



STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

MICHAEL F. EASLEY
GOVERNOR

LYNDO TIPPETT
SECRETARY

June 3, 2008

US Army Corps of Engineers
Raleigh Regulatory Field Office
3331 Heritage Trade Drive, Suite 105
Wake Forest, North Carolina 27587

ATTENTION: Mr. Andy Williams
NCDOT Coordinator, Division 7

SUBJECT: **Application for Section 404 Nationwide Permits 23, 33, Section 401 Water Quality Certification, and Neuse River Riparian Buffer Authorization.**
Replacement of Bridge No. 64 on SR 1561 (Lawrence Road) over the Eno River in Orange County North Carolina. Federal Aid Project No. BRZ-1561(15), State Project No. 8.2502701, WBS Element 33790.1.1, TIP No. B-4592.

Dear Sir:

The North Carolina Department of Transportation (NCDOT) proposes to replace Bridge No. 64 over the Eno River. Bridge No. 64 has five spans and totals 177 feet in length. The project involves replacing the current bridge at the existing location. The new bridge will be approximately 200 feet in length. The proposed structure will be a two span, 39-inch, pre-stressed concrete box beam superstructure on concrete caps and drilled piers. The interior bent will consist of three drilled shafts that will be 3 feet, 6 inches in diameter. During construction, traffic will be maintained by an off-site detour along SR 1002 (St. Mary's Road) and US 70 By-pass. Please find enclosed the Pre-Construction Notification, permit drawings and design plans for the subject project. A Categorical Exclusion was signed in January of 2007 and distributed shortly thereafter. Additional copies are available upon request.

IMPACTS TO WATERS OF THE UNITED STATES

General Description: The project is located in sub basin 03-04-01 of the Neuse River Basin in Orange County. This area is part of Hydrologic Cataloging Unit 03020201. The project area is located within the Central Piedmont Ecoregion of North Carolina.

The Eno River and Strouds Creek are both large perennial streams. Because both streams are perennial, no Jurisdictional Determination was requested from the United States Army Corp of Engineers (USACE).

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

The Eno River and Strouds Creek are the only jurisdictional streams located within the project study area. The Eno River is a perennial stream and has been assigned Stream Index Number 27-2-(10) by the North Carolina Department of Water Quality (DWQ). The Eno River is described as having a substrate ranging in size from silt to boulder with the majority of the substrate being gravel. The Eno River has a channel width of approximately 80 feet, a bank height from 6 to 10 feet and a water depth of 6 inches to 8 feet. Within the project study area, Strouds Creek, a perennial stream, is approximately 10 to 20 feet wide with a bank height of approximately 2 feet and a water depth ranging from 3 inches to 4 feet. The surface waters in the project study area have been assigned a Best Usage Classification of **WS-IV** for the Eno River and **C NSW** for Strouds Creek.

No portion of the Eno River, Strouds Creek, their tributaries, or other surface waters located within 1.0 mile of the project are listed on the North Carolina Division of Water Quality's (NCDWQ) 2006 Final 303(d) List of Impaired Waters.

No waters classified as High Quality Water (HQW), Water Supplies (WS-I or WS-II), nor Outstanding Resource Waters (ORW) occur within 1.0 mile of the project study area.

The Wildlife Resources Commission rescinded the in-water work moratorium for sunfish in an email dated January 28, 2008. This email is included with this permit application.

Permanent Impacts: There will be 13 linear feet (<0.01 acres) of permanent impacts to the Eno River due to the placement of two 3.5 foot diameter shafts in the water.

Temporary Impacts: There will be a total of 0.15 acres (145 linear feet) of temporary jurisdictional impacts associated with the construction of this project. There will be two temporary causeways used during the construction of the new bridge. Causeway #1 will be constructed with Class II Rip Rap and will result in 0.08 acres (66 linear feet) of temporary surface water impacts. Causeway #1 will be removed before causeway #2 is constructed. Causeway #2 will be constructed with the same material used to construct causeway #1 and will result in 0.07 acres (77 linear feet) of temporary surface water impacts.

No more than 50% of the stream width will be impacted at a time.

Bridge Demolition: The existing two-lane structure consists of five spans, each 35 feet in length with a timber deck and an asphalt wearing surface on steel girders. The existing bridge has one bent in the water. The existing bridge will be removed without dropping components into the Eno River. All guidelines for Bridge Demolition and Removal will be followed in addition to Best Management Practices for the Protection of Surface Waters.

Utility Impacts: There will be no sewer, water, electric or other utility impacts due to this bridge replacement project.

IMPACTS TO THE NEUSE RIVER RIPARIAN BUFFER

This project is located within the Neuse River Basin and is therefore subject to Neuse River riparian buffer rules (15A NCAC 2B .0233). Construction of the new bridge will impact buffers along both the Eno River and Strouds Creek. The buffer impacts to the Eno River (Site 1) are classified as a bridge crossing and a road crossing. These impacts are allowable. The buffer impacts associated with Strouds Creek are classified as impacts resulting from road impacts other than crossings or streams and other surface waters. These impacts are allowable with mitigation. Please see Table 1.

Table 1. Neuse River Buffer Impacts

	Bridge	Road Crossing	Road Impacts Other Than Crossings or Streams
Zone 1 (sq. ft)	7264	0	4152
Zone 2 (sq. ft)	2445	573	2628
Mitigation requirements (exempt, allowable or allowable with mitigation)	Allowable	Allowable (impacts less than 150 linear feet or one-third of an acre).*	Allowable with Mitigation

* Approximately 125 linear feet of road crossing impacts

Practical Alternatives Analysis

This bridge has been determined to be structurally deficient and functionally obsolete. Replacement of this inadequate structure will result in safer and more efficient traffic operations. Because this bridge needs to be replaced, impacts to the riparian buffers of the Eno River and Strouds Creek are unavoidable.

FEDERALLY PROTECTED SPECIES

Plants and animals with federal classifications of Endangered (E), Threatened (T), Proposed Endangered (PE), and Proposed Threatened (PT) are protected under provisions of Section 7 and Section 9 of the Endangered Species Act of 1973, as amended. The United States Fish and Wildlife Service (USFWS) lists five Federally Protected species for Orange County, as of January 31, 2008. Table 2 lists the species and their federal status.

Table 2. Federally Protected Species in Orange County, NC

Common Name	Scientific Name	Federal Status	Biological Conclusion	Habitat Present
Bald Eagle	<i>Haliaeetus leucocephalus</i>	Delisted	Not Required	No
Michaux's Sumac	<i>Rhus michauxii</i>	T	No Effect	Yes
Smooth Coneflower	<i>Echinacea laevigata</i>	E	No Effect	Yes
Red-cockaded Woodpecker	<i>Picoides borealis</i>	E	No Effect	No
Dwarf Wedgemussel	<i>Alasmodonta heterodon</i>	E	No Effect	No

The bald eagle was officially delisted on August 8, 2007 (CFR 50 Part 17). The bald eagle is still afforded protection under the Bald and Golden Eagle Protection Act. A description of the bald eagle and its habitat is included in the CE. Suitable habitat for bald eagle nesting/foraging does not exist within the project study area. Additionally, a review of the Natural Heritage Program database (last updated in February 2008) revealed no occurrences of this species within 1.0 mile of the project study area. Therefore, the proposed project will not affect the bald eagle.

Suitable habitat for the red-cockaded woodpecker (RCW) does not exist within the project study area. Pine trees located within the mixed pine hardwood forest found in the study area were not of sufficient age or diameter to support RCW nesting or foraging. The biological conclusion of "No Effect" given in the CE remains valid.

A survey for dwarf wedgemussel (DWM) was conducted on June 8, 2004 by the Catena Group biologists and yielded no individual DWM. The survey results indicated that a significant and viable freshwater mussel fauna occurs in the Eno River within the project study area. However, based on the fact that the record of the dwarf wedgemussel from the Eno River is represented by only 1 relict valve, it is unlikely that the dwarf wedgemussel occurs in the surveyed reach of the Eno River. Therefore it was determined by the Catena Group that the project construction was "Not Likely to Adversely Affect" the dwarf wedge mussel. In a letter dated April 13, 2006, the United States Fish and Wildlife Service concurred that the replacement of Bridge No. 64 over the Eno River "May Affect, but is not Likely to Adversely Affect" the dwarf wedgemussel. This letter is in the CE.

Suitable habitat for Michaux's sumac, in the form of sandy and/or rocky open woods and roadsides is present in the project area. NCDOT biologists conducted a survey for this species on June 6, 2006. No individuals of Michaux's sumac were observed during the survey. Furthermore, a review of the Natural Heritage Program database (last updated February 2008) revealed no occurrences within 1.0 mile of the project study area. Based on survey results and the lack of documented occurrences, a biological conclusion of "No Effect" is warranted for Michaux's sumac.

A field survey for smooth coneflower was conducted on June 6, 2006. Although suitable habitat for smooth coneflower is present in the project area, no species were observed during the field survey. Therefore, a biological conclusion of "No Effect" is warranted for smooth coneflower.

AVOIDANCE, MINIMIZATION and 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 avoidance/minimization activities proposed or completed by NCDOT:

Avoidance/Minimization: Avoidance examines all appropriate and practicable possibilities of averting impacts to "Waters of the US". The NCDOT is committed to incorporating all reasonable and practicable design features to avoid and minimize jurisdictional impacts and to minimize impacts as part of the project design.

- The proposed bridge will be replaced on its existing location.
- A preformed scour hole will be constructed on the northeast side of Lawrence Road.
- There will be two temporary causeways used during construction of the new bridge. Only one causeway will be in the river at a time.
- Best Management Practices for Protection of Surface Waters and Bridge Demolition and Removal will be implemented during the entirety of this project.

Compensatory Mitigation:

The Jeffrey's Warehouse Mitigation Site was originally constructed as on-site mitigation for R-1030 US 117 from south of NC 581 in Goldsboro to the US 264 Bypass in Wilson. There are two parcels associated with this mitigation site. The west parcel (approximately 50.2 acres) is bounded on the northwest by the Little River and on the southeast by the US 117 right-of-way. The east parcel (approximately 37.5 acres) is bounded on the northwest by the US 117 right-of-way, on the northeast by a Wayne County Board of Education school bus maintenance shop, and on the east and southeast by

private property. The site was constructed in 2006 and has undergone two years of hydrologic and vegetative monitoring.

To offset the unavoidable, 4,152 sq.ft. of Zone 1 buffer impacts and 2,628 sq.ft. of Zone 2, buffer impacts associated with T.I.P B-4592, the Jeffrey's Warehouse Mitigation Site will be debited 16,398 S.F. of Neuse Buffer Restoration. These debits are reflected in the debit ledger below.

Site Name	Site TIP	HUC	River Basin	Division	County
Jefferey's Warehouse (JALO)	R-1030AA	3020201	Neuse	4	Wayne

Mitigation Type	As Built Quantity	Available	Debit	Debit	Debit	Debit
			B-3528	B-4300	R-2719A	B-4592
Stream Restoration	3,731	3,279	452(226@2:1)			
Riverine Wetland Restoration	3.66	3.66				
Non-Riverine Wetland Restoration	23.02	23.02				
Riverine Wetland Preservation	12.36	12.36				
Neuse Buffer Restoration	689,607	515,739	75,577	40,075	41,818	16,398

Due to the minimal impacts to the Eno River (<0.01 acres), the NCDOT is not proposing mitigation for these impacts.

SCHEDULE

The project calls for a let date of January 20, 2009 and a review date of December 9, 2008. This project has a date of availability of March 3, 2009. It is expected that the contractor will begin construction shortly after that date.

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). It is anticipated that the temporary impacts will be authorized under Section 404 Nationwide Permit 33 for the causeways. We are therefore also requesting the issuance of a Nationwide Permit 33.


Section 401 Water Quality Certification: We anticipate Section 401 General Water Quality Certifications (WQC) 3701 and 3688 will be applicable to this project. This project will impact Neuse Riparian Buffers, therefore written concurrence will be required. In accordance with 15A NCAC 2H, Section .0500(a) and 15A NCAC 2B.0200 we are providing five copies of this application to the North Carolina Department of Environment and Natural Resources, Division of Water Quality, for their review.

Buffer Permit: This project has been designed to comply with the Neuse Riparian Buffer Regulations (15A NCAC 2B.0242). NCDOT requests a Neuse Riparian Buffer Authorization from the Division of Water Quality.

A copy of this permit application will be posted on the NCDOT website at:

<http://www.ncdot.org/doh/preconstruct/pe/neu/permit.html>. If you have any questions or need additional information, please contact Sara Easterly at 919-715-5499 or seeasterly@dot.state.nc.us.

Sincerely,



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

Cc:

w/attachment

Mr. Brian Wrenn, NCDWQ (2 Copies)
Mr. Travis Wilson, NCWRC
Mr. Gary Jordan, USFWS

w/o attachment (see permits website for attachments)

Dr. David Chang, P.E., Hydraulics
Mr. Greg Perfetti, P.E., Structure Design
Mr. Victor Barbour, P.E., Project Services Unit
Mr. Mark Staley, Roadside Environmental
Mr. J. M. Mills, P.E., Division 7 Engineer
Mr. Jerry Parker, Division 7 Environmental Officer
Mr. Jay Bennett, P.E., Roadway Design
Mr. Majed Alghandour, P. E., Programming and TIP
Mr. Art McMillan, P.E., Highway Design
Ms. Theresa Ellerby, P. E., PDEA Project Planning Engineer
Mr. Scott McLendon, USACE, Wilmington

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:

<input checked="" type="checkbox"/> Section 404 Permit	<input checked="" type="checkbox"/> Riparian or Watershed Buffer Rules
<input type="checkbox"/> Section 10 Permit	<input type="checkbox"/> Isolated Wetland Permit from DWQ
<input checked="" type="checkbox"/> 401 Water Quality Certification	<input type="checkbox"/> Express 401 Water Quality Certification
2. Nationwide, Regional or General Permit Number(s) Requested: Nationwide Permit 23 and Nationwide Permit 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: North Carolina Department of Transportation
Mailing Address: Gregory J. Thorpe, Ph.D., Manager
Project Development and Environmental Analysis Branch
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: Proposed replacement of bridge No. 64 over the Eno River on SR 1561 (Lawrence Road) in Orange County
2. T.I.P. Project Number or State Project Number (NCDOT Only): B-4592
3. Property Identification Number (Tax PIN): N/A
4. Location
County: Orange Nearest Town: Hillsboro
Subdivision name (include phase/lot number): N/A
Directions to site (include road numbers/names, landmarks, etc.): Highway 70 west to Saint Mary's Road to Lawrence 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): _____ °N _____ °W
6. Property size (acres): Please refer to attached drawings.
7. Name of nearest receiving body of water: Eno River
8. River Basin: Neuse
(Note – this must be one of North Carolina's seventeen designated major river basins. The River Basin map is available at <http://h2o.enr.state.nc.us/admin/maps/>.)
9. Describe the existing conditions on the site and general land use in the vicinity of the project at the time of this application: The local area surrounding the proposed project consists of gently rolling hills and land with both agriculture and residential development.

10. Describe the overall project in detail, including the type of equipment to be used: NCDOT proposes to replace bridge No. 64 over the Eno River on SR 1561 (Lawrence Road). 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: The purpose of this project is to improve safety by replacing to current structure that has a sufficiency rating of 29.9 out of a possible 100. The current bridge is considered functionally obsolete and structurally deficient

IV. Prior Project History

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

V. Future Project Plans

Are any future permit requests anticipated for this project? If so, describe the anticipated work, and provide justification for the exclusion of this work from the current application.
N/A

VI. Proposed Impacts to Waters of the United States/Waters of the State

It is the applicant's (or agent's) responsibility to determine, delineate and map all impacts to wetlands, open water, and stream channels associated with the project. Each impact must be listed separately in the tables below (e.g., culvert installation should be listed separately from riprap dissipater pads). Be sure to indicate if an impact is temporary. All proposed impacts, permanent and temporary, must be listed, and must be labeled and clearly identifiable on an accompanying site plan. All wetlands and waters, and all streams (intermittent and perennial) should be shown on a delineation map, whether or not impacts are proposed to these systems. Wetland and stream evaluation and delineation forms should be included as appropriate. Photographs may be included at the applicant's discretion. If this proposed impact is strictly for wetland or stream mitigation, list and describe the impact in Section VIII below. If additional space is needed for listing or description, please attach a separate sheet.

1. Provide a written description of the proposed impacts: There will be approximately 145 linear feet (0.14 acres) of temporary stream impacts to the Eno River and 13 feet of permanent impacts due to the replacement of bridge No. 64.

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

Wetland Impact Site Number (indicate on map)	Type of Impact	Type of Wetland (e.g., forested, marsh, herbaceous, bog, etc.)	Located within 100-year Floodplain (yes/no)	Distance to Nearest Stream (linear feet)	Area of Impact (acres)
N/A					
N/A					
Total Wetland Impact (acres)					0

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

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

Stream Impact Number (indicate on map)	Stream Name	Type of Impact	Perennial or Intermittent?	Average Stream Width Before Impact	Impact Length (linear feet)	Area of Impact (acres)
Site 1	Eno River	Temporary Causeway #1	Perennial	20 feet	68	0.08
Site 1	Eno River	Temporary Causeway #2	Perennial	20 feet	77	0.07
Site 1	Eno River	Permanent Impacts	Perennial	20 feet	13	<0.01
Total Stream Impact (by length and acreage)					158	0.16

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

Open Water Impact Site Number (indicate on map)	Name of Waterbody (if applicable)	Type of Impact	Type of Waterbody (lake, pond, estuary, sound, bay, ocean, etc.)	Area of Impact (acres)
N/A				
Total Open Water Impact (acres)				0

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

Stream Impact (acres):	0.16
Wetland Impact (acres):	0.00
Open Water Impact (acres):	0.00
Total Impact to Waters of the U.S. (acres)	0.16
Total Stream Impact (linear feet):	158

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.

N/A

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.): N/A

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

Current land use in the vicinity of the pond: N/A

Size of watershed draining to pond: N/A Expected pond surface area: N/A

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/newetlands/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.

Compensatory mitigation will be derived from an inventory of assets already in existence within the same 8-digit cataloguing unit (Jeffereys Warehouse).

2. Mitigation may also be made by payment into the North Carolina Ecosystem Enhancement Program (NCEEP). Please note it is the applicant's responsibility to contact the NCEEP at (919) 715-0476 to determine availability, and written approval from the NCEEP indicating that they are will to accept payment for the mitigation must be attached to this form. For additional information regarding the application process for the NCEEP, check the NCEEP website at <http://h2o.enr.state.nc.us/wrp/index.htm>. If use of the NCEEP is proposed, please check the appropriate box on page five and provide the following information:

Amount of stream mitigation requested (linear feet): N/A
Amount of buffer mitigation requested (square feet): 6,780
Amount of Riparian wetland mitigation requested (acres): N/A
Amount of Non-riparian wetland mitigation requested (acres): N/A
Amount of Coastal wetland mitigation requested (acres): N/A

IX. Environmental Documentation (required by DWQ)

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

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

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

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

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

1. Will the project impact protected riparian buffers identified within 15A NCAC 2B .0233 (Neuse), 15A NCAC 2B .0259 (Tar-Pamlico), 15A NCAC 02B .0243 (Catawba) 15A NCAC 2B .0250 (Randleman Rules and Water Supply Buffer Requirements), or other (please identify Neuse)? 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	4,152	3	12,456
2	2,628	1.5	3,942
Total	6,780		16,398

* 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. Mitigation will be provided by Jeffrey's Warehouse Mitigation Site..

XI. Stormwater (required by DWQ)

Describe impervious acreage (existing and proposed) versus total acreage on the site. Discuss stormwater controls proposed in order to protect surface waters and wetlands downstream from

the property. If percent impervious surface exceeds 20%, please provide calculations demonstrating total proposed impervious level. _____

N/A

XII. Sewage Disposal (required by DWQ)

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

N/A

XIII. Violations (required by DWQ)

Is this site in violation of DWQ Wetland Rules (15A NCAC 2H .0500) or any Buffer Rules?

Yes ☐ No ☒

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

XIV. Cumulative Impacts (required by DWQ)

Will this project (based on past and reasonably anticipated future impacts) result in additional development, which could impact nearby downstream water quality? Yes ☐ No ☒

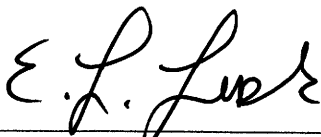
If yes, please submit a qualitative or quantitative cumulative impact analysis in accordance with the most recent North Carolina Division of Water Quality policy posted on our website at <http://h2o.enr.state.nc.us/ncwetlands>. If no, please provide a short narrative description:

N/A

XV. Other Circumstances (Optional):

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

N/A



Applicant/Agent's Signature

6.3.08

Date

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

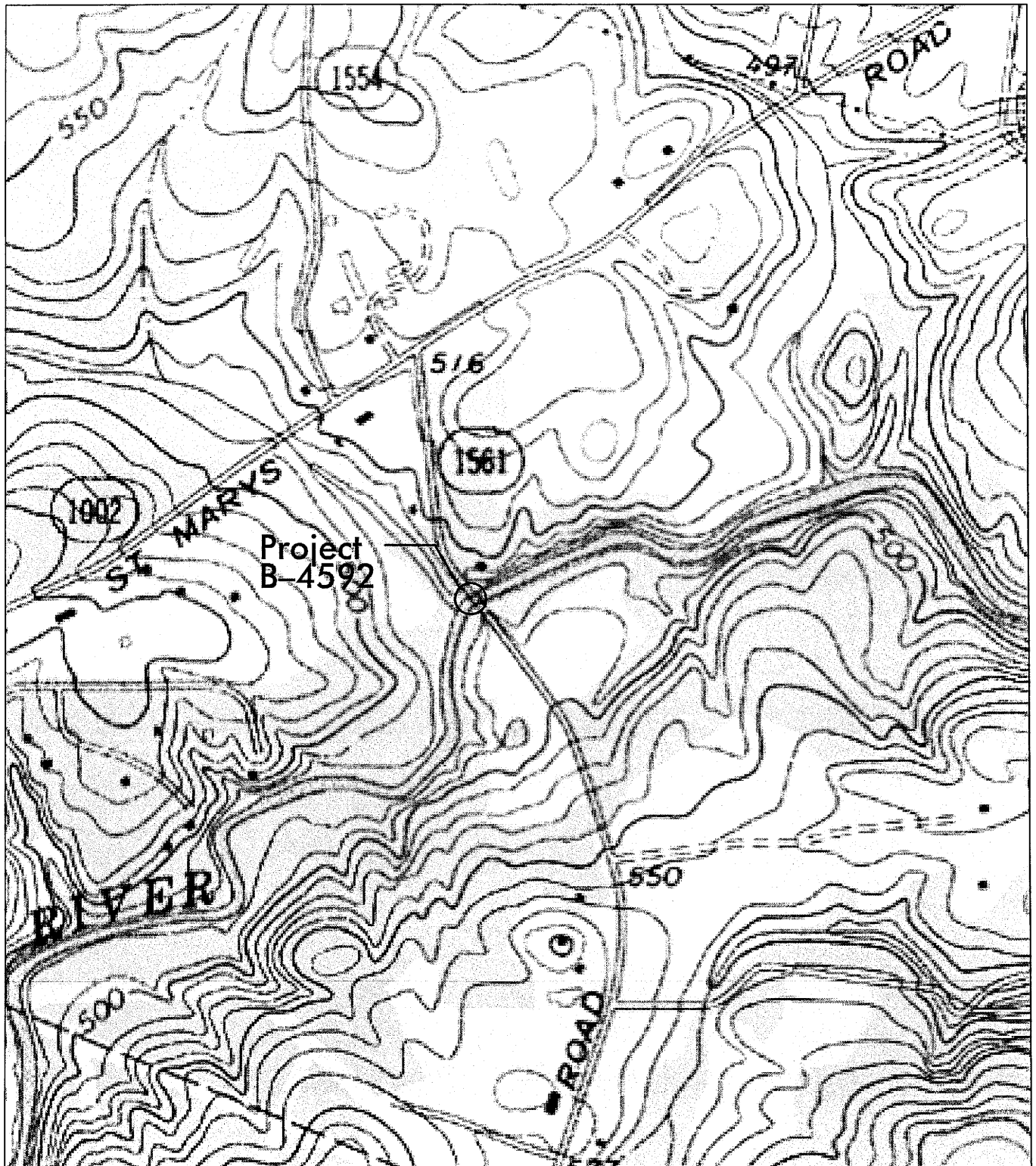
Subject: RE: sunfish moratoriums

Date: Fri, 15 Feb 2008 08:43:30 -0500

From: "Travis Wilson" <travis.wilson@ncwildlife.org>

To: "Rachelle Beauregard" <rbeauregard@dot.state.nc.us>

WRC does not request an in-water work moratorium for B-4592 and B-4216



TOPO MAP

SCALE: 1" : 2000'

NCDOT

DIVISION OF HIGHWAYS
ORANGE COUNTY

PROJECT: 33790.1.1 (B-4592)

BRIDGE NO. 64 OVER
THE ENO RIVER AND
APPROACHES ON SR 1561

PROPERTY OWNERS

NAMES AND ADDRESSES

	NAMES	ADDRESSES
1	DAVID R.MARION & WENDY M.MARION	211 LAWRENCE RD HILLSBOROUGH, NC 27278
2	JOSEPHINE BARBOUR	P O BOX 258 OAK RIDGE, NC 27310
3	JOHN W.HARTWELL & PATRICIA H.HARTWELL	3001 HARTWELL POND DR HILLSBOROUGH, NC 27278
4	RUTH R.PETTY	P O BOX 698 HILLSBOROUGH, NC 27278-0698

NCDOT

ORANGE COUNTY
PROJECT: 33790.1.1 (B-4592)
BRIDGE NO.64 OVER
THE ENO RIVER
APPROACHES ON SR 1561

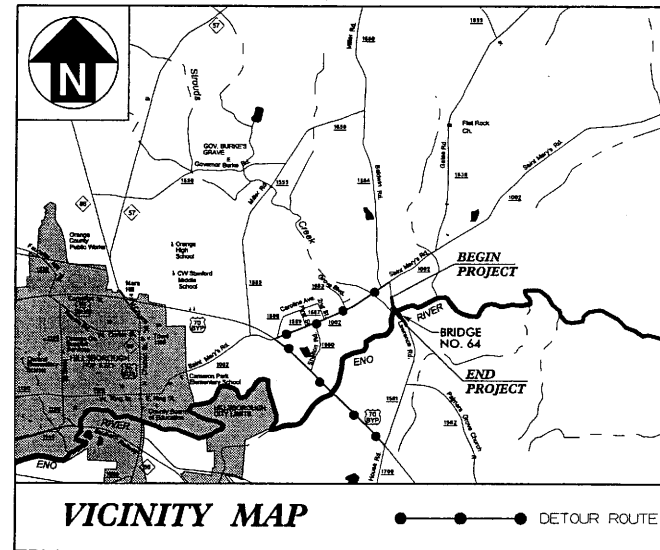
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09/08/99

CONTRACT:

TIP PROJECT: B-4592

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



STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

ORANGE COUNTY

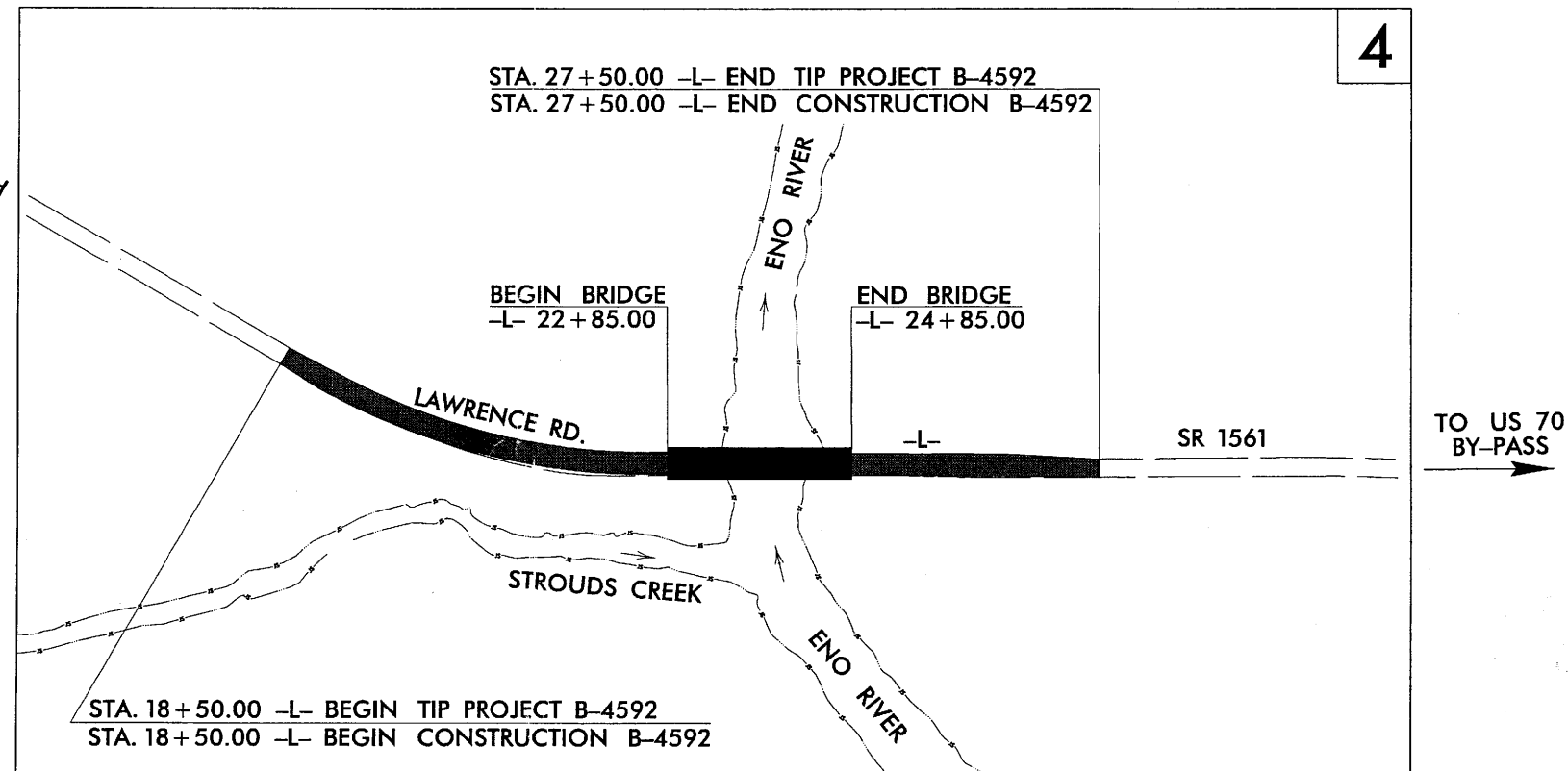
LOCATION: BRIDGE NO. 64 OVER ENO RIVER ON SR 1561

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

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-4592	1	
W&S ELEMENT		F.A. PROJ. NO.	DESCRIPTION
33790.1.1	BRZ-1561(5)		P.E .
33790.2.1	BRZ-1561(5)		R/W, UTL.
Permit Drawing			
Sheet 4 of 10			

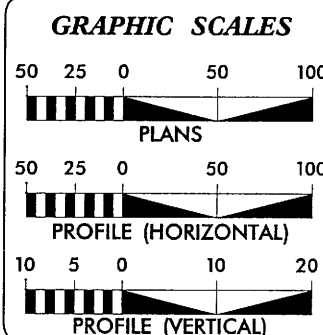
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

STREAM AND
WETLAND IMPACTS



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PO Box 33127
RALEIGH, N.C. 27636
(919) 851-1912
(919) 851-1918 (FAX)
WWW.MULKEYINC.COM

THIS PROJECT IS NOT WITHIN ANY MUNICIPAL BOUNDARIES.
CLEARING ON THIS PROJECT SHOULD BE PERFORMED TO THE LIMITS ESTABLISHED BY METHOD III.



DESIGN DATA	
ADT 2008 =	3,970
ADT 2030 =	7,400
DHV =	13 %
D =	75 %
T =	2 %*
V =	50 MPH
* TTST 1% DUAL 1%	
FUNCTIONAL CLASSIFICATION	LOCAL RURAL

PROJECT LENGTH	
LENGTH ROADWAY TIP PROJECT B-4592	= 0.133 MILES
LENGTH STRUCTURE TIP PROJECT B-4592	= 0.038 MILES
TOTAL LENGTH TIP PROJECT B-4592	= 0.171 MILES

Prepared in the Office of:

MULKEY
ENGINEERS & CONSULTANTS
FOR THE NORTH CAROLINA DEPT. OF TRANSPORTATION
2006 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
JANUARY 18, 2008

LETTING DATE:
JANUARY 20, 2009

TIM JORDAN, PE
ROADWAY PROJECT ENGINEER

DAVID BOCKER, PE
HYDRAULIC PROJECT ENGINEER

DOUG TAYLOR, PE
NCDOT ROADWAY DESIGN PROJECT ENGINEER

HYDRAULICS ENGINEER

SIGNATURE: _____ P.E.

ROADWAY DESIGN ENGINEER

SIGNATURE: _____ P.E.

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

STATE HIGHWAY DESIGN ENGINEER

P.E.

ORANGE COUNTY, NC
BRIDGE 64 ON SR 1561
OVER END RIVER
2/21/08

PROJECT REFERENCE NO.		SHEET NO.	
B-4592		4	
RW SHEET NO.			
ROADWAY DESIGN ENGINEER		HYDRAULICS ENGINEER	
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<div style="border: 1px solid black; padding: 5px; text-align: center;"> <p>PRELIMINARY PLANS</p> <p>DO NOT USE FOR CONSTRUCTION</p> </div>			
<p>Permit Drawing</p> <p>Sheet 6</p>			
<p>FOR -L- PROFILE SEE SHEET 5</p>			

 DENOTES TEMPORARY
IN SURFACE WATERS

 DENOTES FILL
IN SURFACE WATERS

CAUSEWAY "QUANTITIES"
VOLUME OF CLASS II RIP RAP
BELOW ORDINARY HIGH WATER = 368 YD³

CAUSEWAY #1
TO BE REMOVED PRIOR TO CAUSEWAY #2

DETAIL A
SPECIAL BASE DITCH
(Not to Scale)

Natural Ground 3:1 D 4:1

B

Min. D = 1.0' Ft.
B = 3' Ft.

- STA 19+00 TO STA 21+70 LT

DETAIL B

PREFORMED SCOUR HOLE
VIEW TO SCOUR

FLAME VIEW

PIPE OR BITCH OUTLET

SQUARE PREFORMED SCOUR HOLE (PSH)

PERMANENT OR REINFORCING MATTING (PSRM)

GRID WITH NATIVE GRASSES AT INSTALLATION

SECTION A-A

PIPE OR BITCH OUTLET

PSH

NATURAL GROUND

1.6' THICK

1.0'

STATION	S	P	H	P	S	SMALL NO. AMP. FEET	PSH FT	PSRM THICKNESS IN	PSRM NO.
SB+SB LT	4	1	4	0.8	8.7	1.8	#	18.7	

CONCRETE
MONUMENT
4.07' NORTH
OF LINE
PB 97 PG 76

DETAIL D
SPECIAL DITCH
(NOT TO SCALE)

Natural Ground

D

VAR. 24 - 36

Front Ditch Slope

MIN. D = 1 Ft.

STA. 25+90 TO STA. 27+00 LT
STA. 26+10 TO STA. 27+00 RT

DETAIL E
SLOPE PROTECTION
 (Not to Scale)

ELEV. 485.0

2' MIN

3.5' MIN

Natural Ground

CLASS BRR
 # / FT TO
 ELEV. 485.0

— STA. 20+35 TO STA. 21+20 RT
 — STA. 22+00 TO STA. 22+73 RT

REVISIONS

8/17/99

STREAM AND WETLAND IMPACTS (CAUSEWAY 2)

NAD 83/01
NC GRID

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ORANGE COUNTY, NC
BRIDGE 64 ON SR 1561
OVER ENO RIVER
2/21/08
ENGLISH

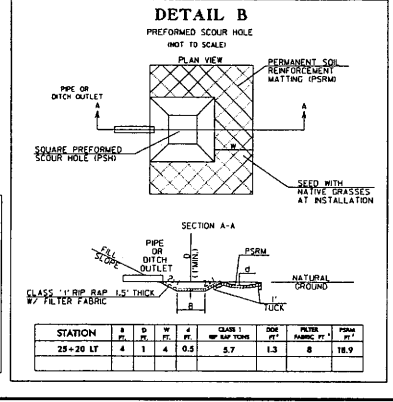
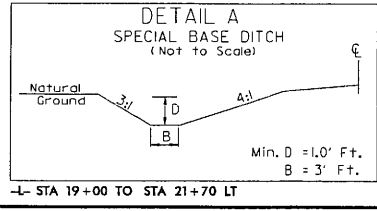
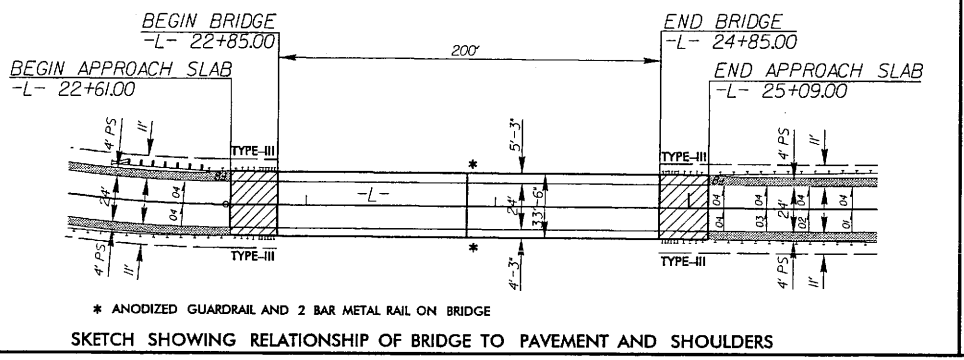
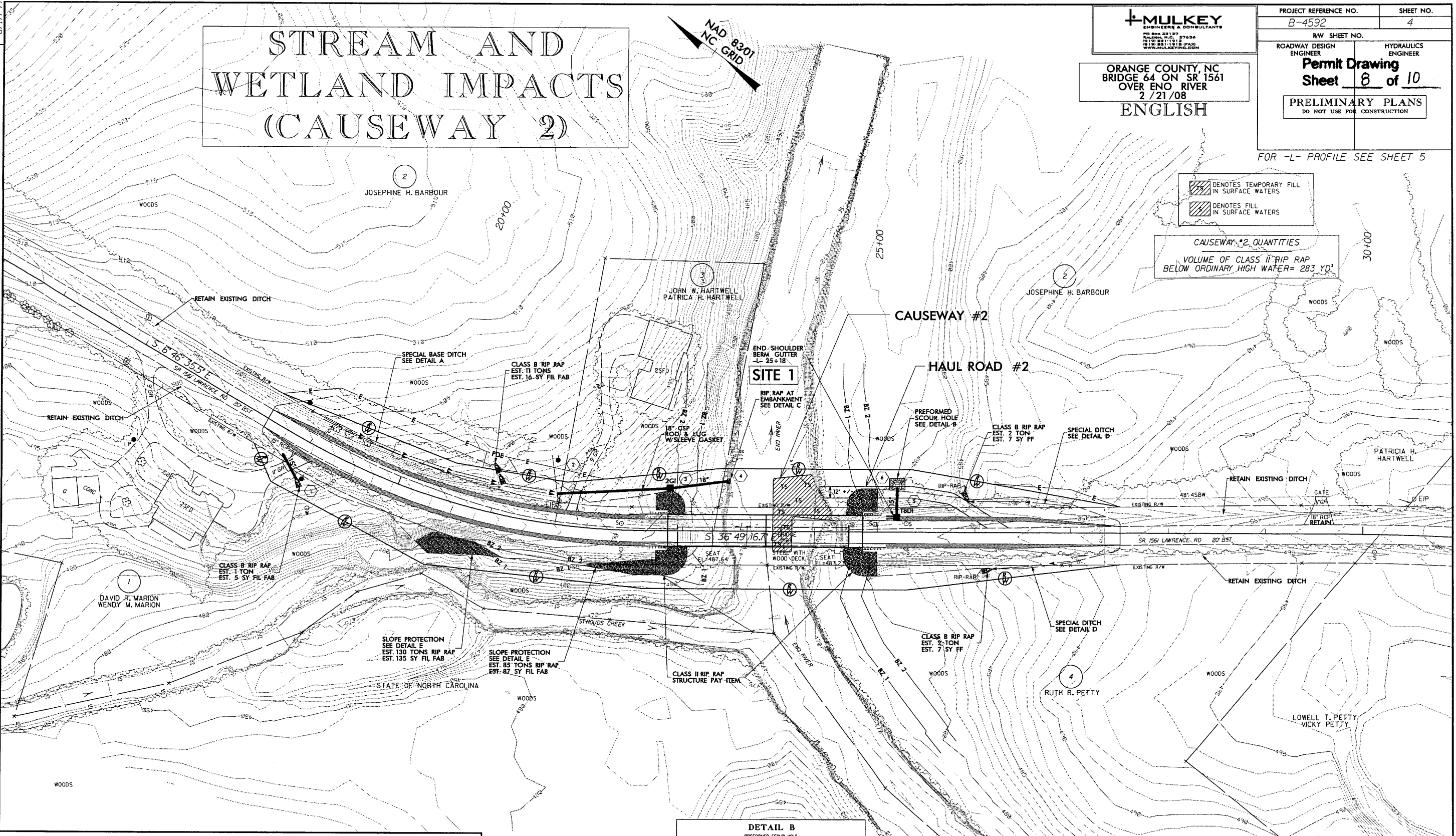
PROJECT REFERENCE NO.	SHEET NO.
B-4592	4
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
Permit Drawing	
Sheet 8 of 10	
PRELIMINARY PLANS	
DO NOT USE FOR CONSTRUCTION	

FOR -L- PROFILE SEE SHEET 5

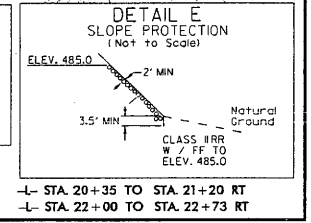
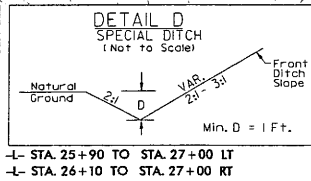
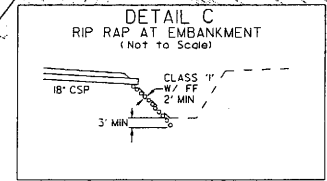
15' DENOTES TEMPORARY FILL IN SURFACE WATERS
15' DENOTES FILL IN SURFACE WATERS

CAUSEWAY #2 QUANTITIES
VOLUME OF CLASS II RIP RAP BELOW ORDINARY HIGH WATER= 283 YD³

REVISIONS



CONCRETE MONUMENT
4.07' NORTH
OF LINE
PB 97 PG 76



3/10/2008
R:\Hydro\Permits\B4592_Hyd.prm.psh4_wet2.dgn
2:58:56 PM

5/28/99

BRIDGE HYDRAULIC DATA	
DESIGN DISCHARGE	= 8350 CFS
DESIGN FREQUENCY	= 25 YRS
DESIGN HW ELEVATION	= 483.6 FT
BASE DISCHARGE	= 11,400 CFS
BASE FREQUENCY	= 100 YRS
BASE HW ELEVATION	= 485.6 FT
OVERTOPPING DISCHARGE	= 21,300 CFS
OVERTOPPING FREQUENCY	= 500+ YRS
OVERTOPPING ELEVATION	= 491.2 FT
W.S.ELEVATION AT DATE OF SURVEY	= 470.5 FT
DATE OF SURVEY	= 4/20/06

-BL-6
EL = 497.50

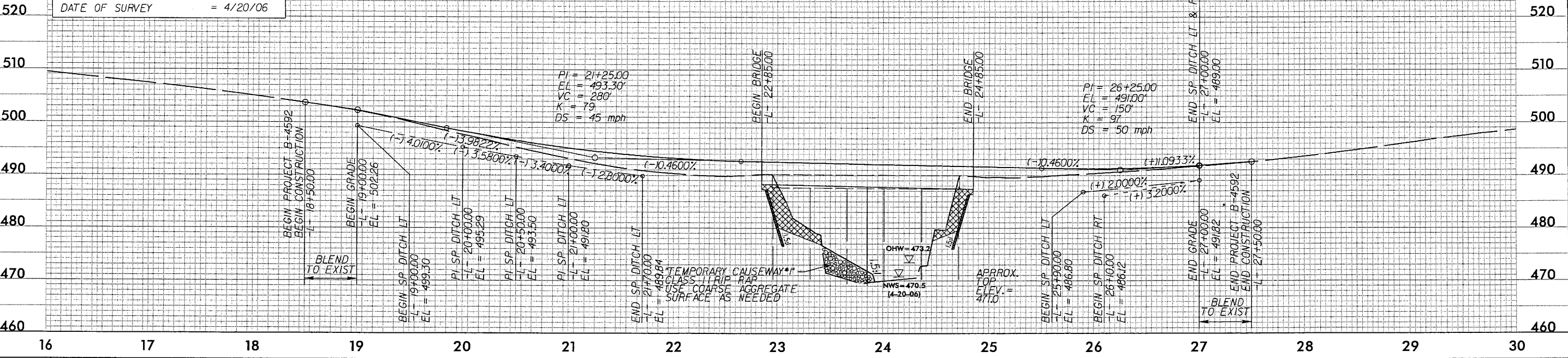
-BL-7
EL = 488.98

BM-*)
RAILROAD SPIKE IN 15' OAK TREE
-L- STA 25+47.36 365.95' LEFT
EL = 477.34'



PROJECT REFERENCE NO. B-4592	SHEET NO. 5
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
Permit Drawing Sheet 9 of 10	
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	

-BL-8
EL = 501.11



STREAM AND
WETLAND IMPACTS
(CAUSEWAY 1)

5/28/99

BRIDGE HYDRAULIC DATA

DESIGN DISCHARGE = 8350 CFS
DESIGN FREQUENCY = 25 YRS
DESIGN HW ELEVATION = 4836 FT
BASE DISCHARGE = 11,400 CFS
BASE FREQUENCY = 100 YRS
BASE HW ELEVATION = 4856 FT
OVERTOPPING DISCHARGE = 21,300 CFS
OVERTOPPING FREQUENCY = 500+ YRS
OVERTOPPING ELEVATION = 491.2 FT
W.S. ELEVATION AT DATE OF SURVEY = 470.5 FT
DATE OF SURVEY = 4/20/06

-BL-6
EL = 497.50

-BL-7
EL = 488.98

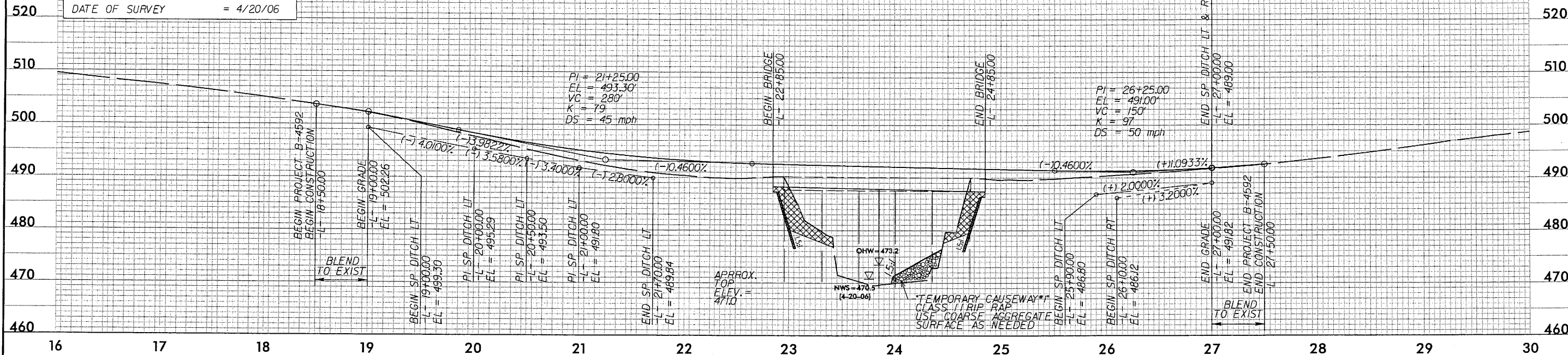
BM-1
RAILROAD SPIKE IN 15' OAK TREE
-L- STA 25+47.36 365.95' LEFT
EL = 477.34

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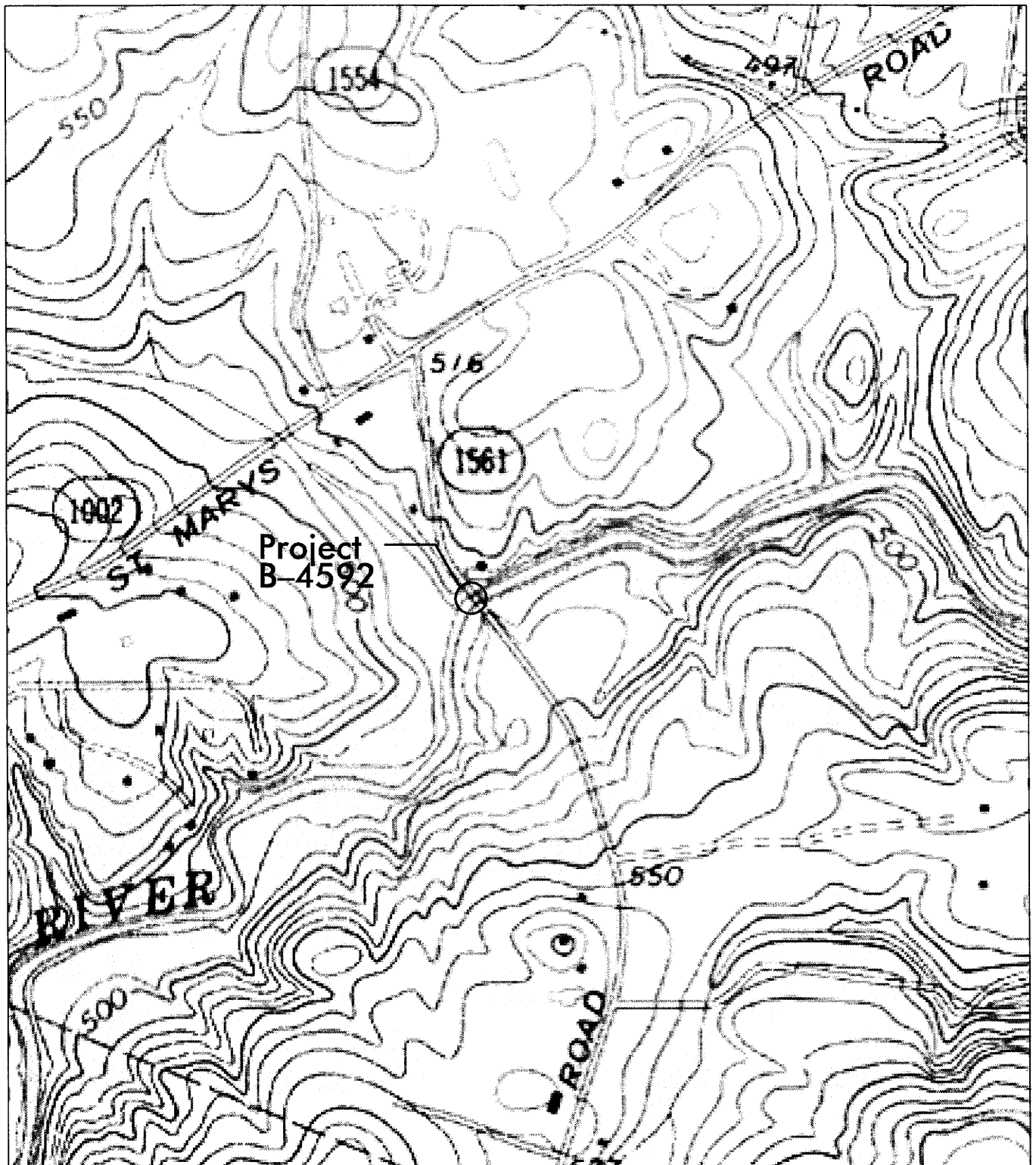
PROJECT REFERENCE NO. **B-4592** SHEET NO. **5**
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
Permit Drawing
Sheet 10 of 10
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

-BL-8
EL = 501.11

FOR -L- PLAN VIEW SEE SHEET 4



STREAM AND
WETLAND IMPACTS
(CAUSEWAY 2)



TOPO MAP

SCALE: 1" : 2000'

NCDOT

DIVISION OF HIGHWAYS
ORANGE COUNTY

PROJECT: 33790.1.1 (B-4592)

BRIDGE NO. 64 OVER
THE ENO RIVER AND
APPROACHES ON SR 1561

SHEET 1 OF 6

2/21/2008

PROPERTY OWNERS

NAMES AND ADDRESSES

	NAMES	ADDRESSES
1	DAVID R.MARION & WENDY M.MARION	211 LAWRENCE RD HILLSBOROUGH, NC 27278
2	JOSEPHINE BARBOUR	P O BOX 258 OAK RIDGE, NC 27310
3	JOHN W.HARTWELL & PATRICIA H.HARTWELL	3001 HARTWELL POND DR HILLSBOROUGH, NC 27278
4	RUTH R.PETTY	P O BOX 698 HILLSBOROUGH, NC 27278-0698

NCDOT

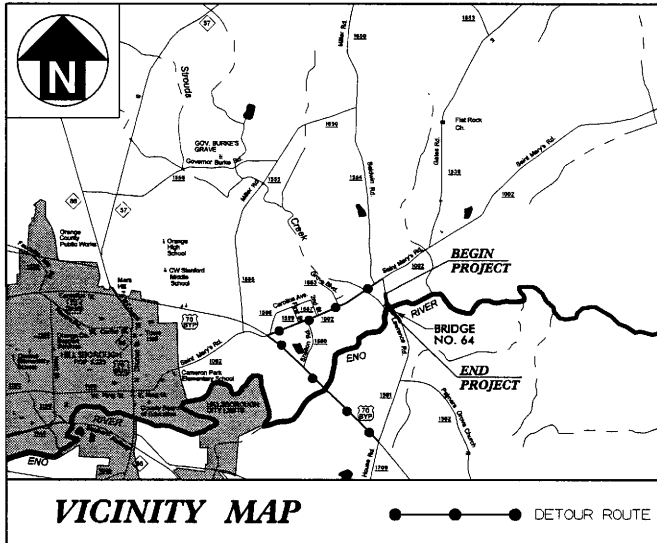
ORANGE COUNTY
PROJECT: 33790.1.1 (B-4592)
BRIDGE NO. 64 OVER
THE ENO RIVER
APPROACHES ON SR 1561

09/08/99

TIP PROJECT: B-4592

CONTRACT:

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



STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

ORANGE COUNTY

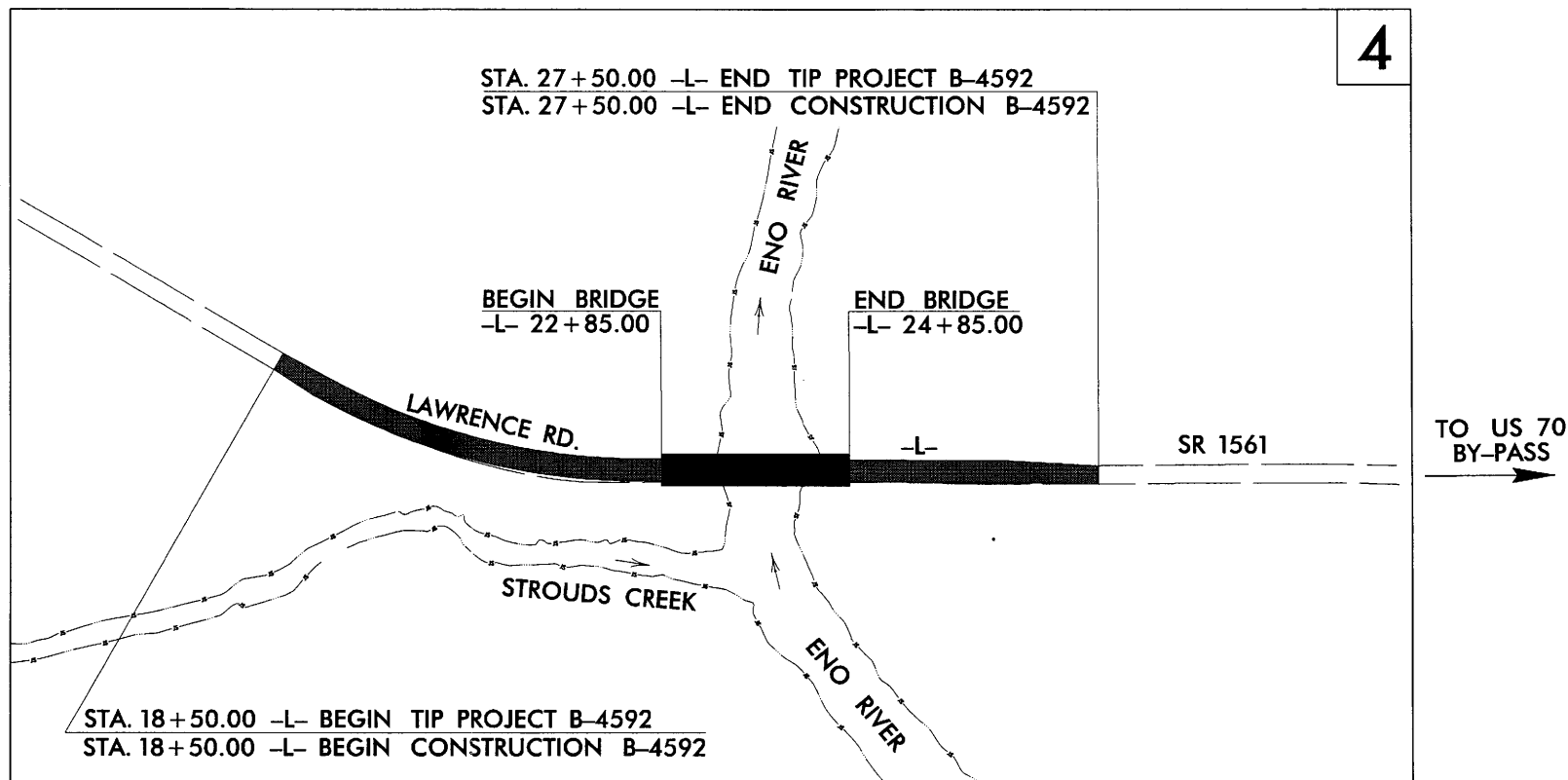
LOCATION: BRIDGE NO. 64 OVER ENO RIVER ON SR 1561

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

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-4592	1	
WAS ELEMENT	P.A. PROJ. NO.	DESCRIPTION	
33790.1.1	BRZ-1561(5)	P.E.	
33790.2.1	BRZ-1561(5)	RW, UTL.	
		Buffer Drawing	
		Sheet 4 of 6	

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

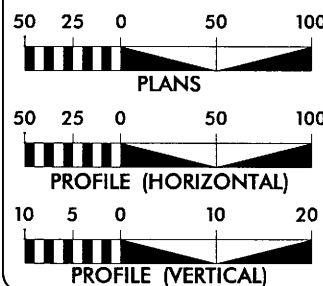
BUFFER IMPACTS



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PO Box 33127
RALEIGH, N.C. 27636
(919) 851-1912
(919) 851-1918 (FAX)
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THIS PROJECT IS NOT WITHIN ANY MUNICIPAL BOUNDARIES.
CLEARING ON THIS PROJECT SHOULD BE PERFORMED TO THE LIMITS ESTABLISHED BY METHOD III.

GRAPHIC SCALES



DESIGN DATA

ADT 2008 = 3,970
ADT 2030 = 7,400
DHV = 13 %
D = 75 %
T = 2 %*
V = 50 MPH
* TTST 1% DUAL 1%
FUNCTIONAL CLASSIFICATION
LOCAL RURAL

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT B-4592 = 0.133 MILES
LENGTH STRUCTURE TIP PROJECT B-4592 = 0.038 MILES
TOTAL LENGTH TIP PROJECT B-4592 = 0.171 MILES

Prepared In the Office of:

MULKEY
ENGINEERS & CONSULTANTS
FOR THE NORTH CAROLINA DEPT. OF TRANSPORTATION
2006 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
JANUARY 18, 2008

LETTING DATE:
JANUARY 20, 2009

TIM JORDAN, PE
ROADWAY PROJECT ENGINEER

DAVID BOCKER, PE
HYDRAULIC PROJECT ENGINEER

DOUG TAYLOR, PE
NCDOT ROADWAY DESIGN PROJECT ENGINEER

HYDRAULICS ENGINEER

SIGNATURE: _____ P.E.

ROADWAY DESIGN ENGINEER

SIGNATURE: _____ P.E.

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

STATE HIGHWAY DESIGN ENGINEER

P.E.

BUFFER IMPACTS

NAD 83/01
NC GRID

MULKEY
ENGINEERS & CONSULTANTS
RD BOX 351 ST
RAVENEL, SC 29724
(815) 881-1818
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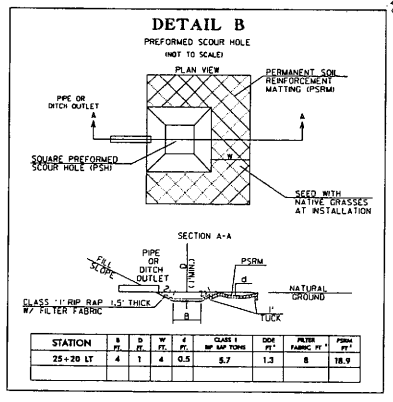
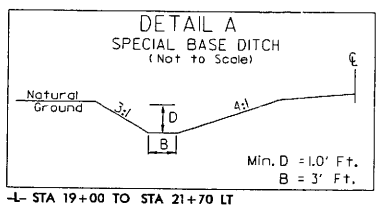
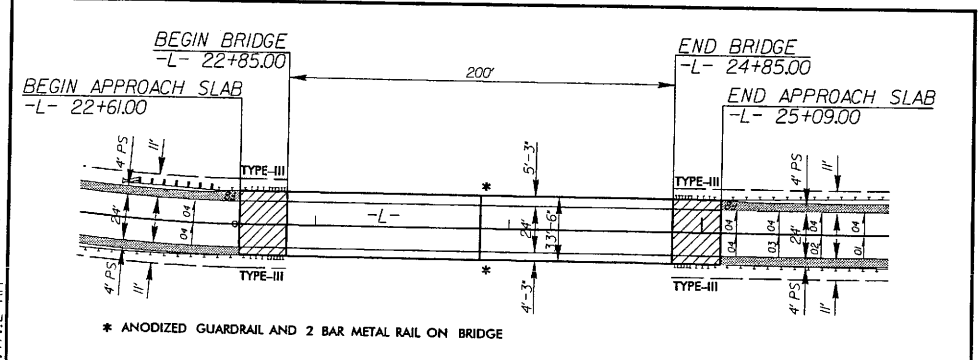
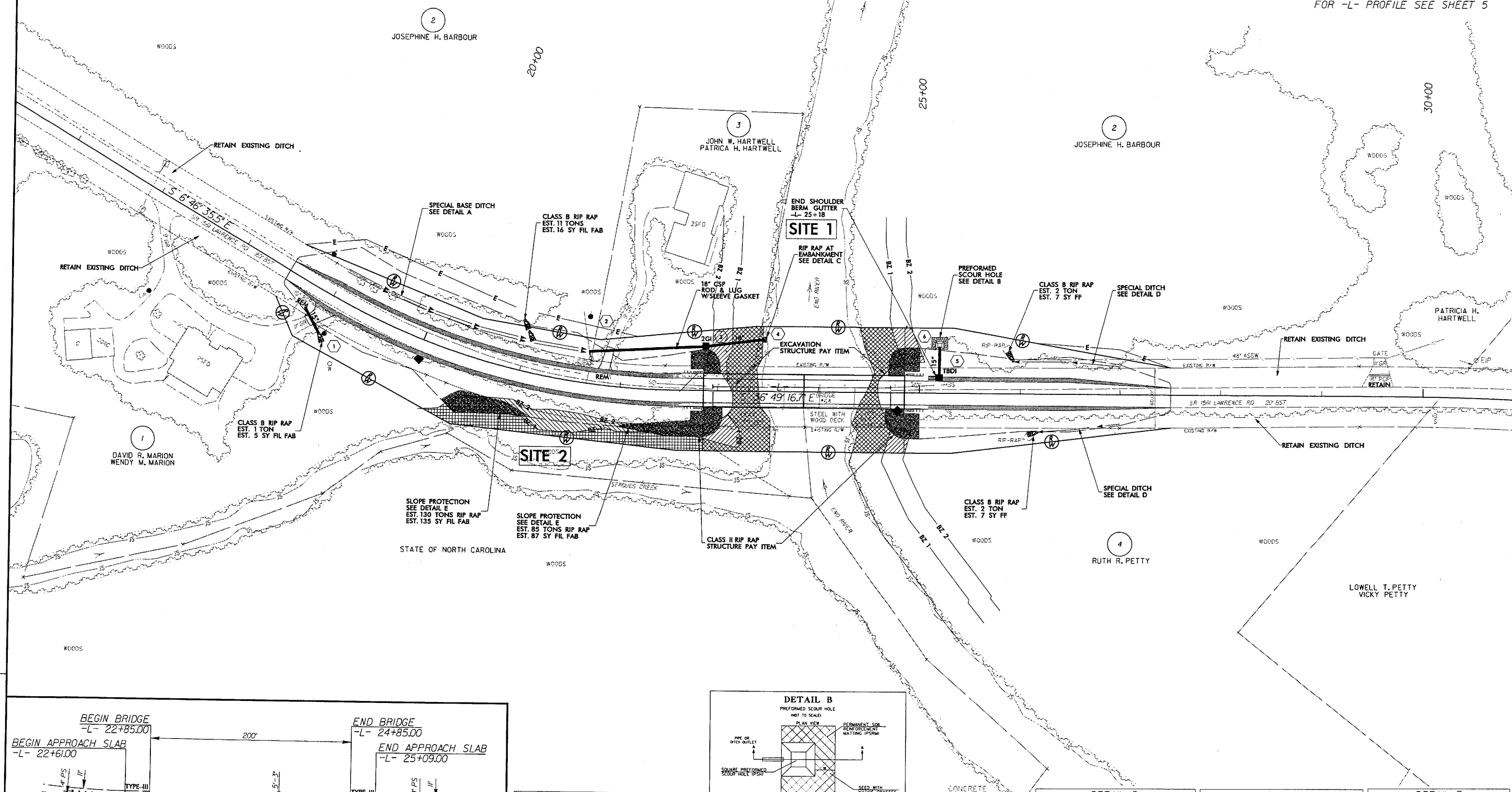
ORANGE COUNTY, NC
BRIDGE 64 ON SR 1561
OVER ENO RIVER
3/12/08
ENGLISH

PROJECT REFERENCE NO.	SHEET NO.
B-4592	4
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
Buffer Drawing	Sheet 5 of 6
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	

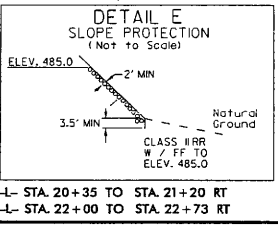
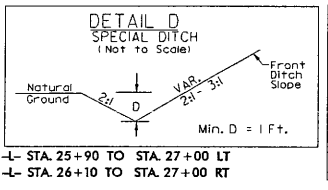
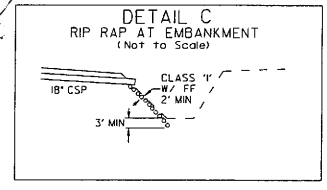
FOR -L- PROFILE SEE SHEET 5

- ALLOWABLE IMPACTS ZONE 1
- ALLOWABLE IMPACTS ZONE 2
- MITIGABLE IMPACTS ZONE 1
- MITIGABLE IMPACTS ZONE 2

REVISIONS



CONCRETE MONUMENT
4.07' NORTH
OF LINE
PB 97 PG 76



3/12/2008
R:\Hydraulics\Permits\B4592_Hyd_prm.psh4.buf.dgn
11:47:12 AM

5/28/99

BRIDGE HYDRAULIC DATA	
DESIGN DISCHARGE	= 8350 CFS
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-BL-6
EL = 497.50

-BL-7
EL = 488.98

BM-#1
RAILROAD SPIKE IN 15" OAK TREE
-L- STA 25+47.36 365.95' LEFT
EL = 477.34'

MULKEY

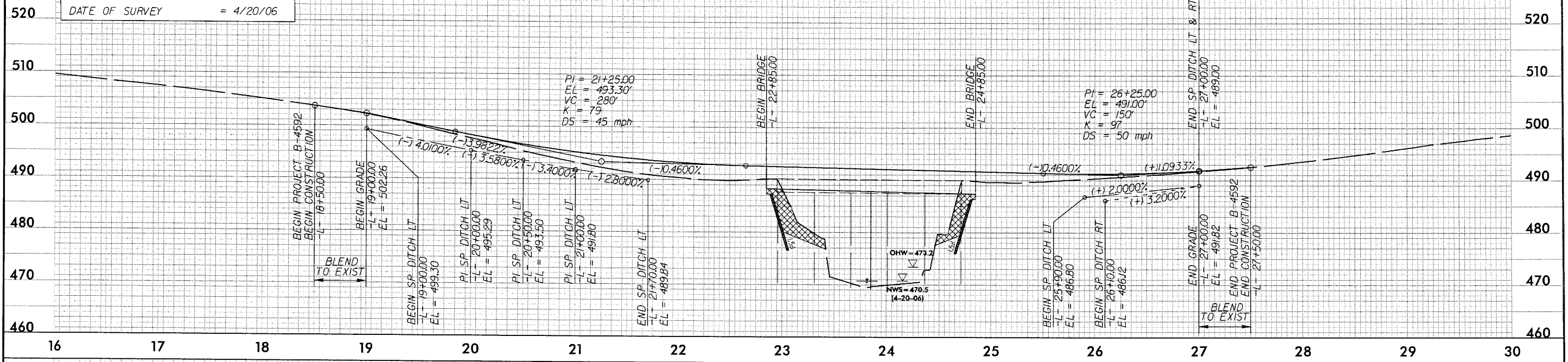
ENGINEERS & CONSULTANTS

PO BOX 33137
RICHMOND, VA 23268
(813) 881-1111 FAX
WWW.MULKEYINC.COM

PROJECT REFERENCE NO.	SHEET NO.
B-4592	5
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
Buffer Drawing Sheet 6 of 6	
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	

-BL-8
EL = 501.11

-L-
FOR -L- PLAN VIEW SEE SHEET 4

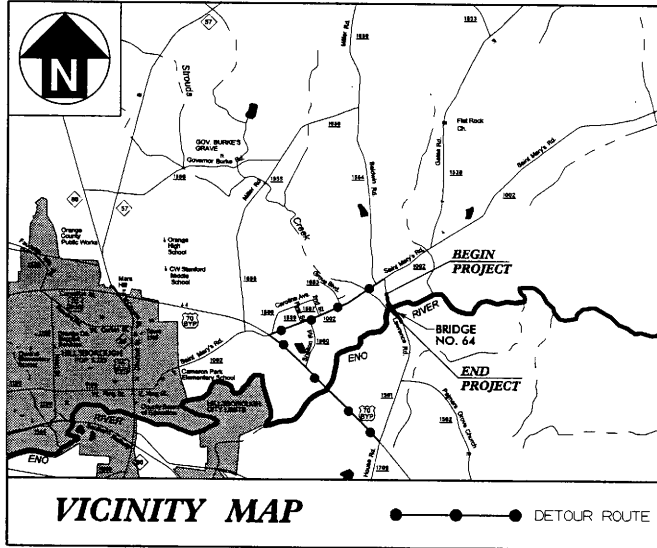


03/08/99

TIP PROJECT: B-4592

CONTRACT:

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



STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

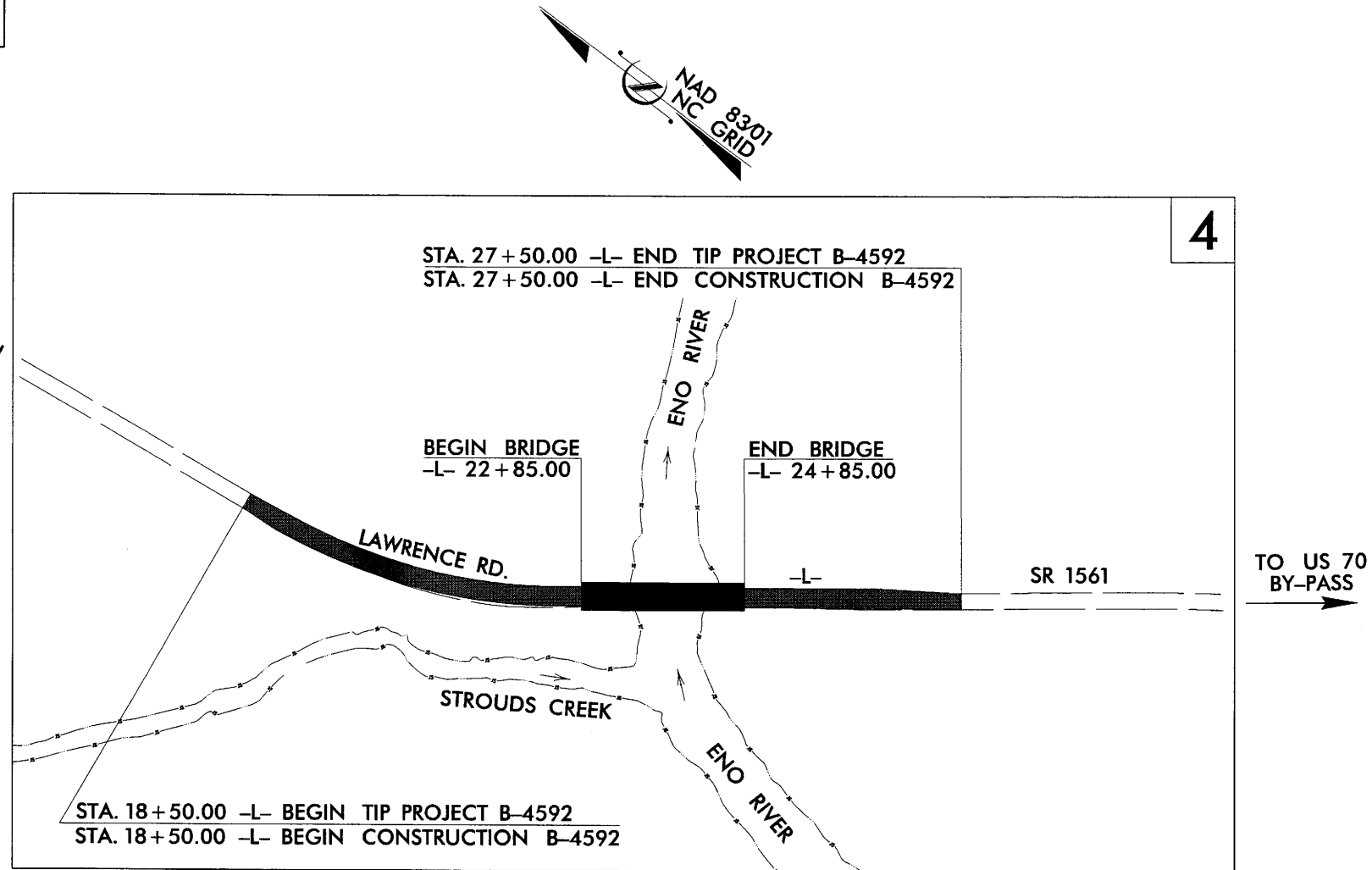
ORANGE COUNTY

LOCATION: BRIDGE NO. 64 OVER ENO RIVER ON SR 1561

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

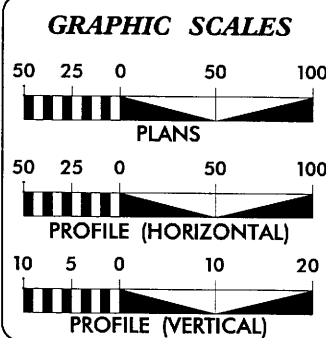
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
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WAS ELEMENT	P.A. PROJ. NO.	DESCRIPTION	
33790.1.1	BRZ-1561(5)	P.E.	
33790.2.1	BRZ-1561(5)	R/W, UTL.	

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



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LENGTH ROADWAY TIP PROJECT B-4592 = 0.133 MILES
LENGTH STRUCTURE TIP PROJECT B-4592 = 0.038 MILES
TOTAL LENGTH TIP PROJECT B-4592 = 0.171 MILES

Prepared in the Office of:
MULKEY
ENGINEERS & CONSULTANTS
FOR THE NORTH CAROLINA DEPT. OF TRANSPORTATION
2006 STANDARD SPECIFICATIONS
RIGHT OF WAY DATE:
JANUARY 18, 2008
LETTING DATE:
JANUARY 20, 2009
TIM JORDAN, PE
ROADWAY PROJECT ENGINEER
DAVID BOCKER, PE
HYDRAULIC PROJECT ENGINEER
DOUG TAYLOR, PE
NCDOT ROADWAY DESIGN PROJECT ENGINEER

HYDRAULICS ENGINEER
SIGNATURE: _____ P.E.
ROADWAY DESIGN ENGINEER
SIGNATURE: _____ P.E.

**DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA**

STATE HIGHWAY DESIGN ENGINEER

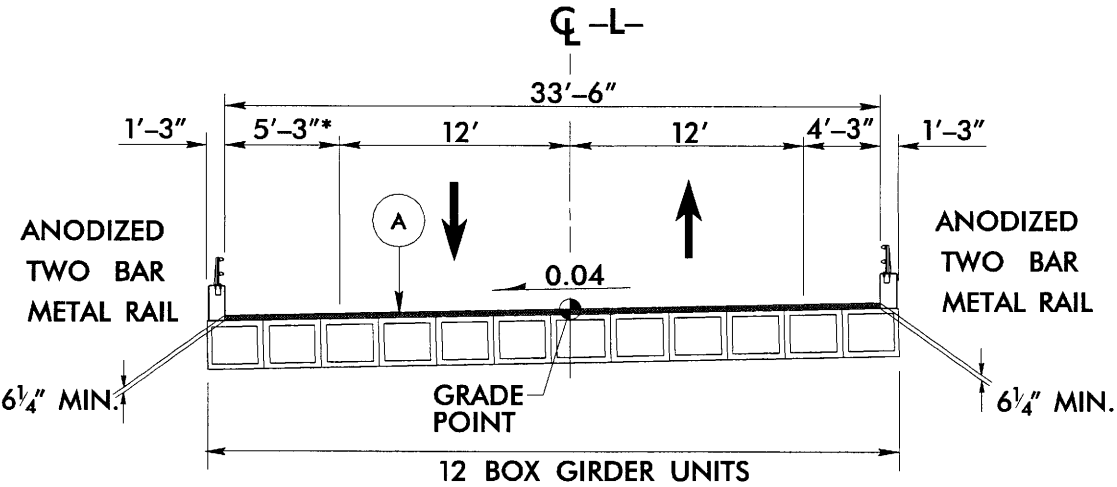
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PAVEMENT SCHEDULE
(FINAL PAVEMENT DESIGN)

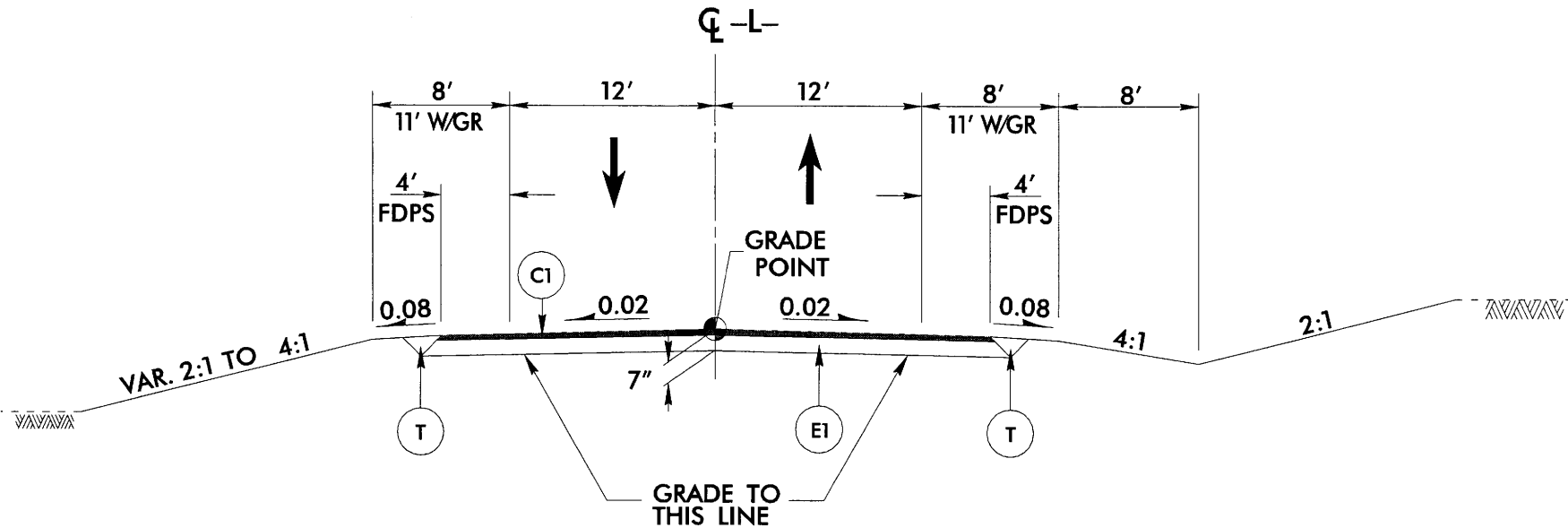
A	CONCRETE WEARING SURFACE (STRUCTURE PAY ITEM)
C1	PROP. APPROX. 2½" ASPHALT CONCRETE SURFACE COURSE, TYPE SF9.5A, AT AN AVERAGE RATE OF 137.5 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.
E1	PROP. APPROX. 4½" ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 513 LBS. PER SQ. YD.
T	EARTH MATERIAL.

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



-L- STA 22+85.00 (BEGIN BRIDGE) TO STA 24+85.00 (END BRIDGE)

* WIDENED FOR HYDRAULIC SPREAD ON STRUCTURE



TYPICAL SECTION NO. 1

USE TYPICAL SECTION NO. 1
AT THE FOLLOWING LOCATIONS

TRANSITION FROM EXISTING TO T.S. NO. 1 FROM
-L- STA. 18+50.00 TO STA. 19+00.00

-L- STA. 19+00.00 TO STA. 22+85.00 (BEGIN BRIDGE)
-L- STA. 24+85.00 (END BRIDGE) TO STA. 26+50.00

TRANSITION FROM T.S. NO. 1 TO EXISTING
-L- STA. 26+50.00 TO STA. 27+50.00

PROJECT REFERENCE NO.	SHEET NO.
B-4592	2
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	

MULKEY
ENGINEERS & CONSULTANTS

PO BOX 32127
RALEIGH, NC 27636
(919) 881-1111
WWW.MULKEYENGINEERS.COM

PROJECT REFERENCE NO.
B-4592

SHEET NO.
4

R/W SHEET NO.

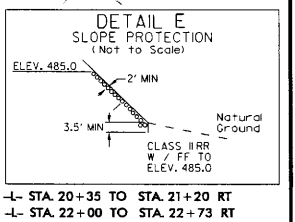
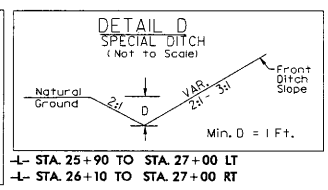
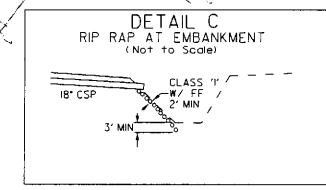
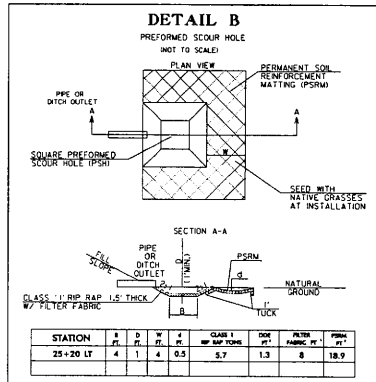
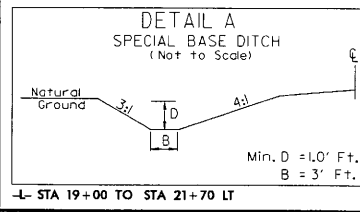
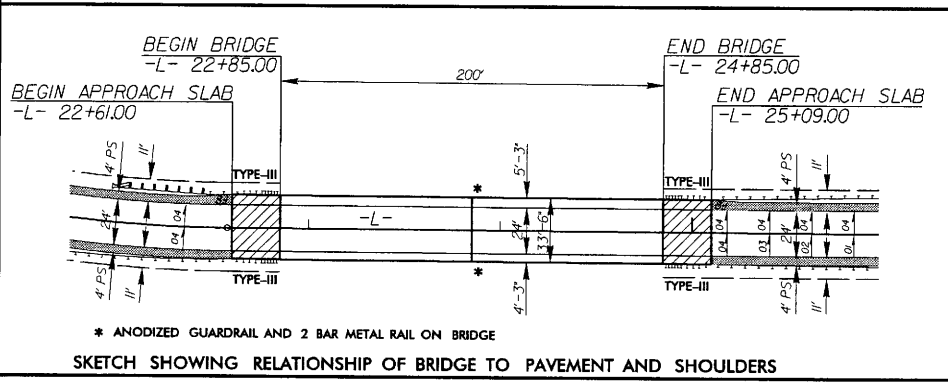
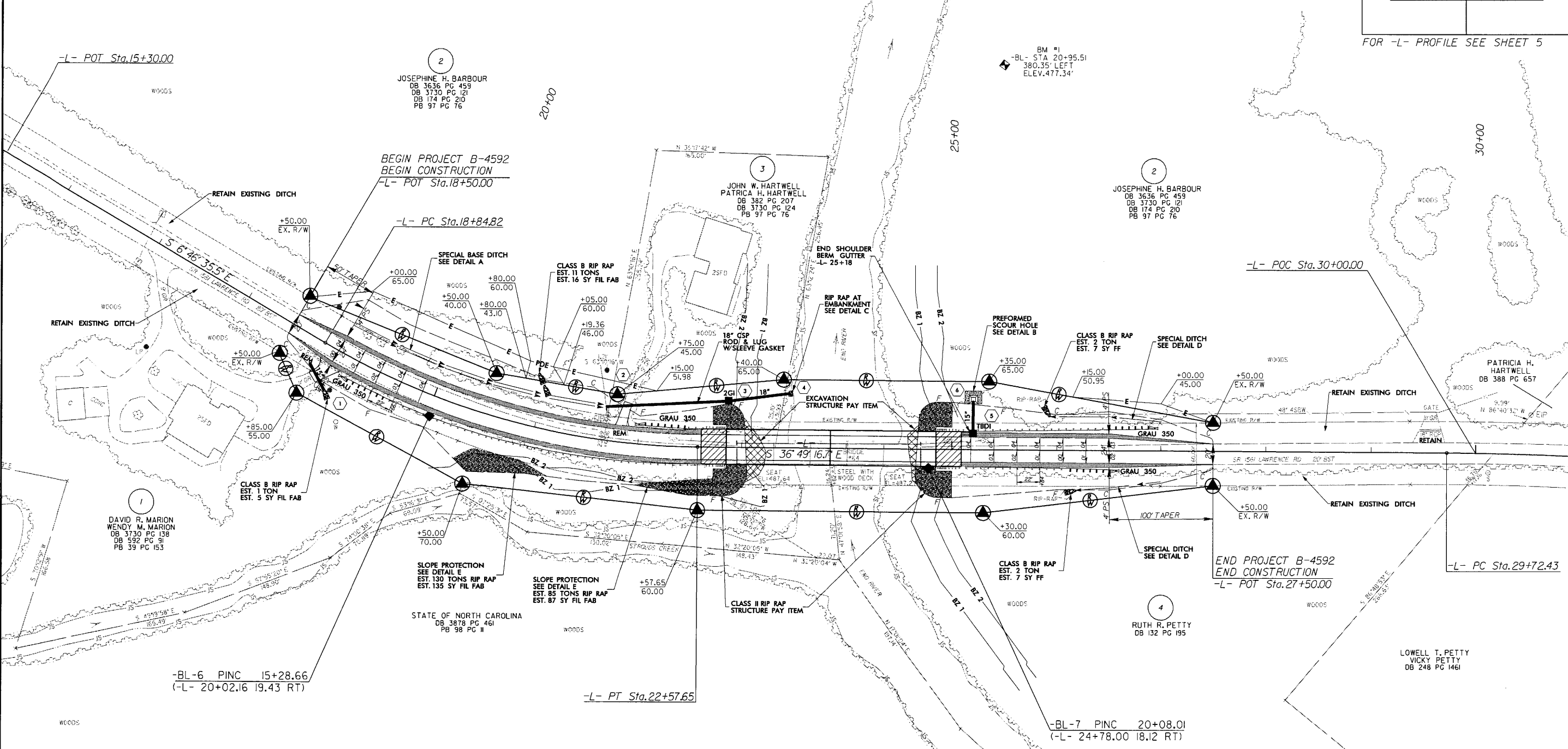
ROADWAY DESIGN ENGINEER

HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

FOR -L- PROFILE SEE SHEET 5

-L-		
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D = 8'03'30.5"	D = 2'12'13.3"	D = 5'14'48.7"
L = 372.83'	L = 149.38'	L = 304.18'
T = 190.81'	T = 74.71'	T = 153.08'
R = 711.00'	R = 2,600.00'	R = 1,092.00'
SE = 04	SE = 04	SE = 04
RO = 88'	RO = 88'	RO = 88'
DS = 45 mph	DS = 45 mph	DS = 45 mph



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-BL-6
EL = 497.50

-BL-7
EL = 488.98

BM-*/
RAILROAD SPIKE IN 15" OAK TREE
-L- STA 25+47.36 365.95' LEFT
EL = 477.34'



B-4592

5

ROADWAY DESIGN
ENGINEER

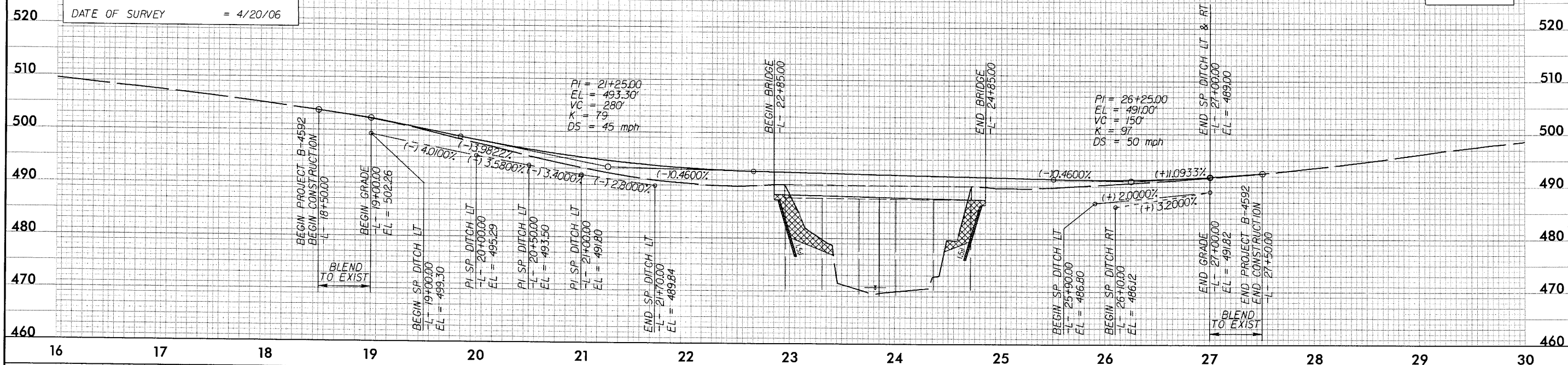
HYDRAULICS

PRELIMINARY PLANS
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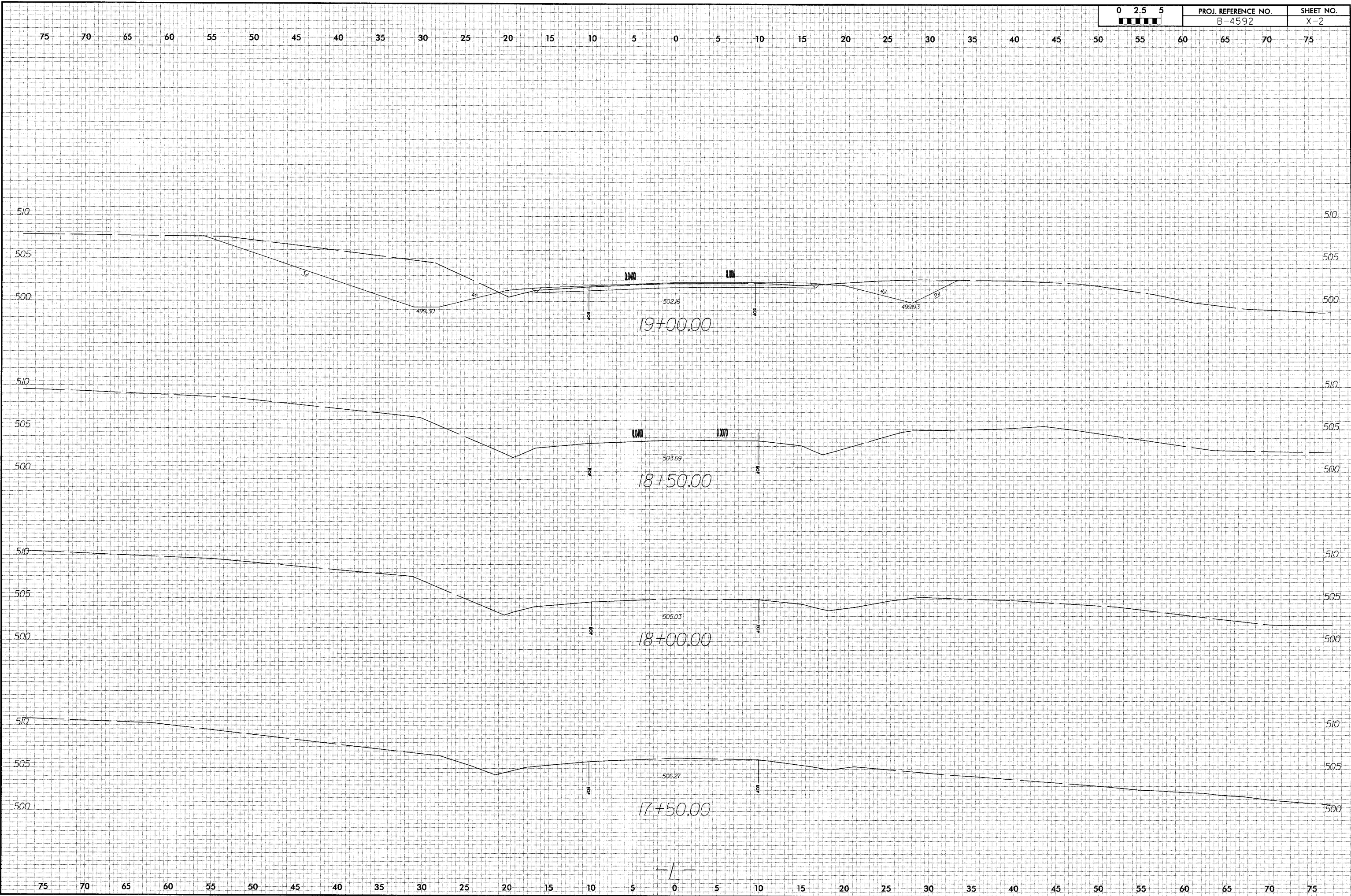
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FOR -L- PLAN VIEW SEE SHEET 4



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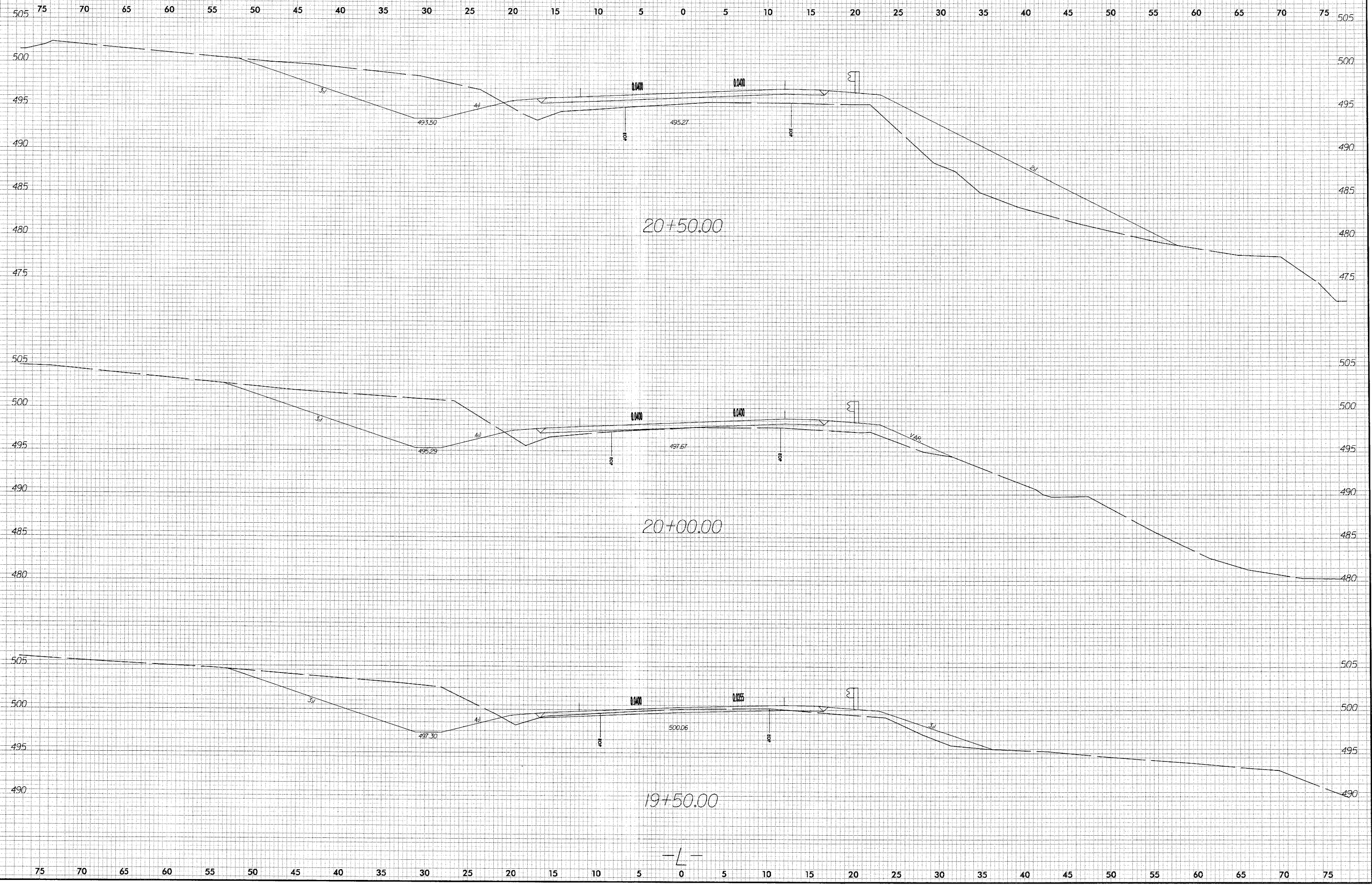
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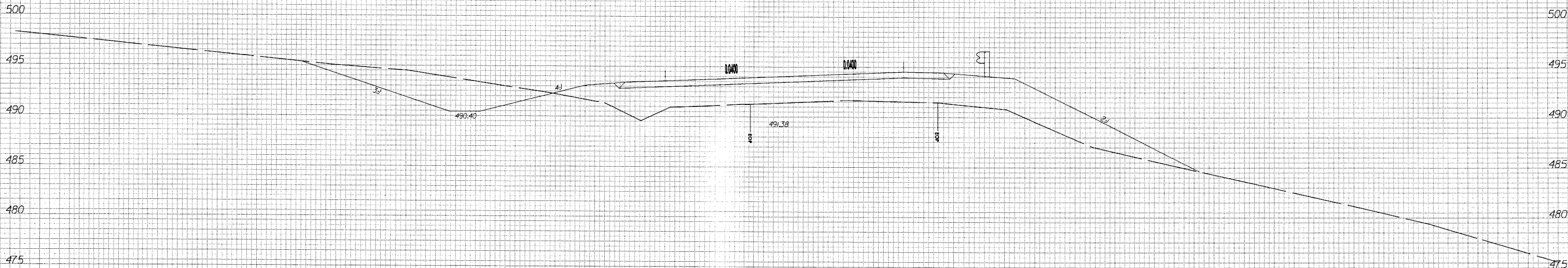


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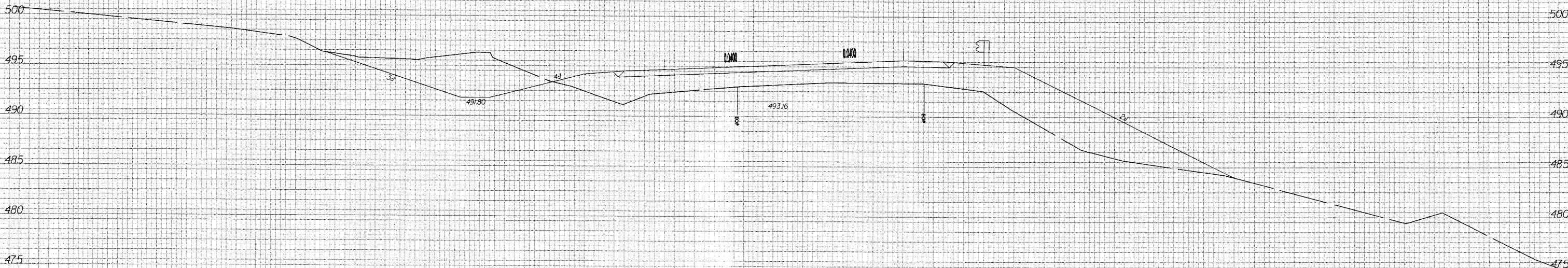
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21+50.00



21+00.00

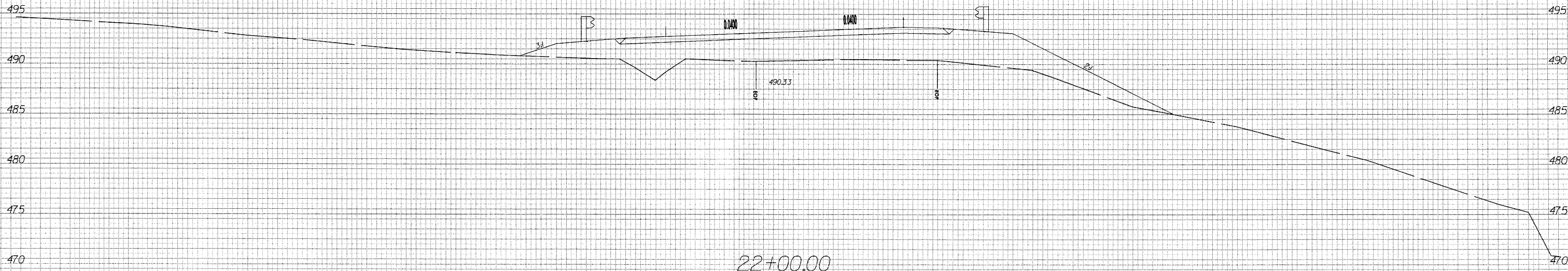
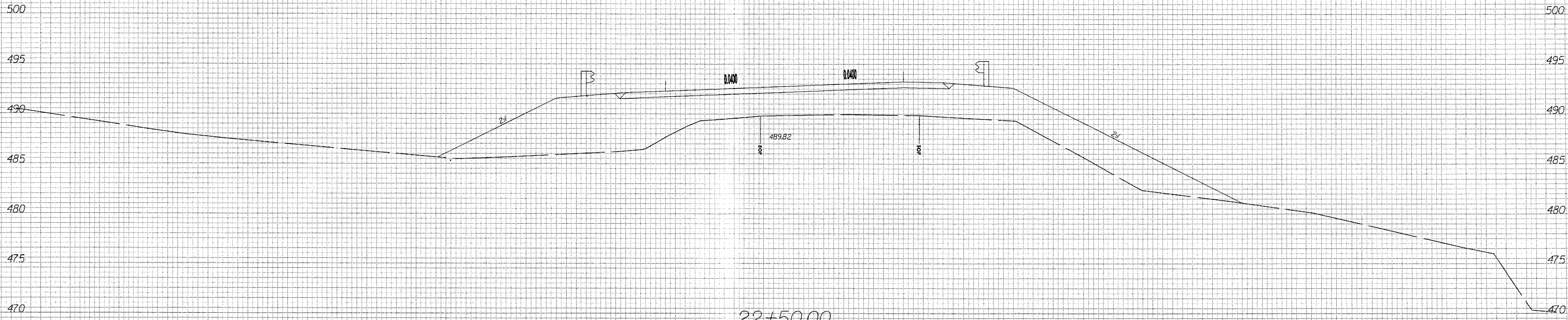
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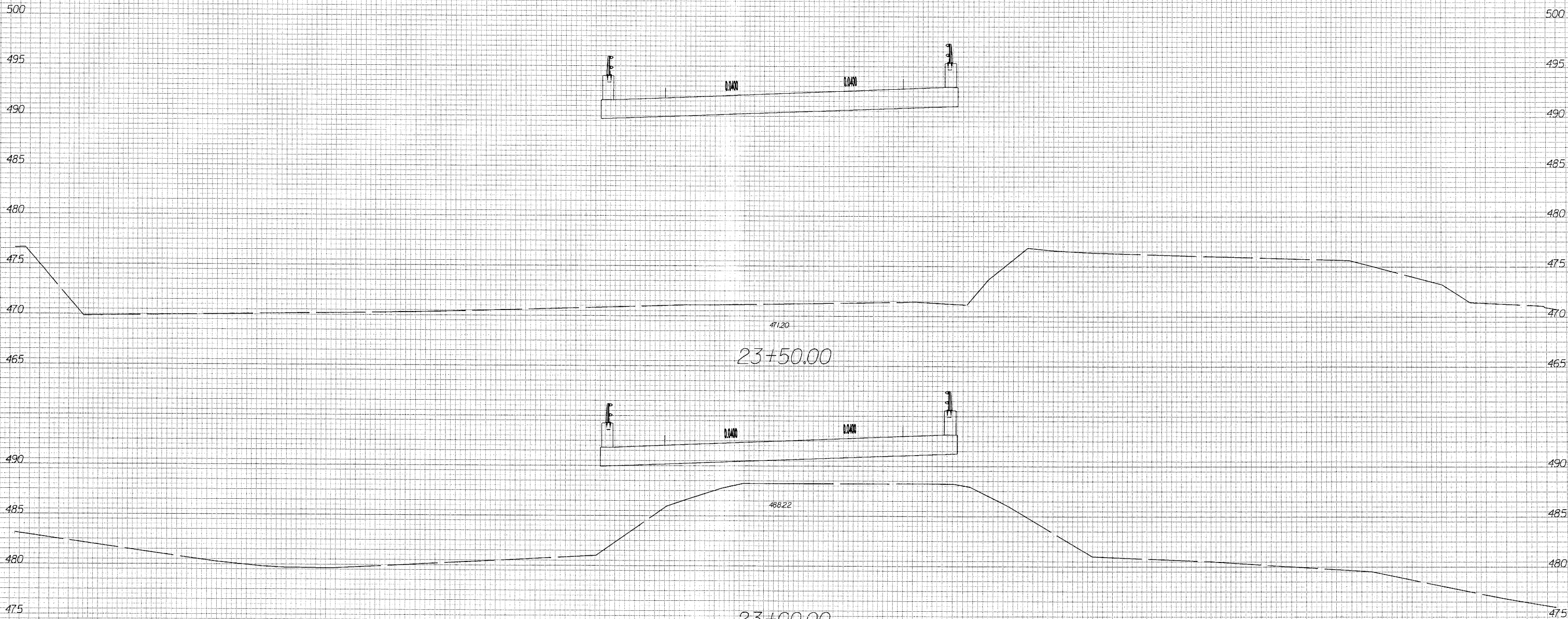


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BEGIN BRIDGE 22+85.00

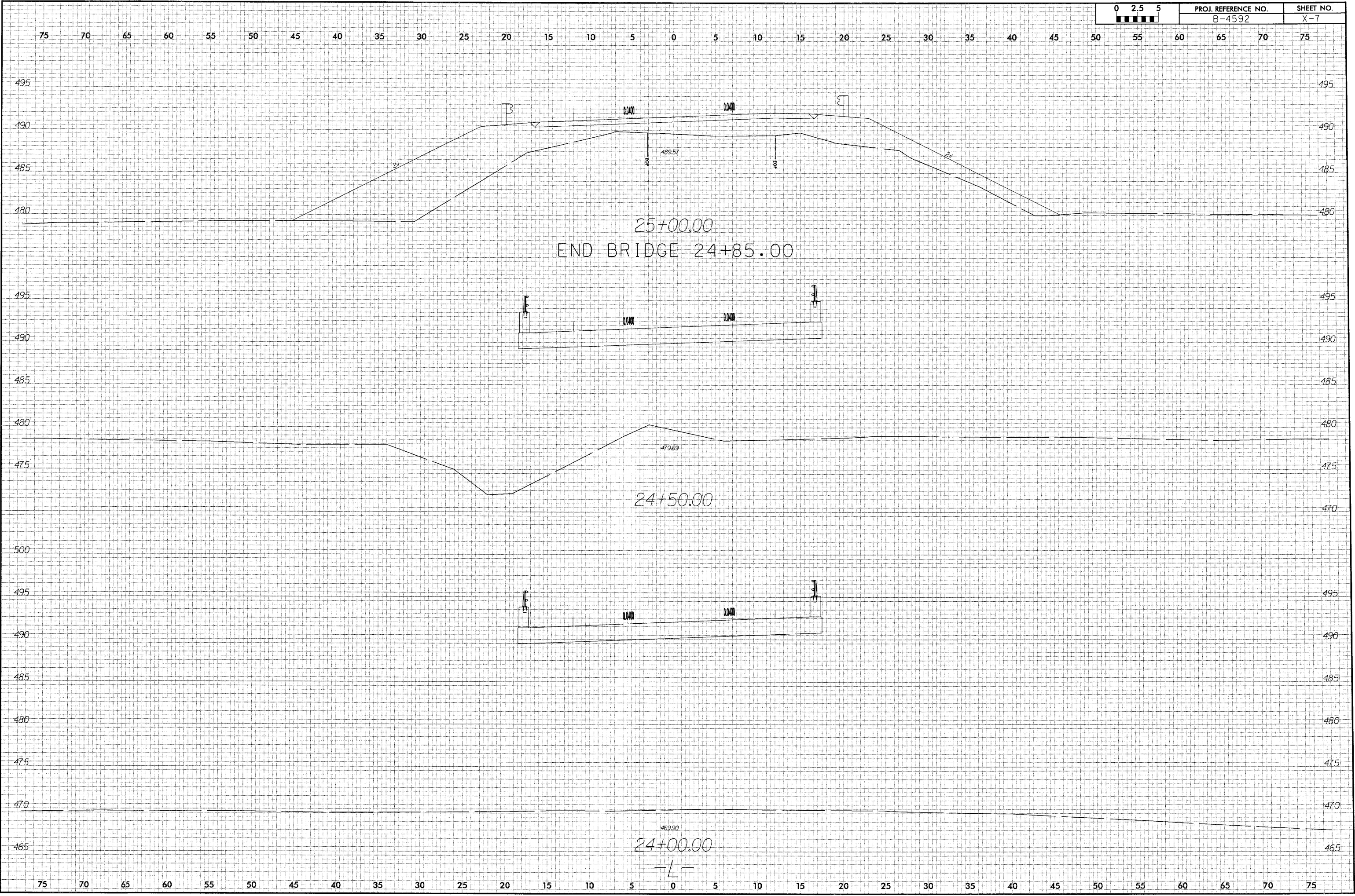
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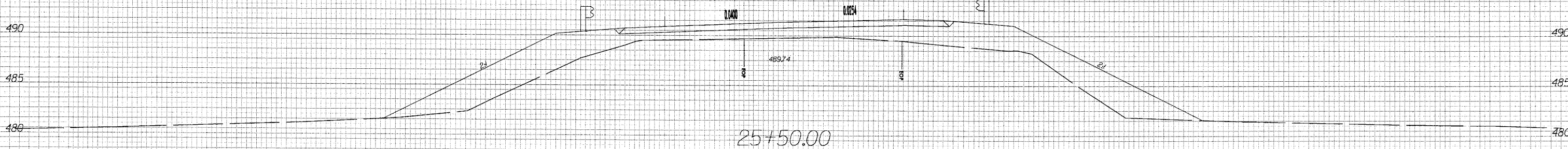
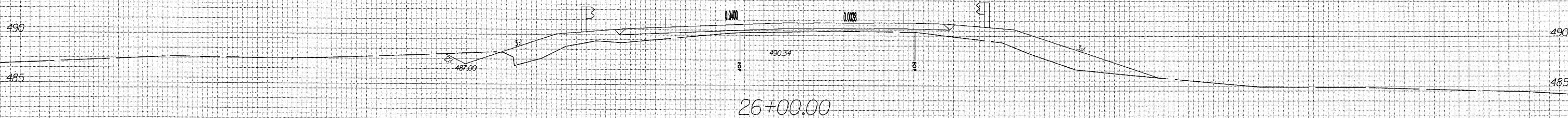
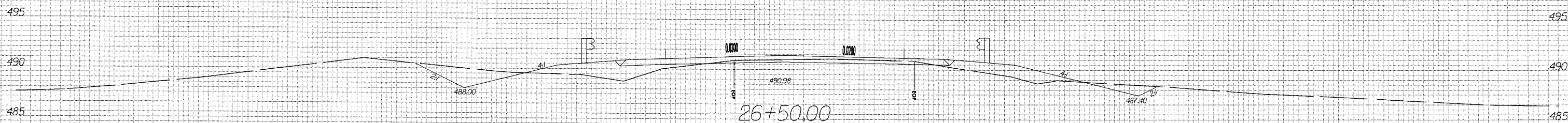
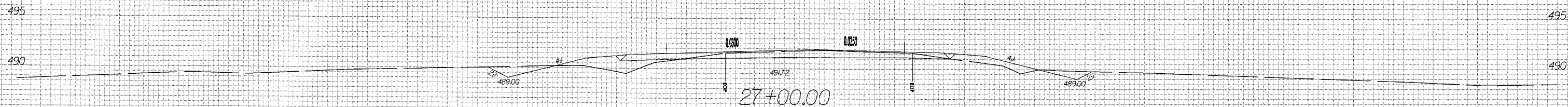
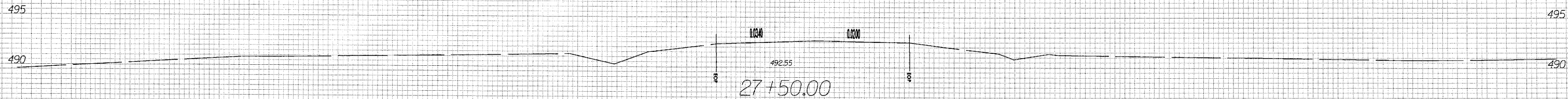
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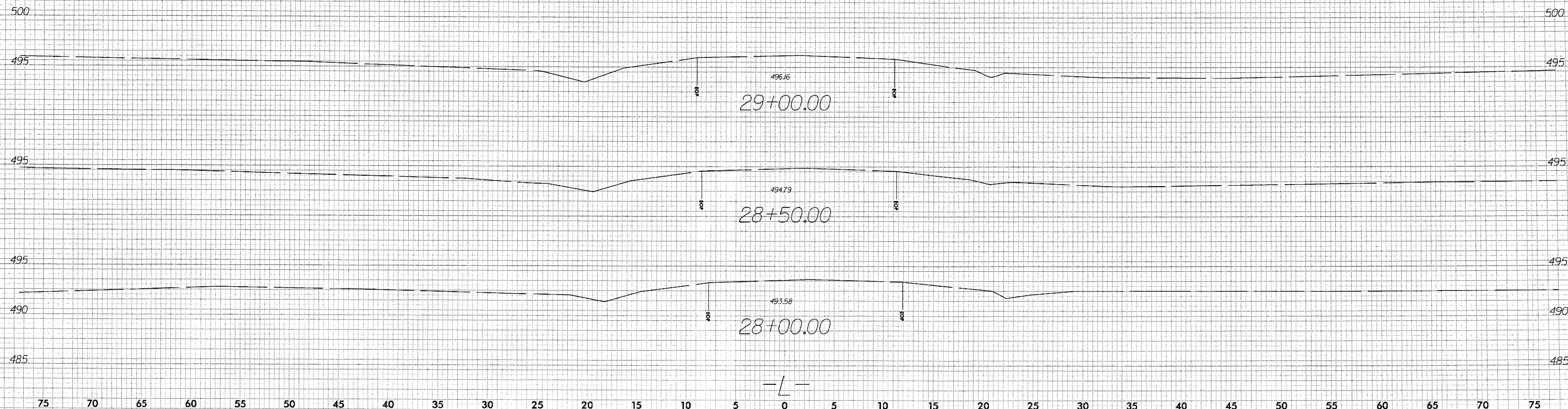
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B-4592

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ORANGE COUNTY
BRIDGE NO. 64 ON SR 1561 (LAWRENCE ROAD)
OVER END RIVER
FEDERAL-AID PROJECT NO. BRZ-1561(5)
STATE PROJECT NO. B.2502701
WBS No. 33790.1.1
T.I.P. No. B-4592

CATEGORICAL EXCLUSION

UNITED STATES DEPARTMENT OF TRANSPORTATION

FEDERAL HIGHWAY ADMINISTRATION

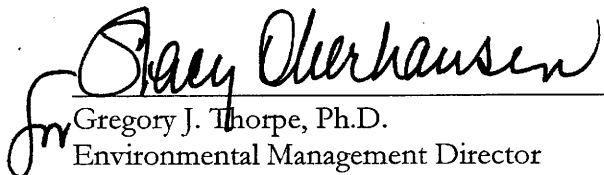
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NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

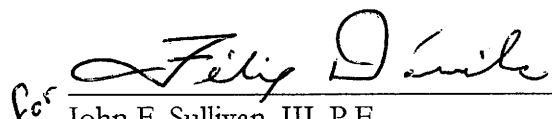
DIVISION OF HIGHWAYS

APPROVED:

01/03/07
Date


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

1/04/07
Date


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

ORANGE COUNTY
BRIDGE NO. 64 ON SR 1561 (LAWRENCE ROAD)
OVER END RIVER
FEDERAL-AID PROJECT NO. BRZ-1561(5)
STATE PROJECT NO. 8.2502701
WBS No. 33790.1.1
T.I.P. No. B-4592

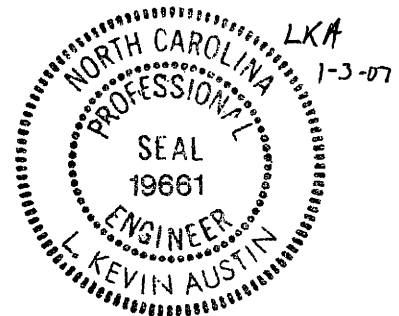
CATEGORICAL EXCLUSION

JANUARY 2007

DOCUMENT PREPARED BY:
MULKEY ENGINEERS & CONSULTANTS
CARY, NORTH CAROLINA

1-3-07
Date

L. Kevin Austin
L. Kevin Austin, P.E.
Principal



1/3/07
Date

Nicole H. Bennett
Nicole H. Bennett, AICP
Project Manager

FOR THE NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

1/3/07
Date

Theresa J. Ellerby
Theresa Ellerby
Project Manager
Consultant Engineering Group

PROJECT COMMITMENTS

**ORANGE COUNTY
BRIDGE NO. 64 ON SR 1561 (LAWRENCE ROAD)
OVER ENO RIVER
FEDERAL-AID PROJECT NO. BRZ-1561(5)
STATE PROJECT NO. 8.2502701
WBS NO. 33790.1.1
T.I.P. NO. B-4592**

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, General Certification Conditions, and Section 401 Conditions of Certification will be used. The following special commitments have been agreed to by NCDOT:

HYDRAULICS UNIT / STRUCTURES

Anodized two-bar metal railing will be provided on the bridge.

Bicycle safe bridge railing will be provided.

Four-foot paved shoulders will be provided along both roadway approaches to the bridge for 100 feet.

DIVISION ENGINEER

Coordinate construction scheduling with T.I.P. Project B-4216 (replacement of Bridge No. 66 on SR 1002) to insure that only one bridge is closed at any given time.

The Neuse River Riparian Buffer rules will be implemented during design, construction and maintenance of the project

ROADWAY DESIGN

Allowance will be made for a future ten-foot multi-use path under the bridge on the east side of the Eno River.

**ORANGE COUNTY
BRIDGE NO. 64 ON SR 1561 (LAWRENCE ROAD)
OVER ENO RIVER
FEDERAL-AID PROJECT NO. BRZ-1561(5)
STATE PROJECT NO. 8.2502701
WBS No. 33790.1.1
T.I.P. No. B-4592**

INTRODUCTION: The replacement of Bridge No. 64 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 STATEMENT

Bridge Maintenance Unit records indicate that Bridge No. 64 has a sufficiency rating of 29.9 out of a possible 100 for a new structure. The bridge is considered functionally obsolete and structurally deficient. The replacement of this inadequate structure will result in safer, more efficient traffic operations.

II. EXISTING CONDITIONS

Bridge No. 64 is located on SR 1561 (Lawrence Road) in Orange County, east of Hillsborough, NC. The statewide functional classification system classifies SR 1561 as Rural Local. It connects to US 70 approximately 1.5 miles south of Bridge No. 64. The Eno River State Park is located approximately two miles upstream from Bridge No. 64. The proposed future boundary of the park will encompass the project site (Figure 2).

Land use along SR 1561 consists of scattered residences, forest, and the Eno River State Park.

The 2006 estimated average daily traffic (ADT) volume is 3,650 vehicles per day (vpd). The projected ADT is 7,400 vpd by design year 2030. The percentages of truck traffic are one percent dual tired vehicles and one percent truck-tractor semi trailer (TTST). The speed limit on SR 1561 is 45 mph in the vicinity of Bridge No. 64.

Bridge No. 64 was built in 1955. It is a tangent two-lane structure with a clear roadway width of 18.7 feet (Figure 3). The bridge has five spans and totals 177 feet in length. The superstructure is composed of a timber deck on a steel girder/timber joists/steel floorbeam system. The substructure consists of reinforced concrete spill through abutments and reinforced concrete post and beam interior bents. Height from crown to streambed is 22 feet. Bridge No. 64 is posted at 12 tons for single vehicles and 16 tons for TTSTs.

The approach roadway is 18 feet wide with two-foot grassed shoulders. The northern approach curve has a radius of approximately 860 feet and posted speed of 45 mph. There is no evidence of overhead or buried utilities in the vicinity of the existing bridge. Utility impacts are anticipated to be low.

There are four daily school bus crossings on Bridge No. 64.

T.I.P. No. B-4592

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

This section of SR 1561 is designated as a Secondary Priority Route in accordance with the Orange County Proposed Bicycle Transportation Route Map (Appendix).

III. ALTERNATIVES

A. PROJECT DESCRIPTION

Based on preliminary hydraulic analysis, the recommended replacement structure is a bridge approximately 36 feet wide. The recommended bridge clear roadway width is 33 feet 5 inches (33'-5") to provide two 12-foot wide travel lanes with a 5-foot 2.5 inch (5'-2 1/2") shoulder on the east side and a 4-foot 2.5 inch (4'-2 1/2") shoulder on the west side (Figure 4). Standard bicycle safe bridge railing, 54 inches in height, and four-foot paved shoulders will be provided. Because of the project's proximity to St. Mary's Rural Historic District and the Eno River State Park, anodized two-bar metal railing will be provided. The existing vertical clearance will be maintained. A minimum 0.3 percent grade is recommended to facilitate bridge deck drainage. The length of the new structure may increase or decrease as necessary to accommodate peak flows as determined by further hydrologic studies. The bridge will accommodate a future ten-foot multi-use path underneath on the east side of the Eno River.

The approach roadway will provide two 12-foot lanes with eight-foot shoulders, including four-foot paved shoulders (Figure 4). The design speed is 50 mph.

B. BUILD ALTERNATIVES

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

Alternative A (preferred) replaces the structure at the existing location (Figure 5A). The new structure will be approximately 200 feet in length. During construction, traffic will be maintained by an off-site detour along SR 1002 (St. Mary's Road) and US 70 Bypass. The detour is approximately two miles long and is expected to be in operation for approximately eight months. The detour will result in about two minutes additional travel time. No substantial impacts are anticipated to emergency services and school bus routes (Appendix). NCDOT Division 7 concurs with the use of this detour.

The construction schedule for the replacement of Bridge No. 64 will be coordinated with the replacement of Bridge No. 66 (B-4216) over the Eno River on 1002. Bridge No. 64 could be replaced first so SR 1561 can be used as the detour route for Bridge No. 66.

Alternative B replaces the structure on new alignment north (downstream) of the existing structure (Figure 5B). The new structure will be approximately 195 feet in length. During construction, traffic will be maintained on the existing structure. This alternative is not recommended because of impacts to Eno River buffers and property owners.

G. ALTERNATIVES ELIMINATED FROM FURTHER STUDY

The No-Build alternative will eventually necessitate closure of the bridge. This is not desirable due to the traffic service provided by SR 1561 over Bridge No. 64.

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.

Upstream replacement options were not considered because of impacts to Strouds Creek.

D. PREFERRED ALTERNATIVE

Alternative A, replacing the bridge on existing alignment while using an off-site detour to maintain traffic, is the preferred alternative. Although impacts for Alternative A and Alternative B are similar, Alternative A minimizes impacts to previously undisturbed areas. Also, Alternative A is more economical than Alternative B.

The Division Engineer concurs with Alternative A as the preferred alternative.

IV. ESTIMATED COST

Table 1 shows estimated costs based on current prices.

Table 1. Estimated Costs

	Alternative A (Preferred)	Alternative B
Structure Removal (Existing)	\$ 42,000	\$ 42,000
Proposed Structure	\$ 684,000	\$ 666,900
Roadway Approaches	\$ 237,050	\$ 413,840
Miscellaneous and Mobilization	\$ 246,950	\$ 307,260
Engineering Contingencies	\$ 190,000	\$ 220,000
ROW/Const. Easements/Utilities	\$ 38,100	\$ 104,700
Total	\$1,438,100	\$1,754,700

The estimated cost of the project as shown in the 2006-2012 Transportation Improvement Program is \$1,380,000, including \$200,000 in prior years, \$80,000 for right-of-way, and \$1,100,000 for construction.

V. NATURAL RESOURCES

A. METHODOLOGY

Field investigations within the project study area were conducted by qualified biologists between January and June 2004. Field surveys were undertaken to determine natural resource conditions and to document natural communities, wildlife, Waters of the U.S., and the presence of protected species or their habitats.

Published information about the project study area and region, water resources, and protected species was derived from a number of resources including:

- National Wetlands Inventory (NWI) maps
- USGS 7.5-minute topographical quadrangle maps (Hillsborough, North Carolina)
- Natural Resources Conservation Service (NRCS) soil survey maps of Orange County
- North Carolina Division of Water Quality (NCDWQ)
- United States Fish and Wildlife Service (USFWS) list of protected species
- North Carolina Natural Heritage Program (NCNHP) database of rare species and unique habitats
- North Carolina Department of Transportation (NCDOT) aerial photography and Geographic Information Systems Data/Maps Distribution

Dominant plant species were identified in each stratum 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 Rohde *et al.* (1994), USFWS (2003), Martof *et al.* (1980), Parmalee and Bogan (1998), Webster *et al.* (1985), Russo (2000), Stokes and Stokes (1996), and UNC (2003). Scientific nomenclature and common names (when applicable) are provided for each plant and animal listed. Subsequent references to the same organism include the common name only.

During field surveys, wildlife identification involved a variety of observation techniques, which included 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 aquatic sampling was not undertaken.

Presence of jurisdictional wetlands and jurisdictional wetland delineations were performed using the three-parameter approach as prescribed in the *Corps of Engineers Wetlands Delineation Manual*. Supplementary technical literature describing the parameters of hydrophytic vegetation, hydric soils, and hydrological indicators were also utilized. Surface waters in the project study area were evaluated using the United States Army Corps of Engineers (USACE) Stream Quality Assessment Worksheet.

B. PHYSIOGRAPHY AND SOILS

The project lies in Orange County, which is situated in the north-central portion of North Carolina and is primarily located in the Piedmont ecoregion. The geography of the county consists

predominantly of rolling areas creating an undulating terrain. Orange County includes the divides of three major river basins (Roanoke, Neuse, and Cape Fear). Approximately 50 percent of the county's population is considered urban.

Elevations in the project study area range from approximately 484 feet above mean sea level (msl) under Bridge No. 64 at the Eno River to approximately 530 feet above msl located at the northern end of the project study area along Lawrence Road.

The project study area lies within the Carolina Slate Belt geological region. This section of the Carolina Slate Belt is comprised of felsic metavolcanic rock. It contains metamorphosed dacitic to rhyolitic flows and tuffs, interbedded with mafic and metavolcanic rock, meta-argillite, and mudstone. The soils in the study area developed from the Carolina Slate Belt system that is part of the Piedmont soil region.

The Tatum-Goldston soil association occurs across the study area. This soil association is described below, and the local soil units are summarized in Table 2. Congaree soil is the most abundant series mapped in the study area.

The Tatum-Goldston soil association consists of sloping to steep, well-drained soils that have a subsoil of silty clay, silty clay loam, and silt loam on uplands. The soil is derived mostly from saprolite. This association is found on side slopes adjacent to the major drainageways. Tatum soils occupy about 80 percent of the association, while Goldston soils make up about 10 percent of the association. The rest of the association is made up of Georgeville, Herndon, and Wilkes series.

Table 2. Soil Map Units – B-4592, Orange County

Series	Taxonomy (Subgroup)	Slope (%)	Permeability	Hydric Class.	Available Water Capacity	High Water Table	Shrink-swell Potential	Site Index Productivity ^B
Congaree fine sandy loam	Typic Udifluvent	0	moderate	B	high	30-48"	low	89-100
Georgeville silt loam	Typic Hapludult	2-6	moderate	-	high	72"	low	63-81
Georgeville silt loam	Typic Hapludult	6-10	moderate	-	high	72"	low	63-81
Herndon silt loam	Typic Hapludult	2-6	moderate	-	medium	72"	low	61-91
Tatum silt loam	Typic Hapludult	8-15	moderate	-	low	48-72"	moderate	65-89

Notes: All soils are classified as well-drained.

^B Site Index: Based on a base age of 50 years; the range presented covers the species listed by the USDA-NRCS.

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. Soils referred to as "Hydric A" are generally 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. Congaree fine sandy loam is the only Hydric B soil map unit that occurs in the project study area. There are no Hydric A soils.

C. WATER RESOURCES

1. Waters Impacted

The project is located within the Neuse River Basin, the third largest basin in the state, covering approximately 6,235 square miles. The project study area is within Neuse River subbasin 03-04-01 and USGS hydrologic unit 03020201. The Eno River and Strouds Creek make up the Waters of the United States in the project study area. Strouds Creek connects to the Eno River approximately 70 feet upstream of Bridge No. 64. Both waterways are depicted on the USGS quad map as perennial streams through the project study area.

2. Water Resource Characteristics

During the site visit, the Eno River was slow to medium-flowing, with substrates ranging in size from silt to boulder; the majority of the substrate being gravel. Strouds Creek is approximately half the size of the Eno River, and is very similar to the Eno River in composition.

A classification system for stream channels based on fluvial geomorphologic principles and landscape position was used for stream analysis. Based on this classification method and field observations during the site visit, the Eno River appears to be a Type C4 channel that is slightly entrenched but stable. Specific channel information on the river is presented in Table 3.

Table 3. Stream Dimensions

Characteristic	Approximate Stream Dimensions of the Eno River
Bankfull height	4 feet
Channel width	80 feet
Water depth	6 inches to 8 feet
Bank height	6 to 10 feet

The NCDWQ classifies surface waters of the state based on their intended best uses. The Eno River is currently classified as “C, NSW” upstream of the bridge, and “WS-IV, B, NSW” downstream of the bridge. Strouds Creek is classified as “C, NSW.” Nutrient Sensitive Waters (NSW) are waters needing additional protection because they are subject to excessive microscopic and macroscopic vegetation growth. Class “B” waters are protected in accordance with their usage for primary recreation, in addition to other usage specified by the “C” classification. Class “C” waters are protected in accordance with their usage for aquatic life propagation and survival, fishing, wildlife, secondary recreation, and agriculture. Class “WS-IV” waters are protected as water supplies which are generally in moderately to highly developed watersheds. Local programs to control nonpoint source and stormwater discharge of pollution are required.

Neither high quality waters (HQW), outstanding resource waters (ORW), trout waters (Tr), 303(d) listed waters, nor water supply watershed waters (WS-I or WS-II) occur within one mile of the study area. The North Carolina Department of Environment and Natural Resources (NCDENR) advises that the Eno River from Hillsborough to the Neuse River is a nationally significant aquatic habitat for the following species:

- Yellow lampmussel (*Lampsilis cariosa*), State Endangered and Federal Species of Concern (FSC)
- Eastern lampmussel (*Lampsilis radiata radiata*), State Endangered
- Notched rainbow (*Villosa constricta*), State Special Concern
- Neuse River waterdog (*Necturus lewisi*), State Special Concern

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. AMS monitoring station A-1 is located on the Eno River near Durham. This station has no noted parameters on water quality.

The nearest benthic macroinvertebrate sampling site (B-3) to the project study area is located on the Eno River, approximately 4.5 miles downstream of the bridge site. This site was given a rating of “excellent” in 2000. 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. As of August 1998, the Eno River had been given an NCIBI rating of “excellent.”

Point source dischargers throughout North Carolina are regulated through the National Pollutant Discharge Elimination System (NPDES) program. Dischargers are required by law to register for a permit. There are nine permitted dischargers in this subbasin of the Neuse River. One discharger holding a minor NPDES permit, and one discharger holding a major NPDES permit (Hillsborough Wastewater Treatment Plant), are located upstream of the bridge site.

3. Anticipated Impacts to Water Resources

a. General Impacts

Increased erosion and sedimentation may result from roadside construction. Removal of vegetation may result in a temporary increase in water temperature. Quick revegetation of these areas will reduce impacts by supporting the underlying soils and shading the stream. Since the study area is located within the Neuse River buffer basin, Best Management Practices (BMPs) for sensitive watersheds will be used for this project.

No adverse long-term impacts to water resources are expected to result from the selected alternative. The proposed project calls for replacement of the bridge at the existing location, which will allow for continuation of present stream flow within the existing channel, thereby protecting stream integrity.

4. Impacts Related to Bridge Demolition and Removal

The rails of Bridge No. 64 can be removed without dropping any components into Waters of the U.S. during bridge demolition. There is potential for components of the concrete deck and concrete portions of the substructure to be dropped into Waters of the U.S. during removal. The resulting temporary fill associated with the concrete substructure is approximately 19 cubic yards.

D. BIOTIC RESOURCES

1. Plant Communities

Four plant communities were observed in the project study area: mixed pine-hardwood forest, bottomland forest, alluvial forest, and man-dominated community. Descriptions are provided below.

a. Mixed Pine-Hardwood Forest

Mixed pine-hardwood forest community is present in the upland area of the site. Typically this community is characterized by a variety of hardwood species in the canopy, a moderate understory, and a sparse herbaceous layer. In forests with a frequent disturbance regime, loblolly pine (*Pinus taeda*), red maple (*Acer rubrum*), and sweetgum (*Liquidambar styraciflua*) may become dominant canopy species. This forested community is best classified as a variation of Schafale and Weakley's Dry Mesic Oak-Hickory Forest. The Dry Mesic Oak-Hickory Forest community is dominated by a mixture of oak (*Quercus* spp.) and hickory (*Carya* spp.) species. The southeast and northeast quadrants of the project study area contain a mixed hardwood and pine forest community located east of the bottomland forest community. The overstory includes sweetgum, northern red oak (*Q. rubra*), southern red oak (*Q. falcata*), loblolly pine, Virginia pine (*Pinus virginiana*), and tulip poplar (*Liriodendron tulipifera*). The understory, vine, and herbaceous layers include eastern red cedar (*Juniperus virginiana*), American beech (*Fagus grandifolia*) saplings, Japanese stilt grass (*Microstegium vimineum*), muscadine grape (*Vitis rotundifolia*), and Japanese honeysuckle (*Lonicera japonica*).

b. Bottomland Forest

The bottomland forest community is situated in the floodplain of the Eno River, between the banks and upland on the eastern side of the river in both the northeast and southeast quadrants of the project study area. This forested community is best classified as a variation of Schafale and Weakley's Piedmont/Mountain Bottomland Forest. This community is characterized by plant species which are tolerant of occasional flooding and often contains a dense understory and herbaceous layer. Dominant species observed in the mature canopy include hackberry (*Celtis occidentalis*), red maple, sweetgum, tulip poplar, southern red oak, white oak (*Q. alba*), sycamore (*Platanus occidentalis*), and river birch (*Betula nigra*). The understory tree and shrub layer includes painted buckeye (*Aesculus sylvatica*) saplings, eastern red cedar, Chinese privet (*Ligustrum sinense*), multiflora rose (*Rosa multiflora*), and strawberry bush (*Euonymus americanus*). Woody vines observed include greenbrier (*Smilax rotundifolia*), Japanese honeysuckle, muscadine grape, and poison ivy (*Toxicodendron radicans*). The herbaceous community includes Japanese stilt grass, river oats (*Chasmanthium latifolium*), aster (family Asteraceae), and various grasses (family Poaceae).

c. Alluvial Forest

The alluvial forest community is in the floodplain of Strouds Creek. This forested community is best classified as a variation of a Schafale and Weakley's Piedmont/Low Mountain Alluvial Forest. The alluvial forest community is characterized by plant species typical of a bottomland forest. Dominant species observed in the mature canopy were American beech, northern red oak, southern red oak, river birch, and tulip poplar. The understory layer includes muscledwood (*Carpinus caroliniana*) and eastern red cedar. Woody vines and herbs include poison ivy, greenbrier, aster, river oats, and various grasses.

d. Man-dominated Community

Man-dominated communities represent areas that are periodically maintained by human influences, such as roadside and power line rights-of-way, regularly mowed lawns, fields, and open areas. Man-dominated areas comprise a majority of the project study area including agricultural fields, roadside maintained areas, and residential lawns. The man-dominated roadside areas are primarily covered with herbaceous vegetation that includes various types of grasses and common weedy species such as plantain (*Plantago* spp.), dog fennel (*Eupatorium capillifolium*), chickweed (*Cerastium* spp.), and Indian strawberry (*Duchesnea indica*). Various grasses and ornamental shrubs are the dominant vegetation in the residential and commercial lawns. Also found were Chinese privet, loblolly pine, tulip poplar, and red maple.

2. Wildlife

Communities within the project area offer a moderate diversity of foraging, nesting, and cover habitat for many species of amphibians, reptiles, birds, and mammals that have adapted to highly impacted and fragmented landscapes. Species that may be associated with these types of communities are described below. An asterisk (*) indicates the species that were directly observed or that evidence was noted during field reconnaissance.

Reptile species associated with the project study area may include the eastern box turtle (*Terrapene carolina*), five-lined skink (*Eumeces fasciatus*), rough green snake (*Opheodrys aestivus*), eastern milk snake (*Lampropeltis triangulum triangulum*), black racer snake (*Coluber constrictor*), and brown snake (*Storeria dekayi*). These reptiles inhabit fields, woodlands, streams, wood piles, and old buildings of the Piedmont and lower mountains in North Carolina.

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

A wide variety of mammals are expected to inhabit the project study area and surrounding landscape. Virginia opossum (*Didelphis virginiana*), woodchuck (*Marmota monax*), gray squirrel* (*Sciurus carolinensis*), eastern harvest mouse (*Reithrodontomys humulis*), raccoon (*Procyon lotor*), beaver (*Castor canadensis*), muskrat (*Ondatra zibethicus*) and white-tailed deer* (*Odocoileus virginianus*) are species most likely to be found. In addition, bats such as the eastern red (*Lasiurus borealis*) and big brown bat (*Eptesicus fuscus*) may also be present in the project study area.

3. Aquatic Communities

The aquatic habitat of the Eno River is expected to be good based on observed conditions during field visits and the existing NCDWQ water quality assessment. The stream has a coarse bottom beneficial to macrobenthic invertebrates.

Common fish that are likely to utilize the Eno River include bluegill (*Lepomis macrochirus*), chain pickerel (*Esox niger*), crappie (*Pomoxis nigromaculatus*), bullhead (*Ameiurus natalis*), and largemouth bass (*Micropterus salmoides*). These fish thrive in moderate moving, soft to coarse substrate waters like those present within the Eno River.

The study area likely exhibits an amphibian population of frogs and toads. Spring peepers (*Hyla crucifer*), pickerel frogs (*Rana palustris*), and green frogs (*R. clamitans*) are most likely to be present in the study area. No frog or toad species were observed during the field investigations.

Reptiles that spend the vast majority of their lives in aquatic communities and are somewhat common throughout this portion of North Carolina include the snapping turtle (*Chelydra serpentina*), eastern musk turtle (*Sternotherus odoratus*), yellowbelly slider (*Chrysemys scripta*), and northern water snake (*Nerodia sipedon*).

4. Anticipated Impacts to Biotic Communities

a. Terrestrial Communities

Anticipated impacts to terrestrial communities based on preliminary alternative designs and are summarized in Table 4.

Table 4. Anticipated Impacts to Terrestrial Communities

Terrestrial Community	Alternative A	Alternative B
	Acreage	Acreage
Bottomland Forest	0.3 acre	0.28 acre
Mixed Pine - Hardwood	0.3 acre	0.6 acre
Alluvial Forest	0.1 acre	0
Man-dominated	0.91 acre	1.2 acres
Totals	1.61 acres	2.08 acres

b. Wetland Communities

There are no wetlands within the project area.

c. Aquatic Communities

Aquatic organisms are very sensitive to the discharges and inputs resulting from construction activities. Appropriate measures must be taken to avoid spillage of construction materials and control runoff. Such measures should 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* (BMP-PSW), sedimentation control guidelines, and design standards for sensitive watersheds will be enforced during the construction stages of the project.

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.

The removal of stream-side vegetation and placement of fill material during construction contributes to erosion and possible sedimentation. Quick revegetation of these areas helps to reduce the impacts by supporting the underlying soils. Erosion and sedimentation may carry soils, toxic compounds, trash, and other materials into the aquatic communities at the construction site. As a result, sand bars may be formed both at the site and downstream.

E. 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." The USACE has the responsibility for implementation, permitting, and enforcement of the provisions of the Act. The USACE regulatory program is defined in 33 CFR 320-330.

Section 401 of the Clean Water Act grants authority to individual States for regulation of discharges into "Waters of the United States." Under North Carolina General Statutes, 113A "Pollution Control and Environment" and codified in NCAC 15A, the NCDWQ has the responsibility for implementation, permitting, and enforcement of the provisions of the CWA.

Wetlands, defined in 33 CFR 328.3, are those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. No jurisdictional wetlands occur within the project study area.

2. Permits

Permits may be required for roadway encroachment into jurisdictional wetlands and surface waters. The USACE issues Section 404 Nationwide 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.

The USACE issues Nationwide Permit 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.

Due to a lack of jurisdictional wetlands within the project study area, permits involving activities that discharge fill into jurisdictional wetlands and surface waters are not anticipated.

3. Buffer Rules

The Neuse River Riparian Buffer Rule applies to 50-foot wide riparian buffers directly adjacent to perennial and intermittent surface waters in the Neuse River Basin. This rule does not apply to portions of the riparian buffer where a use is existing and ongoing. Any change in land use within the riparian buffer is characterized as an impact. The Nutrient Sensitive Waters Management Strategy for the Protection and Maintenance of Riparian Buffers (15 A NCAC 2B .0233) provides a designation for uses that cause impacts to riparian buffers within the Neuse Basin. Neuse River Buffers are divided into two zones. Zone 1 includes the first 30 feet out from the water and essentially must remain undisturbed. Zone 2 consists of the landward 20 feet which must be vegetated, but allows for certain land uses. Grading and replanting in Zone 2 is allowed provided that the health of the vegetation in Zone 1 is not compromised.

Simple perpendicular bridge crossings are designated Allowable within the riparian buffer. The Allowable designation means that the intended uses may proceed within the riparian buffer provided that there are no practical alternates. Allowable with Mitigation buffer impacts for bridge replacement projects are addressed when parallel impacts to jurisdictional waters occur. Allowable and Allowable with Mitigation buffer impacts require written authorization from the Division of Water Quality prior to project development. Both of the proposed alternatives are expected to have only Allowable buffer impacts. Table 5 shows anticipated Neuse River Buffer impacts for the proposed project.

Table 5. Estimated Neuse River Buffer Impacts

Alternatives	Allowable (acres)		
	Zone 1	Zone 2	Total
Alternative A	0.07	0.09	0.16
Alternative B	0.04	0.07	0.12

4. 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 U.S. Given the condition of Bridge No. 64, it is reasonable to conclude that avoidance is not a feasible option.

Minimization includes the examination of appropriate and practicable steps to reduce adverse impacts to waters of the U.S. Both alternatives minimize the amount of in-stream activity due to the use of a bridge as opposed to a culvert. The new bridge will be approximately 25 feet longer than the current bridge, pushing end bents further away from the waters edge and increasing the floodplain area.

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. No mitigation is anticipated for this project.

F. RARE AND PROTECTED SPECIES

Federal law (under the provisions of Section 7 of the Endangered Species Act of 1973, as amended) requires that any action likely to adversely affect a species classified as federally protected be subject to review by the USFWS. Other species may receive additional protection under separate laws.

1. Federally Protected Species

Species which are listed, or are proposed for listing, as endangered or threatened are recorded in Section 4 of the ESA. As of the latest list dated April 27, 2006, the USFWS identified one threatened and four endangered species known to occur in Orange County (Table 6). Species descriptions and biological conclusions are provided below. A pedestrian field survey was conducted between January and June 2004 to determine if suitable habitat is available at the project site for any threatened or endangered species. The North Carolina Natural Heritage Program

(NCNHP) maps were reviewed on January 13, 2004, in March 2005, and in August 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.

Table 6. Federal Protected Species for Orange County, North Carolina

Common Name	Scientific Name	Federal Status
Bald eagle	<i>Haliaeetus leucocephalus</i>	Threatened
Red-cockaded woodpecker	<i>Picoides borealis</i>	Endangered
Dwarf wedge mussel	<i>Alasmodonta heterodon</i>	Endangered
Michaux's sumac	<i>Rhus michauxii</i>	Endangered
Smooth coneflower	<i>Echinacea laevigata</i>	Endangered

Bald eagle (*Haliaeetus leucocephalus*)

Federal Status: Threatened

State Status: Threatened

Date Listed: March 11, 1967

The bald eagle is a large raptor that ranges in size from 32 to 43 inches tall and has a wingspan averaging six feet. These predators weigh an average of 10 to 12 pounds. Adult body plumage is dark brown to chocolate brown, and white on the head and tail. Juveniles are brown and irregularly marked with white until their fourth year. Bald eagles are year-round but transient species in North Carolina and are primarily associated with large bodies of water where food is plentiful and suitable nesting sites are typically found within 0.5 mile of the water. Nests are made in the largest living tree within the area, with an open view of surrounding land and a clear flight path to water. 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 ten weeks after hatching. Bald eagles eat mostly fish robbed from ospreys or picked up dead along shorelines, or other carrion. They may also capture small animals such as rabbits, some birds, and wounded ducks.

Biological Conclusion: *No Effect*

Suitable habitat for the bald eagle consisting of large bodies of open water does not exist within the project area or within 0.5 mile of the project area. The Eno River does not provide suitable habitat for the bald eagle until the back waters of Falls Lake approximately 12.5 miles east of Bridge No. 64. Based upon this consideration, the project will have **NO EFFECT** on the bald eagle.

Red-cockaded woodpecker (*Picoides Borealis*)

Federal Status: Endangered

State Status: Endangered

Date Listed: October 13, 1970

This bird is a small, seven to eight inch tall woodpecker with a black and white barred back and 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 for southern pines, particularly longleaf pine (*Pinus palustris*), 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 commonly only nests in living pine trees. These birds excavate nests in pines that are usually more 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. Cavities are located from 12 to 100 feet above ground level and below live branches. These trees can be identified by the presence of "candles," large encrustations of running sap that surrounds the trees. 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 study area. The percentage of pine within the mixed pine and hardwood forest in the study area is too low for sustaining the red-cockaded woodpecker for nesting or foraging. The project will have **NO EFFECT** on the RCW.

Dwarf wedge mussel (*Alasmidonta heterodon*)

Federal Status: Endangered

State Status: Endangered

Date Listed: March 14, 1990

The dwarf wedge mussel is small, rarely exceeding 1.5 inches in length. The shell's outer surface (periostracum) is usually olive brown or yellowish brown in color, with light green rays that are more noticeable in juveniles. The nacre (inner shell surface) is bluish to silvery white. The shell shape is subtrapezoidal. A unique characteristic of this mussel is its dentition pattern; the right valve possesses two lateral teeth, while the left valve has only one. This trait is opposite of all other North American species having lateral teeth. Three potential fish host species for the glochidia of the dwarf wedge mussel are the tessellated darter (*Etheostoma olmstedt*), Johnny darter (*Etheostoma nigrum*), and mottled sculpin (*Cottus bairdt*).

The dwarf wedge mussel inhabits creek and river areas with a slow to moderate current and a sandy, gravelly, or muddy bottom. In North Carolina, this mussel is documented in the Neuse and Tar River systems. The dwarf wedge mussel population declines are attributed to industrial, domestic, and agricultural pollution. Loss of habitat due to siltation of streams and chemical pollution, especially in the highly developed Orange County site, threaten the survival of this mussel.

Biological Conclusion: *May Affect, Not likely to adversely Affect*

Suitable habitat for the dwarf wedge mussel consisting of nearly silt-free streams, with slow to moderate currents exists within the project study area. However, the Eno River watershed currently exhibits a moderate silt load resulting from development upstream, and therefore, does not provide exceptional habitat for the dwarf wedge mussel.

A freshwater mussel survey was conducted by qualified biologists on June 8 and July 8, 2004. Four types of freshwater mussels were observed: elliptio mussels (*Elliptio* spp.), yellow lampmussel (*Lampsilis cariosa*), Carolina fatmucket (*Lampsili radiata conspicua*), and notched rainbow (*Villosa constricta*). No dwarf wedge mussel individuals were found. The survey report gave a recommended biological conclusion of **MAY AFFECT, NOT LIKELY TO ADVERSELY AFFECT**. The USFWS concurred with this determination in a letter dated April 13, 2006 (Appendix).

Michaux's sumac (*Rhus michauxii*)

Federal Status: Endangered

State Status: Endangered-Special Concern

Date Listed: September 28, 1989

Michaux's sumac is a rhizomatous, densely hairy shrub, with erect stems from one to three feet in height. The compound leaves contain evenly serrated oblong to lanceolate, acuminate leaflets. Most plants are unisexual; however, more recent observations have revealed plants with both male and female flowers on one plant. The flowers are small, borne in a terminal erect, dense cluster and colored greenish yellow to white. Flowering usually occurs from June to July; while the fruit, a red drupe, is produced through the months of August to October. Only 36 extant populations are known, with 31 in North Carolina, three in Virginia and two populations in Georgia.

Michaux's sumac grows in sand to rocky open woods in association with basic soils. It spreads by producing cloning shoots from the roots of mature plants. Apparently, this plant survives best in areas where some form of periodic disturbance provides open areas. At least two of the plant's populations in North Carolina are on highway rights-of-way, roadsides, or on the edges of artificially maintained clearings.

Biological Conclusion: *No Effect*

Suitable habitat for Michaux's sumac is not present in the project study area. Forests in the study area are found on loamy soils and generally have a closed canopy. Disturbed areas that may have provided habitat at one time are maintained as residential lawns and agricultural fields. The project will have **NO EFFECT** on Michaux's sumac.

Smooth coneflower (*Echinacea laevigata*)

Federal Status: Endangered

State Status: Endangered

Date Listed: October 8, 1992

Smooth coneflower is a rhizomatous perennial herb that grows up to five feet tall from a vertical root stock. The stems are smooth, with few leaves. The largest leaves are the basal leaves, which reach eight inches in length and three inches in width, have long stems, and are elliptical to broadly lanceolate, tapering to the base, and smooth to slightly rough. Mid-stem leaves have shorter stems or no stems and are smaller in size than the basal leaves. The rays of the flowers (petal-like structures) are light pink to purplish, usually dropping, and two to 3.2 inches long. Flower heads are usually solitary, with flowering occurring from May through July. The species is now known to survive only in Virginia, North Carolina, South Carolina, and Georgia. Six populations survive in North Carolina. The North Carolina populations are in Durham and Granville Counties.

The habitat of smooth coneflower is open woods, cedar barrens, roadsides, clearcuts, dry limestone bluffs, and power line rights-of-way, usually on magnesium- and calcium-rich silts associated with limestone (in Virginia), gabbro (in North Carolina and Virginia), diabase (in North Carolina and South Carolina), and marble (in South Carolina and Georgia). Optimal sites are characterized by abundant sunlight and little competition in the herbaceous layer. Natural fires, as well as large herbivores, are part of the history of the vegetation in this species' range.

Biological Conclusion: *May Affect, Not Likely to Adversely Affect*

Suitable habitat for smooth coneflower may be present in the project area. A successional (approximately 20 years old) mixed pine and hardwood forest dominated by Virginia pine, loblolly pine, eastern red cedar, and tulip poplar, with an herbaceous layer dominated by Japanese stilt grass, is located uphill of the bottomland hardwood rest in the northeast quadrant of the project area. A survey for smooth coneflower was completed on June 1, 2004 and again on June 6, 2006. No smooth coneflower individuals were observed during either survey. The report gave a recommended biological conclusion of **MAY AFFECT, NOT LIKELY TO ADVERSELY AFFECT**. The USFWS concurred with the findings and biological conclusion in a letter dated July 8, 2004. A copy of the USFWS concurrence is included in the Appendix.

2. Federal Species of Concern

Federal Species of Concern (FSC) are not legally protected under the Endangered Species Act and are not subject to any of its provisions, including Section 7, until they are formally proposed or listed as Threatened 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. The USFWS lists 11 FSCs that are known to occur in Orange County.

Species identified as Endangered, Threatened, or Special Concern by the State of North Carolina are afforded state protection under the State Endangered Species Act and the North Carolina Plant Protection and Conservation Act of 1979. Orange County FSCs per the August 2006 NCNHP

database, their state status, and the existence of suitable habitat within the project area are shown in Table 7.

Table 7. Federal Species of Concern, State Status, and Potential Habitat

Common Name	Scientific Name	State Status	Habitat Available
Carolina darter	<i>Etheostoma collis lepidinion</i>	SC	Yes
Roanoke bass	<i>Ambloplites cavifrons</i>	SR	Yes
Atlantic pigtoe	<i>Fusconaia masoni</i>	E	Yes
Brook floater	<i>Alasmidonta varicosa</i>	E	Yes
Green floater	<i>Lasmigona subviridis</i>	E	Yes
Savanna lilliput	<i>Toxolasma pullus</i>	E	Yes
Yellow lampmussel	<i>Lampsilis cariosa</i>	E	Yes
Creamy tick-trefoil	<i>Desmodium ochroleucum</i>	SR-T	No
Sweet pinesap	<i>Monotropsis odorata</i>	SR-T	No
Torrey's mountain mint	<i>Pycnanthemum torrei</i>	SR-T	No
Buttercup Phacelia	<i>Phacelia covillei</i>	SR-T	Yes

Notes:

E-Endangered, SC-Special Concern, SR-Significantly Rare, -T-Throughout

* Limited information available on this species. Accounts of habitat include "on sandstone" and "on boulders subject to inundation." Habitat is assumed present due to sparse information.

Several state protected species have been identified at various locations within one mile of the project area. These include Yellow lampmussel (*Lampsilis cariosa*), creeper (*Strophitus undulatus*), Atlantic pigtoe (*Fusconaia masoni*), and Neuse River waterdog (*Necturus lewisi*). In addition, three areas mapped as NCNHP Identified Priority Areas (IPA) are located within three miles of the project area. These IPAs are the Eno River Aquatic Habitat, located throughout the Eno River; the Poplar Ridge Slopes, located along the southern side of the Eno River; and an Upland Depression Swamp Forest.

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 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, 2004. 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 January 21, 2004, the HPO concurred with the NCDOT and FHWA 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 HPO, in a memorandum dated March 4, 2004, recommended an archaeological survey for this project because of a previously recorded site (31OR228). An archaeological survey was conducted in October and November 2005 in compliance with Section 106 of the National Historic Preservation Act and the guidelines issued by the Advisory Council of Historic Preservation.

During the course of the survey, one Native American archaeological site (31OR565) was located within the project area. Due to the lack of diagnostic artifacts and the disturbed nature of the site, it was recommended that 31OR565 be assessed as not eligible for the National Register and no further archaeological investigation be conducted in connection with this project. The HPO, in a memorandum dated February 23, 2006, concurred with this recommendation. Copies of both HPO memoranda are included in the Appendix.

VII. ENVIRONMENTAL EFFECTS

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 proposed 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 wildlife or waterfowl refuges of national, state, or local significance in the immediate project area.

The Eno River State Park is located approximately two miles upstream from Bridge No. 64. The Park proposes to expand its boundaries westward along the Eno River to US 70 Bypass. The proposed future boundary will include Bridge No. 64.

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). Since the proposed bridge will be replaced at the existing location, the Farmland Protection Policy does not apply.

The purpose of this project is to replace Bridge No. 64 by constructing a new structure. The project will not result in any meaningful changes in traffic volumes, vehicle mix, location of the existing facility, or any other factor that would cause an increase in emissions impacts relative to the No-Build alternative. As such, FHWA has determined that this project will generate minimal air quality impacts for Clean Air Act criteria pollutants and has not been linked with any special mobile source air toxic (MSAT) concerns. Consequently, this effort is exempt from analysis for MSATs.

EPA regulations for vehicle engines and fuels will cause overall MSATs to decline significantly over the next 20 years. FHWA predicts MSATs will decline in the range of 57 to 87 percent, from 2000 to 2020, based on regulations now in effect, even with a projected 64 percent increase in vehicle miles traveled (VMT). Therefore, both the background level of MSATs and the possibility of even minor MSAT emissions from this project will be reduced.

The project is located in Orange County, which is within the Raleigh-Durham-Chapel Hill nonattainment area for ozone (O₃). The area was designated nonattainment for O₃ under the eight-hour ozone standard effective June 15, 2004. Section 176(c) of the CAAA requires that transportation plans, programs, and projects conform to the intent of the state air quality implementation plan (SIP). The current SIP does not contain any transportation control measures for Orange County. The Durham-Chapel Hill-Carrboro Metropolitan Planning Organization (MPO) 2030 Long Range Transportation Plan (LRTP), the Burlington Graham MPO 2030 LRTP and the 2004-2010 Metropolitan Transportation Improvement Programs (MTIPs) conform to the intent of the SIP (or base year emissions, in areas where no SIP is approved or found adequate). The USDOT made conformity determinations on the Durham-Chapel Hill-Carrboro MPO LRTP, the Burlington Graham MPO LRTP and Orange County projects from the State Transportation Improvement Program (STIP) on June 15, 2005.

For the donut area of Orange County, the projects from the 2006-2012 STIP conform to the intent of the SIP (or base year emissions, in areas where no SIP is approved or found adequate). The current conformity determinations are consistent with the final conformity rule found in 40 CFR Parts 51 and 93. There are no significant changes in the project's design concept of scope, as used in the conformity analyses.

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. This evaluation completes the assessment requirements for highway traffic noise (23 CFR Part 772) and for air quality (1990 CAAA and NEPA). 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 the Eno River at the proposed crossing is 85.2 square miles. Orange County is currently participating in the National Flood Insurance Program. This crossing of the river is located in a FEMA Special Flood Hazard Zone and this reach of the river is in a detailed flood study with a published floodway. It is not anticipated that a floodway modification will be required since the bridge will be an "in kind" replacement. The Flood Hazard Boundary Map (Figure 6) shows the approximate limits of the 100-year flood plain in the vicinity of the project.

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

VIII. PUBLIC INVOLVEMENT

Scoping letters were sent early in the planning process to involve local officials and agency representatives in the development of this project.

A combined Citizens Informational Workshop for B-4592 and B-4216 was held on September 27, 2004 at C. W. Stanford Middle School. Residents, property owners, and business owners had the opportunity to take part in project development, ask questions, and voice concerns. Bridge No. 64 proposed Alternatives A and B were displayed along with alternatives for Bridge No. 66. Seventeen citizens attended the meeting and eight comment sheets were received. Four citizens preferred Alternative A and one preferred Alternative B for Bridge No. 64.

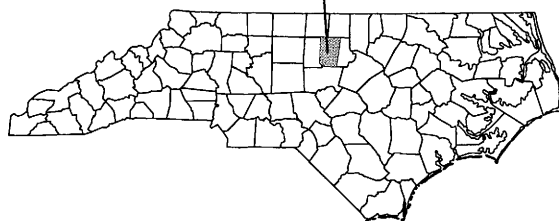
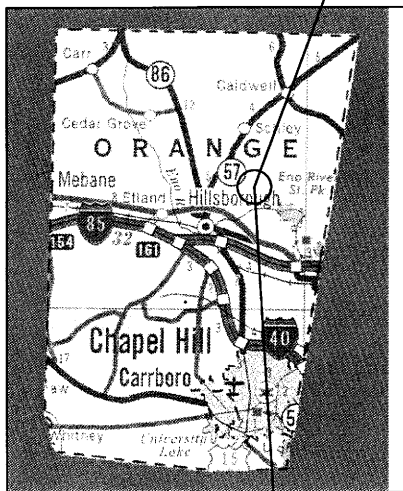
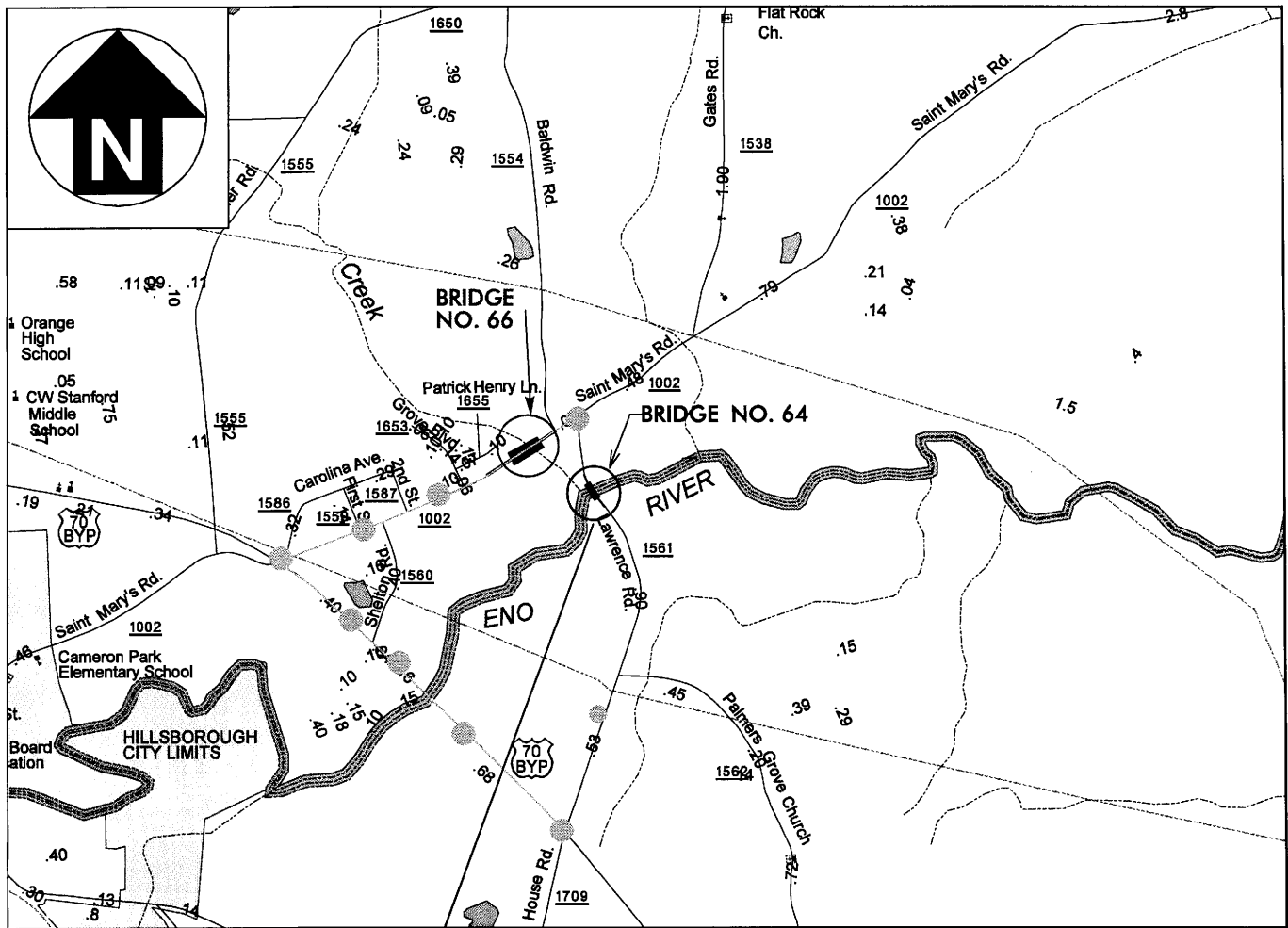
An informational newsletter was sent to area residents and appropriate officials in March 2006 identifying Alternative A as the preferred alternative. No comments were received in response to the newsletter.

IX. AGENCY COMMENTS

The Orange County Planning Department requested that Bridge No. 64 and Bridge No. 66 not be closed at the same time.

Response: Construction schedules for B-4592 and B-4216 will be coordinated so that only one bridge is closed at a time.

All other agency comments were addressed elsewhere in this document. Letters are included in the Appendix.



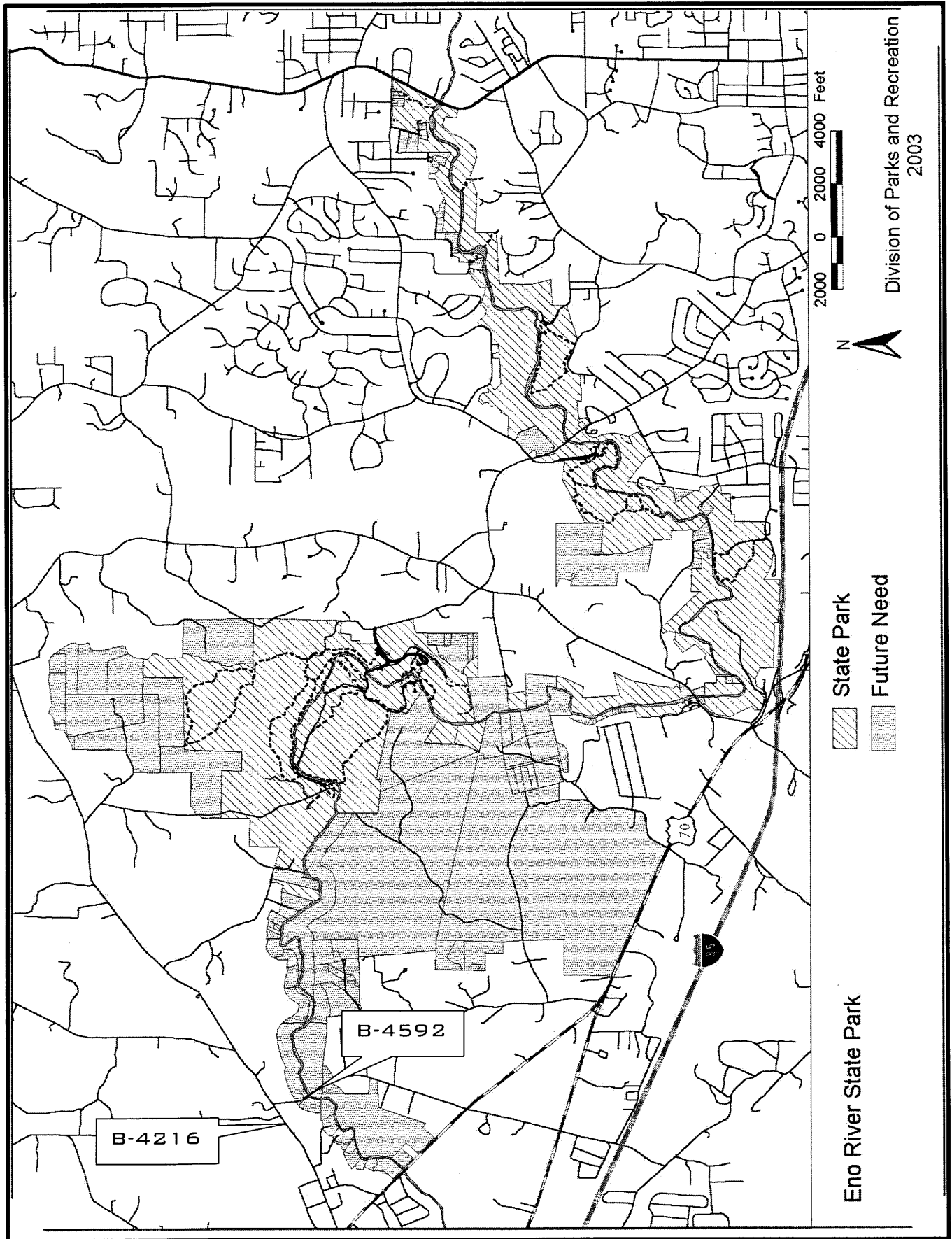
● — ● — ● DETOUR ROUTE



North Carolina Department of Transportation
Project Development & Environmental Analysis

ORANGE COUNTY
BRIDGE NO. 64 ON SR 1561
OVER ENO RIVER
B-4592

FIGURE 1

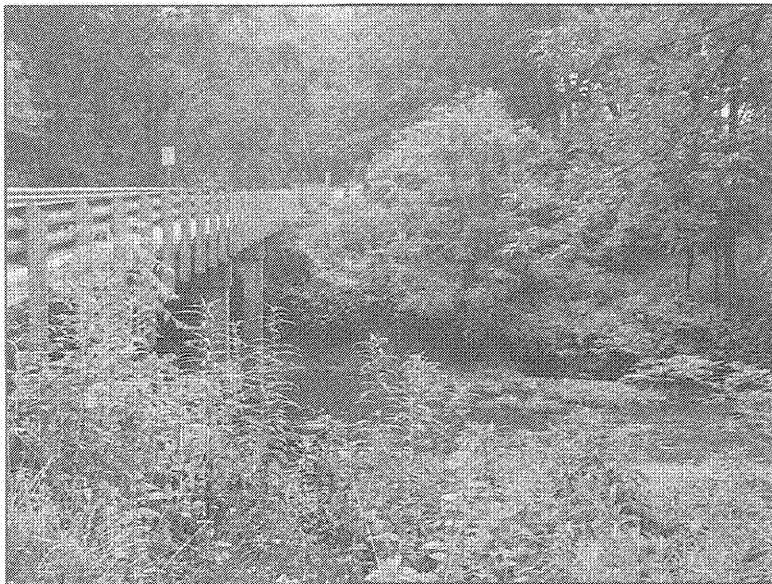


Eno River State Park Proposed Boundary.

FIGURE 2



Bridge No. 64 facing north.

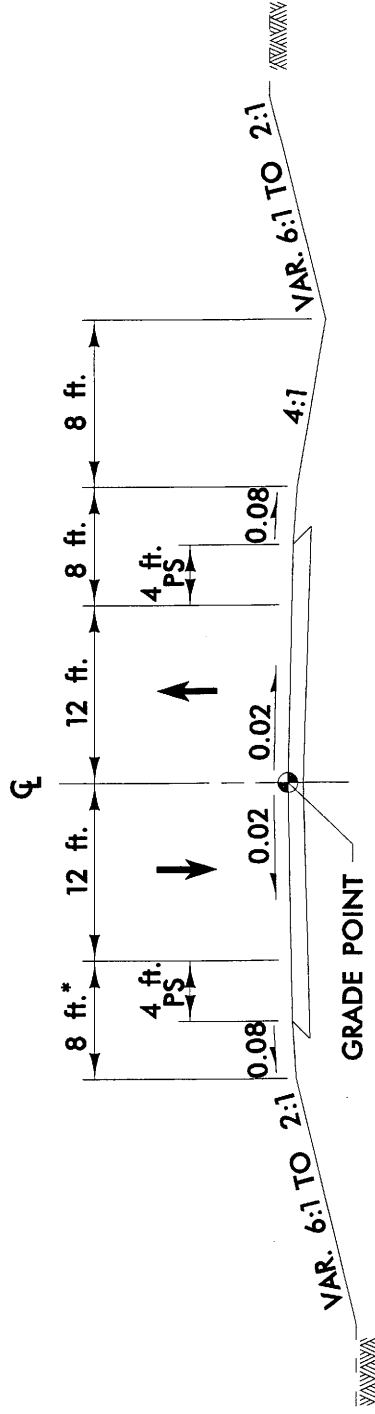


Bridge No. 64, east side (downstream).



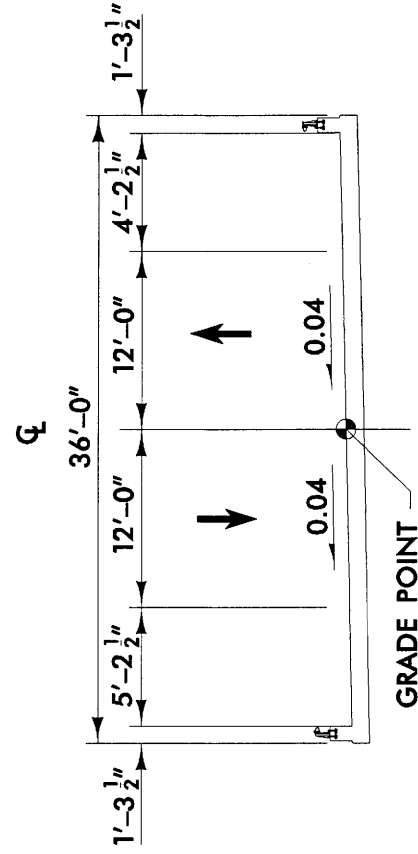
Bridge No. 64 from the confluence of Strouds Creek.

Figure 3



* 11 ft. IF GUARDRAIL IS WARRANTED

TYPICAL APPROACH SECTION
(PROPOSED)



TYPICAL BRIDGE SECTION
(PROPOSED)

TRAFFIC DATA

(CONST. YR.)	2006 ADT =	4,000
(DESIGN YR.)	2030 ADT =	7,400
DUAL	1%	
TTST	1%	

EXISTING BRIDGE LENGTH = 180 ft.

FUNCTIONAL CLASSIFICATION :
LOCAL - RURAL



North Carolina Department
Of Transportation
Project Development &
Environmental Analysis

ORANGE COUNTY
BRIDGE NO. 64 ON SR 1561
(LAWRENCE RD) OVER ENO RIVER
TIP NO: B-4592

**ALTERNATE A
(PREFERRED)**

B-4592

ORANGE COUNTY
SR 1561 BRIDGE NO. 64
OVER ENO RIVER

NAD 83

LA-POT Sta. 15+30.00

LAWRENCE RD.
SR 1561

BEGIN PROJECT B-4592
LA-POT Sta. 18+50.00
EL-POT Sta. 18+50.00

LA-PC Sta. 18+84.82

ENO RIVER

LA-POT Sta. 30+00.00
EL-POT Sta. 30+01.97

LAWRENCE RD.
SR 1561

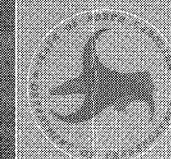
END PROJECT B-4592
LA-POT Sta. 27+50.00

LA-PC Sta. 29+72.43

STROUDS CREEK

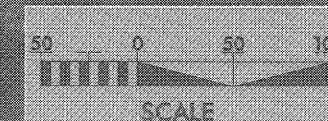
LA-FT Sta. 22+57.65

ENO RIVER
STATE PARK




North Carolina Department
Of Transportation
Project Development &
Environmental Analysis

**B-4592
FIGURE 5A**



ALTERNATE B
B-4592
ORANGE COUNTY
SR 1561 BRIDGE NO. 64
OVER ENO RIVER





North Carolina Department
Of Transportation
Project Development &
Environmental Analysis

B-4592
FIGURE 5B

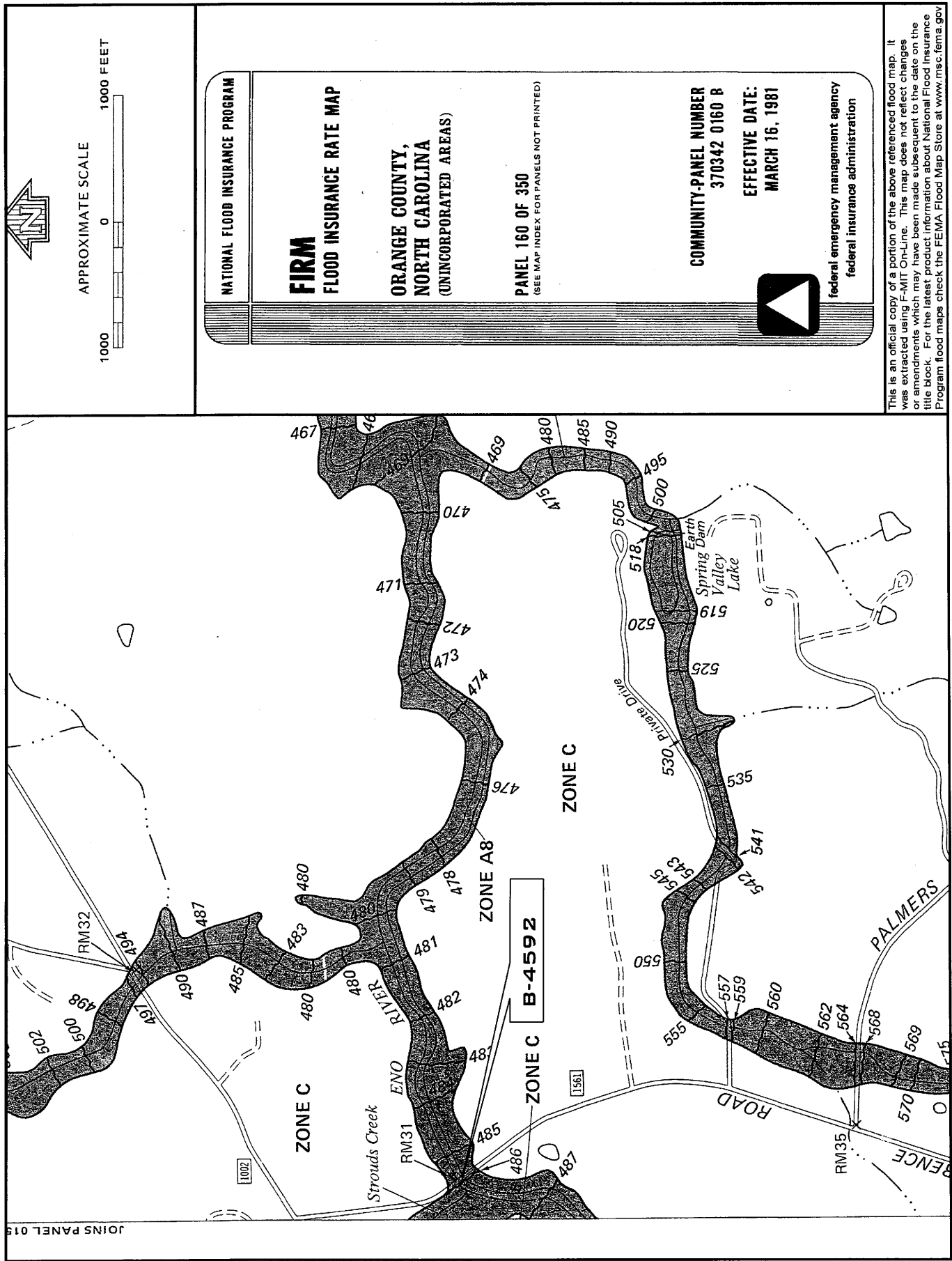
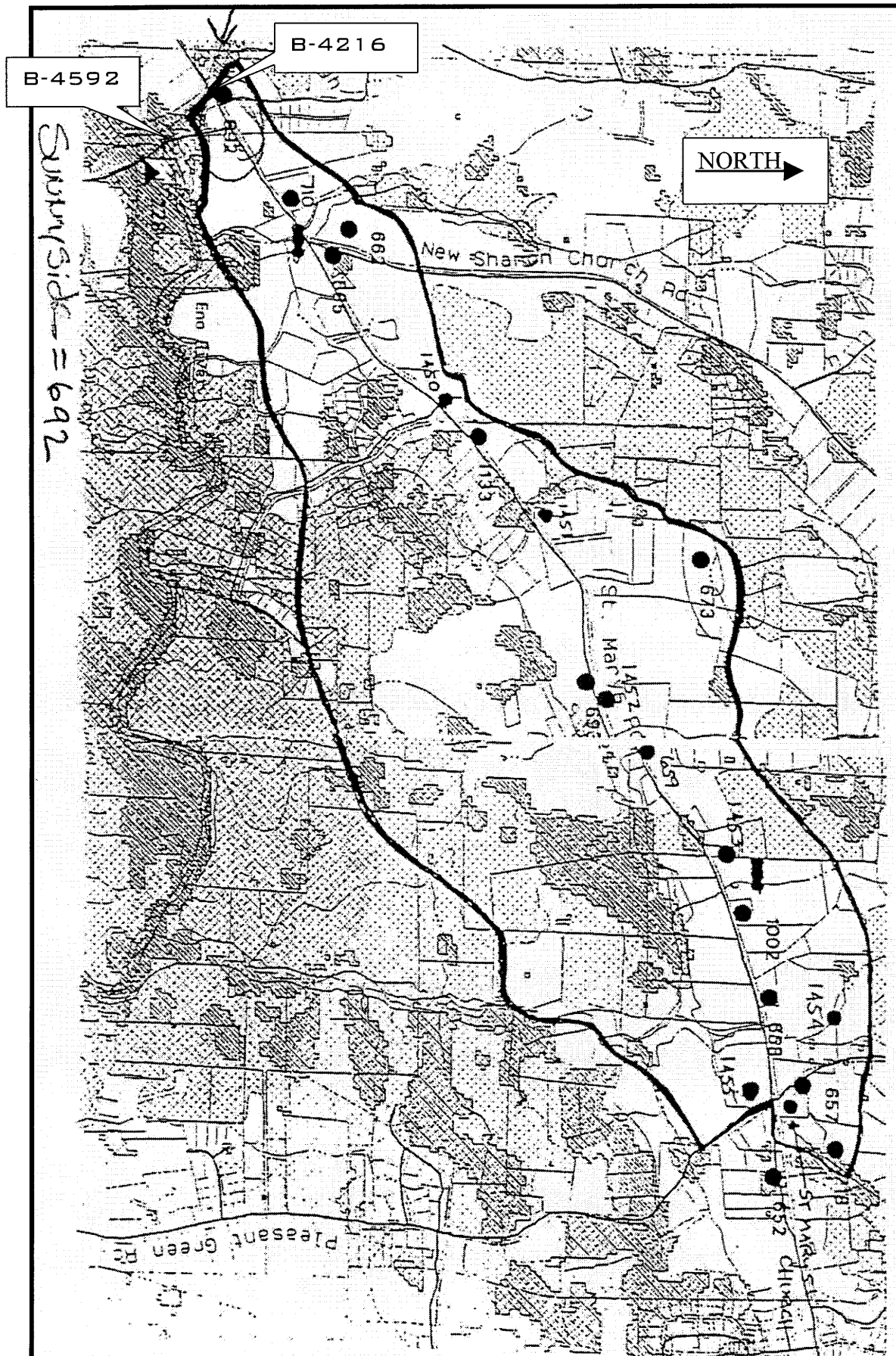


Figure 6



St. Mary's Road Rural Historic District

FIGURE 7

APPENDIX



United States Department of the Interior

FISH AND WILDLIFE SERVICE

Raleigh Field Office

Post Office Box 33726

Raleigh, North Carolina 27636-3726

April 13, 2006

RECEIVED

APR 20 2006

DIVISION OF HIGHWAYS
POEA-OFFICE OF NATURAL ENVIRONMENT

Gregory J. Thorpe, Ph.D.
North Carolina Department of Transportation
Project Development and Environmental Analysis
1598 Mail Service Center
Raleigh, North Carolina 27699-1598

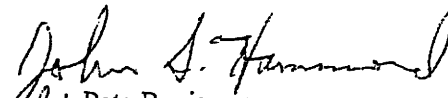
Dear Dr. Thorpe:

This letter is in response to your letter of March 29, 2006 which provided the U.S. Fish and Wildlife Service (Service) with the biological determination of the North Carolina Department of Transportation that the replacement of Bridge No. 64 on SR 1561 over the Eno River in Orange County (TIP No. B-4592) may affect, but is not likely to adversely affect the federally endangered dwarf wedgemussel (*Alasmodonta heterodon*). These comments are provided in accordance with section 7 of the Endangered Species Act (ESA) of 1973, as amended (16 U.S.C. 1531-1543).

According to information provided, mussel surveys were conducted at the project site on June 8 and July 8, 2004. The surveys extended 100 meters upstream and 400 meters downstream of SR 1561. No dwarf wedgemussels were found. Based on the information provided and other information available, the Service concurs with your determination that the proposed bridge replacement may affect, but is not likely to adversely affect the dwarf wedgemussel. We believe that the requirements of section 7(a)(2) of the ESA have been satisfied for this species. We remind you that obligations under section 7 consultation must be reconsidered if: (1) new information reveals impacts of this identified action that may affect listed species or critical habitat in a manner not previously considered in this review; (2) this action is subsequently modified in a manner that was not considered in this review; or (3) a new species is listed or critical habitat determined that may be affected by this identified action.

The Service appreciates the opportunity to review this project. If you have any questions regarding our response, please contact Mr. Gary Jordan at (919) 856-4520 (Ext. 32).

Sincerely,

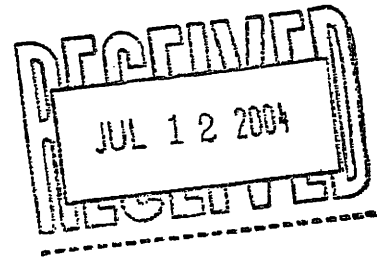

for Pete Benjamin
Ecological Services Supervisor

cc: Todd Tugwell, USACE, Raleigh, NC
Sue Homewood, NCDWQ, Winston-Salem, NC
Travis Wilson, NCWRC, Creedmoor, NC
Chris Militscher, USEPA, Raleigh, NC
John Sullivan, FHWA, Raleigh, NC



United States Department of the Interior

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



July 8, 2004

Julie Gibson
Mulkey Engineers & Consultants
P.O. Box 33127
Raleigh, NC 27636

Dear Ms. Gibson:

This letter is in response to your letter of June 23, 2004 which provided the U.S. Fish and Wildlife Service (Service) with the biological determination of the North Carolina Department of Transportation (NCDOT) that the replacement of Bridge No. 64 on SR 1561 over the Eno River in Orange County (TIP No. B-4592) may affect, but is not likely to adversely affect the federally endangered smooth coneflower (*Echinacea laevigata*). These comments are provided in accordance with section 7 of the Endangered Species Act (ESA) of 1973, as amended (16 U.S.C. 1531-1543).

According to the information you submitted, a plant survey was conducted at the project site on June 1, 2004. No specimens of smooth coneflower were observed. Based on the information provided and other information available, the Service concurs with your determination that the proposed bridge replacement may affect, but is not likely to adversely affect smooth coneflower. We believe that the requirements of section 7(a)(2) of the ESA have been satisfied for this species. We remind you that obligations under section 7 consultation must be reconsidered if: (1) new information reveals impacts of this identified action that may affect listed species or critical habitat in a manner not previously considered in this review; (2) this action is subsequently modified in a manner that was not considered in this review; or (3) a new species is listed or critical habitat determined that may be affected by this identified action.

The Service appreciates the opportunity to review this project. If you have any questions regarding our response, please contact Mr. Gary Jordan at (919) 856-4520 (Ext. 32).

Sincerely,

Tom Augspurger
Ecological Services Acting Supervisor

cc: John Thomas, USACE, Raleigh, NC
Beth Barnes, NCDWQ, Raleigh, NC
Travis Wilson, NCWRC, Creedmoor, NC
Chris Militscher, USEPA, Raleigh, NC

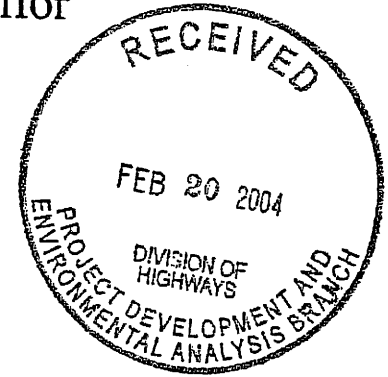


United States Department of the Interior

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.

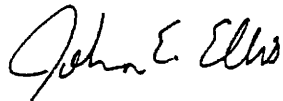
We reserve the right to review any federal permits that may be required for these projects, at the public notice stage. Therefore, it is important that resource agency coordination occur early in

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,



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



North Carolina Department of Cultural Resources
State Historic Preservation Office

Peter B. Sandbeck, Administrator

Michael F. Easley, Governor
Lisbeth C. Evans, Secretary
Jeffrey J. Crow, Deputy Secretary

Office of Archives and History
Division of Historical Resources
David Brook, Director

February 23, 2006

MEMORANDUM

TO: Matt Wilkerson
Office of Human Environment
NCDOT Division of Highways

FROM: Peter Sandbeck

PBS for Peter Sandbeck

SUBJECT: Archaeological Survey, Replacement of Bridge No. 64 on SR 1561 (Lawrence Road)
Over the Eno River, TIP B-4592, Federal Aid No. BRZ-1561(5),
Orange County, ER 04-0398

Thank you for your letter of January 3, 2006, transmitting the archaeological survey report by Caleb Smith of your staff for the above project. We apologize for the delay in our response.

During the course of the survey, one Native American archaeological site (31OR565) was located within the project area. Due to the lack of diagnostic artifacts and the disturbed nature of the site, Mr. Smith has recommended that 31OR565 be assessed as not eligible for the National Register and no further archaeological investigation be conducted in connection with this project. We concur with this recommendation since the project will not involve significant archaeological resources.

The report meets our office's guidelines and those of the Secretary of the Interior.

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

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

cc: Caleb Smith, NCDOT

ADMINISTRATION
RESTORATION
SURVEY & PLANNING

Location
507 N. Blount Street, Raleigh NC
515 N. Blount Street, Raleigh NC
515 N. Blount Street, Raleigh, NC

Mailing Address
4617 Mail Service Center, Raleigh NC 27699-4617
4617 Mail Service Center, Raleigh NC 27699-4617
4617 Mail Service Center, Raleigh NC 27699-4617

Telephone/Fax
(919) 733-4763 / 733-8653
(919) 733-6547 / 715-4801
(919) 733-6545 / 715-4801



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

FROM: David Brook *for David Brook*
Deputy State Historic Preservation Officer

SUBJECT: Request for comments on Bridge Replacement, B-4592, Orange County,
ER04-0398

Thank you for your letter of February 5, 2004, concerning the above project.

Archaeological site 31OR228 is located within the southeast quadrant of the intersection of the Eno River and SR 1561. Although few artifacts were collected from this prehistoric lithic site, no subsurface testing has been conducted to determine if any subsurface deposits are present. We recommend that the Area of Potential Effect (APE) for this project be surveyed and if 31OR228 will be affected by the proposed bridge replacement, the site be tested to determine its eligibility for inclusion in the National Register of Historic Places.

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

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

cc: Matt Wilkerson, NCDOT

www.hpo.dcr.state.nc.us

ADMINISTRATION
RESTORATION
SURVEY & PLANNING

Location
507 N. Blount St, Raleigh, NC
515 N. Blount St, Raleigh, NC
515 N. Blount St, Raleigh, NC

Mailing Address
4617 Mail Service Center, Raleigh, NC 27699-4617
4617 Mail Service Center, Raleigh, NC 27699-4617
4617 Mail Service Center, Raleigh, NC 27699-4617

Telephone/Fax
(919) 733-4763 • 733-8653
(919) 733-6547 • 715-4801
(919) 733-4763 • 715-4801



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 *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.

www.hpo.dcr.state.nc.us

	Location	Mailing Address	Telephone/Fax
ADMINISTRATION	507 N. Blount St, Raleigh, NC	4617 Mail Service Center, Raleigh, NC 27699-4617	(919) 733-4763 • 733-8653
RESTORATION	515 N. Blount St, Raleigh, NC	4617 Mail Service Center, Raleigh, NC 27699-4617	(919) 733-6547 • 715-4801
SURVEY & PLANNING	515 N. Blount St, Raleigh, NC	4617 Mail Service Center, Raleigh, NC 27699-4617	(919) 733-4763 • 715-4801

March 4, 2004

Page 2

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

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

Project Description: Replace Bridge No. 64 on SR 1561On Jan. 21, 2004 representatives of the

- ☒ North Carolina Department of Transportation (NCDOT)
☒ Federal Highway Administration (FHWA)
☒ North Carolina State Historic Preservation Office (HPO)
☐ Other

Reviewed the subject project at

- ☐ Scoping meeting
☒ Historic architectural resources photograph review session/consultation
☐ Other

All parties present agreed

- ☒ There are no properties over fifty years old within the project's area of potential effects.
- ☐ There are no properties less than fifty years old which are considered to meet Criteria Consideration G within the project's area of potential effects.
- ☒ 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 properties identified as Bridge No. 64 (built 1955) are considered not eligible for the National Register and no further evaluation of them is necessary.
- ☒ There are no National Register-listed or Study Listed properties within the project's area of potential effects.
- ☒ All properties greater than 50 years of age located in the APE have been considered at this consultation, and based upon the above concurrence, all compliance for historic architecture with Section 106 of the National Historic Preservation Act and GS 121-12(a) has been completed for this project.
- ☒ There are no historic properties affected by this project. (Attach any notes or documents as needed)

Signed:

Richard Schreier
Representative, NCDOT

21 Jan 2004
Date

Michael C. Damm
FHWA, for the Division Administrator, or other Federal Agency

1/21/04
Date

Sarah D. [Signature]
Representative, HPO

1/21/04
Date

David [Signature]
State Historic Preservation Officer
(SDM)

1/21/04
Date

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




☒ North Carolina Wildlife Resources Commission ☒

Richard B. Hamilton, 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.

5. If temporary access roads or detours are constructed, they should be removed back to original ground elevations immediately upon the completion of the project. Disturbed areas should be seeded or mulched to stabilize the soil and native tree species should be planted with a spacing of not more than 10'x10'. If possible, when using temporary structures the area should be cleared but not grubbed. Clearing the area with chain saws, mowers, bush-hogs, or other mechanized equipment and leaving the stumps and root mat intact, allows the area to revegetate naturally and minimizes disturbed soil.
6. A clear bank (riprap free) area of at least 10 feet should remain on each side of the stream underneath the bridge.
7. In trout waters, the N.C. Wildlife Resources Commission reviews all U.S. Army Corps of Engineers nationwide and general '404' permits. We have the option of requesting additional measures to protect trout and trout habitat and we can recommend that the project require an individual '404' permit.
8. In streams that contain threatened or endangered species, NCDOT biologist Mr. 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:

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.

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 15. 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 15. 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

Subject: Comments concerning Bridge Replacement Projects in Orange County

Date: Mon, 23 Feb 2004 17:19:46 -0500

From: "Karen Lincoln" <klincoln@co.orange.nc.us>

To: <Tellerby@dot.state.nc.us>

CC: "Craig Benedict" <cbenedict@co.orange.nc.us>

Ms. Theresa Ellerby
North Carolina Department of Transportation
Project Development and Environmental Analysis Branch
1548 Mail Service Center
Raleigh, North Carolina

Re: NCDOT request for comments on Bridge Replacement Projects B-4216 and B-4592

Dear Ms. Ellerby:

Thank you for the opportunity to offer comments early in the process for TIP projects for two bridge replacements in Orange County.

Orange County staff has the following comments concerning Bridge Replacement Projects B-4216 and B-4592:

1. Lawrence Road is on the approved 2002-2003 Secondary Road Pavement Program, and is scheduled to be paved by October 1, 2004.
2. NCDOT should not close both roads (St. Mary's Road and Lawrence Road) during the same time period because each of those roads is a potential alternate route for the other for some traffic.
3. By 2005, Churton Grove will have completed the Phase II multifamily section (174 units), and can develop Phase III, which will add another 135 single-family lots to the development. Bridge No. 66 is just east of Churton Grove's entrance off of St. Mary's Rd.

If you need more information from Orange County regarding conditions in the study area, please contact me.

Sincerely,

Karen Lincoln, AICP
Transportation Planner
Orange County Planning Department
306-F Revere Road
Hillsborough, North Carolina 27278

(919) 245-2594
(919) 644-3002 (fax)
klincoln@co.orange.nc.us

Lincoln, Karen klincoln
Current Planning Supervisor
Planning

Nicole Bennett

From: Mike Sisolak [Mike.sisolak@orange.k12.nc.us]
Sent: Thursday, December 14, 2006 10:33 AM
To: Nicole Bennett
Subject: RE: School Bus Crossings on B-4592 - Bridge No. 64 on SR 1561 (Lawrence Road)

2 buses and I don't think it would be much of an inconvenience

Mike Sisolak, Clerical Assistant
Transporation Department
231 Holman Dr.
Hillsborough, NC 27278
(919) 732-2531 X 14503

-----Original Message-----

From: Nicole Bennett [mailto:nbennett@mulkeyinc.com]
Sent: Thursday, December 14, 2006 10:32 AM
To: Mike Sisolak
Subject: RE: School Bus Crossings on B-4592 - Bridge No. 64 on SR 1561 (Lawrence Road)

Good morning. Thank you for getting back to me. It would be extremely helpful if you could provide with the exact number of bus crossings of this bridge because I have to include it in my document. Also, do you foresee rerouting these buses for the bridge replacement causing a huge inconvenience?

Nicole

From: Mike Sisolak [mailto:Mike.sisolak@orange.k12.nc.us]
Sent: Thursday, December 14, 2006 10:28 AM
To: Nicole Bennett
Subject: FW: School Bus Crossings on B-4592 - Bridge No. 64 on SR 1561 (Lawrence Road)

Good Morning Mr. Miller asked me to email you in regards to the email you sent him. At this time we do still have buses traveling on Lawrence Rd. From what we can think of it is probably only about 2 or 3 buses. If you have any more questions or anything email me back.

Thanks,
Mike Sisolak, Clerical Assistant
Transporation Department
231 Holman Dr.
Hillsborough, NC 27278
(919) 732-2531 X 14503

Nicole Bennett

From: Kent McKenzie [kmckenzie@co.orange.nc.us]
Sent: Thursday, December 14, 2006 12:46 PM
To: Nicole Bennett
Cc: Gwen Snowden; Mike Tapp
Subject: FW: NCDOT Projects B-4592 and B-4216

Ms. Bennett,

Colonel Ball is no longer with Orange County Emergency Management, and I am serving as the Interim EM Director. I received the text of your email to Col Ball, but unfortunately the attachments did not come through. Based on your text descriptions of these projects, there will certainly be impacts to Emergency Services, but I don't believe they will be insurmountable ones. The area involved covers two different fire districts, and the project may increase response times for some locations. If you can please re-send the attachments to us, we will consult with both of the Fire Departments that these projects will affect and get our response back to you.

Thanks,

Kent McKenzie

*Major Kent McKenzie
Interim Emergency Management Director,
Emergency Management Deputy Director for EMS
Orange County North Carolina
P.O. Box 8181
Hillsborough, NC 27278*

*Office 919-968-2050
24-hour 919-933-2600*




12/28/2006

ORANGE COUNTY

Priority Bicycle Transportation Routes



Legend

-  Orange County Primary Priority Bicycle Routes
-  Orange County Secondary Priority Bicycle Routes
-  Hillsborough Bicycle Routes