a variable permeability rate. The depth to bedrock is 1 to 10 feet and the high water table is below 8 feet.

Mixed Alluvial land (Mc)

This land consists of material that has accumulated from the sediments washed down from the surrounding upland areas. This land occurs on bottoms that border meandering streams that have shallow banks. In many places, the whole area is comprised of a maze of old stream channels and natural levees. The land is poorly drained with a high organic content. Most alluvial areas do not have developed horizons but have various layers of sand, silt, and clay layers occurring at various depths. This land is typically flood-prone.

Local Alluvial land (Ld)

This land consists of material that has accumulated from the sediments washed down from the surrounding upland areas. The land is poorly drained with a high organic content. Most alluvial areas do not have developed horizons but have various layers of sand, silt, and clay layers occurring at various depths. This land is typically flood-prone. This well drained alluvial land consists of materials that sloughed or was washed down from the surrounding soils.

The NRCS defines a hydric soil as one that is saturated, flooded, or ponded long enough during the growing season to develop anaerobic conditions in the upper part of the soil. Such soils usually support hydrophytic vegetation. Based on information obtained from the Alamance County soil survey, Helena, Wilkes, and Local Alluvial land are not classified as hydric and do not contain hydric inclusions. Local Alluvial land may contain hydric inclusions due to landscape position.

2.3 Water Resources

Streams, creeks, and tributaries within the project vicinity are part of the Haw River watershed within the Cape Fear River Basin. The Cape Fear River basin is the largest river basin in the state covering 9,149 square miles in twenty-four counties. The Cape Fear River is formed by the confluence of the Deep and Haw Rivers.

Jordan Creek and an unnamed tributary of Jordan Creek represent the surface waters in the project study area. The project is located approximately one mile east of Lake Burlington. It is situated in NCDWQ Sub-basin 03-00-40 and the Hydrologic Unit Code (HUC) is 03030002. The project study area contains approximately 480 linear feet of Jordan Creek and approximately 600 linear feet of an unnamed tributary of Jordan Creek.

Jordan Creek is a perennial stream that flows north to south underneath the bridge proposed for replacement. The top of bank width is approximately 22 feet wide with a wetted width of 18 to 20 feet. One to three feet of moderately flowing water was observed within the channel during the site visit. Jordan Creek has a bankfull depth of 5.5 feet throughout the project study area. The 3 to 5 feet tall stream banks appeared stable. The substrate consisted of silt and sand. The water was clear with moderate sediment deposition. The stream received a DWQ stream classification of 54. DWQ stream classification forms are contained in Appendix B.

Based on Rosgen classification, Jordan Creek is an "F" channel. It is entrenched with a meandering, riffle/pool channel on a low gradient with a high width/depth ratio.

An unnamed tributary to Jordan Creek is located approximately 100 to 200 feet south of SR 1002 within the project study area. The moderately flowing tributary runs parallel to SR 1002 for approximately 600 feet, flowing east to west, discharging into Jordan Creek approximately 100 feet south of the existing bridge. The unnamed tributary to Jordan Creek appears to be a perennial stream. The top of bank width is approximately 8 feet wide with a wetted width of 1-foot. During the field review, 1 to 3 inches of water was observed in the channel. The stream has a bankfull depth of 2 feet throughout the project study area. The stream banks were deeply incised and unstable. The substrate consisted of silt and sand. The water was clear and had moderate sediment deposition. The tributary received a DWQ classification of 26.5. Although the water levels observed in the channel during the non-growing season (January) would indicate that the channel was likely intermittent, other primary field indicators observed such as the channels geomorphology and biological indicators are characteristic of a perennial stream. KHA will schedule a field verification with the U.S. Army Corps of Engineers (USACE) and the North Carolina Division of Water Quality (NCDWQ) to obtain a final jurisdictional determination for the tributary.

NCDWQ classifies surface waters of the state based on their intended best uses. Jordan Creek and its tributaries are classified as "WS-II NSW" waters. Class "WS-II" denotes waters protected as water supplies which are generally in predominantly undeveloped watersheds. The supplemental classification, Nutrient Sensitive Waters (NSW), denotes waters subject to growths of microscopic or macroscopic vegetation requiring limitations on nutrient inputs.

No High Quality Waters (HQW) or Outstanding Resource Waters (ORW) occur within the project vicinity. Jordan Creek and its tributaries are not listed on the DWQ 2000 Draft 303 (d) list of impaired waters.

Jordan Creek and it unnamed tributary are not classified as C-Tr (Trout) and Alamance County is not one of the 25 mountain counties designated by the North Carolina Wildlife Resource Commission (NCWRC) as containing Mountain Trout Waters (MTWs). Jordon Creek does not support trout or anadromous fish species and is not designated as essential fish habitat. Jordan Creek does support a diverse sunfish population and a moratorium on in-stream work will be requested by the NCWRC from April 1 to June 15 (2/19/03 memorandum from Shari Bryant ,NCWRC – Appendix E).

The Ambient Monitoring System (AMS) is a network of stream, lake, and estuarine water quality monitoring stations strategically located for the collection of physical and chemical water data. The type of water quality data or parameters collected is determined by the waterbodies' classification and corresponding water quality standards. The AMS determines the "use support" status of waterbodies, meaning how well a waterbody supports its designated uses. On July 6, 1998, macroinvertebrate data was collected from Jordan Creek. The site was rated as "good-fair".

2.3.1 Point and Non-point Source Discharges

Point source dischargers are permitted through the National Pollutant Discharge Elimination System (NPDES) program and are required to register for a permit. Based upon DWQ's database, there are no NPDES permit locations within one mile of the project study area.

Non-point source discharge refers to runoff that enters surface waters through stormwater, snowmelt or atmospheric deposition. Land use activities such as land development, construction, mining operations, crop production, animal feeding lots, failing septic systems, landfills, roads and parking lots are contributors of non-point source pollutants. The land uses surrounding and within the project study area are mainly agriculture and forestry with some residential development. An old gas station is located in the northwest quadrant of the SR 1002/Lowder Road intersection. Sediment is the most widespread cause of non-point source pollution in North Carolina. In agriculture, sediment and nutrients are major polluters. Land clearing and plowing disturbs soils to a degree where they are susceptible to erosion, which can lead to sedimentation in streams. Pesticides, chemical fertilizers, and land application of animal wastes can be transported via runoff to receiving streams and potentially elevate concentrations of toxic compounds and nutrients. Animal wastes can also be a source of bacterial contamination and elevate biochemical oxygen demand.

2.4 Physical Resources Impacts

The proposed project is expected to impact both soils and topography. The topography is gently sloping. The possible construction of a new bridge and/or road improvements is likely to require the

removal of soils and the placement of fill. No adverse long-term impacts to soils and topography are expected from the proposed bridge replacement.

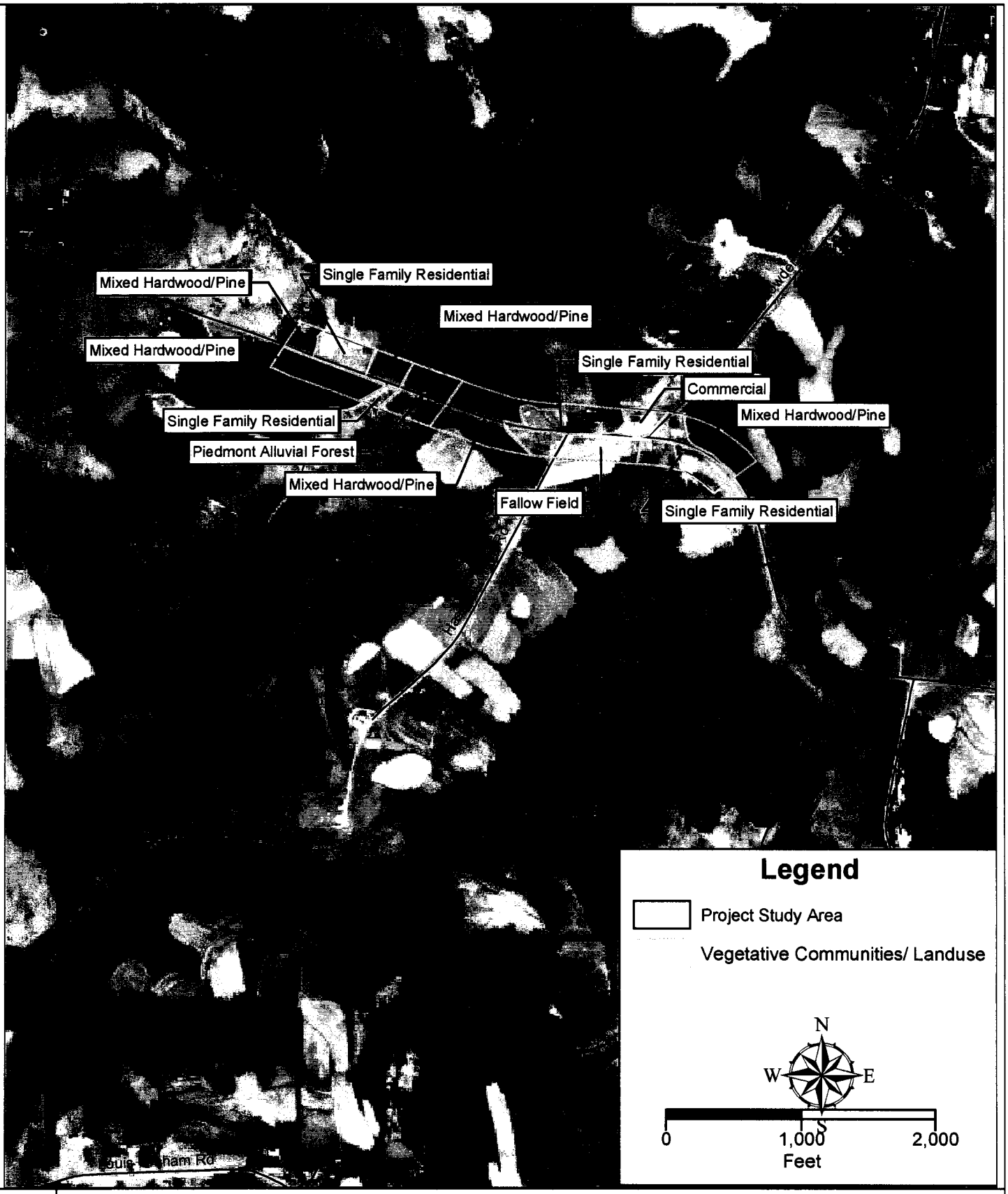
The primary sources of water-quality degradation in rural areas are nonpoint-source discharges and storm water runoff. Precautions should be taken to minimize impacts to water sources in the project vicinity. Aquatic organisms are very sensitive to discharges and inputs from construction. Appropriate measures must be taken to avoid petroleum spillage and control runoff. Potential impacts associated with construction of the proposed project include the following: increased sedimentation resulting from the clearing of streams and in-stream construction activities, soil compaction, loss of shading due to vegetation removal, and fertilizers and pesticides used in revegetation. Measures to minimize these potential impacts include formulation of an erosion and sedimentation control plan, provision for waste material and storage, stormwater management measures, and appropriate road-maintenance measures. NCDOT's Best Management Practices for Protection of Surface Waters (BMPs-PSW) and Sedimentation Control guidelines should be strictly enforced during the construction stages of the project. Limiting in-stream activities and revegetating stream banks immediately following the completion of grading can further reduce impacts. No adverse long-term impacts to water resources are expected to result from the proposed bridge replacement.

3.0 Biotic Resources

This section describes the existing vegetation and associated wildlife that occur within the project study area. The project study area is composed three different vegetative communities based on topography, soils, hydrology, and disturbance. These systems are interrelated and in many aspects interdependent. Potential impacts affecting these communities are also discussed. Scientific nomenclature and common name (when applicable) are provided for each plant and animal species listed. Subsequent references to the same organism only include the common name.

3.1 Plant Communities

Three plant communities were observed in the project study area: piedmont alluvial forest, mesic mixed hardwood/pine, and fallow field. Also, located within the project study area are maintained-disturbed areas that include the grassed shoulders on both sides of SR 1002, and single-family residential lawns. An overhead utility is located within the SR 1002 right-of-way. The plant communities are mapped on Figure 2 and are described in Table 1.



Title	Vegetative Communities and Landuse (1993 USGS Orthophoto)

Kimley-Horn and Associates, Inc.

Prepared For:

Project	Project Study Area T.I.P. No. B-4000 Replacement of Bridge #45 on SR 1002 Alamance County, North Carolina

Date:	Scale:	Project No.	Figure:
2/25/03	1 in. = 1,000 ft.	011700019	2

Table 1. Land Use within the Project Study Area.

Community Type	Acres (Hectares)	Percentage of Project Study Area
Piedmont Alluvial Forest	3.5 (1.4)	10%
Mesic Mixed Hardwood/Pine Forest	13.5 (5.5)	42%
Fallow Field	2.7 (1.1)	8%
Maintained-Disturbed Area	13.0 (5.3)	40%

3.1.1 Piedmont Alluvial Forest

The piedmont alluvial forest community is situated along the floodplain of the Jordan Creek. This alluvial forest can best be characterized as a variation of the Piedmont Alluvial Forest (Schafale and Weakly, 1990). Approximately 3.5 acres (1.4 hectares) of this community are located within the project study area comprising 10% of the plant communities within the project study area. The canopy was dominated by river birch (*Betula nigra*), sycamore (*Platanus occidentalis*), sweetgum (*Liquidambar styraciflua*), tulip poplar (*Liriodendron tulipifera*), red maple (*Acer rubrum*), and American elm (*Ulmus americana*). Understory trees, shrubs, vines, and herbs included musclewood (*Carpinus caroliniana*), box elder (*A. negundo*), black willow (*Salix nigra*), Chinese privet (*Ligustrum sinense*), greenbrier (*Smilax* spp.), poison ivy (*Toxicodendron radicans*), Japanese honeysuckle (*Lonicera japonica*), crossvine (*Anisostichus capreolata*), blackberry (*Rubus* spp.), river oats (*Chasmanthium latifolium*), wild onions (*Allium canadense*), and chickweed (*Stellaria media*).

3.1.2 Mesic Mixed Hardwood/Pine Forest

The mesic mixed hardwood/pine community is located on the upland slopes and ridges. Approximately 13.5 acres (5.5 hectares) of this community are located within the project study area comprising 42% of the plant communities within the project study area. This fragmented community was dominated by tulip poplar, white oak (*Quercus alba*), shortleaf pine (*Pinus echinata*), various oaks (*Q.* spp.), and eastern red cedar (*Juniperus virginiana*). Vines include crossvine and greenbrier. The forested floor contained scattered Christmas fern (*Polystichum acrostichoides*).

3.1.3 Fallow Field

The fallow field is located adjacent to the single-family residences. Approximately 2.7 acres (1.1 hectares) of this community are located within the project study area comprising 8% of the plant communities within the project study area. The field is dominated by little bluestem (*Schizachyrium scoparium*), broomsedge (*Andropogon virginicus*), fescue grass (*Festuca* spp.) and Bermuda grass (*Cynadon dactylon*).

3.1.4 Maintained-Disturbed Area

The maintained-disturbed areas are located on the grassed shoulders on both sides of SR 1002 and within the maintained residential lawns. An overhead utility is located within the SR 1002 right-of-way. Because of mowing and the use of herbicides, this community is kept in a constant state of early succession. The dominant species in this community are fescue and Bermuda grass with scattered oaks and ornamental shrubs. Approximately 13 acres (5.3 hectares) of this community are located within the project study area comprising 40% of the plant communities within the project study area.

3.2 Terrestrial Wildlife

The maintained roadside, overhead utility right-of-way, and fallow field provide rich ecotones for foraging, while the alluvial forest provides foraging and cover. White-tailed deer (*Odocoilieus virginianus*) and raccoon (*Procyon lotor*) tracks were observed along Jordan Creek. Rabbit scat was observed and evidence of past beaver foraging were observed within the alluvial forest community. The field survey was conducted on January 14, 2003 as repair work by NCDOT was being performed on the bridge over Jordan Creek. This repair work most likely frightened many wildlife species. Although sightings of wildlife accustomed to human activity was observed such as the American crow (*Corvus brachyrhynchos*), red-tailed hawk (*Buteo jamaicensis*), cardinal (*Cardinalis cardinalis*), and turkey vulture (*Cathartes aura*) was observed.

Common mammals, which could be expected to utilize the project study area habitat, includes the opossum (*Didelphis virginiana*), gray squirrel (*Sciurus carolinensis*), striped skunk (*Mephitis mephitis*), coyote (*Canis latrans*), red fox (*Vulpes vulpes*), gray fox (*Urocyon cinereoargenteus*) and various shrews, moles, bats, and mice.

Common birds, which could be expected to utilize the project study area habitat, includes the Carolina chickadee (*Parus carolinensis*), mockingbird (*Mimus polygottos*), wild turkey (*Meleagris gallopavo*), mourning dove (*Zenaida macroura*), field sparrow (*Spizella pusilla*), robin (*Turdus migratorius*), Carolina wren (*Thryothorus ludovicianus*), cardinal, and blue jay (*Cyanocitta cristata*).

Common reptiles and amphibians, which could be expected to utilize the project area habitat, includes eastern garter snake (*Thamnophis sirtalis sirtalis*), water snakes (*Nerodia* spp.), eastern box turtle (*Terrapene carolina*), five-lined skink (*Eumeces fasciathus*), toads (*Bufo* spp.), leopard frogs (*Rana* spp.), tree frogs (*Hyla* spp.), and salamanders (*Ambystoma* spp.).

3.3 Aquatic Habitats and Wildlife

Jordan Creek and its associated tributary provide aquatic habitat within the project study area. The physical characteristics (size and water quality) of the stream, as well as the adjacent terrestrial community, directly influence faunal composition of this aquatic community. The quality of aquatic habitat within the project study area is expected to be moderate due to agricultural run-off and the amount of sediment deposition. Woody debris located throughout the stream provides habitat, shade, and concealment pockets for several aquatic species. Aquatic invertebrates are a major component of aquatic ecosystems, as primary and secondary consumers, as well as prey items for organisms higher in the food chain.

Insects typically found in this type of community include Mayflies (Ephemeroptera), stoneflies (Plecoptera), caddisflies (Tricoptera), dragonflies (*Odonta* sp.), aquatic beetles (Coleoptera), mosquito larvae (*Culicidae* sp.) and midges (*Chironomidae* sp.). Caddisflies were observed in Jordan Creek and its associated tributary. Crayfish (*Decapoda)* chimneys were observed in Jordan Creek.

Fishery data was collected for Jordan Creek by NCDWQ in November 1993 and by the N.C. State Museum of Natural Sciences in August 2001. Fish species collected within the project vicinity include gizzard shad (*Dorosoma cepedianum*), highfin shiner (*Notropis altipinnis*), bluehead chub (*Nocomis leptocephalus*), coastal shiner (*N. petersoni)*, creek chub (*Semotilus atromaculatus*), creek chubsucker (*Erimyzon oblongus*), yellow bullhead (*Ameiurus natalis*), speckled killifish (*Fundulus rathbuni*), flier (*Centrarchus macropterus*), redbreast sunfish (*Lepomis auritus*), green sunfish (*L. cyanellus*), pumpkinseed (*L. gibbosus*), warmouth (*L. gulosus*), bluegill (*L. macrochirus*), redear sunfish (*L. microlophus*), largemouth bass (*Micropterus salmoides*), tessellated darter (*Etheostoma olmstedi*), crescent shiner (*Luxilus cerasinus*), golden shiner (*Notemigonus crysoleucas*), shallowtail shiner (*N. procne*), rosyside dace (*Clinostomus funduloides*), and notchlip redhorse (*Moxostoma collapsum*).

Freshwater mussels that may occur include spike (*Elliptio* spp.), Carolina lance (*E.angustata)*, Carolina slabshell (*E.congaraea)* and pondhorn (*Uniomerus* sp.). Other species likely to be found include snapping turtle (*Chelydra serpentina*), Eastern mud turtle (*Kinosternon subrubrum*), sliders (*Chrysemys scripta*), and painted turtles (*Chrysemys picta*).

3.4 Biotic Resource Impacts

Design alternatives have yet to be identified for this project, therefore, no estimated area of impact to these natural communities has been calculated at this time. Table 1 describes the acreage of plant communities within the project study area; however, actual impact acreage within the construction

limits will be less. Impacts to plant communities associated with construction activities include the removal of vegetation, soil compaction, damaging and/or exposing root systems, as well as potential impacts associated with petroleum spills.

Due to the minimal disturbance of plant communities anticipated as a result of the bridge replacement, significant impacts to terrestrial wildlife populations are not expected.

Loss of wildlife is an unavoidable aspect of development. Temporary fluctuations in populations of animal species that 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. Competitive forces in the adapted communities will result in a redefinition of population equilibria.

Aquatic organisms are acutely sensitive to changes in their environment and environmental impacts from construction activities may result in long term or irreversible effects. Impacts usually associated with in-stream construction activities include alterations to the substrate and impacts adjacent streamside vegetation. Such disturbance 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 obtain oxygen.

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, 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.

4.0 Waters of the United States

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 principle 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.

Wetlands, streams, and open waters are regulated by the USACE pursuant to Section 404 of the Clean Water Act. The North Carolina DENR-DWQ also has regulatory input through Section 401 Water Quality Certification. 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 fall under the jurisdictional of the USACE under Section 404 of the Clean Water Act (33 USC 1344).

4.1 Surface Waters

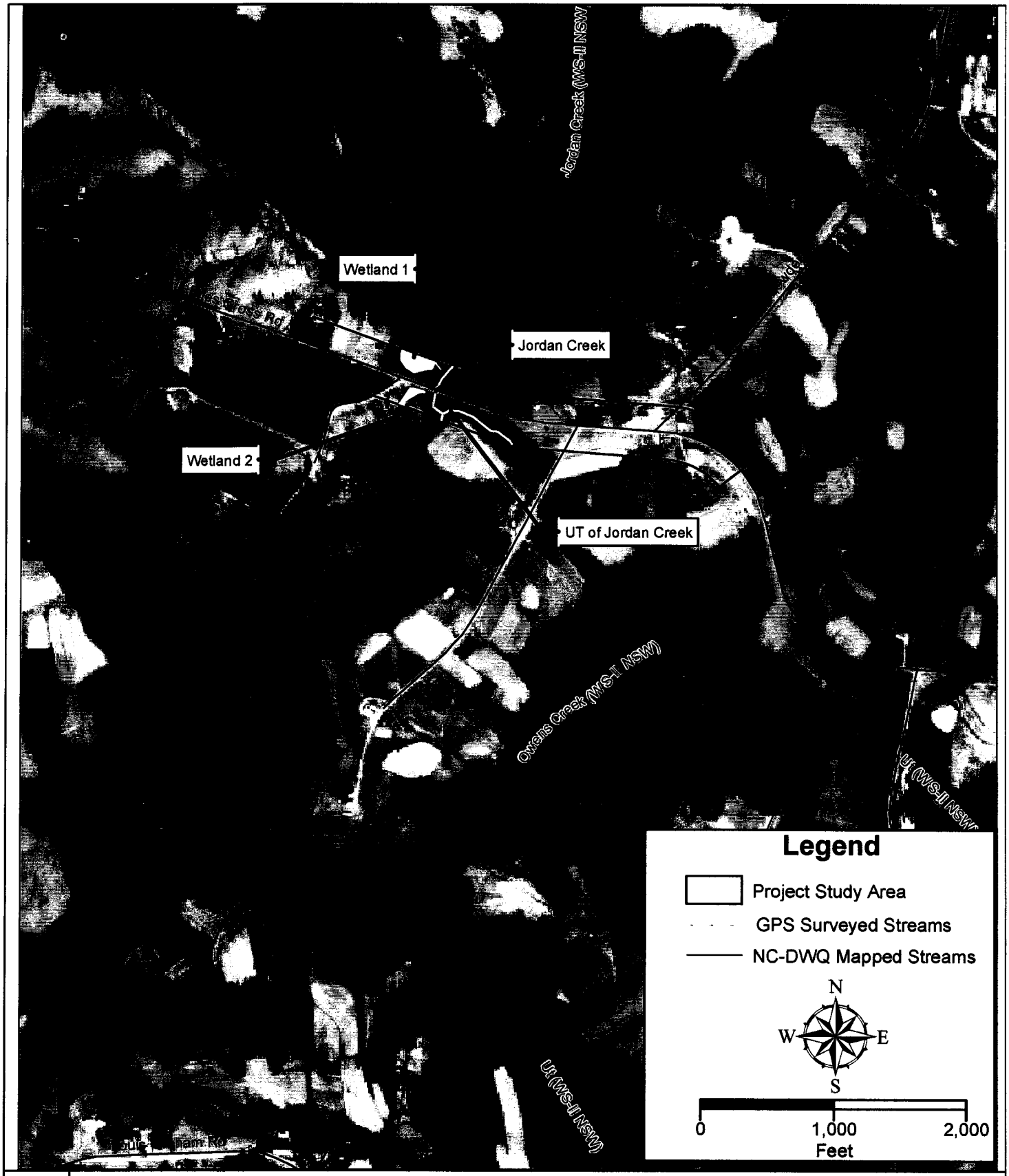
The DWQ defines a perennial stream as a clearly defined channel that contains water for the majority of the year. These channels usually have some or all of the following characteristics: distinctive streambed and bank, aquatic life, and groundwater flow or discharge. Jordan Creek and its associated tributary were identified as perennial streams in the project study area. Detailed stream characteristics, including specific water-quality designations, are present in Section 2.3 Water Resources. DWQ stream classification forms are contained in Appendix B.

4.2 Jurisdictional Wetlands

The project study area was surveyed for jurisdictional wetlands in accordance with guidelines for wetland definition as given in the *1987 Corps of Engineers Wetlands Delineation Manual.* This approach incorporates three criteria in delineating wetlands: (1) the presence of hydrophytic vegetation, (2) the presence of hydric soils, and (3) evidence of wetland hydrology. All three criteria must be present in a given location for an area to be considered a jurisdictional wetland.

Two jurisdictional wetlands were associated with the project study area within the piedmont alluvial forest community. Wetland 1 was located north of SR 1002 and west of Jordan Creek. Wetland 2 was located south of SR 1002 and east of Jordan Creek. The boundaries of each of these wetland locations were identified in the field and located using GPS. The location of the wetlands is shown in Figure 3.

Wetland 1 is a forested wetland dominated by sweetgum, American elm, tulip poplar, red maple, and sycamore with an open understory of scattered Chinese privet, Japanese honeysuckle, and greenbrier. Drainage patterns and manmade ditches were present. Based on the Cowardin classification, the wetland is a Palustrine Forested Broad Leave Deciduous (PFO1). USACE data forms are contained in Appendix C.



Title	Jurisdictional Wetlands and Streams within Project Study Area (1993 USGS Orthophoto)

Kimley-Horn and Associates, Inc.

Prepared For:

Project	Project Study Area T.I.P. No. B-4000 Replacement of Bridge #45 on SR 1002 Alamance County, North Carolina

Date:	Scale:	Project No.	Figure:
2/26/03	1 in. = 1,000 ft.	011700019	3

Wetland 2 is dominated by red maple, sweetgum, riverbirch, willow oak, and sycamore. Near the roadside, this wetland system was part of the maintained right-of-way associated with overhead utilities and was dominated by rush (*Juncus* sp.). Based on the Cowardin classification, the wetland dominated by trees is classified as a PFO1 and the portion within the utility right-of-way is classified as a Palustrine Emergent Marsh Persistent (PEM1). USACE data forms are contained in Appendix C.

4.3 Wetland Functional Assessment

Wetland values for each area within the project study area were evaluated using the Fourth Version of the *Guidance for Rating the Values of Wetlands in North Carolina.* This procedure rates wetlands according to six functional parameters: water storage, bank/shoreline stabilization, pollutant removal, wildlife habitat, aquatic life value, and recreational/educational value. Each parameter is numerically weighted to assess the water quality functions that the wetland system performs.

Wetland 1 received a numerical ranking of 16 and is considered a low quality wetland. Wetland 2 received a numerical ranking of 26 and is considered a low quality wetland. The Wetland Ranking scores for each wetland is listed in Appendix D.

4.4 Impacts to Waters of the United States

Since no alternatives have been selected, specific impacts to "Waters of the United States" cannot by determined. However, some impacts to Jordan Creek and its tributary, Wetland 1, and Wetland 2 could be anticipated for the proposed project. Table 2 describes the acreage of the wetlands and linear footage of the streams located within the project study area; however, actual impacts within the construction limits will be less.

Table 2. Jurisdictional Wetlands and Streams within the Project Study Area.

Jurisdictional Wetland/Stream	Potential Impact Amount
Wetland 1	0.75 Acres (0.3 hectare)
Wetland 2	0.30 Acres (0.1 hectare)
Jordan Creek	480 Linear feet (146 meters)
UT Jordan Creek	600 Linear feet (183 meters)

4.5 Permit Requirements

Impacts to "Waters of the United States" come under the jurisdiction of the USACE. Permits will be required for highway encroachment into jurisdictional wetlands and streams. The Nationwide Permit

#23 (Approved Categorical Exclusions) should cover the impacts to jurisdictional wetlands and streams in the project study area. Nationwide Permit No. 33 (Temporary Construction, Access, and Dewatering) may be needed for temporary construction access if that is not addressed in the NEPA document. A final permitting strategy cannot be developed until a design alternative is selected.

A Section 401 General Water Quality Certification is also required for any activity which may result in a discharge into "Waters of the United States" or for which an issuance of a federal permit is required. The issuance of a required Section 401 certification is a prerequisite to the issuance of a Section 404 permit. Section 401 General Water Quality Certifications for NWP #23 and #33 are No. 3361 and 3366, respectively. However, written concurrence from the N.C. Division of Water Quality (DWQ) is not required provided all standard conditions of these Certifications are met.

Final determination of permit applicability lies with USACE. NCDOT will coordinate with the USACE after the completion of final design to obtain the necessary permits.

4.6 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 project 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: avoidance of impacts (to wetlands), minimizing impacts, rectifying impacts, reducing impacts over time, and compensating for impacts (40 CFR 1508.20). Each of these aspects (avoidance, minimization, and compensatory mitigation) must be considered in sequential order.

Avoidance mitigation examines all appropriate and practicable possibilities of averting impacts to "Waters of the United States". According to a 1990 Memorandum of Agreement (MOE) between the U.S. Environmental Protection Agency (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. Some unavoidable impacts to wetlands and surface waters may result from project construction.

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 (BMP's) to control sedimentation during project construction.
2. Clearing and grubbing activity should be minimized.
3. Reestablishment of vegetation on exposed areas with judicious pesticides and herbicide management.
4. Minimization of "in-stream" activity.
5. Minimization of roadway footprint width.
6. Bridge lengthening in environmentally sensitive areas.

Compensatory mitigation is not normally considered until anticipated impacts to "Waters of 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 that 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 actions should be undertaken in areas adjacent to or contiguous to the discharge site.

In accordance with 15A NCAC 2H.0506 (h) and 40 CFR 1508.20, mitigation will be required for impacts to jurisdictional streams requiring mitigation when these impacts are equal to or greater than 150 linear feet per stream. Although the bridge replacement over Jordan Creek will likely impact less than 150 linear feet of stream, parallel encroachments to the unnamed tributary of Jordan Creek could exceed the 150 linear foot threshold and require mitigation (pending the jurisdictional determination by the USACE and DWQ). In addition, mitigation may be required for wetland impacts exceeding 0.10 acre. At this time, no design alternatives have been selected; however, once alternative and right-of-way widths are established, specific impact calculations for wetlands and streams can be determined and mitigation requirement can be further evaluated.

4.7 Bridge Demolition into Waters of the United States

The demolition and removal of bridge No. 45 may involve dropping components of the bridge into Jordan Creek as the only practical means of removal. According to Section 402-2 of NCDOT's Standard Specifications for Roads and Structures, the chapter titled "Removal of Existing Structures" outlines restrictions and Best Management Practices for Bridge Demolition and Removal.

All spans over Jordan Creek may be considered potential fill except for structures that are all steel and timber. The superstructure is timber deck on I-beams with steel channels and timber joints. The substructure is mass concrete with steel caps. It is not known at this time if the superstructure and substructure of bridge No. 45 are to be removed. Removal of the superstructure and substructure may cause a fill.

4.8 Buffer Rules

Currently, the only buffer regulations in the Cape Fear River Basin apply to the Randleman Reservoir (15A NCAC 2B .0250 – Randleman Rules and Water Supply Buffer Requirements). Jordan Creek is not located within the Randleman Reservoir watershed, therefore, no buffer rules apply for the proposed project.

5.0 Rare and Protected Species

Federal law under the provisions of Section 7 of the Endangered Species Act (ESA) of 1973, as amended, requires that any action likely to adversely affect a federally-protected species be subject to review by the U.S. Fish and Wildlife Service. Other species may warrant protection under separate state laws.

5.1 Federally-Protected Species

Plants and animals with federal classifications of Endangered (E), Threatened (T), Proposed Endangered (PE), and Proposed Threatened (PT) are protected under provisions of Section 7 and Section 9 of the ESA. According to the January 29, 2003 USFWS internet listing, no federally endangered or threatened species are listed for Alamance County.

"Critical habitat," as defined in the Endangered Species Act (ESA), is a term for habitat given special protection for the benefit of a listed species. Critical habitat, as defined by the USFWS, is not designated for any species listed in Alamance County, North Carolina. In addition, according to North Carolina's Natural Heritage Program (NCNHP's) database, no federally threatened, endangered, or species of concern listed by the USFWS have been documented within a 1-mile radius of the proposed project corridor.

5.2 Federal Species of Concern

There are five federal species of concern listed by the USFWS for Alamance County. Federal species of concern (FSC) are not afforded federal protection under the ESA and are not subject to any of its provisions, including Section 7, until they are formally proposed or listed as Threatened or Endangered. Federal species of concern are defined as species under consideration for listing for

which there is insufficient information to support listing as threatened or endangered. The status of these species may be upgraded at any time, thus they are included here for consideration.

In addition, species which are listed as Endangered (E), Threatened (T), or Special Concern (SC) by the NCNHP list of Rare Plant and Animal Species are afforded state protection under the NC State Endangered Species Act and the NC Plant Protection and Conservation Act of 1979. The NCNHP list of July 2002 included these species and identified an additional 9 species receiving protection under state law. Protections afforded to species listed under state law are not applicable to this project. However, federal protection status for these species may be upgraded in the future. Therefore, consideration should be given to potential occurrences within the project study area. Table 3 lists the federal species of concern, their state status, and the existence of suitable habitat within the project study area.

Table 3. Federal Species of Concern Listed for Alamance County, North Carolina.

Scientific Name	Common Name	Federal Status	State Status	Habitat Requirements	Habitat Available
Monotropsis odorata	Sweet pinesap	FSC*	SR-T	Mixed deciduous woods	Yes
Etheostoma collis lepidinion	Carolina darter	FSC	N/L	Rivulets and creeks with infrequent short riffles	Yes
Moxostoma sp.	Carolina redhorse	FSC	N/L	Riverine habitat	No
Lampsilis cariosa	Yellow lampmussel	FSC	E	Medium to large rivers with substrates that range from silt to cobble	No
Villosa vaughaniana	Carolina creekshell	FSC	E	Silty sand or clay along the banks of small streams	Yes
Phacelia covillei	Buttercup phacelia	FSC	SR-T	Bottomlands, rich lower slopes	Yes

Note: FSC – Federal Species of Concern; E-Endangered; T-Threatened; SR-Significantly Rare Throughout Range; N/L – No Listing; * denotes Historic Record-species last observed in county more than 20 years ago

Field assessments were conducted for potential habitat by biologists with KHA and EPEI in January 2003. The assessment included an evaluation of constraints to the presence of listed species within the proposed project study area. Descriptions of these species and their habitat are discussed below.

Sweet pinesap

Sweet pinesap is a yellow, tawny, pinkinsh or red colored plant. The stems are glabrous with leaves that are sessile, bract-like, widely lanceolate with a tapered to acute or obtuse apex. The flowers are in bracteate racemes with pedicels in a pair of bracteoles. The species is known to occur in dry forests and bluffs in the Piedmont and Mountain physiographic regions of the state. The plant flowers in April and is usually identified by its odor, a sweet spicy smell, since it flowers under rotten logs and leaves. Mixed deciduous woods were observed within the project study area along the floodplain of Jordan Creek.

Carolina Darter

There are three allopatric taxa that compose the *collis* group of the Carolinas and Virginia. *E. collis lepidinion* is known to occur in the Roanoke, Neuse, and Cape Fear drainages. Little is known on the biology of the Carolina darter in nature. Its habitat includes hilly regions on the lower and middle Piedmont. It occupies rivulets and creeks with infrequent short riffles in wooded and pasture areas. Juveniles and adults reside in pools and very slow runs, usually occurring on sand, gravel, or detritus in open and stick-littered areas. Potential habitat exists within the project study area.

Carolina Redhorse

The Carolina redhorse is a large catostomid that is found in mainstream riverine habitats. Historically, it occurred in the southeastern Atlantic slope river drainages, from the Altamaha in Georgia to the Pee Dee River in North and South Carolina. The Carolina redhorse is vulnerable to catastrophic accidents and general habitat degradation. Water pollution and transportation accidents that result in spills of hazardous chemicals could result in major fish kills. In addition, increased siltation that results from construction projects could eliminate clean gravel substrates, which are used by the Carolina redhorse for spawning. The elimination of these spawning habitats will greatly reduce the recruitment of new generations of this species. Jordan Creek is not a mainstream riverine habitat.

Yellow Lampshell

The yellow lampshell is a medium sized mussel that reaches 120 mm in length. Male shells are elliptical and somewhat elongate, and female shells are subovate with a bluntly rounded posterior margin. The shells of this species often have a tinge of green with a waxy yellow periostracum and a bluish-white nacre tinged with cream or salmon. The yellow lampshell is found in medium to large

rivers with substrates that range from silt to cobble. The historic range of the yellow lampshell extends from the Ogeechee River Basin, Georgia, north to Nova Scotia, and westward to the St. Lawrence River Basin. In North Carolina, this species is known to occur in the Pee Dee, Waccamaw, Cape Fear, Neuse, and Pamlico basins. Marginal habitat for this species exists within the project study area.

Carolina Creekshell

The Carolina creekshell is a small sized sexually dimorphic mussel that can reach approximately 60 mm in length. The somewhat inflated shells are elliptical in males and obovate to trapezoidal in females. The shells are dark brownish yellow with numerous dark green rays, and a shiny, white or bluish-white nacre. The Carolina creekshell is usually found in silty sand or clay along the banks of small streams and have also been found occupying substrates of mixed sand and gravel. In North Carolina, this species is known to occur in the Catawba, Pee Dee, Cape Fear river basins. Potential habitat exists within the project study area.

Buttercup phacelia

Buttercup phacelia is an annual spreading or decumbent herb with bristly hairs with three-parted leaves. The species is known to occur in rich soils on floodplains and contiguous terraces and slopes in central North Carolina. The plant flowers in April with tubular bell shaped pale blue or lavender flowers. Rich soils with contiguous terraces and slopes were observed within the project study area along the floodplain of Jordan Creek.

6.0 Conclusions

The project study area contains approximately 480 linear feet of Jordan Creek and approximately 600 linear feet of an unnamed tributary of Jordan Creek. Jordan Creek and its tributaries are classified as "WS-II NSW" waters. No High Quality Waters (HQW), or Outstanding Resource Waters (ORW) occur within the project vicinity. Jordan Creek and its tributaries are not listed on the DWQ 2000 Draft 303 (d) list of impaired waters. No buffer rules exist at this time for Jordan Creek and its associated tributaries.

Jordan Creek does not support trout or anadromous fish species and is not designated as essential fish habitat. According to the North Carolina Wildlife Resources Commission, Jordan Creek does support a diverse sunfish population and a warm water fish moratorium will be requested on in-stream work from April 1 to June 15.

Two jurisdictional wetlands are located in the project study area in two of the four quadrants around the bridge. Wetland impacts could exceed 0.10 acre and may require mitigation. An unnamed

tributary to Jordan Creek is located approximately 100 to 200 feet south of SR 1002 within the project study area. The tributary parallels SR 1002 for approximately 600 linear feet before discharging into Jordan Creek approximately 100 feet south of the existing bridge. If stream impacts exceed 150 linear feet, mitigation will be required. No federally endangered or threatened species are listed for Alamance County.

7.0 References

Bogan, A.E. 2002. Workbook and key to the freshwater bivalves of North Carolina. North Carolina Museum of Natural Sciences, Raleigh, NC 101 pp, 10 color plates.

Brown, Kirkman 1990, 1993, 1996. Trees of Georgia and Adjacent States. Timber Press, Portland Oregon. 292 pp, 80 color plates.

Coe, James. 1994. A Guide to Field Identification of North American Species of Eastern Birds. Golden Press, New York.

Cowardin, L.M., V.Carter, F.C. Golet and E.T. LaRoe, 1979. Classification of Wetlands and Deepwater Habitat of the United States. Fish and Wildlife Service, U.S. Department of the Interior.

Department of Natural Resources and Community Development. 1985. Geologic Map of North Carolina. 1:500,000 scale. Compiled by the North Carolina Geological Survey.

Godfrey, Wooten. 1981. Aquatic and Wetland Plants of Southeastern United States Dicotyledons. University of Georgia Press, Athens Georgia. 933 pp.

Godfrey, Wooten. 1981. Aquatic and Wetland Plants of Southeastern United States Monocotyledons. University of Georgia Press, Athens Georgia. 712 pp.

Jenkins, R.E., and N.M. Burkhead. 1993. Freshwater fishes of Virginia. American Fisheries Society, Bethesda, Maryland. 1079 pp, 40 color plates

Martof, Bernard S., William M. Palmer, Joseph R. Bailey and Julian R. Harrison, III 1980. Amphibians and Reptiles of the Carolinas and Virginia. The University of North Carolina Press, Chapel Hill.

North Carolina Department of Agriculture. 1990. Plant Conservation Program List of North Carolina's Endangered, Threatened and Candidate Plant Species. Raleigh, North Carolina.

North Carolina Department of Environment, Health and Natural Resources - Division of Water Quality. 2000. Cape Fear Basinwide Water Quality Plan. Raleigh, North Carolina.

North Carolina Department of the Environment and Natural Resources – Division of Water Quality. (2000). Stream Classifications by Hydrologic Unit. http://h20.enr.state.nc.us/strmclass/

North Carolina Natural Heritage Program. (2000). List of Rare Plant and Animal Species in North Carolina. http://www.ncparks.net/nhp/

Protected Animals of Georgia 1999. Georgia Department of Natural Resources, Wildlife Resource Division, and Nongame Wildlife-Natural Heritage Section.

Radford, Ahles, Bell. 1968. Manual of the Vascular Flora of the Carolinas. The University of North Carolina Press, Chapel Hill. 1155 pp.

U.S. Army Corps of Engineers. 1987. Corps of Engineers Wetlands Delineation Manual. Technical Report Y-87-1. Environmental Laboratory, Vicksburg, Mississippi.

United States Department of Agriculture. 1970. Soil Survey of Alamance County. U.S. Department of Agriculture Press.

United States Department of Agriculture. 1991. Hydric Soils of the United States. U.S. Department of Agriculture Press.

United States Fish and Wildlife Service. 1995. National Wetlands Inventory Map – Lake Burlington Quadrangle. U.S. Government Printing Office, Washington, DC.

United States Fish and Wildlife Service. (2000). Species Accounts. http://endangered.fws.gov/wildlife.html

United States Geologic Survey. (1991). Topographic Map – Lake Burlington Quadrangle. U.S. Government Printing Office, Washington, DC.

Webster, W.D., J.F. Parnell and W.C. Biggs. 1985. Mammals of the Carolinas, Virginia and Maryland. The University of Chapel Hill Press, Chapel Hill.

Appendix A

Site Photographs

Kimley-Horn
and Associates, Inc.

Project: Alamance B-4000

Client: North Carolina Department of Transportation

Prepared by: DNW

Project Number: 011700019

Photo 1: Looking upstream of Jordan Creek toward bridge no. 45.

Photo 2: Looking upstream of UT of Jordan Creek.

Photo 3: Looking west from Jordan Creek upstream of bridge no. 45.

Photo 4: Looking west at Jordan Creek downstream of bridge no. 45

Appendix B

DWQ Stream Classification Forms

NCDWQ Stream Classification Form

Project Name: B-4000 | River Basin: Cape Fear | County: Alamance | Evaluator: DNW

DWQ Project Number: | Nearest Named Stream: Jordan Creek | Latitude: 36°12' 18"N | Signature: DNW

Date: 02/04/03 | USGS QUAD: Lake Burlington, NC | Longitude: 79°23'03"W | Location/Directions: Intersection of Jordan Creek/ Jeffries Cross Road

*PLEASE NOTE: *If evaluator and landowner agree that the feature is a man-made ditch, then use of this form is not necessary. Also, if in the best professional judgement of the evaluator, the feature is a man-made ditch and not a modified natural stream—this rating system should not be used**

Primary Field Indicators: *(Circle One Number Per Line)*

I. Geomorphology	Absent	Weak	Moderate	Strong
1) Is There A Riffle-Pool Sequence?	0	(1)	2	3
2) Is The USDA Texture In Streambed Different From Surrounding Terrain?	0	1	(2)	3
3) Are Natural Levees Present?	(0)	1	2	3
4) Is The Channel Sinuous?	0	1	(2)	3
5) Is There An Active (Or Relic) Floodplain Present?	0	(1)	2	3
6) Is The Channel Braided?	(0)	1	2	3
7) Are Recent Alluvial Deposits Present?	0	(1)	2	3
8) Is There A Bankfull Bench Present?	0	(1)	2	3
9) Is A Continuous Bed & Bank Present?	0	1	(2)	3
*(*NOTE: If Bed & Bank Caused By Ditching And WITHOUT Sinuosity Then Score=0*)*				
10) Is A 2nd Order Or Greater Channel (As Indicated On Topo Map *And/Or* In Field) Present?	*Yes*=3		*No*=(0)	

PRIMARY GEOMORPHOLOGY INDICATOR POINTS: 10

II. Hydrology	Absent	Weak	Moderate	Strong
1) Is There A Groundwater Flow/Discharge Present?	0	(1)	2	3

PRIMARY HYDROLOGY INDICATOR POINTS: 1

III. Biology	Absent	Weak	Moderate	Strong
1) Are Fibrous Roots Present In Streambed?	(3)	2	1	0
2) Are Rooted Plants Present In Streambed?	(3)	2	1	0
3) Is Periphyton Present?	(0)	1	2	3
4) Are Bivalves Present?	(0)	1	2	3

PRIMARY BIOLOGY INDICATOR POINTS: 6

Secondary Field Indicators: *(Circle One Number Per Line)*

I. Geomorphology	Absent	Weak	Moderate	Strong
1) Is There A Head Cut Present In Channel?	0	.5	1	(1.5)
2) Is There A Grade Control Point In Channel?	0	.5	1	(1.5)
3) Does Topography Indicate A Natural Drainage Way?	0	.5	(1)	1.5

SECONDARY GEOMORPHOLOGY INDICATOR POINTS: 4

II. Hydrology	Absent	Weak	Moderate	Strong
1) Is This Year's (Or Last's) Leaflitter Present In Streambed?	1.5	1	(.5)	0
2) Is Sediment On Plants (Or Debris) Present?	0	.5	(1)	1.5
3) Are Wrack Lines Present?	0	(.5)	1	1.5
4) Is Water In Channel *And* >48 Hrs. Since Last *Known* Rain? *(*NOTE: If Ditch Indicated In #9 Above Skip This Step And #5 Below*)*	0	.5	(1)	1.5
5) Is There Water In Channel During Dry Conditions *Or* In Growing Season)?	(0)	.5	1	1.5
6) Are Hydric Soils Present In Sides Of Channel (Or In Headcut)?	*Yes*=(1.5)		*No*=0	

SECONDARY HYDROLOGY INDICATOR POINTS: 4.5

III. Biology	Absent	Weak	Moderate	Strong
1) Are Fish Present?	(0)	.5	1	1.5
2) Are Amphibians Present?	(0)	.5	1	1.5
3) Are AquaticTurtles Present?	(0)	.5	1	1.5
4) Are Crayfish Present?	(0)	.5	1	1.5
5) Are Macrobenthos Present?	0	(.5)	1	1.5
6) Are Iron Oxidizing Bacteria/Fungus Present?	0	(.5)	1	1.5
7) Is Filamentous Algae Present?	(0)	.5	1	1.5

8) Are Wetland Plants In Streambed?	SAV	Mostly OBL	Mostly FACW	Mostly FAC	Mostly FACU	Mostly UPL
(NOTE: If Total Absence Of All Plants In Streambed As Noted Above Skip This Step UNLESS SAV Present*).*	2	1	.75	.5	0	0

SECONDARY BIOLOGY INDICATOR POINTS: 1

TOTAL POINTS (*Primary + Secondary*)= 26.5 *(If Greater Than Or Equal To 19 Points The Stream Is At Least Intermittent)*

NCDWQ Stream Classification Form

Project Name: B-4000 | River Basin: Cape Fear | County: Alamance | Evaluator: DPW

DWQ Project Number: Jordan Creek | Nearest Named Stream: Jordan Creek | Latitude: 36°12'18.66"N | Signature:

Date: 02/04/02 | USGS QUAD: Lake Burlington, NC | Longitude: 79°23'0.03"W | Location/Directions: Intersection of Jordan Creek with Jefferies Cross Road

***PLEASE NOTE:** *If evaluator and landowner agree that the feature is a man-made ditch, then use of this form is not necessary. Also, if in the best professional judgement of the evaluator, the feature is a man-made ditch and not a modified natural stream—this rating system should not be used**

Primary Field Indicators: *(Circle One Number Per Line)*

I. Geomorphology	Absent	Weak	Moderate	Strong
1) Is There A Riffle-Pool Sequence?	0	1	2	(3)
2) Is The USDA Texture In Streambed Different From Surrounding Terrain?	0	1	2	(3)
3) Are Natural Levees Present?	0	1	2	(3)
4) Is The Channel Sinuous?	0	1	2	(3)
5) Is There An Active (Or Relic) Floodplain Present?	0	1	2	(3)
6) Is The Channel Braided?	0	(1)	2	3
7) Are Recent Alluvial Deposits Present?	0	1	2	(3)
8) Is There A Bankfull Bench Present?	0	1	2	(3)
9) Is A Continuous Bed & Bank Present? *(*NOTE: If Bed & Bank Caused By Ditching And WITHOUT Sinuosity Then Score=0*)*	0	1	2	(3)
10) Is A 2nd Order Or Greater Channel (As Indicated On Topo Map *And/Or* In Field) Present?	*Yes=(3)*		*No=0*	

PRIMARY GEOMORPHOLOGY INDICATOR POINTS: 28

II. Hydrology	Absent	Weak	Moderate	Strong
1) Is There A Groundwater Flow/Discharge Present?	0	1	2	(3)

PRIMARY HYDROLOGY INDICATOR POINTS: 3

III. Biology	Absent	Weak	Moderate	Strong
1) Are Fibrous Roots Present In Streambed?	(3)	2	1	0
2) Are Rooted Plants Present In Streambed?	(3)	2	1	0
3) Is Periphyton Present?	0	(1)	2	3
4) Are Bivalves Present?	(0)	1	2	3

PRIMARY BIOLOGY INDICATOR POINTS: 7

Secondary Field Indicators: *(Circle One Number Per Line)*

I. Geomorphology	Absent	Weak	Moderate	Strong
1) Is There A Head Cut Present In Channel?	(0)	.5	1	1.5
2) Is There A Grade Control Point In Channel?	(0)	.5	1	1.5
3) Does Topography Indicate A Natural Drainage Way?	0	.5	1	(1.5)

SECONDARY GEOMORPHOLOGY INDICATOR POINTS: 1.5

II. Hydrology	Absent	Weak	Moderate	Strong
1) Is This Year's (Or Last's) Leaflitter Present In Streambed?	(1.5)	1	.5	0
2) Is Sediment On Plants (Or Debris) Present?	0	.5	1	(1.5)
3) Are Wrack Lines Present?	0	.5	(1)	1.5
4) Is Water In Channel *And* >48 Hrs. Since Last *Known* Rain? *(*NOTE: If Ditch Indicated In #9 Above Skip This Step And #5 Below*)*	0	.5	1	(1.5)
5) Is There Water In Channel During Dry Conditions *Or* In Growing Season)?	0	.5	1	(1.5)
6) Are Hydric Soils Present In Sides Of Channel (Or In Headcut)?	*Yes=(1.5)*		*No=0*	

SECONDARY HYDROLOGY INDICATOR POINTS: 8.5

III. Biology	Absent	Weak	Moderate	Strong
1) Are Fish Present?	0	.5	1	(1.5)
2) Are Amphibians Present?	(0)	.5	1	1.5
3) Are AquaticTurtles Present?	(0)	.5	1	1.5
4) Are Crayfish Present?	0	.5	(1)	1.5
5) Are Macrobenthos Present?	0	.5	(1)	1.5
6) Are Iron Oxidizing Bacteria/Fungus Present?	0	.5	(0)	1.5
7) Is Filamentous Algae Present?	0	.5	1	(1.5)

8) Are Wetland Plants In Streambed? *(* NOTE: If Total Absence Of All Plants In Streambed As Noted Above Skip This Step UNLESS SAV Present*).*	SAV	Mostly OBL	Mostly FACW	Mostly FAC	Mostly FACU	Mostly UPL
	2	1	.75	.5	0	0

SECONDARY BIOLOGY INDICATOR POINTS: 6

TOTAL POINTS *(Primary + Secondary)*= 54 *(If Greater Than Or Equal To 19 Points The Stream Is At Least Intermittent)*

Appendix C

USACE Wetland Data Forms

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual

Project/Site: *State Route 1002 over Jordan Creek*
Applicant/Owner: *NCDOT*
Investigator(s): *Rick Filer & Andy Kiley*

Date: *1/15/03*
County: *Alamance*
State: *North Carolina*

Do Normal Circumstances exist on the site — (Yes) No
Is the site significantly disturbed (Atypical Situation) — Yes (No)
Is this area a potential Problem Area' — Yes (No)
(If needed, explain on reverse

Community ID: *Wetland 1*
Transect ID:
Plot ID:

VEGETATION

	Dominant Plant Species	Stratum	Indicator
1.	*Liquidambar strycalflua*	*Tree*	*FAC+*
2.	*Ulmus americana*	*Tree*	*FACW*
3.	*Liriodendron tulipfera*	*Tree*	*FACU*
4.	*Acer rubrum*	*Tree*	*FAC*
5.	*Platanus occidentalis*	*Tree*	*FACW-*
6.	*Ligustrum sinense*	*Shrub*	*FAC*
7.	*Lonicera japonica*	*Vine*	*FAC-*
8.	*Smilax spp.*	*Vine*	*FAC*
9.			
10.			
11.			
12.			
13.			
14.			
15.			
16.			

Percent of Dominant Species that are OBL, FACW, or FAC (excluding FAC- *88%*

Remarks:

HYDROLOGY

___ Recorded Data (Describe in Remarks
___ Stream, Lake, or tide Gauge
___ Aerial Photographs
___ Other
___ No Recorded Data Available

Field Observations

Depth of Surface Water **0-3** (in.)
Depth to Free Water in Pit **0** (in.)
Depth to Saturated Soil **0** (in.)

Wetland Hydrology Indicators
Primary Indicators
x Inundated
x Saturated in Upper 12 Inches
x Water Marks
x Drift Lines
x Sediment Deposits
x Drainage Patterns in Wetlands
Secondary Indicators (2 or more required)
x Oxidized Root Channels in Upper 12 Inche
x Water-Stained Leaves
___ Local Soil Survey Data
___ FAC-Neutral Test
___ Other (Explain in Remarks)

Remarks:
Past Ditching

SOILS

Map Unit Name (Series and Phase): *Mixed alluvial land*

Drainage Class: *n/a*

Taxonomy (Subgroup): *n/a*

Field Observations: Confirm Mapped Type? Yes (No)

Profile Description

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions Structure, etc.
0-3	*A*	*10YR 5/2*			*ClayLoam*
3+	*Bw*	*10YR4/1*	*10YR5/4*	*10%*	*ClayLoam*

Hydric Soil Indicators

- ___ Histosol
- ___ Histic Epipedon
- ___ Sulfidic Odor
- ___ Aquic Moisture Regime
- x Reducing Conditions
- x Gleyed or Low-Chroma Colors
- ___ Concretions
- ___ High Organic Content in Surface Layer in Sandy Soil
- ___ Organic Streaking in Sandy Soils
- ___ Listed on Local Hydric Soils List
- ___ Listed on National Hydric Soils List
- ___ Other (Explain in Remarks)

Remarks:

WETLAND DETERMINATION

Hydrophytic Vegetation Present? (Yes) No

Wetland Hydrology Present? (Yes) No

Hydric Soils Present? (Yes) No

Is this Sampling Point Within a Wetland? (Yes) No

Remarks:

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual

Project/Site: *State Route 1002 over Jordan Creek*
Applicant/Owner: *NCDOT*
Investigator(s): *Rick Filer & Andy Kiley*

Date: *1/15/03*
County: *Alamance*
State: *North Carolina*

Do Normal Circumstances exist on the site — (Yes) No
Is the site significantly disturbed (Atypical Situation) — Yes (No)
Is this area a potential Problem Area — Yes (No)
(If needed, explain on reverse)

Community ID: *Wetland 2*
Transect ID:
Plot ID:

VEGETATION

	Dominant Plant Species	Stratum	Indicator
1.	*Liquidambar strycalflua*	*Tree*	*FAC+*
2.	*Ulmus americana*	*Tree*	*FACW*
3.	*Cahasmanthium latifolium*	*Herb*	*FAC-*
4.	*Acer rubrum*	*Tree*	*FAC*
5.	*Platanus occidentalis*	*Tree*	*FACW-*
6.	*Ligustrum sinense*	*Shrub*	*FAC*
7.	*Juncus* spp.	*Herb*	*FAC*
8.	*Quercus phellos*	*Tree*	*FACW-*
9.			
10.			
11.			
12.			
13.			
14.			
15.			
16.			

Percent of Dominant Species that are OBL, FACW, or FAC (excluding FAC- *100%*

Remarks:

HYDROLOGY

___ Recorded Data (Describe in Remarks
___ Stream, Lake, or tide Gauge
___ Aerial Photographs
___ Other
___ No Recorded Data Available

Field Observations

Depth of Surface Water 0-1 (in.)
Depth to Free Water in Pit 0 (in.)
Depth to Saturated Soil 0 (in.)

Wetland Hydrology Indicators
Primary Indicators
___ Inundated
_x_ Saturated in Upper 12 Inches
_x_ Water Marks
_x_ Drift Lines
_x_ Sediment Deposits
_x_ Drainage Patterns in Wetlands
Secondary Indicators (2 or more required)
_x_ Oxidized Root Channels in Upper 12 Inche
_x_ Water-Stained Leaves
___ Local Soil Survey Data
_x_ FAC-Neutral Test
___ Other (Explain in Remarks)

Remarks:

SOILS

Map Unit Name
(Series and Phase) *Mixed alluvial land*

Drainage Class: *n/a*

Field Observations
Confirm Mapped Type? **Yes** (No)

Taxonomy (Subgroup) *n/a*

Profile Description

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-4	*A*	*10YR 5/2*			*Clay/Sand/Loam*
5+	*Bw*	*10YR5/2*	*10YR5/4*	*10-20%*	*Clay/Sand/Loam*

Hydric Soil Indicators

- ___ Histosol
- ___ Histic Epipedon
- ___ Sulfidic Odor
- ___ Aquic Moisture Regime
- x Reducing Conditions
- x Gleyed or Low-Chroma Colors
- ___ Concretions
- ___ High Organic Content in Surface Layer in Sandy Soil
- ___ Organic Streaking in Sandy Soils
- ___ Listed on Local Hydric Soils List
- ___ Listed on National Hydric Soils List
- ___ Other (Explain in Remarks)

Remarks:

WETLAND DETERMINATION

Hydrophytic Vegetation Present? (Yes) No

Wetland Hydrology Present? (Yes) No

Hydric Soils Present? (Yes) No

Is this Sampling Point Within a Wetland? (Yes) No

Remarks:

Appendix D

DWQ Wetland Rating Worksheet

WETLAND RATING WORKSHEET Fourth Version

Project Name: TIP No. B-4000 Nearest road: SR 1002

County: Alamance Wetland area: _____ acres Wetland width: _____ feet

Name of evaluator: RF & AK Date: 01/15/03

Wetland location

_____ on pond or lake
__X__ on perennial stream
_____ on intermittent stream
_____ within interstream divide
_____ other: _____

Soil series Wehadkee

_____ predominantly organic (humus, muck, or peat)
__X__ predominantly mineral (non-sandy)
_____ predominantly sandy

Hydraulic factors

___ steep topography
___ ditched or channelized
___ total riparian wetland width ≥ 100 ft

Adjacent land use (within ½ mile upstream, upslope, or radius)

_____ forested/natural vegetation 70 %
_____ agriculture, urban/suburban 30 %
_____ impervious surface ___ %

Dominant vegetation

1) Liquidambar styraciflua
2) Ulmus americana
3) Liriodendron tulipifera

Flooding and wetness

_____ semipermanently to permanently flooded or inundated
__X__ seasonally flooded or inundated
_____ intermittently flooded or temporary surface water
_____ no evidence of flooding or surface water

Wetland type (select one)

__X__ Bottomland hardwood forest
_____ Headwater forest
_____ Swamp forest
_____ Wet flat
_____ Pocosin
_____ Bog forest
_____ Pine savanna
_____ Freshwater marsh
_____ Bog/fen
_____ Ephemeral wetland
_____ Carolina Bay
_____ Other _____

*The rating system cannot be applied to salt or brackish marshes or stream channels.

				weight		
R	Water storage	1	x	4.00	=	4
A	Bank/Shoreline stabilization	0	x	4.00	=	0
T	Pollutant removal	2 [1]	x	5.00	=	10
I	Low flow augmentation	1	x	2.00	=	2
N	Wildlife habitat	2	x	4.00	=	8
G	Aquatic life	2	x	1.00	=	2

Total Score: 26

[1] Add 1 point if in sensitive watershed and >10% nonpoint disturbance within ½ mile radius.

WETLAND RATING WORKSHEET Fourth Version

Project Name: TIP No. B-4000 Nearest road: SR1002

County: Alamance Wetland area: _____ acres Wetland width: _____ feet

Name of evaluator: RF & AK Date: 01/15/03

Wetland location

_____ on pond or lake
__X__ on perennial stream
_____ on intermittent stream
_____ within interstream divide
_____ other: _____

Soil series Wehadkee

_____ predominantly organic (humus, muck, or peat)
__X__ predominantly mineral (non-sandy)
_____ predominantly sandy

Hydraulic factors

___ steep topography
___ ditched or channelized
___ total riparian wetland width ≥ 100 ft

Adjacent land use (within ½ mile upstream, upslope, or radius)

_____ forested/natural vegetation 70 %
_____ agriculture, urban/suburban 30 %
_____ impervious surface ____ %

Dominant vegetation

1) Liquidambar styraciflua
2) Ulmus americana
3) Acer rubrum

Flooding and wetness

_____ semipermanently to permanently flooded or inundated
_____ seasonally flooded or inundated
__X__ intermittently flooded or temporary surface water
_____ no evidence of flooding or surface water

Wetland type (select one)

__X__ Bottomland hardwood forest
_____ Headwater forest
_____ Swamp forest
_____ Wet flat
_____ Pocosin
_____ Bog forest
_____ Pine savanna
_____ Freshwater marsh
_____ Bog/fen
_____ Ephemeral wetland
_____ Carolina Bay
_____ Other _____

*The rating system cannot be applied to salt or brackish marshes or stream channels.

				weight		
R	Water storage	1	x	4.00	=	4
A	Bank/Shoreline stabilization	0	x	4.00	=	0
T	Pollutant removal	1[1]	x	5.00	=	5
I	Low flow augmentation	1	x	2.00	=	2
N	Wildlife habitat	1	x	4.00	=	4
G	Aquatic life	1	x	1.00	=	1

Total Score: 16

[1]Add 1 point if in sensitive watershed and >10% nonpoint disturbance within ½ mile radius.

Appendix E

North Carolina Wildlife Resources Commission Correspondence

North Carolina Wildlife Resources Commission

1721 Mail Service Center, Raleigh, North Carolina 27699-1721, 919-733-3633
Charles R. Fullwood, Executive Director

MEMORANDUM

TO: Norton Webster
Kimley-Horn

FROM: Shari Bryant, Fisheries Biologist
Division of Inland Fisheries

DATE: February 19, 2003

SUBJECT: Request for information regarding N.C. Department of Transportation bridge replacement projects in Alamance, Guilford, and Orange Counties, North Carolina.

Below is the aquatic and fisheries information you requested regarding the subject bridge replacement projects.

1. Alamance Co. – Jordan Creek: Jordan Creek is in the Cape Fear River watershed and has a water quality classification of WSII-NSW. No threatened or endangered aquatic species are documented in Jordan Creek. Fishery data has been collected from two sites. Below is the species list for each site. Given the diverse sunfish population in Jordan Creek, I request a moratorium on instream work from April 1 to June 15.

   Date: 4 November 1993
   Site: SR-1002
   Collectors: N.C. Division of Water Quality

Gizzard shad	*Dorosoma cepedianum*
Highfin shiner	*Notropis altipinnis*
Bluehead chub	*Nocomis leptocephalus*
Coastal shiner	*Notropis petersoni*
Creek chub	*Semotilus atromaculatus*
Creek chubsucker	*Erimyzon oblongus*

Yellow bullhead	*Ameiurus natalis*
Speckled killifish	*Fundulus rathbuni*
Flier	*Centrarchus macropterus*
Redbreast sunfish	*Lepomis auritus*
Green sunfish	*Lepomis cyanellus*
Pumpkinseed	*Lepomis gibbosus*
Warmouth	*Lepomis gulosus*
Bluegill	*Lepomis macrochirus*
Redear sunfish	*Lepomis microlophus*
Largemouth bass	*Micropterus salmoides*
Tessellated darter	*Etheostoma olmstedi*

Date: 1 August 2001
Site: SR-1763
Collectors: N.C. State Museum of Natural Sciences

Crescent shiner	*Luxilus cerasinus*
Highfin shiner	*Notropis altipinnis*
Bluehead chub	*Nocomis leptocephalus*
Golden shiner	*Notemigonus crysoleucas*
Swallowtail shiner	*Notropis procne*
Rosyside dace	*Clinostomus funduloides*
Creek chub	*Semotilus atromaculatus*
Creek chubsucker	*Erimyzon oblongus*
Notchlip redhorse	*Moxostoma collapsum*
Speckled killifish	*Fundulus rathbuni*
Redbreast sunfish	*Lepomis auritus*
Pumpkinseed	*Lepomis gibbosus*
Tessellated darter	*Etheostoma olmstedi*

2. Alamance Co. – Wells Creek: Wells Creek is a tributary to Cane Creek in the Cape Fear River watershed and has a water quality classification of C-NSW. There is no fishery survey data for Wells Creek or Cane Creek. Fish (1968) lists the stream as too small to be of fishing significance. No threatened or endangered aquatic species are documented in Wells Creek. It likely supports a typical piedmont stream fishery including shiners, minnows, dace and sunfish. No instream moratorium is requested on this stream, however, stringent sediment and erosion control methods should be implemented at all times.

3. Guilford Co. – Bull Run: Bull Run is a tributary to the Deep River in the Cape Fear River watershed and has a water quality classification of C. There is no fishery survey data for this stream. No threatened or endangered aquatic species are documented in Bull Run. It likely supports a typical piedmont stream fishery including shiners, minnows, dace and sunfish. In addition, the lower section of Bull Run might support bullheads and largemouth bass. No instream moratorium is requested on this stream, however, stringent sediment and erosion control methods should be implemented at all times.

4. Orange Co. – New Hope Creek: New Hope Creek is in the Cape Fear River watershed and has a water quality classification of C-NSW. No threatened or endangered aquatic species are documented in New Hope Creek. Fish (1968) states that large catches of sunfish have been reported from the section between the NC-54 bridge and SR-1734 and this section of stream has an ecological classification of robin/warmouth. Data has been collected from one site on New Hope Creek. Below is the species list. It is likely that New Hope Creek in Orange County supports a good sunfish population, therefore, I request a moratorium on instream work from April 1 to June 15.

   Date: 31 August 1988
   Site: Bridge at Hollow Rock on Erwin Rd.
   Collectors: Duke University

Chain pickerel	*Esox niger*
Redfin pickerel	*Esox americanus*
Pirateperch	*Aphredoderus sayanus*
Largemouth bass	*Micropterus salmoides*
Redear sunfish	*Lepomis auritus*
Creek chubsucker	*Erimyzon oblongus*
Silvery minnow	*Hybognathus nuchalis*
Whitemouth shiner	*Notropis alborus*
Flat bullhead	*Ameiurus brunneus*
Johnny darter	*Etheostoma nigrum*

References:
Fish, F.F. 1968. A Catalog of the Inland Fishing Waters in North Carolina. Division of Inland Fisheries, Raleigh, North Carolina. 312 pp.

If you have any questions regarding this information, please contact me at 336-449-7625 or bryants5@earthlink.net.

cc: Travis Wilson, Highway Project Coordinator (e-mail)
Brian McRae, District 5, Assistant Fisheries Biologist

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

MICHAEL F. EASLEY
GOVERNOR

LYNDO TIPPETT
SECRETARY

March 14, 2007 Update V 2.0

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

ATTENTION: Mr. Andy Williams
NCDOT Coordinator

Dear Sir:

Subject: **Application for Regional General Permit 31, Section 401 Water Quality Certification 3404** for the replacement of Bridge No. 45 on SR 1002 over Jordan Creek, Alamance County. Federal Project No. BRZ-1002(11), WBS No. 33368.1.1, State Project No. 8.2473401, T.I.P. B-4000, Division 7.

Please see the enclosed Programmatic Categorical Exclusion, Natural Resource Technical Report, Pre-Construction Notification, EEP acceptance letter, permit drawings, and design plans for the subject project. The North Carolina Department of Transportation (NCDOT) proposes to replace Bridge No. 45 over Jordan Creek. The project involves replacing the current bridge on its existing location. The proposed structure will be a 235 foot, 27 inch box beam bridge. The bridge will consist of three spans at 83 feet, 82 feet, and 70 feet. The bridge will provide a clear roadway width of 39-feet 10-inches and an out to out superstructure width of 42 feet. During construction, traffic will be detoured onto existing secondary roads.

IMPACTS TO WATERS OF THE UNITED STATES

The project is located in the Cape Fear River Basin (sub-basin 03-06-02). This area is part of Hydrologic Cataloging Unit 03030002 of the South Atlantic-Gulf Coast Region. The section of Jordan Creek crossed by the subject bridge has been assigned Stream Index Number 16-14-6-(0.5) (8/3/92) by the N.C Division of Water Quality. Jordan Creek has a best usage classification of WS-II, HQW, NSW. Jordan Creek is the only jurisdictional stream within the project area.

No designated Outstanding Resource Waters (ORW) occur within one-mile of the project area. Jordan Creek is not listed on the 2004 List of impaired waters [Section 303(d)] for the Cape Fear River Basin.

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

TELEPHONE: 919-715-1334 or
919-715-1335

FAX: 919-715-5501

LOCATION:
2728 CAPITAL BLVD. SUITE 240
RALEIGH NC 27604

WEBSITE: WWW.NCDOT.ORG

Temporary Impacts

There will be 0.03 acre (54 linear feet) of temporary impacts to Jordan Creek resulting from the construction of a causeway (Site 2). The causeway will be used for removal of existing Bent Number 3.

Permanent Impacts

There will be less than 0.01 acre (24 linear feet) of permanent impacts to Jordan Creek resulting from the placement of fill in the channel (Site 3). The fill is necessary to protect the stream bank from eroding where two standard base ditches enter the stream. Due to the topography of the project area, it is not possible to outlet the ditches prior to entering Jordan Creek.

There will be less than 0.01 acre of permanent riverine wetland impacts resulting from mechanized clearing in the wetland located in the southwest of the existing bridge (Site 1). Mechanized clearing is necessary to provide access for equipment and for construction of the bridge and the new fill slopes.

Utility Impacts

Construction of the new bridge will require the relocation of power and phone utilities. Power lines located on the south side of the project area will be relocated south of the existing location. A wetland, composed of emergent and forested portions, is located within this area. The lines will cross the emergent portion. The poles will be located outside the wetland boundary. Hand clearing will be performed, if necessary, to maintain the 50-foot utility corridor. No jurisdictional impacts will result from the relocation of the power lines.

Phone lines located south of the bridge will be abandoned and new phone cables will be relocated to the north side of the bridge. The lines will be relocated underground and under Jordan Creek using directional bore. No jurisdictional impacts will result from the relocation of the phone lines.

Moratorium

In a letter dated February 19, 2003, the North Carolina Wildlife Resources Commission requested a moratorium on in-stream work from April 1 to June 15 due to a diverse sunfish population within Jordan Creek. The project site was sampled by NCDWQ biologists in November 1993 as part of the Stream Fish Community Assessment Program. The site does support a diverse sunfish population, however, the species identified are common and found throughout the state; no state or federally listed species were identified. Furthermore, several of the sunfish species identified are tolerant of reduced water quality.

NCDOT Best Management Practices and Design Standards in Sensitive Watersheds will be implemented for this project. These protocols mandate the use of stringent erosion and sediment control measures.

Therefore, due to the lack of statutory regulations requiring this moratorium, as well as the stringent erosion and sediment control measures, NCDOT does not believe that this moratorium is warranted.

Bridge Demolition

Existing Bridge No. 45 is approximately 201-feet long with a deck width of 21-feet. The superstructure is composed of a timber floor with an asphalt wearing surface on steel I-beams, channels, and timber joist. The substructure consists of mass concrete abutments, bents, and steel pile crutch bents. One bent is located within the water.

All components of the bridge, except the mass concrete piers, will be removed without dropping any of their components into Waters of the United States. However, there is potential for components of the mass concrete piers to drop into the Waters of the United States during construction. The resulting potential temporary fill associated with the mass concrete piers is approximately 60 cubic yards. If field conditions permit, a turbidity curtain will be used during the removal of the bent located within the stream.

Best Management Practices for Bridge Demolition and Removal and Protection of Surface Waters will be followed.

Restoration Plan

Following construction of the bridge, all material used in the construction of the structure will be removed. The impact area associated with the bridge is expected to recover naturally, since the natural streambed and plant material will not be removed. NCDOT does not propose any additional planting in this area. Class II riprap and filter fabric will be used for bank stabilization. Pre-project elevations will be restored. NCDOT will restore stream to its pre-project contours.

Schedule: The project calls for a letting of July 17, 2007 with a date of availability of August 28, 2007. It is expected that contractor will choose to start construction in August 2007.

Removal and Disposal Plan: Removal and Disposal Plan: The contractor will be required to submit a reclamation plan for the removal and disposal of all material off-site at an upland location. The contractor will use excavation equipment for removal of any earthen material. Heavy-duty trucks, dozers, cranes, and various other pieces of mechanical equipment necessary for construction of roadways and bridges will be used on site. The contractor will have the option of reusing any of the materials that the engineer deems suitable in the construction of the project. After the erosion control devices are no longer needed, all temporary materials will become property of the contractor.

Following construction of the bridge, all temporary fills will be completely removed from wetlands and streams. Restoring natural hydrology and native vegetation will restore wetlands. Stream contours and ~~riparian~~ vegetation will be reestablished upon the removal of the temporary ~~workpads~~. Class II riprap and filter fabric will be used for bank stabilization.

MITIGATION OPTIONS

Avoidance and Minimization and Compensatory Mitigation: The NCDOT is committed to incorporating all reasonable and practicable design features to avoid and minimize jurisdictional impacts, and to provide full compensatory mitigation of all remaining, unavoidable jurisdictional impacts. Avoidance measures were taken during the planning and NEPA compliance stages; minimization measures were incorporated as part of the project design.

According to the Clean Water Act (CWA) §404(b)(1) guidelines, NCDOT must avoid, minimize, and mitigate, in sequential order, impacts to waters of the US. The following is a list of the project's jurisdictional stream avoidance/minimization activities proposed or completed by NCDOT:

Avoidance/Minimization

- Design Standards in Sensitive Watersheds will be used
- The new bridge will be 34 feet longer than the existing bridge, increasing the floodplain under the bridge.
- The proposed bridge will be replaced on its existing location.
- The proposed project will completely span Jordan Creek, allowing for pre-project stream flows to maintain the current water quality, aquatic habitat, and flow regime.
- Fill slopes will not be located within the wetlands.
- An off-site detour will be utilized during construction.
- Temporary construction impacts due to erosion and sedimentation will be minimized through implementation of stringent erosion control schedule and use of Best Management Practices (BMPs).
- The contractor will follow contract specifications pertaining to erosion control measures as outlined in 23 CFR 650 Subpart B and Article 107-13 entitled "Control of Erosion, Siltation, and Pollution" (NCDOT, Specifications for Roads and Structures).

Compensatory Mitigation:

An acceptance letter dated November 27, 2006 from the Ecosystem Enhancement Program (EEP) is attached. NCDOT has avoided and minimized impacts to jurisdictional resources to the greatest extent possible as described above. Unavoidable, permanent impacts to 24 feet of jurisdictional stream will be offset by compensatory mitigation provided by the EEP program. NCDOT is not proposing mitigation for the less than 0.01 acre of riverine wetland impacts because the impacts are minimal.

FEDERALLY PROTECTED SPECIES

Plants and animals with federal classifications of Endangered (E), Threatened (T), Proposed Endangered (PE), and Proposed Threatened (PT) are protected under provisions of Section 7 and Section 9 of the Endangered Species Act of 1973, as amended. As January 29, 2007 the United States Fish and Wildlife Service (USFWS) website does not list any federally protected species

for Alamance County. North Carolina Natural Heritage Program (NCNHP) documents no occurrences of federally protected species within 1.0 miles of the project area.

REGULATORY APPROVALS

Section 404 Permit: Application is hereby made for the Department of Army Section 404 Regional General Permit 31 authorizing for the above-described activities associated with the replacement of Bridge No. 45.

Section 401 Permit: The NCDOT will adhere to all General Water Quality Certifications (WQC) 3404. Written concurrence from the NCDWQ is required. We are providing five copies of this application to the North Carolina Department of Environment and Natural Resources, Division of Water Quality, ~~as notification~~. for review.

A copy of this permit application will be posted on the NCDOT website at: http://www.ncdot.org/doh/preconstruct/pe/. If you have any questions or need additional information, please call Erica McLamb at 715-1521.

Sincerely,

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

w/attachment
- Mr. John Hennessy, NCDWQ (5 Copies)
- Mr. Travis Wilson, NCWRC
- Mr. Gary Jordan, USFWS
- Dr. David Chang, P.E., Hydraulics
- Mr. Greg Perfetti, P.E., Structure Design
- Mr. Mark Staley, Roadside Environmental
- Mr. J. M. Mills, P.E., Division 7 Engineer
- Mr. Jerry Parker, Division 7 Environmental Officer

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. William Goodwin, PDEA
- Mr. Scott McLendon, USACE, Wilmington
- Ms. Beth Harmon, EEP
- Mr. Todd Jones, NCDOT External Audit Branch