



STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION

MICHAEL F. EASLEY  
GOVERNOR

LYNDO TIPPETT  
SECRETARY

October 15, 2007

Mr. Bill Biddlecome  
U. S. Army Corps of Engineers  
Regulatory Field Office  
Post Office Box 1000  
Washington, NC 27889-1000

Mr. Jim Hoadley  
NC Division of Coastal Management  
Elizabeth City District  
1367 US 17 South  
Elizabeth City, NC 27909

Dear Sirs:

**Subject: Application for Nationwide Permits 23 & 33, & CAMA Major Development Permit Request for the Replacement of Bridge No. 62 over Bear Swamp Canal on SR 1110; Perquimans County; TIP Project B-4226; Federal Aid Project No. BRZ-1110(4); State Project No.8.2120301; Debit \$240.00 from WBS 33570.1.1.**

Please find enclosed permit drawings, roadway plans, landowner receipts, a copy of the state stormwater permit, and CAMA MP forms for the above referenced project proposed by the North Carolina Department of Transportation (NCDOT). A Programmatic Categorical Exclusion (PCE) was completed for this project on April 29, 2005, and distributed shortly thereafter. Additional copies are available upon request. The NCDOT proposes to replace existing Bridge No. 62 over Bear Swamp Canal on SR 1110 in Perquimans County. The project involves replacement of the existing functionally obsolete and structurally deficient 75-foot bridge and approaches with a new 150-foot bridge and approaches. The new bridge will feature two 12-foot lanes with a 3-foot offset on the north and an 8-foot offset on the south. The west approach will be approximately 370 feet long and the east approach will be approximately 687 feet long. Proposed permanent impacts are 0.19 acre of riverine wetland impacts for fill. Traffic will be detoured off-site along surrounding roads during construction.

### **Impacts to Water of the United States**

General Description: The project is located in the Pasquotank River Basin (Hydrologic Unit 03010205). A best usage classification of "C SW" has been assigned to Bear Swamp Canal [DWQ Index # 30-6-2]. Neither High Quality Waters (HQW), Water Supplies (WS-I: undeveloped watersheds or WS-II: predominately undeveloped watersheds), nor Outstanding Resource Waters (ORW) occur within 1.0 mile of the project study area. Bear Swamp Canal is not designated as a North Carolina Natural or Scenic River, or as a National Wild and Scenic River. Additionally, Bear Swamp Canal is not listed on the Final 2006 303(d) list of impaired waters due to sedimentation for the Pasquotank River Basin, nor does it drain into any Section 303(d) waters within 1.0 mile of the project study area.

Permanent Impacts: As stated above, permanent impacts consist of fill and the total amount of proposed impacts is 0.19 acre.

**MAILING ADDRESS:**  
NC DEPARTMENT OF TRANSPORTATION  
PROJECT DEVELOPMENT AND ENVIRONMENTAL ANALYSIS  
1548 MAIL SERVICE CENTER  
RALEIGH NC 27699-1548

TELEPHONE: 919-733-3141  
FAX: 919-733-9794

WEBSITE: [WWW.NCDOT.ORG](http://WWW.NCDOT.ORG)

**LOCATION:**  
TRANSPORTATION BUILDING  
1 SOUTH WILMINGTON STREET  
RALEIGH NC

Temporary Impacts: Proposed temporary impacts due to 0.04 acre of temporary fill in wetlands in the hand clearing areas are needed for the installation of erosion control measures, including some or all of the following: temporary silt fence, special sediment control fence, and temporary rock silt checks.

Hand Clearing: Proposed impacts due to hand clearing total 0.12 acre.

Utility Impacts: There will be no impacts to jurisdictional resources due to utilities. The 4" water pipe to the north will be placed using an open cut in uplands and directional bore. The telephone cable and the gas line to the south will be placed using an open cut in uplands and directional bore. Please refer to the utility drawing.

Bridge Demolition: The superstructure for Bridge No. 62 is a concrete deck on I-beams and will allow removal without dropping components into the water. Likewise, it should be possible to remove the timber piles and timber caps without dropping them into the water. Best Management Practices for Bridge Demolition and Removal will be implemented. Any component of the bridge dropped into the water shall be immediately removed.

### **Avoidance and Minimization**

Avoidance examines all appropriate and practicable possibilities of averting impacts to "Waters of the United States". Due to the presence of surface waters and wetlands within the project study area, avoidance of all impacts is not possible. The NCDOT is committed to incorporating all reasonable and practicable design features to avoid and minimize jurisdictional impacts. Minimization measures were incorporated as part of the project design. These included:

- To avoid impacts, NCDOT is replacing Bridge No. 62 in place and utilizing an off-site detour.
- The bridge will be lengthened by 75 feet.
- Top down construction will be utilized.
- NCDOT is also minimizing impacts to surface waters by utilizing longer spans with less bents than the existing bridge.
- NCDOT will observe an in-stream construction moratorium from February 15 to June 30 and utilize Stream Crossing Guidelines for Anadromous Fish Passage.

### **Mitigation**

The proposed project will have permanent impacts to wetlands totaling 0.19 acre due to fill. NCDOT proposes to use the North Carolina Ecosystem Enhancement Program (EEP) for mitigation. A copy of the EEP acceptance letter is included with this application.

### **Federally Protected Species**

As of May 10, 2007, the US Fish and Wildlife Service (USFWS) lists one federally protected species for Perquimans County. In March 2006, the bald eagle (*Haliaeetus leucocephalus*) was given protection in Perquimans County. The bald eagle was delisted as of August 8, 2007 and is no longer protected by the Endangered Species Act. It is, however, protected under the Bald and Golden Eagle Protection Act. No nests or individuals were observed within 660 feet of the project area.

## Project Schedule

The project has a scheduled let of March 18, 2008 with a review date of January 29, 2008.

## Regulatory Approvals

Section 404 Permit: All aspects of this project are being processed by the Federal Highway Administration as a "Categorical Exclusion" in accordance with 23 CFR 771.115(b). The NCDOT requests that these activities be authorized by Nationwide Permits 23. We are also requesting the issuance of a Nationwide Permit 33 for the temporary fill due to the installation of erosion control measures. (72 CFR; 11092-11198, March 12, 2007).

Section 401 Permit: We anticipate 401 General Certification numbers 3632 and 3634 will apply to this project. The NCDOT will adhere to all standard conditions of the aforementioned certification, and therefore are requesting written concurrence from the North Carolina Department of Environmental and Natural Resources, Division of Water Quality. Therefore, in accordance with 15A NCAC 2H, Section .0500(a), we are providing five copies of this application to the NCDWQ for their review and approval. Authorization to debit the \$240 Permit Application Fee from WBS Element 33388.1.1 is hereby given.

CAMA Permit: NCDOT requests that the proposed work be authorized under a Coastal Area Management Act Major Development Permit. The landowner receipts are attached. NCDOT has received a stormwater permit for this project.

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 Chris Underwood at (919) 715-1451.

Sincerely,


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

W/attachment:

Mr. John Hennessy, NCDWQ (2 copies)  
Mr. Travis Wilson, NCWRC  
Mr. Gary Jordan, USFWS  
Mr. Ron Sechler, NMFS  
Mr. Michael Street, NCDMF  
Mr. Steve Sollod, NCDCM  
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. Anthony Roper, P.E., Division 1 Engineer

Mr. Clay Willis, Division 1 Environmental  
Officer  
W/o attachment  
Mr. Scott McLendon, USACE, Wilmington  
Mr. Jay Bennett, P.E., Roadway Design  
Mr. Majed Alghandour, P. E., Programming and  
TIP  
Mr. Art McMillan, P.E., Highway Design  
Mr. Todd Jones, NCDOT External Audit  
Branch  
Ms. Beth Harmon, EEP  
Ms. Natalie Lockhart, PDEA

# APPLICATION for Major Development Permit

(last revised 12/27/06)



North Carolina DIVISION OF COASTAL MANAGEMENT

<b>1. Primary Applicant/ Landowner Information</b>				
Business Name North Carolina Department Of Transportation		Project Name (if applicable) B-4226		
Applicant 1: First Name Gregory	MI J	Last Name Thorpe		
Applicant 2: First Name	MI	Last Name		
<i>If additional applicants, please attach an additional page(s) with names listed.</i>				
Mailing Address 1598 Mail Service Center		PO Box	City Raleigh	State NC
ZIP 27699	Country	Phone No. 919 - 715 - 1334 ext.	FAX No. 919 - 715 - 5501	
Street Address (if different from above)		City	State	ZIP
Email				

<b>2. Agent/Contractor Information</b>				
Business Name				
Agent/ Contractor 1: First Name	MI	Last Name		
Agent/ Contractor 2: First Name	MI	Last Name		
Mailing Address		PO Box	City	State
ZIP		Phone No. 1 - - ext.	Phone No. 2 - - ext.	
FAX No.	Contractor #			
Street Address (if different from above)		City	State	ZIP
Email				

&lt;Form continues on back&gt;

<b>3. Project Location</b>			
County (can be multiple) Perquimans	Street Address	State Rd. # SR 1110	
Subdivision Name	City	State	Zip -
Phone No. - - ext.		Lot No.(s) (if many, attach additional page with list)	
a. In which NC river basin is the project located? Pasquotank		b. Name of body of water nearest to proposed project Bear Swamp Canal	
c. Is the water body identified in (b) above, natural or manmade? <input checked="" type="checkbox"/> Natural <input type="checkbox"/> Manmade <input type="checkbox"/> Unknown		d. Name the closest major water body to the proposed project site. Perquimans River	
e. Is proposed work within city limits or planning jurisdiction? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		f. If applicable, list the planning jurisdiction or city limit the proposed work falls within.	

<b>4. Site Description</b>	
a. Total length of shoreline on the tract (ft.) N/A	b. Size of entire tract (sq.ft.) 2.78 acres
c. Size of individual lot(s) N/A, (If many lot sizes, please attach additional page with a list)	d. Approximate elevation of tract above NHW (normal high water) or NWL (normal water level) 8' <input type="checkbox"/> NHW or <input checked="" type="checkbox"/> NWL
e. Vegetation on tract Wetland vegetation, grasses, and trees	
f. Man-made features and uses now on tract Roadway fill, paved road, and bridge	
g. Identify and describe the existing land uses <u>adjacent</u> to the proposed project site. Agrculture	
h. How does local government zone the tract? Rural Services	i. Is the proposed project consistent with the applicable zoning? (Attach zoning compliance certificate, if applicable) <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA
j. Is the proposed activity part of an urban waterfront redevelopment proposal? <span style="float: right;"><input type="checkbox"/> Yes <input checked="" type="checkbox"/> No</span>	
k. Has a professional archaeological assessment been done for the tract? If yes, attach a copy. <span style="float: right;"><input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA</span>  If yes, by whom? <span style="float: right;">SHPO</span>	
l. Is the proposed project located in a National Registered Historic District or does it involve a National Register listed or eligible property? <span style="float: right;"><input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> NA</span>	

**<Form continues on next page>**

m. (i) Are there wetlands on the site?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
(ii) Are there coastal wetlands on the site?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
(iii) If yes to either (i) or (ii) above, has a delineation been conducted? (Attach documentation, if available)	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No

n. Describe existing wastewater treatment facilities. None
o. Describe existing drinking water supply source. None
p. Describe existing storm water management or treatment systems. None

<b>5. Activities and Impacts</b>	
a. Will the project be for commercial, public, or private use?	<input type="checkbox"/> Commercial <input checked="" type="checkbox"/> Public/Government <input type="checkbox"/> Private/Community
b. Give a brief description of purpose, use, and daily operations of the project when complete. New bridge over Bear swamp Canal. Used for conveying traffic.	
c. Describe the proposed construction methodology, types of construction equipment to be used during construction, the number of each type of equipment and where it is to be stored. Replace existing bridge using road construction equipment.	
d. List all development activities you propose. Bridge replacement.	
e. Are the proposed activities maintenance of an existing project, new work, or both?	Both
f. What is the approximate total disturbed land area resulting from the proposed project?	0.6 <input type="checkbox"/> Sq.Ft or <input checked="" type="checkbox"/> Acres
g. Will the proposed project encroach on any public easement, public accessway or other area that the public has established use of?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> NA
h. Describe location and type of existing and proposed discharges to waters of the state. Surface runoff	
i. Will wastewater or stormwater be discharged into a wetland?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> NA
If yes, will this discharged water be of the same salinity as the receiving water?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA
j. Is there any mitigation proposed?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA
If yes, attach a mitigation proposal.	

**<Form continues on back>**

<b>6. Additional Information</b>	
<i>In addition to this completed application form, (MP-1) the following items below, if applicable, must be submitted in order for the application package to be complete. Items (a) – (f) are always applicable to any major development application. Please consult the application instruction booklet on how to properly prepare the required items below.</i>	
a. A project narrative.	
b. An accurate, dated work plat (including plan view and cross-sectional drawings) drawn to scale. Please give the present status of the proposed project. Is any portion already complete? If previously authorized work, clearly indicate on maps, plats, drawings to distinguish between work completed and proposed.	
c. A site or location map that is sufficiently detailed to guide agency personnel unfamiliar with the area to the site.	

d. A copy of the deed (with state application only) or other instrument under which the applicant claims title to the affected properties.
e. The appropriate application fee. Check or money order made payable to DENR.
<p>f. A list of the names and complete addresses of the adjacent waterfront (riparian) landowners and signed return receipts as proof that such owners have received a copy of the application and plats by certified mail. Such landowners must be advised that they have 30 days in which to submit comments on the proposed project to the Division of Coastal Management.</p> <p>Name Elizabeth W. Bates Phone No.</p> <p>Address 208 Deepwater Drive, Chesapeake, VA 23322</p> <p>Name Robert P. Hollowell Phone No.</p> <p>Address 2103 Center Hill Hwy., Hertford, NC 27944</p> <p>Name Helen O. Hunter Phone No.</p> <p>Address 2075 Center Hill Hwy., Hertford, NC 27944</p>
g. A list of previous state or federal permits issued for work on the project tract. Include permit numbers, permittee, and issuing dates. MCDWQ State Stormwater Permit No. SW7070312 issued on May 8, 2007.
h. Signed consultant or agent authorization form, if applicable.
i. Wetland delineation, if necessary.
j. A signed AEC hazard notice for projects in oceanfront and inlet areas. <i>(Must be signed by property owner)</i>
k. A statement of compliance with the N.C. Environmental Policy Act (N.C.G.S. 113A 1-10), if necessary. If the project involves expenditure of public funds or use of public lands, attach a statement documenting compliance with the North Carolina Environmental Policy Act.

**7. Certification and Permission to Enter on Land**

I understand that any permit issued in response to this application will allow only the development described in the application. The project will be subject to the conditions and restrictions contained in the permit.

I certify that I am authorized to grant, and do in fact grant permission to representatives of state and federal review agencies to enter on the aforementioned lands in connection with evaluating information related to this permit application and follow-up monitoring of the project.

I further certify that the information provided in this application is truthful to the best of my knowledge.

Date 10.15.07

Print Name Elizabeth L. Lusk

Signature 

Please indicate application attachments pertaining to your proposed project.

- DCM MP-2 Excavation and Fill Information                       DCM MP-5 Bridges and Culverts
- DCM MP-3 Upland Development
- DCM MP-4 Structures Information

# BRIDGES and CULVERTS

Attach this form to Joint Application for CAMA Major Permit, Form DCM MP-1. Be sure to complete all other sections of the Joint Application that relate to this proposed project. Please include all supplemental information.

**1. BRIDGES**  This section not applicable

- a. Is the proposed bridge:
  - Commercial  Public/Government  Private/Community
- b. Water body to be crossed by bridge:
 

Bear Swamp Canal
- c. Type of bridge (construction material):
 

cored slab
- d. Water depth at the proposed crossing at NLW or NWL:
 

4.5'
- e. (i) Will proposed bridge replace an existing bridge?  Yes  No
 

If yes,

  - (ii) Length of existing bridge: 75'
  - (iii) Width of existing bridge: 24'
  - (iv) Navigation clearance underneath existing bridge: 7.5'
  - (v) Will all, or a part of, the existing bridge be removed?
 

(Explain) All (new bridge will be longer)
- f. (i) Will proposed bridge replace an existing culvert?  Yes  No
 

If yes,

  - (ii) Length of existing culvert:
  - (iii) Width of existing culvert:
  - (iv) Height of the top of the existing culvert above the NHW or NWL:
  - (v) Will all, or a part of, the existing culvert be removed?
 

(Explain)
- g. Length of proposed bridge: 150'
- h. Width of proposed bridge: 33'
- i. Will the proposed bridge affect existing water flow?  Yes  No
 

If yes, explain:
- j. Will the proposed bridge affect navigation by reducing or increasing the existing navigable opening?  Yes  No
 

If yes, explain: The proposed bridge allows 1' more of vertical clearance.
- k. Navigation clearance underneath proposed bridge: 8.5'
- l. Have you contacted the U.S. Coast Guard concerning their approval?  Yes  No
 

If yes, explain:
- m. Will the proposed bridge cross wetlands containing no navigable waters?  Yes  No
 

If yes, explain:
- n. Height of proposed bridge above wetlands: 8'

**2. CULVERTS**  This section not applicable

- a. Number of culverts proposed:
- b. Water body in which the culvert is to be placed:

**< Form continues on back >**

- c. Type of culvert (construction material):

**Form DCM MP-5 (Bridges and Culverts, Page 2 of 4)**

d. (i) Will proposed culvert replace an existing bridge?  Yes  No

If yes,

- (ii) Length of existing bridge:
- (iii) Width of existing bridge:
- (iv) Navigation clearance underneath existing bridge:
- (v) Will all, or a part of, the existing bridge be removed? (Explain)

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

e. (i) Will proposed culvert replace an existing culvert?  Yes  No

If yes,

- (ii) Length of existing culvert(s):
- (iii) Width of existing culvert(s):
- (iv) Height of the top of the existing culvert above the NHW or NWL:
- (v) Will all, or a part of, the existing culvert be removed? (Explain)

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

f. Length of proposed culvert:

g. Width of proposed culvert:

h. Height of the top of the proposed culvert above the NHW or NWL.

i. Depth of culvert to be buried below existing bottom contour.

j. Will the proposed culvert affect navigation by reducing or increasing the existing navigable opening?  Yes  No

k. Will the proposed culvert affect existing water flow?  Yes  No

If yes, explain:

If yes, explain:

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

**3. EXCAVATION and FILL**

This section not applicable

a. (i) Will the placement of the proposed bridge or culvert require any excavation below the NHW or NWL?  Yes  No

b. (i) Will the placement of the proposed bridge or culvert require any excavation within coastal wetlands/marsh (CW), submerged aquatic vegetation (SAV), shell bottom (SB), or other wetlands (WL)? If any boxes are checked, provide the number of square feet affected.

If yes,

- (ii) Avg. length of area to be excavated:
- (iii) Avg. width of area to be excavated:
- (iv) Avg. depth of area to be excavated:
- (v) Amount of material to be excavated in cubic yards:

CW \_\_\_\_\_  SAV \_\_\_\_\_  SB  
 WL \_\_\_\_\_  None

(ii) Describe the purpose of the excavation in these areas:

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

c. (i) Will the placement of the proposed bridge or culvert require any high-ground excavation?  Yes  No

If yes,

- (ii) Avg. length of area to be excavated: 126'
- (iii) Avg. width of area to be excavated: 74'
- (iv) Avg. depth of area to be excavated:
- (v) Amount of material to be excavated in cubic yards: 800

d. If the placement of the bridge or culvert involves any excavation, please complete the following:

(i) Location of the spoil disposal area: To be determined by the contractor.

(ii) Dimensions of the spoil disposal area: To be determined by the contractor.

(iii) Do you claim title to the disposal area?  Yes  No (If no, attach a letter granting permission from the owner.)

(iv) Will the disposal area be available for future maintenance?  Yes  No

(v) Does the disposal area include any coastal wetlands/marsh (CW), submerged aquatic vegetation (SAVs), other wetlands (WL), or shell bottom (SB)?

CW  SAV  WL  SB  None

If any boxes are checked, give dimensions if different from (ii) above.

(vi) Does the disposal area include any area below the NHW or NWL?  Yes  No

If yes, give dimensions if different from (ii) above.

- e. (i) Will the placement of the proposed bridge or culvert result in any fill (other than excavated material described in Item d above) to be placed below NHW or NWL?  Yes  No

If yes,

(ii) Avg. length of area to be filled:

(iii) Avg. width of area to be filled:

(iv) Purpose of fill:

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- f. (i) Will the placement of the proposed bridge or culvert result in any fill (other than excavated material described in Item d above) to be placed within coastal wetlands/marsh (CW), submerged aquatic vegetation (SAV), shell bottom (SB), or other wetlands (WL)? If any boxes are checked, provide the number of square feet affected.

CW \_\_\_\_\_  SAV \_\_\_\_\_  SB

WL \_\_\_\_\_  None

- (ii) Describe the purpose of the excavation in these areas:

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- g. (i) Will the placement of the proposed bridge or culvert result in any fill (other than excavated material described in Item d above) to be placed on high-ground?  Yes  No

If yes,

(ii) Avg. length of area to be filled:

(iii) Avg. width of area to be filled:

(iv) Purpose of fill:

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**4. GENERAL**

- a. Will the proposed project require the relocation of any existing utility lines?  Yes  No

If yes, explain: All utility lines will be replaced using open cuts and directional bore outside the jurisdictional areas.

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*If this portion of the proposed project has already received approval from local authorities, please attach a copy of the approval or certification.*

- b. Will the proposed project require the construction of any temporary detour structures?  Yes  No

If yes, explain:

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- c. Will the proposed project require any work channels?  Yes  No

If yes, complete Form DCM-MP-2.

- d. How will excavated or fill material be kept on site and erosion controlled?

Silt fence, NCDOT Type B silt basin, diversion ditches, and inlet protection.

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- e. What type of construction equipment will be used (for example, dragline, backhoe, or hydraulic dredge)?

Bulldozer, backhoe, & crane.

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- f. Will wetlands be crossed in transporting equipment to project site?  Yes  No

If yes, explain steps that will be taken to avoid or minimize environmental impacts.

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- g. Will the placement of the proposed bridge or culvert require any shoreline stabilization?  Yes  No

If yes, complete form MP-2, Section 3 for Shoreline Stabilization only.

10.15.07

Date

Project Name

Elizabeth L. Lusk

Ap

Applicant Name

E. L. Lusk

Ap

Applicant Signature



Underwood

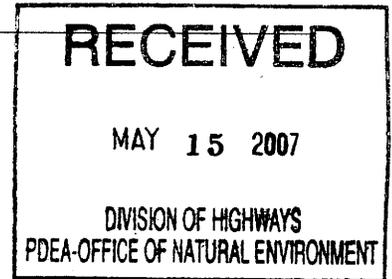
Michael F. Easley, Governor

William G. Ross Jr., Secretary  
North Carolina Department of Environment and Natural Resources

Alan W. Klimek, P.E. Director  
Division of Water Quality

May 8, 2007

NC Department of Transportation  
Project Development Branch  
Attn.: Dr. Gregory J. Thorpe  
1548 Mail Service Center  
Raleigh, NC 27699-1548



**Subject: Permit No. SW7070312  
NCDOT Project B-4226, Replacement of  
Bridge #62  
Other Stormwater Permit  
Linear Public Road / Bridge Project  
Perquimans County**

Dear Dr. Thorpe:

The Washington Regional Office received a complete Stormwater Management Permit Application for the subject project on March 9, 2007. Staff review of the plans and specifications has determined that the project, as proposed, will comply with the Stormwater Regulations set forth in Title 15A NCAC 2H .1000. We are forwarding Permit No. SW7070312 dated May 8, 2007, for the construction of the subject Replacement of Bridge #62 project.

This permit shall be effective from the date of issuance until rescinded and shall be subject to the conditions and limitations as specified therein.

If any parts, requirements, or limitations contained in this permit are unacceptable, you have the right to request an adjudicatory hearing upon written request within thirty (30) days following receipt of this permit. This request must be in the form of a written petition, conforming to Chapter 150B of the North Carolina General Statutes, and filed with the Office of Administrative Hearings, 6714 Mail Service Center, Raleigh, NC 27699-6714. Unless such demands are made this permit shall be final and binding.

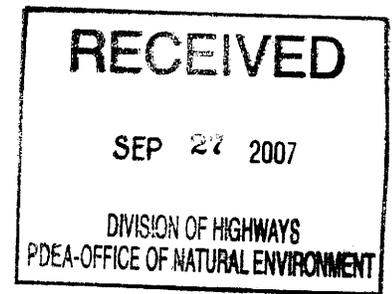
If you have any questions, or need additional information concerning this matter, please contact either me or Samir Dumpor at (252) 946-6481.

Sincerely,

Al Hodge  
Regional Supervisor  
Surface Water Protection Section

AH/sd: J:\WPDATA\WQS\State SW-SD\Permits - General Permits

cc: Perquimans County Building Inspections  
Division of Coastal Management  
Washington Regional Office  
Central Files



September 21, 2007

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

Dear Dr. Thorpe:

Subject: EEP Mitigation Acceptance Letter:

**B-4226**, Replace Bridge Number 62 on SR 1100 over Bear Swamp  
Canal, Perquimans County

The purpose of this letter is to notify you that the Ecosystem Enhancement Program (EEP) will provide the compensatory riparian wetland mitigation for the subject project. Based on the information supplied by you on September 10, 2007, the impacts are located in CU 03010205 of the Pasquotank River Basin in the Northern Outer Coastal Plain (NOCP) Eco-Region, and are as follows:

Riparian Wetland: 0.19 acre

EEP commits to implementing sufficient compensatory riparian wetland mitigation to offset the impacts associated with this project by the end of the MOA Year in which this project is permitted, in accordance with Section X of the Amendment No. 2 to the Memorandum of Agreement between the North Carolina Department of Environment and Natural Resources, the North Carolina Department of Transportation, and the U. S. Army Corps of Engineers, fully executed on March 8, 2007. If the above referenced impact amounts are revised, then this mitigation acceptance letter will no longer be valid and a new mitigation acceptance letter will be required from EEP.

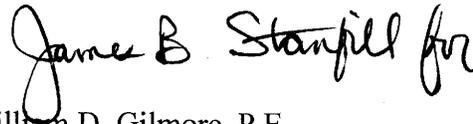
*Restoring... Enhancing... Protecting Our State*

North Carolina Ecosystem Enhancement Program, 1652 Mail Service Center, Raleigh, NC 27699-1652 / 919-715-0476 / [www.nceep.net](http://www.nceep.net)



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

Sincerely,

A handwritten signature in black ink that reads "James B. Stanfill for". The signature is written in a cursive style with a large initial "J" and "S".

William D. Gilmore, P.E.  
EEP Director

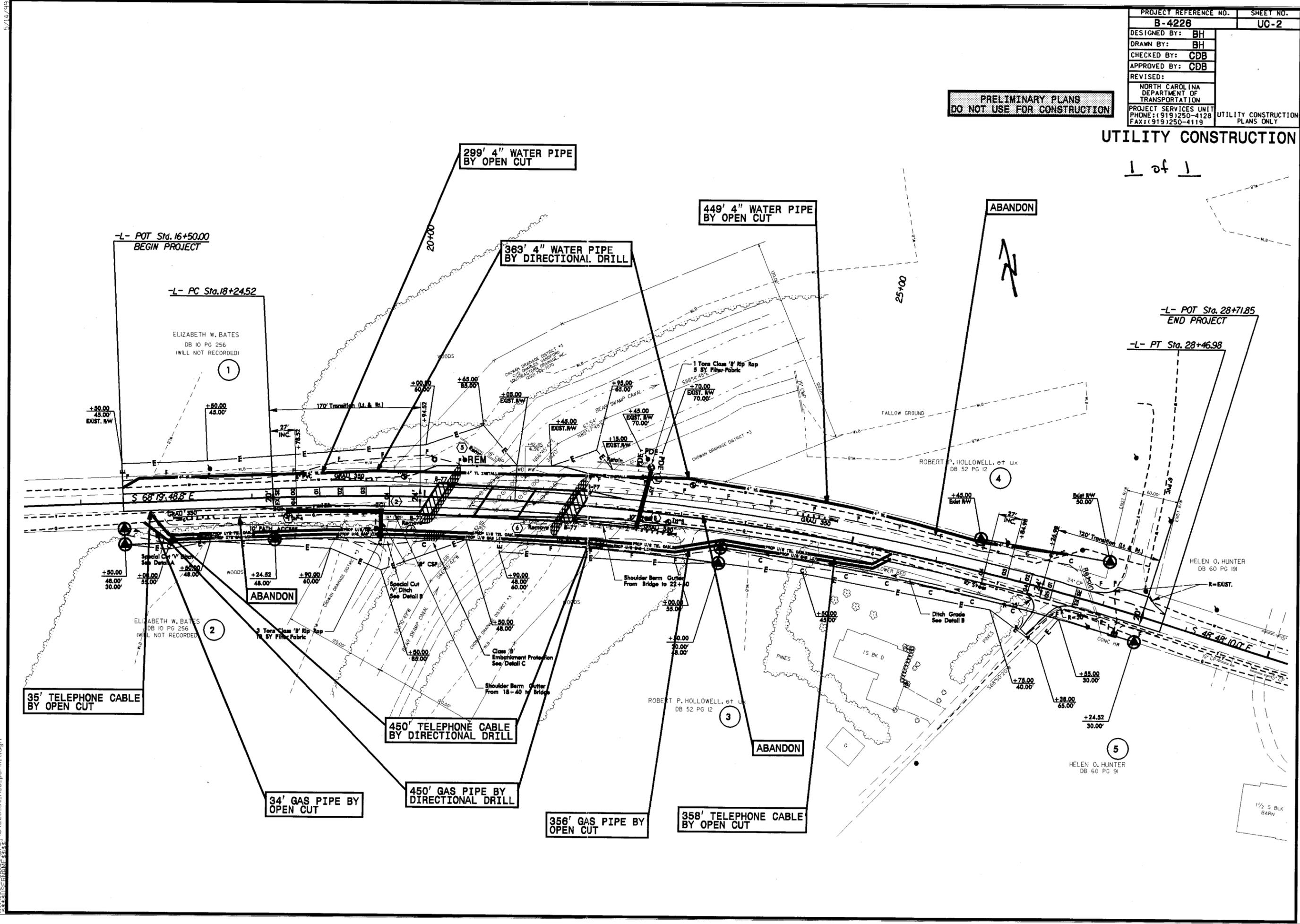
cc: Mr. Bill Biddlecome, USACE – Washington  
Mr. John Hennessy, Division of Water Quality, Wetlands/401 Unit  
File: B-4226

PROJECT REFERENCE NO.	SHEET NO.
B-4226	UC-2
DESIGNED BY: BH	
DRAWN BY: BH	
CHECKED BY: CDB	
APPROVED BY: CDB	
REVISED:	
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION	
PROJECT SERVICES UNIT PHONE: (919) 250-4128 FAX: (919) 250-4119	UTILITY CONSTRUCTION PLANS ONLY

**PRELIMINARY PLANS  
DO NOT USE FOR CONSTRUCTION**

**UTILITY CONSTRUCTION**

1 of 1



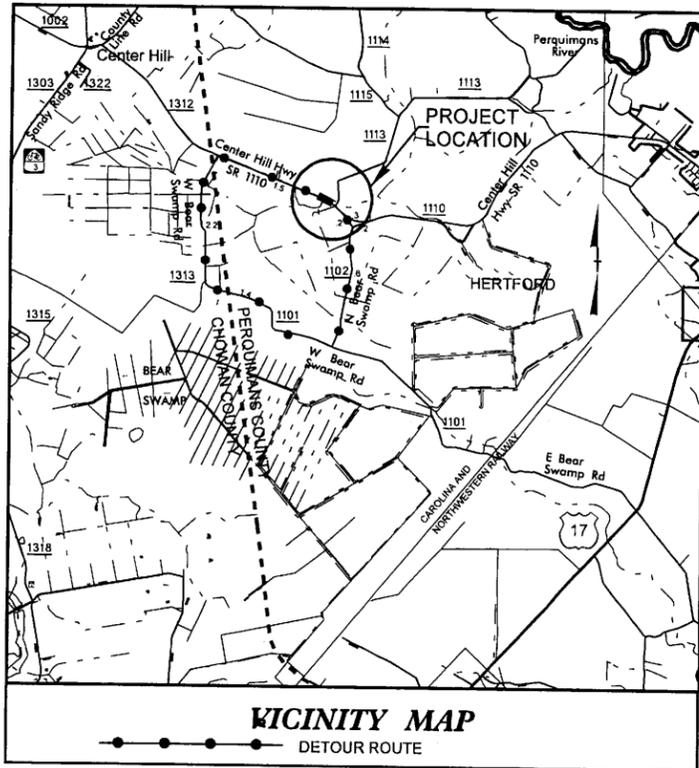
5/24/99  
23-FEB-2007 16:53 \\b4226-ut.neu.prim.t.dgn

TIP PROJECT: B-4226

CONTRACT:

31-JAN-2007 10:50  
F:\hydraulic\B4226\Drawings\Tsh.dgn  
smo\gdn AT HY221528

See Sheet 1-A For Index of Sheets



STATE OF NORTH CAROLINA  
DIVISION OF HIGHWAYS

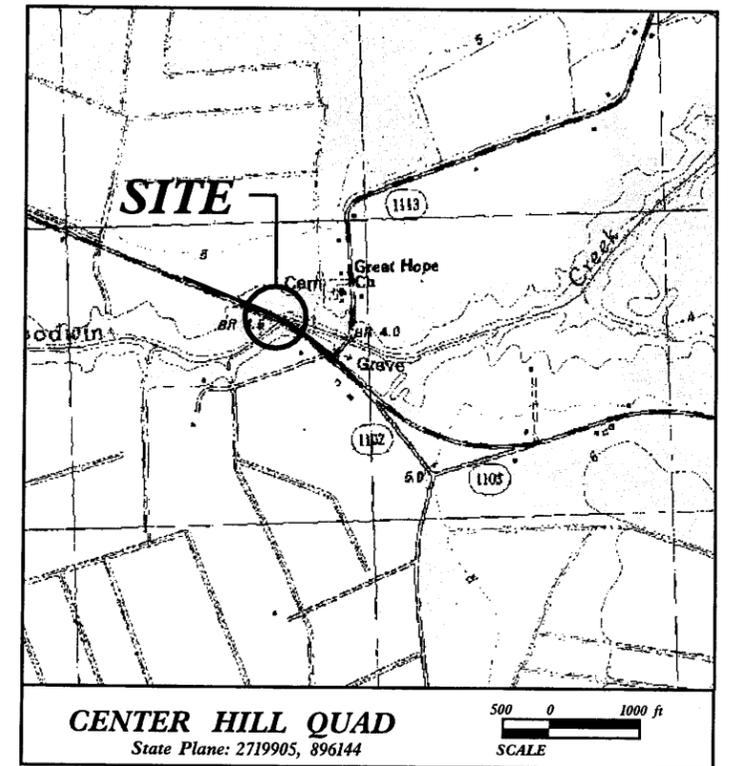
# PERQUIMANS COUNTY

LOCATION: BRIDGE 62 OVER BEAR SWAMP CANAL ON SR 1110

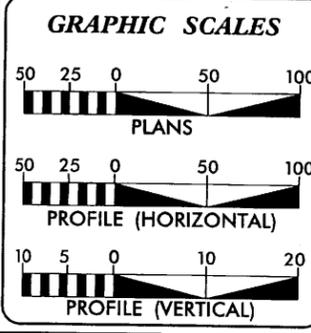
## SITE LOCATION

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-4226	1	
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
33570.1.1	BRZ-1110(4)	PE	

Permit Drawing  
Sheet 1 of 7



**PRELIMINARY PLANS**  
DO NOT USE FOR CONSTRUCTION



**DESIGN DATA**

ADT 2002 =	1200
ADT 2025 =	2100
DHV =	10 %
D =	60 %
T =	3 %*
V =	60 MPH
FUNC. CLASS. = RUAL MINOR COLLECTOR	
* TTST 1	DUAL 2

**PROJECT LENGTH**

LENGTH ROADWAY TIP PROJECT B-4226 =	0.203 MILES
LENGTH STRUCTURE TIP PROJECT B-4226 =	0.028 MILES
TOTAL LENGTH TIP PROJECT B-4226 =	0.231 MILES

Prepared in the Office of:  
**DIVISION OF HIGHWAYS**  
1000 Birch Ridge Dr., Raleigh NC, 27610

2006 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE: MARCH 16, 2007	JASON MOORE, P.E. PROJECT ENGINEER
LETTING DATE: MARCH 18, 2008	BRYAN KEY, P.E. PROJECT DESIGN ENGINEER

**HYDRAULICS ENGINEER**

SIGNATURE: \_\_\_\_\_ P.E.

**ROADWAY DESIGN ENGINEER**

SIGNATURE: \_\_\_\_\_ P.E.

**DIVISION OF HIGHWAYS**  
STATE OF NORTH CAROLINA

STATE DESIGN ENGINEER \_\_\_\_\_ P.E.

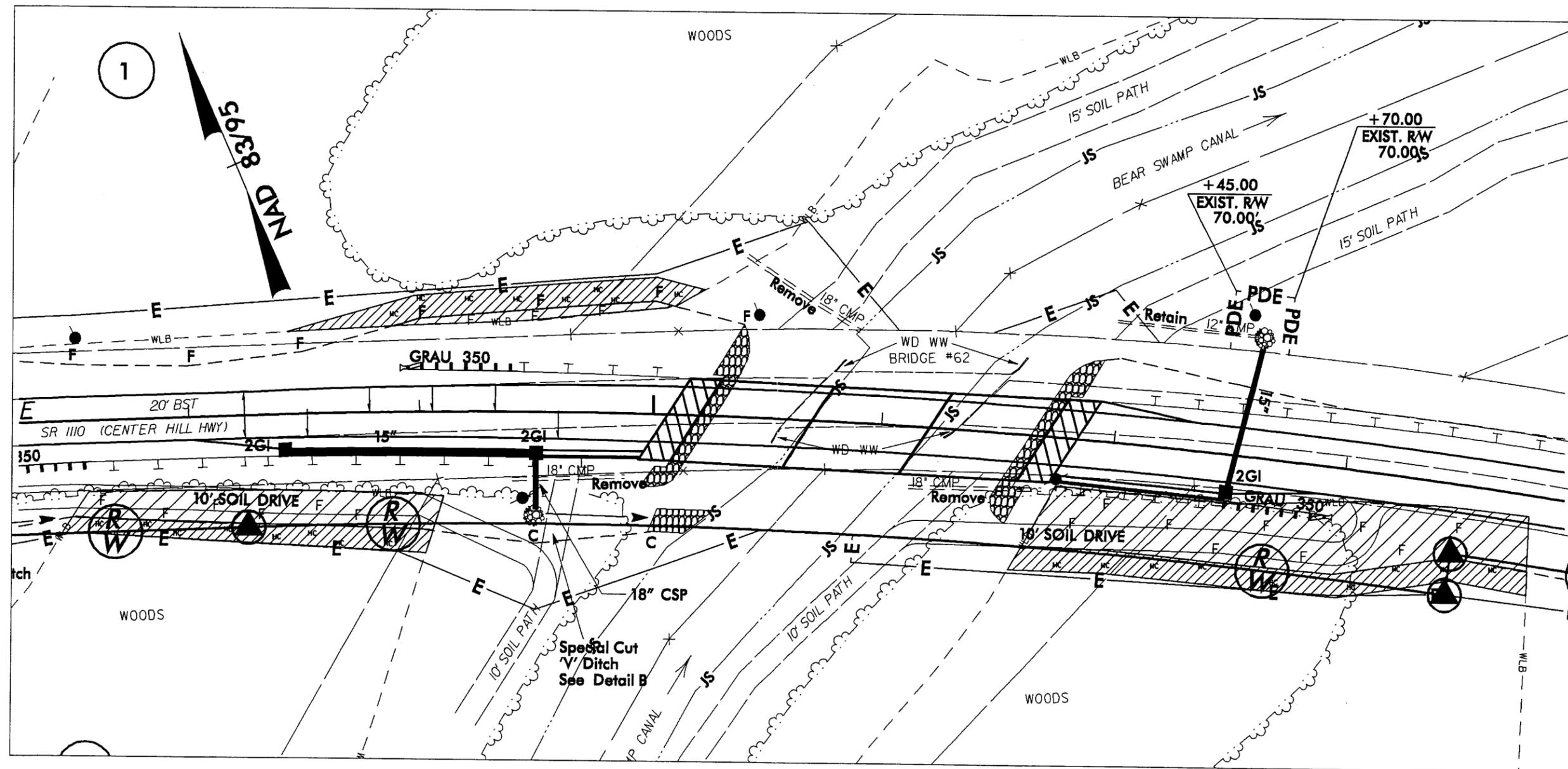
DEPARTMENT OF TRANSPORTATION  
FEDERAL HIGHWAY ADMINISTRATION

APPROVED \_\_\_\_\_ P.E.  
DIVISION ADMINISTRATOR

DATE \_\_\_\_\_



# Permit Drawing Enlargement



DENOTES FILL IN WETLAND  
 DENOTES HAND CLEARING

5/14/99

PRELIMINARY PLANS  
DO NOT USE FOR CONSTRUCTION

**Permit Drawing**  
Sheet 4 of 7

BM #10 ELEV. 12.76 RAILROAD SPIKE  
IN BASE OF 16" PINE  
-L- STA. 16+57, 50' RT.

**-L- LINE**

BM #11 ELEV. 8.84 RAILROAD SPIKE  
IN BASE OF 20" CYPRESS  
-L- STA. 22+71, 41' RT.

**BRIDGE HYDRAULIC DATA**

DESIGN DISCHARGE	= 1200 CFS
DESIGN FREQUENCY	= 25 YRS
DESIGN HW ELEVATION	= 10.4 FT
BASE DISCHARGE	= 1850 CFS
BASE FREQUENCY	= 100 YRS
BASE HW ELEVATION	= 12.2 FT
OVERTOPPING DISCHARGE	= 2300 CFS
OVERTOPPING FREQUENCY	= 100 YRS
OVERTOPPING ELEVATION	= 13 FT

**BEGIN GRADE**  
-L- STA. 18+24.52  
EL. = 14.20

**END GRADE**  
-L- STA. 27+65.98  
EL. = 13.65

**BEGIN RESURFACING**  
-L- STA. 16+50.00

**BEGIN BRIDGE**  
-L- STA. 20+20.00

**END BRIDGE**  
-L- STA. 21+70.00

SR 1113 GREAT HOPE CHURCH ROAD  
-L- STA. 28+25.68

**BEGIN APPROACH SLAB**  
-L- STA. 20+06.17

**END APPROACH SLAB**  
-L- STA. 21+83.86

**END RESURFACING**  
-L- STA. 28+71.85

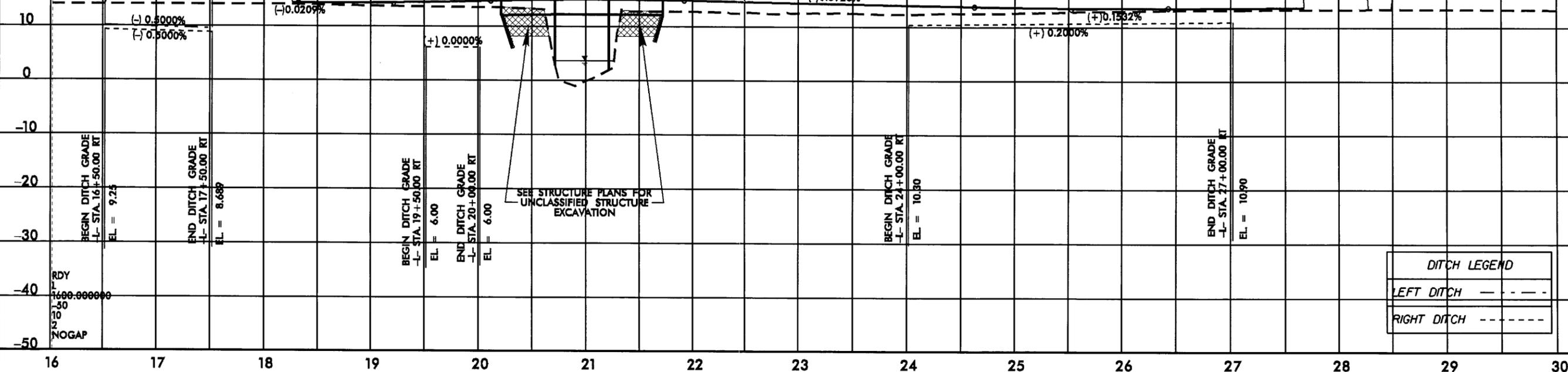
**BEGIN DITCH GRADE**  
-L- STA. 16+50.00 LT  
EL. = 10.00

**END DITCH GRADE**  
-L- STA. 17+50.00 LT  
EL. = 9.50

PI = 19+20.00  
EL = 14.18'  
VC = 180'  
K = 342  
V = 80+mph

PI = 21+00.00  
EL = 15.09'  
VC = 180'  
K = 200  
V = 65mph

PI = 25+50.56  
EL = 13.32'  
VC = 180'  
K = 330  
V = 80+mph



**DITCH LEGEND**

LEFT DITCH	---
RIGHT DITCH	----

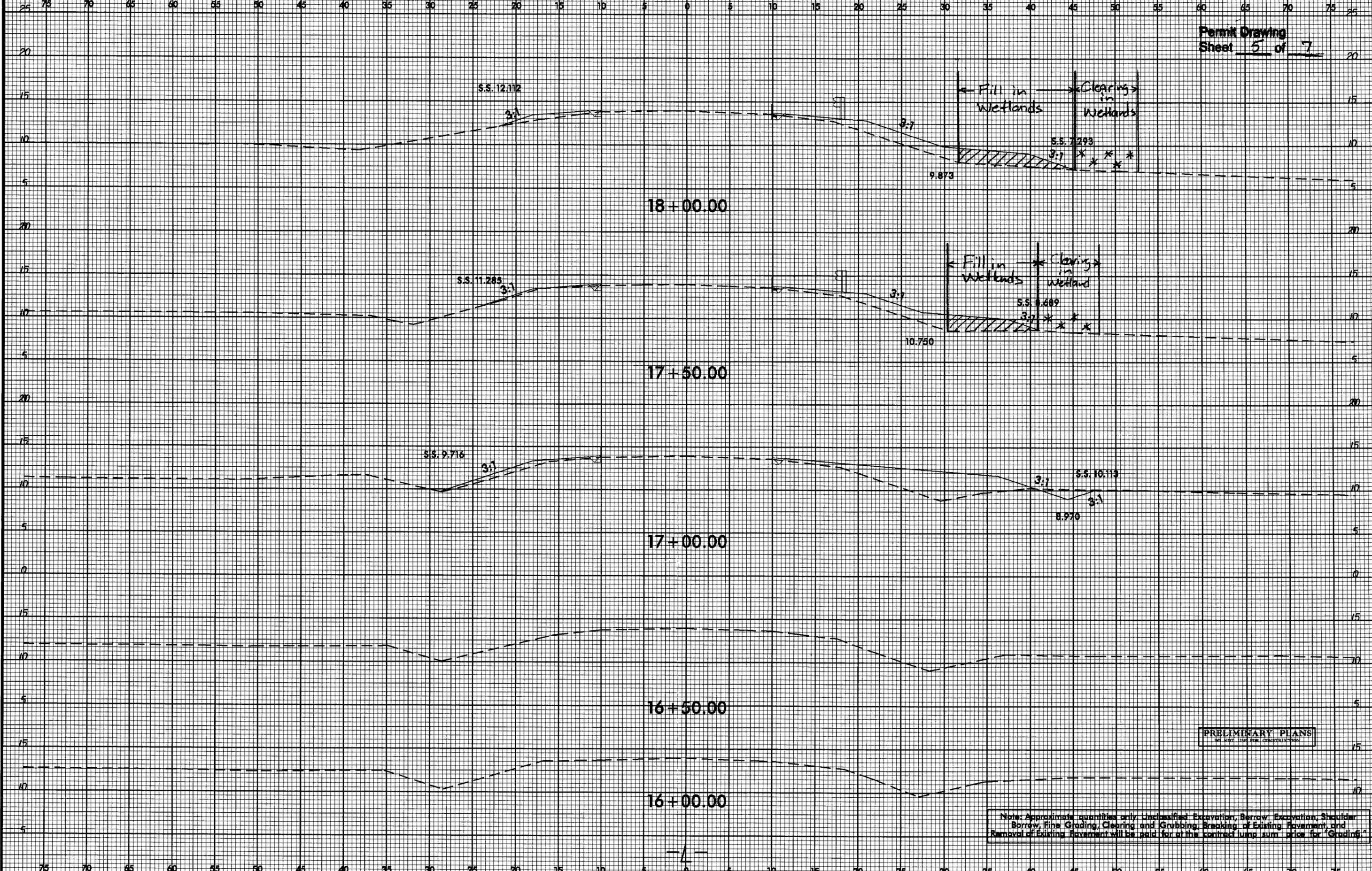
30-JAN-2007 14:35:26 gmt\_lpr1.dgn  
1600-000000  
50  
10  
2  
NOGAP

8/23/9



PROJ. REFERENCE NO. B-4226	SHEET NO. X-1
-------------------------------	------------------

Permit Drawing  
Sheet 5 of 7



PRELIMINARY PLANS  
NO ASS. THERE FOR CONSTRUCTION

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

31-JAN-2007 16:24  
r:\roadway\ssc\B-4226\rdw\pl1.dgn  
smrcan

**WETLAND PERMIT IMPACT SUMMARY**

Site No.	Station (From/To)	Structure Size / Type	WETLAND IMPACTS					SURFACE WATER IMPACTS								
			Permanent Fill In Wetlands (ac)	Temp. Fill In Wetlands (ac)	Excavation in Wetlands (ac)	Mechanized Clearing in Wetlands (ac)	Hand Clearing in Wetlands (ac)	Permanent SW impacts (ac)	Temp. SW impacts (ac)	Existing Channel Impacts Permanent (ft)	Existing Channel Impacts Temp. (ft)	Natural Stream Design (ft)				
1	17+50 to 24+00	Roadway Embankment	0.19				0.12									
1*	20+95	150' Bridge														
<b>TOTALS:</b>			<b>0.19</b>				<b>0.12</b>									

\* Note: Steel piles for interior bents result in 18 sq. ft. of surface water impacts.  
0.04 acre of Temporary Fill in Wetlands in the Hand Clearing areas for erosion control measures.

NC DEPARTMENT OF TRANSPORTATION  
DIVISION OF HIGHWAYS  
Perquimans County  
WBS - 33570.1.1 (B-4226)  
Bridge no. 62 over Bear Swamp on SR 1110

**Permit Drawing**  
Sheet 6 of 7 9/7/2007  
SHEET

### Adjacent Property Owners

Owner/ Business

Elizabeth W. Bates

Robert P. Hollowell

Helen O. Hunter

Address

208 Deepwater Dr.  
Chesapeake VA 23322

2103 Center Hill Hwy.  
Hertford NC 27944

2075 Center Hill Hwy.  
Hertford NC 27944

NC DEPARTMENT OF TRANSPORTATION  
DIVISION OF HIGHWAYS

PERQUIMANS COUNTY  
PROJ - 33570.1.1 (B-4226)

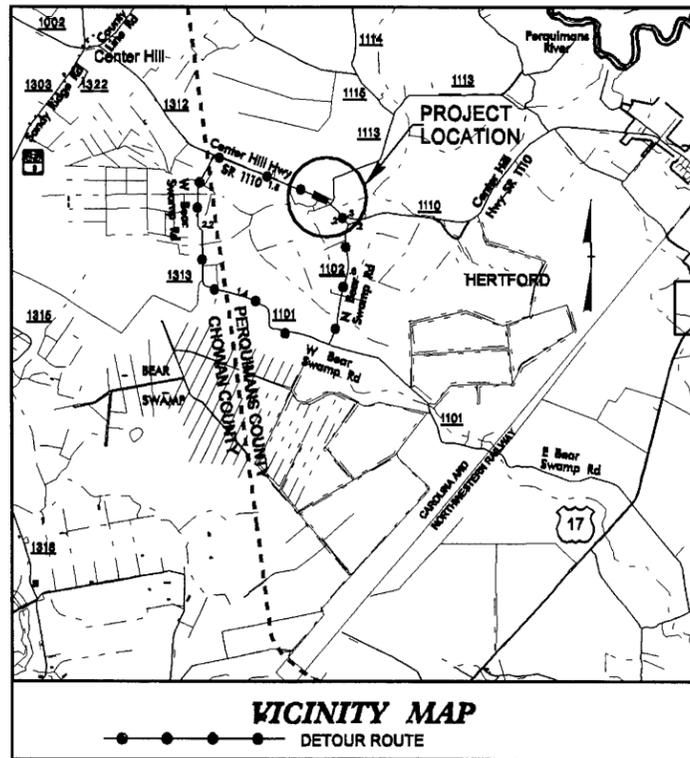
SHEET 1/30/2007

05/08/99

TIP PROJECT: B-4226

CONTRACT:

See Sheet 1-A For Index of Sheets



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

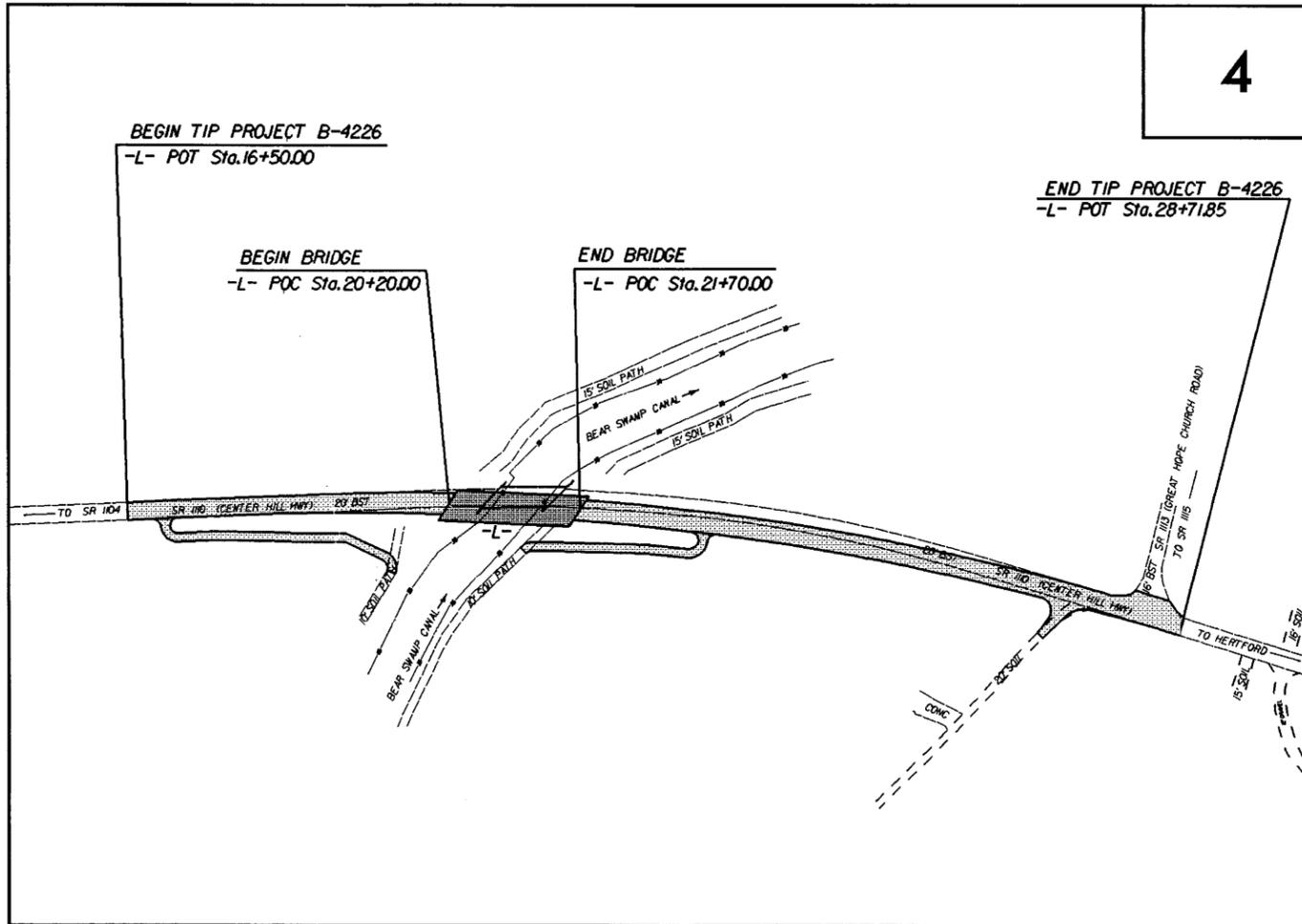
STATE OF NORTH CAROLINA  
 DIVISION OF HIGHWAYS

**PERQUIMANS COUNTY**

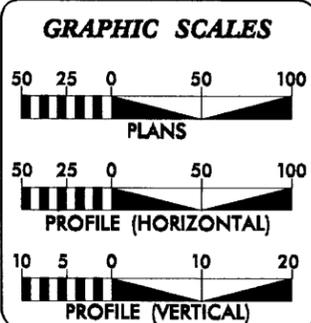
LOCATION: BRIDGE 62 OVER BEAR SWAMP CANAL ON SR 1110

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

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-4226	1	
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
33570.1.1	BRZ-1110(4)	PE	



PRELIMINARY PLANS  
 DO NOT USE FOR CONSTRUCTION



**DESIGN DATA**

ADT 2002 =	1200
ADT 2025 =	2100
DHV =	10 %
D =	60 %
T =	3 %*
V =	60 MPH
FUNC. CLASS. =	RUAL MINOR COLLECTOR
* TTST 1	DUAL 2

**PROJECT LENGTH**

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LENGTH STRUCTURE TIP PROJECT B-4226 =	0.028 MILES
TOTAL LENGTH TIP PROJECT B-4226 =	0.231 MILES

Prepared In the Office of:  
**DIVISION OF HIGHWAYS**  
 1000 Birch Ridge Dr., Raleigh NC, 27610

2006 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE: MARCH 16, 2007

LETTING DATE: MARCH 18, 2008

JASON MOORE, P.E.  
 PROJECT ENGINEER

BRYAN KEY, P.E.  
 PROJECT DESIGN ENGINEER

**HYDRAULICS ENGINEER**

SIGNATURE: \_\_\_\_\_ P.E.

**ROADWAY DESIGN ENGINEER**

SIGNATURE: \_\_\_\_\_ P.E.

**DIVISION OF HIGHWAYS**  
 STATE OF NORTH CAROLINA

STATE DESIGN ENGINEER

DEPARTMENT OF TRANSPORTATION  
 FEDERAL HIGHWAY ADMINISTRATION

APPROVED

DIVISION ADMINISTRATOR

DATE

08-FEB-2007 17:25  
 r:\p\og\w\p\o\1\b4226.rdy\_tsh.dgn  
 \$\$\$USERNAME\$\$\$

3/15/06

Note: Not to Scale

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

STATE OF NORTH CAROLINA  
DIVISION OF HIGHWAYS

# CONVENTIONAL PLAN SHEET SYMBOLS

### BOUNDARIES AND PROPERTY:

State Line	-----
County Line	-----
Township Line	-----
City Line	-----
Reservation Line	-----
Property Line	-----
Existing Iron Pin	⊙ EP
Property Corner	-----
Property Monument	⊠ EGM
Parcel/Sequence Number	⊠ 123
Existing Fence Line	-----
Proposed Woven Wire Fence	-----
Proposed Chain Link Fence	-----
Proposed Barbed Wire Fence	-----
Existing Wetland Boundary	-----
Proposed Wetland Boundary	-----
Existing Endangered Animal Boundary	-----
Existing Endangered Plant Boundary	-----

### BUILDINGS AND OTHER CULTURE:

Gas Pump Vent or U/G Tank Cap	○
Sign	⊙
Well	⊙
Small Mine	⊗
Foundation	⊠
Area Outline	⊠
Cemetery	⊠
Building	⊠
School	⊠
Church	⊠
Dam	⊠

### HYDROLOGY:

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

### RAILROADS:

Standard Gauge	-----
RR Signal Milepost	⊙ MILEPOST 35
Switch	⊠ SWITCH
RR Abandoned	-----
RR Dismantled	-----

### RIGHT OF WAY:

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

### ROADS AND RELATED FEATURES:

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

### VEGETATION:

Single Tree	⊙
Single Shrub	⊙
Hedge	-----
Woods Line	-----
Orchard	⊙
Vineyard	⊠ vineyard

### EXISTING STRUCTURES:

MAJOR:	
Bridge, Tunnel or Box Culvert	----- CONC
Bridge Wing Wall, Head Wall and End Wall	----- CONC WW
MINOR:	
Head and End Wall	----- CONC HW
Pipe Culvert	-----
Footbridge	-----
Drainage Box: Catch Basin, DI or JB	⊠ CB
Paved Ditch Gutter	-----
Storm Sewer Manhole	⊙
Storm Sewer	-----

### UTILITIES:

POWER:	
Existing Power Pole	⊙
Proposed Power Pole	⊙
Existing Joint Use Pole	⊙
Proposed Joint Use Pole	⊙
Power Manhole	⊙
Power Line Tower	⊠
Power Transformer	⊠
U/G Power Cable Hand Hole	⊠
H-Frame Pole	⊙
Recorded U/G Power Line	-----
Designated U/G Power Line (S.U.E.*)	-----

### TELEPHONE:

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

### WATER:

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

### TV:

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

### GAS:

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

### SANITARY SEWER:

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

### MISCELLANEOUS:

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

# SURVEY CONTROL SHEET B-4226

**CONTROL DATA**

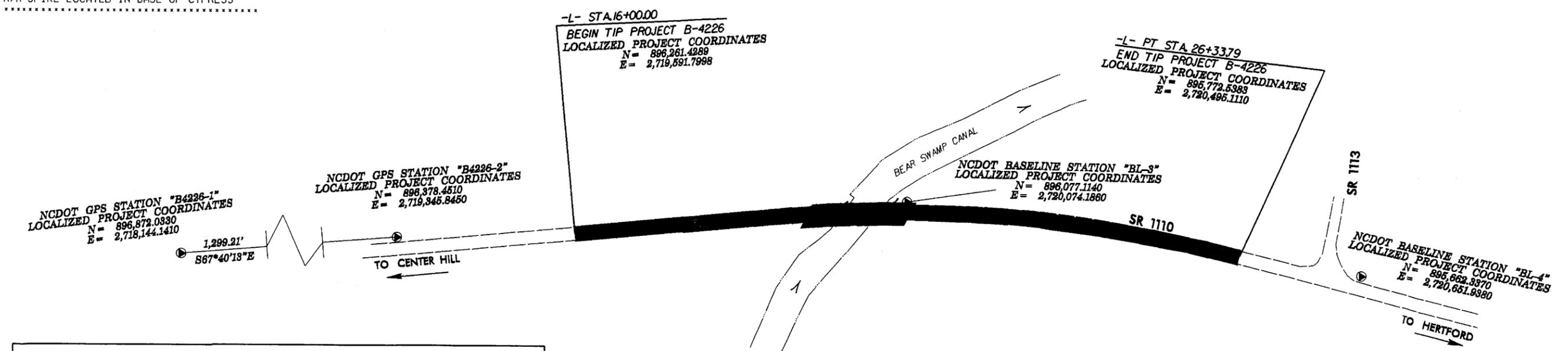
BL POINT	DESC.	NORTH	EAST	ELEVATION	L STATION	OFFSET
BL1	B4226-1	896872.0330	2718144.1410	13.55	OUTSIDE PROJECT LIMITS	
BL2	B4226-2	896378.4510	2719345.8450	12.76	13+28.22	17.99 LT
BL3	BL-3	896077.1140	2720074.1860	13.35	21+15.13	16.10 LT
BL4	BL-4	895662.3370	2720651.9380	11.79	28+24.37	20.39 LT

**BENCHMARK DATA**

```

*****
BM10  ELEVATION - 12.76
N 896216  E 2719571
L STATION 15+97 50 RIGHT
R/R SPIKE LOCATED IN BASE OF PINE
*****
BM11  ELEVATION - 8.84
N 895970  E 2720125
L STATION 22+12 54 RIGHT
R/R SPIKE LOCATED IN BASE OF CYPRESS
*****

```



**DATUM DESCRIPTION**

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCDOT FOR MONUMENT "B4226-2" WITH NAD 1983/95 STATE PLANE GRID COORDINATES OF NORTHING: 896378.451(ft) EASTING: 2719345.845(ft) THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 1.00001095 THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "B4226-2" TO -L- STATION 16+00.00 IS S 64° 33' 20" E 272.375

ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES  
VERTICAL DATUM USED IS NAVD 88

**NOTES:**

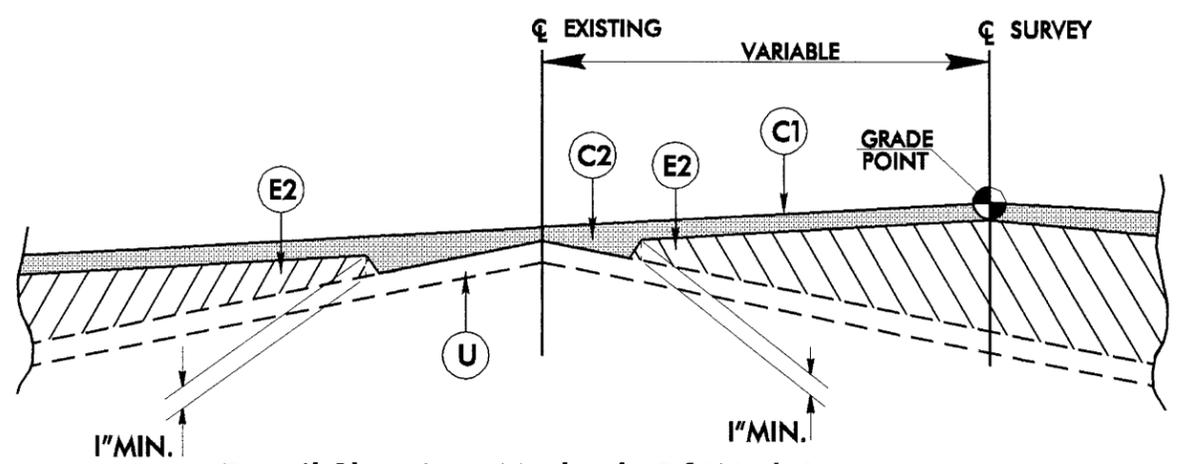
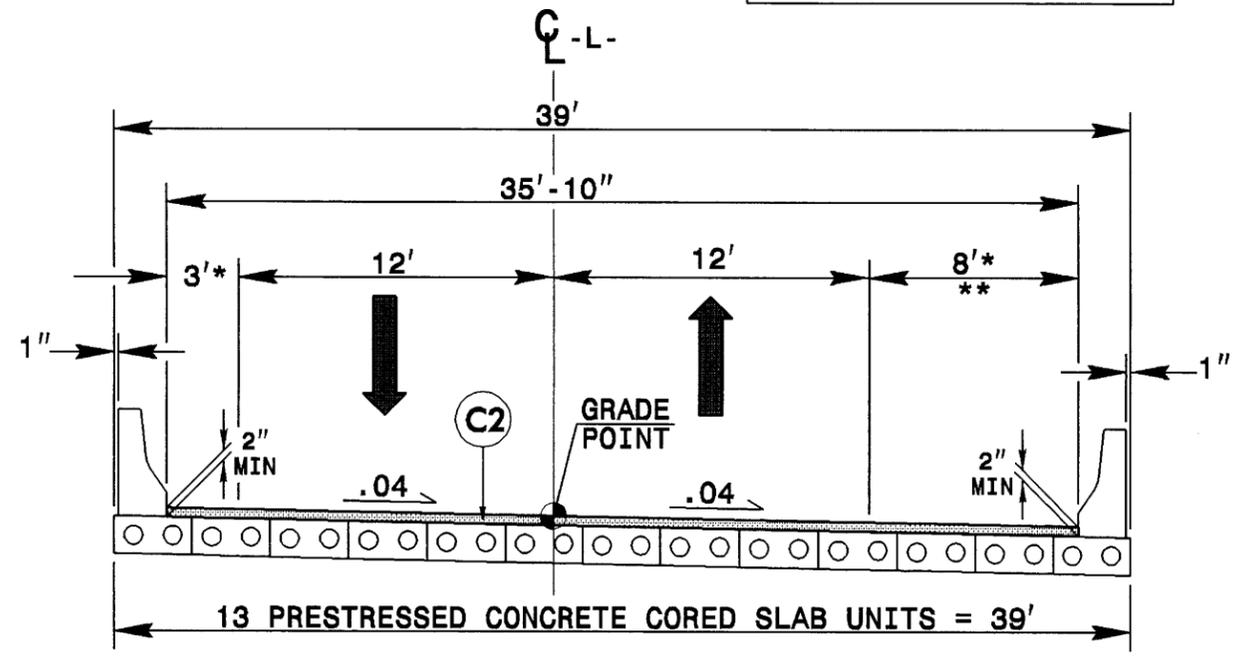
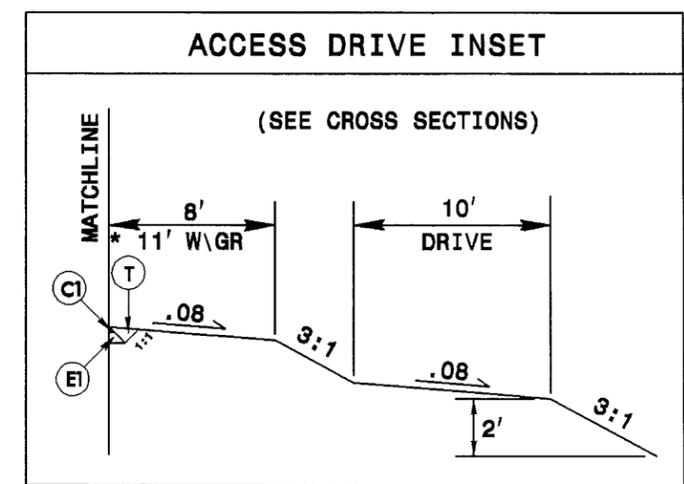
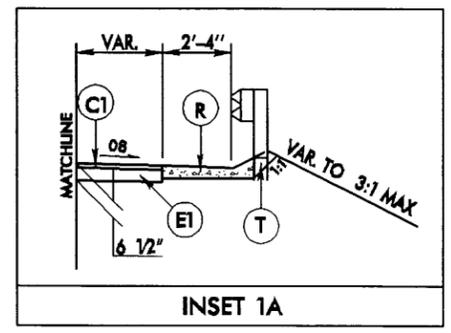
- THE CONTROL DATA FOR THIS PROJECT CAN BE FOUND ELECTRONICALLY BY SELECTING [HTTP://WWW.DO.H.DOT.STATE.NC.US/PRECONSTRUCT/HIGHWAY/LOCATION/PROJECT](http://www.doh.dot.state.nc.us/preconstruct/highway/location/project)
- FILE: b4226\_ls\_control\_060104.txt
- SITE CALIBRATION PARAMETERS HAVE NOT BEEN DETERMINED FOR THIS PROJECT. IF FURTHER INFORMATION IS NEEDED, PLEASE CONTACT THE LOCATION AND SURVEYS UNIT.
- ⊕ INDICATES GEODETIC CONTROL MONUMENTS USED OR SET FOR HORIZONTAL PROJECT CONTROL BY THE NCDOT LOCATION AND SURVEYS UNIT.
- PROJECT CONTROL ESTABLISHED UTILIZING GLOBAL POSITIONING SYSTEM.
- NETWORK FOR GPS "B4226-2" ESTABLISHED FROM NGS ONLINE POSITIONING USER SERVICE (OPUS)

**NOTE: DRAWING NOT TO SCALE**

PROJECT REFERENCE NO. B-4226	SHEET NO. 2
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER
<b>PRELIMINARY PLANS</b> DO NOT USE FOR CONSTRUCTION	

PAVEMENT SCHEDULE			
C1	PROP. APPROX. 2" ASPHALT CONCRETE SURFACE COURSE TYPE SF9.5A, AT AN AVERAGE RATE OF 110 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.	R	SHOULDER BERM GUTTER
C2	PROP. VAR. DEPTH ASPHALT CONCRETE SURFACE COURSE TYPE SF9.5A, AT AN AVERAGE RATE OF 110 LBS. PER SQ. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NOT LESS THAN 1" IN DEPTH OR GREATER THAN 1 1/2" IN DEPTH.	T	EARTH MATERIAL.
E1	PROP. APPROX. 5" ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 570 LBS. PER SQ. YD.	U	EXISTING PAVEMENT.
E2	PROP. VAR. DEPTH ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NOT LESS THAN 3" IN DEPTH OR GREATER THAN 5 1/2" IN DEPTH.	W	VARIABLE DEPTH ASPHALT PAVEMENT (SEE STANDARD WEDGING DETAIL THIS SHEET)

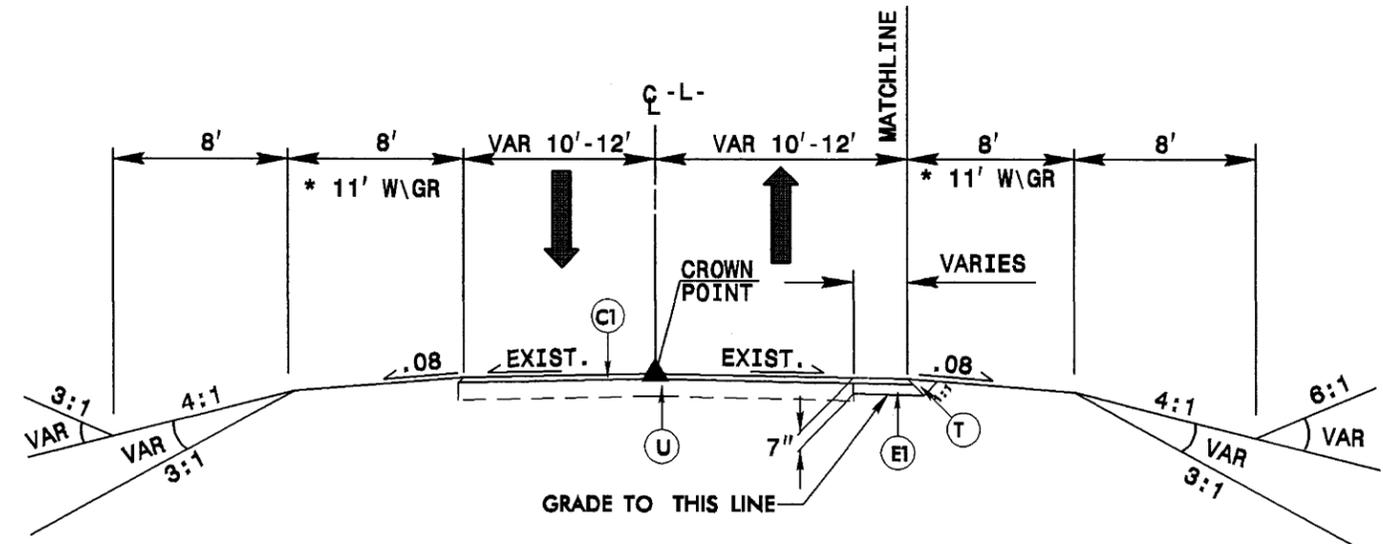
NOTE: PAVEMENT EDGE SLOPES ARE 1:1 UNLESS SHOWN OTHERWISE.



USE TYPICAL SECTION ON STRUCTURE

-L- STA. 20+20.00 (BEGIN BRIDGE) TO STA. 21+70.00 (END BRIDGE)  
 \* OFFSET VARIES DUE TO LANE CURVATURE  
 \*\* WIDENED FOR STOPPING SIGHT DISTANCE

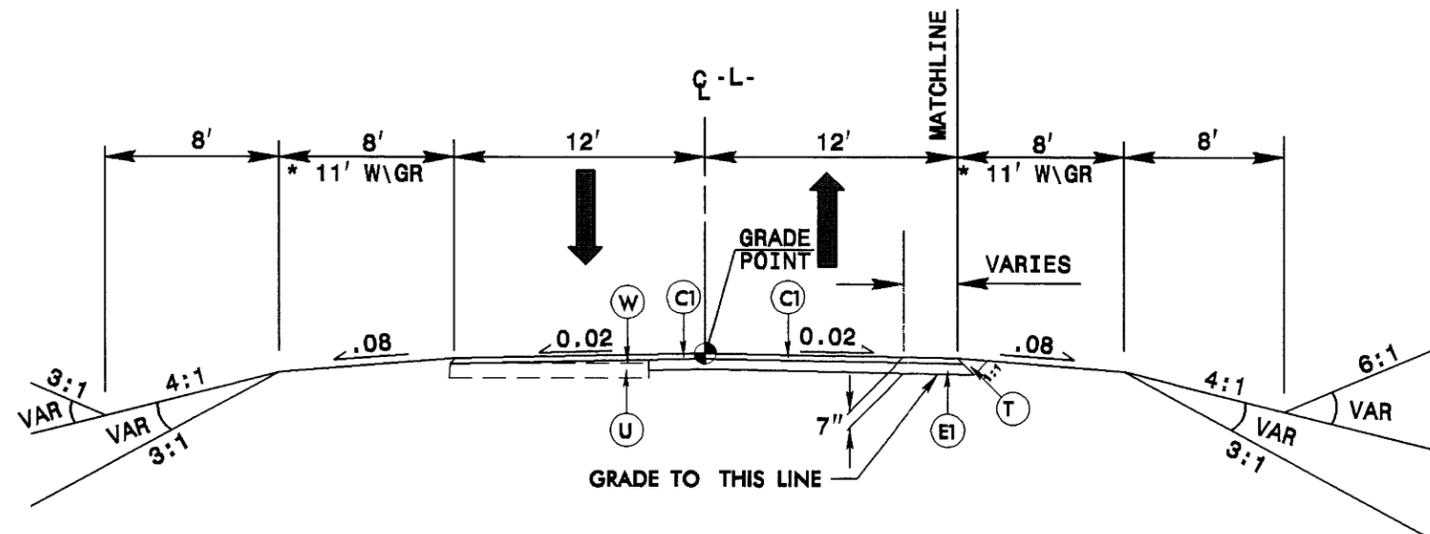
PROJECT REFERENCE NO. B-4226		SHEET NO. 2-A	
ROADWAY DESIGN ENGINEER		PAVEMENT DESIGN ENGINEER	
<b>PRELIMINARY PLANS</b> DO NOT USE FOR CONSTRUCTION			
C1	2" TYPE SF9.5A		
E1	5" TYPE B25.0B		
R	SHOULDER BERM GUTTER		
T	EARTH MATERIAL		
U	EXISTING PAVEMENT.		
W	WEDGING (SEE STANDARD WEDGING DETAIL SHEET 2)		



**TYPICAL SECTION NO. 1**

**USE TYPICAL SECTION NO. 1**

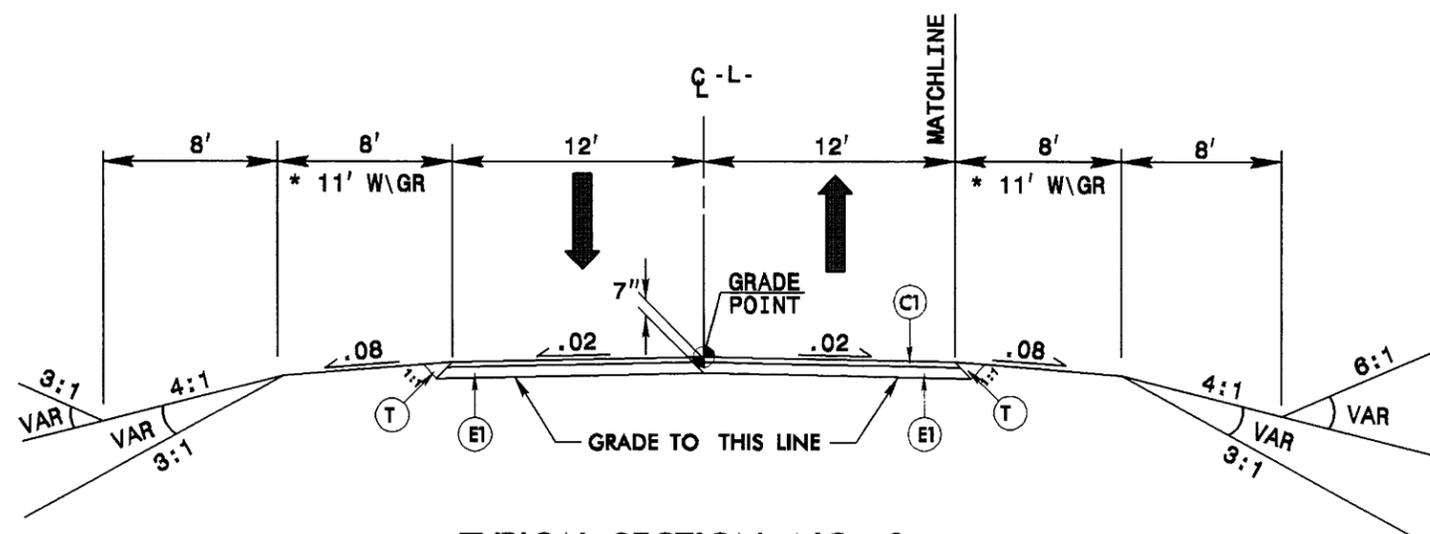
- L- STA. 16+50.00 TO STA. 18+24.52
- L- STA. 27+65.98 TO STA. 28+71.85
- USE ACCESS DRIVE INSET (SEE SHEET 2)
- L- STA. 16+75. +/- TO STA. 18+24.52 RT.



**TYPICAL SECTION NO. 2**

**USE TYPICAL SECTION NO. 2**

- L- STA. 18+24.52 TO STA. 19+20.00
- L- STA. 22+70.00 TO STA. 27+65.98
- USE ACCESS DRIVE INSET (SEE SHEET 2)
- L- STA. 18+24.52 TO STA. 19+20 +/- RT.
- L- STA. 22+70.00 TO STA. 23+25 +/- RT.
- USE INSET 1A (SEE SHEET 2)
- L- STA. 18+40 TO 19+20 RT.



**TYPICAL SECTION NO. 3**

**USE TYPICAL SECTION NO. 3**

- L- STA. 19+20.00 TO STA. 20+20.00 (BEGIN BRIDGE)
- L- STA. 21+70.00 (END BRIDGE) TO STA. 22+70.00
- USE ACCESS DRIVE INSET (SEE SHEET 2)
- L- STA. 21+00. +/- TO STA. 22+70.00 RT.
- USE INSET 1A (SEE SHEET 2)
- L- STA. 19+20 TO APPROACH SLAB RT.
- L- STA. FROM APPROACH SLAB TO 22+50 RT.



5/14/98

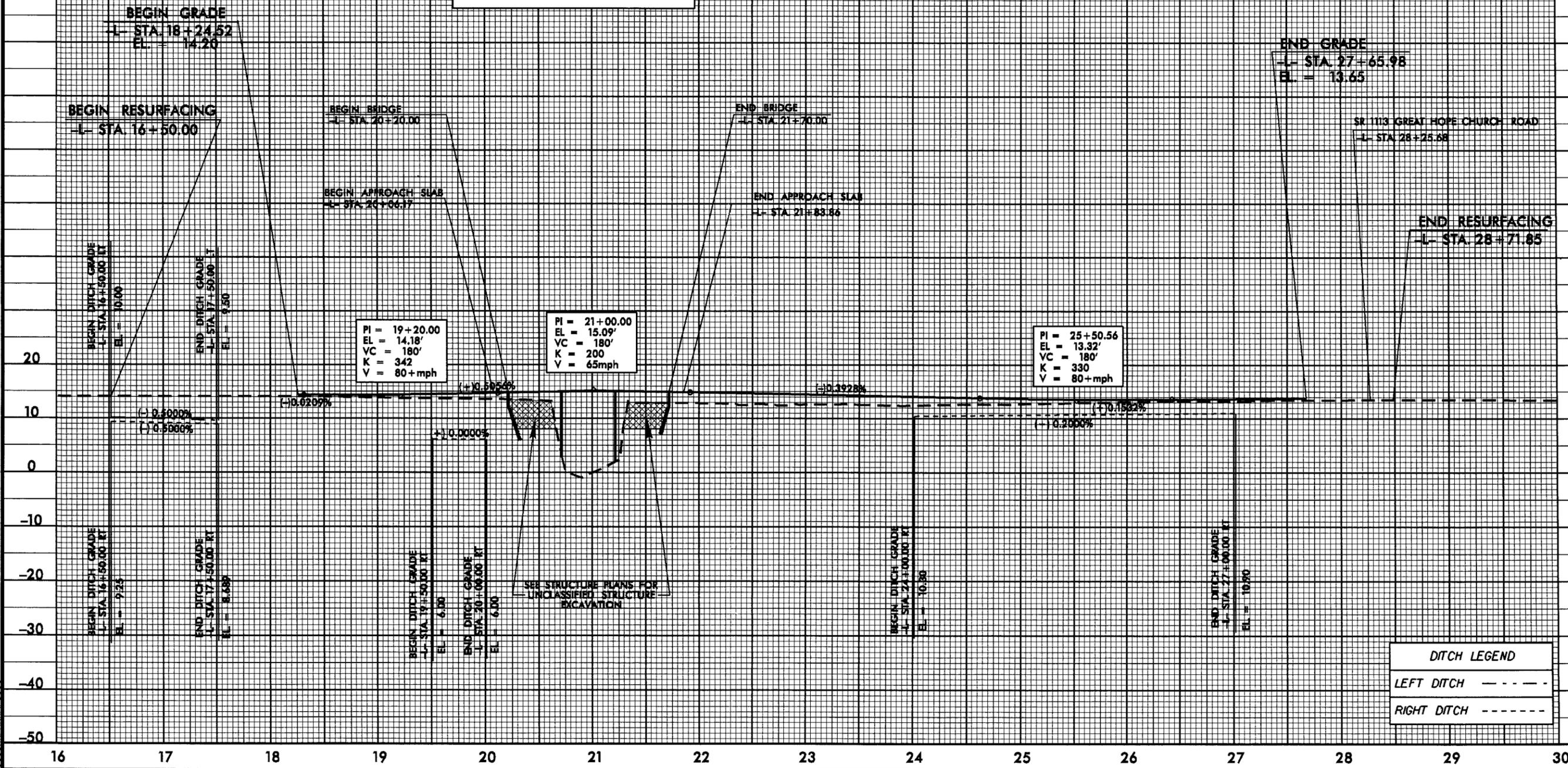
BM #10 ELEV. 12.76 RAILROAD SPIKE  
IN BASE OF 16" PINE  
-L- STA. 16+57, 50' RT.

# -L- LINE

BM #11 ELEV. 8.84' RAILROAD SPIKE  
IN BASE OF 20" CYPRESS  
-L- STA. 22+71, 41' RT.

**BRIDGE HYDRAULIC DATA**

DESIGN DISCHARGE = 1200 CFS  
DESIGN FREQUENCY = 25 YRS  
DESIGN HW ELEVATION = 10.4 FT  
BASE DISCHARGE = 1850 CFS  
BASE FREQUENCY = 100 YRS  
BASE HW ELEVATION = 12.2 FT  
OVERTOPPING DISCHARGE = 2300 CFS  
OVERTOPPING FREQUENCY = 100 YRS  
OVERTOPPING ELEVATION = 13 FT



**BEGIN GRADE**  
-L- STA. 18+24.52  
EL. = 14.26

**BEGIN RESURFACING**  
-L- STA. 16+50.00

**BEGIN BRIDGE**  
-L- STA. 20+20.00

**END BRIDGE**  
-L- STA. 21+70.00

**END GRADE**  
-L- STA. 27+65.98  
EL. = 13.65

SR 1113 GREAT HOPE CHURCH ROAD  
-L- STA. 26+25.68

**BEGIN APPROACH SLAB**  
-L- STA. 20+66.17

**END APPROACH SLAB**  
-L- STA. 21+83.66

**END RESURFACING**  
-L- STA. 28+71.85

PI = 19+20.00  
EL = 14.18'  
VC = 180'  
K = 342  
V = 80+ mph

PI = 21+00.00  
EL = 15.09'  
VC = 180'  
K = 200  
V = 65 mph

PI = 25+50.56  
EL = 13.32'  
VC = 180'  
K = 330  
V = 80+ mph

SEE STRUCTURE PLANS FOR UNCLASSIFIED STRUCTURE EXCAVATION

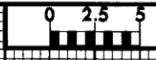
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RIGHT DITCH - - - - -

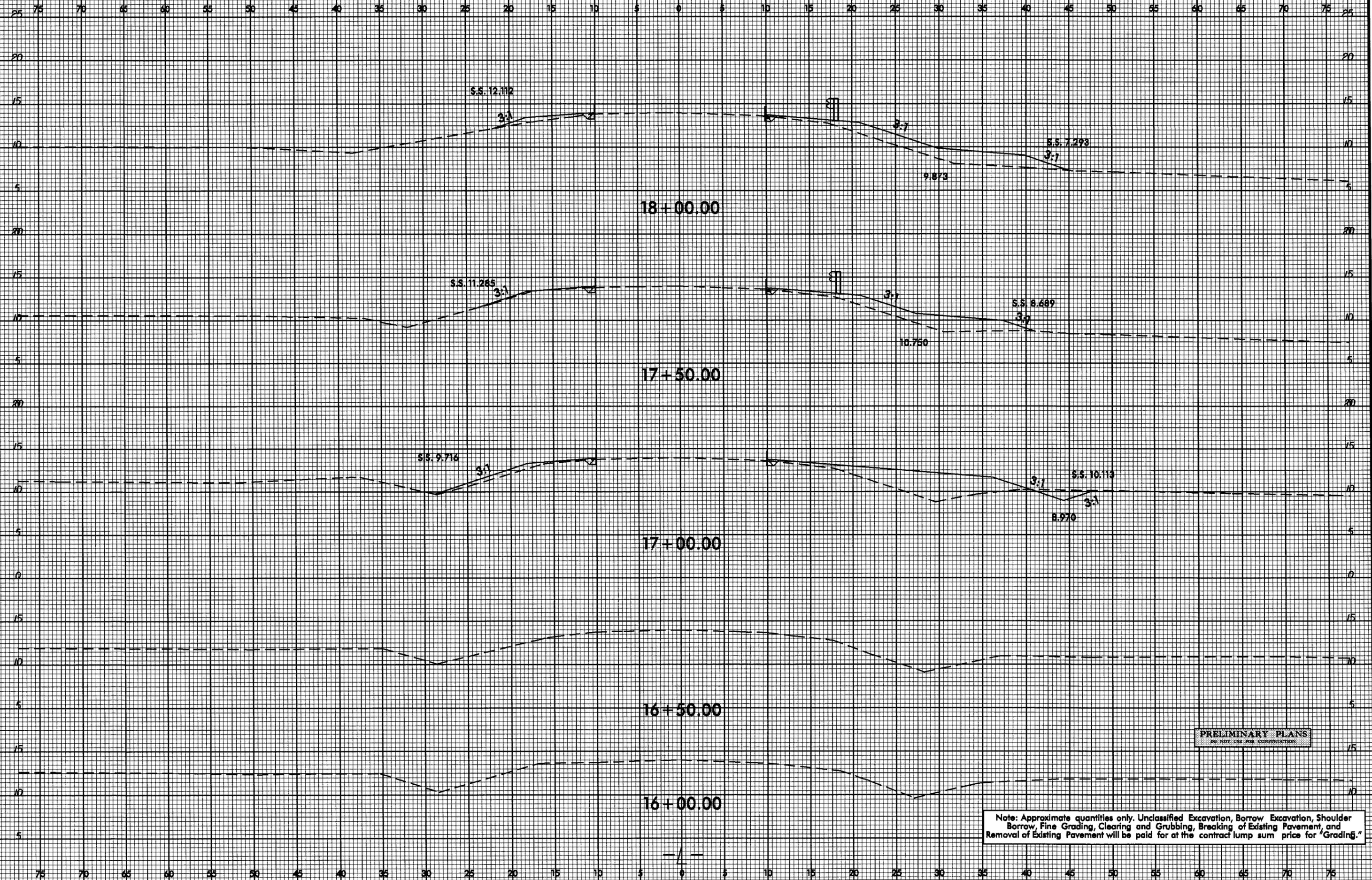
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B-4226

SHEET NO.  
X-1



PRELIMINARY PLANS  
DO NOT USE FOR CONSTRUCTION

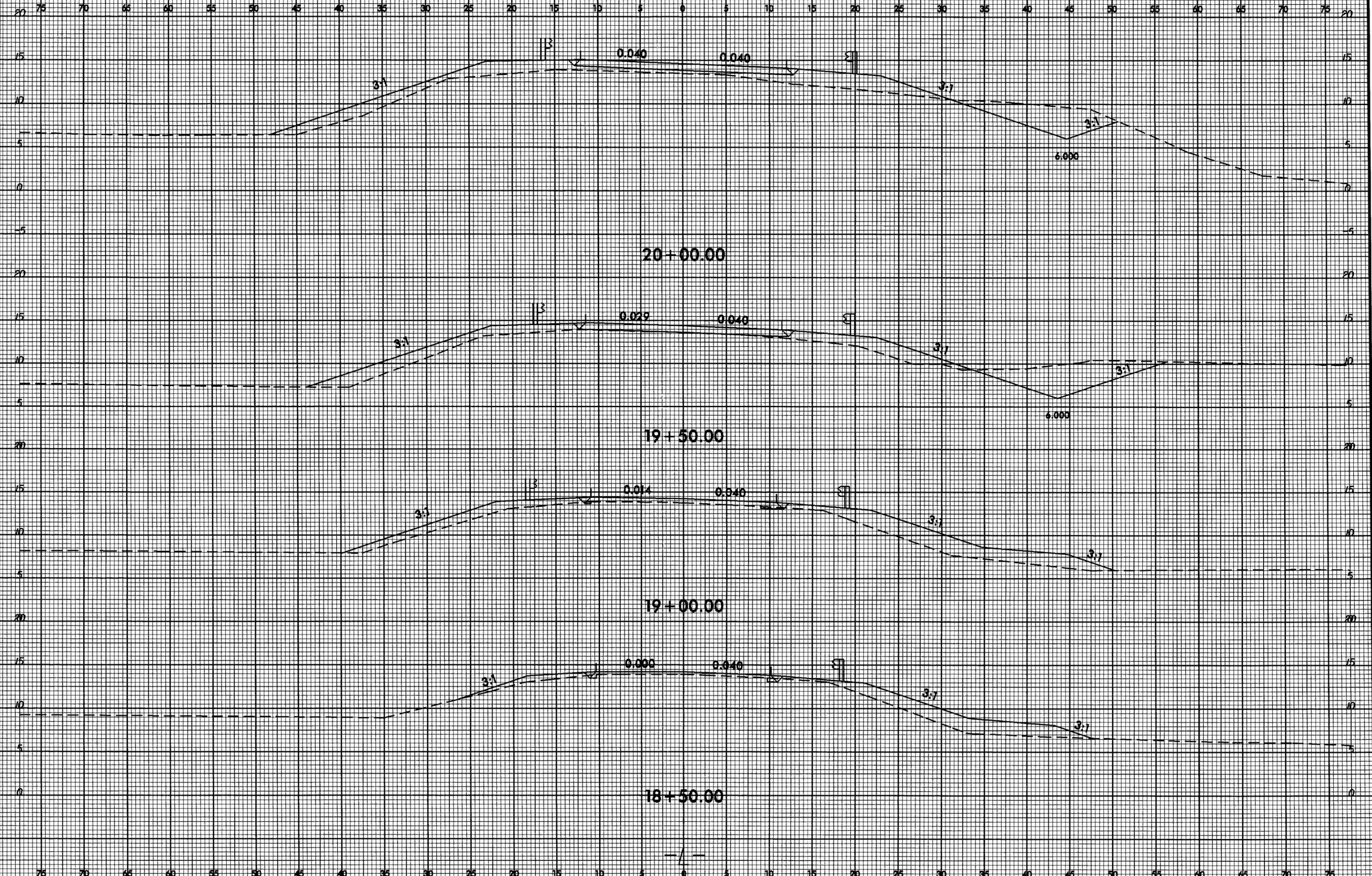
Note: Approximate quantities only. Unclassified Excavation, Borrow Excavation, Shoulder Borrow, Fine Grading, Clearing and Grubbing, Breaking of Existing Pavement and Removal of Existing Pavement will be paid for at the contract lump sum price for "Grading."

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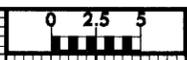


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B-4226	X-2

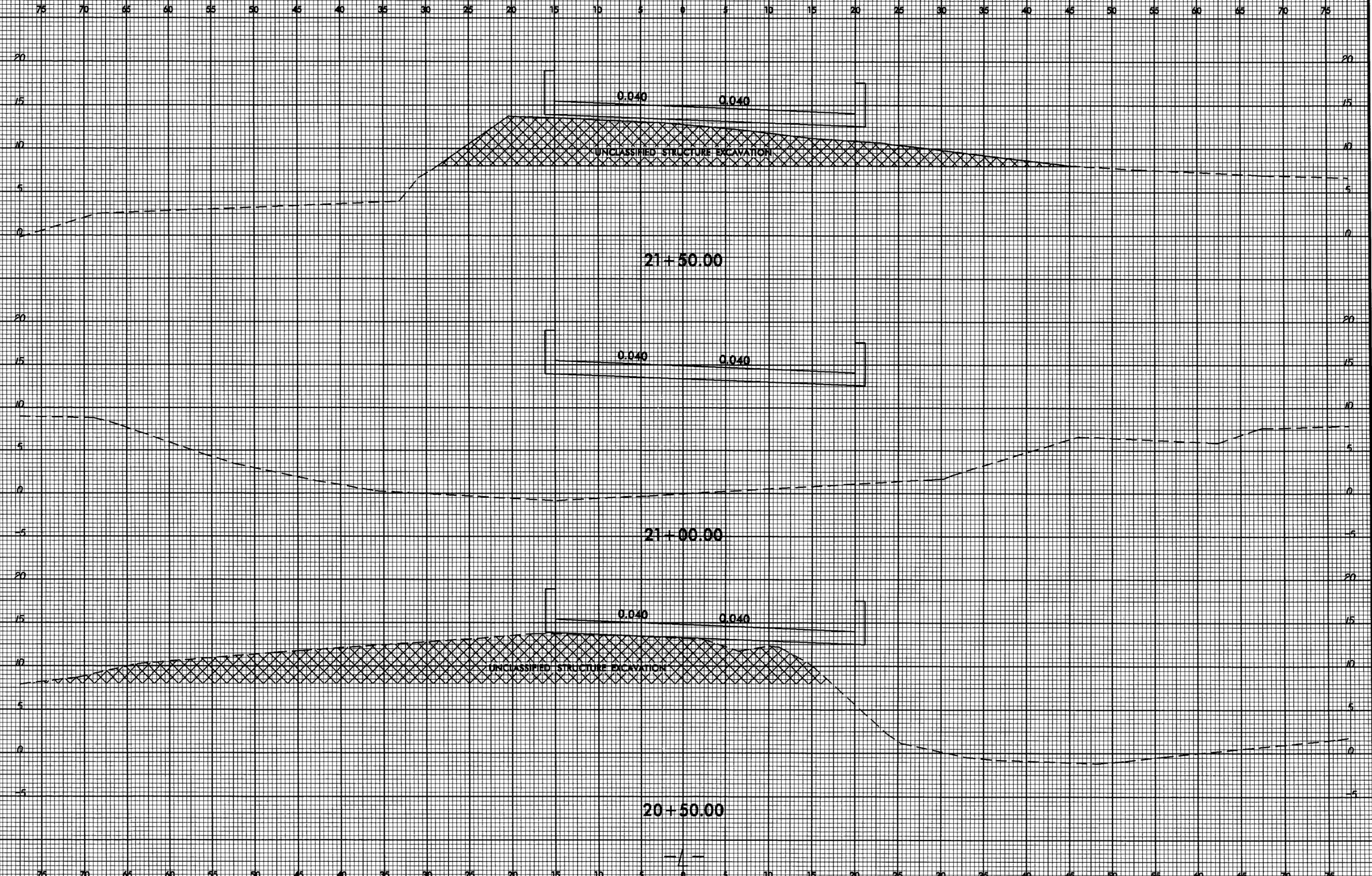


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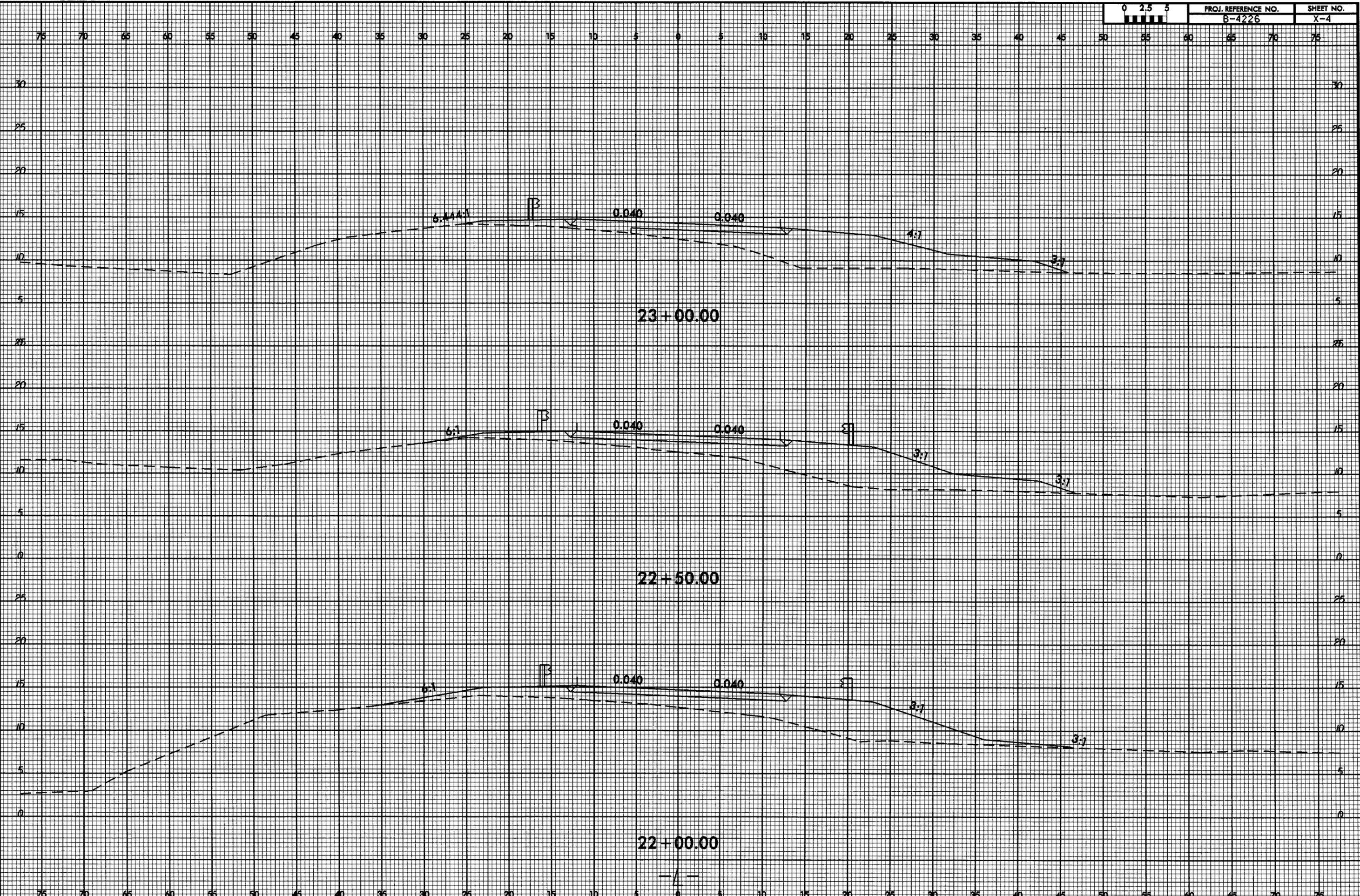


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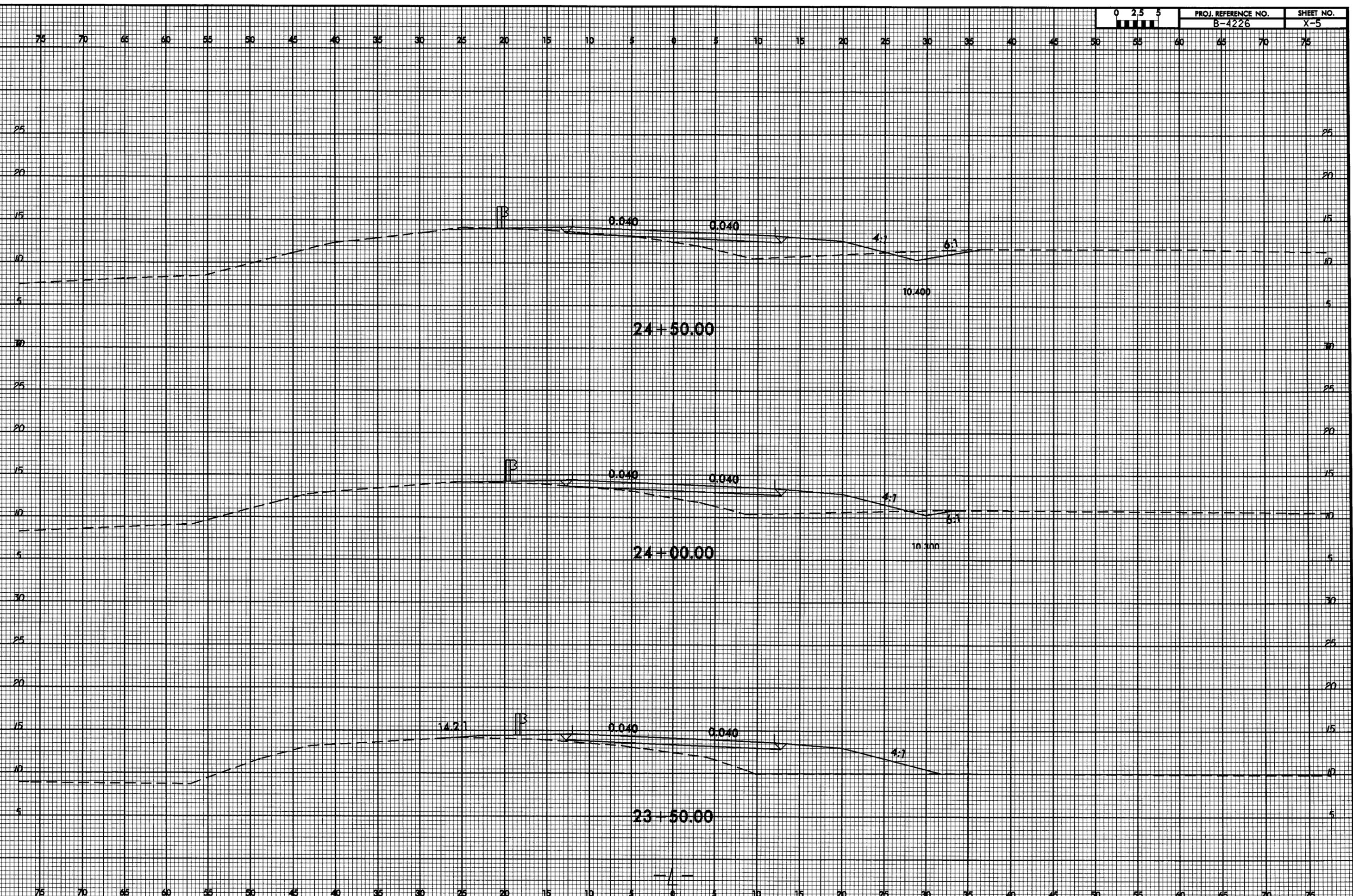


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B-4226	X-4



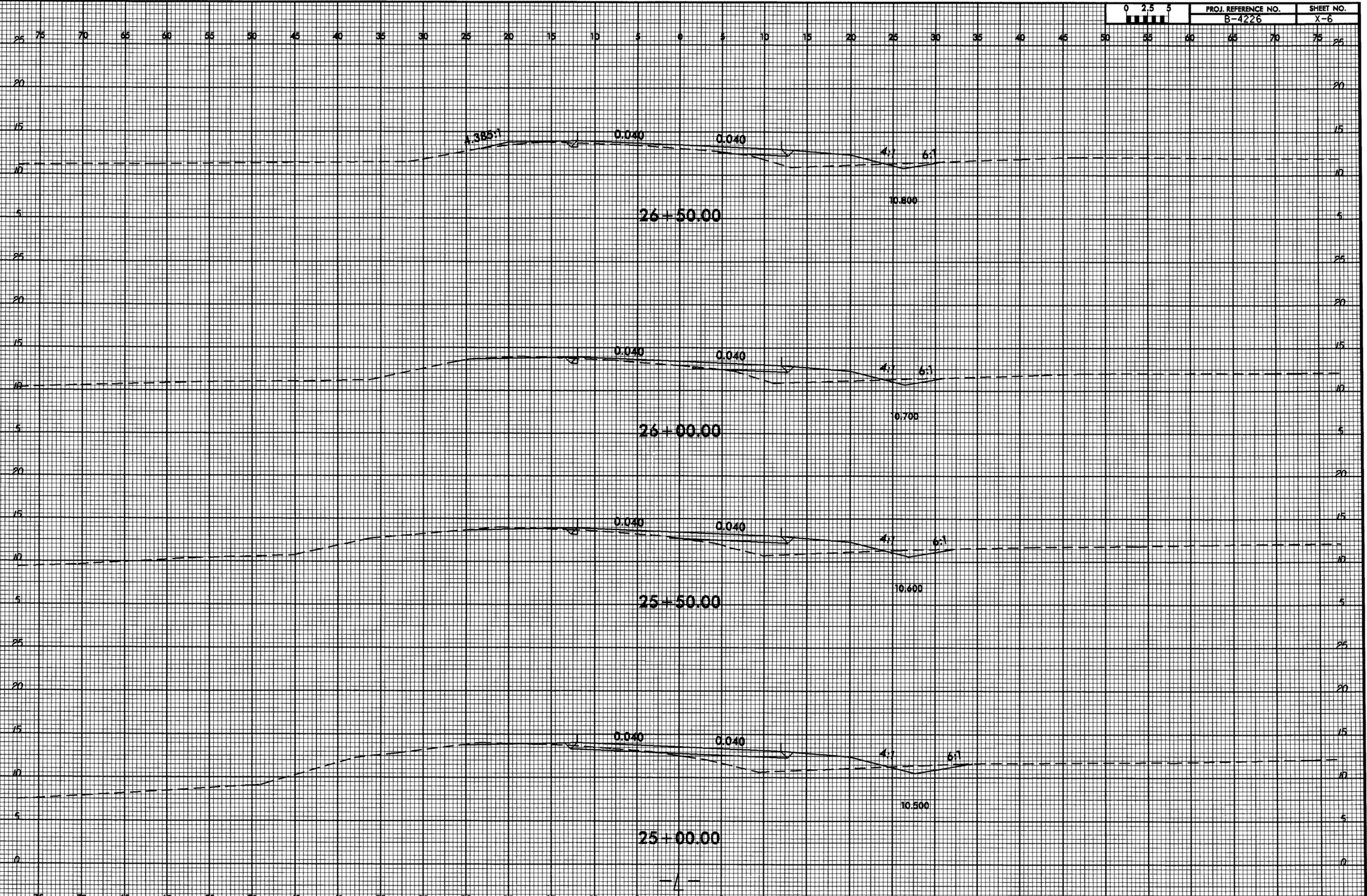
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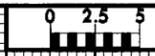
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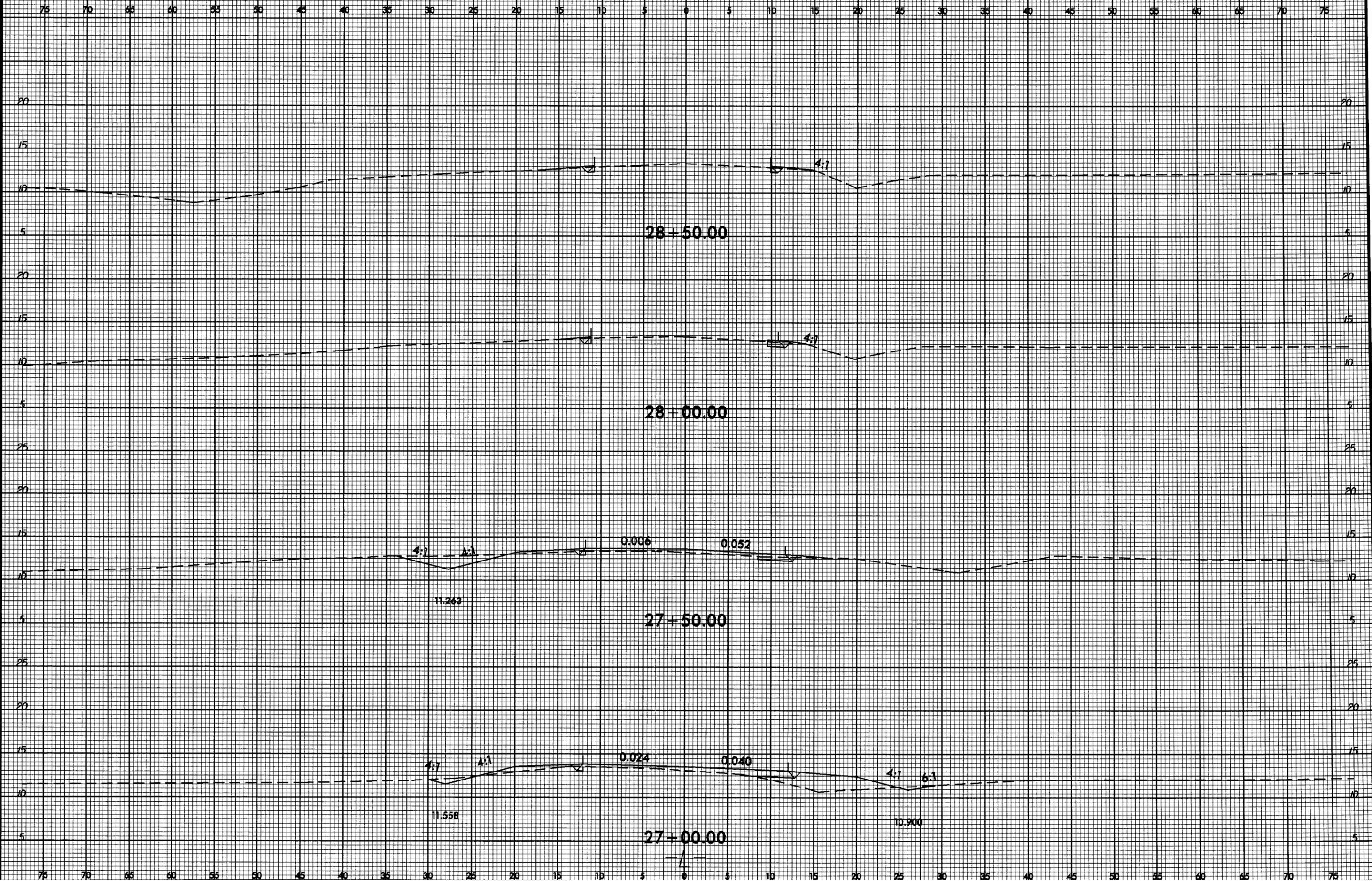


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PROJ. REFERENCE NO.	SHEET NO.
B-4226	X-7



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## CATEGORICAL EXCLUSION ACTION CLASSIFICATION FORM

TIP Project No.	<u>B-4226</u>
State Project No.	<u>8.2120301</u>
WBS No.	<u>33570.1.1</u>
Federal Project No.	<u>BRZ-1110(4)</u>

**A. Project Description:**

This project proposes to replace Bridge No. 62 on SR 1110 over Bear Swamp Canal in Perquimans County. The existing 75-foot bridge will be replaced with a bridge approximately 100 feet in length at the same location and approximate low chord elevation as the existing bridge. The cross section of the new bridge will include two 12-foot lanes with one 3.0-foot minimum offset on the outside of the curve and one 8.0-foot minimum offset on the inside of the curve. The approach roadway will be widened to accommodate a 24-foot pavement width consisting of two 12-foot lanes with eight-foot grass shoulders. The total project length is approximately 1110 feet, with approach work for approximately 360 feet to the west and 500 feet to the east. Guardrail will be installed where warranted. Traffic will be detoured offsite during construction (See Section D, Studied Offsite Detour).

**B. Purpose and Need:**

Bridge Maintenance Records indicate that Bridge No. 62, built in 1940, has a sufficiency rating of 16.9 out of a possible 100. The bridge does not currently have any posted weight restrictions. The superstructure is composed of a reinforced concrete deck on steel I-beams and a substructure composed of timber caps on timber piles. The structural appraisal rating of two out of a possible nine, based on Federal Highway Administration (FHWA) guidelines, renders the bridge structurally deficient. The sufficiency rating of less than 50 and the structural appraisal rating make the bridge eligible for the Federal Bridge Replacement and Rehabilitation Program. The 65-year old timber structure is fast approaching the end of its useful life. The replacement of this structure will result in safer traffic operations.

**C. Proposed Improvements:**

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

1. Modernization of a highway by resurfacing, restoration, rehabilitation, reconstruction, adding shoulders, or adding auxiliary lanes (e.g., parking, weaving, turning, climbing).
  - a. Restoring, Resurfacing, Rehabilitating, and Reconstructing pavement (3R and 4R improvements)
  - b. Widening roadway and shoulders without adding through lanes
  - c. Modernizing gore treatments
  - d. Constructing lane improvements (merge, auxiliary, and turn lanes)
  - e. Adding shoulder drains

- f. Replacing and rehabilitating culverts, inlets, and drainage pipes, including safety treatments
  - g. Providing driveway pipes
  - h. Performing minor bridge widening (less than one through lane)
  - i. Slide Stabilization
  - j. Structural BMP's for water quality improvement
2. Highway safety or traffic operations improvement projects including the installation of ramp metering control devices and lighting.
- a. Installing ramp metering devices
  - b. Installing lights
  - c. Adding or upgrading guardrail
  - d. Installing safety barriers including Jersey type barriers and pier protection
  - e. Installing or replacing impact attenuators
  - f. Upgrading medians including adding or upgrading median barriers
  - g. Improving intersections including relocation and/or realignment
  - h. Making minor roadway realignment
  - i. Channelizing traffic
  - j. Performing clear zone safety improvements including removing hazards and flattening slopes
  - k. Implementing traffic aid systems, signals, and motorist aid
  - l. Installing bridge safety hardware including bridge rail retrofit
3. Bridge rehabilitation, reconstruction, or replacement or the construction of grade separation to replace existing at-grade railroad crossings.
- a. Rehabilitating, reconstructing, or replacing bridge approach slabs
  - b. Rehabilitating or replacing bridge decks
  - c. Rehabilitating bridges including painting (no red lead paint), scour repair, fender systems, and minor structural improvements
  - d. Replacing a bridge (structure and/or fill)
4. Transportation corridor fringe parking facilities.
5. Construction of new truck weigh stations or rest areas.
6. Approvals for disposal of excess right-of-way or for joint or limited use of right-of-way, where the proposed use does not have significant adverse impacts.
7. Approvals for changes in access control.
8. Construction of new bus storage and maintenance facilities in areas used predominantly for industrial or transportation purposes where such construction is not inconsistent with existing zoning and located on or near a street with adequate capacity to handle anticipated bus and support vehicle traffic.
9. Rehabilitation or reconstruction of existing rail and bus buildings and ancillary facilities where only minor amounts of additional land are required and there is not a substantial increase in the number of users.
10. Construction of bus transfer facilities (an open area consisting of passenger shelters, boarding areas, kiosks and related street improvements) when located in

a commercial area or other high activity center in which there is adequate street capacity for projected bus traffic.

11. Construction of rail storage and maintenance facilities in areas used predominantly for industrial or transportation purposes where such construction is not inconsistent with existing zoning and where there is no significant noise impact on the surrounding community.
12. Acquisition of land for hardship or protective purposes, advance land acquisition loans under section 3(b) of the UMT Act. Hardship and protective buying will be permitted only for a particular parcel or a limited number of parcels. These types of land acquisition qualify for a CE only where the acquisition will not limit the evaluation of alternatives, including shifts in alignment for planned construction projects, which may be required in the NEPA process. No project development on such land may proceed until the NEPA process has been completed.
13. Acquisition and construction of wetland, stream and endangered species mitigation sites.
14. Remedial activities involving the removal, treatment or monitoring of soil or groundwater contamination pursuant to state or federal remediation guidelines.

**D. Special Project Information:**

**Estimated Costs:**

Total Construction	\$ 650,000
Right of Way	\$ 53,000
Total	\$ 703,000

**Estimated Traffic:**

Year 2002	- 1200 vpd
Year 2025	- 2100 vpd
TTST	- 1%
Dual	- 2%

**Design Speed:**

60 mph

**Design Exceptions:**

There are no anticipated design exceptions for this project.

**Functional Classification:**

Rural Minor Collector

**Studied Offsite Detour Route:**

The NCDOT Guidelines for Evaluation of Offsite Detours For Bridge Replacement Projects considers several variables starting with the estimated time of delay and the length of road closure. The studied offsite detour route uses SR 1102, SR1101, SR 1313 (Chowan County) and SR 1104 (see Figure 1). The estimated additional travel time for the average road user is approximately seven minutes (5.0 additional miles). This delay is acceptable based on a road closure time of approximately six to nine months.

Perquimans County Emergency Management Services and Perquimans County School Transportation Office both stated that an offsite detour would not hinder their operations. The Division One Construction Engineer concurs with the use of an offsite detour during construction. The existing bridge is surrounded by wetlands. Therefore, the use of an offsite detour is feasible at this location.

**Division Office Comments:**

The Division One Construction Office concurs with the recommended alternate for replacing Bridge No. 62.

**Bridge Demolition:**

Bridge No. 62 has a superstructure composed of reinforced concrete on steel I-beams. Based on current construction practices, the bridge can be removed without dropping any elements into Bear Swamp Canal. Therefore, there is no anticipated temporary fill associated with the demolition of Bridge No. 62.

**Alternates Discussion**

The no-build alternate for this project is not prudent. The existing bridge will continue to deteriorate necessitating eventual closure of the bridge. This is unacceptable due to the traffic that SR 1110 serves.

Rehabilitation is not feasible due to the timber composition of the existing bridge.

Replacing the bridge in the existing location and maintaining traffic on site is not prudent due to the environmental impacts to the surrounding wetlands and the additional cost of the temporary detour structure and approach fills. There is a feasible offsite detour available (See Studied Detour Route discussion above).

**E. Threshold Criteria**

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

<u>ECOLOGICAL</u>	<u>YES</u>	<u>NO</u>
(1) Will the project have a substantial impact on any unique or important natural resource?	<input type="checkbox"/>	<u>  X  </u>
(2) Does the project involve habitat where federally listed endangered or threatened species may occur?	<input type="checkbox"/>	<u>  X  </u>
(3) Will the project affect anadromous fish?	<input type="checkbox"/>	<u>      </u>

- |     |  |                                     |                                     |
|-----|--|-------------------------------------|-------------------------------------|
|     |  | <input checked="" type="checkbox"/> | _____                               |
| (4) | If the project involves wetlands, is the amount of permanent and/or temporary wetland taking less than one-tenth (1/10) of an acre and have all practicable measures to avoid and minimize wetland takings been evaluated? | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |
| (5) | Will the project require the use of U. S. Forest Service lands?  | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| (6) | Will the quality of adjacent water resources be adversely impacted by proposed construction activities?  | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| (7) | Does the project involve waters classified as Outstanding Water Resources (OWR) and/or High Quality Waters (HQW)?  | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| (8) | Will the project require fill in waters of the United States in any of the designated mountain trout counties?   | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| (9) | Does the project involve any known underground storage tanks (UST's) or hazardous materials sites?   | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |

**PERMITS AND COORDINATION**

**YES      NO**

- |      |  |                          |                                     |
|------|--|--------------------------|-------------------------------------|
| (10) | If the project is located within a CAMA county, will the project significantly affect the coastal zone and/or any "Area of Environmental Concern" (AEC)? | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| (11) | Does the project involve Coastal Barrier Resources Act resources?  | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| (12) | Will a U. S. Coast Guard permit be required?   | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| (13) | Will the project result in the modification of any existing regulatory floodway?   | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| (14) | Will the project require any stream relocations or channel changes?  | <input type="checkbox"/> | <input checked="" type="checkbox"/> |

**SOCIAL, ECONOMIC, AND CULTURAL RESOURCES**

**YES      NO**

- |      |   |                          |                                     |
|------|---|--------------------------|-------------------------------------|
| (15) | Will the project induce substantial impacts to planned growth or land use for the area? | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| (16) | Will the project require the relocation of any family or                                | <input type="checkbox"/> | _____                               |

- |      |   |                          |                          |
|------|---|--------------------------|--------------------------|
|      | business?   | <input type="checkbox"/> | <u>  X  </u>             |
| (17) | Will the project have a disproportionately high and adverse human health and environmental effect on any minority or low-income population?   | <input type="checkbox"/> | <u>  X  </u>             |
| (18) | If the project involves the acquisition of right of way, is the amount of right of way acquisition considered minor?  | <u>  X  </u>             | <input type="checkbox"/> |
| (19) | Will the project involve any changes in access control?   | <input type="checkbox"/> | <u>  X  </u>             |
| (20) | Will the project substantially alter the usefulness and/or land use of adjacent property?   | <input type="checkbox"/> | <u>  X  </u>             |
| (21) | Will the project have an adverse effect on permanent local traffic patterns or community cohesiveness?  | <input type="checkbox"/> | <u>  X  </u>             |
| (22) | Is the project included in an approved thoroughfare plan and/or Transportation Improvement Program (and is, therefore, in conformance with the Clean Air Act of 1990)?  | <u>  X  </u>             | <input type="checkbox"/> |
| (23) | Is the project anticipated to cause an increase in traffic volumes?   | <input type="checkbox"/> | <u>  X  </u>             |
| (24) | Will traffic be maintained during construction using existing roads, staged construction, or on-site detours?   | <u>  X  </u>             | <input type="checkbox"/> |
| (25) | If the project is a bridge replacement project, will the bridge be replaced at its existing location (along the existing facility) and will all construction proposed in association with the bridge replacement project be contained on the existing facility? | <u>  X  </u>             | <input type="checkbox"/> |
| (26) | Is there substantial controversy on social, economic, or environmental grounds concerning the project?  | <input type="checkbox"/> | <u>  X  </u>             |
| (27) | Is the project consistent with all Federal, State, and local laws relating to the environmental aspects of the project?   | <u>  X  </u>             | <input type="checkbox"/> |
| (28) | Will the project have an "effect" on structures/properties eligible for or listed on the National Register of Historic Places?  | <input type="checkbox"/> | <u>  X  </u>             |
| (29) | Will the project affect any archaeological remains, which are important to history or pre-history?  | <input type="checkbox"/> | <u>  X  </u>             |
| (30) | Will the project require the use of Section 4(f) resources (public parks, recreation lands, wildlife and waterfowl refuges, historic sites, or historic bridges, as defined in  |                          |                          |

Section 4(f) of the U. S. Department of Transportation Act of 1966)?

X

- (31) Will the project result in any conversion of assisted public recreation sites or facilities to non-recreation uses, as defined by Section 6(f) of the Land and Water Conservation Act of 1965, as amended?

X

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

X

**F. Additional Documentation Required for Unfavorable Responses in Part E**

- 3 North Carolina Division of Marine Fisheries stated that anadromous fish are found in this section of Bear Swamp Canal. Therefore, an in stream work moratorium from February 15 to June 30 will be in effect. NCDOT will adhere to the "Stream Guidelines for Anadromous Fish Crossings."
- 4 There are wetlands located in the project vicinity. It is estimated that approximately 0.2 acres will be impacted at this time. This is a preliminary estimate based on the information available at this time. The wetland impacts and any required mitigation will be finalized during the permitting process. NCDOT will avoid and minimize the impacts to the wetlands during final design to the best extent practical.

**G. CE Approval**

TIP Project No.	<u>B-4226</u>
State Project No.	<u>8.2120301</u>
WBS No.	<u>33570.1.1</u>
Federal Project No.	<u>BRZ-1110(4)</u>

Project Description:

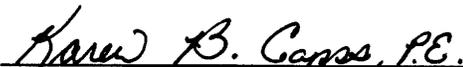
This project proposes to replace Bridge No. 62 on SR 1110 over Bear Swamp Canal in Perquimans County. The bridge will be replaced with a 100-foot long bridge at the same location and approximate low chord elevation as the existing bridge. The cross section of the new bridge will include two 12-foot lanes with one 3.0-foot minimum offset on the outside of the curve and one 8.0-foot minimum offset on the inside of the curve. The approach roadway will be widened to accommodate a 24-foot pavement width consisting of two 12-foot lanes with eight-foot grass shoulders. The total project length is approximately 1110 feet. Guardrail will be installed where warranted. Traffic will be detoured offsite during construction (See Section D, Studied Offsite Detour).

Categorical Exclusion Action Classification:

<u>      </u>	TYPE II(A)
<u>  X  </u>	TYPE II(B)

Approved:

<u>4-21-05</u>	
Date	Project Planning Unit Head Project Development & Environmental Analysis Branch

<u>4-21-05</u>	
Date	Project Development Engineer Project Development & Environmental Analysis Branch

For Type II(B) projects only:

<u>4-29-05</u>	
Date	for John F. Sullivan, III, Division Administrator Federal Highway Administration

# PROJECT COMMITMENTS

**Perquimans County  
Bridge No. 62 on SR 1110  
Over Bear Swamp Canal  
Federal Project BRZ-1110 (4)  
State Project 8.21203011  
WBS No. 33570.1.1  
TIP No. B-4226**

## Commitments Developed Through Project Development and Design

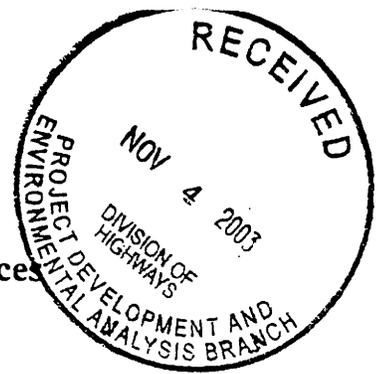
*Division 1 Construction Engineer, Structure Design Unit, Roadway Design Unit*

Bear Swamp Canal has potential as a travel corridor for anadromous fish. Therefore, an in-stream moratorium will be in effect from February 15 to June 30. The Stream Crossing Guidelines for Anadromous Fish Passage will be implemented, as applicable.

*Division 1 Construction Engineer*

In order to allow Emergency Management Services (EMS) and school transportation time to prepare for road closure, the NCDOT Resident Engineer will notify Larry Chappel with Perquimans County EMS and Richard O'Neal the director of school transportation, prior to road closure.





North Carolina Department of Cultural Resources

State Historic Preservation Office

David L. S. Brook, Administrator

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

Division of Historical Resources

October 29, 2003

MEMORANDUM

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

FROM: David Brook *David Brook*

SUBJECT: Replacement of Bridge No. 62 on SR 1110 over Bear Swamp Canal, B-4226,  
Perquimans County, ER03-0958

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

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

In terms of historic architectural resources, we are aware of no historic structures located within the area of potential effect. However, we are unable to make a recommendation until we receive photographs of any structures over fifty years old located within the project area.

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

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

[www.hpo.dcr.state.nc.us](http://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) 733-6545 • 715-4801

October 29, 2003

Page 2

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

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

**NATURAL SYSTEMS REPORT**

**Replacement of Bridge No. 62  
SR 1110 (Center Hill Road) over Bear Swamp Canal**

**Perquimans County, North Carolina  
(B-4226)  
(State Project No. 8.2120301)  
(Federal Aid No. BRZ-1110 [4])**

**Prepared for:**



**The North Carolina Department of Transportation  
Raleigh, North Carolina**

**March 2003**

**NATURAL SYSTEMS REPORT**

**Replacement of Bridge No. 62  
SR 1110 (Center Hill Road) over Bear Swamp Canal**

**Perquimans County, North Carolina  
(B-4226)  
(State Project No. 8.2120301)  
(Federal Aid No. BRZ-1110 [4])**

**Prepared for:**



**The North Carolina Department of Transportation  
Raleigh, North Carolina**

**Prepared by:**



**EcoScience**

**EcoScience Corporation  
1101 Haynes Street, Suite 101  
Raleigh, North Carolina 27604  
Tel (919) 828-3433 Fax (919) 828-3518**

**March 2003**

## EXECUTIVE SUMMARY

Proposed replacement of Bridge No. 62 at SR 1110 (Center Hill Road) over Bear Swamp Canal, Perquimans County, North Carolina, TIP No. B-4226.

### INTRODUCTION

The project proposes replacement of Bridge No. 62 on SR 1110 (Center Hill Road) over Bear Swamp Canal and the associated floodplain. The project area is approximately 35.2 acres (14.2 hectares) in size, and includes the channel, banks, and associated floodplain and terraces of Bear Swamp Canal. Land use consists of a riparian corridor of undeveloped forested land, agricultural land, and sparse rural residential and community development. The project area is within the Coastal Plain physiographic province, approximately 3.0 to 5.0 feet (0.9 to 1.5 meters) above mean sea level. Approximately 19.0 acres (7.7 hectares) (54 percent) of the project area is underlain by hydric soils, consisting of Tomotley fine sandy loam and Chowan silt loam.

### PHYSICAL CHARACTERISTICS

#### Water Resources

The project area is located within sub-basin 03-01-52 of the Pasquotank River Basin (DWQ 2002a). This area is part of USGS Hydrologic Unit 03010205 of the South Atlantic/Gulf Region. The structure targeted for replacement spans Bear Swamp Canal and the adjacent floodplain and terraces. This section of Bear Swamp Canal has been assigned Stream Index Number 30-6-2 by the N.C. Division of Water Quality (DWQ 2002b).

The Best Usage Classification for Bear Swamp Canal is **C Sw** (DWQ 2002a). No Watershed Critical Areas or water resources classified as High Quality Waters, Water Supplies (WS-I or WS-II), or Outstanding Resource Waters are located within 1.0 mile (1.6 kilometers) of the project area.

#### Biotic Resources

Four terrestrial communities were identified in the project area: disturbed/maintained land, agricultural land, Coastal Plain Bottomland Hardwoods (Blackwater Subtype), and Mesic Mixed Hardwood Forest (Coastal Plain Subtype). A summary of plant community areas is presented in the following table.

Plant community coverage within the project area.

<b>Plant Community</b>	<b>Area</b>
disturbed/maintained land	12.6 acres (5.1 hectares)
agricultural land	12.5 acres (5.1 hectares)
Coastal Plain Bottomland Hardwoods (Blackwater Subtype)	3.5 acres (1.4 hectares)
Mesic Mixed Hardwood Forest (Coastal Plain Subtype)	1.6 acres (0.6 hectare)

## JURISDICTIONAL TOPICS

### Surface Waters and Wetlands

Bear Swamp Canal is considered jurisdictional surface waters under Section 404 of the Clean Water Act. Currently, one bent is located in the canal. Based on field investigations, the project area also contains jurisdictional wetlands. Areas of these systems within the project area are summarized in the following table.

<b>Cowardin Classification</b>	<b>Area</b>	<b>DWQ Rating</b>
PFO1C (Coastal Plain Bottomland Hardwoods; disturbed/agricultural land)	4.5 (1.8)	58
R2UBHx (Bear Swamp Canal)	1.6 (0.6)	-
PUBHx (isolated ponds)	0.7 (0.3)	-
PEM1A disturbed/maintained land	0.02 (0.001)	
Total	6.8 (2.8)	

During project construction, Bridge No. 62 will be dismantled without dropping portions of the structure into Bear Swamp Canal. Therefore, no temporary fill from bridge demolition is expected to be placed in waters of the United States. As this reach of Bear Swamp Canal is in the Coastal Plain, and has potential as a travel corridor and breeding area for migratory fish, this project can be classified as Case 2, where in-water work will be avoided during moratorium periods (February 15 through June 15) associated with fish migration, spawning, and nursery areas.

To minimize fishing and non-fishing activities that adversely affect marine fisheries, areas of Essential Fish Habitat (EFH) afford limited protection under the Magnuson-Stevens Act of 1996 (16 U.S.C. 1801 *et seq.*). EFH has been broadly defined by congress as "those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity." Fishing and non-fishing related activities that can adversely affect fisheries include fishing gear, dredging, filling, agricultural and urban runoff, and point-source pollution discharge. Based on the latest directive from the National Marine Fisheries Service (NMFS 2000), the nearest designated EFH is associated with bluefish (*Pomatomus saltatrix*) and summer flounder (*Paralichthys dentatus*)

within the Albemarle Sound, approximately 28 river miles (45 river kilometers) downstream of the project area.

### **Permits**

The project area may contain Public Trust Waters AECs. If replacement of the bridge avoids impacts to AECs, the DCM will review the permit application for CAMA consistency. If an AEC is proposed to be impacted, a CAMA Major Permit or General Permit for bridge replacement (15A NCAC 07H.2300) may be applicable.

This project may be processed as a Categorical Exclusion (CE) under Federal Highway Administration (FHWA) guidelines. The USACE has made available Nationwide Permit (NWP) No. 23 (67 FR 2020, 2082; December 15, 2002) for CEs due to minimal impacts to waters of the United States expected with bridge construction. DWQ has made available a General 401 Water Quality Certification for NWP No. 23 (GC 3361). If temporary construction is required that is not described in the CE, a NWP No. 33 for temporary construction, access, and dewatering (67 FR 2020, 2084) and associated DWQ General Water Quality certification, (GC 3366) may be required. In the event that NWP No. 23 will not suffice, impacts attributed to bridge replacement and associated approach improvements may qualify under General Bridge Permit (GP) 031 issued by the Wilmington USACE District. DWQ has made available a General 401 Water Quality Certification for GP 031 (GC 3375). Notification to the USACE Wilmington district office is required if this general permit is utilized.

### **Federally Protected Species**

Species with the federal classification of Endangered, Threatened, or officially Proposed for such listing are protected under the Endangered Species Act (ESA) of 1973, as amended (16 U.S.C. 1531 et seq.). No federally protected species are listed for Perquimans County (February 25, 2003 FWS list).

### **CONCLUSIONS**

The project area contains 6.8 acres (2.8 hectares) of jurisdictional areas that could potentially be impacted by the proposed project. Permits likely to be required for this project are a Section 404 NWP No. 23 and No. 33 along with their corresponding Section 401 Water Quality Certifications. Breeding or migration areas for anadromous fish also may occur within the project area. The National Marine Fisheries Service will be consulted as to the timing of construction activities to minimize impacts to fisheries resources. The N.C. Department of Coastal Management (DCM) will review the project application for consistency with the coastal management program.

Construction of a replacement bridge within the footprint of the existing Bridge No. 62 is recommended to minimize impacts to wetlands, plant communities, and fisheries resources. Enhancement of riparian vegetation is possible for the entire on-site reach. Areas of hydric soils which are currently used for agricultural plants could also be replanted with bottomland hardwood vegetation.

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**Replacement of Bridge No. 62  
SR 1110 (Center Hill Road) over Bear Swamp Canal  
Perquimans County, North Carolina  
(B-4226)**

**1.0 INTRODUCTION**

1.1 Project Description

The North Carolina Department of Transportation (NCDOT) proposes replacement of Bridge No. 62 on SR 1110 (Center Hill Road) over Bear Swamp Canal (named on the Center Hill USGS topographic map as Goodwin Creek) and the associated floodplain (Figure 1). This bridge is approximately 5 miles (8 kilometers) west of Hertford, NC. Bridge No. 62 spans Bear Swamp Canal and adjacent banks for a distance of approximately 75 feet (23 meters). The existing roadway is approximately 25 feet (8 meters) wide with a total, maintained right-of-way width of approximately 50 feet (15 meters) (Figure 2).

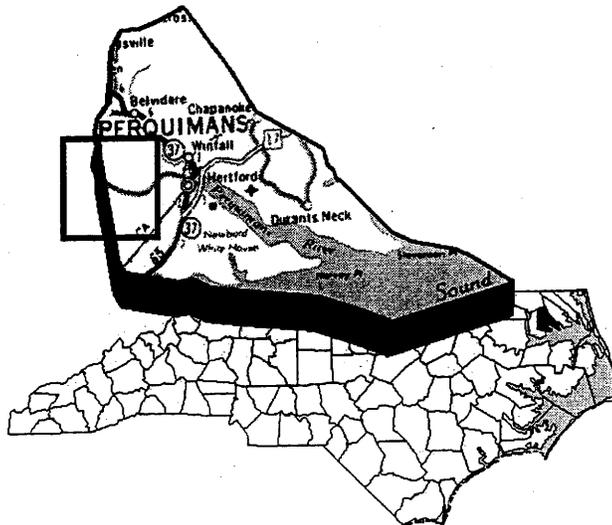
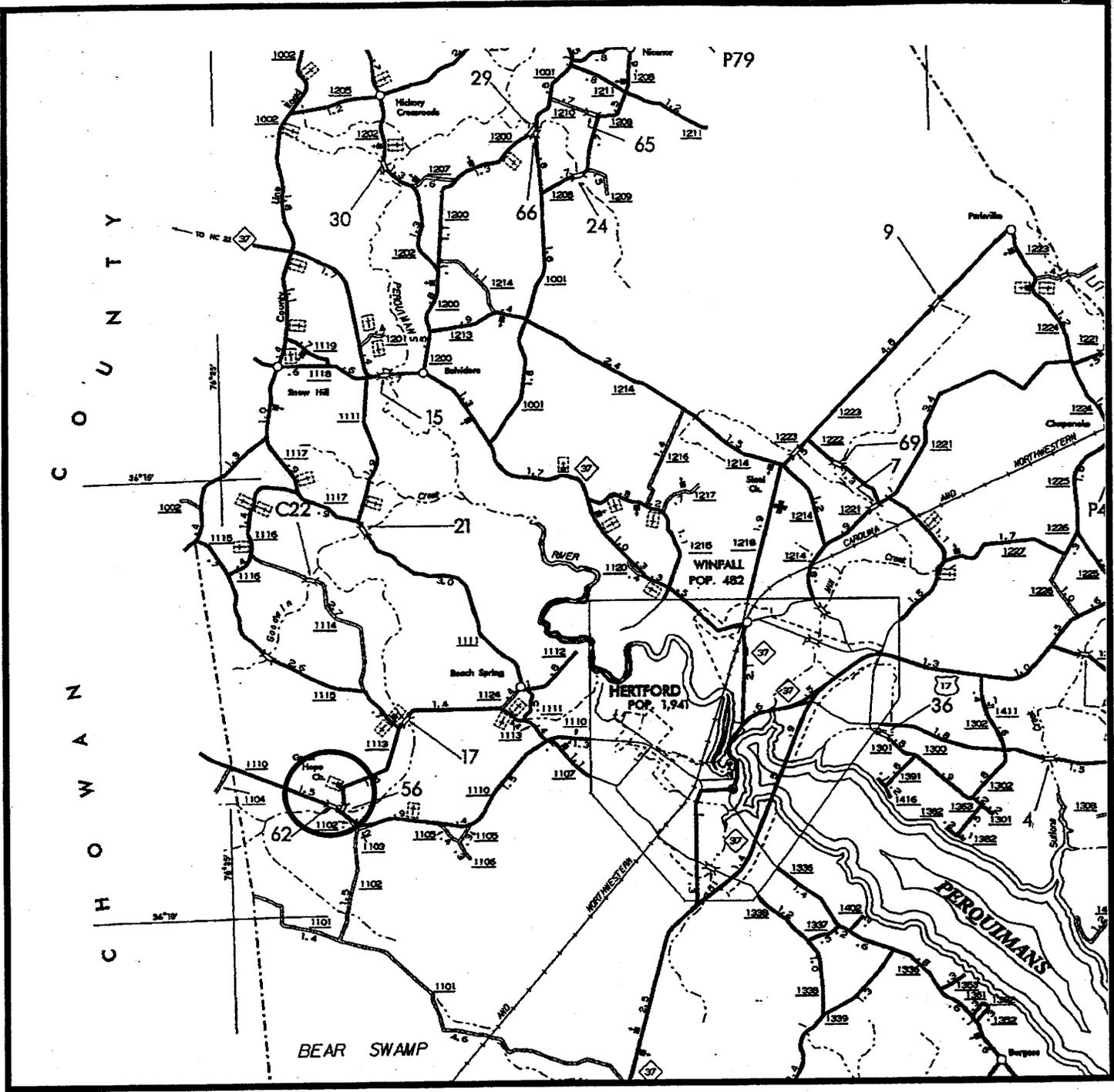
Bridge No. 62 was built in 1940 of timber piles and caps, with a superstructure of reinforced concrete on I-beams. The bridge will be dismantled without dropping portions of the structure into Bear Swamp Canal. The NCDOT project engineer will complete bridge materials and fill data at a later time. NCDOT will coordinate with various resource agencies during project planning to ensure that all concerns regarding bridge demolition are resolved.

1.2 Purpose

The purpose of this study is to provide an evaluation of biological resources in the project area. Specific tasks performed for this study include 1) an assessment of biological features within the project area including descriptions of vegetation, wildlife, protected species, jurisdictional wetlands, and water quality, 2) a delineation of Section 404 jurisdictional areas and subsequent survey of jurisdictional boundaries (utilizing Trimble XRS Differential Global Positioning System technology), 3) an evaluation of plant communities and their areas within the project area, and 4) a preliminary determination of permit needs.

1.3 Methods

Materials and literature supporting this investigation have been derived from a number of sources including U.S. Geological Survey (USGS) topographic mapping (Center Hill, NC 7.5 minute quadrangle), U.S. Fish and Wildlife Service (FWS) National Wetlands Inventory (NWI) mapping (Center Hill, NC 7.5 minute quadrangle), N.C. Division of Coastal Management (DCM) wetlands mapping, Natural Resources Conservation Service (NRCS; formerly the Soils Conservation Service) soils mapping (SCS 1986), and recent aerial photography (scale 1:2400) furnished by NCDOT.



	<p>NORTH CAROLINA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS PROJECT DEVELOPMENT &amp; ENVIRONMENTAL ANALYSIS BRANCH</p>
<p><b>PERQUIMANS COUNTY REPLACE BRIDGE NO. 62 ON SR 1110 OVER BEAR SWAMP CANAL B-4226</b></p>	
<p>Figure 1</p>	



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## Figure 2 B-4226 Perquimans County

Replacement of  
Bridge No. 62  
SR 1110 over  
Bear Swamp Canal

State Project No.  
8.2120301

Federal Aid No.  
BRZ-1110[4]

Prepared for:  
The North Carolina  
Department of  
Transportation  
Raleigh, North Carolina

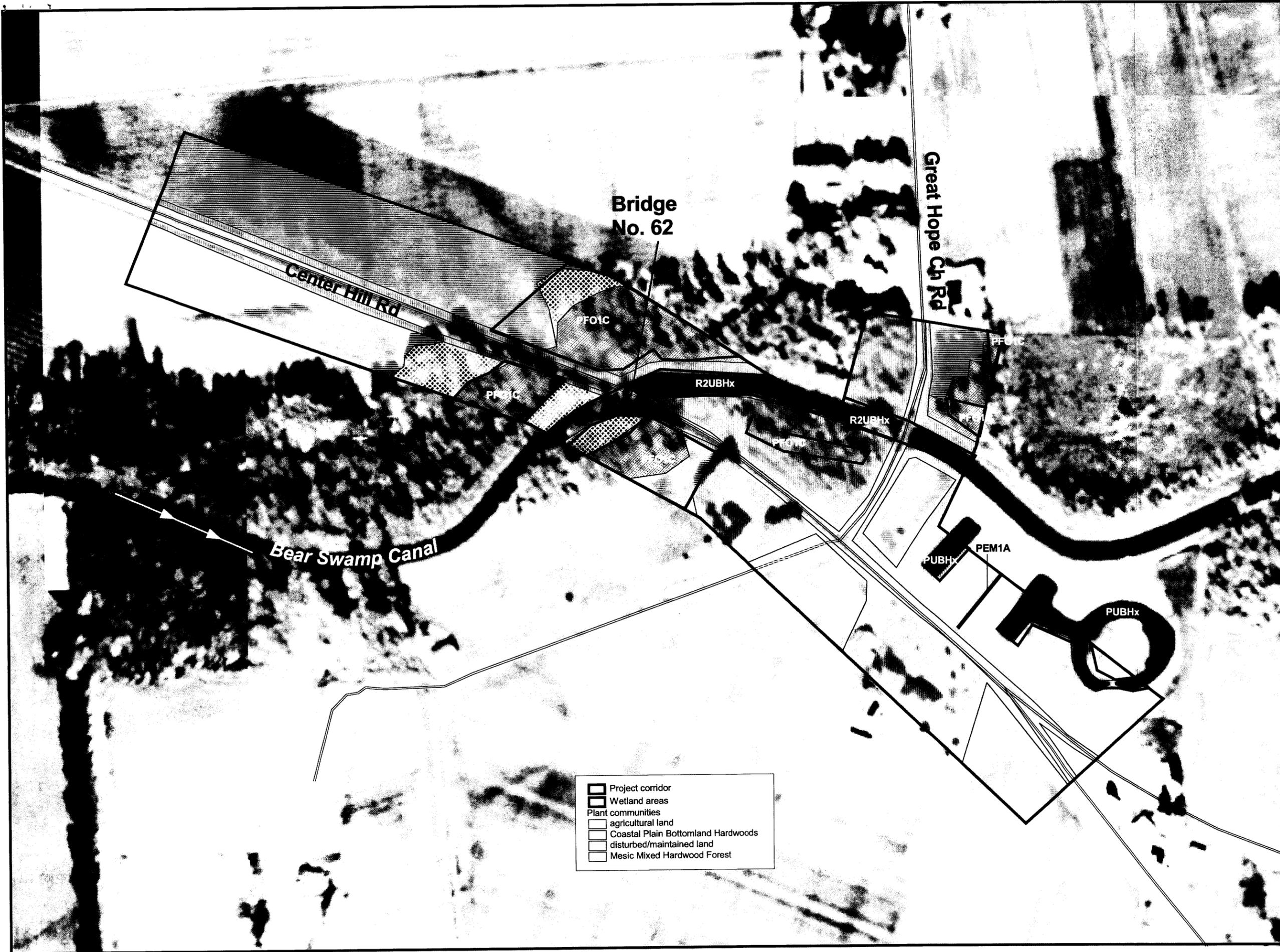
Client: NCDOT

Project: 02-113.08

Date: March 2003

Drawn By: ES

Scale: 1" = 250'



The most current FWS listing of federally protected species with ranges extending into Perquimans County (February 25, 2003 FWS list) is addressed in this report. In addition, NHP records documenting the presence of federally or state listed species were consulted before commencing field investigations. Significant Aquatic Endangered Species Habitats proposed by the North Carolina Wildlife Resources Commission (WRC) (June 13, 1995 listing) were consulted to determine the presence of Proposed Critical Habitats for aquatic species.

Plant community descriptions are based on a classification system utilized by the N.C. Natural Heritage Program (NHP) (Schafale and Weakley 1990). When appropriate, community classifications were modified to better reflect field observations. Vascular plant names follow nomenclature found in Radford *et al.* (1968) with adjustments for updated nomenclature (Kartesz 1998). Jurisdictional areas were evaluated using the three-parameter approach following U.S. Army Corps of Engineers (USACE) delineation guidelines (DOA 1987). Jurisdictional areas were characterized according to a classification scheme established by Cowardin *et al.* (1979). Aquatic and terrestrial wildlife habitat requirements and distributions were determined by supportive literature (Martof *et al.* 1980, Potter *et al.* 1980, Webster *et al.* 1985, Menhinick 1991, Hamel 1992, Palmer and Braswell 1995, and Rohde *et al.* 1994). Water quality information for area streams and tributaries was derived from available sources (DWQ 2002a, 2002b). Quantitative sampling was not undertaken to support existing data.

The project area was walked and visually surveyed for significant features. For purposes of this evaluation, the project area has been delineated by the NCDOT (Figure 2). Special concerns evaluated in the field include 1) potential protected species habitat and 2) wetlands and water quality protection in Bear Swamp Canal.

#### 1.4 Qualifications

The field work for this investigation was conducted on December 17, 2002 by EcoScience Corporation biologists Elizabeth Scherrer and Sandy Smith.

Ms. Scherrer is a Project Scientist with five years of experience in the environmental field. She holds an M.S. in forestry from North Carolina State University, with minors in botany and ecology. Her research involved the restoration of farmed wetlands on the North Carolina Coastal Plain, with emphasis on the influence of microtopography on hydrology and plant communities. At Tall Timbers Research Station in Tallahassee, FL, she designed and implemented a study of red-cockaded woodpecker habitats in the Apalachicola National Forest. Professional expertise includes wetland and jurisdictional area delineations, plant and wildlife identification and community mapping, plant community parameter analysis, protected species surveys, and environmental document preparation.

Mr. Smith is a Senior Scientist with 14 years of experience in the environmental field. Mr. Smith has a bachelor's degree in biology from Davidson College and a master's degree in marine/coastal biology from the University of North Carolina at Wilmington. He has conducted

field research and species inventories involving seabirds, shorebirds, colonial waterbirds, songbirds, small mammals, reptiles, amphibians, freshwater and estuarine fish, and benthic invertebrates. Professional expertise includes jurisdictional area delineations, stream and riparian buffer determinations, plant and wildlife identification and community mapping, protected species surveys, environmental permitting, and environmental document preparation.

## 1.5 Definitions of Area Terminology

The project area boundary (Figure 2) has been delineated by NCDOT, and encompasses approximately 35.2 acres (14.2 hectares). The project area follows SR 1110 along a northwest-southeast orientation for a distance of 3000 feet (914 meters). An extension of the project area follows SR 1113 (Great Hope Church Road) north for approximately 650 feet (198 meters) and encompasses another crossing of Bear Swamp Canal on SR 1113. The width of the project area is approximately 450 feet (137 meters). Included within the project area are Bear Swamp Canal, the associated floodplain, and adjacent terraces. The project vicinity is the area within 0.5 mile (0.8 kilometer) of the project area, and the project region is the area included in a 7.5 minute USGS quadrangle map with the project area as the center.

## 2.0 PHYSICAL RESOURCES

### 2.1 Physiography and Soils

The project area is underlain by the Large River Valleys and Flood Plain System soil region in the Coastal Plain physiographic province of North Carolina. In this system, the large river valleys generally have a narrow floodplain and a system of higher, nearly level, terraces. A distinct scarp usually separates the terraces from each other and from the river. River valley sediments range from gravel through sand and silt to clay. Soil profiles are somewhat thinner than those of adjacent uplands. Gravel deposits occur at point bars, both modern and ancient, and along natural river levees. Eolian sands are common as continuous deposits along valleys (Daniels *et al.* 1999). The project area is located within a level, wide floodplain that has been extensively ditched and drained. In this area, Bear Swamp Canal is a deep, excavated channel winding through the floodplain. Elevations in the project area range from a high of approximately 5.0 feet (1.5 meters) National Geodetic Vertical Datum (NGVD), on the north end of the project area, to approximately 3.0 feet (0.9 meter) NGVD adjacent to the stream channel. Within the channel, elevation falls to approximately 6.0 feet (1.8 meters) below sea level near Bridge No. 62. Land use within and near the project area is almost exclusively agricultural, with scattered rural residential lots and public facilities.

Based on soil mapping for Perquimans County (SCS 1986), the project area is underlain by three soil series: Tomotley fine sandy loam (*Typic Ochraquults*), Chowan silt loam (*Thapto-Histic Fluvaquents*), and Augusta fine sandy loam (*Aeric Ochraquults*). Within the project area, the Tomotley and Chowan series occur along the stream channel, and Augusta fine sandy loam

is found on the first terrace adjacent to the channel. Tomotley soils also occur farther away from the channel, on the second terrace north and south of Bear Swamp Canal. The Tomotley and Chowan series are considered hydric soils in Perquimans County by the NRCS (1997). Both of these soils support woody vegetation under natural conditions. Tomotley soils are saturated for a significant period during the growing season, while Chowan soils may be ponded for very long periods during the growing season. Augusta fine sandy loam may contain hydric inclusions of Tomotley soils in depressions. In total, approximately 54 percent (19.0 acres [7.7 hectares]) of the project area is underlain by Tomotley and Chowan hydric soils.

The Tomotley series consists of poorly drained, moderately to moderately slowly permeable soils on broad flats and in slight depressions. This series formed in loamy fluvial and marine sediments. Slopes are nearly level, from 0 to 2 percent, and the seasonal high water table is at or near the soil surface. This soil is subject to rare flooding. The soils are strongly to extremely acid.

The Chowan series consists of very poorly drained, moderately slowly to moderately rapidly permeable soils on floodplains of small streams that flow into the Albemarle Sound, Chowan River, and Perquimans River. The soils have surface mineral horizons over highly decomposed organic material. Slopes are nearly level (0 to 2 percent). The seasonal high water table is at or near the soil surface. These soils are frequently flooded for very long periods. Acidity ranges from medium acid to extremely acid.

The Augusta series consists of somewhat poorly drained, nearly level soils in shallow depressions and on low, smooth ridges adjacent to small streams and waterways that flow into the Albemarle Sound, Chowan River, and Perquimans River. The soils are moderately permeable, and formed in loamy marine and fluvial sediments. Soil reactivity is medium acid to very strongly acid. The seasonal high water table is 1 to 2 feet (30 to 61 centimeters) beneath the soil surface.

## 2.2 Water Resources

The project area is located within sub-basin 03-01-52 of the Pasquotank River Basin (DWQ 2002a). This area is part of USGS Hydrologic Unit 03010205 of the South Atlantic/Gulf Region. The structure targeted for replacement spans Bear Swamp Canal and the adjacent floodplain and terraces. This section of Bear Swamp Canal has been assigned Stream Index Number 30-6-2 by the N.C. Division of Water Quality (DWQ 2002b). Bear Swamp Canal drains into the Perquimans River approximately 7.2 miles (11.6 kilometers) downstream of the project area.

At the project area, Bear Swamp Canal is a well-defined, third-order, excavated, perennial stream with low flow over a sand substrate. During field investigations, the depth of the water was approximately 6.0 feet (1.8 meters). Above the water level, the steep banks rose for approximately another 6.0 feet (1.8 meters). Levees of spoil material lined the banks along the length of the project area, rising approximately 3.0 feet (0.9 meter) above the adjacent ground

surface. At Bridge No. 62, Bear Swamp Canal is approximately 65 feet (20 meters) wide. The floodplain of Bear Swamp Canal is nearly level. Water clarity was moderate, with visibility to 1.0 foot (0.3 meter), and flow velocity was low. Upstream, the headwaters of Bear Swamp Canal are highly channelized, ditched and drained. The main channel is excavated for approximately 2.4 stream miles (3.9 stream kilometers) downstream before the stream attains the qualities of a swampy, poorly defined, Coastal Plain river with low flow velocity.

Classifications are assigned to waters of the State of North Carolina based on the existing or contemplated best usage of various streams or segments of streams in the basin. A Best Usage Classification of **C Sw** has been assigned to this reach of Bear Swamp Canal. The designation **C** denotes waters suitable for aquatic life propagation and protection, agriculture, and secondary recreation. Secondary recreation includes wading, boating, and other uses not involving human body contact with waters on an organized or frequent basis. The supplemental classification **Sw** denotes waters which have low velocities and other natural characteristics which are different from adjacent streams. The designation recognizes waters that will naturally be more acidic (have lower pH values) and have lower levels of dissolved oxygen. In general, management strategies for point and non-point source pollution control require no increase in nutrients over background levels. No designated High Quality Waters (**HQW**), Outstanding Resource Waters (**ORW**), Water Supply I (**WS-I**), or Water Supply II (**WS-II**) waters occur within 1.0 mile (1.6 kilometers) of the project area (DWQ 2002a). No watershed Critical Area (**CA**) occurs within 1.0 mile (0.6 kilometer) of the project area, or within the Subbasin. The nearest water body with any of these designations is the Alligator River, approximately 36.0 miles (57.9 kilometers) southeast, with the ORW designation.

The Division of Water Quality (DWQ) (previously known as the Division of Environmental Management, Water Quality Section [DEM]) has initiated a whole-basin approach to water quality management for the 17 river basins within the state. Water quality for the proposed project area is summarized in the *Pasquotank Basinwide Water Quality Plan* (DWQ 2002a). Based on DWQ data, Bear Swamp Canal is currently not monitored nor given a Use Support Rating for its Best Usage Classification. DWQ maintains a Benthic Macroinvertebrate monitoring station approximately 2.0 miles (3.2 kilometers) above Hertford on the Perquimans River, and an Ambient Monitoring Station on the Perquimans River at SR 1336 in Hertford. These stations are approximately 13.2 and 16.0 miles (21.2 and 25.7 kilometers), respectively, downstream of the project area. One problem parameter (pH) was noted in 2000 at the Ambient Monitoring Station. However, the Perquimans River and Bear Swamp Canal have not been assigned a bioclassification based on this data. Biocriteria are currently being developed to assess swampy streams such as Bear Swamp Canal. Overall, there are few indicators of water quality problems in the subbasin (DWQ 2002a).

Sub-basin 03-01-52 of the Pasquotank River Basin supports five National Pollutant Discharge Elimination System permitted point source dischargers. Total discharge is 0.472 million gallons per day (1.79 million liters per day). There are no major permit holders. The dischargers in the sub-basin are located on the Perquimans River at Hertford; Mill Creek, draining into the

Perquimans River near Winfall; Bethel Creek, draining into the Yeopim River and the Albemarle Sound; and on the Albemarle Sound in Chowan County. The nearest discharger is approximately 16.0 stream miles (25.7 stream kilometers) downstream at Hertford. Major non-point sources of pollution for Bear Swamp Canal, the Perquimans River, and the Albemarle Sound include nutrient inputs from agricultural areas, confined animal operations, and urbanized areas. Aquatic habitat degradation is also exacerbated by removal of native riparian vegetation. Sedimentation and nutrient inputs are major problems associated with non-point source discharges and often result in algal blooms and elevated levels of fecal coliform bacteria. In addition, oxygen-consuming wastes discharged into low- or zero-flow streams, such as Bear Swamp Canal, result in lowered levels of dissolved oxygen and poor habitat for aquatic species. Currently in this subbasin, the Little River (12 miles [19 kilometers] east of the project area), Scuppernong Creek, and Kendrick Creek (both south of Albemarle Sound) are listed on the state's year 2000 §303(d) list. No stream within the project area or within 10 miles (16 kilometers) of it is 303(d) listed.

Temporary construction impacts due to erosion and sedimentation will be minimized through implementation of a stringent erosion control schedule and the use of Best Management Practices (BMPs). The contractor will follow contract specifications pertaining to erosion control measures as outlined in 23 CFR 650 Subpart B and Article 107-13 entitled "Control of Erosion, Siltation, and Pollution" (NCDOT, Specifications for Roads and Structures). These measures include the use of dikes, berms, silt basins, and other containment measures to control runoff; elimination of construction staging areas in floodplains and adjacent to waterways; re-seeding of herbaceous cover on disturbed sites; management of chemicals (herbicides, pesticides, de-icing compounds) with potential negative impacts on water quality; and avoidance of direct discharges into streams by catch basins and roadside vegetation.

The proposed bridge replacement will allow for continuation of pre-project stream flows in Bear Swamp Canal, thereby protecting the integrity of this waterway. Long-term impacts resulting from construction are expected to be negligible. In order to minimize impacts to water resources, NCDOT's *Best Management Practices for the Protection of Surface Waters* will be strictly enforced during the entire life of the project. Due to the composition of Bear Swamp Canal streambed, sediment curtains should be utilized to minimize potential water quality degradation as a result of bridge replacement. Tall fescue is not suitable for erosion controls along stream banks.

During project construction, Bridge No. 62 will be dismantled without dropping portions of the structure into Bear Swamp Canal. Therefore, no temporary fill from bridge demolition is expected to be placed in waters of the United States.

## 3.0 BIOTIC RESOURCES

### 3.1 Terrestrial Communities

#### 3.1.1 Vegetation Communities

Four distinct plant communities were identified within the project area: disturbed/maintained land, agricultural land, Coastal Plain Bottomland Hardwoods (Blackwater Subtype), and Mesic Mixed Hardwood Forest (Coastal Plain Subtype). Plant community descriptions are based on a classification system utilized by N.C. Natural Heritage Program (NHP) (Schafale and Weakley 1990), where applicable. These communities are described below in order of their dominance within the project area.

**Disturbed/maintained land** - Disturbed/maintained land occurs along the 20-foot (6-meter) wide shoulders of SR 1110, and also includes two cleared residential lots, a large public park at the eastern end of the project area, a recently clear-cut woodlot at the junction of SR 1110 and 1113, and linear areas along Bear Swamp Canal that are maintained by periodic mowing. Like agricultural land, some areas of disturbed land occupy areas of hydric soil within the project area. Along the roadside and in mowed lawn areas, planted grasses are supplemented by microstegium (*Microstegium vimineum*), foxtail grass (*Setaria geniculata*), Indian strawberry (*Duchesnea indica*), wild onion (*Allium canadense*), henbit (*Lamium amplexicaule*), sow-thistle (*Sonchus asper*), cocklebur (*Xanthium strumarium*), and plantain (*Plantago lanceolata*). Along the edges of Bear Swamp Canal, the disturbed community may be considered an extension of the Bottomland Hardwood community adjacent to it; however, this area is kept in an early state of succession by mowing. Regular disturbance has allowed grasses and weedy species to become established. Shrubby plants in this area include immature specimens of black walnut (*Juglans nigra*), red maple (*Acer rubrum*), swamp cottonwood (*Populus deltoides*), and laurel oak (*Quercus laurifolia*). Also established are Chinese privet (*Ligustrum sinense*), swamp rose (*Rosa palustris*), marsh mallow (*Kosteletskya virginica*), and pokeweed (*Phytolacca americana*), and vines such as Japanese honeysuckle (*Lonicera japonica*), grape (*Vitis* sp.), and trumpet creeper (*Campsis radicans*). Herbaceous elements include grasses such as broomsedge (*Andropogon* sp.) and the herbaceous weeds already mentioned. Wetland portions of this community support herb and shrub species such as cattail (*Typha latifolia*), soft rush (*Juncus effusus*), blackberry (*Rubus* sp.), and swamp rose.

**Agricultural land** – Large areas of agricultural land surround the project area on all sides. Sections of agricultural land are included within the project area at both ends, and in small pockets at the center between other plant community types. Some agricultural fields extend into hydric (Tomotley and Chowan) soil pedons, as well as occupying the better-drained Augusta series lands. During the field visit, most fields were either recently plowed under or recently planted. Crops noted included soybeans and sorghum. Few weedy species had invaded these areas, but cocklebur, henbit, and wild onion were present.

**Coastal Plain Bottomland Hardwoods (Blackwater Subtype)** – This plant community is temporarily flooded, and likely comprises the historic, dominant plant community in the hydric soil pedons within the project area. The remnants of Bottomland Hardwoods now in the project area occur on Tomotley and Chowan soils along the channel of Bear Swamp Canal. Schafale and Weakley (1990) describe this community as flooded, at least occasionally, but seldom disturbed by flowing water. These small Bottomland Hardwood stands support a mixed-age canopy layer. The moist soil and large proportion of edge habitat support a well-developed subcanopy and shrub layer with, rarely, small central areas of open understory. Canopy species include red maple, sycamore (*Platanus occidentalis*), laurel oak, cherrybark oak (*Quercus pagoda*), swamp cottonwood, American elm (*Ulmus americana*), black walnut, and a few bald cypress (*Taxodium distichum*) in ponded areas. The subcanopy and shrub layer includes Chinese privet and wax myrtle (*Morella cerifera*) as well as immature individuals of canopy species. Vines include Japanese honeysuckle, grape, and greenbrier (*Smilax rotundifolia*). Herbs were not identified below the dense upper layers.

**Mesic Mixed Hardwood Forest (Coastal Plain Subtype)** – Mesic Mixed Hardwood Forest is found at the upper edges of the Bottomland Hardwood plant community and on raised spoil areas lining Bear Swamp Canal. It occurs on Augusta soils and on small inclusions of upland soil within the Chowan series pedon. According to Schafale and Weakley (1990), this community occurs on mesic upland areas protected from fire. These areas are narrow and generally open in the understory, with a mature canopy layer. Canopy species include American elm, laurel oak, pin oak (*Quercus palustris*), water oak (*Q. nigra*), loblolly pine (*Pinus taeda*), red maple, sweetgum (*Liquidambar styraciflua*), and sycamore. The minor subcanopy component includes American holly (*Ilex opaca*), black cherry (*Prunus serotina*), and immature American beech (*Fagus grandifolia*). The shrub layer contains Chinese privet and giant cane (*Arundinaria gigantea*). The vine component includes greenbrier, grape, and Japanese honeysuckle. Herbs are present at edges, and include wingstem (*Verbesina occidentalis*) and goldenrod (*Solidago* sp.).

### 3.1.2 Faunal Communities

No terrestrial mammals were observed during the site visit but physical signs of two mammal species, white-tailed deer (*Odocoileus virginianus*) and nutria (*Myocastor coypus*) were observed within the project area, near the Bear Swamp Canal banks and the small ponds in the project area. Other mammal species expected to occur within generally fragmented, disturbed lowland habitat are Virginia opossum (*Didelphis virginiana*), least shrew (*Cryptotis parva*), eastern mole (*Scalopus aquaticus*), red bat (*Lasiurus borealis*), eastern cottontail (*Sylvilagus floridanus*), gray squirrel (*Sciurus carolinensis*), white-footed mouse (*Peromyscus leucopus*), hispid cotton rat (*Sigmodon hispidus*), red fox (*Vulpes vulpes*), raccoon (*Procyon lotor*), and long-tailed weasel (*Mustela frenata*).

Birds observed in lowland wooded areas within or adjacent to the project area are red-shouldered hawk (*Buteo lineatus*), red-bellied woodpecker (*Melanerpes carolinus*), downy

woodpecker (*Picoides pubescens*), yellow-bellied sapsucker (*Sphyrapicus varius*), northern flicker (*Colaptes auratus*), Carolina chickadee (*Poecile carolinensis*), Carolina wren (*Thryothorus ludovicianus*), and golden-crowned kinglet (*Regulus satrapa*). Birds seen or heard in open fields, disturbed areas, or shrubby areas are killdeer (*Charadrius vociferus*), American kestrel (*Falco sparverius*), northern harrier (*Circus cyaneus*), gray catbird (*Dumetella carolinensis*), northern mockingbird (*Mimus polyglottos*), eastern phoebe (*Sayornis phoebe*), northern cardinal (*Cardinalis cardinalis*), American robin (*Turdus migratorius*), yellow-rumped warbler (*Dendroica coronata*), dark-eyed junco (*Junco hyemalis*), white-throated sparrow (*Zonotrichia albicollis*), American goldfinch (*Carduelis tristis*), European starling (*Sturnus vulgaris*), blue jay (*Cyanocitta cristata*), eastern meadowlark (*Sturnella magna*), common grackle (*Quiscalus quiscula*), and American crow (*Corvus brachyrhynchos*). Near open water, great blue heron (*Ardea herodias*) and tundra swan (*Olor columbianus*) were seen. Flying overhead were turkey vulture (*Cathartes aura*) and ring-billed gull (*Larus delawarensis*). Other bird species expected to be found in this agriculture-dominated area are Canada goose (*Branta canadensis*), red-tailed hawk (*Buteo jamaicensis*), mourning dove (*Zenaidura macroura*), eastern screech-owl (*Otus asio*), common nighthawk (*Chordeiles minor*), eastern kingbird (*Tyrannus tyrannus*), horned lark (*Eremophila alpestris*), tree swallow (*Iridoprocne bicolor*), purple martin (*Progne subis*), tufted titmouse (*Baeolophus bicolor*), white-breasted nuthatch (*Sitta carolinensis*), house wren (*Troglodytes aedon*), eastern bluebird (*Sialia sialis*), loggerhead shrike (*Lanius ludovicianus*), American pipit (*Anthus spinoletta*), common yellowthroat (*Geothlypis trichas*), eastern towhee (*Pipilo erythrophthalmus*), and red-winged blackbird (*Agelaius phoeniceus*).

No terrestrial reptile or amphibian species were observed during the site visit. Some terrestrial reptiles and amphibians which may occur within forested lowlands in the project area include eastern box turtle (*Terrapene carolina*), slimy salamander (*Plethodon glutinosus*), eastern spadefoot toad (*Scaphiopus holbrookii*), southern toad (*Bufo terrestris*), southern cricket frog (*Acris gryllus*), Carolina anole (*Anolis carolinensis*), southeastern five-lined skink (*Eumeces inexpectatus*), slender grass lizard (*Ophisaurus attenuatus*), rat snake (*Elaphe obsoleta*), brown snake (*Storeria dekayi*), and rough earth snake (*Virginia striatula*).

### 3.2 Aquatic Communities

Observations of aquatic plant communities observed within the project area were limited to duckweed (*Lemna* sp.), cow lily (*Nuphar lutea*), and hedge hyssop (*Gratiola* sp.).

Limited investigations resulted in no observations of aquatic reptiles or amphibians. Aquatic or semi-aquatic reptiles and amphibians expected to occur within the project area vicinity include eastern newt (*Notophthalmus viridescens*), two-toed amphiuma (*Amphiuma means*), southern leopard frog (*Rana utricularia*), eastern mud turtle (*Kinosternon subrubrum*), Florida cooter (*Pseudemys floridana*), yellowbelly slider (*Trachemys scripta*), northern water snake (*Nerodia sipedon*), and eastern ribbon snake (*Thamnophis sauritus*).

No sampling was undertaken in Bear Swamp Canal to determine fishery potential. Small, unidentified minnows were observed in Bear Swamp Canal during the field survey. Fish species that may be present in this reach of Bear Swamp Canal include bowfin (*Amia calva*), American eel (*Anguilla rostrata*), common carp (*Cyprinus carpio*), American shad (*Alosa sapidissima*), alewife (*Alosa pseudoharengus*), golden shiner (*Notemigonus crysoleucas*), yellow bullhead (*Ameiurus natalis*), eastern mudminnow (*Umbra pygmaea*), eastern mosquitofish (*Gambusia holbrooki*), flier (*Centrarchus macropterus*), and blackbanded sunfish (*Enneacanthus chaetodon*).

WRC has developed a Significant Aquatic Endangered Species Habitat database to enhance planning, siting, and impact analysis in areas proposed by WRC as being critical due to the presence of endangered or threatened aquatic species. No Significant Aquatic Endangered Species Habitat occurs within Sub-basin 03-01-52. No restricted Natural Areas, Fish Nursery Areas, or areas of Submersed Rooted Vasculars occur within the Subbasin. However, an Anadromous Fish Spawning Area occurs 2.4 stream miles (3.9 stream kilometers) downstream, at the point where the excavated portion of Bear Swamp Canal ends. Therefore, this reach of Bear Swamp Canal has potential as a spawning area for anadromous fish (such as American shad and alewife) and a travel corridor for migratory fish. In-water work during project construction will be avoided during moratorium periods (February 15 through June 15) associated with fish migration, spawning, and nursery areas.

To minimize fishing and non-fishing activities that adversely affect marine fisheries, areas of Essential Fish Habitat (EFH) afford limited protection under the Magnuson-Stevens Act of 1996 (16 U.S.C. 1801 *et seq.*). EFH has been broadly defined by congress as “those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity.” Fishing and non-fishing related activities that can adversely affect fisheries include fishing gear, dredging, filling, agricultural and urban runoff, and point-source pollution discharge. No marine, estuarine, or tidally influenced waters are located within the project area. Based on the latest directive from the National Marine Fisheries Service (NMFS 2000), the nearest designated EFH is associated with bluefish (*Pomatomus saltatrix*) and summer flounder (*Paralichthys dentatus*) within the Albemarle Sound, approximately 28 river miles (45 river kilometers) downstream of the project area.

### 3.3 Summary of Anticipated Impacts

Plant communities within the project area were delineated to determine approximate area and location of each within the project area. A summary of plant community areas is presented in Table 1.

No significant habitat fragmentation is expected as a result of project activities since potential improvements will be restricted to adjoining roadside margins. Construction noise and associated disturbances will have short-term impacts on avifauna and migratory wildlife movement patterns. No High Quality Resources exist in or near the project area.

**Table 1:** Plant community coverage within the project area. Areas are expressed in acres, with hectares in parentheses.

<b>Plant Community</b>	<b>Area</b>
Disturbed/maintained land	12.6 (5.1)
Agricultural land	12.5 (5.1)
Coastal Plain Bottomland Hardwoods (Blackwater Subtype)	3.5 (1.4)
Mesic Mixed Hardwood Forest (Coastal Plain Subtype)	1.6 (0.6)

No Significant Aquatic Endangered Species Habitat or EFH exists within the project region, or within the Pasquotank River Basin. This reach of Bear Swamp Canal is in the Coastal Plain, and has potential as a travel corridor for migratory fish. In addition, the project area is 2.4 stream miles upstream of an Anadromous Fish Spawning Area, as defined by the National Marine Fisheries Service. Therefore, this project can be classified as Case 2, where in-water work will be avoided during moratorium periods (February 15 through June 15) associated with fish migration, spawning, and nursery areas. Impacts associated with turbidity and suspended sediments resulting from bridge replacement will be minimized through the use of silt curtains and the implementation of stringent erosion control measures.

Potential down-stream impacts to aquatic habitat will be avoided by bridging the canal to maintain regular flow and stream integrity. Short-term impacts associated with turbidity and suspended sediments will affect benthic populations. Temporary impacts to downstream habitat from increased sediment during construction will be minimized by the implementation of stringent erosion control measures.

## **4.0 JURISDICTIONAL TOPICS**

### **4.1 Waters of the United States**

Surface waters within the embankments of Bear Swamp Canal are subject to jurisdictional consideration under Section 404 of the Clean Water Act as waters of the United States (33 CFR Section 328.3). Bear Swamp Canal channel has been characterized according to Cowardin et al. (1979) as a riverine, lower perennial, unconsolidated bottom, permanently flooded, excavated system (R2UBHx). The field visit confirmed this designation, and documented a sand/mud substrate.

Vegetated wetlands are defined by the presence of three primary criteria: hydric soils, hydrophytic vegetation, and evidence of hydrology at or near the surface for a portion (12.5 percent) of the growing season (DOA 1987). NWI mapping describes palustrine, forested, broad-leaved deciduous, seasonally flooded (PFO1C) areas adjacent to Bear Swamp Canal. These wetlands correspond roughly to the boundaries of Coastal Plain Bottomland Hardwoods, and to two areas adjacent to SR 1113 that have been recently clearcut and are now classified

as disturbed. Two small ponds that partly extend into the eastern end of the project area are classified as palustrine, forested, unconsolidated bottom, permanently flooded, excavated wetlands (PUBHx). These ponds were noted to have a mud substrate. A 3-foot (1-meter) wide, man-made, linear depression extends through a maintained grassy field in the eastern portion of the project area. This depression is characterized by temporarily saturated soils, predominantly herbaceous vegetation, and surface flow only following large precipitation events. Based on Cowardin *et al.*(1979), this feature is a palustrine, persistent emergent, temporarily flooded wetland (PEM1A). In all, approximately 19 percent (6.8 acres [2.8 hectares]) of the project area consists of jurisdictional wetlands (Figure 2). Wetlands within the project area would be considered riverine by the DWQ based on their location within the Bachelor Creek floodplain. Table 2 lists these wetland types and their areas within the project area.

**Table 2:** Wetland types within the project area. Areas are expressed in acres, with hectares in parentheses.

<b>Cowardin Classification</b>	<b>Plant Community</b>	<b>Area</b>	<b>DWQ Rating</b>
PFO1C	Coastal Plain Bottomland Hardwoods; disturbed/agricultural land	4.5 (1.8)	58
R2UBHx	Bear Swamp Canal	1.6 (0.6)	-
PUBHx	isolated ponds	0.7 (0.3)	-
PEM1A	Disturbed/maintained land	0.02 (0.001)	-
<b>Total</b>		<b>6.8 (2.8)</b>	

If an on-site detour becomes necessary, use of a temporary detour bridge may be required depending on the results of a geotechnical investigation of the wetland substrate's consolidation potential. This would be necessary if impacts to medium-quality wetlands, due to the construction of a temporary causeway, are determined to be intolerable and must be minimized.

During project construction, Bridge No. 62 will be dismantled without dropping portions of the structure into Bear Swamp Canal. Therefore, no temporary fill from bridge demolition is expected to be placed in waters of the United States. The NCDOT project engineer will complete bridge materials and fill data at a later time. NCDOT will coordinate with various resource agencies during project planning to ensure that all concerns regarding bridge demolition are resolved.

#### 4.2 CAMA Areas of Environmental Concern

The proposed project will occur in one (Perquimans) of the 20 North Carolina coastal counties covered by the Coastal Area Management Act (CAMA) (N.C.G.S. 113A-118). CAMA authorizes the N.C. Division of Coastal Management (DCM) to manage development in Areas of Environmental Concern (AECs) in the 20 counties. Estuarine waters, estuarine shorelines, coastal wetlands, and public trust areas are designated as AECs. Any activity involving construction, excavation, filling, or other land disturbance within an AEC is considered

development and requires authorization under CAMA. Because the project area contains an open water within a CAMA county, a DCM representative will need to verify the presence or absence of a Public Trust Water Area of Environmental Concern (AEC).

### 4.3 Permit Issues

#### 4.3.1 Permits

The project area may contain Public Trust Waters AECs. If replacement of the bridge avoids impacts to AECs, the DCM will review the permit application for CAMA consistency. If an AEC is proposed to be impacted, a CAMA Major Permit or General Permit for bridge replacement (15A NCAC 07H.2300) may be applicable.

This project may be processed as a Categorical Exclusion (CE) under Federal Highway Administration (FHWA) guidelines. The USACE has made available Nationwide Permit (NWP) No. 23 (67 FR 2020, 2082; December 15, 2002) for CEs due to minimal impacts to waters of the United States expected with bridge construction. DWQ has made available a General 401 Water Quality Certification for NWP No. 23 (GC 3361). If temporary construction is required that is not described in the CE, a NWP No. 33 for temporary construction, access, and dewatering (67 FR 2020, 2084) and associated DWQ General Water Quality certification, (GC 3366) may be required. In the event that NWP No. 23 will not suffice, impacts attributed to bridge replacement and associated approach improvements may qualify under General Bridge Permit (GP) 031 issued by the Wilmington USACE District. DWQ has made available a General 401 Water Quality Certification for GP 031 (GC 3375). Notification to the USACE Wilmington district office is required if this general permit is utilized.

#### 4.3.2 Mitigation

The USACE has adopted through the Council on Environmental Quality (CEQ) a wetland mitigation policy which embraces the concept of "no net loss of wetlands" and sequencing. The purpose of this policy is to restore and maintain the chemical, biological, and physical integrity of waters of the United States, and specifically wetlands. Mitigation of wetland impacts has been defined by the CEQ to include: avoiding impacts (to wetlands), minimizing impacts, rectifying impacts, reducing impacts over time, and compensating for impacts (40 CFR Section 1508.20). Each of the three main aspects (avoidance, minimization, and compensatory mitigation) must be considered sequentially.

Avoidance entails examination of all appropriate and practicable possibilities of averting impacts to waters of the United States. According to a 1990 Memorandum of Agreement between the U.S. Environmental Protection Agency and the USACE, in determining "appropriate and practicable" measures to offset unavoidable impacts, such measures should be appropriate to the scope and degree of those impacts and practicable in terms of cost, existing technology, and logistics in light of overall project purposes. Impacts to wetlands in the project area are

expected to be temporary in nature, depending on the footprint of the final bridge design. Temporary impacts due to bridge construction may be unavoidable during a replacement project.

Minimization includes the examination of appropriate and practicable steps to reduce adverse impacts to waters of the United States. Implementation of these steps will be required through project modifications and permit conditions. Minimization typically focuses on decreasing the footprint of the proposed project through the reduction of right-of-way widths, fill slopes and/or roadside shoulder widths. Lengthening of the bridge to lessen the length of the approach causeway is another method to minimize impacts in bridge projects. All efforts will be made to decrease impacts to surface waters.

Compensatory mitigation is not normally considered until anticipated impacts to waters of the United States have been avoided and minimized to the maximum extent possible. It is recognized that "no net loss of wetlands" functions and values may not be achieved in every permit action. In accordance with 15A NCAC 2H .0506(h), DWQ may require compensatory mitigation for projects with greater than or equal to 1.0 acre (0.5 hectare) of impacts to jurisdictional wetlands or greater than or equal to 150 linear feet (46 linear meters) of total perennial stream impacts. Furthermore, in accordance with 67 FR 2020, 2092; January 15, 2002, the USACE requires compensatory mitigation when necessary to ensure that adverse effects to the aquatic environment are minimal. The size and type of proposed project impact, and function and value of the impacted aquatic resource, are factors considered in determining acceptability of compensatory mitigation. Appropriate and practicable compensatory mitigation is required for unavoidable adverse impacts which remain after all appropriate and practicable minimization has been performed. Compensatory actions often include restoration, preservation and enhancement, and creation of waters of the United States. Such actions should be undertaken first in areas adjacent to or contiguous to the discharge site.

Mitigation for Section 404 jurisdictional area impacts may not need to be proposed for this project due to the potentially limited nature of the project impacts. However, utilization of BMPs is recommended in an effort to minimize impacts. Temporary impacts to floodplains associated with construction activities could be mitigated by replanting disturbed areas with native riparian species and removal of temporary fill material upon project completion. Fill or alteration of more than 150 linear feet (46 linear meters) of stream may require compensatory mitigation in accordance with 15 NCAC 2H .0506(h). A final determination regarding mitigation rests with the USACE and DWQ.

Opportunities for mitigation exist within the project area. Replacement of the existing bridge with one not requiring bents in the stream would result in improvements in streamflow. Enhancement of riparian vegetation is possible for the entire on-site reach. Areas of hydric soils which are currently cleared or used for agricultural plants could also be replanted with bottomland hardwood vegetation.

#### 4.4 Protected Species

Species with the federal classification of Endangered (E), Threatened (T), or officially Proposed (P) for such listing are protected under the Endangered Species Act (ESA) of 1973, as amended (16 U.S.C. 1531 et seq.). The term "Endangered Species" is defined as "any species which is in danger of extinction throughout all or a significant portion of its range," and the term "Threatened Species" is defined as "any species which is likely to become an Endangered species within the foreseeable future throughout all or a significant portion of its range" (16 U.S.C. 1532). According to the February 25, 2003 FWS list, no species with the E, T, or P classification are listed for Perquimans County.

**Federal Species of Concern** - The February 25, 2003 list also includes a category of species designated as "Federal species of concern" (FSC). A species with this designation is one that may or may not be listed in the future (formerly C2 candidate species or species under consideration for listing for which there is insufficient information to support listing). The FSC designation provides no federal protection under the ESA for the species listed. In Perquimans County, the FWS lists Rafinesque's big-eared bat (*Corynorhinus rafinesquii*) with the FSC classification. The Rafinesque's big-eared bat's state status is Threatened. No suitable habitat exists on or near the project area for the bat. The NHP records one occurrence of Rafinesque's big-eared bat approximately 3.8 miles (6.1 kilometers) northeast of the project area in Chowan County.

## 5.0 REFERENCES

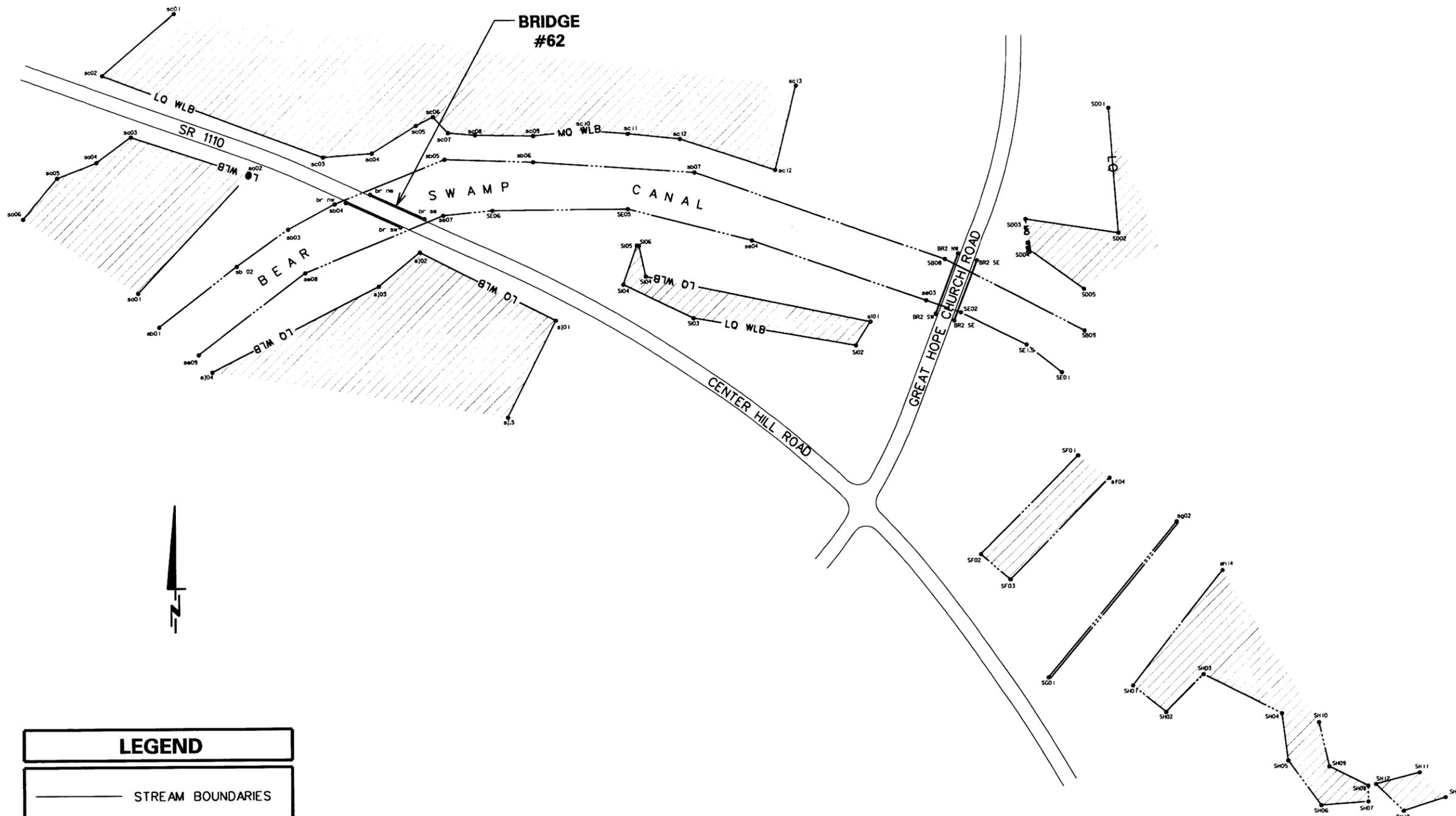
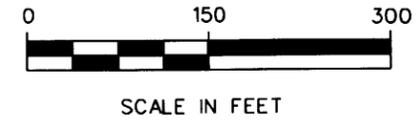
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EcoScience Corporation

Raleigh, North Carolina



LEGEND	
	STREAM BOUNDARIES
	WETLAND
	BRIDGE

REVISIONS

Client:  
**NCDOT**

Project:  
**Replacement of Bridge #62 (B-4226) SR 110 (Center Hill Road) over Bear Swamp Canal**  
PERQUIMANS COUNTY, NORTH CAROLINA

Title:  
**STREAM / WETLAND DELINEATION**

Own By: MAF Date: MAR 2003

Ckd By: APS Scale: 1" = 150'

ESC Project No.: 02-113.08

FIGURE  
**3**

SA 02

### Wetland Rating Worksheet

Project name B4226/Bear Swamp Canal Nearest road SR 1110  
County Perryman Name of Evaluator ESC - E. Scherrer Date 12-17-02

#### Wetland location

- on pond or lake
- on perennial stream
- on intermittent stream
- within interstream divide
- other

#### Adjacent land use (within 1/2 mile upstream)

- forested/natural vegetation 5 %
- agriculture, urban/suburban 95 %
- impervious surface 0 %

#### Soil Series Chowan silt loam

- predominantly organic-humus, muck, or peat
- predominantly mineral- non-sandy
- predominantly sandy

#### Dominant Vegetation

- (1) Acer rubrum
- (2) Quercus pyoda
- (3) Ulmus americana

#### Hydraulic Factors

- steep topography
- ditched or channelized
- wetland width  $\geq$  50 feet

#### Flooding and Wetness

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

#### Wetland Type (select one)

- Bottomland hardwood forest
- Headwater forest
- Swamp forest
- Wet flat
- Pocosin
- Pine savanna
- Freshwater marsh
- Bog/fen
- Ephemeral wetland
- Other

\*The rating system cannot be applied to salt or brackish marshes

Water storage	<u>3</u>	*	4	=	<u>12</u>	Total score <u>58</u>
Bank/Shoreline stabilization	<u>1</u>	*	4	=	<u>4</u>	
Pollutant removal	<u>4</u>	*	5	=	<u>20</u>	
Wildlife habitat	<u>4</u>	*	2	=	<u>8</u>	
Aquatic life value	<u>3</u>	*	4	=	<u>12</u>	
Recreation/Education	<u>2</u>	*	1	=	<u>2</u>	

Add 1 point if in sensitive watershed and  $>$ 10% nonpoint disturbance within 1/2 mile upstream

SA-02 Wetland

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

Project/Site: <u>B-4226 / Bear Swamp Canal</u> Applicant/Owner: <u>NC DOT</u> Investigator: <u>ESL - E. Scherrer</u>	Date: <u>12-17-02</u> County: <u>Perquimans</u> State: <u>NC</u>
Do Normal Circumstances exist on the site?      Yes No Is the site significantly disturbed (Atypical Situation)?      Yes No Is the area a potential Problem Area?      Yes No (If needed, explain on reverse)	Community ID: <u>Wetland</u> Transect ID: <u>SA-02</u> Plot ID: _____

**VEGETATION**

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. <u>Quercus pagoda</u>	<u>C</u>	<u>FAC+</u>	9. _____	_____	_____
2. <u>Juglans nigra</u>	<u>C</u>	<u>FACU</u>	10. _____	_____	_____
3. <u>Ligustrum sinense</u>	<u>S</u>	<u>FAC</u>	11. _____	_____	_____
4. <u>Acer rubrum</u>	<u>C</u>	<u>FAC</u>	12. _____	_____	_____
5. <u>Ulmus americana</u>	<u>C</u>	<u>FACW</u>	13. _____	_____	_____
6. <u>Cyperus palustris</u>	<u>C</u>	<u>FACW</u>	14. _____	_____	_____
7. <u>Taxodium distichum</u>	<u>C</u>	<u>OBL</u>	15. _____	_____	_____
8. _____	_____	_____	16. _____	_____	_____

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-)      86%

Remarks:

**HYDROLOGY**

<input type="checkbox"/> Recorded Data (Describe in Remarks): <input type="checkbox"/> Stream, Lake or Tide Gauge <input type="checkbox"/> Aerial Photographs <input type="checkbox"/> Other <input checked="" type="checkbox"/> No Recorded Data Available	<b>Wetland Hydrology Indicators:</b> <b>Primary Indicators:</b> <input checked="" type="checkbox"/> Inundated <input checked="" type="checkbox"/> Saturated in Upper 12 Inches <input type="checkbox"/> Water Marks <input type="checkbox"/> Drift Lines <input type="checkbox"/> Sediment Deposits <input checked="" type="checkbox"/> Drainage Patterns in Wetlands <b>Secondary Indicators (2 or more required):</b> <input type="checkbox"/> Oxidized Root Channels in Upper 12 Inches <input checked="" type="checkbox"/> Water-Stained Leaves <input checked="" type="checkbox"/> Local Soil Survey Data <input checked="" type="checkbox"/> FAC-Neutral Test Other (Explain in Remarks)
<b>Field Observations:</b> Depth of Surface Water: <u>0</u> (in.) Depth to Free Water in Pit: <u>12</u> (in.) Depth to Saturated Soil: <u>10</u> (in.)	Remarks:

**SOILS**

JA 02 Wetland

Map Unit Name (Series and Phase): <u>Chowan silt loam</u>		Drainage Class: <u>very poorly drained</u>	
Taxonomy (Subgroup): <u>TRAPPO-HISTIC Fluvaquents</u>		Field Observations Confirm Mapped Type: <input checked="" type="radio"/> Yes <input type="radio"/> No	
<b>Profile Description:</b>			
Depth Concretions, (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)
			Mottle Abundance/Contrast
			Texture, Structure, etc.
0-1	O		
1-10		10YR 2/1	
10+		10YR 2/1	
Hydric Soil Indicators:			
<input type="checkbox"/> Histosol <input type="checkbox"/> Histic Epipedon <input type="checkbox"/> Sulfidic Odor <input checked="" type="checkbox"/> Aquic Moisture Regime <input checked="" type="checkbox"/> Reducing Conditions <input checked="" type="checkbox"/> Gleyed or Low-Chroma Colors		<input type="checkbox"/> Concretions <input type="checkbox"/> High Organic Content in Surface layer in Sandy Soils <input type="checkbox"/> Organic Streaking in Sandy Soils <input checked="" type="checkbox"/> Listed on Local Hydric Soils List <input type="checkbox"/> Listed on National Hydric Soils List <input type="checkbox"/> Other (Explain in Remarks)	
Remarks:			

**WETLAND DETERMINATION**

Hydrophytic Vegetation Present? <input checked="" type="radio"/> Yes <input type="radio"/> No (Circle) Wetland Hydrology Present? <input checked="" type="radio"/> Yes <input type="radio"/> No Hydric Soils Present? <input checked="" type="radio"/> Yes <input type="radio"/> No	(Circle) Is this Sampling Point Within a Wetland? <input checked="" type="radio"/> Yes <input type="radio"/> No
Remarks:	

Approved by HQUSACE 2/92

SA 02 Upland

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

Project/Site: <u>B-4224 / Bear Swamp Canal</u> Applicant/Owner: <u>NC DOT</u> Investigator: <u>ESC - E. Scherrer</u>	Date: <u>12-17-02</u> County: <u>Argeminas</u> State: <u>NC</u>
Do Normal Circumstances exist on the site?      Yes No Is the site significantly disturbed (Atypical Situation)?      Yes No Is the area a potential Problem Area?      Yes No (If needed, explain on reverse)	Community ID: <u>Upland</u> Transect ID: <u>SA 02</u> Plot ID: _____

**VEGETATION**

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. <u>Pinus taeda</u>	<u>C</u>	<u>FAC</u>	9. _____	_____	_____
2. <u>Acer rubrum</u>	<u>C</u>	<u>FAC</u>	10. _____	_____	_____
3. <u>Liquidambar styr.</u>	<u>C</u>	<u>FACW</u>	11. _____	_____	_____
4. <u>Quercus nigra</u>	<u>C</u>	<u>FAC</u>	12. _____	_____	_____
5. <u>Ilex opaca</u>	<u>S</u>	<u>FAC-</u>	13. _____	_____	_____
6. <u>Panus serotina</u>	<u>S</u>	<u>FACU</u>	14. _____	_____	_____
7. _____	_____	_____	15. _____	_____	_____
8. _____	_____	_____	16. _____	_____	_____

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-)      67%

Remarks:

**HYDROLOGY**

<input type="checkbox"/> Recorded Data (Describe in Remarks): <input type="checkbox"/> Stream, Lake or Tide Gauge <input type="checkbox"/> Aerial Photographs <input type="checkbox"/> Other <input checked="" type="checkbox"/> No Recorded Data Available	<b>Wetland Hydrology Indicators:</b> <b>Primary Indicators:</b> <input type="checkbox"/> Inundated <input type="checkbox"/> Saturated in Upper 12 Inches <input type="checkbox"/> Water Marks <input type="checkbox"/> Drift Lines <input type="checkbox"/> Sediment Deposits <input type="checkbox"/> Drainage Patterns in Wetlands <b>Secondary Indicators (2 or more required):</b> <input type="checkbox"/> Oxidized Root Channels in Upper 12 Inches <input type="checkbox"/> Water-Stained Leaves <input type="checkbox"/> Local Soil Survey Data <input checked="" type="checkbox"/> FAC-Neutral Test <input type="checkbox"/> Other (Explain in Remarks)
Field Observations:  Depth of Surface Water: <u>0</u> (in.) Depth to Free Water in Pit: <u>&gt;12</u> (in.) Depth to Saturated Soil: <u>&gt;12</u> (in.)	
Remarks:	

**SOILS**

SA02 Upland

Map Unit Name (Series and Phase): <u>Chowan silt loam</u>		Drainage Class: <u>very poorly drained</u>		
Taxonomy (Subgroup): <u>IM/ta - Histic Fluvaquents</u>		Field Observations Confirm Mapped Type: Yes <u>No</u>		
<b>Profile Description:</b>				
Depth Concretions, (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist) Abundance/Contrast	Mottle Texture, Structure, etc.
<u>0-1</u>	<u>0</u>			
<u>1-12+</u>	<u>A</u>	<u>10YR 5/3</u>		<u>loam</u>
<b>Hydric Soil Indicators:</b>				
<input type="checkbox"/> Histosol	<input type="checkbox"/> Concretions			
<input type="checkbox"/> Histic Epipedon	<input type="checkbox"/> High Organic Content in Surface layer in Sandy Soils			
<input type="checkbox"/> Sulfidic Odor	<input type="checkbox"/> Organic Streaking in Sandy Soils			
<input type="checkbox"/> Aquic Moisture Regime	<input checked="" type="checkbox"/> Listed on Local Hydric Soils List			
<input type="checkbox"/> Reducing Conditions	<input type="checkbox"/> Listed on National Hydric Soils List			
<input type="checkbox"/> Gleyed or Low-Chroma Colors	<input type="checkbox"/> Other (Explain in Remarks)			
Remarks:				

**WETLAND DETERMINATION**

Hydrophytic Vegetation Present? <u>Yes</u> No (Circle)	(Circle)
Wetland Hydrology Present? <u>Yes</u> No	
Hydric Soils Present? <u>Yes</u> No	Is this Sampling Point Within a Wetland? <u>Yes</u> No
Remarks:	

Approved by HQUACE 2/92

SA 05

### Wetland Rating Worksheet

Project name B4226 / Bear Swamp Canal Nearest road SR 1119  
County Perryman Name of Evaluator ESA - E. Schröder Date 12-17-02

#### Wetland location

- on pond or lake
- on perennial stream
- on intermittent stream
- within interstream divide
- other

#### Adjacent land use (within 1/2 mile upstream)

- forested/natural vegetation 5 %
- agriculture, urban/suburban 95 %
- impervious surface 0 %

#### Soil Series Augusta fine sandy loam

- predominantly organic-humus, muck, or peat
- predominantly mineral- non-sandy
- predominantly sandy

#### Dominant Vegetation

- (1) Platanus occidentalis
- (2) Quercus laurifolia
- (3) Ligustrum sinense

#### Hydraulic Factors

- steep topography
- ditched or channelized
- wetland width  $\geq$  50 feet

#### Flooding and Wetness

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

#### Wetland Type (select one)

- Bottomland hardwood forest
- Headwater forest
- Swamp forest
- Wet flat
- Pocosin
- Pine savanna
- Freshwater marsh
- Bog/fen
- Ephemeral wetland
- Other

\*The rating system cannot be applied to salt or brackish marshes

Water storage	<u>3</u>	*	4	=	<u>12</u>	Total score <u>56</u>
Bank/Shoreline stabilization	<u>1</u>	*	4	=	<u>4</u>	
Pollutant removal	<u>4</u>	*	5	=	<u>20</u>	
Wildlife habitat	<u>3</u>	*	2	=	<u>6</u>	
Aquatic life value	<u>3</u>	*	4	=	<u>12</u>	
Recreation/Education	<u>2</u>	*	1	=	<u>2</u>	

Add 1 point if in sensitive watershed and >10% nonpoint disturbance within 1/2 mile upstream

SA 05  
Wetland

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

Project/Site: <u>B-4226 / Bear Swamp Canal</u>		Date: <u>12-17-02</u>
Applicant/Owner: <u>NC DOT</u>		County: <u>Perquimans</u>
Investigator: <u>ESL - E. Schrier</u>		State: <u>NC</u>
Do Normal Circumstances exist on the site?	Yes No	Community ID: <u>Wetland</u> Transect ID: <u>SA 05</u> Plot ID: _____
Is the site significantly disturbed (Atypical Situation)?	Yes No	
Is the area a potential Problem Area? (If needed, explain on reverse)	Yes No	

**VEGETATION**

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. <u>Platanus occidentalis</u>	<u>C</u>	<u>FACW</u>	9. _____	_____	_____
2. <u>Taxodium distichum</u>	<u>C</u>	<u>OBL</u>	10. _____	_____	_____
3. <u>Quercus laurifolia</u>	<u>C</u>	<u>FACW</u>	11. _____	_____	_____
4. <u>Ulmus americana</u>	<u>C</u>	<u>FACW</u>	12. _____	_____	_____
5. <u>Liquidambar styr.</u>	<u>C</u>	<u>FACW</u>	13. _____	_____	_____
6. <u>Quercus nigra</u>	<u>C</u>	<u>FAC</u>	14. _____	_____	_____
7. <u>Ligustrum sibirice</u>	<u>S</u>	<u>FAC</u>	15. _____	_____	_____
8. <u>Asimina triloba</u>	<u>S</u>	<u>FAC</u>	16. _____	_____	_____

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

Remarks:

**HYDROLOGY**

<p><u>Recorded Data (Describe in Remarks):</u></p> <p><input type="checkbox"/> Stream, Lake or Tide Gauge</p> <p><input type="checkbox"/> Aerial Photographs</p> <p><input type="checkbox"/> Other</p> <p><input checked="" type="checkbox"/> No Recorded Data Available</p>	<p><b>Wetland Hydrology Indicators:</b></p> <p><b>Primary Indicators:</b></p> <p><input checked="" type="checkbox"/> Inundated</p> <p><input checked="" type="checkbox"/> Saturated in Upper 12 Inches</p> <p><input type="checkbox"/> Water Marks</p> <p><input type="checkbox"/> Drift Lines</p> <p><input type="checkbox"/> Sediment Deposits</p> <p><input checked="" type="checkbox"/> Drainage Patterns in Wetlands</p> <p><b>Secondary Indicators (2 or more required):</b></p> <p><input checked="" type="checkbox"/> Oxidized Root Channels in Upper 12 Inches</p> <p><input type="checkbox"/> Water-Stained Leaves</p> <p><input checked="" type="checkbox"/> Local Soil Survey Data</p> <p><input checked="" type="checkbox"/> FAC-Neutral Test</p> <p>Other (Explain in Remarks)</p>
<p><b>Field Observations:</b></p> <p>Depth of Surface Water: <u>0.2</u> (in.)</p> <p>Depth to Free Water in Pit: <u>1</u> (in.)</p> <p>Depth to Saturated Soil: <u>0</u> (in.)</p>	
Remarks:	

SA 05 Wetland

**SOILS**

<b>Map Unit Name</b> (Series and Phase): <u>Augusta-fine sandy loam</u>		<b>Drainage Class:</b> <u>somewhat poorly drained</u>	
<b>Taxonomy (Subgroup):</b> <u>Aeric Ochroglepts</u>		<b>Field Observations</b> Confirm Mapped Type: Yes <input type="radio"/> No <input checked="" type="radio"/>	
<b>Profile Description:</b>			
<b>Depth</b> <b>Concretions,</b> <b>(inches)</b>	<b>Horizon</b>	<b>Matrix Color</b> <b>(Munsell Moist)</b>	<b>Mottle Colors</b> <b>(Munsell Moist)</b>
			<b>Mottle</b> <b>Abundance/Contrast</b>
			<b>Texture,</b> <b>Structure, etc.</b>
<u>0-1</u>	<u>O</u>		
<u>1-12+</u>	<u>A</u>	<u>10YR 3/2</u>	<u>10YR 4/3</u> <u>Common distinct</u> <u>loam</u>
<b>Hydric Soil Indicators:</b>			
<input type="checkbox"/> Histosol	<input type="checkbox"/> Concretions		
<input type="checkbox"/> Histic Epipedon	<input type="checkbox"/> High Organic Content in Surface layer in Sandy Soils		
<input type="checkbox"/> Sulfidic Odor	<input type="checkbox"/> Organic Streaking in Sandy Soils		
<input checked="" type="checkbox"/> Aquic Moisture Regime	<input checked="" type="checkbox"/> Listed on Local Hydric Soils List		
<input checked="" type="checkbox"/> Reducing Conditions	<input type="checkbox"/> Listed on National Hydric Soils List		
<input checked="" type="checkbox"/> Gleyed or Low-Chroma Colors	<input type="checkbox"/> Other (Explain in Remarks)		
<b>Remarks:</b> <u>Possible inclusion of Tomotley soils</u>			

**WETLAND DETERMINATION**

Hydrophytic Vegetation Present? <input checked="" type="radio"/> Yes <input type="radio"/> No (Circle) Wetland Hydrology Present? <input checked="" type="radio"/> Yes <input type="radio"/> No Hydric Soils Present? <input checked="" type="radio"/> Yes <input type="radio"/> No	(Circle) Is this Sampling Point Within a Wetland? <input checked="" type="radio"/> Yes <input type="radio"/> No
<b>Remarks:</b>	

Approved by HOUACE 2/92

HJL  
8/93

SA 05  
Upland

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

<b>Project/Site:</b> <u>B-4226 / Bear Swamp Canal</u> <b>Applicant/Owner:</b> <u>NC DOT</u> <b>Investigator:</b> <u>ESC - E. Schmitt</u>	<b>Date:</b> <u>12-17-02</u> <b>County:</b> <u>Perquimans</u> <b>State:</b> <u>NC</u>
<b>Do Normal Circumstances exist on the site?</b> Yes No <b>Is the site significantly disturbed (Atypical Situation)?</b> Yes No <b>Is the area a potential Problem Area?</b> Yes No (If needed, explain on reverse)	<b>Community ID:</b> <u>Upland</u> <b>Transect ID:</b> <u>SA 05</u> <b>Plot ID:</b> _____

**VEGETATION**

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. <u>Pinus taeda</u>	<u>C</u>	<u>FAC</u>	9. _____	_____	_____
2. <u>Quercus nigra</u>	<u>C</u>	<u>FAC</u>	10. _____	_____	_____
3. <u>Pinus strobus</u>	<u>C</u>	<u>FACU</u>	11. _____	_____	_____
4. <u>Acer rubrum</u>	<u>C</u>	<u>FAC</u>	12. _____	_____	_____
5. <u>Phytolacca americana</u>	<u>S</u>	<u>FACU+</u>	13. _____	_____	_____
6. <u>Liquidambar styr.</u>	<u>CS</u>	<u>FAC+</u>	14. _____	_____	_____
7. <u>Fragaria virginiana</u>	<u>S</u>	<u>FACU</u>	15. _____	_____	_____
8. _____	_____	_____	16. _____	_____	_____

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-)     57%

Remarks: \_\_\_\_\_

**HYDROLOGY**

<input type="checkbox"/> Recorded Data (Describe in Remarks): <input type="checkbox"/> Stream, Lake or Tide Gauge <input type="checkbox"/> Aerial Photographs <input type="checkbox"/> Other <input checked="" type="checkbox"/> No Recorded Data Available	<b>Wetland Hydrology Indicators:</b> <b>Primary Indicators:</b> <input type="checkbox"/> Inundated <input type="checkbox"/> Saturated in Upper 12 Inches <input type="checkbox"/> Water Marks <input type="checkbox"/> Drift Lines <input type="checkbox"/> Sediment Deposits <input type="checkbox"/> Drainage Patterns in Wetlands <b>Secondary Indicators (2 or more required):</b> <input type="checkbox"/> Oxidized Root Channels in Upper 12 Inches <input type="checkbox"/> Water-Stained Leaves <input type="checkbox"/> Local Soil Survey Data <input checked="" type="checkbox"/> FAC-Neutral Test <input type="checkbox"/> Other (Explain in Remarks)
<b>Field Observations:</b>  Depth of Surface Water: <u>0</u> (in.) Depth to Free Water in Pit: <u>712</u> (in.) Depth to Saturated Soil: <u>712</u> (in.)	Remarks: _____





Crustal @ SB-01

strongly down banks  
banks of fill

no flow ~ 16 ft deep

SA-02 well 2

soil: 0-1 organic

1-10 10 YR 2/1 @ loam

10+ 10 YR 2/1 sily clay loam, green

hd: st 10+ inches down

surface pits surfaced

veg: mostly; clump out, Symbas mgs

shrub: Ligustrum sinense

lvt: Vitis

Roadside dirt

Eubalia, Buchenae, Alnus, Larix, Sumbas,  
Festuca, Scleria, Pteridium, Zantheum  
Sambucus

Field

Zantheum, cordophora

SA-05 well 2

soil: 0-1 organic

1-12+ 10 YR 3/2 w/ mott 10 YR 4/3 loam

hd: surface ponding surfaced, Phragmites

veg: Symbas mgs, Conyza

shrub: Ligustrum, Rowan

lvt: Vitis, Sumbas

SA-05 well 1

soil: 0-1 organic

1-12+ 10 YR 5/3 loam

② Mixed Soil

Amis beds

Ases subum

Ligustrum

Ligustrum

Myrica caribaea

Rosa gracilis

Lonicera

Amurhensis

Sambucus

Vitis

③ Partially Hardwood

Ases subum

Toxodion bixibum

Syzygium

Vitis

partly mixed

open understory

④ began gone → shrub assemblage under way

Canal

1 aquatic unknown

Zoda

Najas

Polysiphonia

Lentina

⑤ Saturated Woodruff of shrub under way

Taxodium

Ligustrum

Sourwood

Cherrybark oak

Am Elm

Bridge B 17.5 x 5 = 87.5 ft long 30-ft wide  
concrete, 1 bent in canal w/ 6 vertical beam legs

St ditch, vegetated 3 ft wide flanked to W  
cut-bail, Eulalia, Juncus effusus, Ryegrass  
~~Zostera~~, *Potamogeton*, much mallow

SI recently timbered + cleared, no veg  
with 2 10 YR 2/1 saturated ponding  
upd 10 YR 3/3 no hyd

Bridge A 75 ft long, 25 ft wide