STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

MICHAEL F. EASLEY
GOVERNOR

LYNDO TIPPETT
SECRETARY

October 1, 2007

U. S. Army Corps of Engineers
Regulatory Field Office
Post Office Box 1890
Wilmington, NC 28402-1890

ATTENTION: Mr. Richard Spencer
NCDOT Coordinator

Subject: **Section 404 Nationwide Permit 23 and 33 Application** for the replacement of Bridge No. 20 on NC 902 over Sandy Branch, Chatham County. Federal Project No. BRZ-902(3), WBS No. 33427.1.1, State Project No. 8.1522301, T.I.P. B-4063, Division 8.

Dear Sir:

The North Carolina Department of Transportation (NCDOT) proposes to replace Bridge No. 20 over Sandy Branch. The project involves replacing the current bridge on new alignment east of the existing structure. The proposed structure will be a single-span bridge approximately 90 feet in length and will span Sandy Branch. The minimum clear roadway width will be 30 feet to provide two 12-foot lanes, with minimum 3-foot shoulders. The approach roadway will provide two 12-foot lanes with 8-foot grass shoulders. During construction, traffic will be maintained on the existing bridge. Please find enclosed the Pre-Construction Notification, permit drawings and design plans for the subject project. A Categorical Exclusion was signed in November 2006 and distributed shortly thereafter. Additional copies are available upon request.

IMPACTS TO WATERS OF THE UNITED STATES

The project is located in the Cape Fear River Basin (sub-basin 03-06-12). This area is part of Hydrologic Cataloging Unit 03030003 of the Carolina Slate Belt Region. The section of Sandy Branch crossed by the bridge has been assigned Stream Index Number 17-43-16-1 by the N.C Division of Water Quality. Sandy Branch has a best usage classification of C. Sandy Branch and one unnamed tributary (UT) to Sandy Branch are the only jurisdictional streams that will be impacted by the proposed project.

Sandy Branch is a perennial stream that flows in a southeasterly direction towards Bear Creek. Sandy Branch is approximately 20 to 25 feet wide with a substrate of large gravel, cobble and bedrock.

UT 1 to Sandy Branch is an intermittent channel located along NC 902. UT 1 is approximately 3 to 4 feet wide with a substrate of gravel, sand and silt.

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

WEBSITE: WWW.NCDOT.ORG

LOCATION:
2728 CAPITAL BLVD. SUITE 240
RALEIGH NC 27604

No designated High Quality Waters (HQW), Outstanding Resource Waters (ORW), WS-I or WS-II waters occur within one-mile of the project area. Sandy Branch is not listed on the 2006 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.

There was one wetland located within the study area. This wetland is located on the southwest side of NC 902 and is 0.01 acres in size. The wetland is classified as a palustrine Forested Broadleaf Deciduous Seasonally Flooded (PFO1C). This wetland is not being impacted by the construction of the new bridge.

Temporary Impacts

Construction of the new bridge will result in a total of 0.01-acre (100 linear feet) of temporary impacts. An unnamed tributary to Sandy Branch located on the eastern side of NC 902 will have 66 linear feet of temporary stream impacts due to the installation of a 72-inch crosspipe (Site 1). Sandy Branch will have 0.01 acre (34 linear feet) of temporary stream impacts due to the construction of a temporary work pad (Site 2).

Permanent Impacts

There will be a total of 60 linear feet of permanent stream impacts for the construction of the new bridge. There will be 48 linear feet of permanent stream impacts to UT 1 to Sandy Branch due to the installation of a 72-inch crosspipe (Site 1). There will be 12 linear feet of permanent stream impacts to Sandy Branch resulting from bank stabilization (Site 2).

There will be no wetland impacts associated with this project.

Utility Impacts

Construction of the new bridge will require the relocation of water, power and phone utilities. One power pole located on the north side of the project area is in conflict with the construction of a lateral "V" ditch and will be pushed back 5-feet towards the right-of-way line. No jurisdictional impacts will result from the relocation of the power pole.

All telephone poles will be relocated outside of the project limits. No jurisdictional impacts will result from the relocation of the telephone poles.

There is a ¾-inch water services line located to the north of NC 902 that is in conflict with construction of the ditch and will be relocated outside the ditch line to within 5-feet of the proposed right or way line. No jurisdictional impacts will result from the relocation of the water services line.

Bridge Demolition

Existing Bridge No. 20 has two spans and totals 70-feet in length. The superstructure consists of a reinforced concrete deck on I-beams with metal railings. The substructure consists of end bents composed of reinforced concrete caps on timber piles, and the interior bent is reinforced concrete post and beam. One bent is located within the water.

The bridge will be removed without dropping any components into waters of the United States. 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.

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 the streams. 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

- The proposed project will completely span Sandy Branch, allowing for pre-project stream flows to maintain the current water quality, aquatic habitat, and flow regime.
- Traffic will be maintained on the existing structure 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).

Compensatory Mitigation:

There will be a minimal amount of stream impacts associated with the construction of the new bridge. The 12-feet of impacts to Sandy Branch are minimal and only for bank stabilization and will not create an adverse effect on the aquatic environment. The remaining 48-feet of impacts to an intermittent UT to Sandy Branch are minimal and therefore, no compensatory mitigation is proposed.

FEDERALLY PROTECTED SPECIES

Plants and animals with federal classifications of Endangered, Threatened, Proposed Endangered and Proposed Threatened are protected under provisions of Section 7 and Section 9 of the Endangered Species Act of 1973, as amended. As of May 10, 2007, the United States Fish and Wildlife Service (USFWS) lists four federally protected species for Chatham County. Table 1 lists the species, their status and biological conclusion.

Table 1. Federally-Protected Species for Chatham County, NC

Common Name	Scientific Name	Federal Status	Habitat Present	Biological Conclusion
Bald eagle	*Haleaeetus leucephalus*	Delisted	No	N/A
Cape Fear Shiner	*Notropis mekistocholas*	E	No	No Effect
Harperella	*Ptilimnium nodosum*	E	No	No Effect
Red-cockaded woodpecker	*Picoides borealis*	E	No	No Effect

A Biological Conclusion of "No Effect" was given in the Categorical Exclusion for the bald eagle based on lack of habitat. It has been delisted as of August 8, 2007 from the Endangered Species Act but is still protected under the Bald and Golden Eagle Protection Act. A Biological Conclusion of "No Effect" was also given to the Cape Fear shiner, harperella, and the red-cockaded woodpecker. A field survey for the Cape Fear shiner was conducted on October 26, 2006 by NCDOT Biologists. There was no suitable habitat for the Cape Fear Shiner in the project area. Therefore, it is the conclusion of NCDOT that the original call of "No Effect" is still valid for the Cape Fear Shiner.

A field survey for harperella and the red-cockaded woodpecker was conducted on July 12, 2007 by NCDOT Biologists. The project area did not contain suitable habitat for harperella or the red-cockaded woodpecker. It is the conclusion of NCDOT that the original call of "No Effect" is still valid for harperella and the red-cockaded woodpecker.

Schedule: The review date for this project is February 26, 2008. The project calls for a letting of April 15, 2008 with a date of availability of May 27, 2008. It is expected that contractor will choose to start construction in May 2008.

REGULATORY APPROVALS

Section 404 Permit: The project is being processed by the Federal Highway Administration as a "Categorical Exclusion" in accordance with 23 CFR 771.115(b). The NCDOT requests that these activities be authorized by a Nationwide Permit 23, (Federal Register Vol. 72, No. 47 Pages 11092-11198; March 12, 2007). We are also requesting the issuance of a Nationwide 33 for the temporary causeway associated with bridge construction within Sandy Branch.

Section 401 Permit: We anticipate General Certification numbers 3632 and 3634 will apply to this project. All general conditions of the Water Quality Certifications will be met. Therefore, in accordance with 15A NCAC 2H, Section .0500(a) and 15A NCAC 2B.0200 we are providing two copies of this application to the North Carolina Department of Environmental and Natural Resources, Division of Water Quality, for their notification.

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 Sara Easterly at 715-5499.

Sincerely,

E. L. Lusk

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

w/attachment

Mr. John Hennessy, NCDWQ (2 Copies)
Mr. Travis Wilson, NCWRC
Mr. Gary Jordan, USFWS
Dr. David Chang, P.E., Hydraulics
Mr. Mark Staley, Roadside Environmental
Mr. Greg Perfetti, P.E., Structure Design
Mr. Victor Barbour, P.E., Project Services Unit
Mr. Tim Johnson, P.E., Division 8 Engineer
Mr. Art King, Division 8 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. Scott McLendon, USACE, Wilmington
Ms. Theresa Ellerby, Project Development Engineer

Office Use Only: Form Version March 05

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

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

I. Processing

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

2. Nationwide, Regional or General Permit Number(s) Requested: NW 23 & NW 33

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

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

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

II. Applicant Information

1. Owner/Applicant Information

   Name: Gregory J. Thorpe, Ph.D., Environmental Management Director
   Mailing Address: North Carolina Department of Transportation (NCDOT)
   Project Development and Environmental Analysis
   1598 Mail Service Center
   Raleigh, NC 27699-1598

   Telephone Number: 919-733-3141 Fax Number: 919-733-9794
   E-mail Address: gthorpe@dot.state.nc.us

2. Agent/Consultant Information (A signed and dated copy of the Agent Authorization letter must be attached if the Agent has signatory authority for the owner/applicant.)

   Name: _____
   Company Affiliation: _____
   Mailing Address: _____

   Telephone Number: _____ Fax Number: _____
   E-mail Address: _____

III. Project Information

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

1. Name of project: Replacement of Bridge No. 20 on NC 902 over Sandy Branch

2. T.I.P. Project Number or State Project Number (NCDOT Only): B-4063

3. Property Identification Number (Tax PIN): _____

4. Location
   County: Chatham Nearest Town: Bonelee
   Subdivision name (include phase/lot number): NA
   Directions to site (include road numbers/names, landmarks, etc.): Highway 421 West to NC 902. Turn left on NC 902. The project site is located southwest of the intersection of NC 902 and Barker Road.

5. Site coordinates (For linear projects, such as a road or utility line, attach a sheet that separately lists the coordinates for each crossing of a distinct waterbody.)
   Decimal Degrees (6 digits minimum): 35° 37' 15" °N 79° 22' 49" °W

6. Property size (acres): Total project length is 0.357 miles

7. Name of nearest receiving body of water: Sandy Branch

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: Project area is located in a rural community with the surrounding area being comprised mainly of agricultural land.

10. Describe the overall project in detail, including the type of equipment to be used: Bridge No. 20 will be replaced on new alignment east of the existing structure. During construction, traffic will be maintained on the existing structure. 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: Bridge No. 20 has a sufficiency rating of 38.3 out of a possible 100 for a new structure. The bridge is considered structurally deficient and functionally obsolete. The replacement of this inadequate structure will result in safer more efficient traffic operations.

IV. Prior Project History

If jurisdictional determinations and/or permits have been requested and/or obtained for this project (including all prior phases of the same subdivision) in the past, please explain. Include the USACE Action ID Number, DWQ Project Number, application date, and date permits and certifications were issued or withdrawn. Provide photocopies of previously issued permits, certifications or other useful information. Describe previously approved wetland, stream and buffer impacts, along with associated mitigation (where applicable). If this is a NCDOT project, list and describe permits issued for prior segments of the same T.I.P. project, along with construction schedules. A Jurisdictional Determination (Action ID. 200400395) from the U.S. Army Corps of Engineers was given on December 23, 2004.

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.
There are no future permit requests anticipated for this project.

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: See cover letter

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)
NA					
NA					
NA					
Total Wetland Impact (acres)					NA

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

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 and then divide by 43,560.

Stream Impact Number (indicate on map)	Stream Name	Type of Impact	Perennial or Intermittent?	Average Stream Width Before Impact	Impact Length (linear feet)	Area of Impact (acres)
Site 1	UT to Sandy Branch	Temporary Fill in Surface Water	Intermittent	4-feet	66	<0.01
Site 1	UT to Sandy Branch	Permanent Fill in Surface Water	Intermittent	4-feet	48	0.01
Site 2	Sandy Branch	Permanent Fill in Surface Water	Perennial	25-feet	12	<0.01
Site 2	Sandy Branch	Temporary Fill in Surface Water	Perennial	25-feet	34	0.01
Total Stream Impact (by length and acreage)					160	0.02

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

Open Water Impact Site Number (indicate on map)	Name of Waterbody (if applicable)	Type of Impact	Type of Waterbody (lake, pond, estuary, sound, bay, ocean, etc.)	Area of Impact (acres)
NA	NA	NA	NA	0.00
Total Open Water Impact (acres)				NA

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

Stream Impact (acres):	0.02
Wetland Impact (acres):	0.00
Open Water Impact (acres):	0.00
Total Impact to Waters of the U.S. (acres)	0.02
Total Stream Impact (linear feet):	160

7. Isolated Waters

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

8. Pond Creation

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

VII. Impact Justification (Avoidance and Minimization)

Specifically describe measures taken to avoid the proposed impacts. It may be useful to provide information related to site constraints such as topography, building ordinances, accessibility, and financial viability of the project. The applicant may attach drawings of alternative, lower-impact site layouts, and explain why these design options were not feasible. Also discuss how impacts were minimized once the desired site plan was developed. If applicable, discuss construction techniques to be followed during construction to reduce impacts. See 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.
   No mitigation is proposed for the minimal amount of stream impacts.

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

IX. Environmental Documentation (required by DWQ)

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			
2			
Total			

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

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

_____

_____

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._____

_____

XII. Sewage Disposal (required by DWQ)

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

XIII. Violations (required by DWQ)

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

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

XIV. 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:

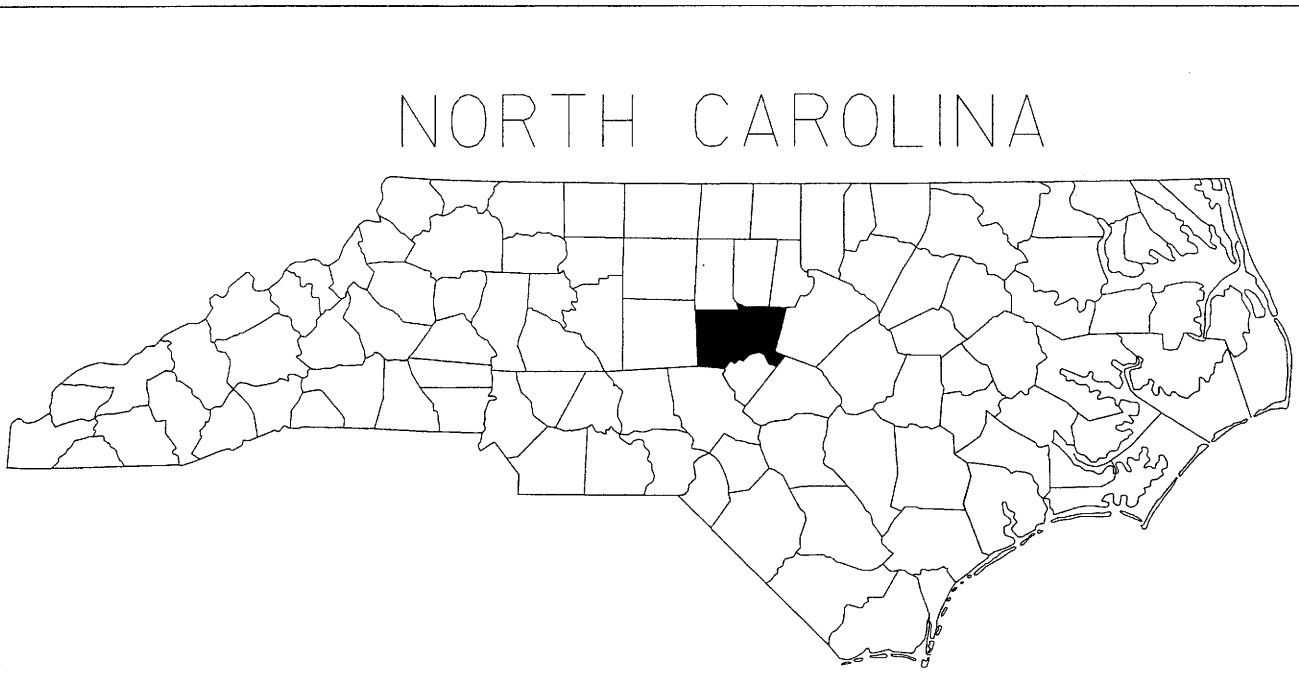
XV. Other Circumstances (Optional):

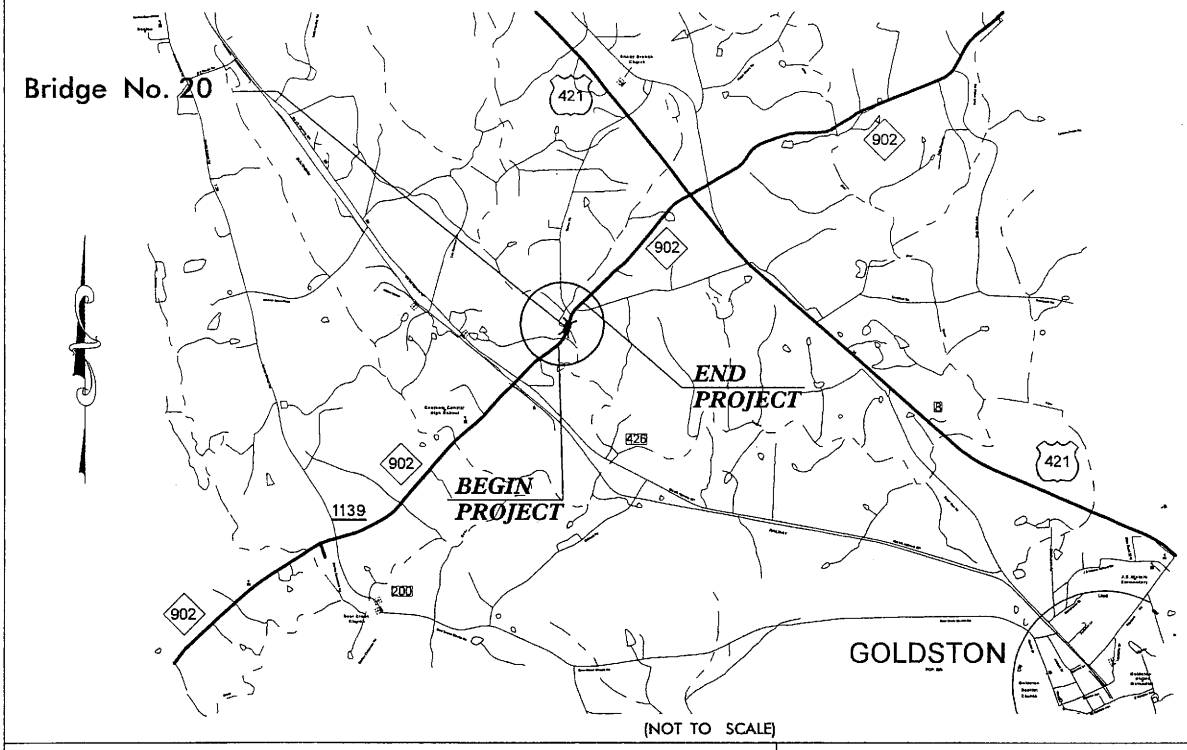
It is the applicant's responsibility to submit the application sufficiently in advance of desired construction dates to allow processing time for these permits. However, an applicant may choose to list constraints associated with construction or sequencing that may impose limits on work schedules (e.g.,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

E. F. Luke for Gregory J. Thorpe, PhD 9.28.07

Applicant/Agent's Signature **Date**

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





(NOT TO SCALE)

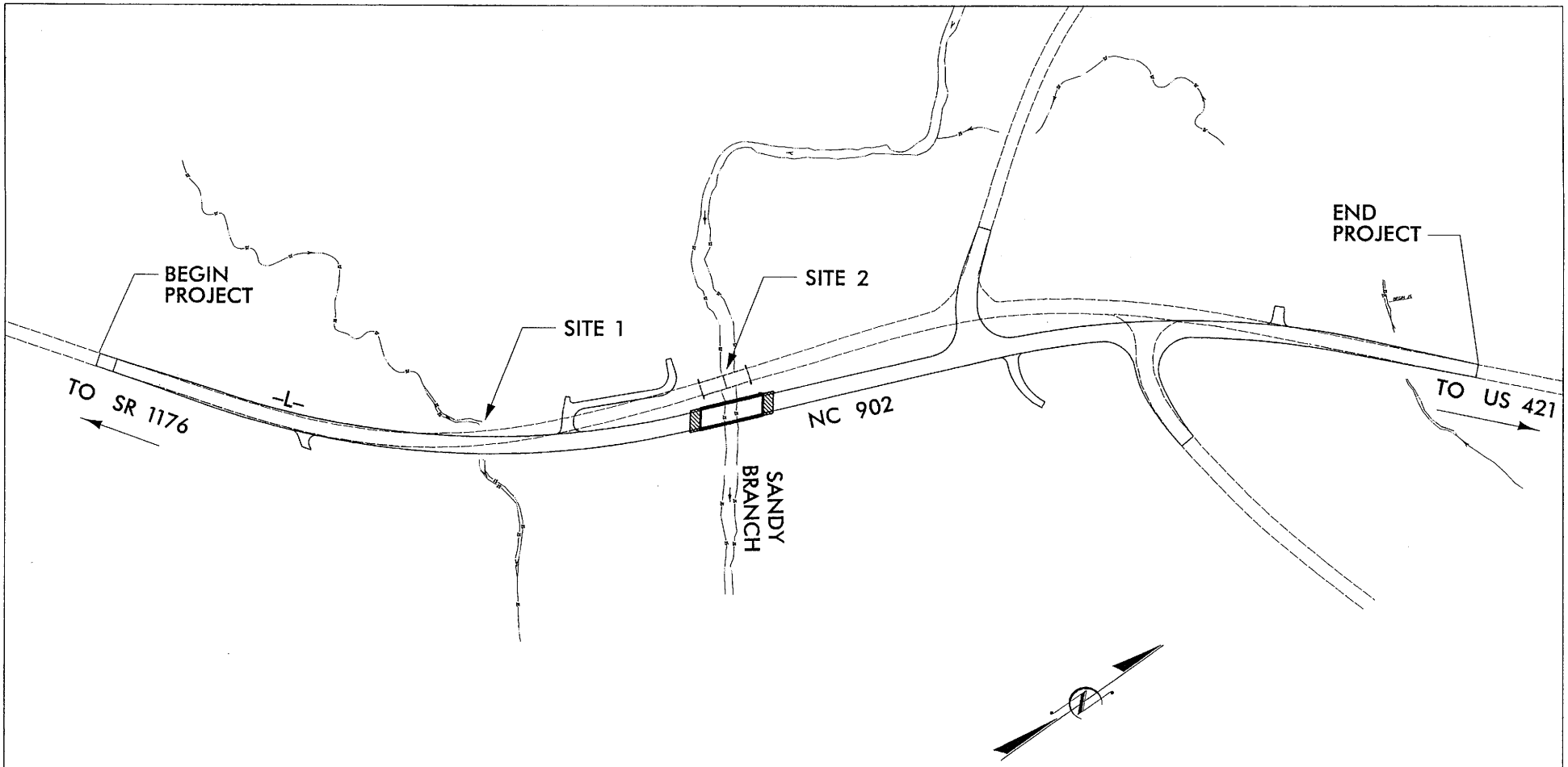
VICINITY MAPS

(NOT TO SCALE)

NCDOT

DIVISION OF HIGHWAYS
CHATHAM COUNTY
PROJECT: 33427.1.1 (B-4063)
BRIDGE NO. 20 OVER
SANDY BRANCH AND
APPROACHES ON NC 902

SHEET 1 OF 7 5/30/2007



SITE MAP

(NOT TO SCALE)

NCDOT

DIVISION OF HIGHWAYS

CHATHAM COUNTY

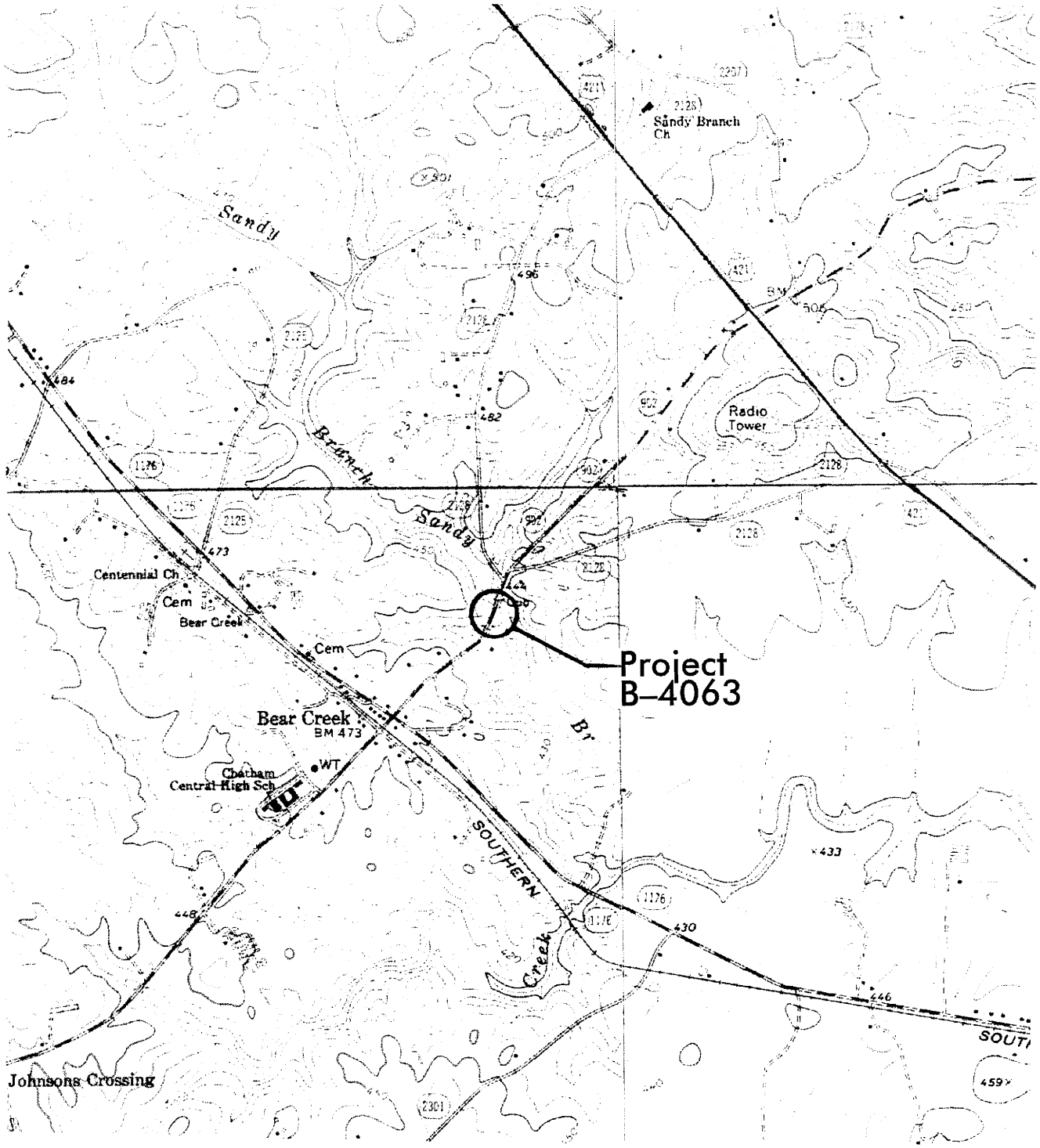
PROJECT: 33427.1.1 (B-4063)

BRIDGE NO. 20 OVER

SANDY BRANCH AND

APPROACHES ON NC 902

05 / 30 / 2007



TOPO MAP

SCALE: 1" : 2000'

NCDOT

DIVISION OF HIGHWAYS
CHATHAM COUNTY
PROJECT: 33427.1.1 (B-4063)
BRIDGE NO. 20 OVER
SANDY BRANCH AND
APPROACHES ON NC 902

SHEET 3 OF 7

05 / 10 / 2007

PROPERTY OWNERS

NAMES AND ADDRESSES

	NAMES	ADDRESSES
1	JEFFREY ADCOCK	P.O. BOX 23 BEAR CREEK, NC 27207
3	DAVID GILMORE	387 SHADY GROVE CH STALEY, NC 273355
4	LUTHER JONES	1359 BARKER RD BEAR CREEK, NC 27207
5	J.B. BEAVER	14125 HWY 902 BEAR CREEK, NC 27207

NCDOT

DIVISION OF HIGHWAYS

CHATHAM COUNTY

PROJECT: 33427.1.1 (B-4063)

BRIDGE NO. 20 OVER

SANDY BRANCH AND

APPROACHES ON NC 902

05/10/2007

WETLAND PERMIT IMPACT SUMMARY

Site No.	Station (From/To)	Structure Size / Type	WETLAND IMPACTS					SURFACE WATER IMPACTS				
			Permanent Fill In Wetlands (ac)	Temp. Fill In Wetlands (ac)	Excavation in Wetlands (ac)	Mechanized Clearing in Wetlands (ac)	Hand Clearing in Wetlands (ac)	Permanent SW impacts (ac)	Temp. SW impacts (ac)	Existing Channel Impacts Permanent (ft)	Existing Channel Impacts Temp. (ft)	Natural Stream Design (ft)
1	-L- 18+77 to 19+30 LT	72" Crosspipe							0.00		52	
1	-L- 19+25 to 19+67 RT	72" Crosspipe						0.01	0.00	48	14	
2	-L- 22+81 +/- RT	1 @90' Steel Girder Bridge						0.00		6		
2	-L- 22+85 +/- LT	1 @90' Steel Girder Bridge							0.01		34	
2	-L- 22+97 +/- LT	1 @90' Steel Girder Bridge						0.00		6		
TOTALS:								0.01	0.01	60	100	

ATN Revised 3/31/05

NC DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

CHATHAM COUNTY
WBS - 33427.1.1 (B-4063)

SHEET 5 of 7 8/13/2007

RECEIVED
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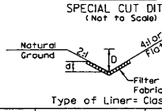
DIVISION OF HIGHWAYS
HYDRAULICS UNIT

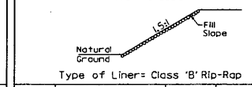
DETAIL 'A'
SPECIAL CUT DITCH
(Not to Scale)



Type of Liner= Class 'A' Rip-Rap

LINE	STA. TO STA.	RIP RAP (TONS)	FILTER FABRIC (YD²)
-L-	13+75 – 15+00 LT.	40	197

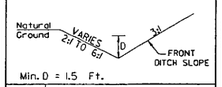
DETAIL 'B'
SLOPE PROTECTION
(Not to Scale)



Type of Liner= Class 'B' Rip-Rap

LINE	STA. TO STA.	RIP RAP (TONS)	FILTER FABRIC (YD²)
-L-	18+65 – 19+40 LT.	35	75

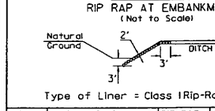
DETAIL 'D'
CUT DITCH
(Not to Scale)



Min. D = 1.5 Ft.

LINE	STA. TO STA.
-L-	21+00 – 22+50 LT.

DETAIL 'E'
RIP RAP AT EMBANKMENT
(Not to Scale)



Type of Liner = Class 1Rip-Rap W/ FF

LINE	STA. TO STA.	RIP RAP (TONS)	FILTER FABRIC (YD²)
-L-	22+60 – 22+75 LT.	16.0	19
-L-	23+00 – 23+10 LT.	12.0	13
-L-	22+80 – 23+00 RT.	21.0	25

DETAIL 'C'
LATERAL 'V' DITCH
(Not to Scale)

Type of Liner = Class 'B' Rip-Rap

LINE	STA. TO STA.	D.D.E. (YD3)	RIP RAP (TONS)	FILTER FABRIC (YD2)
-L-	18+50 – 19+35 RT.	54	45	110

DETAIL 'F'
LATERAL BASE DITCH
(Not to Scale)

Type of Liner = Class B Rip-Rap

LINE	STA. TO STA.	D.D.E. (YD3)	RIP RAP (TONS)	FILTER FABRIC (YD²)
-L-	23+00 – 24+25 RT.	65	70	190

DETAIL 'G'
CUT DITCH
(Not to Scale)

Type of Liner = Class 'B' Rip-Rap

LINE	STA. TO STA.	RIP RAP (TONS)	FILTER FABRIC (YD²)
-L-	23+10 – 24+00 LT.	42	117

DETAIL 'J'
EMBANKMENT EXCAVATION
(Not to Scale)

LINE	STA. TO STA.	D.D.E. (YD3)
-L-	22+40 – 23+82 LT.	250.0

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(919) 851-1918 (FAX)
WWW.MULKEYINC.COM

PROJECT REFERENCE NO.	SHEET NO.
B-4063	4
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

Permit Drawing
Sheet 6 of 7

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

CHATHAM COUNTY, NC
BRIDGE 20 ON NC 902
OVER SANDY BRANCH
5/30/07

ENGLISH

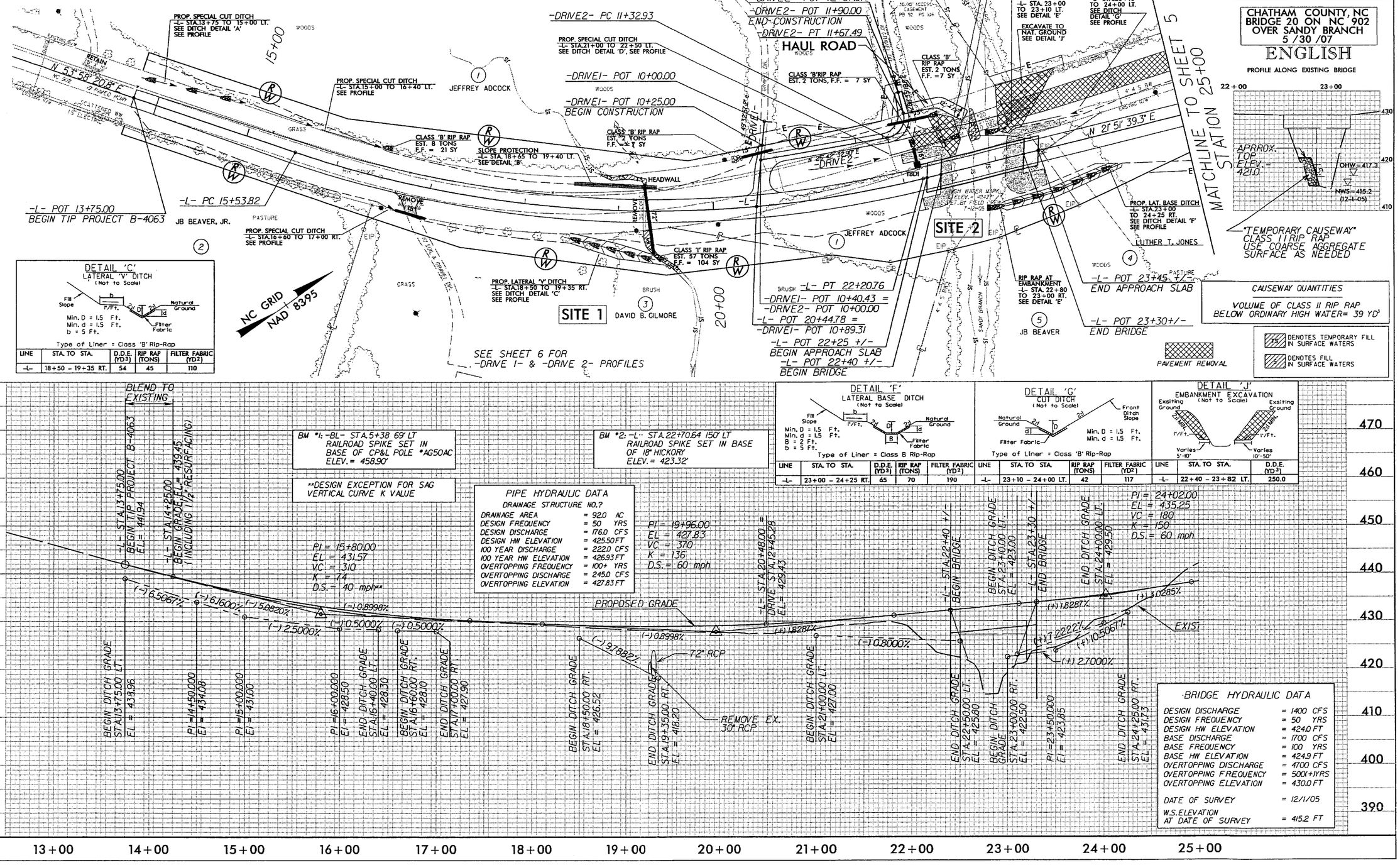
PROFILE ALONG EXISTING BRIDGE

"TEMPORARY CAUSEWAY"
CLASS I RIP RAP
USE COARSE AGGREGATE
SURFACE AS NEEDED

CAUSEWAY QUANTITIES
VOLUME OF CLASS II RIP RAP BELOW ORDINARY HIGH WATER= 39 YD³

DENOTES TEMPORARY FILL IN SURFACE WATERS
DENOTES FILL IN SURFACE WATERS

PAVEMENT REMOVAL



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PROJECT REFERENCE NO.	SHEET NO.
B-4063	4
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER

Permit Drawing
Sheet 7 of 7

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

CHATHAM COUNTY, NC
BRIDGE 20 ON NC 902
OVER SANDY BRANCH
5/30/07

ENGLISH

PROFILE ALONG EXISTING BRIDGE

DETAIL 'A'
SPECIAL CUT DITCH
(Not to Scale)

Type of Liner= Class 'A' Rip-Rap

LINE	STA. TO STA.	RIP RAP (TONS)	FILTER FABRIC (YD²)
-L-	13+75 – 15+00 LT.	40	197

DETAIL 'B'
SLOPE PROTECTION
(Not to Scale)

Type of Liner= Class 'B' Rip-Rap

LINE	STA. TO STA.	RIP RAP (TONS)	FILTER FABRIC (YD²)
-L-	18+65 – 19+40 LT.	35	75

DETAIL 'D'
CUT DITCH
(Not to Scale)

Min. D = 1.5 Ft.

LINE	STA. TO STA.
-L-	21+00 – 22+50 LT.

DETAIL 'E'
RIP RAP AT EMBANKMENT
(Not to Scale)

Type of Liner = Class I Rip-Rap W/ FF

LINE	STA. TO STA.	RIP RAP (TONS)	FILTER FABRIC (YD²)
-L-	22+60 – 22+75 LT.	16.0	19
-L-	23+00 – 23+10 LT.	12.0	13
-L-	22+80 – 23+00 RT.	21.0	25

DETAIL 'C'
LATERAL 'V' DITCH
(Not to Scale)

Type of Liner = Class 'B' Rip-Rap

LINE	STA. TO STA.	D.D.E. (YD³)	RIP RAP (TONS)	FILTER FABRIC (YD²)
-L-	18+50 – 19+35 RT.	54	45	110

DETAIL 'F'
LATERAL BASE DITCH
(Not to Scale)

Type of Liner = Class B Rip-Rap

LINE	STA. TO STA.	D.D.E. (YD³)	RIP RAP (TONS)	FILTER FABRIC (YD²)
-L-	23+00 – 24+25 RT.	65	70	190

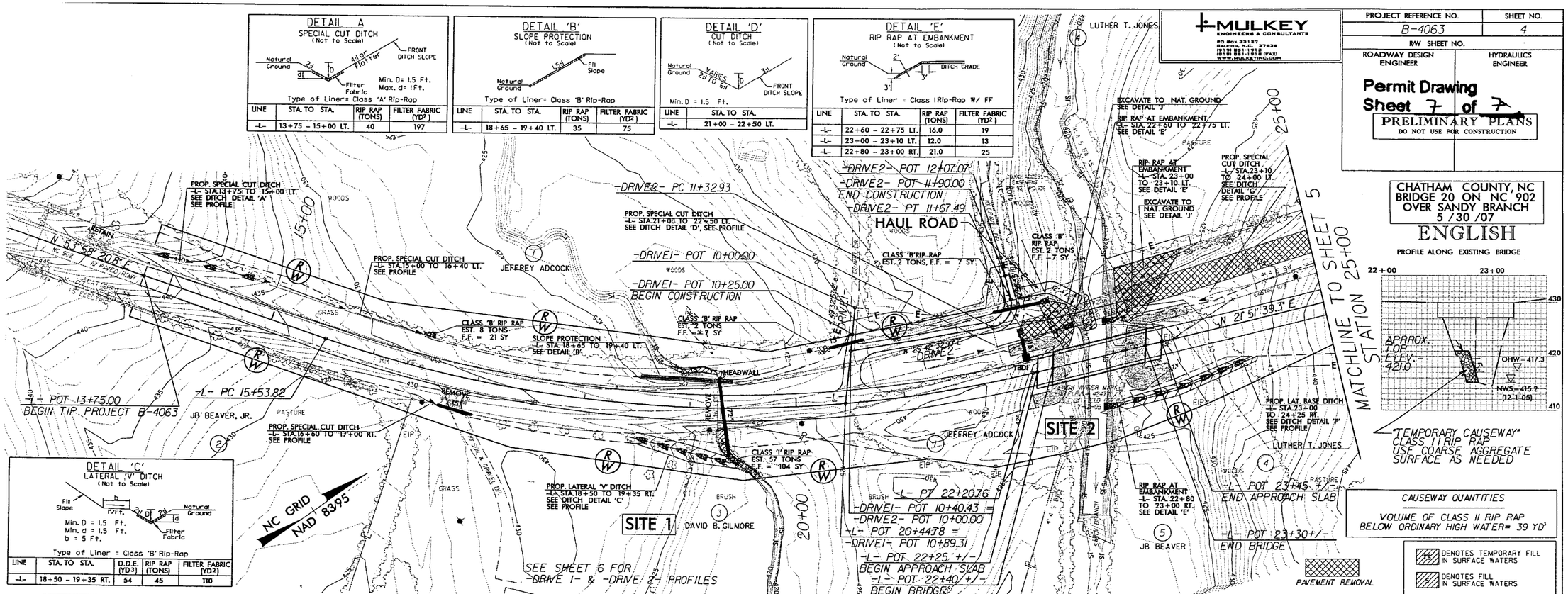
DETAIL 'G'
CUT DITCH
(Not to Scale)

Type of Liner = Class 'B' Rip-Rap

LINE	STA. TO STA.	RIP RAP (TONS)	FILTER FABRIC (YD²)
-L-	23+10 – 24+00 LT.	42	117

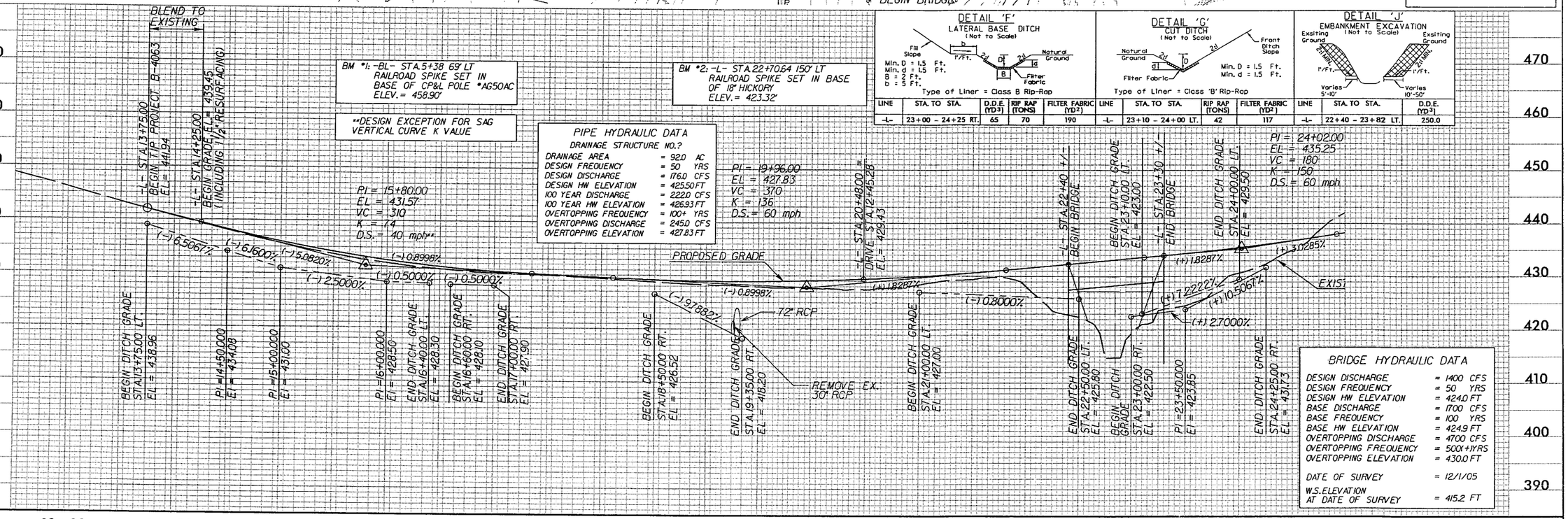
DETAIL 'J'
EMBANKMENT EXCAVATION
(Not to Scale)

LINE	STA. TO STA.	D.D.E. (YD³)
-L-	22+40 – 23+82 LT.	250.0



CAUSEWAY QUANTITIES

VOLUME OF CLASS II RIP RAP BELOW ORDINARY HIGH WATER= 39 YD³



PIPE HYDRAULIC DATA

DRAINAGE STRUCTURE NO.?

DRAINAGE AREA	= 92.0 AC
DESIGN FREQUENCY	= 50 YRS
DESIGN DISCHARGE	= 176.0 CFS
DESIGN HW ELEVATION	= 425.50 FT
100 YEAR DISCHARGE	= 222.0 CFS
100 YEAR HW ELEVATION	= 426.93 FT
OVERTOPPING FREQUENCY	= 100+ YRS
OVERTOPPING DISCHARGE	= 245.0 CFS
OVERTOPPING ELEVATION	= 427.83 FT

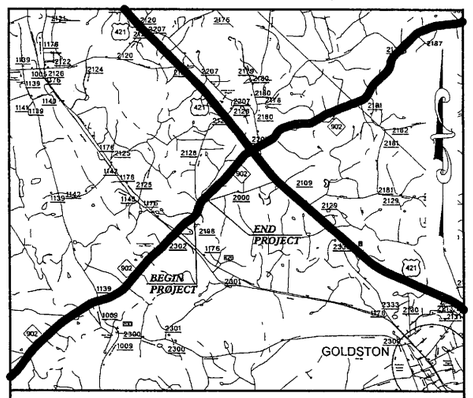
BRIDGE HYDRAULIC DATA

DESIGN DISCHARGE	= 1400 CFS
DESIGN FREQUENCY	= 50 YRS
DESIGN HW ELEVATION	= 424.0 FT
BASE DISCHARGE	= 1700 CFS
BASE FREQUENCY	= 100 YRS
BASE HW ELEVATION	= 424.9 FT
OVERTOPPING DISCHARGE	= 4700 CFS
OVERTOPPING FREQUENCY	= 500+YRS
OVERTOPPING ELEVATION	= 430.0 FT
DATE OF SURVEY	= 12/1/05
W.S. ELEVATION AT DATE OF SURVEY	= 415.2 FT

TIP: B-4063

CONTRACT:

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



VICINITY MAP
(NOT TO SCALE)

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

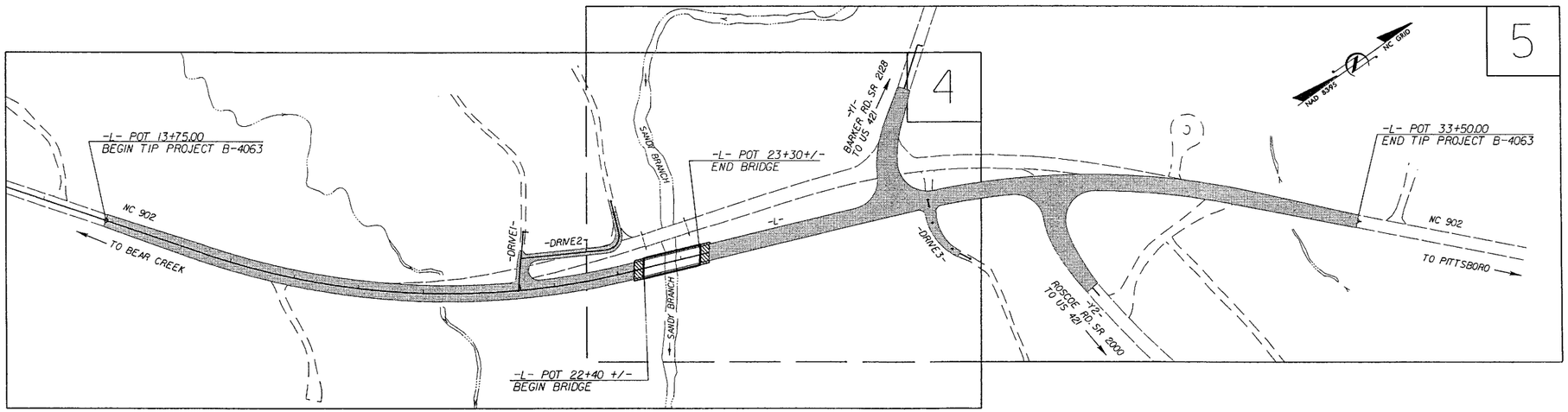
CHATHAM COUNTY

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-4063	1	

WBS NO.	F. A. PROJ. NO.	DESCRIPTION
33427.1.1	BRZ-902(3)	P.E.
33427.2.1	BRZ-902(3)	R/W, UTIL

LOCATION: BRIDGE NO. 20 OVER SANDY BRANCH AND APPROACHES ON NC 902

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



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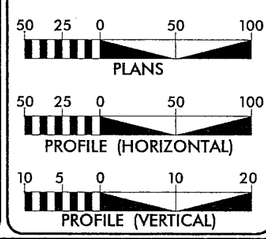
NCDOT CONTACT : DOUG TAYLOR, PE
PROJECT ENGINEER – ROADWAY DESIGN

THIS PROJECT IS NOT WITHIN ANY MUNICIPAL BOUNDARIES.

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

GRAPHIC SCALES



DESIGN DATA

ADT 2007 = 1725
ADT 2030 = 3350
DHV = 10 %
D = 60 %
T = 7 % *
V = 60 MPH
FUNCTION. = RURAL MAJOR
CLASS. COLLECTOR
* (TTST 4% + DUALS 3%)
**DESIGN EXCEPTION–
SAG VERTICAL CURVE
K VALUE

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT B-4063	=	0.357 MI
LENGTH STRUCTURE TIP PROJECT B-4063	=	0.017 MI
TOTAL LENGTH TIP PROJECT B-4063	=	0.374 MI

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

2006 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE: APRIL 20, 2007

LETTING DATE: APRIL 15, 2008

TIM S. HAYES, PE
PROJECT ENGINEER

JOHNNY R. BANKS
PROJECT MANAGER

HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
P.E.

SIGNATURE:

ROADWAY DESIGN ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
P.E.

SIGNATURE:

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

ART McMILLAN, P.E.
STATE HIGHWAY DESIGN ENGINEER

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Note: Not to Scale

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

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS
CONVENTIONAL SYMBOLS

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(919) 851-1918 (FAX)
www.mulkeyinc.com

PROJECT REFERENCE NO.	SHEET NO.
B-4063	1-B
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

BOUNDARIES AND PROPERTY:

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

BUILDINGS AND OTHER CULTURE:

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

HYDROLOGY:

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

RAILROADS:

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

RIGHT OF WAY:

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

ROADS AND RELATED FEATURES:

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

VEGETATION:

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

EXISTING STRUCTURES:

MAJOR:

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

MINOR:

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

UTILITIES:

POWER:

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

TELEPHONE:

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

WATER:

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

TV:

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

GAS:

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

SANITARY SEWER:

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

MISCELLANEOUS:

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

REVISIONS

10/25/05

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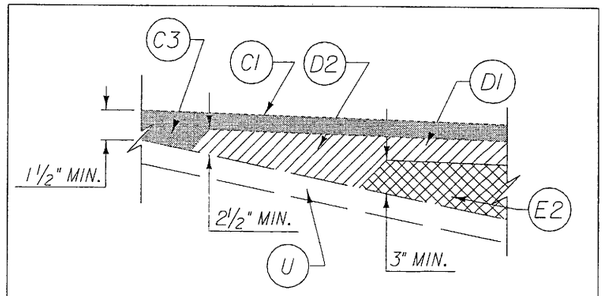
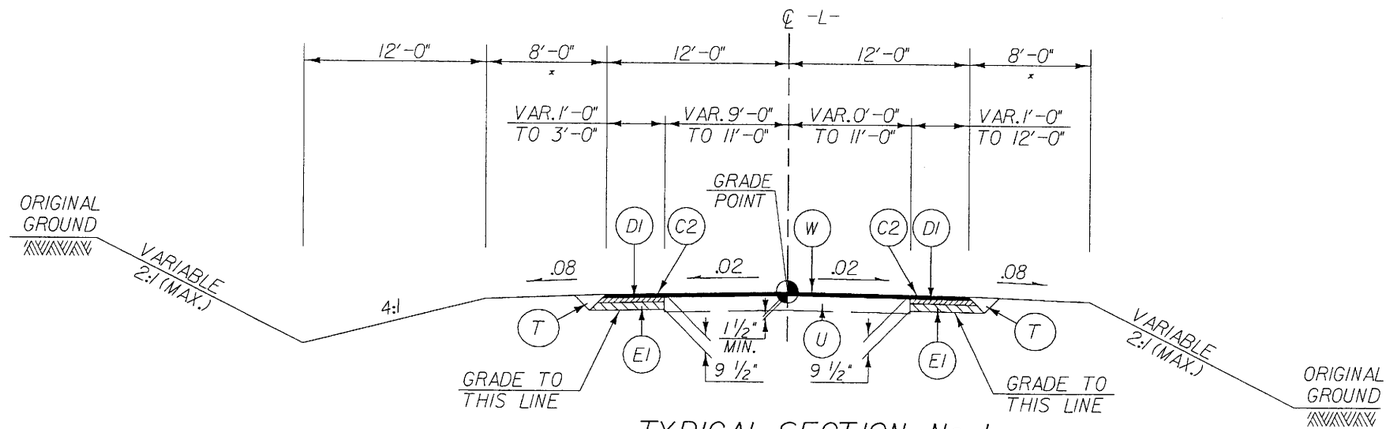
PAVEMENT SCHEDULE

C1	PROPOSED APPROX. 1 1/2" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YARD
C2	PROPOSED APPROX. 3 " ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YARD IN EACH OF TWO LAYERS.
C3	PROPOSED VARIABLE DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 112 LBS. PER SQ. YARD, PER 1" DEPTH, TO BE PLACED IN LAYERS NOT LESS THAN 1 1/2" OR GREATER THAN 2" IN DEPTH.
D1	PROPOSED APPROX. 2 1/2" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE 119.0B, AT AN AVERAGE RATE OF 285 LBS. PER SQ. YARD
D2	PROPOSED VARIABLE DEPTH ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE 119.0B, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YARD, PER 1" DEPTH, TO BE PLACED IN LAYERS NOT LESS THAN 2 1/2" OR GREATER THAN 4" IN DEPTH.
E1	PROPOSED APPROXIMATE 4" ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YARD.
E2	PROPOSED VARIABLE DEPTH ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YARD, PER 1" DEPTH, TO BE PLACED IN LAYERS NOT LESS THAN 3 " OR GREATER THAN 5 1/2" IN DEPTH.
J1	6" AGRREGATE BASE COURSE
J2	8" AGRREGATE BASE COURSE
T	EARTH MATERIAL
U	EXISTING PAVEMENT
W	WEDGING DETAIL

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



WEDGING DETAIL (W)



TYPICAL SECTION No. 1

x ADD 3'-0" FOR GUARDRAIL

USE TYPICAL SECTION No. 1 AS FOLLOWS:

TRANSITION FROM EXISTING TO T.S. NO. 1 FROM -L- STA. 13+75.00 TO STA. 14+25.00

FROM -L- STA. 14+25.00 TO STA. 20+30.00
FROM -L- STA. 28+50.00 TO -L- STA. 33+00.00

TRANSITION FROM T.S. NO. 1 TO EXISTING FROM -L- STA. 33+00.00 TO STA. 33+50.00

REVISIONS

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PROJECT REFERENCE NO.	SHEET NO.
B-4063	2
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

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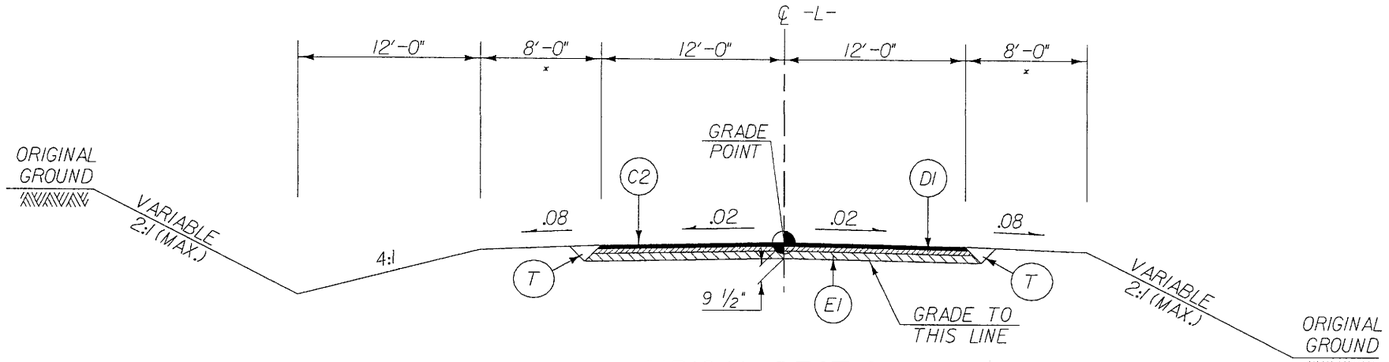
PROJECT REFERENCE NO.	SHEET NO.
B-4063	2-A
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

REVISIONS



TYPICAL SECTION No. 2

x ADD 3'-0" FOR GUARDRAIL

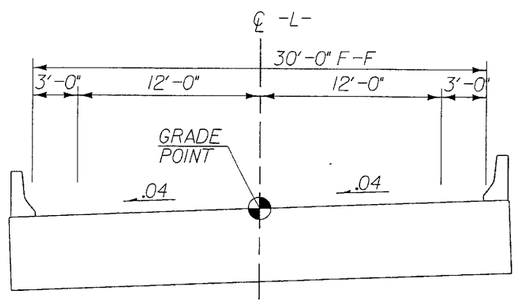
USE TYPICAL SECTION No. 2 AS FOLLOWS:
FROM -L- STA. 20+30 TO STA. 22+40 +/- (BEGIN BRIDGE)
FROM -L- STA. 23+30 +/- (END BRIDGE) TO -L- STA. 28+50

C1	1 1/2" S9.5B
C2	3" S9.5B
C3	VAR. DEPTH SF9.5B
D1	2 1/2" I19.0B
D2	VAR. DEPTH I19.0B
E1	4" B25.0B
E2	VAR. DEPTH B25.0B
J1	6" ABC
J2	8" ABC
T	EARTH MATERIAL
U	EXIST. PAVEMENT
W	WEDGING

NOTE:

1. SEE SHEET 2 FOR DETAILED DESCRIPTION OF PAVEMENT SCHEDULE

2. ALL PAVEMENT EDGES ARE 1:1 UNLESS OTHERWISE NOTED



TYPICAL SECTION No. 3

USE TYPICAL SECTION No. 3 AS FOLLOWS:
FROM -L- STA. 22+40 +/- (BEGIN BRIDGE) TO -L- STA. 23+30 +/- (END BRIDGE)

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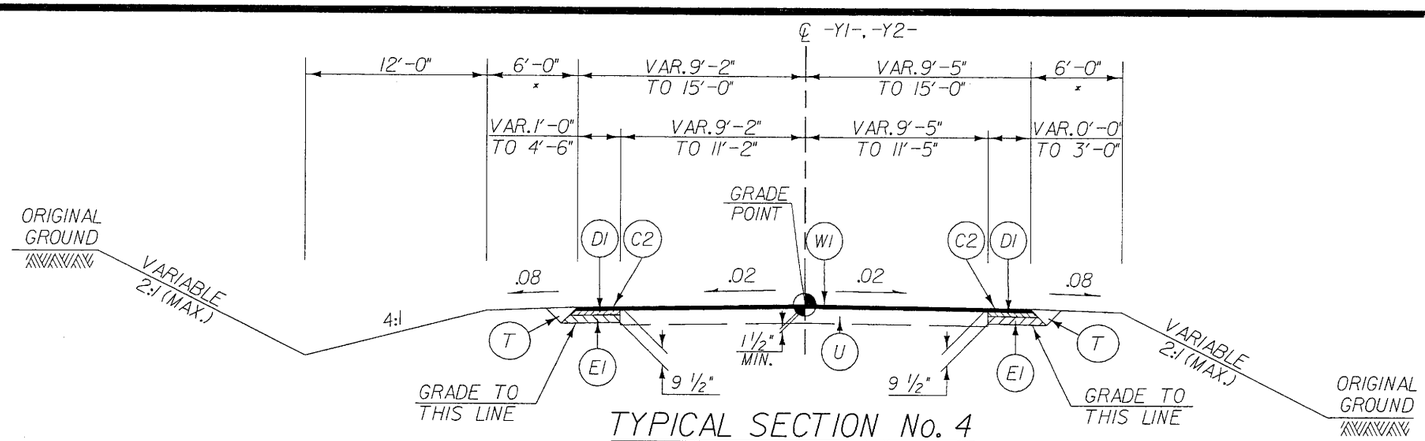
PROJECT REFERENCE NO.	SHEET NO.
B-4063	2-B
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

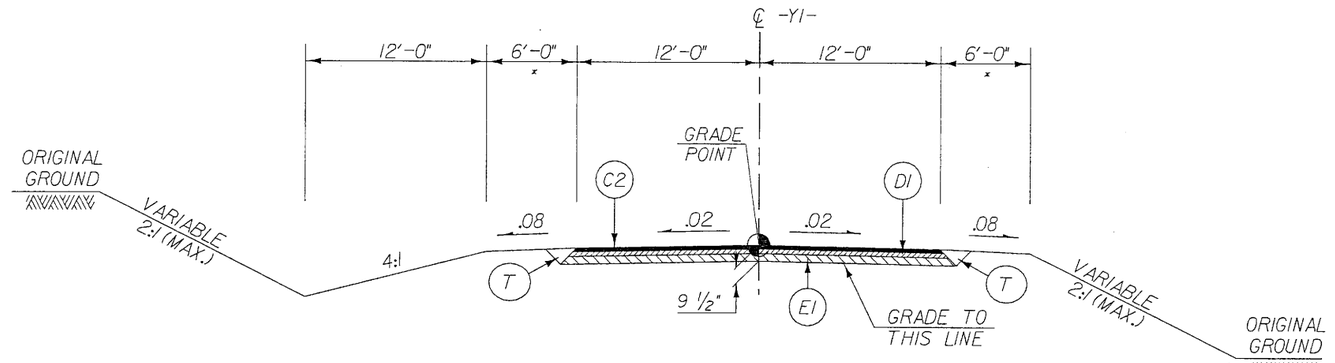
REVISIONS



TYPICAL SECTION No. 4

USE TYPICAL SECTION No.4 AS FOLLOWS:
TRANSITION FROM EXISTING TO T.S.NO.4 FROM -Y1- STA.10+70.00 TO STA.10+95.00
FROM -Y1- STA.10+95.00 TO STA.11+09
FROM -Y2- STA.10+78 TO STA.11+50.00
TRANSITION FROM EXISTING TO T.S.NO.4 FROM -Y2- STA.11+50.00 TO STA.11+75.00

x ADD 3'-0" FOR GUARDRAIL



TYPICAL SECTION No. 5

x ADD 3'-0" FOR GUARDRAIL

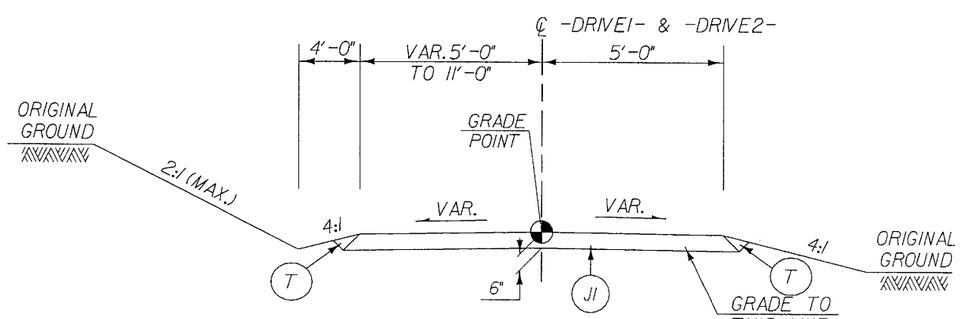
USE TYPICAL SECTION No.5 AS FOLLOWS:
FROM -Y1- STA.11+09 TO STA.11+83

C1	1½" S9.5B
C2	3" S9.5B
C3	VAR. DEPTH SF9.5B
D1	2½" I19.0B
D2	VAR. DEPTH I19.0B
E1	4" B25.0B
E2	VAR. DEPTH B25.0B
J1	6" ABC
J2	8" ABC
T	EARTH MATERIAL
U	EXIST. PAVEMENT
W	WEDGING

NOTE:

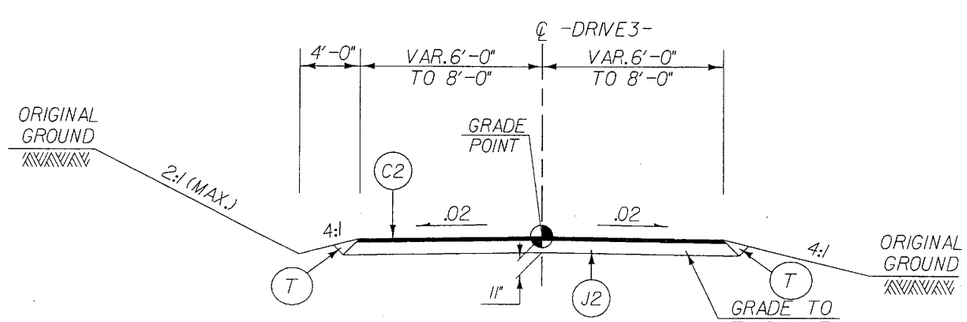
1. SEE SHEET 2 FOR DETAILED DESCRIPTION OF PAVEMENT SCHEDULE

2. ALL PAVEMENT EDGES ARE 1:1 UNLESS OTHERWISE NOTED



TYPICAL SECTION No. 5

USE TYPICAL SECTION No.5 AS FOLLOWS:
FROM -DRIVE1- STA.10+25.00 TO STA.10+77 +/-
FROM -DRIVE2- STA.10+23 +/- TO STA.11+90.00



TYPICAL SECTION No. 6

USE TYPICAL SECTION No.6 AS FOLLOWS:
FROM -DRIVE3- STA.10+12 TO STA.11+00.00

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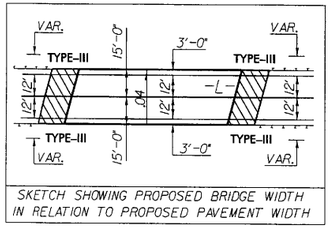
PROJECT REFERENCE NO.	SHEET NO.
B-4063	4
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

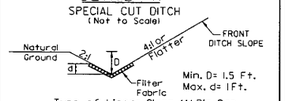
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

REVISIONS



SKETCH SHOWING PROPOSED BRIDGE WIDTH IN RELATION TO PROPOSED PAVEMENT WIDTH

DETAIL 'A'
SPECIAL CUT DITCH
(Not to Scale)

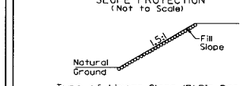


Min. D= 1.5 Ft.
Max. d= 1Ft.

Type of Liner= Class 'A' Rip-Rap

LINE	STA. TO STA.	RIP RAP (TONS)	FILTER FABRIC (YD²)
-L-	13+75 - 15+00 LT.	40	197

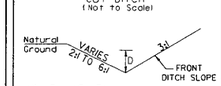
DETAIL 'B'
SLOPE PROTECTION
(Not to Scale)



Type of Liner= Class 'B' Rip-Rap

LINE	STA. TO STA.	RIP RAP (TONS)	FILTER FABRIC (YD²)
-L-	18+65 - 19+40 LT.	35	75

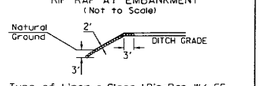
DETAIL 'D'
CUT DITCH
(Not to Scale)



Min. D = 1.5 Ft.

LINE	STA. TO STA.
-L-	21+00 - 22+50 LT.

DETAIL 'E'
RIP RAP AT EMBANKMENT
(Not to Scale)



Type of Liner = Class I Rip-Rap W/ FF

LINE	STA. TO STA.	RIP RAP (TONS)	FILTER FABRIC (YD²)
-L-	22+60 - 22+75 LT.	16.0	19
-L-	23+00 - 23+10 LT.	12.0	13
-L-	22+80 - 23+00 RT.	21.0	25

-L-
PI Sta 18+96.30
Δ = 32° 06' 41.5" (LT)
D = 4° 48' 53.2"
L = 666.94'
T = 342.48'
R = 1,190.00'
Se = 0.04
D.S. = 55 mph

-DRIVE2-
PI Sta 11+55.56
Δ = 94° 17' 52.0" (LT)
D = 272° 50' 13.4"
L = 34.56'
T = 22.64'
R = 21.00'

BM #2:
-L- STA. 22+70.64, 153.44' LT.
ELEV. = 423.32
RR SPIKE IN BASE OF 18" HICKORY TREE

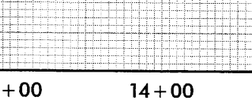
BM #1:
-BL- STA. 5+38 69' LT
RAILROAD SPIKE SET IN BASE OF CP&L POLE #AG50AC
ELEV. = 458.90'

**DESIGN EXCEPTION FOR SAG VERTICAL CURVE K VALUE

PIPE HYDRAULIC DATA
DRAINAGE STRUCTURE NO.?

DRAINAGE AREA	= 92.0 AC
DESIGN FREQUENCY	= 50 YRS
DESIGN DISCHARGE	= 176.0 CFS
DESIGN HW ELEVATION	= 425.50 FT
100 YEAR DISCHARGE	= 222.0 CFS
100 YEAR HW ELEVATION	= 426.93 FT
OVERTOPPING FREQUENCY	= 100+ YRS
OVERTOPPING DISCHARGE	= 245.0 CFS
OVERTOPPING ELEVATION	= 427.83 FT

DETAIL 'C'
LATERAL 'V' DITCH
(Not to Scale)

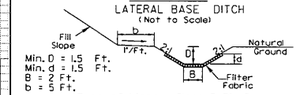


Min. D = 1.5 Ft.
Min. d = 1.5 Ft.
b = 5 Ft.

Type of Liner = Class 'B' Rip-Rap

LINE	STA. TO STA.	D.D.E. (YD3)	RIP RAP (TONS)	FILTER FABRIC (YD²)
-L-	18+50 - 19+35 RT.	54	45	110

DETAIL 'F'
LATERAL BASE DITCH
(Not to Scale)

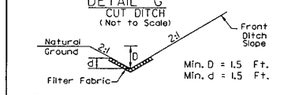


Min. D = 1.5 Ft.
Min. d = 1.5 Ft.
B = 2 Ft.
b = 5 Ft.

Type of Liner = Class B Rip-Rap

LINE	STA. TO STA.	D.D.E. (YD3)	RIP RAP (TONS)	FILTER FABRIC (YD²)
-L-	23+00 - 24+25 RT.	65	70	190

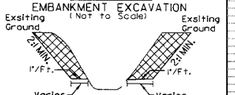
DETAIL 'G'
CUT DITCH
(Not to Scale)



Type of Liner = Class 'B' Rip-Rap

LINE	STA. TO STA.	RIP RAP (TONS)	FILTER FABRIC (YD²)
-L-	23+10 - 24+00 LT.	42	117

DETAIL 'J'
EMBANKMENT EXCAVATION
(Not to Scale)



LINE	STA. TO STA.	D.D.E. (YD3)
-L-	22+40 - 23+82 LT.	250.0

BRIDGE HYDRAULIC DATA

DESIGN DISCHARGE	= 1400 CFS
DESIGN FREQUENCY	= 50 YRS
DESIGN HW ELEVATION	= 424.0 FT
BASE DISCHARGE	= 1700 CFS
BASE FREQUENCY	= 100 YRS
BASE HW ELEVATION	= 424.9 FT
OVERTOPPING DISCHARGE	= 4700 CFS
OVERTOPPING FREQUENCY	= 500(+)YRS
OVERTOPPING ELEVATION	= 430.0 FT
DATE OF SURVEY	= 12/1/05
W.S. ELEVATION AT DATE OF SURVEY	= 415.2 FT

PAVEMENT REMOVAL

SEE SHEET 6 FOR -DRIVE 1- & -DRIVE 2- PROFILES

MATCHLINE TO SHEET 5 STATION 25+00

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PROJECT REFERENCE NO.	SHEET NO.
B-4063	5
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

NC GRID
NAD 83/95

TRAFFIC DIAGRAM

1700 3400	200 400	-Y1- SR 2128	400 800
NC 902		-L-	1700 3400

ADT 2007
ADT 2030

TRAFFIC DIAGRAM

NC 902			-L-
1700 3400	30 60	30 60	1700 3400
-Y2- SR 2000		60 100	

ADT 2007
ADT 2030

-L-
PI Sta 29+16.70
Δ = 24° 51' 08.3" (RT)
D = 4° 48' 53.2"
L = 516.17'
T = 262.21'
R = 1,190.00'
Se = 0.04
D.S. = 55 mph

-Y1-
PI Sta 11+80.67
Δ = 30° 39' 10.2" (LT)
D = 28° 38' 52.4"
L = 107.00'
T = 54.81'
R = 200.00'
Se = EXIST.
D.S. = 25 mph

-Y2-
PI Sta 10+65.96
Δ = 26° 21' 39.9" (LT)
D = 38° 11' 49.9"
L = 69.01'
T = 35.13'
R = 150.00'
Se = EXIST.
D.S. = 20 mph

PI Sta 11+46.14
Δ = 13° 49' 12.2" (LT)
D = 15° 00' 00.0"
L = 92.13'
T = 46.29'
R = 381.97'
Se = EXIST.
D.S. = 35 mph

PAVEMENT REMOVAL

-BY- 107 POT 5+00.00 =
-Y1- POT 10+01.28, 14.38' LT.
-Y1- POT 10+00.00
-Y1- POT 10+70.00
BEGIN CONSTRUCTION
-Y1- PC 11+25.86
-L- POC 26+54.50
-BL- 104
-PINC 21+16.55 =
-BY- 104 POT 6+83.97
-L- POT 26+15.20, 87.39' LT.
-Y1- PT 12+32.86
-L- POT: 26+35.00 =
-Y1- POT: 12+54.66
-L- POC 26+86.38 =
-DRIVE3- POT 10+00.00
-DRIVE3- PC Sta. 10+35.59
-DRIVE3- POC 10+79.41
END CONSTRUCTION
-DRIVE3- PT 10+87.36
-DRIVE3- POT 11+18.30
-Y2- PC 10+30.83
-Y2- POC 10+75.00
END CONSTRUCTION
-Y2- PT 11+91.98
-BL- 105 PINC 23+11.54 =
-L- POC 21+99.29, 54.13' LT.
-L- POC 28+75.00 =
-Y2- POT 10+00.00
-Y2- PCC 10+99.84
-L- PT 31+70.66
-L- POT 33+50.00
END TIP PROJECT B-4063
-L- POT 33+56.58
-BL- 106 POT 31+32.74

MATCHLINE TO SHEET 4
MATCHLINE TO SHEET 5

LUTHER T. JONES
DB 388 PG 607
PB 87 PG 354
PB 92 PG 106

JB BEAVER
DB JL PG 79
PB 87 PG 354
PB 88 PG 300

DAVID MABRY
DB 816 PG 96
PB 88 PG 300

HOMER PHILLIPS
DB 544 PG 272
PB 88 PG 300

RODNEY BESSERT
DB 842 PG 55
PB 88 PG 300

JB BEAVER
DB 496 PG 988
DB JL PG 79
PB 87 PG 354
PB 88 PG 300

CLASS 'B' RIP RAP
EST. 3 TONS, F.F. = 10 SY

CLASS 'B' RIP RAP
EST. 11 TONS, F.F. = 28 SY

CLASS 'B' RIP RAP
EST. 5 TONS
F.F. = 14 SY

PROP. SPECIAL CUT DITCH
-L- STA.29+20 TO 30+50 LT.
SEE PROFILE

PROP. SPECIAL CUT DITCH
-L- STA.29+50 TO 32+15 RT.
SEE PROFILE

PROP. SPECIAL CUT DITCH
-L- STA.31+50 TO 32+35 RT.
SEE PROFILE

PROP. SPECIAL CUT DITCH
-Y2- STA.10+50 TO 11+50 LT.
SEE PROFILE

PROP. SPECIAL
2' BASE DITCH
-Y2- STA.10+70
TO 11+40 RT.
SEE DITCH DETAIL 'I'
SEE PROFILE

PROP. COLLAR

RETAIN EXIST. DITCH

TOE PROTECTION
-L- STA. 32+15
TO 33+00 RT.
SEE DETAIL 'H'

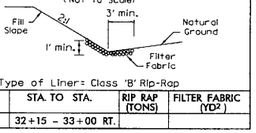
179.3' UNIFORM TAPER
(LT. & RT. EOP)

UNDERGROUND SEPTIC TANK
NOT IN USE

BM #3
ELEV.= 423.32
RR SPIKE IN BASE
OF 18" HICKORY TREE

SEE SHEET 6 FOR
-Y1- & -Y2- PROFILES

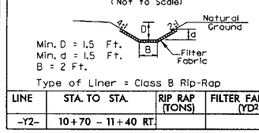
DETAIL 'H'
TOE PROTECTION
(Not to Scale)



Type of Liner: Class 'B' Rip-Rap

LINE	STA. TO STA.	RIP RAP (TONS)	FILTER FABRIC (YD²)
-L-	32+15 - 33+00 RT.		

DETAIL 'I'
LATERAL BASE DITCH
(Not to Scale)



Type of Liner = Class B Rip-Rap

LINE	STA. TO STA.	RIP RAP (TONS)	FILTER FABRIC (YD²)
-Y2-	10+70 - 11+40 RT.		

PROPOSED GRADE
EXISTING GROUND
REMOVE EX. 24" RCP
36" RCP

BEGIN DITCH GRADE
STA.29+20.00 LT.
EL = 447.00

PI = 29+50.000
EL = 447.16

BEGIN DITCH GRADE
STA.29+50.00 RT.
EL = 445.50

PI = 30+00.0000
EL = 450.00

END DITCH GRADE
STA.30+50.00 LT.
EL = 452.00

END DITCH GRADE
STA.30+50.00 RT.
EL = 450.69

BEGIN DITCH GRADE
STA.31+50.00 RT.
EL = 453.62

END DITCH GRADE
STA.32+15.00 RT.
EL = 452.32

-L- STA.26+35.00 =
-Y1- STA.12+54.66
EL.= 442.31

-L- STA.28+75.00 =
-Y2- STA.10+80.00
EL.= 449.58

(+) 3.0285%
(+) 0.5333%
(+) 5.6800%
(+) 4.0000%
(+) 2.9120%
(+) 5.1900%
(+) 2.9120%
(-) 2.0000%
(+) 3.3000%

PI = 30+00.00
EL = 453.36
VC = 200
K = 1717
D.S. = 80 mph ±

BM #3: -BL- STA.31+23 43' LT
RAILROAD SPIKE SET IN BASE
OF CEMC POLE
ELEV. = 469.84'

PI = 32+10.00
EL = 459.48
VC = 180
K = 464
D.S. = 80 mph ±

-L- STA.33+00.00
END GRADE EL = 462.45
(INCLUDING 1 1/2" RESURFACING)

-L- STA.33+50.00
END TIP PROJECT B-4063
EL.= 463.94

BLEND TO EXISTING

PIPE HYDRAULIC DATA
DRAINAGE STRUCTURE NO.?

DRAINAGE AREA	= 10.9	AC
DESIGN FREQUENCY	= 50	YRS
DESIGN DISCHARGE	= 34.6	CFS
DESIGN HW ELEVATION	= 442.63	FT
100 YEAR DISCHARGE	= 39.30	CFS
100 YEAR HW ELEVATION	= 442.87	FT
OVERTOPPING FREQUENCY	= 200+	YRS
OVERTOPPING DISCHARGE	= 95.0	CFS
OVERTOPPING ELEVATION	= 447.66	FT

PIPE HYDRAULIC DATA
DRAINAGE STRUCTURE NO.?

DRAINAGE AREA	= 4.30	AC
DESIGN FREQUENCY	= 50	YRS
DESIGN DISCHARGE	= 17.7	CFS
DESIGN HW ELEVATION	= 452.19	FT
100 YEAR DISCHARGE	= 19.8	CFS
100 YEAR HW ELEVATION	= 452.06	FT
OVERTOPPING FREQUENCY	= 200+	YRS
OVERTOPPING DISCHARGE	= 36.0	CFS
OVERTOPPING ELEVATION	= 455.15	FT

490 480 470 460 450 440 430 420 410

25+00 26+00 27+00 28+00 29+00 30+00 31+00 32+00 33+00 34+00

REVISIONS

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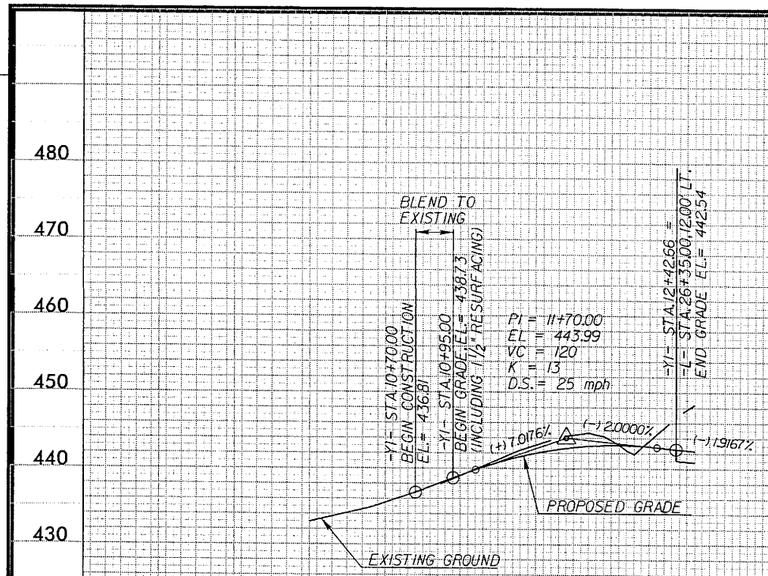
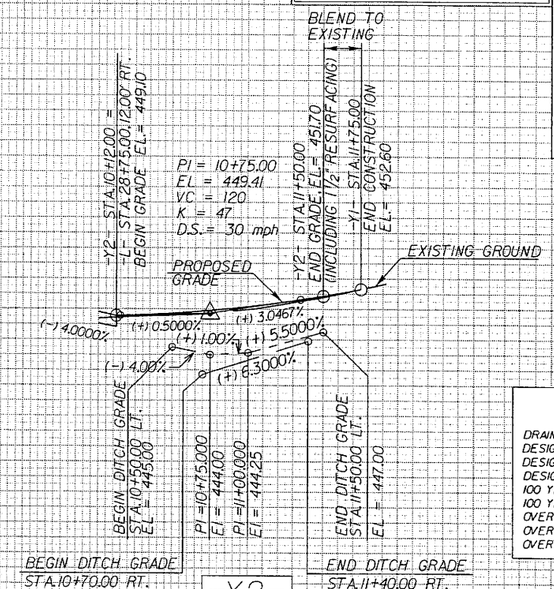
PROJECT REFERENCE NO.	SHEET NO.
B-4063	6
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

REVISIONS

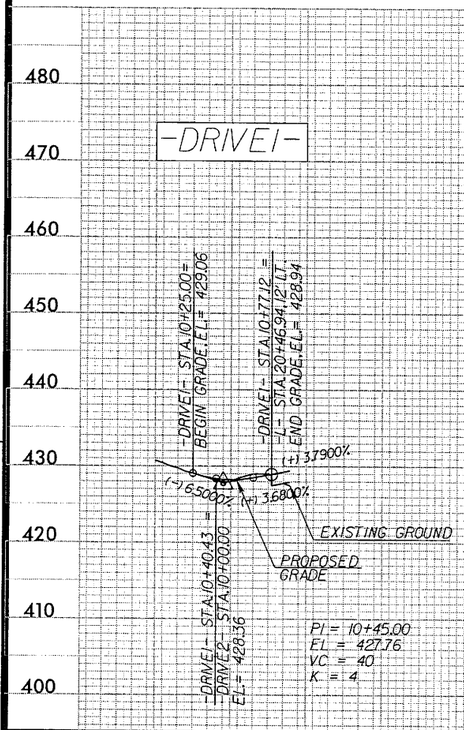


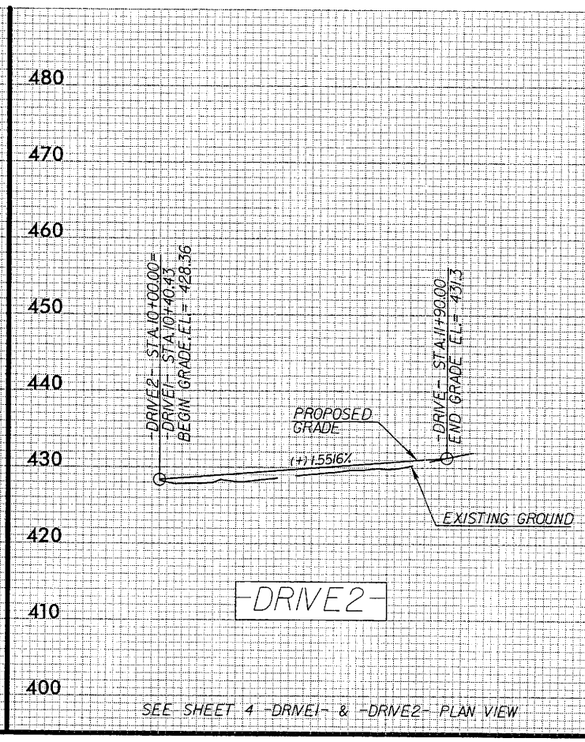


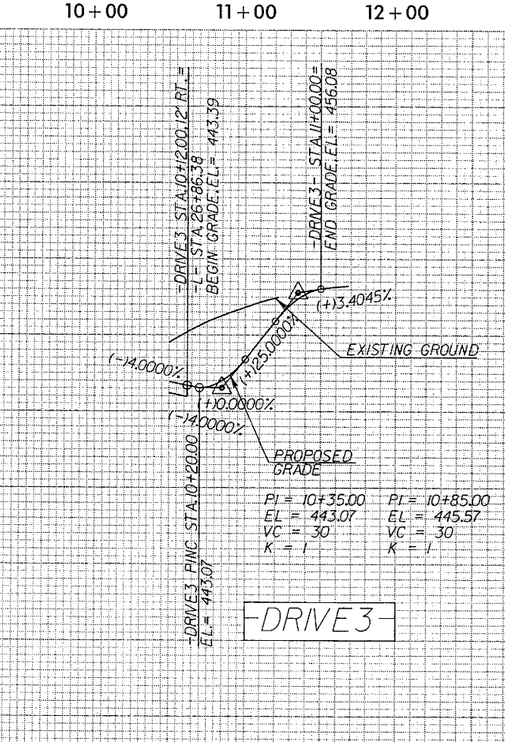
PIPE HYDRAULIC DATA
DRAINAGE STRUCTURE NO.?

DRAINAGE AREA	= 3.9	AC
DESIGN FREQUENCY	= 25	YRS
DESIGN DISCHARGE	= 12.2	CFS
DESIGN HW ELEVATION	= 445.86	FT
100 YEAR DISCHARGE	= 15.8	CFS
100 YEAR HW ELEVATION	= 446.22	FT
OVERTOPPING FREQUENCY	= 100+	YRS
OVERTOPPING DISCHARGE	= 35.0	CFS
OVERTOPPING ELEVATION	= 449.32	FT

SEE SHEET 5 -Y1- & -Y2- PLAN VIEW







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PROJ. REFERENCE NO.	SHEET NO.
B-4063	X-1

PRELIMINARY PLANS
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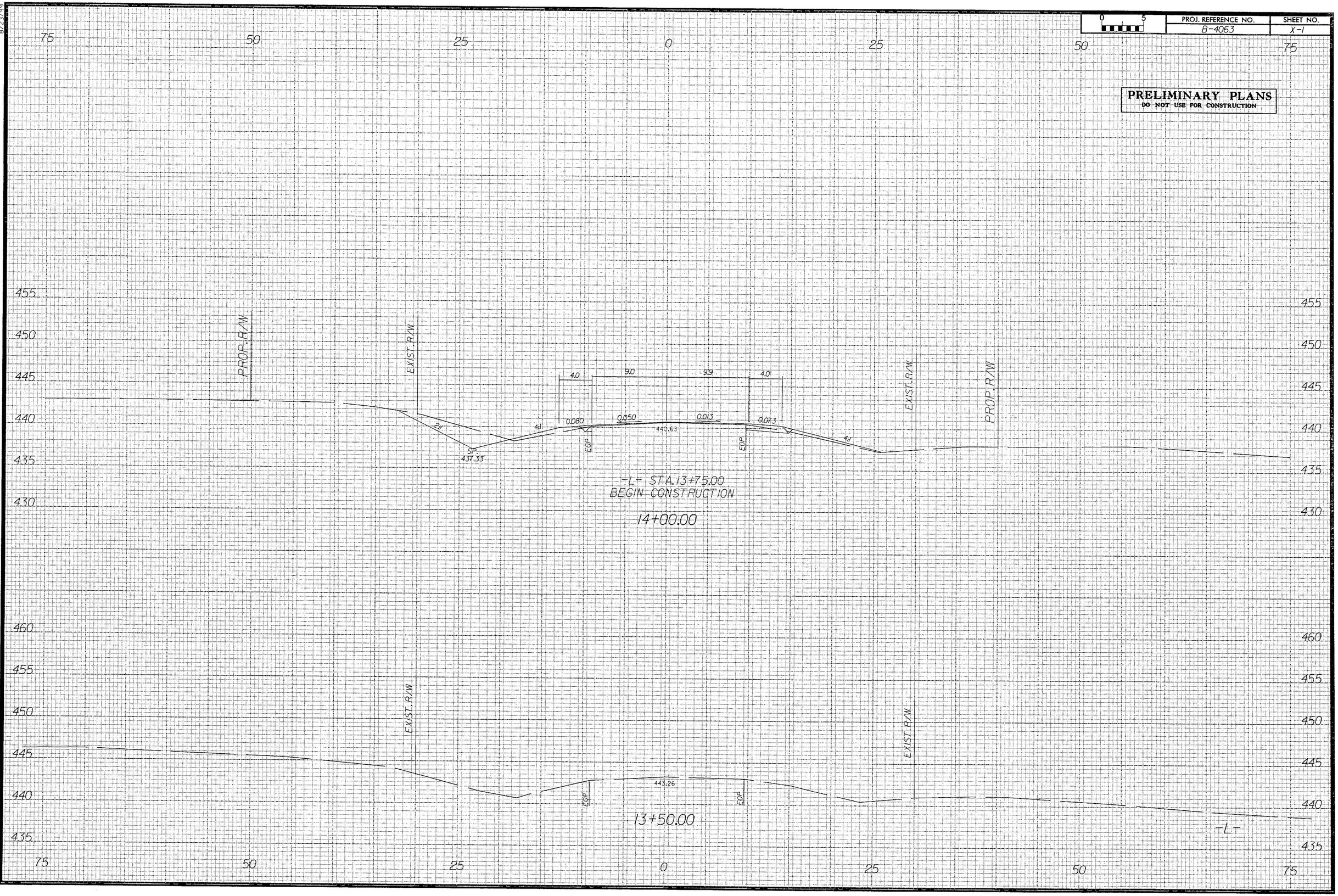

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PROJ. REFERENCE NO.	SHEET NO.
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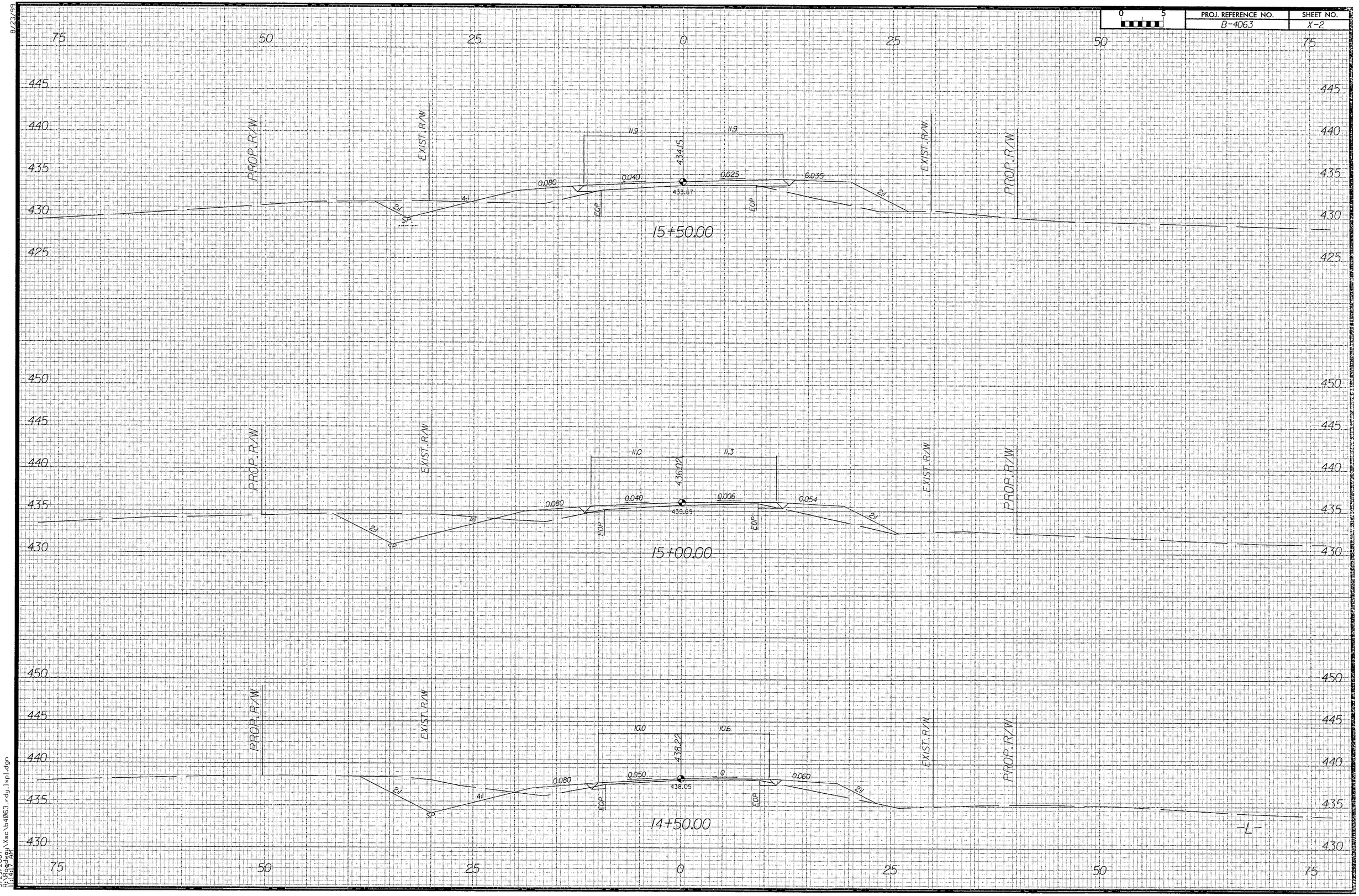

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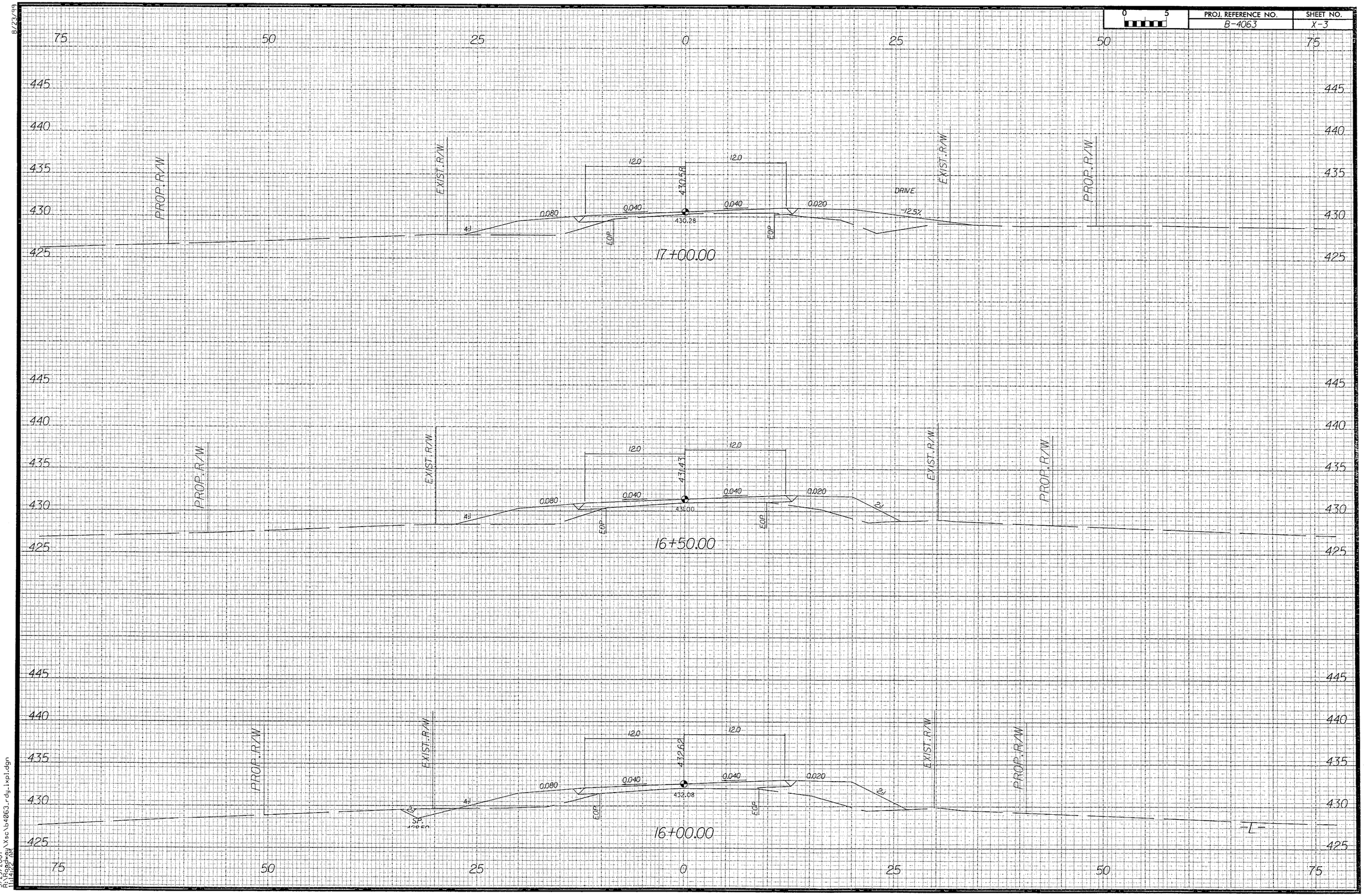

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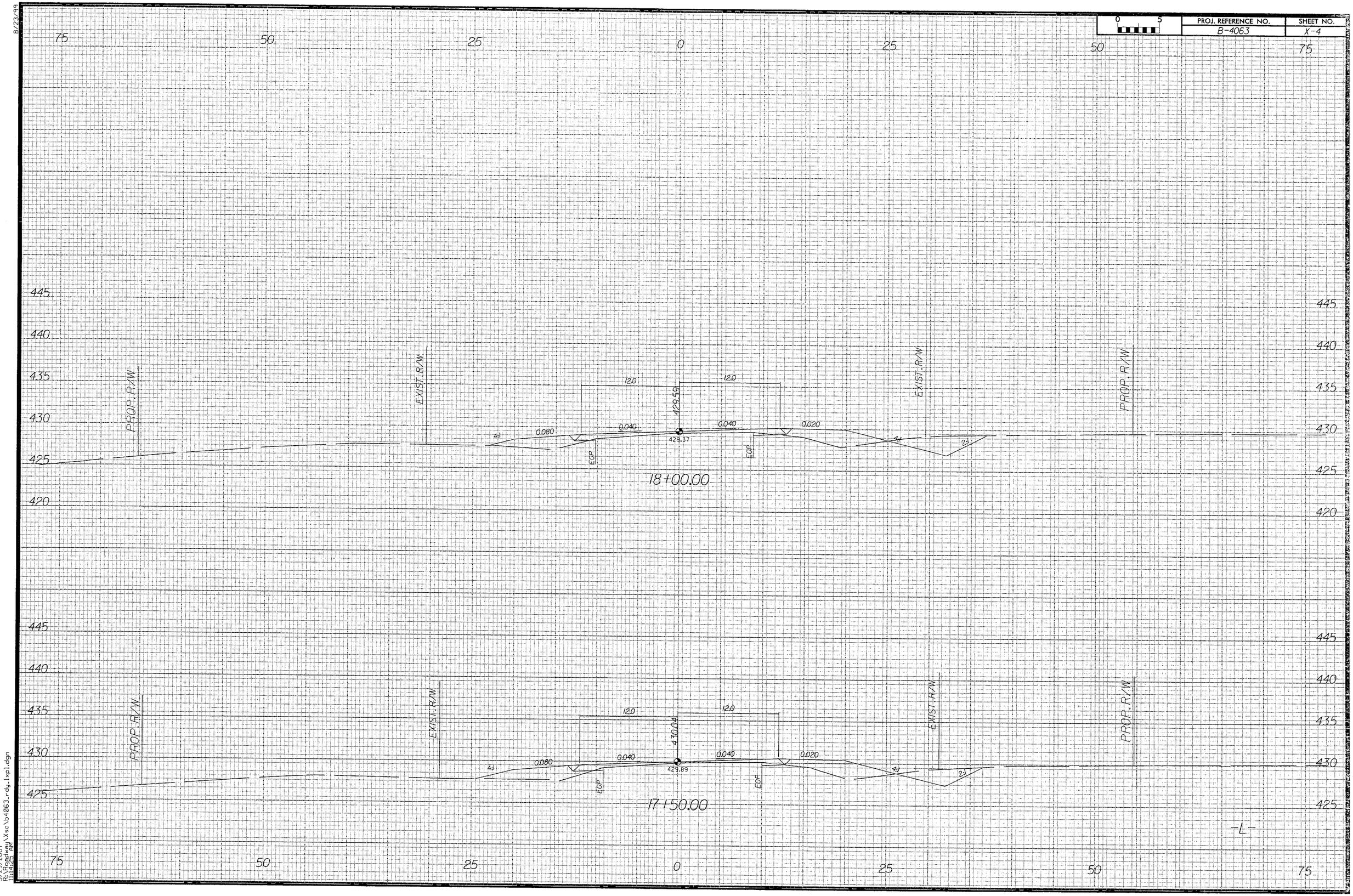

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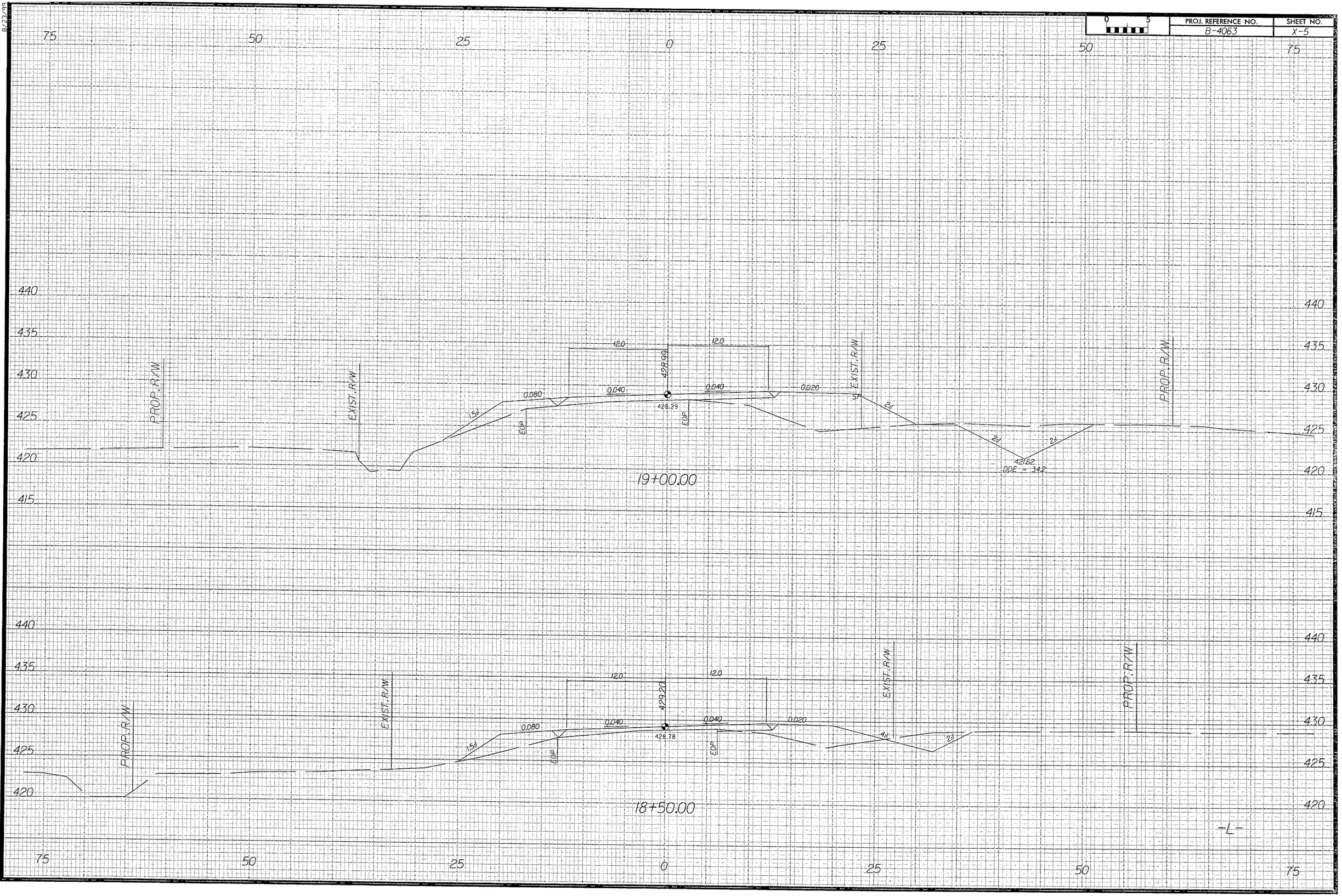

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PROJ. REFERENCE NO.	SHEET NO.
B-4063	X-6

0 5

445 440 435 430 425 420 415

75 50 25 0 25 50 75

PROP. R/W
EXIST. R/W
-DRIVE1- EOP
EOP
12.0
429.45
427.44
0.040
0.040
0.020
5%
2:1
20+50.00

PROP. R/W
EXIST. R/W
12.0
12.0
429.11
427.67
0.080
0.040
0.040
0.020
2:1
4:1
5%
2:1
EOP
EOP
20+00.00

PROP. R/W
EXIST. R/W
12.0
12.0
428.96
427.93
0.080
0.040
0.040
0.020
2:1
5%
2:1
EOP
EOP
19+50.00

-L-

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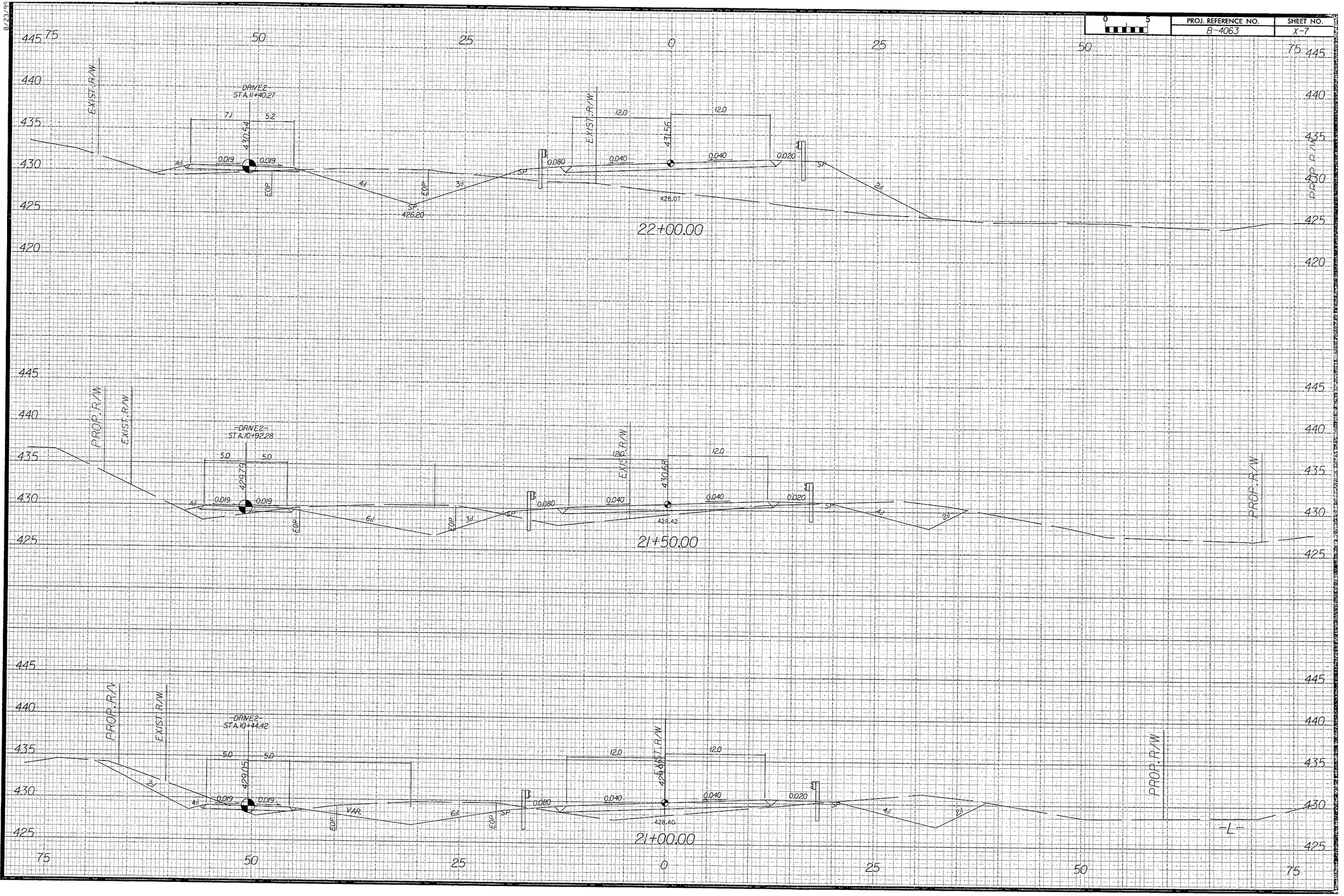
PROJ. REFERENCE NO.	SHEET NO.
B-4063	X-7

0 5



PROJ. REFERENCE NO.	SHEET NO.
B-4063	X-8

0 5

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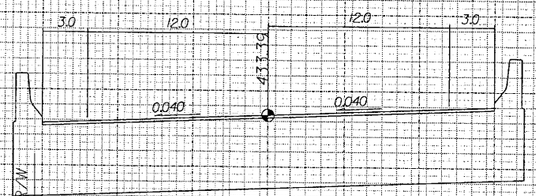
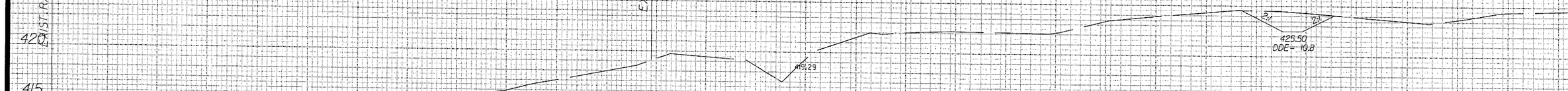
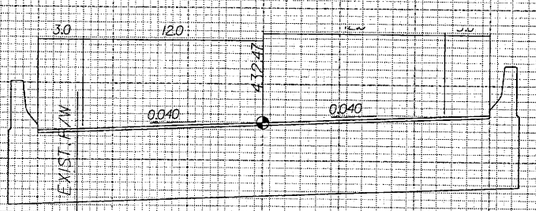
445 440 435 430 425 420 415 410

-L- STA. 23+30 +/-
END BRIDGE

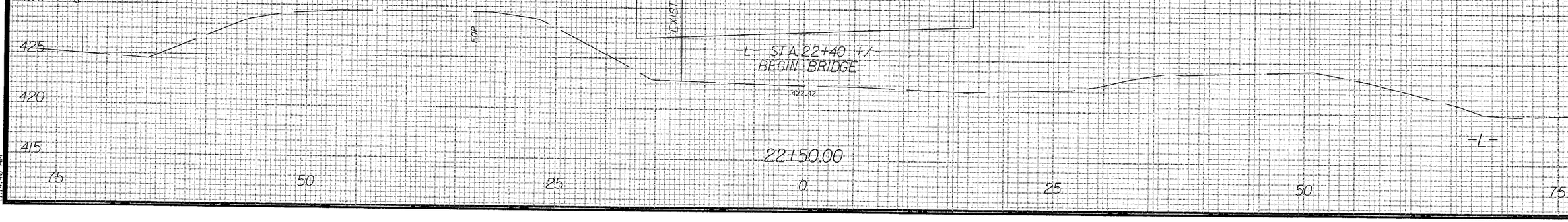




23+00.00



-L- STA. 22+40 +/-
BEGIN BRIDGE



22+50.00

75 50 25 0 25 50 75

8/23/99

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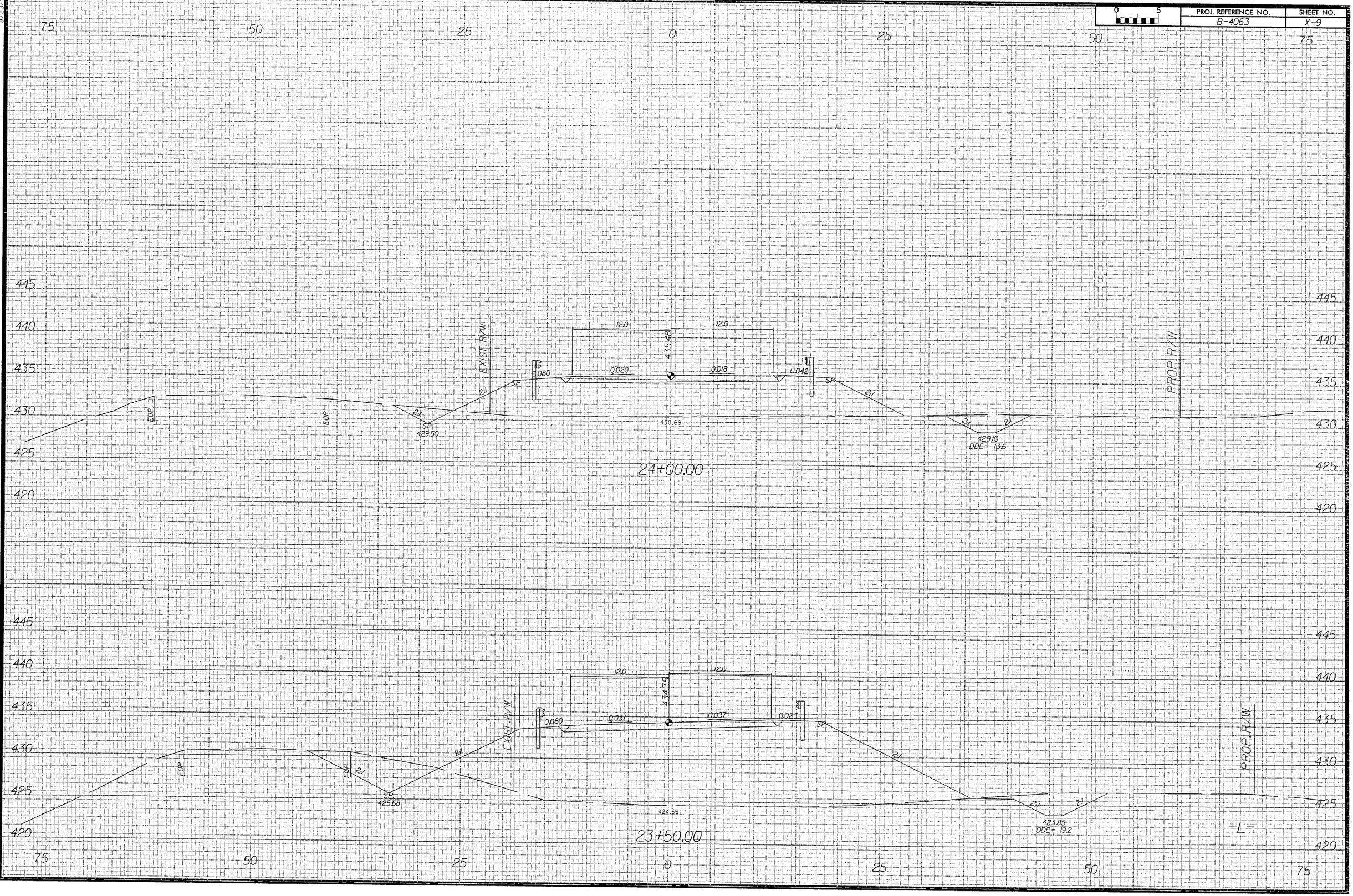

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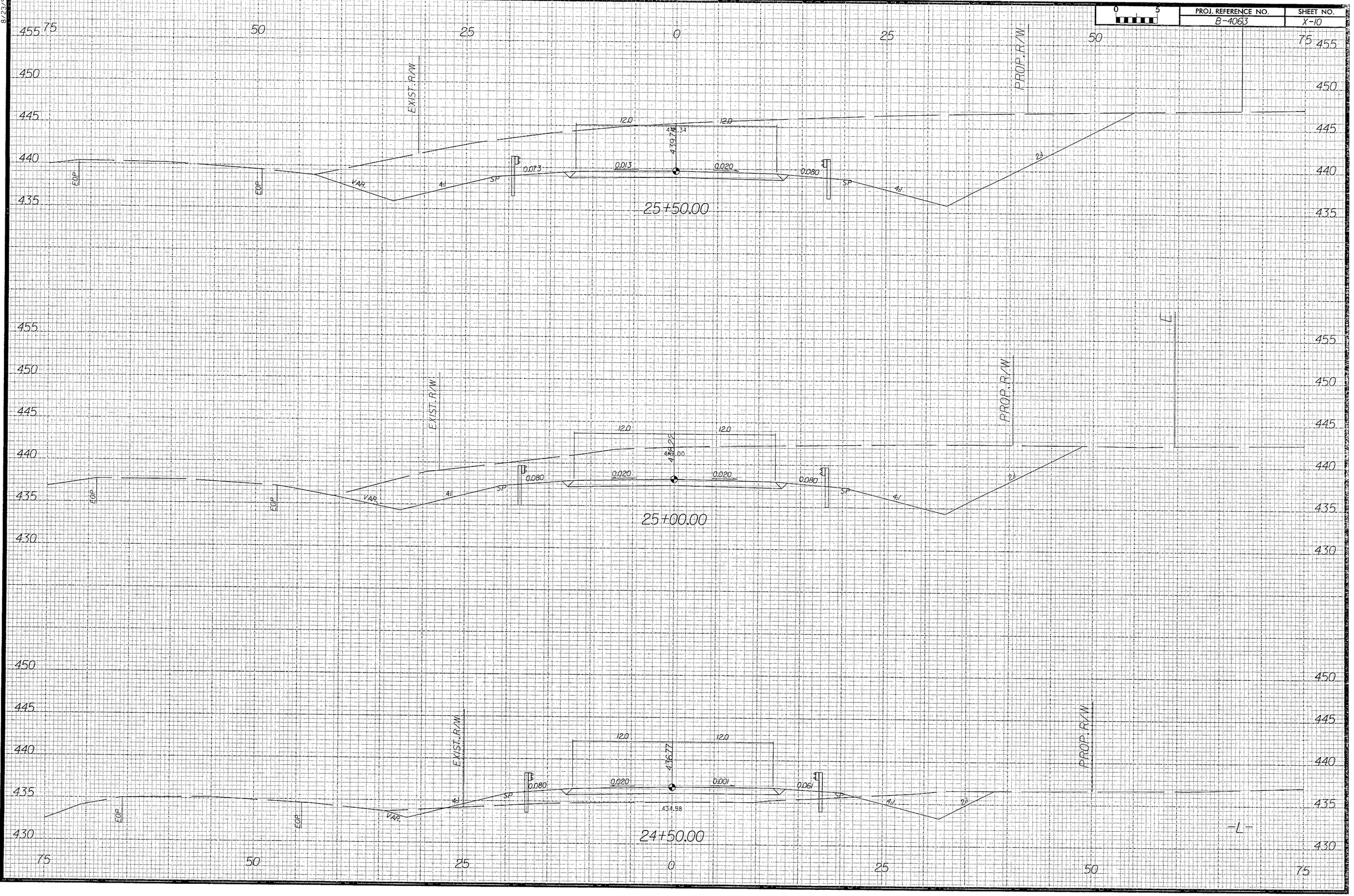

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PROJ. REFERENCE NO.	SHEET NO.
B-4063	X-11

0 5

75 50 25 0 25 50 75

465 460 455 450 445 440 435

EXIST. R/W

EOP

-Y1- EOP

12.0 12.0

448.72

449.72

0.025 0.025

0.080

4:1

2:1

PROP. R/W

℄

26+50.00

EXIST. R/W

EOP

-Y1- EOP

12.0 12.0

447.63

441.25

0.006 0.020

0.080

4:1

2:1

PROP. R/W

℄

26+00.00

-L-

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B-4063	X-12

0 5

75 50 25 0 25 50 75

465 460 455 450 445 440

EXIST. R/W

PROP. R/W

12.0 12.0

445.79

438.72

0.020 0.040 0.040 0.080

EOP 2% 4:1 4:1 2%

27+50.00

EXIST. R/W

PROP. R/W

12.0 12.0

442.98

438.78

0.020 0.040 0.040 0.080

EOP EOP 2% 4:1 4:1 DRIVE +25.0%

27+00.00

-L-

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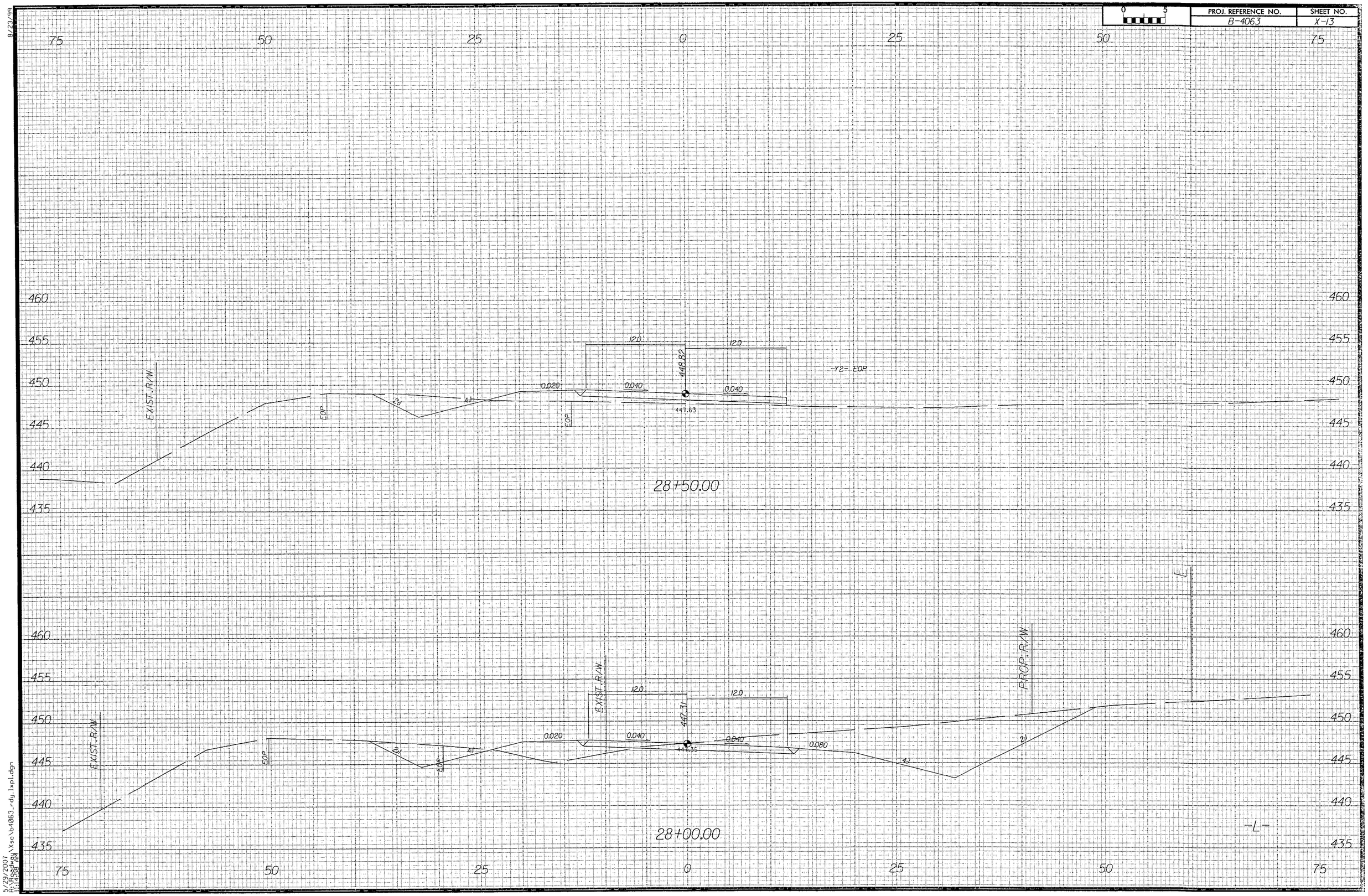

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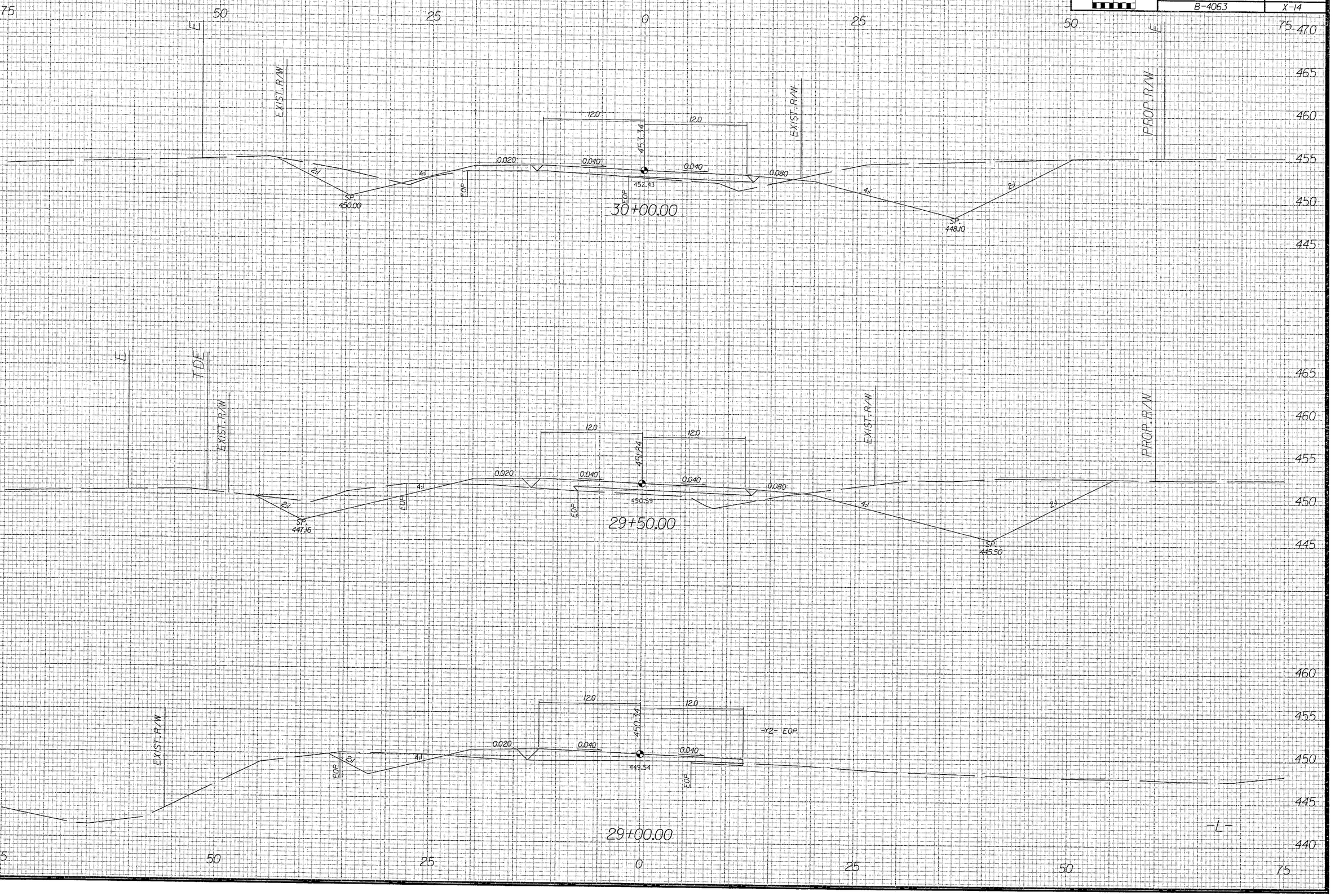
B-4063	X-14



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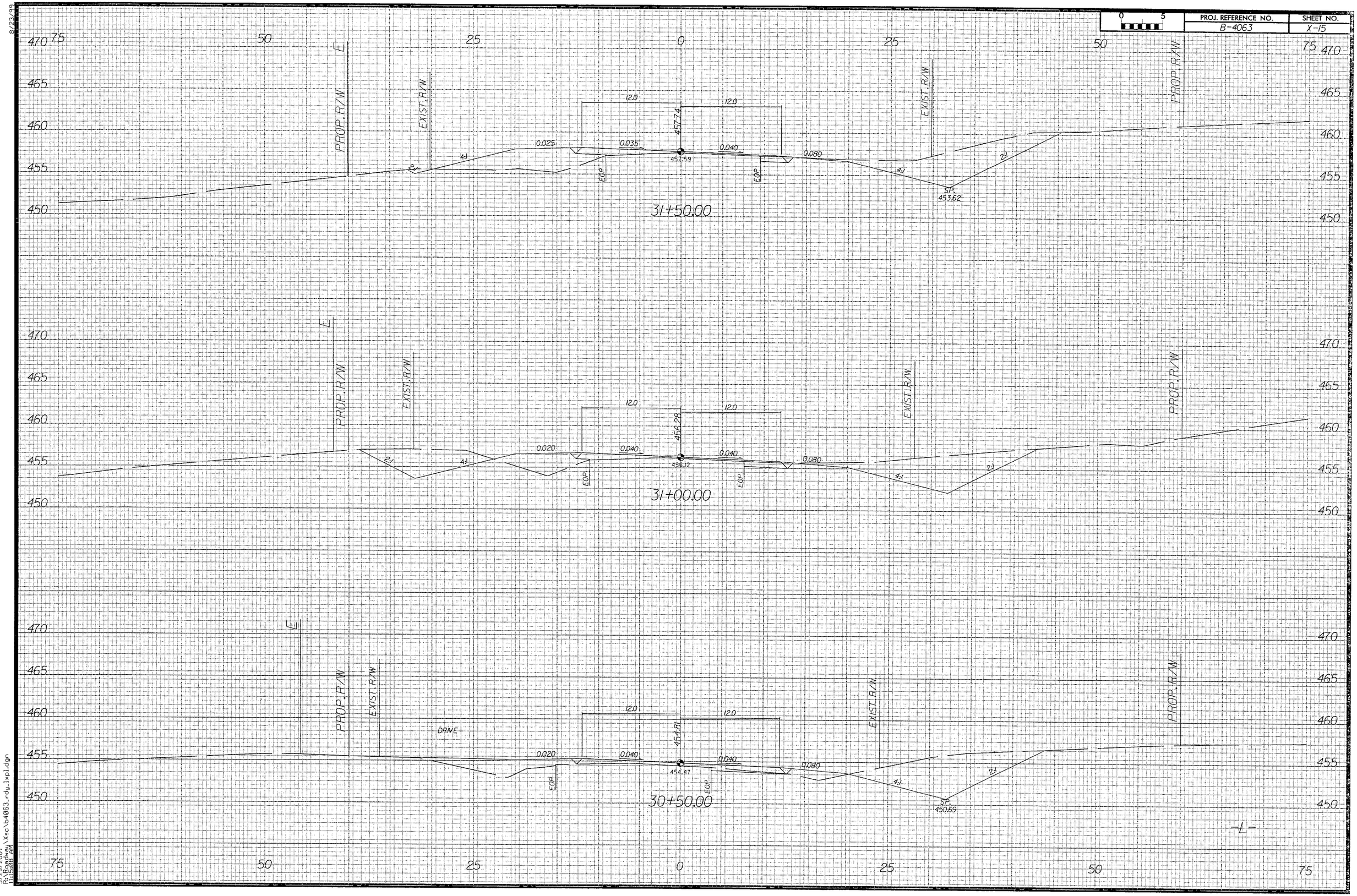

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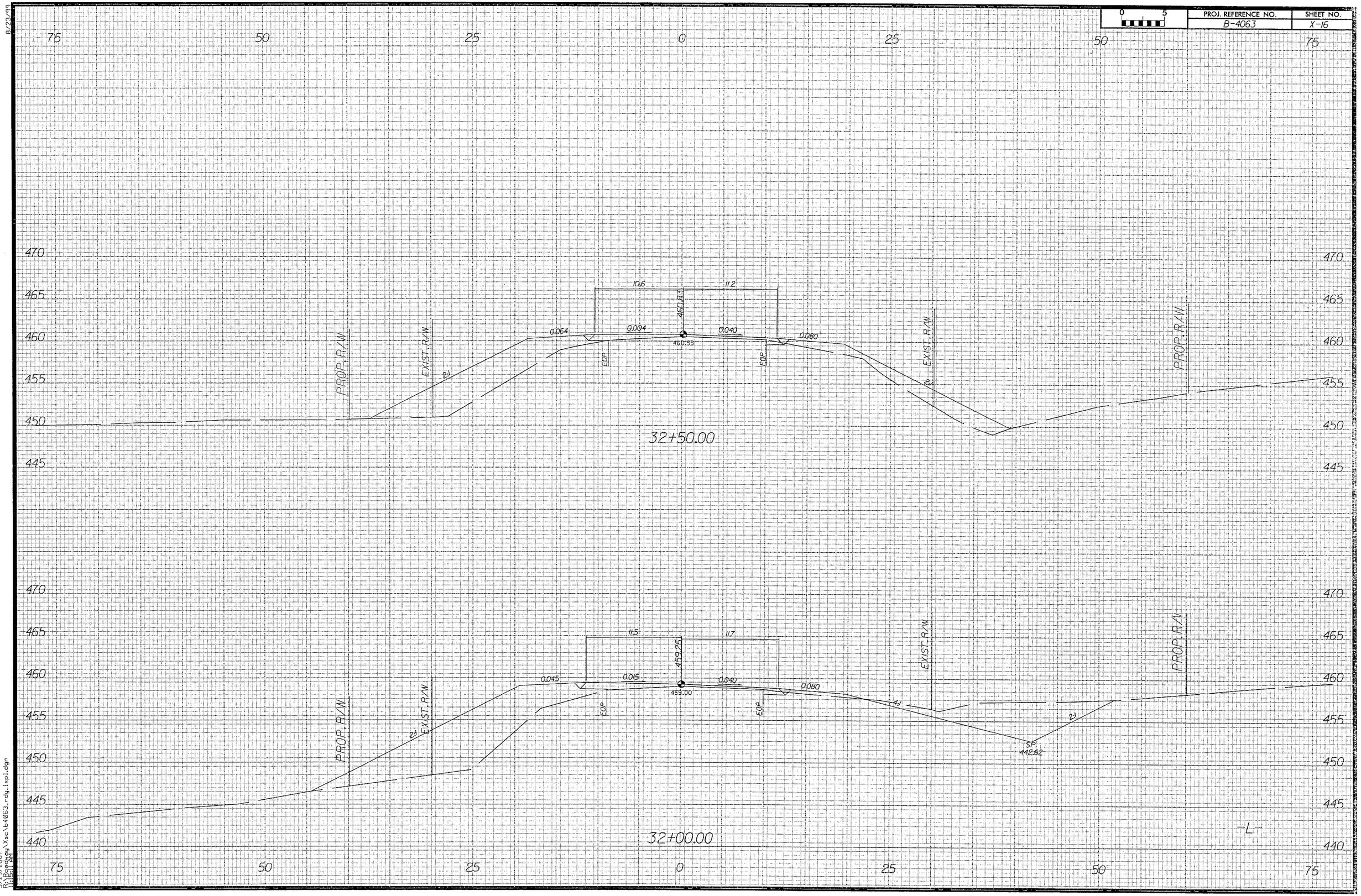

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PROJ. REFERENCE NO.	SHEET NO.
B-4063	X-17

0 5

75 50 25 0 25 50 75

480 475 470 465 460 455 450

-L- STA 33+50.00
END CONSTRUCTION

8.8 16.1

EXIST. R/W

463.96

EOP EOP

33+50.00

PROP. R/W EXIST. R/W

9.7 10.7

462.45

0.080 0.023 0.040 0.080

2% 2%

462.27

EOP EOP

33+00.00

EXIST. R/W PROP. R/W

-L-

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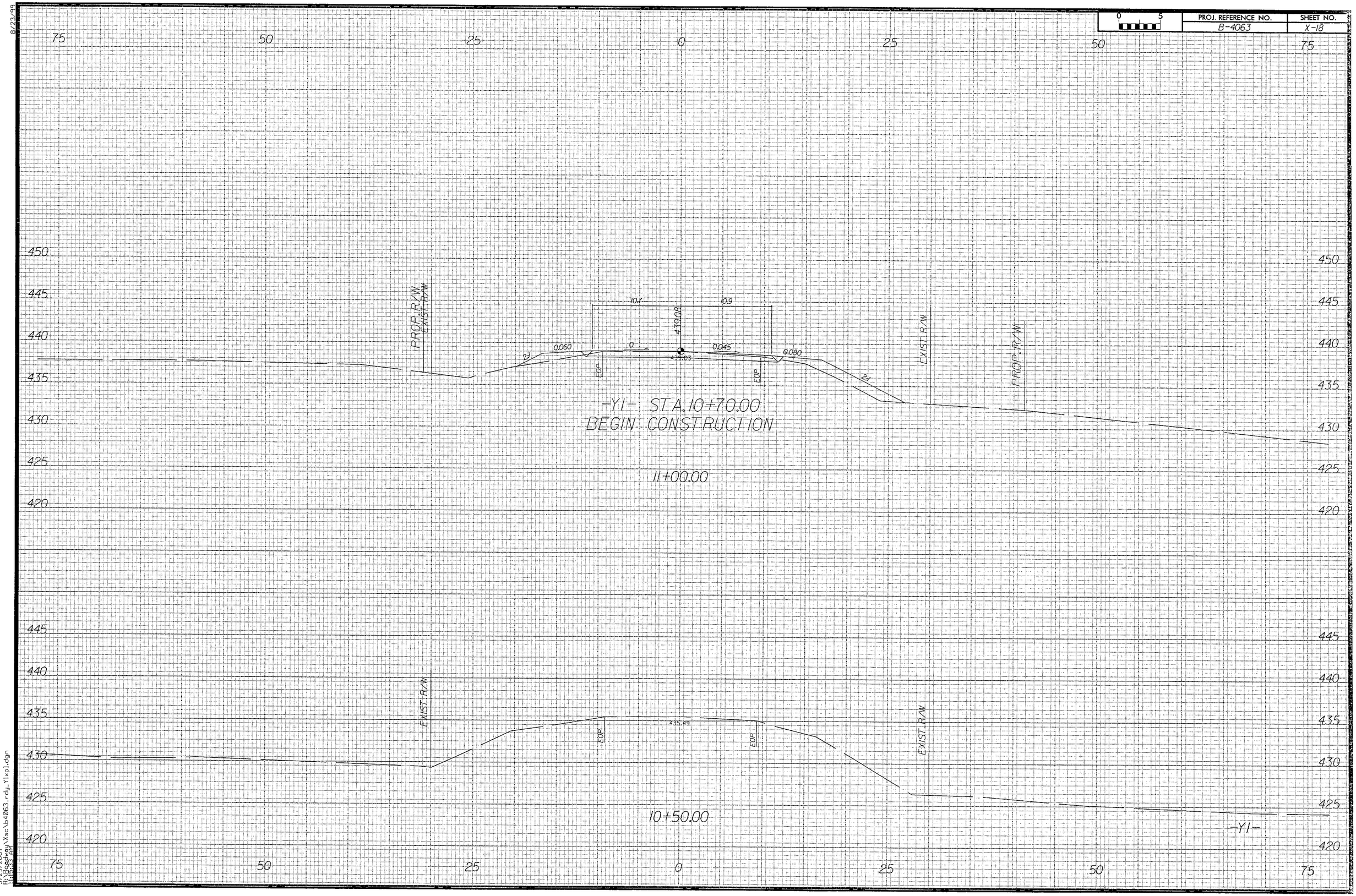

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75 50 25 0 25 50 75

455 450 445 440 435

17.0 15.0 443.06 0.053 0.005 0.020 0.078 2:1 4:1 5P 4:1 2:1

12+00.00

EXIST. R/W EXIST. R/W EXIST. R/W PROP. R/W

13.3 13.3 441.99 0.020 0.020 0.080 0.080 EOP EOP 2:1 4:1 4:1 2:1

11+50.00

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-Y1-

75 50 25 0 25 50 75

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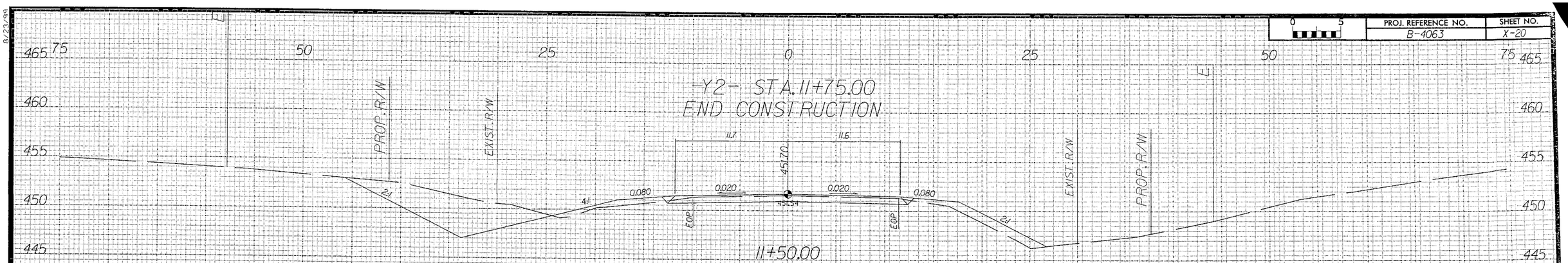

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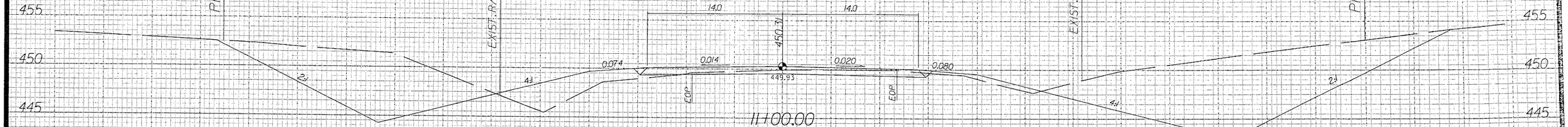

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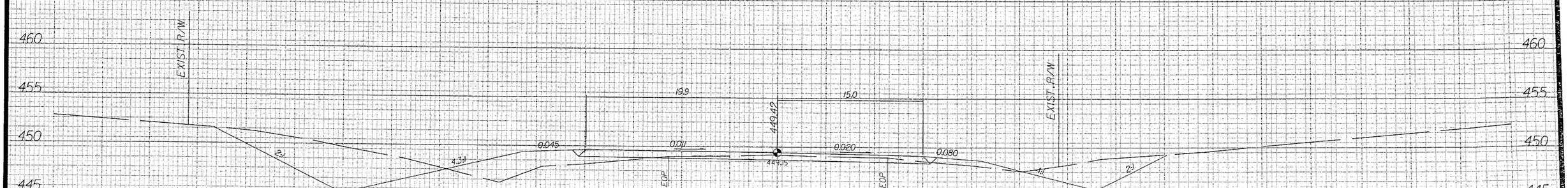

10+50.00

-Y2-

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NC 902
Bridge No. 20 Over Sandy Branch
Chatham County
Federal-Aid Project No. BRZ-902(3)
State Project No. 8.1522301
WBS No. 33427.1.1
T.I.P. No. B-4063

CATEGORICAL EXCLUSION

UNITED STATES DEPARTMENT OF TRANSPORTATION

FEDERAL HIGHWAY ADMINISTRATION

AND

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

DIVISION OF HIGHWAYS

APPROVED:

11/20/06
DATE

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

12/01/06
DATE

for John F. Sullivan, III, P.E.
Division Administrator
Federal Highway Administration

NC 902
Bridge No. 20 Over Sandy Branch
Chatham County
Federal-Aid Project No. BRZ-902(3)
State Project No. 8.1522301
WBS No. 33427.1.1
T.I.P. No. B-4063

CATEGORICAL EXCLUSION

November 2006

Document Prepared by:
Mulkey Engineers & Consultants
Cary, North Carolina

11-17-06
Date

J. A. Bissett, Jr., P.E.
Vice President

11-17-06
Date

Nicole H. Bennett, AICP
Project Manager

For the North Carolina Department of Transportation

11/17/06
Date

Theresa Ellerby
Project Manager
Consultant Engineering Group – Western Region

PROJECT COMMITMENTS

NC 902
Bridge No. 20 Over Sandy Branch
Chatham County
Federal-Aid Project No. BRZ-902(3)
State Project No. 8.1522301
WBS No. 33427.1.1
T.I.P. No. B-4063

The standard Nationwide Permit No. 23 Conditions, the General Nationwide Permit Conditions, Section 404 Only Conditions, Regional Conditions, State Consistency Conditions, NCDOT's Guidelines for Best Management Practices for the Protection of Surface Waters, Erosion and Sediment Control Guidelines for Contract Construction, Best Management Practices for Construction and Maintenance Activities, General Certification Conditions, and Section 401 Conditions of Certification, will be followed by NCDOT.

There are no special commitments for this project.

NC 902
Bridge No. 20 Over Sandy Branch
Chatham County
Federal-Aid Project No. BRZ-902(3)
State Project No. 8.1522301
WBS No. 33427.1.1
T.I.P. No. B-4063

INTRODUCTION: The replacement of Bridge No. 20 is included in the 2006-2012 North Carolina Department of Transportation (NCDOT) Transportation Improvement Program (T.I.P.) and in the Federal-Aid Bridge Replacement Program. The location is shown in Figure 1. No substantial environmental impacts are anticipated. The project is classified as a Federal "Categorical Exclusion."

I. PURPOSE AND NEED

Bridge Maintenance Unit records indicate that Bridge No. 20 has a sufficiency rating of 38.3 out of a possible 100 for a new structure. The bridge is considered functionally obsolete. The replacement of this inadequate structure will result in safer and more efficient traffic operations.

II. EXISTING CONDITIONS

Bridge No. 20 is located on NC 902 in Chatham County, approximately 9.0 miles southeast of Siler City, North Carolina. NC 902 is classified as a Rural Minor Collector by the statewide functional classification system and listed as a North Carolina Scenic Byway.

Land use in the project area is rural in nature, primarily consisting of single-family residential and agricultural properties. Cattle's fencing is located in the northeast and northwest quadrants. The future land use in the area is expected to remain residential in nature.

The 2006 estimated average daily traffic (ADT) volume is 1,650 vehicles per day (vpd). The projected 2030 ADT is 3,400 vpd. The percentages of truck traffic are 3 percent dual tired vehicles and 4 percent truck-tractor semi trailer (TTST). The speed limit on NC 902 is not posted in the vicinity of Bridge No. 20; therefore, a statuary speed limit of 55 miles per hour (mph) applies.

Bridge No. 20 was built in 1950 (Figure 2). It is a tangent two-lane structure with a clear roadway width of 20 feet. The bridge has two spans and totals 70 feet in length. The superstructure consists of a reinforced concrete deck on I-beams with metal railings. The substructure consists of end bents composed of reinforced concrete caps on timber piles, and the interior bent is reinforced concrete post and beam. The height from crown to streambed is 15 feet. Bridge No. 20 is posted at 18 tons for single vehicle (SV) and 23 tons for TTST.

The approach roadway provides two 10-foot travel lanes with 6-foot grassed shoulders. The approach curve from the south has a 780-foot radius with a design speed of 50 mph. The approach curve from the north has a 965-foot radius with a design speed of 55 mph. The bridge is located in a vertical sag curve and on a tangent between two horizontal curves.

There are four buses that cross Bridge No. 20 totaling approximately 10 trips each day.

US Sprint has aerial telephone cable that crosses over Sandy Branch along the west side of NC 902. Progress Energy has aerial power transmission lines that run along NC 902 on the west side. A private water line approximately 1.5 inches in diameter is located along the west side of NC 902 south of Bridge No. 20 and supplies water to the property in the southwest quadrant. Utility impacts are expected to be low.

Four accidents were reported in the project area during the period from October 2002 to September 2005. There were no fatalities.

The widening of US 421 to four lanes from the Town of Gulf to Siler City (R-2610) is scheduled to be completed in 2007.

NC 902 at the project site is part of a designated bicycle route. There are no indications that there are an unusual number of bicyclists using this road.

III. ALTERNATIVES

A. Project Description

Based on preliminary hydraulic analysis, the recommended replacement structure is a single-span bridge approximately 90 feet in length. The existing vertical clearance will be maintained. A minimum 0.3 percent grade is recommended to facilitate bridge deck drainage. The minimum clear roadway width will be 30 feet to provide two 12-foot lanes, with minimum 3-foot shoulders (Figure 3A). The length of the new structure may increase or decrease as necessary to accommodate peak flows as determined by a detailed hydrologic analysis during the final design phase.

The approach roadway will provide two 12-foot lanes with 8-foot grass shoulders (Figure 3A). The design speed will be 60 mph.

B. Build Alternatives

Four build alternatives were studied for this project. They are described below.

Alternative A replaces the bridge at the existing location (Figure 4A). During construction, traffic will be maintained by an off-site detour that follows SR 1176 (Old US Highway 421), SR 2333 (Ralph Sipe Road), and US 421. The detour is approximately six miles in length. The user cost incurred by detoured motorist for an approximate nine months road closure is approximately $1,080,000.

Design exceptions for the horizontal curve for the existing southern approach curve and stopping sight distance are anticipated.

This alternative was not selected because it has two design exceptions and an off-site detour.

Alternative B replaces the bridge at the existing location (Figure 4B). During construction, traffic will be maintained by an on-site detour east of the existing structure. The detour structure will provide for two 11-foot travel lanes with 2-foot shoulders (Figure 3B). The detour approach roadway will provide two 11-foot travel lanes and 6-foot grass shoulders.

Design exceptions for the horizontal curve for the existing southern approach curve and stopping sight distance are anticipated.

This alternative was not selected because it has two design exceptions.

Alternative C (preferred) replaces the bridge on new alignment east of the existing structure (Figure 4C). During construction, traffic will be maintained on the existing structure.

C. Alternatives Eliminated From Further Study

Alternative D replaces the bridge on new alignment west of the existing structure (Figure 4D). During construction, traffic will be maintained on the existing structure. This alternative was eliminated because it impacted aquatic ripple habitat, wetlands, and utilities west of Bridge No. 20.

The "do-nothing" alternative will eventually necessitate closure of the bridge. This is not desirable due to the traffic service provided by NC 902 and Bridge No. 20.

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

D. Preferred Alternative

Alternative C was selected as the preferred alternative because it maintains traffic on site, no design exceptions are anticipated, it avoids impacts to wetlands and aquatic ripple habitat, and minimizes impacts to utilities.

The Division Engineer concurs with Alternative C as the preferred.

E. Design Exception

No design exceptions are anticipated with the preferred Alternative C.

IV. ESTIMATED COST

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

Table 1. Estimated Cost

	Alternative A	Alternative B	Alternative C (preferred)
Structure Removal (Existing)	$ 19,600	$ 19,600	$ 19,600
Structure Proposed	376,500	376,500	334,500
Roadway Approaches	190,100	190,100	584,000
Temporary Detour Pipes	0	50,200	0
Detour Approaches	0	280,800	0
Miscellaneous and Mobilization	145,800	278,800	316,900
Engineering Contingencies	118,000	204,000	195,000
ROW/Const. Easements/Utilities	68,500	94,300	105,500
TOTAL	$918,500	$1,494,300	$1,555,500

The estimated cost of the project as shown in the 2006-2012 Transportation Improvement Program is $1,375,000, including $75,000 for right-of-way, $1,150,000 for construction, and $150,000 in prior years.

V. NATURAL RESOURCES SUMMARY

A. Methodology

Field investigations along the project area were conducted by qualified biologists on January 19, 2004. Field surveys were undertaken to determine natural resource conditions and to document natural communities, wildlife, Waters of the United States (US), and the presence of protected species or their habitats.

Published information regarding the project area and region was derived from a number of resources including:

- USGS 7.5-minute topographic quadrangle map (Bear Creek, North Carolina)
- US Fish and Wildlife Service (USFWS) National Wetlands Inventory (NWI) maps
- USGS and NCDOT aerial photography of the project area
- Natural Resources Conservation Service (NRCS) soil survey maps of Chatham County
- Water resources information was obtained from publications of the North Carolina Division of Water Quality (NCDWQ)
- USFWS list of protected species for Chatham County
- North Carolina Natural Heritage Program (NCNHP) database of rare species and unique habitats

Dominant plant species were identified in each strata for all natural communities encountered. Plant community descriptions are based on those classified in Schafale and Weakley (1990), where applicable. Names and descriptions of plant species generally follow Radford *et al.* (1968), unless more current information is available. Animal names and descriptions follow Bogan (2002), Conant and Collins (1998), Lee *et al.* (1980 et seq.), Martof *et al.* (1980), Stokes and Stokes (1996), and Webster *et al.* (1985). Scientific names and common names (when applicable) are provided for each plant and animal species listed. Subsequent references to the same organism include the common name only.

During field surveys, wildlife identification involved a variety of observation techniques: active searching and capture, visual observations (both with and without the use of binoculars), and observing the characteristic signs of wildlife (sounds, scat, tracks, and burrows). Any organisms that may have been captured during these searches were identified and released without injury. Quantitative water sampling was not undertaken to support existing data.

Jurisdictional wetland determinations were performed using the three-parameter approach as prescribed in the 1987 *Corps of Engineers Wetlands Delineation Manual* (Environmental Laboratory, 1987). Supplementary technical literature describing the parameters of hydrophytic vegetation, hydric soils, and hydrological indicators was also utilized. Wetland functions were evaluated according to the NCDWQ's rating system, 4th version (1995). Surface waters in the project area were evaluated and classified based on a preponderance of perennial stream characteristics as defined in NCDWQ's *Stream Classification Method*, 2nd version (1999) and evaluated using the most recent version of the USACE *Stream Quality Assessment Worksheet.*

B. Physical Characteristics

1. Physiography and Soils

The project site is located in southern Chatham County and encompasses an area approximately one mile northeast of the community of Bear Creek. Chatham County is situated in the central part of the state in the Piedmont physiographic province. The geography of Chatham County consists predominantly of rolling hills, with steep areas surrounding major streams. Narrow, nearly level floodplains exist along most of the small to medium sized streams.

Elevations in the project area range from approximately 425 feet above mean sea level (msl) along Sandy Branch to approximately 580 feet above msl at the radio tower located one mile northeast of the project area, as depicted on the Bear Creek, North Carolina, USGS topographic quadrangle map. The project site is located in the Carolina Slate Belt system, which is composed of bedded argillites, felsic volcanics, and mafic volcanics and fine-grained schists (NCSU, 1999). The geology underlying the area is a boundary between a metavolcanic-epiclastic rock system and metamudstone and metaargillite system. The metavolcanic-epiclastic rock system is composed of metamorphosed argillite, mudstone, volcanic sandstone, conglomerate, and volcanic rock. The metamudstone and metaargillite system is thin to thick bedded with cleavage of the axial and bedding planes common. It is interbedded with metamudstone, metaconglomerate, and metavolcanic rock (NCDLR, 1985).

The process of soil development depends on both biotic and abiotic influences. These influences include past geologic activities, nature of parent materials, environmental and human influences, plant and animal activity, time, climate, and topographical position. Soil units mapped at the project site include Riverview silt loam, Nanford-Badin complex, and Cid-Lignum complex. These soils are briefly described below.

- Riverview silt loams occur along rivers and streams and are frequently flooded. They are very deep, well drained soils with moderate permeability and a high to very high available water capacity. The apparent seasonal high water table is within 3 to 5 feet of the soil surface between December and March. Depth to bedrock is generally more than 5 feet.

- The Nanford-Badin Complex occurs either along interstream divides and broad ridges (lower slopes) or on ridges and side slopes (steeper slopes). Nanford soils are deep, well drained soils with high available water capacity. Badin soils are moderately deep, well drained soils with a moderate available water capacity. Depth to the seasonal high water table is more than 6 feet and depth to bedrock is more than 5 feet.

- Cid-Lignum Complex soils are deep soils that are somewhat poorly and moderately well drained, with a moderate (Cid) or high (Lignum) available water capacity. The depth to a perched seasonal high water table ranges from 1 to 2.5 feet for Cid soils and between 1 and 2.5 feet for Lignum soils. Depth to soft bedrock is generally between 1.5 and 3.5 feet below the soil surface.

Hydric soils are defined as soils that are saturated, flooded, or ponded long enough during the growing season to develop anaerobic conditions that favor the growth and regeneration of hydrophytic vegetation (Cowardin *et al.*, 1979).

Soils referred to as "hydric A" are completely hydric throughout the mapped soil unit. "Hydric B" soils are non-hydric soils that contain inclusions of hydric soils, usually in depressional areas or along the border with other soil units. Based on current Chatham County soil survey field sheets, two hydric B soil map units occur in depressions and drainageways in the project area: Cid loam and Riverview silt loam.

2. Water Resources

Streams, creeks, and tributaries within the project vicinity are completely within the Cape Fear River Basin, the largest river basin in the state.

Sandy Branch and two unnamed tributaries (UTs) are the only surface waters within the project study area. Sandy Branch is a tributary to Bear Creek and is a perennial stream. It flows in a southeasterly direction to its confluence with Bear Creek approximately one mile downstream of the bridge. One tributary (UT1) is an intermittent channel located along NC 902 south of the project site that has its confluence with Sandy Branch downstream of the bridge. The other tributary (UT2) is an intermittent channel located along SR 2128. It flows across the northwest quadrant of the study area before joining Sandy Branch upstream of the bridge. Stream evaluation forms for Sandy Branch and these two UTs are in the Appendix.

Sandy Branch is located within Cape Fear River Subbasin 03-06-12, which includes the Rocky River, Bear Creek, Tick Creek, and Loves Creek. Streams in this subbasin are rocky streams characterized by very low base flows during summer months. The NCDWQ stream index number for Sandy Branch is 17-43-16-1 and the USGS 8-digit hydrologic unit is 03030003. The North Carolina Administrative Code defines a perennial stream as having water flowing in a well-defined channel for a majority of the year (greater than 90 percent of the time) (NCAC,1999).

The NCDWQ classifies surface waters of the state based on their intended best uses. Streams which have not been assigned a best usage classification or rating generally carry the same classification or rating as the receiving waters. Sandy Branch and its UTs account for the surface waters in the project study area and are Class "C" waters. The class "C" designation denotes freshwaters protected for secondary recreation, fishing, wildlife, fish and aquatic life propagation and survival, and others uses. The two UTs have not been assigned a use classification by the NCDWQ; therefore, they carry the same classification as Sandy Branch. No Outstanding Resource Waters (ORW), High Quality Waters (HQW), or drinking water supply (WS-I or WS-II) waters occur within a one mile radius of the project study area. There are no 303(d) listed streams within a one mile radius of the project site.

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 quality data. The nearest stream with a use support rating is the Rocky River, located more than 12 miles downstream of the project site below the Bear Creek confluence. An AMS monitoring station (B-4) is located at US 15/501 near Center Grove on this portion of the Rocky River. Sandy Branch is currently not rated (NR) for use support due to insufficient data. Waters that are not rated generally carry the same use support rating as the receiving waters. Sandy Branch has a "fully supporting" (FS) rating. A "FS" rating is given to waterbodies that fully support their designated uses and generally have good or excellent water quality.

The North Carolina Index of Biotic Integrity (NCIBI) is used to assess the biological integrity of streams by examining the structure and health of the fish community. The index incorporates information about species richness and composition, trophic composition, fish abundance and fish condition. A monitoring site is located approximately 2.3 miles south of the project study area at a headwater reach of the Rocky River above the Rocky River Reservoir. This site was last sampled in 1998 and received a "Good" NCIBI rating.

Bioclassification criteria have been developed that are based on the number of benthic macroinvertebrates (primarily Ephemeroptera, Plecoptera, and Tricoptera) present in streams and rivers because they are very sensitive to the effects of water pollution. Streams and river reaches are given a bioclassification rating that ranges from Excellent to Poor based on benthic macroinvertebrate collection data. These bioclassifications, which have been developed for North Carolina's major ecoregions, are used to assess the various impacts of both point source discharges and non-point source runoff. Benthic macroinvertebrate samples were collected from three sites along the Rocky River between 1993 and 1998. The sampling location closest to the bridge site is located at US 15/501, downstream from the project site and is identified as B-4. This site was last sampled in 1998 and was given a bioclassification rating of "Good" (NCDWQ, 1999).

Point source dischargers throughout North Carolina are regulated through the National Pollutant Discharge Elimination System (NPDES) program. According to the August 18, 2005 list of active

NPDES permits issued by NCDWQ there are four permitted dischargers within Cape Fear Subbasin 03-06-12. One facility, the Siler City Wastewater Treatment Plant, has a discharge greater than 1.0 million gallons per day and discharges to Loves Creek. There are no permitted dischargers on Sandy Branch.

Short-term impacts to water quality from construction-related activities include increased sedimentation and turbidity. Long-term construction related impacts to water resources include substrate destabilization, bank erosion, increased turbidity, altered flow rates, and possible temperature fluctuations within the channel due to removal of streamside vegetation. Best management practices will be taken to minimize impacts to water resources from runoff and erosion in the project area.

Field characteristics of the stream were assessed based on the classification system established by Dave Rosgen of Wildland Hydrology. The Rosgen classification system for stream channels is based on fluvial geomorphologic principles and landscape position. The stream channel is between 20 and 25 feet wide near the bridge, with fast flowing clear water over a substrate of large gravel, cobble, and bedrock. Channel width at the top of the bank is between 30 and 35 feet, with bank heights averaging 5 to 7 feet above the water. Water depths appeared to be 6 to 8 inches at riffles and 2 to 4 feet at pools.

a. Anticipated Impacts to Water Resources

Construction includes replacement of Bridge No. 20 on NC 902 over Sandy Branch. Placement of end bents and interior bents will impact surface waters as follows:

- Alternatives A and C (preferred) will have approximately 0.01 acre of permanent fill and 60 linear feet of existing channel impacts. Channel impacts occur on UT1 because roadway widening for the bridge approach requires extension of the existing pipe.

- Alternative B will have approximately 0.01 acre of temporary fill for the detour bridge, 0.01 acre of permanent fill, and 135 linear feet of existing channel impacts. Channel impacts include 60 linear feet to UT1 for extension of the existing pipe.

b. Impacts Related to Bridge Demolition

Bridge demolition activities to remove the existing bridge are included as part of the build alternatives. The steel and timber components of the existing bridge will be removed without being dropped into Waters of the US. However, there is potential for components of the concrete deck and piles to create a maximum temporary fill of approximately 46 cubic yards. The bridge demolition activities associated with this replacement will strictly follow NCDOT's *Best Management Practices for Construction and Maintenance Activities.* All methods of demolition shall be considered and implemented where practical, other than dropping the bridge in the water.

C. Biotic Resources

1. Terrestrial Communities

Two plant communities occur in the study area: mixed hardwood forest and man-dominated/disturbed areas. Recent timber operations had clear cut an area in the southeast quadrant, between Sandy Branch and UT1, south of the bridge. One wetland was delineated within the mixed hardwood forest community on the southwest side of the bridge.

a. Mixed Hardwood Forest Community

The mixed hardwood forest is located adjacent to the stream and along the roadside in undisturbed areas. This community appears to be a variation of the Mesic Mixed Hardwood Forest (Piedmont Subtype) identified by Schafale and Weakley (1990). These occur on acidic soils in lower slopes, steep north-facing slopes, ravines, and occasionally well-drained small stream bottoms. Under natural conditions they are uneven-aged, with old trees present. Reproduction occurs mainly in canopy gaps, with disturbed areas having increased amounts of pines and early successional hardwoods such as tulip poplar and sweetgum (Schafale and Weakley, 1990). In the project area, dominant canopy and subcanopy species include tulip poplar (*Liriodendron tulipifera*), sweetgum (*Liquidambar styraciflua*), white oak (*Quercus alba*), American beech (*Fagus grandifolia*), pignut hickory (*Carya glabra*), shortleaf pine (*Pinus echinata*), and loblolly pine (*P. taeda*). Shrubs and vines included saplings of mature canopy trees as well as red cedar (*Juniperus virginiana*), ironwood (*Carpinus caroliniana*), groundnut (*Apios americana*), blackberry (*Rubus argutus*), greenbriar (*Smilax rotundifolia*), wild grape (*Vitis rotundifolia.*), and Japanese honeysuckle (*Lonicera japonica*). The herbaceous vegetation consisted primarily of wild ginger (*Hexastylis* sp. And *Asarum* sp.), cranefly orchid (*Tipularia discolor*), Christmas fern (*Polystichum acrostichoides*), and foam flower (*Tiarella* sp.).

b. Man-Dominated/Disturbed Community

The man-dominated/disturbed community represents areas that are periodically maintained by human influences. At the project site these areas include pastureland used for cattle grazing, land cleared of timber, maintained lawns, and right-of-way along the roads. Dominant vegetation includes various grasses (Poaceae family) and typical weedy species such as dandelion (*Taraxacum officinale*), mullein (*Verbascum* sp.), henbit (*Lamium maculatum*), and chickweed (*Cerastium* sp.).

c. Wildlife

The forest and man-dominated communities offer a moderate diversity of foraging, nesting, and cover habitat for many species of amphibians, reptiles, birds, and mammals. Species that may be associated with these types of communities are described below. An asterisk (*) indicates the species that were directly observed or for which evidence was noted during field reconnaissance.

Reptile species associated with the project area may include snakes such as the rough green snake (*Opheodrys aestivus*), eastern milk snake (*Lampropeltis triangulum triangulum*), and mole kingsnake (*L. calligaster rhombomaculata*) which inhabit fields, woodlands, river bottoms, and stream edges of the Piedmont and lower mountains in North Carolina. Rough green snakes forage on spiders, moth and butterfly larvae, crickets, and grasshoppers and will often forage among vines or shrubs along stream

banks. The eastern milk snake forages for rodents in fields and woodlands and will frequently enter barns in search of food. The mole kingsnake will eat lizards, rodents, and turtle eggs and is considered an accomplished burrower in thickets, woodlands, and cultivated fields. No reptiles were observed during the site visit.

Many bird species may inhabit or migrate through the project area. Inhabitants may include red-bellied woodpecker* (*Melanerpes carolinus*), hairy woodpecker (*Picoides villosus*), downy woodpecker (*P. pubescens*), blue jay (*Cyanocitta cristata*), Carolina chickadee (*Parus carolinensis*), tufted titmouse (*P. bicolor*), white-breasted nuthatch (*Sitta carolinensis*), American robin (*Turdus migratorius*), cardinal* (*Cardinalis cardinalis*), mockingbird (*Mimus polyglottos*), house finch (*Carpodacus mexicanus*), Carolina wren (*Thryothorus ludovicianus*), dark-eyed junco (*Junco hyemalis*), American goldfinch (*Carduelis tristis*), and brown-headed cowbird (*Molothrus ater*). Predatory or scavenger species may include red-tailed hawk* (*Buteo jamaicensis*), eastern screech owl (*Otus asio*), barred owl (*Strix varia*), and turkey vulture* (*Cathartes aura*).

A variety of mammals adapted to disturbed and man-dominated areas are expected to inhabit the project area and surrounding landscape. Virginia opossum* (*Didelphis virginiana*), woodchuck (*Marmota monax*), gray squirrel* (*Sciurus carolinensis*), eastern harvest mouse (*Reithrodontomys humulis*), raccoon* (*Procyon lotor*), eastern spotted skunk (*Spilogale putorius*), and white-tailed deer* (*Odocoileus virginianus*) are species mostly likely to be found. In addition, bats such as the little brown myotis (*Myotis lucifugus*), Eastern red (*Lasiurus borealis*), and big brown bat (*Eptesicus fuscus*) may also be present in the project study area.

d. Anticipated Impacts to Terrestrial Communities

Potential impacts to plant communities are based on the approximate area of each plant community within the proposed right of way and temporary construction easements. These estimated impacts are depicted in Table 2.

Table 2: Estimated Terrestrial Biotic Community Impacts

Vegetative Community	Impacts Per Alternative (acres)		
	Alternative A	Alternative B	Alternative C (preferred)
Mixed Hardwood Forest	0.25	0.52	0.45
Man-Dominated/Disturbed	0.94	2.24	3.00
TOTAL IMPACTS	1.19	2.76	3.45

2. Aquatic Communities

Sandy Branch is a perennial stream that flows in a southeasterly direction towards Bear Creek. Two tributaries to Sandy Branch cross the project study area; one is an intermittent stream located south of the bridge and the other is an intermittent stream located in the northwest quadrant of the project site. Based on the observed fluvial geomorphological conditions and the water quality at the time of the field visit, aquatic habitats in the Sandy Branch drainage area are expected to be moderately stable. Sandy Branch flows over a large bedrock and boulder outcrop upstream of the bridge, which is considered a special aquatic habitat. According to USACE regulatory guidance, any riffle/pool sequence or bedrock formation in a stream is considered a special aquatic habitat. Several deep

pools and runs were observed within the study area. A visual survey of the stream found several larvae of macroinvertebrate species that included caddisflies (Tricoptera) and mayflies (Ephemeroptera).

The amphibian population in the study area may include salamanders and frogs. A small wetland area near the southwest side of the bridge may provide habitat for egg deposition by salamanders and frogs after spring mating seasons. Salamanders forage on insects, both aquatic and terrestrial, crustaceans, worms, and other organisms in forest floodplains and vernal pools. Salamanders can be found in a variety of habitats, although most are associated with small streams and seepages. They can also be found along streams where stones, large branches and other wood debris offer shelter for both the salamander and their food. They are active mostly at night, but can be found by overturning logs and stones in wet areas along the stream banks. Spring peepers (*Hyla crucifer*) and pickerel frogs (*Rana palustris*) may also be present. Spring peepers mainly inhabit woodlands, while pickerel frogs are found along shaded streams and wet areas. No amphibian species were observed during the site visit, which can be attributed to the fact that the site reconnaissance was conducted during the winter season.

a. Anticipated Impacts to Aquatic Communities

Aquatic organisms are very sensitive to the discharges and inputs resulting from construction activities. Appropriate measures will be taken to avoid spillage and control runoff. Such measures will include an erosion and sedimentation control plan, provisions for waste materials 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 will be strictly enforced during the construction stages of the project. Long-term impacts to water resources may include permanent changes to the stream banks and temperature increases caused by the removal of stream-side vegetation.

The removal of stream-side vegetation and placement of fill material during construction contributes to erosion and possible sedimentation. Quick revegetation of these areas reduces 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, sand bars may be formed both at the site and downstream.

Impacts usually associated with in-stream construction include increased channelization and scouring of the streambed. In-stream construction alters the substrate and impacts adjacent stream-side vegetation. Such disturbances within the substrate lead to increased siltation, which can clog the gills and feeding mechanisms of benthic organisms, fish, and amphibian species.

D. Special Topics

1. Waters of the United States: Jurisdictional Issues

Surface waters and wetlands within the project area are subject to jurisdictional consideration under Section 404 of the Clean Water Act (CWA) as "Waters of the United States." At the Federal Level the USACE has the responsibility for implementation, permitting, and enforcement of the provision of the CWA. The USACE regulatory program is defined in 33 CFR 320-330. At the state level

NCDWQ has the responsibility for implementation, permitting, and enforcement of the provisions of the CWA.

Jurisdictional surface waters include perennial and intermittent streams and certain impoundments. Sandy Branch occurs as a perennial surface water in the study area. Stream rating forms are included in the Appendix.

One wetland was identified and delineated during the field survey and is shown on Figure 4C as Wetland A. Wetland boundaries were verified during a jurisdictional determination field meeting with the USACE on April 27, 2004. Wetland delineation forms are included in the Appendix.

2. Permits

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

It is anticipated that this project will fall under Nationwide Permit 23 (NW 23). The USACE issues NW 23 permits for activities that are categorically excluded from environmental documentation because it is included within a category of actions that do not have a significant effect on the environment. Regional conditions also require compliance with General Condition 13 concerning notification and coordination with the USACE for permit applications for projects with greater than 150 total linear feet of impacts.

This project might also need Nationwide Permit 33 (NW 33). The USACE issues NW 33 when construction activities necessitate the use of temporary structures such as cofferdams, placement of access fill material, or dewatering of the construction site. In addition to the requirements for NWP 23, any work below the ordinary high water mark must be permanently stabilized at the earliest practicable date and a restoration plan of reasonable measures to avoid and minimize adverse effects to aquatic resources must be submitted.

A Section 401 General Water Quality Certification is necessary for projects that require Section 404 permits. The state has General Certifications which will match the permit type authorized by the USACE. The NCDWQ must issue the 401 Certification before the USACE will issue the 404 Permit. Compensatory mitigation may be required when more than 150 linear feet of stream and/or more than one acre of wetland impacts occur. Written concurrence from the NCDWQ is not required.

Bridge No. 20 steel and timber components will be removed without being dropped into Waters of the US. However, there is potential for components of the concrete deck and piles to create a maximum temporary fill of approximately 46 cubic yards. The bridge demolition activities

associated with this replacement will strictly follow NCDOT's *Best Management Practices for Construction and Maintenance Activities.* All methods of demolition will be considered and implemented where practical, other than dropping the concrete in the water.

3. Mitigation

Mitigation of wetland impacts has been defined by the Council on Environmental Quality to include avoidance, minimization, and compensation. These activities must be considered in sequential order.

Avoidance examines all appropriate and practicable possibilities of averting impacts to Waters of the US. It is not feasible for this roadway to completely avoid Waters of the US because it traverses Sandy Branch.

Minimization includes the examination of appropriate and practicable steps to reduce adverse impacts to Waters of the US. The proposed structure is a single span and no bents will be located in the branch.

Compensatory mitigation includes restoration, enhancement, creation, or preservation of wetland and stream functions and values that are lost when these systems are converted to other uses. The USACE usually requires compensatory mitigation for activities authorized under Section 404 of the Clean Water Act when unavoidable impacts total more than 0.10 acre of wetlands or 150 linear feet of perennial or intermittent streams. The NCDWQ may require compensatory mitigation for activities authorized under Section 401 of the Clean Water Act for unavoidable impacts to more than 1.0 acre of wetlands or more than 150 linear feet of perennial or intermittent streams.

Compensatory wetland and stream mitigation is not anticipated for the preferred Alternative C.

E. Rare and Protected Species

Some populations of plants and animals are declining either as a result of natural forces or their difficulty competing with humans for resources. Rare and protected species listed for Chatham County, and any likely impacts to these species as a result of the proposed project construction, are discussed in the following sections.

1. Federally Protected Species

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

The USFWS lists four species under Federal protection for Chatham County as of April 27, 2006. These species are listed in Table 3.

Table 3. Federally Protected Species for Chatham County

Common Name	Scientific Name	Federal Status	State Status
Red-cockaded woodpecker	*Picoides borealis*	Endangered	Endangered
Cape Fear shiner	*Notropis mekistocholas*	Endangered	Endangered
Harperella	*Ptilimnium nodosum*	Endangered	Endangered
Bald eagle	*Haliaeetus leucocephalus*	Threatened (Proposed for delisting)	Threatened

Natural Heritage Program maps of element occurrences were reviewed on September 29, 2006 to determine if any protected species have been identified near the project area. This map review confirmed that no species identified as Endangered or Threatened by the USFWS have been identified within a one mile radius of the project area.

Red-cockaded woodpecker (*Picoides borealis)*
Federal Status: Endangered
Date Listed: October 13, 1990

This bird is a small, 7 to 8-inch tall woodpecker with a black and white barred back and a conspicuous large white cheek surrounded by a black cap, nape, and throat. Males have a very small red mark at the upper edge of the white cheek and just behind the eye. The red-cockaded woodpecker (RCW) is found in open pine forests in the southeastern United States. The RCW uses open old growth stands of southern pines, particularly longleaf pine, for foraging and nesting habitat. A forested stand optimally should contain at least 50 percent pine and lack a thick understory. The RCW is unique among woodpeckers because it nests almost exclusively in living pine trees. These birds excavate nests in pines greater than 60 years old that are contiguous with open, pine dominated, foraging habitat. The foraging range of the RCW may extend 500 acres and must be contiguous with suitable nesting sites.

Living pines infected with red-heart disease (*Formes pini*) are often selected for cavity excavation because the inner heartwood is usually weakened. Cavities are located from 12 to 100 feet above ground level and below live branches. These trees can be identified by "candles," a large encrustation of running sap that surrounds the tree. Colonies consist of one to many of these candle trees. The RCW lays its eggs in April, May, and June; the eggs hatch approximately 10 to 12 days later.

Biological Conclusion: ***No Effect***

Suitable habitat for RCW does not exist within the project area. No pine-dominated stands are present in the project vicinity. The pines that are present in the project area are a minor component of the mixed hardwood stands. Since appropriate habitat does not exist and there are no known populations in the project vicinity, it is reasonable to conclude the proposed project will have no effect on the red-cockaded woodpecker.

Bald eagle (*Haliaeetus leucocephalus*)
Federal Status: Threatened (Proposed for Delisting)
Date Listed: March 11, 1967

The bald eagle is a very large bird of prey that ranges in size from 32 to 43 inches tall and has a wingspan of more than six feet. Adult body plumage is dark brown to chocolate-brown with a white head and tail, while immature birds are brown and irregularly marked with white until their fourth year. They are primarily associated with large bodies of water where food is plentiful. Eagle nests are found in close proximity to large, open expanses of water (usually within one-half mile) with a clear flight path to the water. Nests are made in the largest living tree within the area, with an open view of the surrounding land. Human disturbance can cause nest abandonment. Nests can be as large as six feet across and are made of sticks and vegetation. These platform nests may be used by the same breeding pair for many years. Breeding begins in December or January and the young remain in the nest at least 10 weeks after hatching. Bald eagles eat mostly fish robbed from ospreys or picked up dead along shorelines. They may also capture small mammals such as rabbits, some birds, wounded ducks, and carrion. Bald eagles are a year-round and transient species in North Carolina.

As of July 6, 1999, the bald eagle is under consideration by the USFWS for a proposed de-listing of the threatened status. However, this raptor will still be protected under the Migratory Bird Treaty Act and the Bald and Golden Eagle Protection Act. Populations will continue to be monitored for at least another five years under provisions of the Endangered Species Act.

Biological Conclusion: ***No Effect***

Suitable nesting and foraging habitat for bald eagles does not exist in the study area. The only surface waters within the project vicinity are streams and small farm ponds. No large, open bodies of water are present within the project vicinity. Based on the lack of appropriate habitat and no known populations occurring within the project vicinity, it is reasonable to conclude that the proposed project will have no effect on the bald eagle.

Cape Fear shiner (*Notropis mekistocholas*)
Federal Status: Endangered
Date Listed: September 25, 1987

The Cape Fear shiner is a small fish, usually less than two inches long. The top and sides of the body are a pale silvery yellow to golden color and scales are outlined in black. A black stripe runs along the sides and the fins are yellowish and somewhat pointed. The upper lip is black, and the lower lip bears a thin black bar along its margin. This species can be distinguished from similar species by the black upper and lower lips and nearly horizontal position of the mouth. During the spring spawning season, the golden body color is intensified in males while females take on a silvery cast. Males also develop numerous small tubercles on the upper body from the snout to the dorsal fin during the spawning season. Spawning occurs around mid-May and a secondary spawning may occur during the late summer (USFWS, 1991).

The Cape Fear shiner is generally associated with gravel, cobble, and boulder substrates and has been observed to inhabit slow pools, riffles, and slow runs. Juveniles are often found in slow runs among large rock outcrops in midstream, and in flooded side channels and pools. During winter months, they may migrate into smaller tributary streams. The most obvious features of their preferred habitat are large islands and bars of water willow (*Justicia americana*). This shiner species is typically associated with schools of other related species, but it is never the numerically dominant species. Known populations are located around the junction of the Rocky River and Deep River in Chatham and Lee Counties where the fish inhabits the Deep River from the upstream limits of the backwaters of Locksville Dam upstream to the Rocky River; then upstream from the Rocky River to Bear Creek, and upstream from Bear Creek to the bridge at SR 2156 (Woody Dam Road) (USFWS, 1991).

Biological Conclusion: ***No Effect***

Appropriate habitat for Cape Fear Shiner is not available in Sandy Branch at the project site. A telephone conversation with the USFWS on February 2, 2004, confirmed that no known populations of this species have been collected from Sandy Branch. A survey was conducted on October 26, 2006, and no suitable habitat was found. Based on the lack of appropriate habitat and no known populations occurring within the project vicinity, it is reasonable to conclude that the proposed project will have no effect on the Cape Fear Shiner.

Harperella (*Ptilimnium nodosum)*
Federal Status: Endangered
Date Listed: September 28, 1988

Harperella is an herbaceous species 6 to 36 inches tall with leaves that are reduced to hollow, quill-like structures. Small white flowers occur in umbels similar to those of Queen Anne's lace (*Daucus carota*). These flowers have five regular parts and are bisexual or unisexual, with each umbel containing both perfect and male florets. Riverine populations flower beginning in late June or July and continue until frost. Pollination biology of the species has not been studied, but seed set is apparently profuse since high densities and number of individual plants can occur each year in localized areas. The riverine form is a perennial or possibly biennial species that can flower in both years (USFWS, 1990).

Harperella is native to seasonally flooded rocky streams in the southeast and typically occurs in two habitat types: palustrine and riverine. Palustrine habitats include edges of intermittent pineland ponds in the coastal plain. Riverine habitats include either rocky or gravel shoals and margins of clear, swift-flowing stream sections. Moisture requirements limit this plant to a narrow band of water that is neither too shallow nor too deep for it to complete its life cycle. Changes in hydrologic regime of streams such as upstream impoundments, declining water quality, and pond drainage are important threats to this plant (USFWS, 1990).

Biological Conclusion: ***No Effect***

Appropriate habitat is available for harperella on Sandy Branch upstream of Bridge No. 20 at the project site. The USFWS has identified the period between July and October as the optimum survey time for harperella. A plant-by-plant pedestrian survey was conducted on October 8, 2004 on

approximately 300 feet of Sandy Branch upstream of the bridge site. No populations of harperella were found during 4 man-hours of searching the site. No evidence of harperella exists at the project study area and the NHP has no record of known populations within a one-mile radius of the bridge site. Guidelines recently established by the NCDOT and USFWS state that a "**No Effect**" biological conclusion determination for plants is appropriate when field surveys of the appropriate habitat find no specimens of a listed species and NCNHP maps show no populations are located within a one-mile radius of the site.

2. Federal Species of Concern and State Listed Species

Federal Species of Concern (FSC) are not legally protected under the Endangered Species Act and are not subject to any of its provisions, including Section 7, until they are formally proposed or listed as Threatened or Endangered. Species designated as FSC are defined as taxa which may or may not be listed in the future. These species were formerly Candidate 2(C2) species or species under consideration for listing for which there is insufficient information to support listing. FSC species per the August 2006 NCNHP database, their state status, and the existence of suitable habitat within the study area are shown in Table 4.

Table 4. Federal Species of Concern Listed for Chatham County

Common Name	Scientific Name	State Status	Habitat Available in Study Area
Bachman's sparrow	*Aimophila aestivalis*	SC	Yes
Carolina redhorse	*Moxostoma* sp.	SR (PE)	Yes
Brook floater	*Alasmidonta varicosa*	E	Yes
Atlantic pigtoe	*Fusconaia masoni*	E*	Yes
Septima's clubtail dragonfly	*Gomphus septima*	SR	Yes
Yellow lampmussel	*Lampsilis cariosa*	E	Yes
Virginia quillwort	*Isoetes virginica*	SR-L*	No
Buttercup phacelia	*Phacelia covillei*	SR-T	No
Carolina creekshell	*Villosa vaughaniana*	E	Yes
Sweet pinesap	*Monotropsis odorata*	SR-T	No
Carolina darter – Eastern	*Etheostoma collis pop. 2*	SC	Yes

NOTE:
E – Endangered, T – Threatened, SC – Special Concern, SR – Significantly Rare, -L – Limited, -T – Throughout,
* - Historic Record

A mussel survey was completed by qualified biologists on April 4, 2004, and found no occurrence of mussel species in Sandy Branch at the project site.

VI. CULTURAL RESOURCES

A. Compliance Guidelines

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

B. Historic Architecture

A field survey of the Area of Potential Effects (APE) was conducted on July 28, 2003. All structures within the APE were photographed, and later reviewed by NCDOT architectural historians and staff at the State Historic Preservation Office (HPO). In a concurrence form dated October 14, 2003, NCDOT, HPO, and FHWA concurred that there are no historic architectural resources either listed in or eligible for listing in the National Register of Historic Places within the APE. A copy of the concurrence form is included in the Appendix.

C. Archaeology

The SHPO, in a memorandum dated March 4, 2004, recommended that "no archaeological investigation be conducted in connection with this project." A copy of the SHPO memorandum is included in the Appendix.

VII. ENVIRONMENTAL EFFECTS

The project is expected to have an overall positive impact. Replacement of a structurally deficient and functionally obsolete bridge will result in safer traffic operations.

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

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

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

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

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

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

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

The Farmland Protection Policy Act requires all federal agencies or their representatives to consider the potential impacts to prime and important farmland soils by all land acquisition and construction projects. Prime and important farmland soils are defined by the Natural Resources Conservation Service (NRCS). *(Have not received form back)*

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

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

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

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

An examination of records at the North Carolina Department of Environment and Natural Resources, Division of Water Quality, Groundwater Section and the North Carolina Division of Solid Waste Management revealed no hazardous waste sites in the project area. A field reconnaissance survey was performed and no underground storage tank (UST) sites were found within the project area. If any unregulated USTs or any potential source of contamination is discovered during right-of-way initial contacts with impacted property owners, then an assessment will be conducted to determine the extent of any contamination at that time.

The drainage area of Sandy Branch at the proposed crossings is 3.7 square miles. Chatham County is currently participating in the National Flood Insurance Program. This crossing of Sandy Branch is located in a FEMA Approximate Flood Hazard Zone, Zone A (Figure 5). This reach of stream is not in a detailed flood study. Attached is a Flood Insurance Rate Map for Chatham County. The approximate 100-year base flood appears to overtop the existing roadway. The proposed structure

will need to match the performance of the existing structure; therefore, no increase in the 100-year water surface will result in the floodplain. This stream is not included on the 303(D) list for impaired streams.

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

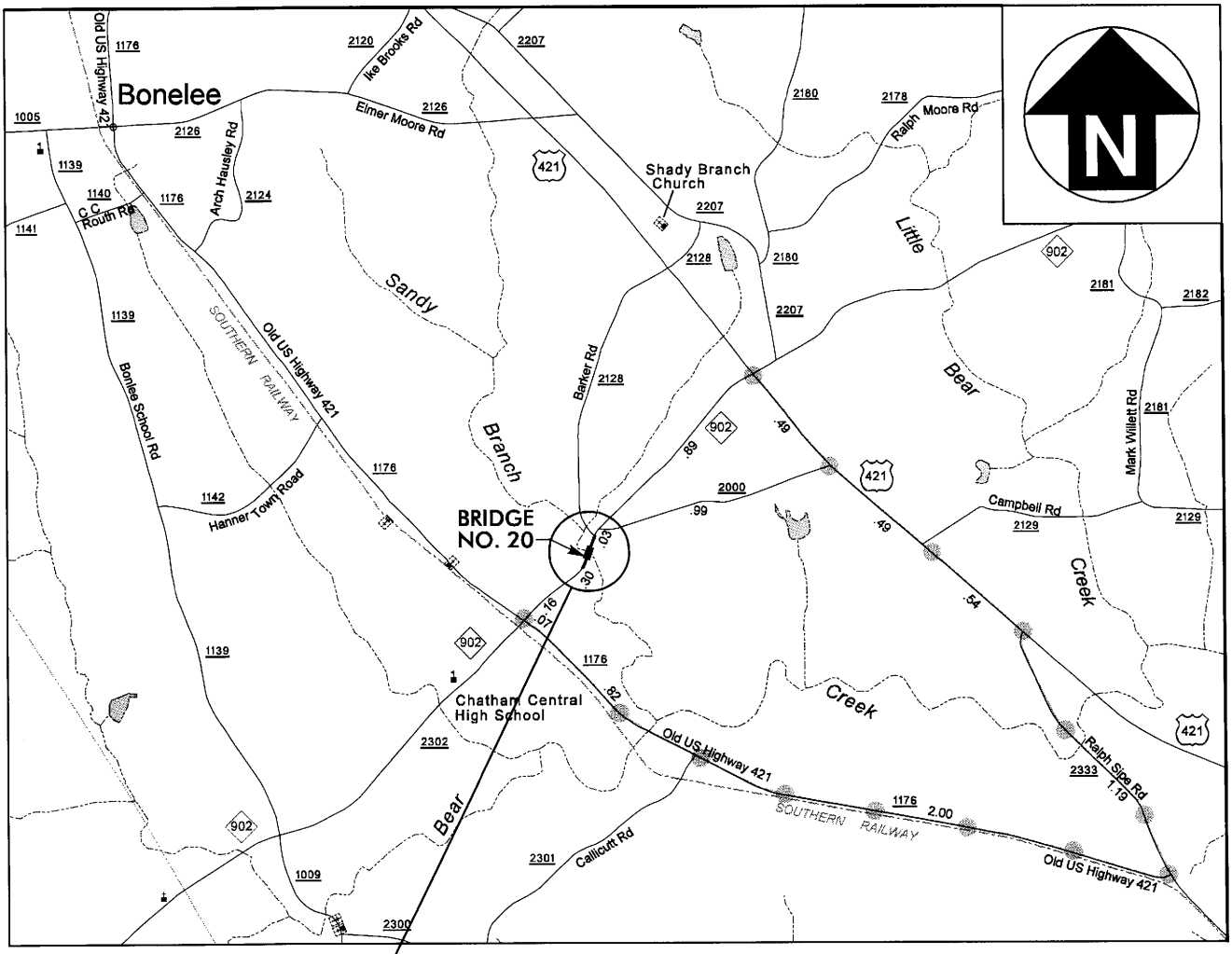
VIII. PUBLIC INVOLVEMENT

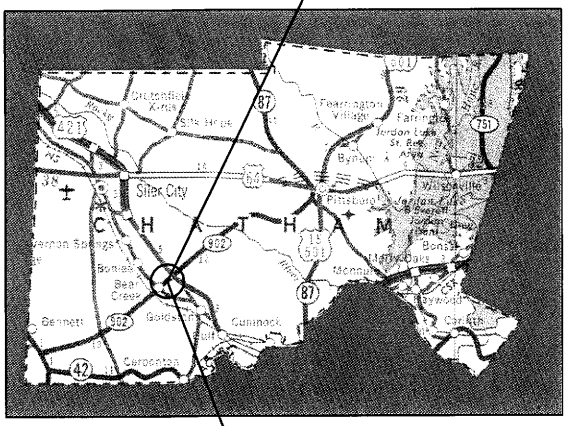
Efforts were undertaken early in the planning process to contact local officials and various agencies to involve them in the project development.

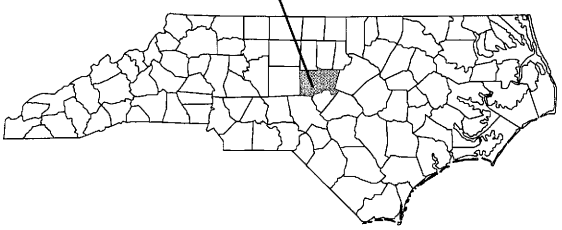
A citizen's informational meeting was held on October 11, 2004 at the Chatham Central High School cafeteria to review Alternatives A, B, C, and D. Five citizens attended the workshop and no comment sheets were received at the workshop. Citizens requested that the sharp southern approach curve to Bridge No. 20 and sight distance at their driveways be improved.

IX. AGENCY COMMENTS

All agency comments have been addressed within the document. Letters received from the agencies are included in the appendix.





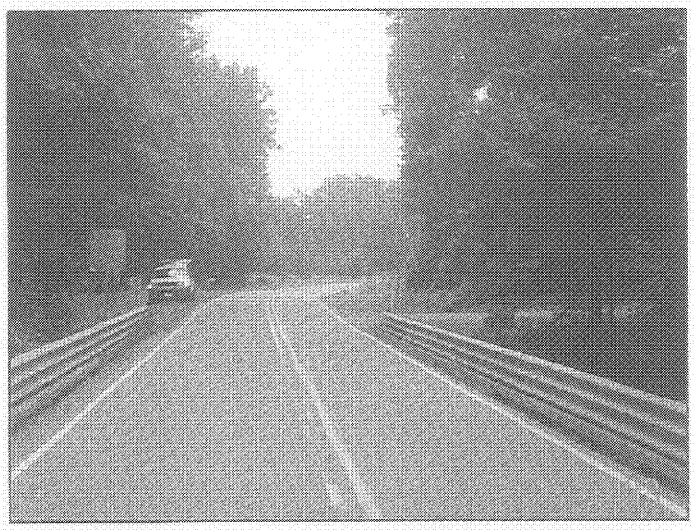


DETOUR ROUTE

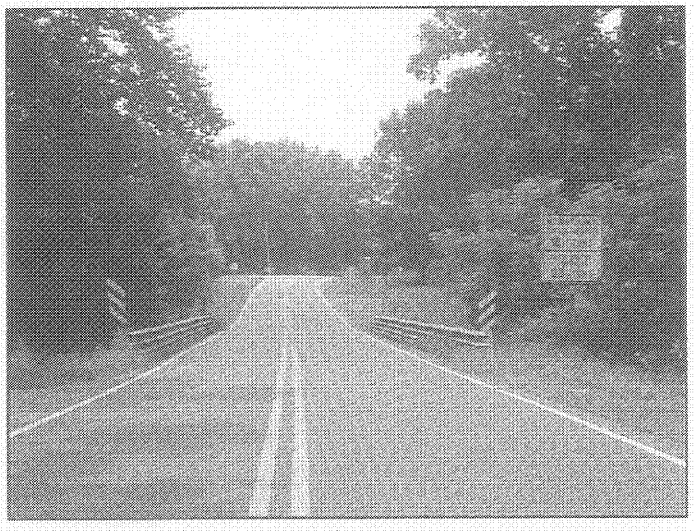
North Carolina Department of Transportation
Project Development & Environmental Analysis

CHATHAM COUNTY
BRIDGE NO. 20 ON NC 902
OVER SANDY BRANCH
B-4063

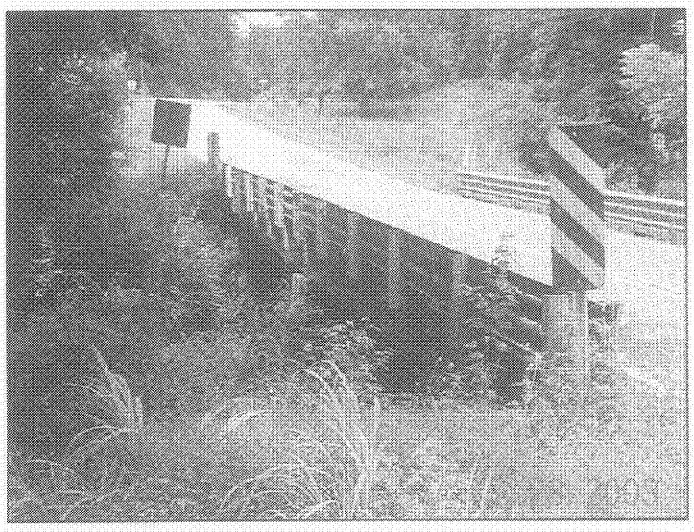
FIGURE 1



View of south approach from Bridge No. 20.



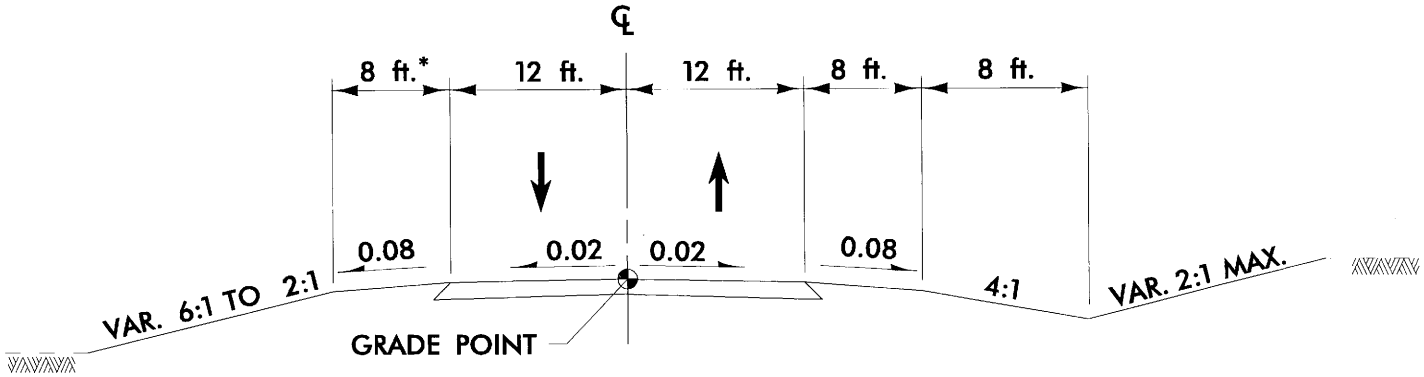
View of north approach from Bridge No. 20.



Bridge No. 20 side view from west.

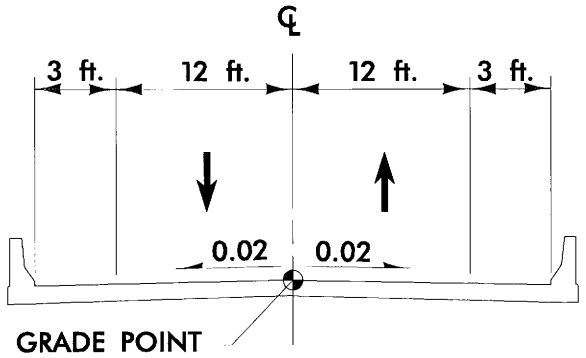
Figure 2

B-4063 Bridge No. 20 on NC 902 over Sandy Branch



TYPICAL APPROACH SECTION
(PROPOSED)

* 11 ft. WITH GUARDRAIL IS WARRANTED



TYPICAL BRIDGE SECTION
(PROPOSED)

TRAFFIC DATA

(CONST. YR.) 2006 ADT = 1,650
(DESIGN YR.) 2030 ADT = 3,350
DUAL 3%
TTST 4%

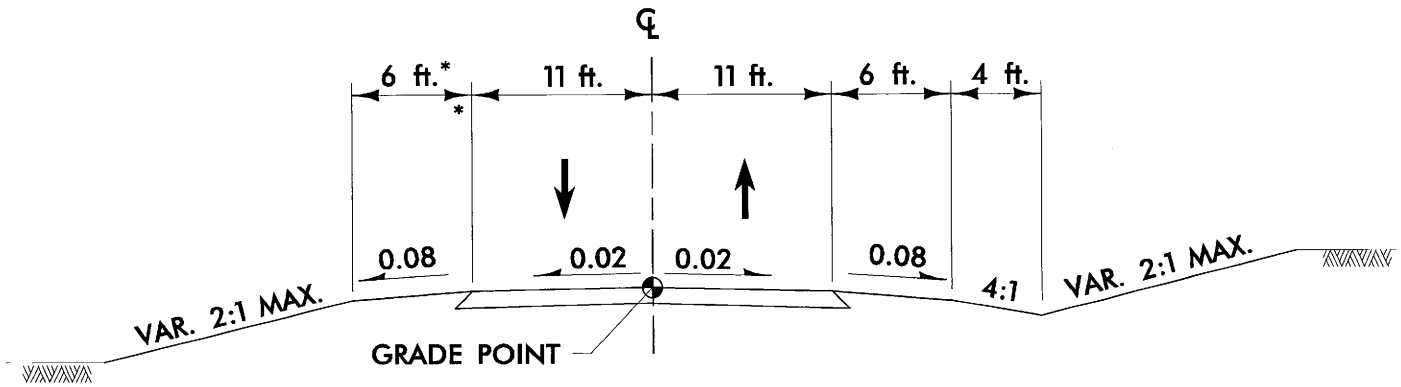
EXISTING BRIDGE LENGTH = 70 ft.

FUNCTIONAL CLASSIFICATION :
MINOR COLLECTOR – RURAL

North Carolina Department of Transportation
Project Development & Environmental Analysis

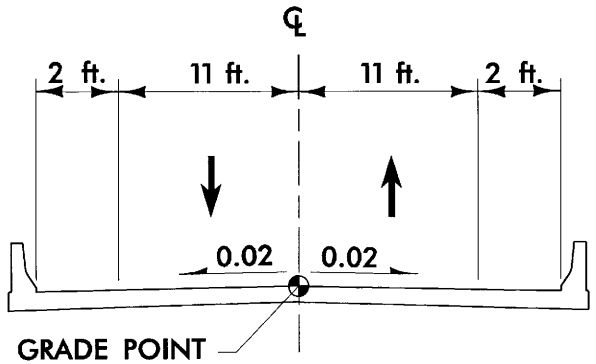
CHATHAM COUNTY
BRIDGE NO. 20 ON NC 902
OVER SANDY BRANCH
TIP NO: B-4063

FIGURE 3A



TYPICAL APPROACH SECTION
(DETOUR)

* 8 ft. WITH GUARDRAIL IS WARRANTED



TYPICAL BRIDGE SECTION
(DETOUR)

TRAFFIC DATA

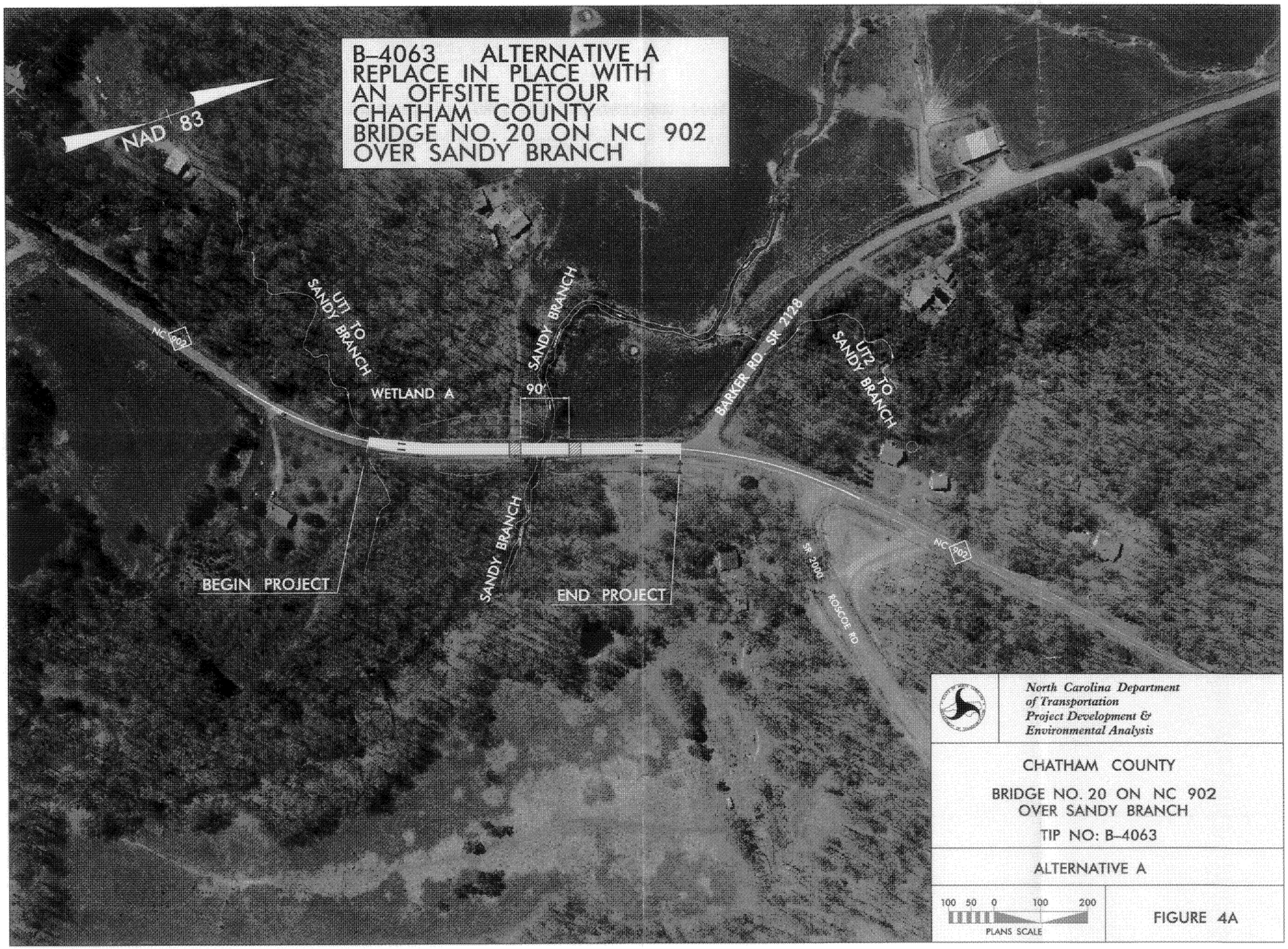
(CONST. YR.)	2006 ADT =	1,650
(DESIGN YR.)	2030 ADT =	3,350
DUAL	3%	
TTST	4%	

FUNCTIONAL CLASSIFICATION :
MINOR COLLECTOR – RURAL

North Carolina Department
Of Transportation
Project Development &
Environmental Analysis

CHATHAM COUNTY
BRIDGE NO. 20 ON NC 902
OVER SANDY BRANCH
TIP NO: B–4063

FIGURE 3B


B–4063 ALTERNATIVE A
REPLACE IN PLACE WITH
AN OFFSITE DETOUR
CHATHAM COUNTY
BRIDGE NO. 20 ON NC 902
OVER SANDY BRANCH
NAD 83
NC 902
UT1 TO SANDY BRANCH
WETLAND A
SANDY BRANCH
90'
BARKER RD. SR 2128
UT2 TO SANDY BRANCH
BEGIN PROJECT
SANDY BRANCH
END PROJECT
SR 2000 ROGASKE RD
NC 902
North Carolina Department of Transportation
Project Development & Environmental Analysis
CHATHAM COUNTY
BRIDGE NO. 20 ON NC 902
OVER SANDY BRANCH
TIP NO: B–4063
ALTERNATIVE A
100 50 0 100 200
PLANS SCALE
FIGURE 4A

B-4063 ALTERNATIVE B
REPLACE IN PLACE (ALT A)
WITH AN ON SITE DETOUR
CHATHAM COUNTY
BRIDGE NO. 20 ON NC 902
OVER SANDY BRANCH

NAD 83

NC 902

UT 1 TO SANDY BRANCH

SANDY BRANCH

WETLAND A

90'

BARKER RD SR 2128

UT 2 TO SANDY BRANCH

OFF

3@72" CSP

TEMP. DETOUR

BEGIN PROJECT

SANDY BRANCH

SR 2000 ROSCOE RD

END PROJECT

NC 902

North Carolina Department of Transportation
Project Development & Environmental Analysis

CHATHAM COUNTY

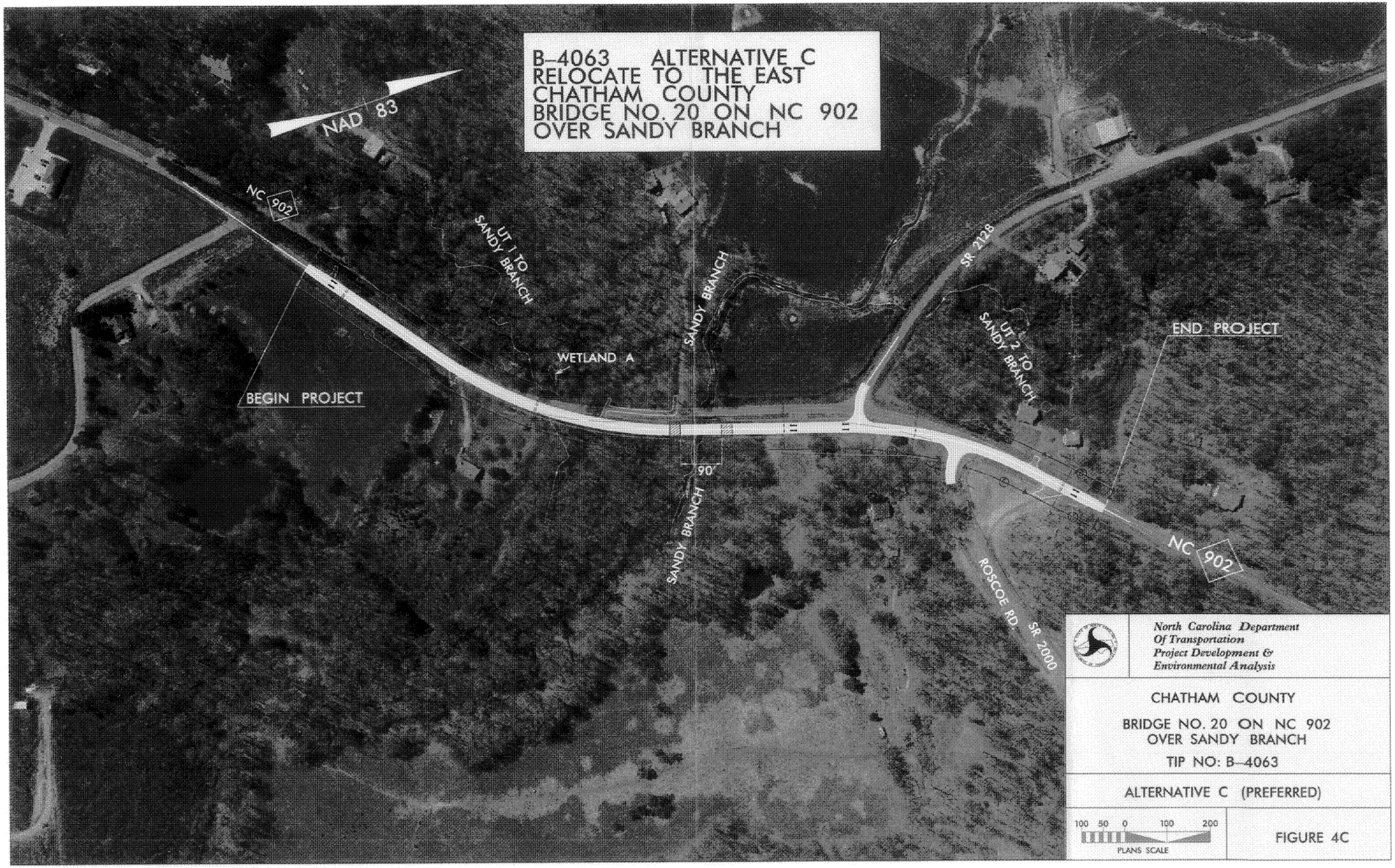
BRIDGE NO. 20 ON NC 902
OVER SANDY BRANCH

TIP NO: B-4063

ALTERNATIVE B

100 50 0 100 200
PLANS SCALE

FIGURE 4B



North Carolina Department Of Transportation
Project Development & Environmental Analysis

CHATHAM COUNTY

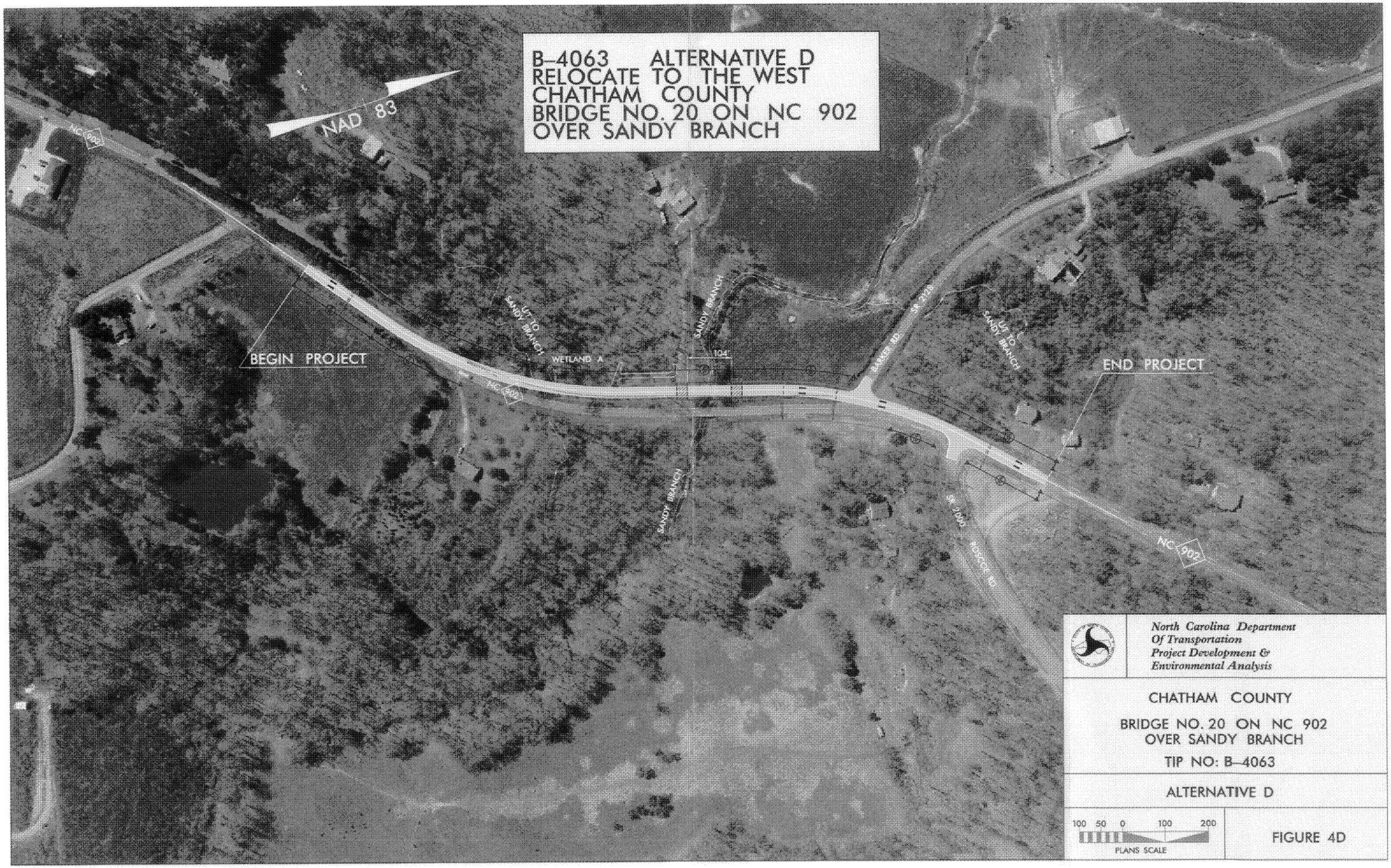
BRIDGE NO. 20 ON NC 902
OVER SANDY BRANCH

TIP NO: B–4063

ALTERNATIVE C (PREFERRED)

100 50 0 100 200
PLANS SCALE

FIGURE 4C



North Carolina Department Of Transportation
Project Development & Environmental Analysis

CHATHAM COUNTY

BRIDGE NO. 20 ON NC 902
OVER SANDY BRANCH

TIP NO: B–4063

ALTERNATIVE D

100 50 0 100 200
PLANS SCALE

FIGURE 4D

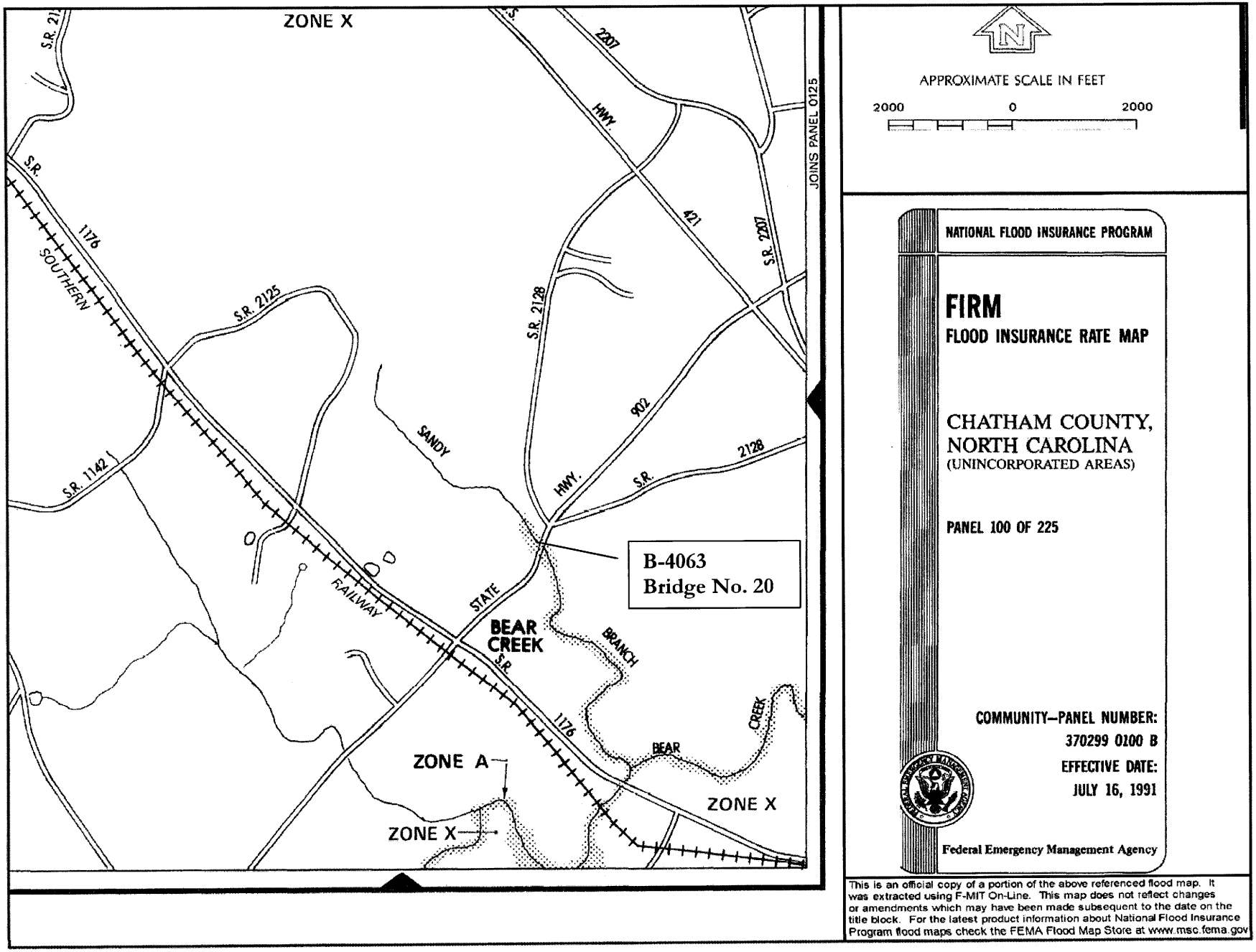

ZONE X
S.R. 2207
HWY. 421
JOINS PANEL 0125
S.R. 1176
SOUTHERN
S.R. 2125
S.R. 2128
S.R. 2207
SANDY
HWY. 902
S.R. 2128
S.R. 1142
B-4063
Bridge No. 20
RAILWAY
STATE
BEAR CREEK
S.R. 1176
BRANCH
BEAR CREEK
ZONE A
ZONE X
ZONE X
APPROXIMATE SCALE IN FEET
2000 0 2000
NATIONAL FLOOD INSURANCE PROGRAM
FIRM
FLOOD INSURANCE RATE MAP
CHATHAM COUNTY, NORTH CAROLINA
(UNINCORPORATED AREAS)
PANEL 100 OF 225
COMMUNITY–PANEL NUMBER:
370299 0100 B
EFFECTIVE DATE:
JULY 16, 1991
Federal Emergency Management Agency
This is an official copy of a portion of the above referenced flood map. It was extracted using F-MIT On-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at www.msc.fema.gov

Figure 5

APPENDIX

NOTIFICATION OF ADMINISTRATIVE APPEAL OPTIONS AND PROCESS AND REQUEST FOR APPEAL

Applicant: NCDOT	File Number: 2004-00395	Date: 23 December 2004
Attached is:		See Section below
	INITIAL PROFFERED PERMIT (Standard Permit or Letter of permission)	A
	PROFFERED PERMIT (Standard Permit or Letter of permission)	B
	PERMIT DENIAL	C
X	APPROVED JURISDICTIONAL DETERMINATION	D
	PRELIMINARY JURISDICTIONAL DETERMINATION	E

SECTION I - The following identifies your rights and options regarding an administrative appeal of the above decision. Additional information may be found at http://www.usace.army.mil/inet/functions/cw/cecwo/reg or Corps regulations at 33 CFR Part 331.

A: INITIAL PROFFERED PERMIT: You may accept or object to the permit.

- ACCEPT: If you received a Standard Permit, you may sign the permit document and return it to the district engineer for final authorization. If you received a Letter of Permission (LOP), you may accept the LOP and your work is authorized. Your signature on the Standard Permit or acceptance of the LOP means that you accept the permit in its entirety, and waive all rights to appeal the permit, including its terms and conditions, and approved jurisdictional determinations associated with the permit.
- OBJECT: If you object to the permit (Standard or LOP) because of certain terms and conditions therein, you may request that the permit be modified accordingly. You must complete Section II of this form and return the form to the district engineer. Your objections must be received by the district engineer within 60 days of the date of this notice, or you will forfeit your right to appeal the permit in the future. Upon receipt of your letter, the district engineer will evaluate your objections and may: (a) modify the permit to address all of your concerns, (b) modify the permit to address some of your objections, or (c) not modify the permit having determined that the permit should be issued as previously written. After evaluating your objections, the district engineer will send you a proffered permit for your reconsideration, as indicated in Section B below.

B: PROFFERED PERMIT: You may accept or appeal the permit

- ACCEPT: If you received a Standard Permit, you may sign the permit document and return it to the district engineer for final authorization. If you received a Letter of Permission (LOP), you may accept the LOP and your work is authorized. Your signature on the Standard Permit or acceptance of the LOP means that you accept the permit in its entirety, and waive all rights to appeal the permit, including its terms and conditions, and approved jurisdictional determinations associated with the permit.
- APPEAL: If you choose to decline the proffered permit (Standard or LOP) because of certain terms and conditions therein, you may appeal the declined permit under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer. This form must be received by the division engineer within 60 days of the date of this notice.

C: PERMIT DENIAL: You may appeal the denial of a permit under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer. This form must be received by the division engineer within 60 days of the date of this notice.

D: APPROVED JURISDICTIONAL DETERMINATION: You may accept or appeal the approved JD or provide new information.

- ACCEPT: You do not need to notify the Corps to accept an approved JD. Failure to notify the Corps within 60 days of the date of this notice, means that you accept the approved JD in its entirety, and waive all rights to appeal the approved JD.
- APPEAL: If you disagree with the approved JD, you may appeal the approved JD under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer. This form must be received by the division engineer within 60 days of the date of this notice.

E: PRELIMINARY JURISDICTIONAL DETERMINATION: You do not need to respond to the Corps regarding the preliminary JD. T reliminary JD is not appealable. If you wish, you may request an approved JD (which may be appealed), by contacting the Corps district for further instruction. Also you may provide new information for further consideration by the Corps to reevaluate the JD.

ECTION II - REQUEST FOR APPEAL or OBJECTIONS TO AN INITIAL PROFFERED PERMIT

EASONS FOR APPEAL OR OBJECTIONS: (Describe your reasons for appealing the decision or your objections to an initial roffered permit in clear concise statements. You may attach additional information to this form to clarify where your reasons or ections are addressed in the administrative record.)

DDITIONAL INFORMATION: The appeal is limited to a review of the administrative record, the Corps memorandum for the record f the appeal conference or meeting, and any supplemental information that the review officer has determined is needed to clarify the dministrative record. Neither the appellant nor the Corps may add new information or analyses to the record. However, you may rovide additional information to clarify the location of information that is already in the administrative record.

OINT OF CONTACT FOR QUESTIONS OR INFORMATION:

you have questions regarding this decision and/or the ppeal process you may contact:	If you only have questions regarding the appeal process you may also contact: **Mr. Arthur Middleton, Administrative Appeal Review Officer** CESAD-ET-CO-R U.S. Army Corps of Engineers, South Atlantic Division 60 Forsyth Street, Room 9M15 Atlanta, Georgia 30303-8801

IGHT OF ENTRY: Your signature below grants the right of entry to Corps of Engineers personnel, and any government consultants, conduct investigations of the project site during the course of the appeal process. You will be provided a 15 day notice of any site vestigation, and will have the opportunity to participate in all site investigations.

ature of appellant or agent.	Date:	Telephone number:

DIVISION ENGINEER:
Commander
U.S. Army Engineer Division, South Atlantic
60 Forsyth Street, Room 9M15
Atlanta, Georgia 30303-3490

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Raleigh Field Office
Post Office Box 33726
Raleigh, North Carolina 27636-3726

February 18, 2004

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

Dear Dr. Thorpe:

This letter is in response to your request for comments from the U.S. Fish and Wildlife Service (Service) on the potential environmental impacts of the proposed replacement of the following ten bridges:

- B-4002, Alamance County, Bridge No. 96 on SR 2116 over Meadow Creek
- B-4063, Chatham County, Bridge No. 20 on NC 902 over Sandy Branch
- B-4109, Durham County, Bridge No. 120 on SR 1303 over Mud Creek
- B-4216, Orange County, Bridge No. 66 on SR 1002 over Strouds Creek
- B-4300, Wake County, Bridge No. 29 on SR 1007 over Clarks Creek
- B-4301, Wake County, Bridge No. 229 on SR 1007 over Poplar Creek
- B-4302, Wake County, Bridge No. 336 on SR 1301 over Terrible Creek
- B-4303, Wake County, Bridge No. 102 on SR 1844 over Lower Bartons Creek
- B-4304, Wake County, Bridge No. 143 on SR 2217 over Beaver Dam Creek
- B-4592, Orange County, Bridge No. 64 on SR 1561 over Eno River

These comments provide scoping information in accordance with provisions of the Fish and Wildlife Coordination Act (16 U.S.C. 661-667d) and section 7 of the Endangered Species Act (ESA) of 1973, as amended (16 U.S.C. 1531-1543).

For bridge replacement projects, the Service recommends the following general conservation measures to avoid or minimize environmental impacts to fish and wildlife resources:

1. Wetland, forest and designated riparian buffer impacts should be avoided and minimized to the maximum extent practical;

2. If unavoidable wetland impacts are proposed, every effort should be made to identify compensatory mitigation sites in advance. Project planning should include a detailed compensatory mitigation plan for offsetting unavoidable wetland impacts. Opportunities

to protect mitigation areas in perpetuity via conservation easements, land trusts or by other means should be explored at the outset;

3. Off-site detours should be used rather than construction of temporary, on-site bridges. For projects requiring an on-site detour in wetlands or open water, such detours should be aligned along the side of the existing structure which has the least and/or least quality of fish and wildlife habitat. At the completion of construction, the detour area should be entirely removed and the impacted areas be planted with appropriate vegetation, including trees if necessary;

4. Wherever appropriate, construction in sensitive areas should occur outside fish spawning and migratory bird nesting seasons. In waterways that may serve as travel corridors for fish, in-water work should be avoided during moratorium periods associated with migration, spawning and sensitive pre-adult life stages. The general moratorium period for anadromous fish is February 15 - June 30;

5. New bridges should be long enough to allow for sufficient wildlife passage along stream corridors;

6. Best Management Practices (BMP) for Protection of Surface Waters should be implemented;

7. Bridge designs should include provisions for roadbed and deck drainage to flow through a vegetated buffer prior to reaching the affected stream. This buffer should be large enough to alleviate any potential effects from run-off of storm water and pollutants;

8. The bridge designs should not alter the natural stream and stream-bank morphology or impede fish passage. To the extent possible, piers and bents should be placed outside the bank-full width of the stream;

9. Bridges and approaches should be designed to avoid any fill that will result in damming or constriction of the channel or flood plain. If spanning the flood plain is not feasible, culverts should be installed in the flood plain portion of the approach to restore some of the hydrological functions of the flood plain and reduce high velocities of flood waters within the affected area.

A list of federally protected species for each county in North Carolina can be found at http://nc-es.fws.gov/es/countyfr.html . Additional information about the habitats in which each species is often found can also be found at http://endangered.fws.gov . Please note, the use of the North Carolina Natural Heritage Program data should not be substituted for actual field surveys if suitable habitat occurs near the project site. If suitable habitat exists in the project area, we recommend that biological surveys for the listed species be conducted and submitted to us for review. All survey documentation must include survey methodologies and results.

We reserve the right to review any federal permits that may be required for these projects, at the public notice stage. Therefore, it is important that resource agency coordination occur early in

the planning process in order to resolve any conflicts that may arise and minimize delays in project implementation. In addition to the above guidance, we recommend that the environmental documentation for these projects include the following in sufficient detail to facilitate a thorough review of the action:

1. A clearly defined and detailed purpose and need for the proposed project;

2. A description of the proposed action with an analysis of all alternatives being considered, including the "no action" alternative;

3. A description of the fish and wildlife resources, and their habitats, within the project impact area that may be directly or indirectly affected;

4. The extent and acreage of waters of the U.S., including wetlands, that are to be impacted by filling, dredging, clearing, ditching, or draining. Acres of wetland impact should be differentiated by habitat type based on the wetland classification scheme of the National Wetlands Inventory (NWI). Wetland boundaries should be determined by using the 1987 Corps of Engineers Wetlands Delineation Manual and verified by the U.S. Army Corps of Engineers;

5. The anticipated environmental impacts, both temporary and permanent, that would be likely to occur as a direct result of the proposed project. The assessment should also include the extent to which the proposed project would result in secondary impacts to natural resources, and how this and similar projects contribute to cumulative adverse effects;

6. Design features and construction techniques which would be employed to avoid or minimize the fragmentation or direct loss of wildlife habitat and waters of the US;

7. If unavoidable wetland impacts are proposed, project planning should include a detailed compensatory mitigation plan for offsetting the unavoidable impacts.

The Service appreciates the opportunity to comment on these projects. Please continue to advise us during the progression of the planning process, including your official determination of the impacts of this project. If you have any questions regarding our response, please contact Mr. Gary Jordan at (919) 856-4520, ext. 32.

Sincerely,

John E. Ellis

for Garland B. Pardue, Ph.D.
Ecological Services Supervisor

cc: Eric Alsmeyer, USACE, Raleigh, NC
John Thomas, USACE, Raleigh, NC
Richard Spencer, USACE, Wilmington, NC
John Hennessy, NCDWQ, Raleigh, NC
Travis Wilson, NCWRC, Creedmoor, NC
Chris Militscher, USEPA, Raleigh, NC

U.S. DEPARTMENT OF AGRICULTURE
SOIL CONVERSION SERVICE

SCS-CPA-106

FARMLAND CONVERSION IMPACT RATING FOR CORRIDOR TYPE PROJECTS

PART I *(To be Completed by Federal Agency)*	3. Date of Land Evaluation Request 3/1/06	4. Sheet 1 of 1
1. Names of Project B-4063	5. Federal Agency Involved FHWA	
2. Type of Project BRIDGE REPLACEMENT	6. County and State Chatham County, NC	
PART II *(To be completed by SCS)*	1. Date Request Received by SCS 4/14/06	2. Person Completing Form Alan Walters
3. Does the corridor contain prime unique statewide or local important farmland? Yes X (If no the FPPA does not apply – Do not complete additional parts of this form No____	4. Acres Irrigated 0	Average Farm Size 105 AC
5. Major Crop(s) CORN	6. Farmable Land in Government Jurisdiction: 393160 Acres	7. Amount of Farmland As Defined in FPPA 81861 Acres
8. Name of Land Evaluation System Used CHATHAM LE	9. Name of Local Site Assessment System NONE	10. Date Land Evaluation Returned by SCS 4/19/06

PART III *(To be completed by Federal Agency)*	Alternative Corridor for Segment			
	Corridor A	Corridor B	Corridor C	Corridor D
A. Total Acres to be Converted Directly	0.60	0.61	2.52	n/a
B. Total Acres to be Converted Indirectly or to Receive Services	0	0	0	n/a
C. Total Acres in Corridor	0.60	0.61	2.52	n/a
PART IV *(To be completed by SCS)* Land Evaluation Information				
A. Total Acres Prime and Unique Farmland	0.60	0.61	2.52	
B. Total Acres Statewide and Local Important Farmland				
C. Percentage of Farmland in County or Local Govt. Unit to be Converted	<0.001	<0.001	<0.001	
D. Percentage of Farmland in Govt. Jurisdiction with Same or Higher Relative Value	65.8	65.8	65.8	
PART V *(To be completed by SCS)* Land Evaluation Criterion Relative Value of Farmland to be Serviced or Converted (Scale of 0-100 Points)	68	68	68	
PART VI *(To be completed by Federal Agency)* Corridor Assessment Criteria (These criteria are explained in 7 CFR 658.5(c)) — Maximum Points				
1. Area in Nonurban Use — 15	14	14	14	
2. Perimeter in Nonurban Use — 10	8	8	8	
3. Percent of Corridor Being Farmed — 20	0	0	0	
4. Protection Provided by State and Local Government — 20	0	0	0	
5. Size of Present Farm Unit Compared to Average — 10	0	0	0	
6. Creation of Nonfarmable Farmland — 25	0	0	0	
7. Availability of Farm Support Services — 5	0	0	0	
8. On-Farm Investments — 20	2	2	2	
9. Effects of Conversion On Farm Support Services — 25	0	0	0	
10. Compatibility with Existing Agricultural Use — 10	0	0	0	
TOTAL CORRIDOR ASSESSMENT POINTS — 160	24	24	24	
PART VII *(To be completed by Federal Agency)*				
Relative Value of Farmland (From Part V) — 100	68	68	68	
Total Corridor Assessment (Form Part VI above or a local site assessment) — 160	24	24	24	
TOTAL POINTS (Total of above 2 lines) — 260	92	92	92	

1. Corridor Selected:	2. Total Acres of Farmlands to be Converted by Project:	3. Date of Selection:	4. Was a Local Site Assessment Used?
C	2.52	11-12-04	Yes____ No X

5. Reason for Selection:
maintains traffic onsite, avoids impacts to wetlands, and Special aquatic habitat, minimizes impacts to utilities, no design exception needed

Signature of Person Completing this Part: Nicole M Bennett — Date 9-12-2006

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

UT OFF Barker Rd.

USACE AID#_____ DWQ #_____ Site #____ (indicate on attached map)

STREAM QUALITY ASSESSMENT WORKSHEET

Provide the following information for the stream reach under assessment:

1. Applicant's name: NCDOT B-4063
2. Evaluator's name: Cindy Carr
3. Date of evaluation: 2-19-04
4. Time of evaluation: ~ 2:00 pm
5. Name of stream: Sandy Branch UT
6. River basin: Cape Fear
7. Approximate drainage area: 3.9 mi²
8. Stream order: 2nd
9. Length of reach evaluated: 100 LF
10. County: Chatham
11. Site coordinates (if known): prefer in decimal degrees.
12. Subdivision name (if any):

Latitude (ex. 34.872312): _____ Longitude (ex. -77.556611): _____

Method location determined (circle): GPS Topo Sheet Ortho (Aerial) Photo/GIS Other GIS Other

13. Location of reach under evaluation (note nearby roads and landmarks and attach map identifying stream(s) location): Flows under SR2128 Barker Rd. near NC902 intersection.
14. Proposed channel work (if any):
15. Recent weather conditions: Snow earlier in week, Rain ~ 0.75 in. w/last 7 days
16. Site conditions at time of visit: Clear, Sunny ~ 65°F
17. Identify any special waterway classifications known: ___Section 10 ___Tidal Waters ___Essential Fisheries Habitat ___Trout Waters ___Outstanding Resource Waters ___Nutrient Sensitive Waters ___Water Supply Watershed ____(I-IV)
18. Is there a pond or lake located upstream of the evaluation point? YES (NO) If yes, estimate the water surface area:
19. Does channel appear on USGS quad map? (YES) NO
20. Does channel appear on USDA Soil Survey? (YES) NO
21. Estimated watershed land use: 5% Residential 5% Commercial ___% Industrial 15% Agricultural 60% Forested 15% Cleared / Logged ___% Other (_____)
22. Bankfull width: ~ 6 Feet
23. Bank height (from bed to top of bank): ~ 4 Feet
24. Channel slope down center of stream: ✓Flat (0 to 2%) ___Gentle (2 to 4%) ___Moderate (4 to 10%) ___Steep (>10%)
25. Channel sinuosity: ___Straight ✓Occasional bends ___Frequent meander ___Very sinuous ___Braided channel

Instructions for completion of worksheet (located on page 2): Begin by determining the most appropriate ecoregion based on location, terrain, vegetation, stream classification, etc. Every characteristic must be scored using the same ecoregion. Assign points to each characteristic within the range shown for the ecoregion. Page 3 provides a brief description of how to review the characteristics identified in the worksheet. Scores should reflect an overall assessment of the stream reach under evaluation. If a characteristic cannot be evaluated due to site or weather conditions, enter 0 in the scoring box and provide an explanation in the comment section. Where there are obvious changes in the character of a stream under review (e.g., the stream flows from a pasture into a forest), the stream may be divided into smaller reaches that display more continuity, and a separate form used to evaluate each reach. The total score assigned to a stream reach must range between 0 and 100, with a score of 100 representing a stream of the highest quality.

Total Score (from reverse): 48 **Comments:** Stream occurs along toe of roadway slope- upstream at Barker Road. Confluence with Sandy Branch occurs immediately downstream at culvert under Barker Road, and is located in cattle pasture land with unrestricted livestock access to stream waters.

Evaluator's Signature Cindy Carr **Date** 2-19-04

This channel evaluation form is intended to be used only as a guide to assist landowners and environmental professionals in gathering the data required by the United States Army Corps of Engineers to make a preliminary assessment of stream quality. The total score resulting from the completion of this form is subject to USACE approval and does not imply a particular mitigation ratio or requirement. Form subject to change – version 06/03. To Comment, please call 919-876-8441 x 26.

STREAM QUALITY ASSESSMENT WORKSHEET

	#	CHARACTERISTICS	ECOREGION POINT RANGE			SCORE
			Coastal	Piedmont	Mountain	
PHYSICAL	1	Presence of flow / persistent pools in stream (no flow or saturation = 0; strong flow = max points)	0–5	0–4	0–5	3
	2	Evidence of past human alteration (extensive alteration = 0; no alteration = max points)	0–6	0–5	0–5	5
	3	Riparian zone (no buffer = 0; contiguous, wide buffer = max points)	0–6	0–4	0–5	2
	4	Evidence of nutrient or chemical discharges (extensive discharges = 0; no discharges = max points)	0–5	0–4	0–4	4
	5	Groundwater discharge (no discharge = 0; springs, seeps, wetlands, etc. = max points)	0–3	0–4	0–4	4
	6	Presence of adjacent floodplain (no floodplain = 0; extensive floodplain = max points)	0–4	0–4	0–2	3
	7	Entrenchment / floodplain access (deeply entrenched = 0; frequent flooding = max points)	0–5	0–4	0–2	2
	8	Presence of adjacent wetlands (no wetlands = 0; large adjacent wetlands = max points)	0–6	0–4	0–2	0
	9	Channel sinuosity (extensive channelization = 0; natural meander = max points)	0–5	0–4	0–3	1
	10	Sediment input (extensive deposition = 0; little or no sediment = max points)	0–5	0–4	0–4	1
	11	Size & diversity of channel bed substrate (fine, homogenous = 0; large, diverse sizes = max points)	NA*	0–4	0–5	1
STABILITY	12	Evidence of channel incision or widening (deeply incised = 0; stable bed & banks = max points)	0–5	0–4	0–5	1
	13	Presence of major bank failures (severe erosion = 0; no erosion, stable banks = max points)	0–5	0–5	0–5	4
	14	Root depth and density on banks (no visible roots = 0; dense roots throughout = max points)	0–3	0–4	0–5	3
	15	Impact by agriculture, livestock, or timber production (substantial impact = 0; no evidence = max points)	0–5	0–4	0–5	2
HABITAT	16	Presence of riffle-pool/ripple-pool complexes (no riffles/ripples or pools = 0; well-developed = max points)	0–3	0–5	0–6	1
	17	Habitat complexity (little or no habitat = 0; frequent, varied habitats = max points)	0–6	0–6	0–6	1
	18	Canopy coverage over streambed (no shading vegetation = 0; continuous canopy = max points)	0–5	0–5	0–5	3
	19	Substrate embeddedness (deeply embedded = 0; loose structure = max)	NA*	0–4	0–4	3
BIOLOGY	20	Presence of stream invertebrates (see page 4) (no evidence = 0; common, numerous types = max points)	0–4	0–5	0–5	0
	21	Presence of amphibians (no evidence = 0; common, numerous types = max points)	0–4	0–4	0–4	1
	22	Presence of fish (no evidence = 0; common, numerous types = max points)	0–4	0–4	0–4	0
	23	Evidence of wildlife use (no evidence = 0; abundant evidence = max points)	0–6	0–5	0–5	3
		Total Points Possible	100	100	100	
		TOTAL SCORE (also enter on first page)				48

* These characteristics are not assessed in coastal streams.

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: 6

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? none observed	(0)	.5	1	1.5
4) Are Crayfish Present? none found	(0)	.5	1	1.5
5) Are Macrobenthos Present? none found	(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
2	1	.75	0.5	0	0

(NOTE: If Total Absence Of All Plants In Streambed As Noted Above Skip This Step UNLESS SAV Present*).*

SECONDARY BIOLOGY INDICATOR POINTS: 0.5

TOTAL POINTS *(Primary* 22 + *Secondary* 8*)*= 30

(If Greater Than Or Equal To 19 Points The Stream Is At Least Intermittent)

Extensive sediment deposition in channel

OFF Barker Rd.
Sandy Branch UT

NCDWQ Stream Classification Form

Project Name: B-4063	River Basin: Cape Fear	County: Chatham	Evaluators: Cindy Carr
DWQ Project Number:	Nearest Named Stream: Sandy Branch	Latitude:	Signature: Cindy Carr
Date: 2-19-04	USGS QUAD: Bear Creek, NC	Longitude:	Location/Directions: on Barker Road near NC902 intersection

*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: 16

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? none observed	(0)	1	2	3

PRIMARY BIOLOGY INDICATOR POINTS: 3

STREAM QUALITY ASSESSMENT WORKSHEET

	#	CHARACTERISTICS	ECOREGION POINT RANGE			SCORE
			Coastal	Piedmont	Mountain	
PHYSICAL	1	Presence of flow / persistent pools in stream (no flow or saturation = 0; strong flow = max points)	0 – 5	0 – 4	0 – 5	2
	2	Evidence of past human alteration (extensive alteration = 0; no alteration = max points)	0 – 6	0 – 5	0 – 5	2
	3	Riparian zone (no buffer = 0; contiguous, wide buffer = max points)	0 – 6	0 – 4	0 – 5	2
	4	Evidence of nutrient or chemical discharges (extensive discharges = 0; no discharges = max points)	0 – 5	0 – 4	0 – 4	4
	5	Groundwater discharge (no discharge = 0; springs, seeps, wetlands, etc. = max points)	0 – 3	0 – 4	0 – 4	2
	6	Presence of adjacent floodplain (no floodplain = 0; extensive floodplain = max points)	0 – 4	0 – 4	0 – 2	1
	7	Entrenchment / floodplain access (deeply entrenched = 0; frequent flooding = max points)	0 – 5	0 – 4	0 – 2	1
	8	Presence of adjacent wetlands (no wetlands = 0; large adjacent wetlands = max points)	0 – 6	0 – 4	0 – 2	1
	9	Channel sinuosity (extensive channelization = 0; natural meander = max points)	0 – 5	0 – 4	0 – 3	2
	10	Sediment input (extensive deposition = 0; little or no sediment = max points)	0 – 5	0 – 4	0 – 4	2
	11	Size & diversity of channel bed substrate (fine, homogenous = 0; large, diverse sizes = max points)	NA*	0 – 4	0 – 5	2
STABILITY	12	Evidence of channel incision or widening (deeply incised = 0; stable bed & banks = max points)	0 – 5	0 – 4	0 – 5	0
	13	Presence of major bank failures (severe erosion = 0; no erosion, stable banks = max points)	0 – 5	0 – 5	0 – 5	1
	14	Root depth and density on banks (no visible roots = 0; dense roots throughout = max points)	0 – 3	0 – 4	0 – 5	2
	15	Impact by agriculture, livestock, or timber production (substantial impact = 0; no evidence = max points)	0 – 5	0 – 4	0 – 5	1
HABITAT	16	Presence of riffle-pool/ripple-pool complexes (no riffles/ripples or pools = 0; well-developed = max points)	0 – 3	0 – 5	0 – 6	1
	17	Habitat complexity (little or no habitat = 0; frequent, varied habitats = max points)	0 – 6	0 – 6	0 – 6	1
	18	Canopy coverage over streambed (no shading vegetation = 0; continuous canopy = max points)	0 – 5	0 – 5	0 – 5	2
	19	Substrate embeddedness (deeply embedded = 0; loose structure = max)	NA*	0 – 4	0 – 4	1
BIOLOGY	20	Presence of stream invertebrates (see page 4) (no evidence = 0; common, numerous types = max points)	0 – 4	0 – 5	0 – 5	0
	21	Presence of amphibians (no evidence = 0; common, numerous types = max points)	0 – 4	0 – 4	0 – 4	0
	22	Presence of fish (no evidence = 0; common, numerous types = max points)	0 – 4	0 – 4	0 – 4	0
	23	Evidence of wildlife use (no evidence = 0; abundant evidence = max points)	0 – 6	0 – 5	0 – 5	2
		Total Points Possible	100	100	100	
		TOTAL SCORE (also enter on first page)				32

* These characteristics are not assessed in coastal streams.

UT OFF NC902

USACE AID#_____ DWQ #_____ Site #____ (indicate on attached map)

STREAM QUALITY ASSESSMENT WORKSHEET

Provide the following information for the stream reach under assessment:

1. Applicant's name: NCDOT B-4063
2. Evaluator's name: CINDY CARR
3. Date of evaluation: 1-14-04
4. Time of evaluation: 11:00 am
5. Name of stream: Sandy BRANCH UT
6. River basin: CAPE FEAR 03-06-12
7. Approximate drainage area: 3.9 mi²
8. Stream order: 2ND
9. Length of reach evaluated: ~300 LF
10. County: Chatham
11. Site coordinates (if known): prefer in decimal degrees.
12. Subdivision name (if any):

Latitude (ex. 34.872312): _____ Longitude (ex. -77.556611):_____

Method location determined (circle): GPS Topo Sheet Ortho (Aerial) Photo/GIS Other GIS Other_____

13. Location of reach under evaluation (note nearby roads and landmarks and attach map identifying stream(s) location): SW of Bridge No.20 on NC902 ~0.4 miles NE of US 421 intersection
14. Proposed channel work (if any):_____
15. Recent weather conditions: Clear, cold, no rain within 48 hours
16. Site conditions at time of visit: Sunny, Dry, Cold ~ 38 to 40°F
17. Identify any special waterway classifications known: ___Section 10 ___Tidal Waters ___Essential Fisheries Habitat ___Trout Waters ___Outstanding Resource Waters ___Nutrient Sensitive Waters ___Water Supply Watershed ____(I-IV)
18. Is there a pond or lake located upstream of the evaluation point? (YES) NO If yes, estimate the water surface area: TWO - 0.5 ac ea.
19. Does channel appear on USGS quad map? (YES) NO
20. Does channel appear on USDA Soil Survey? (YES) NO
21. Estimated watershed land use: 5% Residential ___% Commercial ___% Industrial 25% Agricultural 60% Forested 10% Cleared / Logged ___% Other (_____)
22. Bankfull width: ~3 to 4 Feet
23. Bank height (from bed to top of bank): ~3 to 4 Feet
24. Channel slope down center of stream: ✓ Flat (0 to 2%) ___Gentle (2 to 4%) ___Moderate (4 to 10%) ___Steep (>10%)
25. Channel sinuosity: ___Straight ✓ Occasional bends ___Frequent meander ___Very sinuous ___Braided channel

Instructions for completion of worksheet (located on page 2): Begin by determining the most appropriate ecoregion based on location, terrain, vegetation, stream classification, etc. Every characteristic must be scored using the same ecoregion. Assign points to each characteristic within the range shown for the ecoregion. Page 3 provides a brief description of how to review the characteristics identified in the worksheet. Scores should reflect an overall assessment of the stream reach under evaluation. If a characteristic cannot be evaluated due to site or weather conditions, enter 0 in the scoring box and provide an explanation in the comment section. Where there are obvious changes in the character of a stream under review (e.g., the stream flows from a pasture into a forest), the stream may be divided into smaller reaches that display more continuity, and a separate form used to evaluate each reach. The total score assigned to a stream reach must range between 0 and 100, with a score of 100 representing a stream of the highest quality.

Total Score (from reverse): 32 **Comments:** Channel on Southeast side of stream runs through land that was recently clear cut of timber up to the stream banks.

Evaluator's Signature Cindy Carr **Date** 2-11-04

This channel evaluation form is intended to be used only as a guide to assist landowners and environmental professionals in gathering the data required by the United States Army Corps of Engineers to make a preliminary assessment of stream quality. The total score resulting from the completion of this form is subject to USACE approval and does not imply a particular mitigation ratio or requirement. Form subject to change – version 06/03. To Comment, please call 919-876-8441 x 26.

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: 0.5

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: 1

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
2	1	.75	0.5	0	0

(NOTE: If Total Absence Of All Plants In Streambed As Noted Above Skip This Step UNLESS SAV Present*).*

SECONDARY BIOLOGY INDICATOR POINTS: 0

TOTAL POINTS *(Primary* 22 + *Secondary* 1.5)= 23.5

(If Greater Than Or Equal To 19 Points The Stream Is At Least Intermittent)

OFF NC 902
SANDY BRANCH UT

NCDWQ Stream Classification Form

Project Name: B-4063	River Basin: CAPE FEAR 03-06-12	County: CHATHAM	Evaluators: CINDY CARR
DWQ Project Number:	Nearest Named Stream: SANDY BRANCH	Latitude:	Signature: Cindy Carr
Date: 1-14-04	USGS QUAD: BEAR CREEK	Longitude:	Location/Directions: ON NC 902 Near US 421 / NC 902 Intersection

***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: 13

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: 6

STREAM QUALITY ASSESSMENT WORKSHEET

	#	CHARACTERISTICS	ECOREGION POINT RANGE			SCORE
			Coastal	Piedmont	Mountain	
PHYSICAL	1	Presence of flow / persistent pools in stream (no flow or saturation = 0; strong flow = max points)	0–5	0–4	0–5	4
	2	Evidence of past human alteration (extensive alteration = 0; no alteration = max points)	0–6	0–5	0–5	2
	3	Riparian zone (no buffer = 0; contiguous, wide buffer = max points)	0–6	0–4	0–5	2
	4	Evidence of nutrient or chemical discharges (extensive discharges = 0; no discharges = max points)	0–5	0–4	0–4	2
	5	Groundwater discharge (no discharge = 0; springs, seeps, wetlands, etc. = max points)	0–3	0–4	0–4	0
	6	Presence of adjacent floodplain (no floodplain = 0; extensive floodplain = max points)	0–4	0–4	0–2	0
	7	Entrenchment / floodplain access (deeply entrenched = 0; frequent flooding = max points)	0–5	0–4	0–2	0
	8	Presence of adjacent wetlands (no wetlands = 0; large adjacent wetlands = max points)	0–6	0–4	0–2	0
	9	Channel sinuosity (extensive channelization = 0; natural meander = max points)	0–5	0–4	0–3	1
STABILITY	10	Sediment input (extensive deposition = 0; little or no sediment = max points)	0–5	0–4	0–4	2
	11	Size & diversity of channel bed substrate (fine, homogenous = 0; large, diverse sizes = max points)	NA*	0–4	0–5	4
	12	Evidence of channel incision or widening (deeply incised = 0; stable bed & banks = max points)	0–5	0–4	0–5	2
	13	Presence of major bank failures (severe erosion = 0; no erosion, stable banks = max points)	0–5	0–5	0–5	3
	14	Root depth and density on banks (no visible roots = 0; dense roots throughout = max points)	0–3	0–4	0–5	4
	15	Impact by agriculture, livestock, or timber production (substantial impact = 0; no evidence = max points)	0–5	0–4	0–5	2
HABITAT	16	Presence of riffle-pool/ripple-pool complexes (no riffles/ripples or pools = 0; well-developed = max points)	0–3	0–5	0–6	3
	17	Habitat complexity (little or no habitat = 0; frequent, varied habitats = max points)	0–6	0–6	0–6	4
	18	Canopy coverage over streambed (no shading vegetation = 0; continuous canopy = max points)	0–5	0–5	0–5	4
	19	Substrate embeddedness (deeply embedded = 0; loose structure = max)	NA*	0–4	0–4	3
BIOLOGY	20	Presence of stream invertebrates (see page 4) (no evidence = 0; common, numerous types = max points)	0–4	0–5	0–5	4
	21	Presence of amphibians (no evidence = 0; common, numerous types = max points)	0–4	0–4	0–4	2
	22	Presence of fish (no evidence = 0; common, numerous types = max points)	0–4	0–4	0–4	2
	23	Evidence of wildlife use (no evidence = 0; abundant evidence = max points)	0–6	0–5	0–5	5
		Total Points Possible	100	100	100	
		TOTAL SCORE (also enter on first page)				55

* These characteristics are not assessed in coastal streams.

SANDY BRANCH OFF NC902

USACE AID#_____ DWQ #_____ Site #____ (indicate on attached map)

STREAM QUALITY ASSESSMENT WORKSHEET

Provide the following information for the stream reach under assessment:

1. Applicant's name: NCDOT B-4063
2. Evaluator's name: CINDY CARR
3. Date of evaluation: 1-14-04
4. Time of evaluation: ~ 11:30 AM
5. Name of stream: SANDY BRANCH
6. River basin: CAPE FEAR 03-06-12
7. Approximate drainage area: 3.9 mi²
8. Stream order: 3RD/4th
9. Length of reach evaluated: ~ 300 LF
10. County: CHATHAM
11. Site coordinates (if known): prefer in decimal degrees.
12. Subdivision name (if any):

Latitude (ex. 34.872312): _____ Longitude (ex. -77.556611): _____

Method location determined (circle): GPS Topo Sheet Ortho (Aerial) Photo/GIS Other GIS Other

13. Location of reach under evaluation (note nearby roads and landmarks and attach map identifying stream(s) location): AT BRIDGE NO. 20 ON NC902, ~ 0.5 miles NE of US 421 intersection
14. Proposed channel work (if any):
15. Recent weather conditions: Clear, cold, no rain within 48 hours
16. Site conditions at time of visit: Sunny, DRY, Cold ~ 38 to 40°F
17. Identify any special waterway classifications known: ___Section 10 ___Tidal Waters ___Essential Fisheries Habitat ___Trout Waters ___Outstanding Resource Waters ___Nutrient Sensitive Waters ___Water Supply Watershed ____(I-IV)
18. Is there a pond or lake located upstream of the evaluation point? YES (NO) If yes, estimate the water surface area:
19. Does channel appear on USGS quad map? (YES) NO
20. Does channel appear on USDA Soil Survey? (YES) NO
21. Estimated watershed land use: 5 % Residential ___% Commercial ___% Industrial 25 % Agricultural 60 % Forested 10 % Cleared / Logged ___% Other (_____)
22. Bankfull width: ~20 to 25 Feet
23. Bank height (from bed to top of bank): ~ 5 to 7 FT.
24. Channel slope down center of stream: ✓ Flat (0 to 2%) ___Gentle (2 to 4%) ___Moderate (4 to 10%) ___Steep (>10%)
25. Channel sinuosity: ✓ Straight ___Occasional bends ___Frequent meander ___Very sinuous ___Braided channel

Instructions for completion of worksheet (located on page 2): Begin by determining the most appropriate ecoregion based on location, terrain, vegetation, stream classification, etc. Every characteristic must be scored using the same ecoregion. Assign points to each characteristic within the range shown for the ecoregion. Page 3 provides a brief description of how to review the characteristics identified in the worksheet. Scores should reflect an overall assessment of the stream reach under evaluation. If a characteristic cannot be evaluated due to site or weather conditions, enter 0 in the scoring box and provide an explanation in the comment section. Where there are obvious changes in the character of a stream under review (e.g., the stream flows from a pasture into a forest), the stream may be divided into smaller reaches that display more continuity, and a separate form used to evaluate each reach. The total score assigned to a stream reach must range between 0 and 100, with a score of 100 representing a stream of the highest quality.

Total Score (from reverse): 55 **Comments:** POULTRY & CATTLE OPERATIONS LOCATED IMMEDIATELY ADJACENT TO UPSTREAM & DOWNSTREAM AREAS OF CHANNEL, RECENT CLEARCUT LOCATED ON SE SIDE OF STREAM.

Evaluator's Signature Cindy Carr **Date** 1-14-04

This channel evaluation form is intended to be used only as a guide to assist landowners and environmental professionals in gathering the data required by the United States Army Corps of Engineers to make a preliminary assessment of stream quality. The total score resulting from the completion of this form is subject to USACE approval and does not imply a particular mitigation ratio or requirement. Form subject to change – version 06/03. To Comment, please call 919-876-8441 x 26.

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: 3

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

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
2	1	.75	0.5	0	0

(NOTE: If Total Absence Of All Plants In Streambed As Noted Above Skip This Step UNLESS SAV Present*).*

SECONDARY BIOLOGY INDICATOR POINTS: 11

TOTAL POINTS *(Primary* 26 + *Secondary* 11 *)*= 37

(If Greater Than Or Equal To 19 Points The Stream Is At Least Intermittent)

NCDWQ Stream Classification Form

SANDY BRANCH

Project Name: B-4063	River Basin: CAPE FEAR 03-06-12	County: CHATHAM	Evaluators: CINDY CARR
DWQ Project Number:	Nearest Named Stream: SANDY BRANCH	Latitude:	Signature: Cindy Carr
Date: 1-14-04	USGS QUAD: BEAR CREEK	Longitude:	Location/Directions: ON NC902 NEAR US421/NC902 INTERSECTION

***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: 15

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: 8

1. Water storage - Contiguous w/in 50' of intermittent stream but no evidence of overland flow: little topographic relief. >70% vegetated cover, <20 acres. [0]

2. Bank/Shoreline Stabilization - Contiguous to stream w/some evidence of flow within wetland. W/in 50' of stream, not steep or urbanized - Veg width ≥ 40' with deciduous trees/shrubs [3]

3. POLLUTANT REMOVAL - Contiguous to stream w/o overbank flooding - <10% urbanized [0]

4. WILDLIFE HABITAT - Mature trees, >80% cover Hardwood mast, fleshy fruits = little food/cover Riparian system <10 acs size [1]

5. AQUATIC LIFE HABITAT: Ephemeral, <2 Feet ≥ 1 foot, >50% forested [4]

6. Not publically accessible [0]

WETLAND RATING WORKSHEET (4th VERSION)

WETLAND A

Project Name:	B-4063	County:	Chatham
Nearest Road:	NC 902	Date:	1-14-04
Wetland Area (ac):	20.01	Wetland Width (ft):	8 Feet
Name of Evaluator(s):	CINDY CARR		

WETLAND LOCATION:

_____ on sound or estusuary, pond or lake
_____ on perennial steam
__✓__ on intermittent stream
_____ within interstream divide
_____ other _____

ADJACENT LAND USE:

(within 1/2 mile upstream, upslope or radius)

_____ forested/natural vegetation	80 %
_____ agricultural/ urbanized	18 %
_____ impervious surface	2 %

Adjacent Special Natural Areas

SOILS:

Soil Series: _____

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

DOMINANT VEGETATION:

1 Liriodendron tulipifera
2 Rubus argutus
3 Acer negundo
4 _____

HYDRAULIC FACTORS:

__✓__ freshwater
_____ brackish
_____ steep topography
_____ ditched or channelized
_____ total wetland width >= 100 feet

FLOODING AND WETNESS:

_____ semipermanently to permenently flooded or inundated
_____ seasonally flooded or inundated
__✓__ intermittently flooded or temporary surface water
_____ no evidence of flooding or surface water

WETLAND TYPE: (select one)*

_____ Bottomland Hardwood Forest
_____ Swamp Forest
_____ Carolina Bay
_____ Pocosin
_____ Pine Savannah
_____ Freshwater Marsh
_____ Bog/Fen
_____ Headwater Forest
_____ Bog Forest
__✓__ Ephemeral Wetland
_____ Other: _____

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

DEM RATING

1	WATER STORAGE	0	X 4.00 =	0
2	BANK, SHORELINE STABILIZATION	3	X 4.00 =	12.0
3	POLLUTANT REMOVAL	0 *	X 5.00 =	0
4	WILDLIFE HABITAT	1	X 2.00 =	2.0
5	AQUATIC LIFE HABITAT	4	X 4.00 =	16.0
6	RECREATION/EDUCATION	0	X 1.00 =	0
			TOTAL WETLAND SCORE =	30.0

* Add one point if in sensitive watershed and >10% nonpoint disturbance within 1/2 mile upstream, upslope, or radius.

SOILS

Map Unit Name (Series and Phase): *Cid-Lignum complex*

Drainage Class: *Somewhat Poorly Drained*

Taxonomy (Subgroup) *Aquic Hapludults*

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 - 1	*Oe*	*-*	*n/a*	*n/a*	*Very coarse organic material, many fine roots*
1 - 5	*Btg1*	*2.5 Y 4/2*	*7.5 YR 4/6*	*Many, Distinct, Medium*	*Silty Clay Loam, many fine roots*
5 - 14	*Btg2*	*2.5 Y 7/2*	*7.5 YR 5/8*	*Common, Distinct, Coarse*	*Silty Clay Loam*
14 - 20	*Bt*	*2.5 Y 5/2*	*5 YR 4/6*	*Common, Distinct, Coarse*	*Clay, firm, slightly sticky*

Hydric Soil Indicators:

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

Remarks: *Cid soils are listed as Hydric "B" on the NC hydric soils list.*

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: *Wetland A is classified as a wetland based upon the criteria set forth in the 1987 Army Corps of Engineers Wetlands Delineation Manual.*

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: B-4063, Bridge No. 20 on NC 902
Applicant/Owner: NC Department of Transportation
Investigator(s): Cindy Carr, Mulkey Engineers & Consultants, Inc.

Date: 1/19/2004
County: Chatham
State: NC

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: Mixed Hardwood Forest
Transect ID: Wetland
Plot ID: WA

VEGETATION

	Dominant Plant Species	Stratum	Indicator		Dominant Plant Species	Stratum	Indicator
1.	*Arisaema triphyllum*	*Herb*	*FACW*	9.			
2.	*Smilax rotundifolia*	*Vine*	*FAC*	10.			
3.	*Rubus sp.*	*Vine*	-	11.			
4.	*Ulmus americana*	*Shrub*	*FACW*	12.			
5.	*Acer negundo*	*Shrub*	*FACW*	13.			
6.	*Ligustrum sinense*	*Shrub*	*FACW*	14.			
7.	*Sambucus canadensis*	*Shrub*	*FACW*	15.			
8.	*Acer rubrum*	*Tree*	*FACW*	16.			

Percent of Dominant Species that are OBL, FACW, or FAC (excluding FAC-). *90*

Remarks: *Wetland vegetation is present based on greater than 50% of the plant species are classified as FAC-OBL in the National List of Plant Species that Occur in Wetlands. Sample plot was taken approximately 3 feet east of data point WA2.*

HYDROLOGY

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

Field Observations:

Depth of Surface Water: 3 (in.)
Depth to Free Water in Pit: 3 (in.)
Depth to Saturated Soil: 5 (in.)

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

Remarks: *Rainfall recorded at Siler City Airport for Chatham County at 0.01 inches on 1/17/04 and 0.29 inches on 1/18/04. Adjacent to intermittent stream channel and near toe of road slope.*

SOILS

Map Unit Name (Series and Phase): *Cid-Lignum complex*

Drainage Class: *Somewhat Poorly Drained*

Taxonomy (Subgroup) *Aquic Hapludults*

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 - 1	*Oe*				*Very coarse organic material, many fine roots*
1 - 16	*Bt1*	*10 YR 5/4*	*n/a*	*n/a*	*Silty Clay Loam*
16 - 18+	*Bt2*	*2.5 Y 5/2*	*5 YR 4/6*	*Few, Distinct, Medium*	*Sandy Clay Loam*

Hydric Soil Indicators:

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

Remarks: *Cid soils are listed as Hydric "B" on the NC hydric soils list.*

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: *Upland data point for Wetland A is not classified as a wetland based upon the criteria set forth in the 1987 Army Corps of Engineers Wetlands Delineation Manual.*

Approved by HQUSACE 3/92

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: B-4063, Bridge No. 20 on NC 902
Applicant/Owner: NC Department of Transportation
Investigator(s): Cindy Carr, Mulkey Engineers & Consultants, Inc.

Date: 1/19/2004
County: Chatham
State: NC

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? (If needed, explain on reverse)	Yes	No

Community ID: Mixed Hardwood Forest
Transect ID: Upland
Plot ID: WA

VEGETATION

	Dominant Plant Species	Stratum	Indicator		Dominant Plant Species	Stratum	Indicator
1.	*Microstegium vimineum*	*Herb*	*FAC*	9.			
2.	*Parthenocissus quinquefolia*	*Vine*	*FAC*	10.			
3.	*Smilax rotundifolia*	*Vine*	*FAC*	11.			
4.	*Rubus sp.*	*Vine*	-	12.			
5.	*Lonicera japonica*	*Vine*	*FAC*	13.			
6.	*Ligustrum sinense*	*Shrub*	*FAC*	14.			
7.	*Liriodendron tulipifera*	*Tree*	*FAC*	15.			
8.	*Acer rubrum*	*Tree*	*FAC*	16.			

Percent of Dominant Species that are OBL, FACW, or FAC (excluding FAC-). *90*

Remarks:

HYDROLOGY

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

Field Observations:

Depth of Surface Water: ___-___ (in.)
Depth to Free Water in Pit: ___-___ (in.)
Depth to Saturated Soil: ___-___ (in.)

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

Remarks:

P. O. Box 613
297 West Street
ittsboro, N. C. 27312-0613

CHATHAM COUNTY
Office of Emergency Operations

Phones - 919/542-2811
919/542-2911

February 20, 2004

Ms. Theresa Ellerby
NC Department of Transportation
Project Development and Environmental Analysis
1548 Mail Service Center
Raleigh, NC 27699

Dear Ms. Ellerby:

My concern on the Bridge Replacement Project B-4063 is from an emergency response view only.

If the existing bridge were removed before the new one is in place, there would be a delay in responses to the homes just east of the bridge. If this is the only way that the bridge must be replaced, we will make every effort to keep the delay to a minimum.

Thank you for allowing us to express our concerns in this matter.

Sincerely,

Tony S. Tucker

Tony Tucker, Director
Chatham County Emergency Operations

Subject: **Replacement of Bridge No. 20 over Sandy Branch on NC 902, Chatham County; Bridge Replacement Project B-4063**
Date: Thu, 19 Feb 2004 10:05:14 -0500
From: "Roy Kidd Jr." <roy_kidd@chatham.k12.nc.us>
Organization: Chatham County Schools Bus Garage
To: tellerby@dot.state.nc.us

I don't see a problem with the replacing of the bridge for our operation of bus routes. We have a total of 4 buses from Bonlee and Chatham Central that crosses that bridge 10 times per day.

Thanks,

Roy Kidd, Jr.

Roy Kidd, Jr. <roy_kidd@chatham.k12.nc.us>
Transportation Director
Chatham County Schools
Transportation

4. B-4216, Orange County, Bridge No. 66 over Strouds Creek on SR 1002. We recommend replacing this bridge with a bridge. Due to the close proximity of the Eno River we request conducting a survey for the following state endangered and federal species of concern mussels: Yellow lampmussel and Atlantic pigtoe. Also, a significant fishery for sunfish exists at this site, therefore we request an in-water work moratorium for sunfish from April 1 to June 30. Standard recommendations apply.

5. B-4300, Wake County, Bridge No. 29 over Clarks Creek on SR 1007. We recommend replacing this bridge with a bridge. NCDOT should follow all stream crossing guidelines for anadromous fish passage, including an in-water work moratorium from February 15 to June 30. Standard recommendations apply.

6. B-4301, Wake County, Bridge No. 229 over Poplar Creek on SR 1007. We recommend replacing this bridge with a bridge. NCDOT should follow all stream crossing guidelines for anadromous fish passage, including an in-water work moratorium from February 15 to June 30. Standard recommendations apply.

7. B-4302, Wake County, Bridge No. 336 over Terrible Creek on SR 1301. We recommend replacing this bridge with a bridge. Standard recommendations apply.

8. B-4303, Wake County, Bridge No. 102 over Lower Bartons Creek on SR 1844. We recommend replacing this bridge with a bridge. Standard recommendations apply.

9. B-4304, Wake County, Bridge No. 143 over Beaver Dam Creek on SR 2217. We recommend replacing this bridge with a bridge. Standard recommendations apply.

10. B-4592, Orange County, Bridge No. 64 over the Eno River on SR 1561. We recommend replacing this bridge with a bridge. We request conducting a survey for the following state endangered and federal species of concern mussels: Yellow lampmussel and Atlantic pigtoe. Also, a significant fishery for sunfish exists at this site, therefore we request an in-water work moratorium for sunfish from April 1 to June 30. Standard recommendations apply.

NCDOT should routinely minimize adverse impacts to fish and wildlife resources in the vicinity of bridge replacements. Restoring previously disturbed floodplain benches should narrow and deepen streams previously widened and shallowed during initial bridge installation. NCDOT should install and maintain sedimentation control measures throughout the life of the project and prevent wet concrete from contacting water in or entering into these streams. Replacement of bridges with spanning structures of some type, as opposed to pipe or box culverts, is recommended in most cases. Spanning structures allow wildlife passage along streambanks and reduce habitat fragmentation.

If you need further assistance or information on NCWRC concerns regarding bridge replacements, please contact me at (919) 528-9886. Thank you for the opportunity to review and comment on these projects.

Cc: Gary Jordan, U.S. Fish and Wildlife Service, Raleigh

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

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

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

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

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

Project specific comments:

1. B-4002, Alamance County, Bridge No. 96 over Meadow Creek on SR 2116. We recommend replacing this bridge with a bridge. Standard recommendations apply.

2. B-4063, Chatham County, Bridge No. 20 over Sandy Branch on NC 902. We recommend replacing this bridge with a bridge. Standard recommendations apply.

3. B-4109, Durham County, Bridge No. 120 over Mud Creek on SR 1303. We recommend replacing this bridge with a bridge. Standard recommendations apply.

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

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

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

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

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

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

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

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

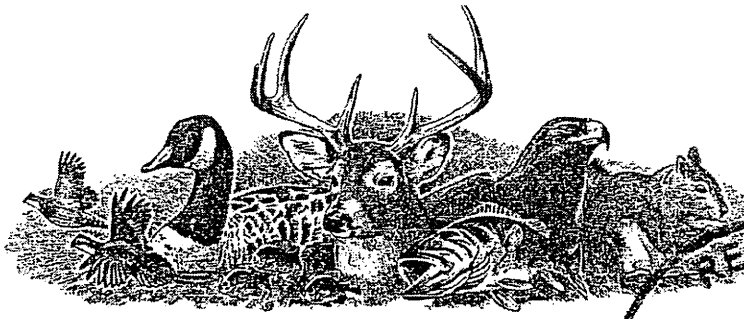
13. All work in or adjacent to stream waters should be conducted in a dry work area. Sandbags, rock berms, cofferdams, or other diversion structures should be used where possible to prevent excavation in flowing water.

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

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

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

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



North Carolina Wildlife Resources Commission

Charles R. Fullwood, Executive Director

MEMORANDUM

TO: Gregory J. Thorpe
Environmental Management Director, PDEA

FROM: Travis Wilson, Highway Project Coordinator
Habitat Conservation Program

DATE: February 27, 2004

SUBJECT: NCDOT Bridge Replacements in Alamance, Chatham, Durham, Orange, and Wake counties. TIP Nos. B-4002, B-4063, B-4109, B-4216, B-4300, B-4301, B-4302, B-4303, B-4304, and B-4592.

Biologists with the N. C. Wildlife Resources Commission (NCWRC) have reviewed the information provided and have the following preliminary comments on the subject project. Our comments are provided in accordance with provisions of the National Environmental Policy Act (42 U.S.C. 4332(2)(c)) and the Fish and Wildlife Coordination Act (48 Stat. 401, as amended; 16 U.S.C. 661-667d).

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

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

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

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

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

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

B-4303, Wake County, Bridge No. 102 over Lower Bartons Creek on SR 1844 (Mt. Vernon Church Road). The Lower Barton Creek Ultramafic Slopes natural area lies on the south side of the road; this is an unprotected site of Local significance. Just downstream of the bridge is the following –

Carolina ladle crayfish (*Cambarus davidi*), State Significantly Rare

B-4304, Wake County, Bridge No. 143 over Beaver Dam Creek on SR 2217 (Old Milburnie Road). There is a vague, historic record of the following, just downstream –

veined skullcap (*Scutellaria nervosa*), State Significantly Rare

B-4592, Orange County, Bridge No. 64 over the Eno River on SR 1561 (Lawrence Road). See comments for project B-4216. This site is a few miles above Eno River State Park. Also, a tract just upstream of the bridge has been recently acquired, or is in the process of being acquired. In addition, the section of the Eno River from Hillsborough to the confluence with the Neuse River is a Nationally significant aquatic habitat, for many additional rare species than those listed above.

Our program recommends that NC DOT enact strong sedimentation controls to ensure that populations of these rare species, and particularly the water quality of the Eno River, not be impacted during the bridge replacements. The use of Natural Heritage Program data should not be substituted for actual field surveys, particularly if the project area contains suitable habitat for rare species, significant natural communities, or priority natural areas.

You may wish to check the Natural Heritage Program database website at <www.ncsparks.net/nhp/search.html> for a listing of rare plants and animals and significant natural communities in the county and on the topographic quad map. Please do not hesitate to contact me at 919-715-8697 if you have questions or need further information.

Sincerely,

Harry E. LeGrand Jr

Harry E. LeGrand, Jr., Zoologist
Natural Heritage Program

HEL/hel

cc: Brian Strong, Division of Parks and Recreation, Resource Management Program
David Cook, Superintendent, Eno River State Park

NCDENR
North Carolina Department of Environment and Natural Resources

Michael F. Easley, Governor

William G. Ross Jr., Secretary

February 27, 2004

Dr. Gregory J. Thorpe
N.C. Department of Transportation
Project Development and Environmental Analysis
1548 MSC
Raleigh, NC 27699-1548

Subject: Replacement of Bridges in Alamance, Chatham, Durham, Orange, and Wake counties

Dear Dr. Thorpe:

The Natural Heritage Program has no record of rare species, significant natural communities, or priority natural areas at the site nor within a mile of the project area, for the projects listed below:

B-4002, Alamance County, Bridge No. 96 over Meadow Creek on SR 2116 (Preacher Holmes Road)
B-4063, Chatham County, Bridge No. 20 over Sandy Branch on NC 902
B-4109, Durham County, Bridge No. 120 over Mud Creek on SR 1303 (Pickett Road)
B-4300, Wake County, Bridge No. 29 over Clarks Creek on SR 1007 (Poole Road)
B-4301, Wake County, Bridge No. 229 over Poplar Creek on SR 1007 (Poole Road)
B-4302, Wake County, Bridge No. 336 over Terrible Creek on SR 1301 (Sunset Lake Road).

Our Program does have records of rare species, significant natural communities, or priority natural areas at the site or within a mile of the project area, for the projects listed below:

B-4216, Orange County, Bridge No. 66 over Strouds Creek on SR 1002 (St. Marys Road). This site lies just upstream of the Eno River, where there are numerous rare aquatic animal species. Species recorded at the confluence of Strouds Creek and the river (at Lawrence Road) are –

yellow lampmussel (*Lampsilis cariosa*), State Endangered and Federal Species of Concern
eastern lampmussel (*Lampsilis radiata radiata*), State Threatened
notched rainbow (*Villosa constricta*), State Special Concern
Neuse River waterdog (*Necturus lewisi*), State Special Concern

1601 Mail Service Center, Raleigh, North Carolina 27699-1601
Phone: 919-733-4984 \ FAX: 919-715-3060 \ Internet: www.enr.state.nc.us/ENR/

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

cc: Mary Pope Furr, NCDOT
Matt Wilkerson, NCDOT

North Carolina Department of Cultural Resources
State Historic Preservation Office

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

Division of Historical Resources
David L. S. Brook, Director

March 4, 2004

MEMORANDUM

TO: Stacey Baldwin
Project Development and Environmental Analysis Branch
NCDOT Division of Highways

FROM: David Brook for David Brook

SUBJECT: Request for comments on Bridge Replacement projects
B-4002, Alamance County
B-4063, Chatham County
B-4109, Durham County
B-4216, Orange County
B-4300, Wake County
B-4301, Wake County
B-4302, Wake County
B-4303, Wake County
B-4304, Wake County
B-4592, Orange County
ER03-0389 through ER03-0398

Thank you for your letters of February 5, 2004, concerning the above projects.

We are unable to comment on the potential effect of these projects on historic resources until we receive further information.

Please forward a labeled 7.5 minute USGS quadrangle map for each of the above projects clearly indicating the project vicinity, location, and termini. In addition, please include the name of the quadrangle map.

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

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

Federal Aid # BRZ-902(3) *TIP #* B-4063 *County*: Chatham

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

Project Description: Replace Bridge No. 20 on NC 902 over Sandy Branch

On 10/14/2003, representatives of the

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

Reviewed the subject project at

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

All parties present agreed

- [ ] There are no properties over fifty years old within the project's area of potential effects.
- [x] There are no properties less than fifty years old which are considered to meet Criteria Consideration G within the project's area of potential effects.
- [x] There are properties over fifty years old within the project's Area of Potential Effects (APE), but based on the historical information available and the photographs of each property, the property identified as Bridge #20 Props A-C is considered not eligible for the National Register and no further evaluation of it is necessary.
- [x] There are no National Register-listed or Study Listed properties within the project's area of potential effects.
- [x] All properties greater than 50 years of age located in the APE have been considered at this consultation, and based upon the above concurrence, all compliance for historic architecture with Section 106 of the National Historic Preservation Act and GS 121-12(a) has been completed for this project.
- [x] There are no historic properties affected by this project. (*Attach any notes or documents as needed*)

Signed:

Mary Pope Furr — 10-14-2003
Representative, NCDOT — Date

[signature] — 10/14/03
FHWA, for the Division Administrator, or other Federal Agency — Date

Renee Gledhill-Earley — 10/14/03
Representative, HPO — Date

David Brook — 10-14-03
State Historic Preservation Officer — Date

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