



STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION

MICHAEL F. EASLEY  
GOVERNOR

LYNDO TIPPETT  
SECRETARY

April 2, 2004

MEMORANDUM TO: Mr. H. Allen Pope, P.E.  
Division 3 Engineer

FROM: *for* Philip S. Harris, III, P.E., Manager *PHH*  
Office of the Natural Environment  
Project Development and  
Environmental Analysis Branch

SUBJECT: New Hanover County, Military Cutoff Road (SR1409) widening  
from north of US 74 to US 17. Work Order Number 8.2251001;  
TIP Number U-2734

The attached U. S. Army Corps of Engineers Individual Permit is the final Section 404 permit countersigned by the USACE 3/25/2004 and dated March 25, 2004. All conditions are identical to those in the packet transmitted to you on March 19, 2004. All environmental permits have been received for the construction of this project. Copies of these permits and the permit applications are posted at <http://www.ncdot.org/planning/pe/naturalunit/Permit.html>.

PSH/ang

Attachment

cc: Mr. Art McMillan, P.E.  
Mr. Omar Sultan  
Mr. Jay Bennett, P.E.  
Mr. David Chang, P.E.  
Mr. Randy Garris, P.E.  
Mr. Greg Perfetti, P.E.  
Mr. Mark Staley  
Mr. Mr. John F. Sullivan, III, FHWA  
Mr. Mason Herndon, Division 3 Environmental Officer

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

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

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

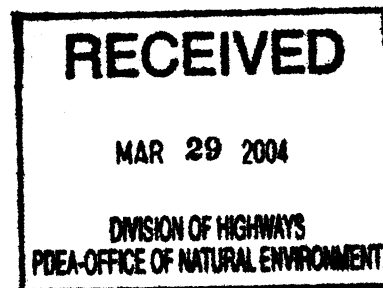
LOCATION:  
TRANSPORTATION BUILDING  
1 SOUTH WILMINGTON STREET  
RALEIGH NC



DEPARTMENT OF THE ARMY  
WILMINGTON DISTRICT, CORPS OF ENGINEERS  
P.O. BOX 1890  
WILMINGTON, NORTH CAROLINA 28402-1890

March 25, 2004

IN REPLY REFER TO



Regulatory Division

Subject: Action ID. 199701755; Tip No. U-2734

Dr. Gregory J. Thorpe, Ph.D.  
Environmental Management Director, PDEA  
N.C. Department of Transportation  
1548 Mail Service Center  
Raleigh, NC 27699-1548

Dear Dr. Thorpe:

In accordance with the written request of October 28, 2003, and the ensuing administrative record, enclosed is a permit to authorize the discharge of dredged and fill material into waters of the United States, for construction of the Military Cutoff Road (SR 1409) widening project from two lanes to a four lane divided facility with a raised median from Drysdale Drive to US 17 (Market Street), New Hanover County, North Carolina.

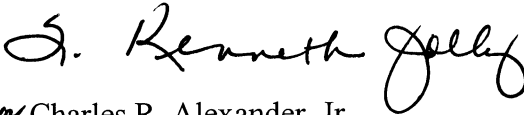
If any change in the authorized work is required because of unforeseen or altered conditions or for any other reason, the plans revised to show the change must be sent promptly to this office. Such action is necessary, as revised plans must be reviewed and the permit modified.

Carefully read your permit. The general and special conditions are important. Your failure to comply with these conditions could result in a violation of Federal law. Certain significant general conditions require that:

- a. You must complete construction before December 31, 2007.
- b. You must notify this office in advance as to when you intend to commence and complete work.
- c. You must allow representatives from this office to make periodic visits to your worksite as deemed necessary to assure compliance with permit plans and conditions.

Should you have questions, contact Mr. Dave Timpy of the Wilmington Field Office regulatory staff at telephone (910) 251-4634

Sincerely,

  
for Charles R. Alexander, Jr.  
Colonel, U.S. Army  
District Engineer

Enclosures

Copy Furnished with enclosures:  
Chief, Source Data Unit  
NOAA/National Ocean Service  
ATTN: Sharon Tear N/CS261  
1315 East-West Hwy., Rm 7316  
Silver Spring, MD 20910-3282

Copies Furnished with special conditions and plans:

Mr. Garland Pardue, Field Supervisor  
U.S. Fish and Wildlife Service  
Fish and Wildlife Enhancement  
Post Office Box 33726  
Raleigh, North Carolina 27636-3726

Mr. Ron Sechler  
National Marine Fisheries  
Service, NOAA  
Pivers Island  
Beaufort, North Carolina 28516

Mr. David Rackley  
National Marine Fisheries  
Service, NOAA  
219 Fort Johnson Road  
Charleston, South Carolina 29412-9110

Mr. Ronald Mikulak, Chief  
Wetlands Section - Region IV  
Water Management Division  
U.S. Environmental Protection Agency  
Atlanta Federal Center  
61 Forsyth Street, SW  
Atlanta, Georgia 30303

Mr. Doug Huggett  
Division of Coastal Management  
North Carolina Department of  
Environment and Natural Resources  
1638 Mail Service Center  
Raleigh, North Carolina 27699-1638

Mr. William D. Gilmore, P.E.  
EEP Transition Manager  
Ecosystem Enhancement Program  
1652 Mail Service Center  
Raleigh, NC 27699-1652

Mr. Ronald E. Ferrell, Program Manager  
Wetlands Restoration Program  
Division of Water Quality  
1619 Mail Service Center  
Raleigh, North, Carolina 27699-1619

DEPARTMENT OF THE ARMY PERMIT

RECEIVED

MAR 24 2004

REGULATORY

Permittee NC Department of Transportation

Permit No. 199701755

Issuing Office USAED, Wilmington

NOTE: The term "you" and its derivatives, as used in this permit, means the permittee or any future transferee. The term "this office" refers to the appropriate district or division office of the Corps of Engineers having jurisdiction over the permitted activity or the appropriate official of that office acting under the authority of the commanding officer.

You are authorized to perform work in accordance with the terms and conditions specified below.

Project Description:

Place fill material impacting a total of impacting a total of 1.45 acre of wetlands and 1,480 linear feet of perennial stream, for construction of the Military Cutoff Widening project (T.I.P. No. U-2734).

Project Location:

On Military Cutoff Road between Eastwood Wood and US Highway 17 and includes the widening of Military Cutoff Road to four lanes with a divided median and bicycle and pedestrian path, in New Hanover Counties.

Permit Conditions:

General Conditions:

1. The time limit for completing the work authorized ends on December 31, 2007. If you find that you need more time to complete the authorized activity, submit your request for a time extension to this office for consideration at least one month before the above date is reached.
2. You must maintain the activity authorized by this permit in good condition and in conformance with the terms and conditions of this permit. You are not relieved of this requirement if you abandon the permitted activity, although you may make a good faith transfer to a third party in compliance with General Condition 4 below. Should you wish to cease to maintain the authorized activity or should you desire to abandon it without a good faith transfer, you must obtain a modification of this permit from this office, which may require restoration of the area.
3. If you discover any previously unknown historic or archeological remains while accomplishing the activity authorized by this permit, you must immediately notify this office of what you have found. We will initiate the Federal and state coordination required to determine if the remains warrant a recovery effort or if the site is eligible for listing in the National Register of Historic Places.

e. Damage claims associated with any future modification, suspension, or revocation of this permit.

4. Reliance on Applicant's Data: The determination of this office that issuance of this permit is not contrary to the public interest was made in reliance on the information you provided.

5. Reevaluation of Permit Decision. This office may reevaluate its decision on this permit at any time the circumstances warrant. Circumstances that could require a reevaluation include, but are not limited to, the following:

a. You fail to comply with the terms and conditions of this permit.

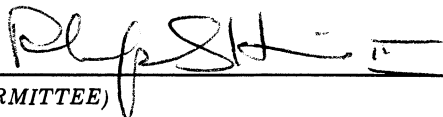
b. The information provided by you in support of your permit application proves to have been false, incomplete, or inaccurate (See 4 above).

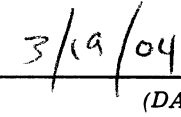
c. Significant new information surfaces which this office did not consider in reaching the original public interest decision.

Such a reevaluation may result in a determination that it is appropriate to use the suspension, modification, and revocation procedures contained in 33 CFR 325.7 or enforcement procedures such as those contained in 33 CFR 326.4 and 326.5. The referenced enforcement procedures provide for the issuance of an administrative order requiring you to comply with the terms and conditions of your permit and for the initiation of legal action where appropriate. You will be required to pay for any corrective measures ordered by this office, and if you fail to comply with such directive, this office may in certain situations (such as those specified in 33 CFR 209.170) accomplish the corrective measures by contract or otherwise and bill you for the cost.

6. Extensions. General condition 1 establishes a time limit for the completion of the activity authorized by this permit. Unless there are circumstances requiring either a prompt completion of the authorized activity or a reevaluation of the public interest decision, the Corps will normally give favorable consideration to a request for an extension of this time limit.

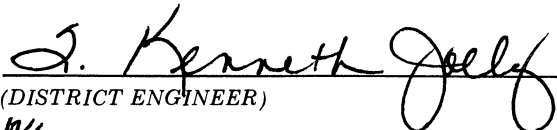
Your signature below, as permittee, indicates that you accept and agree to comply with the terms and conditions of this permit.

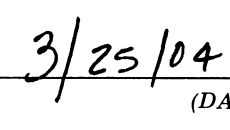
  
\_\_\_\_\_  
(PERMITTEE)


  
\_\_\_\_\_  
(DATE)

**NC DEPARTMENT OF TRANSPORTATION**

This permit becomes effective when the Federal official, designated to act for the Secretary of the Army, has signed below.

  
\_\_\_\_\_  
(DISTRICT ENGINEER)

  
\_\_\_\_\_  
(DATE)

  
CHARLES R. ALEXANDER, JR. COLONEL

When the structures or work authorized by this permit are still in existence at the time the property is transferred, the terms and conditions of this permit will continue to be binding on the new owner(s) of the property. To validate the transfer of this permit and the associated liabilities associated with compliance with its terms and conditions, have the transferee sign and date below.

\_\_\_\_\_  
(TRANSFeree)

\_\_\_\_\_  
(DATE)



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

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

March 17, 2004

Dr. Gregory J. Thorpe, Manager  
Planning and Environmental Branch  
North Carolina Department of Transportation  
1548 Mail Service Center  
Raleigh, North Carolina 27699-1548

Dear Dr. Thorpe:

Re: **Revised** 401 Water Quality Certification Pursuant to Section 401 of the Federal Clean Water Act,  
Proposed widening of Military Cutoff Road (SR 1409) from North of Eastwood Road (US 74) to Market Street (US 17) in New Hanover County.  
WQC Project No. 03-1327  
Corps Action ID No. 199701755  
TIP Number U -2734

Attached hereto is a copy of a revised Certification No. 3453 issued to The North Carolina Department of Transportation dated March 17, 2004.

If we can be of further assistance, do not hesitate to contact us.

Sincerely,

A handwritten signature in black ink, appearing to read "Alan W. Klimek", with a long horizontal line extending to the right. The signature is written over the printed name below it.  
for  
Alan W. Klimek, P.E.

Attachments

cc: Dave Timpy; Corps of Engineers Wilmington Field Office  
Noelle Lutheran, DWQ Wilmington Regional Office  
Cathy Brittingham, Division of Coastal Management  
Bill Gilmore, Ecosystem Enhancement Program  
Central Files  
File Copy





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

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

**NORTH CAROLINA 401 WATER QUALITY CERTIFICATION: REVISED**

**THIS REVISED CERTIFICATION** is issued in conformity with the requirements of Section 401 Public Laws 92-500 and 95-217 of the United States and subject to the North Carolina Division of Water Quality (DWQ) Regulations in 15 NCAC 2H, Section .0500. This Certification authorizes the NCDOT to place fill material in 1.45 acres of jurisdictional wetlands and 1480 linear feet of streams in New Hanover County. The project shall be constructed pursuant to the application dated October 28, 2003 to construct the widening of Military Cutoff Road.

**Wetland & Surface Water Impacts in the Cape Fear River Basin**

Section	Non-Riverine (acres)	Stream Impacts (linear feet)	Natural Channel Design (linear feet)
Site 1A	0	30	0
Site 1	0.06	1099	456
Site 2	0.19	131	0
Site 3	0.75	128	0
Site 4	0.32	0	0
Site 5	0	92	0
Site 6	0.11	0	0
Site 7	0.02	0	0
<b>Total</b>	<b>1.45</b>	<b>1480</b>	<b>456</b>

The application provides adequate assurance that the discharge of fill material into the waters of the Cape Fear River Basin in conjunction with the proposed development will not result in a violation of applicable Water Quality Standards and discharge guidelines. Therefore, the State of North Carolina certifies that this activity will not violate the applicable portions of Sections 301, 302, 303, 306, 307 of PL 92-500 and PL 95-217 if conducted in accordance with the application and conditions hereinafter set forth.

This approval is only valid for the purpose and design that you submitted in your application, as described in the Public Notice. Should your project change, you are required to notify the DWQ and you may be required to submit a new application. If the property is sold, the new owner must be given a copy of this Certification and approval letter, and is thereby responsible for complying with all the conditions. If additional wetland or stream impacts occur for this project (now or in the future), then additional compensatory mitigation will be required as described in 15A NCAC 2H .0506 (h) (6) and (7). For this approval to remain valid, you are required to comply with all the conditions listed below. In addition, you should obtain all other federal, state or local permits before proceeding with your project including (but not limited to) Sediment and Erosion control, Coastal Stormwater, Non-discharge and Water Supply watershed regulations. This Certification shall expire three years from the date of the cover letter from DWQ or on the same day as the expiration date of the corresponding Corps of Engineers Permit, whichever is sooner.





**Condition(s) of Certification:**

1. Construction must be conducted in such a manner as to prevent a significant increase in turbidity outside the area of construction or construction-related discharge. Erosion and sediment control practices must be in full compliance with all specifications governing the proper design, installation and operation and maintenance of such Best Management Practices in order to assure compliance with the appropriate turbidity water quality standard.
  - a. The erosion and sediment control measures for the project must equal or exceed the proper design, installation, operation and maintenance outlined in the most recent version of the North Carolina Sediment and Erosion Control Planning and Design Manual. These devices shall be maintained on all construction sites, borrow sites, and waste pile (spoil) projects, including contractor-owned or leased borrow pits associated with the project.
  - b. For borrow pit sites, the erosion and sediment control measures must equal or exceed the proper design, installation, operation and maintenance outlined in the most recent version of the North Carolina Surface Mining Manual. The reclamation measures and implementation must comply with the reclamation in accordance with the requirements of the Sedimentation Pollution Control Act.
2. Sediment and erosion control measures shall not be placed in wetlands or waters to the maximum extent practicable. If placement of sediment and erosion control devices in wetlands and waters is unavoidable, they shall be removed and the natural grade restored after the Division of Land Resources has released the project;
3. The NCDOT shall strictly adhere to sediment and erosion control Best Management Practices as described for High Quality Waters entitled "Design Standards in Sensitive Watersheds" (15A NCAC 04B .0124) throughout design and construction of the entire project (TIP U-2734).
4. The outside edge of the buffer, wetland or water boundary as well as along the construction corridor within these boundaries approved under this authorization shall be clearly marked by orange fabric fencing for the areas that have been approved to infringe within the buffer, wetland or water prior to any land disturbing activities.
5. If an environmental document is required, this Certification is not valid until a FONSI or ROD is issued by the State Clearinghouse. All water quality-related conditions of the FONSI or ROD shall become conditions of this Certification;
6. No live or fresh concrete shall come into contact with waters of the state until the concrete has hardened.
7. There shall be no excavation from or waste disposal into jurisdictional wetlands or waters associated with this permit without appropriate modification of this permit. Should waste or borrow sites be located in wetlands or stream, compensatory mitigation will be required since it is a direct impact from road construction activities.



8. All channel relocations will be constructed in a dry work area, and stabilized before stream flows are diverted. Channel relocations will be completed and stabilized prior to diverting water into the new channel. Whenever possible, channel relocations shall be allowed to stabilize for an entire growing season. Vegetation used for bank stabilization shall be limited to native woody species, and should include establishment of a 30-foot wide wooded and an adjacent 20-foot wide vegetated buffer on both sides of the relocated channel to the maximum extent practical. A transitional phase incorporating coir fiber and seedling establishment is allowable. Also, rip-rap may be allowed if it is necessary to maintain the physical integrity of the stream, but the applicant must provide additional, written justification and any calculations used to determine the extent of rip-rap coverage requested.
9. During the construction of the project, no staging of equipment of any kind is permitted in waters of the U.S., or protected riparian buffers.
10. All temporary fills in wetlands and surface waters shall be removed upon completion of the project. In addition, the post-construction removal of any temporary bridge structures or fill will need to return the project site to its pre-construction contours and elevations. The revegetation of the impacted areas with appropriate native species will be required.
11. Riparian vegetation must be reestablished within the construction limits of the project by the end of the growing season following completion of construction.
12. The dimension, pattern and profile of the stream above and below the crossing should not be modified by widening the stream channel or reducing the depth of the stream. Disturbed floodplains and streams should be restored to natural geomorphic conditions.
13. Any riprap used must not interfere with the location or dimensions of the stream's thalweg or aquatic life passage during low flow conditions.
14. All mechanized equipment operated near surface waters must be regularly inspected and maintained to prevent contamination of stream waters from fuels, lubricants, hydraulic fluids, or other toxic materials.
15. Discharging hydroseed mixtures and washing out hydroseeders and other equipment in or adjacent to surface waters is prohibited.
16. NCDOT, and its authorized agents, shall conduct its activities in a manner consistent with State water quality standards (including any requirements resulting from compliance with §303(d) of the Clean Water Act) and any other appropriate requirements of State law and Federal law. If DWQ determines that such standards or laws are not being met (including the failure to sustain a designated or achieved use) or that State or federal law is being violated, or that further conditions are necessary to assure compliance, DWQ may reevaluate and modify this certification to include conditions appropriate to assure compliance with such standards and requirements in accordance with 15A NCAC 2H.0507(d). Before modifying the certification, DWQ shall notify NCDOT and the US Army Corps of Engineers, provide public notice in



accordance with 15A NCAC 2H.0503 and provide opportunity for public hearing in accordance with 15A NCAC 2H.0504. Any new or revised conditions shall be provided to NCDOT in writing, shall be provided to the United States Army Corps of Engineers for reference in any permit issued pursuant to Section 404 of the Clean Water Act, and shall also become conditions of the 404 Permit for the project.

17. A copy of this Water Quality Certification shall be posted on the construction site at all times. In addition, the Water Quality Certification (and all subsequent modifications, if any, shall be maintained with the Division Engineer and the on-site project manager.
18. Culverts that are less than 48-inch in diameter should be buried to a depth equal to or greater than 20% of their size to allow for aquatic life passage. Culverts that are 48-inch diameter or larger should be buried at least 12 inches below the stream bottom to allow natural stream bottom material to become established in the culvert following installation and to provide aquatic life passage during periods of low flow. This may require increasing the size of the culvert to meet flow conveyance requirements. If any of the existing pipes are perched, they shall be removed and replaced, and re-installed correctly, unless demonstrated that this is topographically unfeasible.
19. Compensatory mitigation shall be done for impacts to 1.45 acres of jurisdictional non-riverine wetlands. At a replacement ratio of 2:1, 2.90 acres of mitigation for non-riverine wetlands shall be provided. Performance of mitigation through use of the NC Ecosystem Enhancement Program is hereby approved. An effort shall be made to provide the wetland mitigation in the Howe Creek watershed. If suitable mitigation sites are not available for use in the Howe Creek watershed, then EEP shall provide a minimum of 1.45 acres of restoration of non-riverine wetlands in the Hydrologic Cataloging Unit 03030001040010 or 03030001040020 by July 22, 2005. The EEP will provide 14.5 acres of preservation in the Southern Outer Coastal Plain by July 22, 2005 and half of the proposed preservation mitigation would be available at that time for mitigation for other project impacts. Flexible wetland mitigation in the Howe Creek watershed is acceptable to the Division of Water Quality to meet a portion of this requirement.
20. Compensatory mitigation shall be done for impacts to 1044 linear feet of streams. At a replacement ratio of 1:1, 1044 linear feet of mitigation for streams shall be provided. 456 linear feet of streams shall be mitigated through the use of on-site restoration (at a replacement ratio of 1:1) of a UT to Howe Creek. The restoration shall be constructed in accordance with a final design approved by the NC Division of Water Quality. If the NC Division of Water Quality does not comment on or approve the previously submitted on-site stream mitigation plan by April 15, 2004, then that plan is automatically approved. In addition, mitigation for 122 linear feet of streams shall be provided through the use of on-site preservation of 614 linear feet of streams (preservation ratio of 5:1).

Finally, 902 linear feet of streams shall be mitigated through the use of off-site stream mitigation. Performance of mitigation through use of the NC Ecosystem Enhancement Program is hereby approved. An effort shall be made to provide the stream mitigation in the Howe Creek watershed. If suitable mitigation sites are not available for use in the



Howe Creek watershed, then EEP shall notify DWQ of the search results and shall provide a minimum of 902 linear feet of stream mitigation in the Hydrologic Cataloging Unit 03030001040010 or 03030001040020 by July 22, 2005. Flexible stream mitigation in the Howe Creek watershed is acceptable to the Division of Water Quality to meet a portion of this requirement.

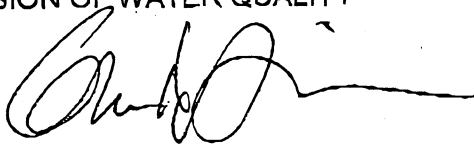
21. Two copies of the final construction drawings shall be furnished to NCDWQ prior to the pre-construction meeting. Written verification shall be provided along with these final construction drawings. This confirmation must state that the final construction drawings comply with the attached permit drawings contained in the application dated October 28, 2003.
22. Upon completion of the project, the NCDOT shall complete and return the enclosed "Certification of Completion Form" to notify DWQ when all work included in the 401 Certification has been completed. The responsible party shall complete the attached form and return it to the 401/Wetlands Unit of the Division of Water Quality upon completion of the project.

Violations of any condition herein set forth may result in revocation of this Certification and may result in criminal and/or civil penalties. This Certification shall become null and void unless the above conditions are made conditions of the Federal 404 and/or Coastal Area Management Act Permit. This Certification shall expire upon the expiration of the 404 or CAMA permit.

If this Certification is unacceptable to you have the right to an adjudicatory hearing upon written request within sixty (60) days following receipt of this Certification. 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, N.C. 27699-76714. If modifications are made to an original Certification, you have the right to an adjudicatory hearing on the modifications upon written request within sixty (60) days following receipt of the Certification. Unless such demands are made, this Certification shall be final and binding.

This the 17<sup>th</sup> day of March 2004

DIVISION OF WATER QUALITY

  
for Alan W. Klimek, P.E.

WQC No. 3453



**Certificate of Completion**

DWQ Project No.: \_\_\_\_\_ County: \_\_\_\_\_

Applicant: \_\_\_\_\_

Project Name: \_\_\_\_\_

Date of Issuance of 401 Water Quality Certification: \_\_\_\_\_

**Certificate of Completion**

Upon completion of all work approved within the 401 Water Quality Certification or applicable Buffer Rules, and any subsequent modifications, the applicant is required to return this certificate to the 401/Wetlands Unit, North Carolina Division of Water Quality, 1650 Mail Service Center, Raleigh, NC, 27699-1621. This form may be returned to DWQ by the applicant, the applicant's authorized agent, or the Project Engineer. It is not necessary to send certificates from all of these.

**Applicant's Certification**

I, \_\_\_\_\_, hereby state that, to the best of my abilities, due care and diligence was used in the observation of the construction such that the construction was observed to be built within substantial compliance and intent of the 401 Water Quality Certification and Buffer Rules, the approved plans and specifications, and other supporting materials.

Signature: \_\_\_\_\_ Date: \_\_\_\_\_

**Agent's Certification**

I, \_\_\_\_\_, hereby state that, to the best of my abilities, due care and diligence was used in the observation of the construction such that the construction was observed to be built within substantial compliance and intent of the 401 Water Quality Certification and Buffer Rules, the approved plans and specifications, and other supporting materials.

Signature: \_\_\_\_\_ Date: \_\_\_\_\_

**If this project was designed by a Certified Professional**

I, \_\_\_\_\_, as a duly registered Professional \_\_\_\_\_ (i.e., Engineer, Landscape Architect, Surveyor, etc.) in the State of North Carolina, having been authorized to observe (periodically, weekly, full time) the construction of the project, for the Permittee hereby state that, to the best of my abilities, due care and diligence was used in the observation of the construction such that the construction was observed to be built within substantial compliance and intent of the 401 Water Quality Certification and Buffer Rules, the approved plans and specifications, and other supporting materials.

Signature \_\_\_\_\_ Registration No. \_\_\_\_\_

Date \_\_\_\_\_



North Carolina Department of Environment and Natural Resources  
**Division of Coastal Management**

Michael F. Easley, Governor

Charles S. Jones, Director

William G. Ross Jr., Secretary

March 18, 2004

Colonel Charles R. Alexander  
U.S. Army Corps of Engineers  
Wilmington District  
P.O. Box 1890  
Wilmington, NC 28402-1890

Reference: TIP No. U-2734. Widening of Military Cutoff Road (SR 1409) from North of Eastwood Road (US 74) to Market Street (US 17) in New Hanover County. USACE Public Notice issued on 12/8/03. Action ID No. 199701755.

Dear Colonel Alexander:

The N.C. Division of Coastal Management (DCM) has completed its review of the above referenced Public Notice pursuant to 15 CFR 930 Subpart D, Consistency for Activities requiring a Federal License and NC Executive Order 15, Consistency for State Activities. As part of its review, DCM has also circulated the U.S. Army Corps of Engineers' (USACE) public notice to state agency reviewers for comment.

According to the USACE public notice issued on 12/8/03, the USACE is reviewing an application from the N.C. Department of Transportation (NCDOT) to widen Military Cutoff Road (SR 1409) from two lanes to a four lane divided facility with a raised median from Drysdale Drive to US 17 (Market Street). From Drysdale Drive to 0.2 miles north of Drysdale Drive and from Station Road to Paradise Way, a four-lane divided with raised median roadway with grassed shoulders is proposed on the west side and curb and gutter is proposed along the east side of Military Cutoff. From 0.2 miles north of Drysdale Drive to Station Road, a four-lane grassed shoulder section is proposed. From Paradise Way to US 17, a four-lane curb and gutter section is proposed. A 10-foot wide bicycle and pedestrian path is proposed along the east side of Military Cutoff from Drysdale Drive to the Gordon Road Extension project (TIP Project No. U-2725)

According to the USACE public notice issued on 12/8/03, the proposed project crosses Howe Creek and four of its unnamed tributaries. The portion of Howe Creek and its tributaries within the project have been assigned a DWQ Index No. of 18-87-23 and best usage classification of SA, ORW. Waters with a classification of SA, ORW are defined as High Quality Waters by the North Carolina Division of Water Quality.

1638 Mail Service Center, Raleigh, North Carolina 27699-1638  
Phone: 919-733-2293 \ FAX: 919-733-1495 \ Internet: [www.nccoastalmanagement.net](http://www.nccoastalmanagement.net)

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According to the USACE public notice issued on 12/8/03, construction of the proposed project will permanently impact 1.45 acres of non-riverine wetlands and 1480 feet of jurisdictional stream associated with Howe Creek. Permanent impacts to jurisdictional wetlands are summarized as follows: wet pine flatwoods (0.06 acres); bottomland hardwoods (0.32 acres); and pond pine woodland (1.07 acres). The NCDOT is proposing to use onsite mitigation opportunities and the North Carolina Ecosystem Enhancement Program (EEP) to provide the necessary compensatory mitigation for the unavoidable wetland and stream impacts associated with this project.

DCM has determined that the proposed project as described in the USACE public notice issued on 12/8/03 is **consistent** with the North Carolina Coastal Management Program provided the following conditions are met:

1. NCDOT shall comply with the Stormwater Permit (No. SW8 030816) issued on 10/20/03 by the N.C. Division of Water Quality (DWQ) under stormwater management rules of the Environmental Management Commission.
2. NCDOT shall comply with the revised Water Quality Certification No. 3453 (DWQ Project No. 03-1327) issued on 3/17/04 by the N.C. Division of Water Quality (DWQ).
3. In accordance with NCDOT's permit application for Section 404 and 401 permits dated 10/28/03, compensatory mitigation for 1.45 acres of non-riverine wetland impacts will be provided by the North Carolina Ecosystem Enhancement Program (EEP).
4. In accordance with the NCDOT letter to the Ecosystem Enhancement Program dated 2/6/04, compensatory mitigation for 1480 feet of stream impacts will be as follows: Natural channel design and relocation of 456 linear feet of stream impacted within Site 1 of U-2734 at a mitigation ratio of 1:1; preservation of 614 linear feet of stream within the Site 1 right-of-way of U-2734 at a mitigation ratio of 5:1; and compensatory mitigation provided by the EEP for the remaining 902 linear feet of stream impacts.
5. This project must comply with the Design Standards in Sensitive Watersheds, 15A NCAC 4B .0124.
6. In accordance with NCDOT's cover letter for the Section 404 and 401 permit application dated 10/28/03, construction related impacts associated with the proposed action will be minimized through the use of High Quality Waters erosion and sediment control measures.
7. The permittee shall follow Best Management Practices for the protection of Surface Waters and sedimentation and erosion control measures sufficient to protect aquatic resources.
8. In accordance with NCDOT's cover letter for the Section 404 and 401 permit application dated 10/28/03, the project shall not result in any temporary wetland impacts.

9. Culverts and pipes must be designed to allow for aquatic life and fish passage. The inverts of all pipes and culverts that are placed within streams appearing as blue lines on United States Geological Survey (USGS) quad sheets must be buried at least one foot below normal bed elevation.
10. The inverts of culverts and pipes that are not placed within streams appearing as blue lines on United States Geological Survey (USGS) quad sheets must be buried a minimum of one foot below the bed of the stream for pipes and culverts greater than 48 inches in diameter, and must be buried below the bed of the stream to a depth equal to or greater than 20 percent of the diameter of the pipe or culvert for pipes and culverts that are 48 inches in diameter or smaller to allow for aquatic life passage. These measurements must be based on natural thalweg depths.
11. The dimension, pattern and profile of the stream above and below the base flow barrel(s) should not be modified by widening the stream channel or reducing the depth of the stream.
12. Riprap placed for bank stabilization should be limited to the streambank below the high water mark, and vegetation should be used for stabilization above the high water elevation.
13. Heavy equipment should be operated from the bank rather than in the stream channel in order to minimize sedimentation and reduce the likelihood of introducing other pollutants into the streams.
14. If concrete is used during construction, adequate precautions must be taken to prevent direct contact between wet (uncured) concrete and stream water due to the potential for elevated pH that can cause a fish kill. Water that has contacted uncured concrete should not be discharged to surface waters.
15. Discharging hydroseeding mixtures and washing out hydroseeders and other equipment in or adjacent to surface waters is strictly prohibited.
16. In accordance with comments received from the N.C. Division of Land Resources, all DOT land disturbing activity must be in compliance with the N.C. Sedimentation Pollution Control Act and conform with the Memorandum of Understanding that DOT has with the N.C. Division of Land Resources.
17. Any relocation of utility lines that is not already depicted on the workplan drawings, or described within the permit application, will require approval by DCM, either under the authority of this consistency determination, or by the utility company obtaining separate authorization.




In addition to the above conditions, DCM also offers the following comments.

- If multiple barrels are required, barrels other than the base flow barrel(s) should be placed on or near stream bankfull or floodplain bench elevation (similar to Lyonsfield design). This may be accomplished by utilizing sills on the upstream end to restrict or divert flow to the base flow barrel(s) during low flows to accommodate fish movement. Install alternating or notched baffles in a manner that mimics existing stream pattern. This should enhance aquatic life passage by depositing sediments in the barrel, maintaining channel depth and flow regimes, and providing resting places for fish and other aquatic organisms. In essence, base flow barrel(s) should provide a continuum of water depth and channel width without substantial modifications of velocity.
- Stormwater should be routed to buffer areas and not discharge directly to the streams.

If you have any questions regarding DCM's finding or conditions, please contact Cathy Brittingham at (919) 733-2293 x238 or via e-mail at [Cathy.Brittingham@ncmail.net](mailto:Cathy.Brittingham@ncmail.net). Thank you for your consideration of the North Carolina Coastal Management Program.

Sincerely,

  
Charles S. Jones

Cc: Dave Timpy, USACE  
John Hennessy, NCDWQ  
Linda Lewis, NCDWQ  
Jim Gregson, NCDCM  
Bill Arrington, NCDCM  
Travis Wilson, NCWRC  
Elizabeth Lusk, NCDOT  
Bill Gilmore, NCDENR-EEP

## **SPECIAL CONDITIONS**

### **Military Cutoff Widening TIP Project No. U-2734 Action ID 199701755**

Special Conditions to be placed on the Department of the Army permit:

1. All work must be performed as shown on the attached plans, which are a part of this permit. Failure to institute and carry out the details of the following special conditions, below, will result in a directive to cease all ongoing and permitted work within waters and/or wetlands associated with the permitted project, or such other remedies and/or fines as the District Engineer or his authorized representatives may seek.
2. One copy of the final construction drawings shall be furnished to the District Engineer prior to the pre-construction meeting. Written verification shall be provided that the final construction drawings comply with the attached permit drawings. The permittee shall ensure that the construction design plans for this project do not deviate from the permit plans attached to this authorization. Any deviation in the construction design plans shall be brought to the attention of the Corps of Engineers, Mr. Dave Timpy, Wilmington Regulatory Field Office prior to any active construction in waters or wetlands.
3. The permittee shall schedule a preconstruction meeting between its representatives, the contractor's representatives, and the Corps of Engineers, Wilmington Regulatory Field Office NCDOT Regulatory Project Manager, prior to any work within jurisdictional waters and wetlands to ensure that there is a mutual understanding of all of the terms and conditions contained within this Department of the Army Permit. The permittee shall notify the Corps of Engineers Project Manager a minimum of thirty (30) days in advance of the scheduled meeting in order to provide that individual with ample opportunity to schedule and participate in the required meeting.
4. The permittee shall require its contractors and/or agents to comply with the terms and conditions of this permit in the construction and maintenance of this project, and shall provide each of its contractors and/or agents associated with the construction or maintenance of this project with a copy of this permit. Copies of this permit and any modifications authorized by the USACE shall be available for review at the construction site at all times. All violations, including non-compliance of these conditions, of the authorized permit shall be reported to the District Engineer within 24 hours of the violation.
5. The temporary placement or double handling of excavated or fill material or construction equipment and materials within waters and wetlands is not authorized.
6. All fill material must be adequately stabilized at the earliest practicable date to prevent erosion of fill material into adjacent waters or wetlands.

7. All fill material will be clean and free of any pollutants except in trace quantities.
8. The permittee shall remove all sediment and erosion control measures placed in wetlands or waters, and restore natural grades in those areas, prior to final inspection of the project.
9. This permit authorizes the clearing of an additional ten (10) feet beyond the slope stake limits in wetlands, as shown on the plans, to install the necessary sediment and erosion control measures.
10. The permittee shall take measures to prevent live or fresh concrete from coming into contact with any surface waters until the concrete has hardened.
11. The permittee will maintain the authorized work in good condition and in conformance with the terms and conditions of this permit. The permittee is not relieved of this requirement if he abandons the permitted activity without having it transferred to a third party.
12. No attempt will be made by the permittee to prevent the full and free use by the public of all navigable waters at or adjacent to the authorized work. Use of the permitted activity must not interfere with the public's right to free navigation on all navigable waters of the United States.
13. The permittee understands and agrees that, if future operations by the United States require the removal, relocation, or other alteration of the structures or work herein authorized, or if, in the opinion of the Secretary of the Army or his authorized representative, said structure or work shall cause unreasonable obstruction to the free navigation of the navigable water, the permittee will be required, upon due notice from the Corps of Engineers, to remove, relocate, or alter the structural work or obstructions caused thereby, without expense to the United States. No claim shall be made against the United States on account of any such removal or alteration.
14. Compensatory mitigation for the 1.45 acres of wetland impacts and 1480 feet of perennial stream impacts associated with his project shall be performed as described in the letter from the North Carolina Department of Transportation dated February 6, 2004 and as detailed in the following conditions:
  - a. Natural channel design and relocation of 456 linear feet of stream impacted within Site 1 of U-2734 at a mitigation ratio of 1:1 or 456 mitigation credits.
  - b. Preservation of 614 linear feet of stream within the Site 1 right-of-way of U-2734 at a mitigation ratio of 5:1 or 122 (614/5) mitigation credits. This stream is located at Stations 22+10 to 22+80 and 23+40 to 24+50.
  - c. The EEP will provide the compensatory mitigation to address the remaining 902 linear feet of stream impacts.

Compensatory mitigation for the unavoidable impacts to 1.45 acres of wetland and 902 linear feet of perennial stream associated with the proposed project shall be provided by the Ecosystem Enhancement Program (EEP), as outlined in the letter dated March 11, 2004 from William D. Gilmore, EEP Transition Manager. The EEP will provide 14.5 acres of preservation of non-riverine wetlands and 9,020 linear feet of preservation of warm water

stream channel in the Southern Outer Coastal Plain Eco-Region at the Hancock Timber Site in Pender County that has been acquired and protected by the EEP. Pursuant to the EEP Memorandum of Agreement (MOA) between the State of North Carolina and the US Army Corps of Engineers signed on July 22, 2003, the EEP will provide a minimum of 1.45 acres of restoration of non-riverine wetlands and 902 linear feet of restoration of warm water stream channel in the Howe Creek watershed (Hydrologic Cataloging Unit 03030001040020; Note: a mitigation site located in Hydrologic Catalog Unit 03030001040010 may be used if a mitigation site in Hydrologic Catalog Unit 03030001040020 is not available) by July 22, 2005 and half of the proposed preservation mitigation would be available at that time for mitigation for other project impacts. Construction within wetlands on the permitted highway project shall begin only after the EEP has provided written confirmation to the District Engineer that the EEP and not the NCDOT is responsible for providing the required mitigation, pursuant to Paragraph VI.B.7 of the MOA. The NCDOT shall, within 30 days of the issue date of this permit, certify that sufficient funds have been provided to EEP to complete the required mitigation, pursuant to Paragraph V. of the MOA.

15. All land disturbing activity associated with the highway construction will be conducted in a way that prevents a significant increase in turbidity outside the area of construction or construction-related discharge. Increases such that the turbidity in the water body is 50 NTU's or less is not considered significant.

16. The permittee and its contractors and/or agents shall not excavate, fill, or perform mechanized landclearing at any time in the construction or maintenance of this project within waters and/or wetlands, or cause the degradation of waters and/or wetlands, except as authorized by this permit, or any modification to this permit. There shall be no excavation from, waste disposal into, or degradation of, jurisdictional wetlands or waters associated with this permit without appropriate modification of this permit, including appropriate compensatory mitigation. This prohibition applies to all borrow and fill activities connected with this project.

17. To ensure that all borrow and waste activities occur on high ground and do not result in the degradation of adjacent wetlands and streams, except as authorized by this permit, the permittee shall require its contractors and/or agents to identify all areas to be used to borrow material, or to dispose of dredged, fill, or waste material. The permittee shall ensure that all such areas comply with the preceding condition (17.) of this permit, and shall require and maintain documentation of the location and characteristics of all borrow and disposal sites associated with this project. This information will include data regarding soils, vegetation and hydrology sufficient to clearly demonstrate compliance with the preceding condition (17.). All information will be available to the Corps of Engineers upon request. NCDOT shall require its contractors to complete and execute reclamation plans for each waste and borrow site and provide written documentation that the reclamation plans have been implemented and all work is completed. This documentation will be provided to the Corps of Engineers within 30 days of the completion of the reclamation work. All jurisdictional wetland lines on borrow and waste sites shall be verified by the Corps of Engineers and shown on the approved reclamation plans.

18. If the permittee discovers any previously unknown historic or archeological remains while accomplishing the authorized work, he will immediately notify the Wilmington District Engineer who will initiate the required State/Federal coordination.

19. All culverts must be buried to a depth of at least one foot below the bed of the stream or wetland.

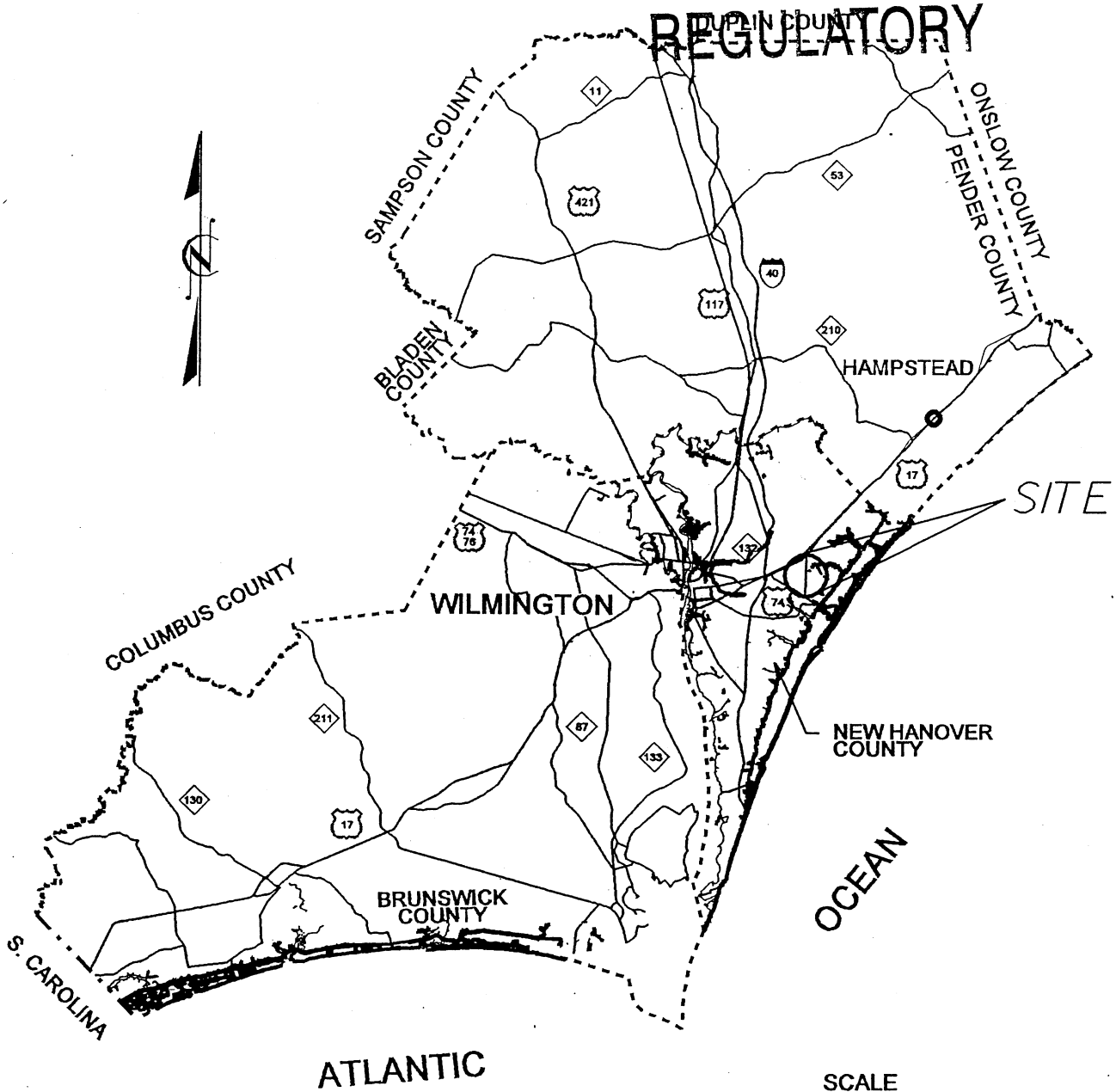
20. Aquatic Life Movements. No activity may substantially disrupt the movement of those species of aquatic life indigenous to the waterbody, including those species which normally migrate through the area, unless the activity's primary purpose is to impound water. Culverts placed in streams must be installed to maintain low flow conditions.

21. All conditions attached to the Section 401 Water Quality Certification for this project, issued March 17, 2004, are incorporated as conditions of this permit.

RECEIVED

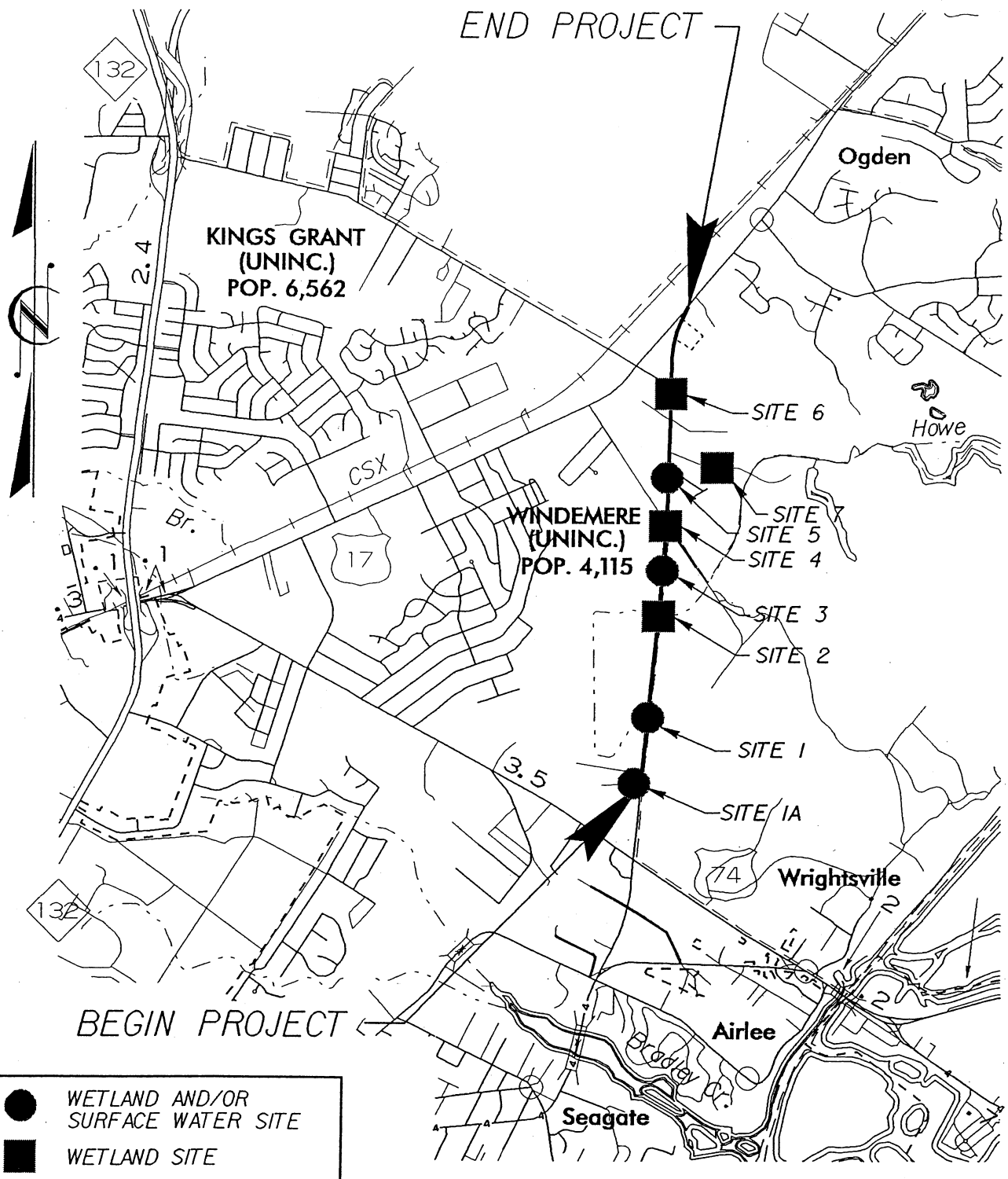
OCT 29 2004

REGULATORY



VICINITY  
MAP

N.C. DEPT. OF TRANSPORTATION  
DIVISION OF HIGHWAYS  
NEW HANOVER COUNTY  
PROJECT 34857.1.1 (U-2734)  
MILITARY CUT-OFF ROAD  
IN WILMINGTON, NC



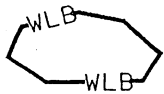
● WETLAND AND/OR SURFACE WATER SITE  
 ■ WETLAND SITE

# SITE MAP


N.C. DEPT. OF TRANSPORTATION  
 DIVISION OF HIGHWAYS  
 NEW HANOVER COUNTY  
 PROJECT: 34857.1.1 (U-2734)  
 MILITARY CUT-OFF ROAD  
 IN WILMINGTON, NC

# LEGEND

— WLB — WETLAND BOUNDARY


 WETLAND

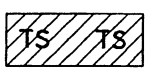
 DENOTES FILL IN WETLAND

 DENOTES FILL IN SURFACE WATER

 DENOTES FILL IN SURFACE WATER (POND)

 DENOTES TEMPORARY FILL IN WETLAND

 DENOTES EXCAVATION IN WETLAND

 DENOTES TEMPORARY FILL IN SURFACE WATER

 DENOTES MECHANIZED CLEARING

← ← FLOW DIRECTION

— TB — TOP OF BANK

--- WE --- EDGE OF WATER

--- C --- PROP. LIMIT OF CUT

--- F --- PROP. LIMIT OF FILL

—▲— PROP. RIGHT OF WAY

--- NG --- NATURAL GROUND

--- PL --- PROPERTY LINE

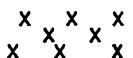
— TDE — TEMP. DRAINAGE EASEMENT


— PDE — PERMANENT DRAINAGE EASEMENT

— EAB — EXIST. ENDANGERED ANIMAL BOUNDARY

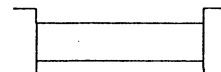
— EPB — EXIST. ENDANGERED PLANT BOUNDARY

---▽--- WATER SURFACE

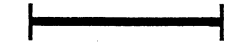
 LIVE STAKES


 BOULDER

— — — CORE FIBER ROLLS

 PROPOSED BRIDGE

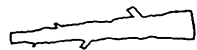
 PROPOSED BOX CULVERT


 PROPOSED PIPE CULVERT  
 (DASHED LINES DENOTE EXISTING STRUCTURES)  
 12"-48" PIPES  
 54" PIPES & ABOVE


 SINGLE TREE

———— WOODS LINE

———— DRAINAGE INLET

 LOG VANE

 RIP RAP

 ADJACENT PROPERTY OWNER OR PARCEL NUMBER IF AVAILABLE

———— BZ1 ——— BUFFER ZONE 1

———— BZ2 ——— BUFFER ZONE 2

**N.C. DEPT. OF TRANSPORTATION  
DIVISION OF HIGHWAYS**

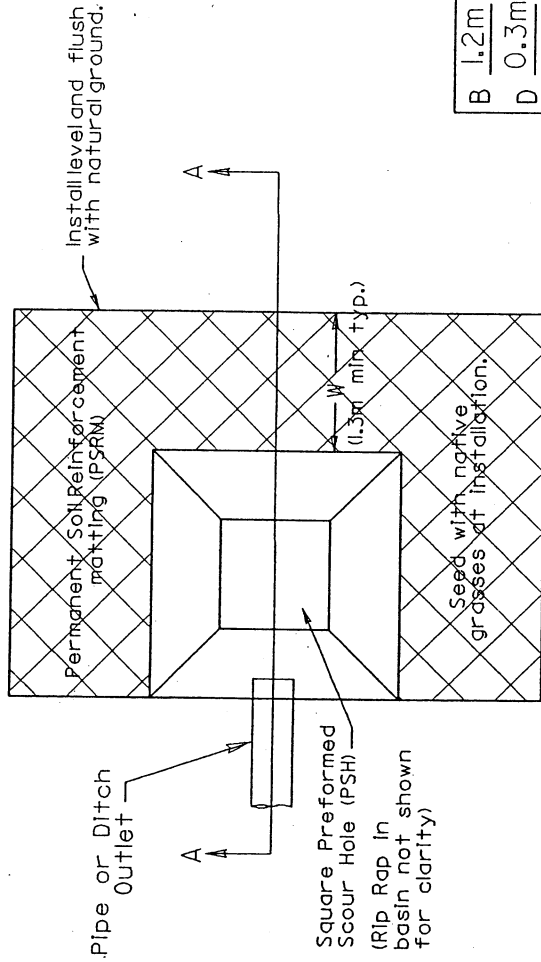
**NEW HANOVER COUNTY**

**PROJECT: 34857.1.1 (U-2734)  
MILITARY CUT-OFF ROAD  
IN WILMINGTON, NC**



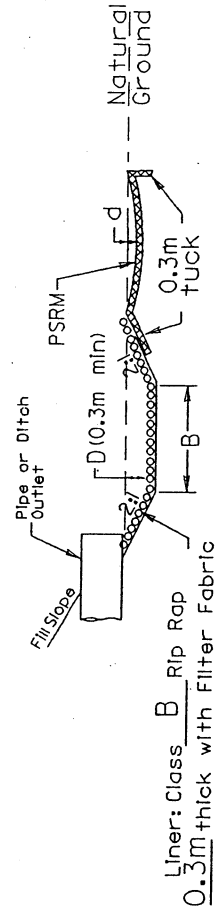
# PREFORMED SCOUR HOLE

PLAN VIEW

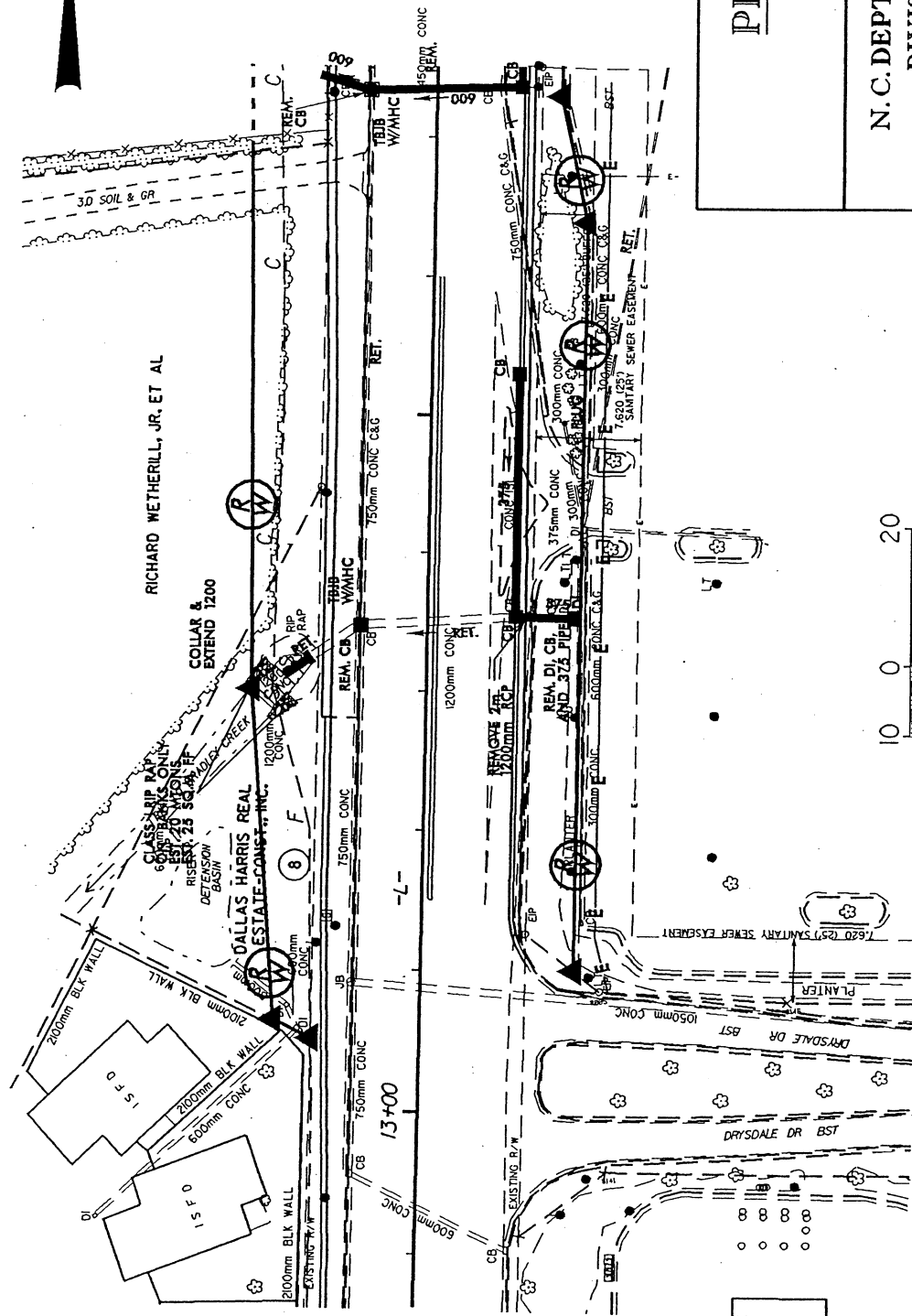


B	1.2m
D	0.3m
W	1.3m
d	0.15m

SECTION A-A



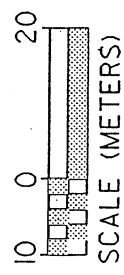
**NCDOT**  
 DIVISION OF HIGHWAYS  
 NEW HANOVER COUNTY  
 PROJECT: 34857.11 (U-2734)  
 MILITARY CUTOFF ROAD  
 IN WILMINGTON, NC



PLAN VIEW  
SITE 1A

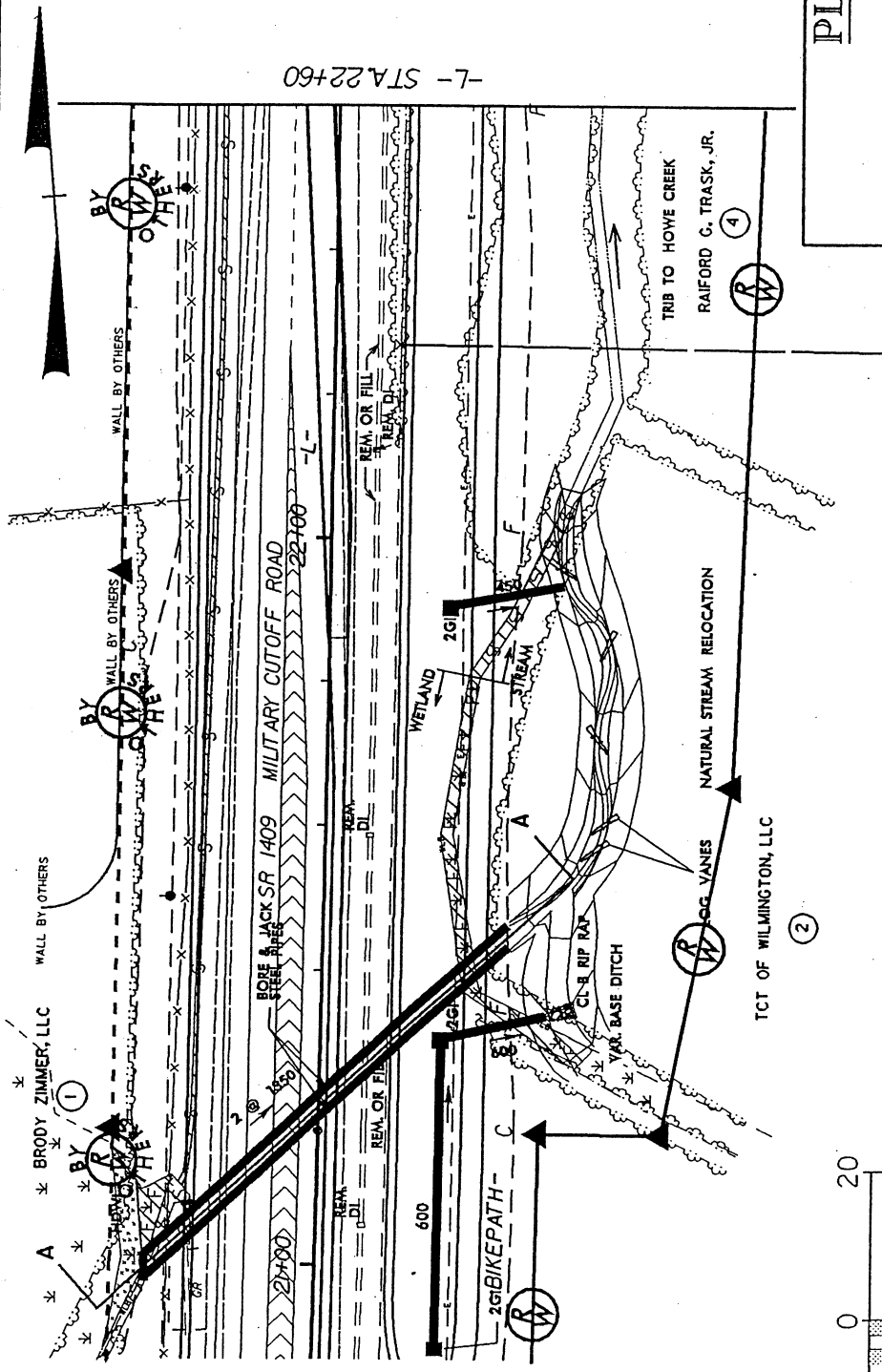
N.C. DEPT. OF TRANSPORTATION  
DIVISION OF HIGHWAYS  
NEW HANOVER COUNTY  
PROJECT 34857.1.1 - U-2734  
MILITARY CUT-OFF ROAD  
IN WILMINGTON, NC

SHEET 5 OF 34 9/03



 DENOTES FILL IN SURFACE WATER

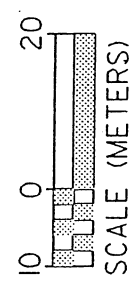
-L- STA. 22+60

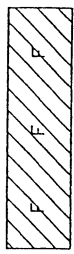
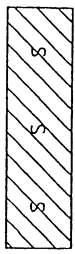
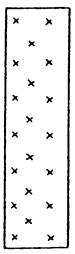


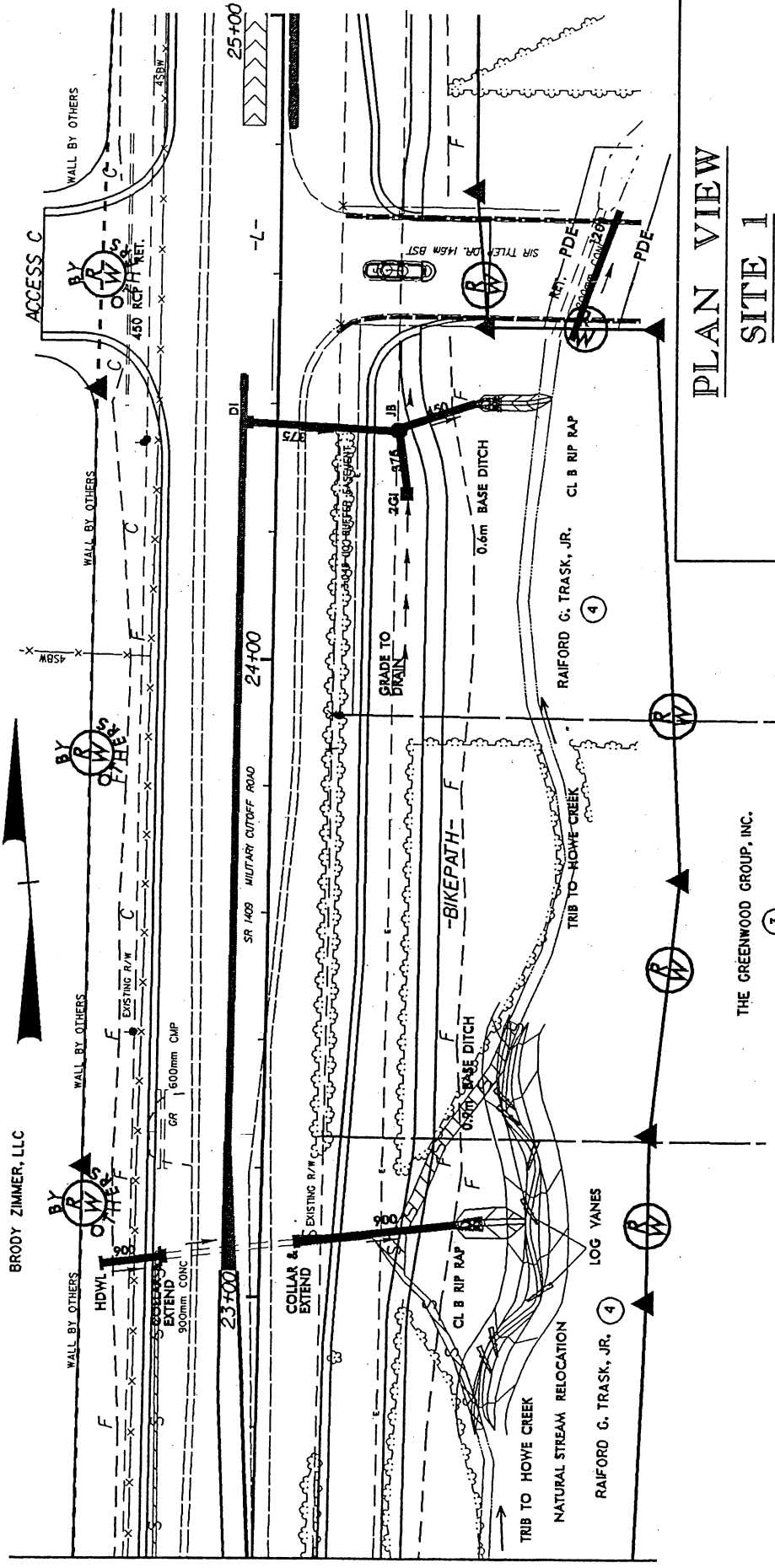
PLAN VIEW  
SITE 1

N.C. DEPT. OF TRANSPORTATION  
DIVISION OF HIGHWAYS  
NEW HANOVER COUNTY  
PROJECT 34857.1.1 - U-2734  
MILITARY CUT-OFF ROAD  
IN WILMINGTON, NC

SHEET 6 OF 34 10/03



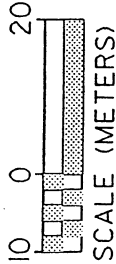
- 
 DENOTES FILL IN WETLANDS
- 
 DENOTES FILL IN SURFACE WATER
- 
 DENOTES MECHANIZED CLEARING



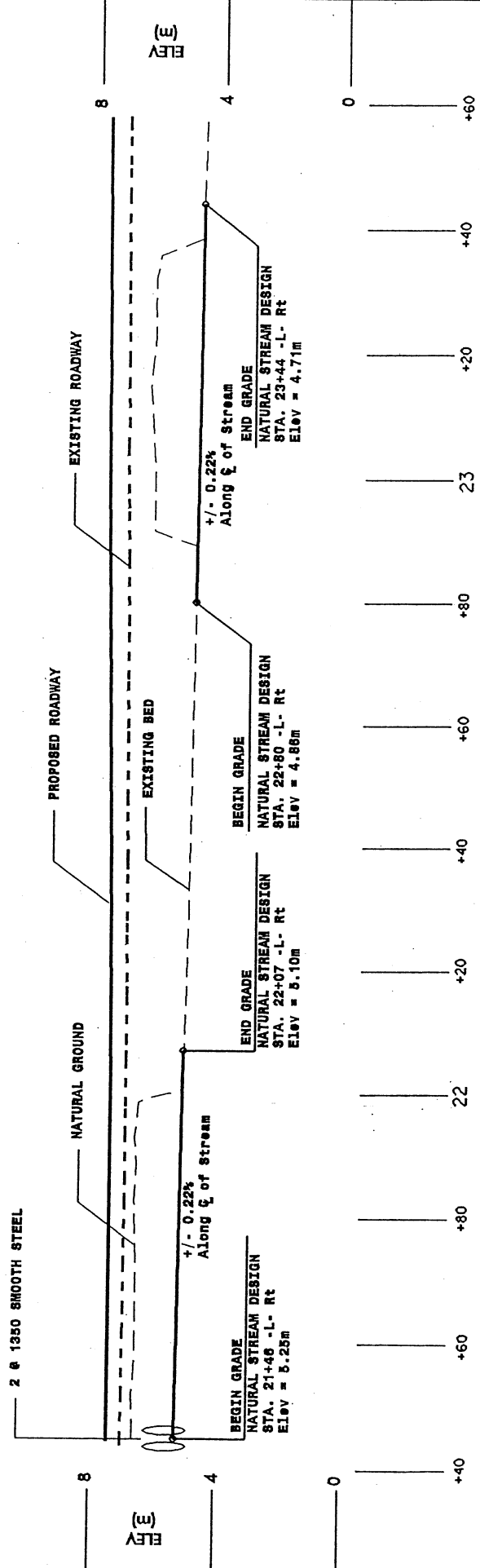
-L- STA.22+60

**PLAN VIEW**  
**SITE 1**

N.C. DEPT. OF TRANSPORTATION  
DIVISION OF HIGHWAYS  
NEW HANOVER COUNTY  
PROJECT 34857.1.1 - U-2734  
MILITARY CUT-OFF ROAD  
IN WILMINGTON, NC



■ DENOTES FILL IN  
■ SURFACE WATER



PROFILE

NATURAL STREAM DESIGN  
 STA 21 + 46 TO 22 + 07 -L- (RT)  
 STA 22 + 80 TO 23 + 44 -L- (RT)

NCDOT  
 DIVISION OF HIGHWAYS  
 NEW HANOVER COUNTY  
 PROJECT: 34857.1.1 (U-2734)  
 MILITARY CUTOFF ROAD  
 IN WILMINGTON, NC

-L-

WETLANDS LIMITS

10

5

0

6:1

2 @ 1350 SMOOTH STEEL

SLOPE = 0.44%

-BIKEPATH-

3:1

3:1

EXISTING STREAM BED

EXISTING STREAM BED

PROPOSED STREAM BED

10

5

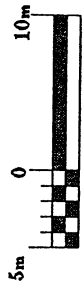
0

10

0

10

0



SITE 1  
SECTION A-A

NCDOT

DIVISION OF HIGHWAYS  
NEW HANOVER COUNTY

PROJECT: 34857.1.1 (U-2734)  
MILITARY CUTOFF ROAD  
IN WILMINGTON, NC

SHEET 9 OF 34 9/03

**NOTES:**

BURY APPROXIMATELY 1/3 OF LOG VANE LENGTH IN THE OUTSIDE POOL BANK AND 1/3 IN THE STREAM BED, WITH THE REMAINING 1/3 EXPOSED.

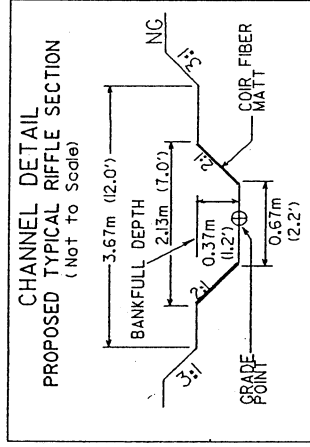
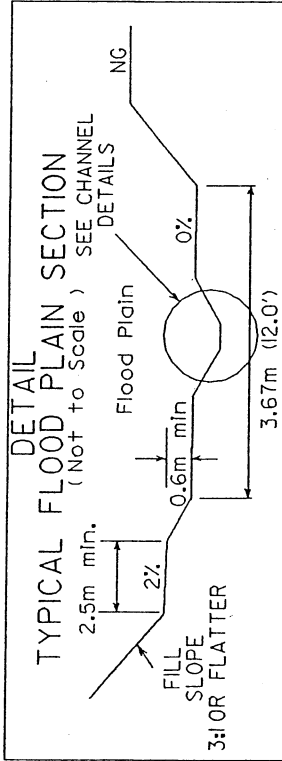
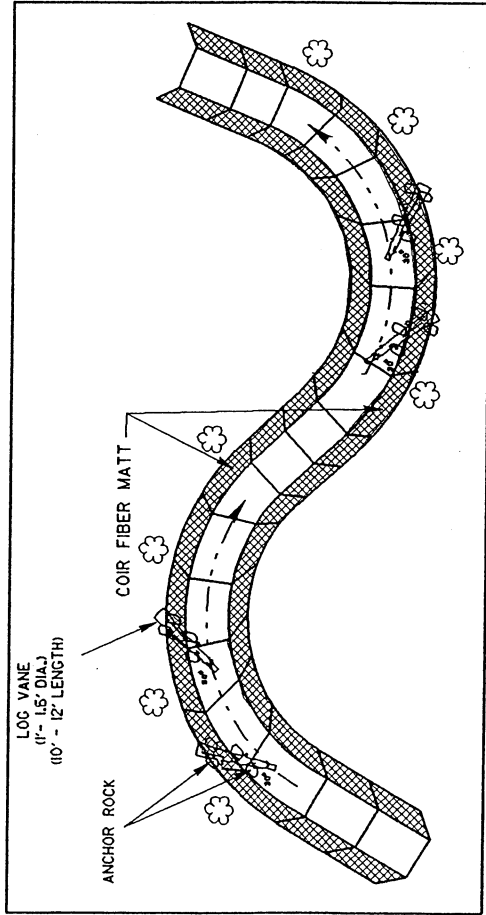
THE EXPOSED PORTION OF LOG VANE SHOULD BE APPROXIMATELY HALF OF THE BANKFULL WIDTH

WHEN BACKFILLING OVER AND AROUND LOG VANES AND ANCHOR ROCKS FIRMLY SECURE ALL COMPONENTS INCLUDING JOINTS, CONNECTIONS AND GAPS.

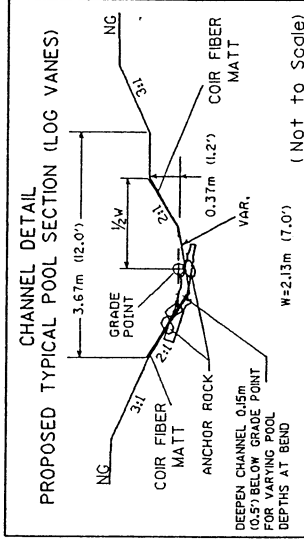
PLANTINGS SHOULD BE PLACED ABOVE BANKFULL DEPTH

MIN. LOG VANE DIA = 0.3m. UTILIZE LOGS AT SITE.

USE ANCHOR ROCK APPROXIMATELY 100 - 200 LBS.



TYPICAL SECTION BETWEEN BENDS



TYPICAL SECTION AT BENDS

**NATURAL STREAM DESIGN**  
**STA 21 + 46 TO 22 + 07 -L- (RT)**  
**STA 22 + 80 TO 23 + 44 -L- (RT)**

**NCDOT**

**DIVISION OF HIGHWAYS**  
**NEW HANOVER COUNTY**

**PROJECT: 34857.1.1 (U-2734)**  
**MILITARY CUTOFF ROAD**  
**IN WILMINGTON, NC**

**PROJECT #:** 8.2251001 (U-2734)  
**COUNTY:** New Hanover  
**DESCRIPTION:** Widening of Military Cutoff Road (SR 1409)  
in Wilmington, NC  
**STREAM:** Tributary to Howe Creek

**NATURAL STREAM DESIGN**  
**Sta 21+46 – Sta 22+07 –L- (Rt)**  
**and from Sta 22+80 – Sta 23+44 –L- (Rt)**

The proposed widening of Military Cutoff Road (SR 1409) will result in the impact (fill) of a portion of stream east and west of the existing facility. The stream is a tributary to Howe Creek. The stream design/classification will be based on Dave Rosgen's principles and techniques for river morphology.

The basin is urbanizing and is located in the Coastal hydrologic region. Presently, the existing stream approaches the roadway from the southwest, "heads up", and then traverses down the west side in the roadway ditch to a 36" cross pipe. It then traverses through the cross pipe to the east side of Military Cutoff Road and back into the existing natural stream. Also, from previous field meetings with NCDOT personnel and agency representatives, it was observed that another existing stream is located on the east side of Military Cutoff Road south of the location of the 36" outlet. Portions, of which, will be filled in by the widening project. It was therefore recommended to connect to this existing stream at a location further south of the present crossing and provide restoration for those portions of existing stream to be filled in.

The original stream relocation proposed the use of parallel pipe culverts crossing under Military Cutoff Road at an approximate 30° skew and reconnecting to the existing stream at Sta 21+90 –L-(Rt). From this point downstream to Sir Tyler Drive (approximately 890 ft) the stream would be redesigned and relocated. This included portions of the stream that would be filled in by the proposed roadway widening and portions of the stream that would not be impacted by the project but were to be relocated and improved. A stream reach downstream of Sir Tyler Drive was used as the reference. This design was produced in February of 2001 and was recommended until March of 2003. At this time, another field review meeting was held with Dave Timpy (USACE). From this meeting several design changes were recommended. The recommendations included:

Reconnect to the existing stream further south than original proposal, allowing for additional stream restoration.

Eliminate relocating/altering that portion of remnant stream that is not being impacted by the proposed widening.

Use the existing stream along the portion of relocation as the reference reach.



The existing stream was resurveyed to observe its morphological characteristics. These characteristics include bankfull area, depth, width and discharge. This information was then compared to data generated from the available (yet unapproved to date) NC Stream Restoration Institute's Coastal Regional equations and with the USGS Rural Coastal equations. Data was then analyzed using the HEC-RAS modeling system to compare the accuracy of all the characteristics between the surveyed reference and the regional equations.

The reference reach (existing stream) was observed to be stable, yet moderately entrenched. The stream banks were deep but vegetated. The floodplain is also vegetated, except for a portion next to Sir Tyler Road. The stream was observed to have a meandering thalweg within the main channel banks. While the main stream channel is slightly meandering the thalweg has more significant meandering. Also, the stream was observed to have a low sediment supply and deposition. Based on the observed field data, NCSRI regional information and hydraulic modeling the reference stream was classified as an E6 stream.

The proposed stream was designed to retain the bankfull characteristics of the reference stream while improving the dimensions from that of the reference reach. Flatter side slopes and a slightly wider bankfull floodplain are proposed to improve the entrenchment characteristics. A meandering thalweg is also proposed within the main stream channel. To aid in bank stability, log vanes are proposed in the bend/pool areas. Also, coir fiber mat will be placed on the banks. This will assist in stabilizing the banks and thus assist in establishing vegetation along the stream banks. With the modifications to the prescribed channel dimensions it is believed an improved E6 stream will be provided.

In addition, it is proposed to leave the portion of stream that will not be impacted by the widening in its present condition without additional channel form improvements. The proposed stream channel form is similar to that of the existing stream. It is believed the risk of adversely effecting the existing stream vegetation and stability outweighs the attempt to acquire minimal channel form improvement. It is stated in Rosgen's **Applied River Morphology** that E6 streams "are very stable unless the streambanks are disturbed and significant changes in sediment supply and/or streamflow occur." The portion of restored and preserved stream, and their buffers, will be contained within Right-of-Way from the outlet of the dual 54" pipes to Sir Tyler Road.

The bed material was found to be fine sand, silt and organic material. Shear stress and sediment transport properties for fine sand were analyzed. Shear stresses were calculated based on velocities and flow depths generated from the HEC-RAS modeling system. This information was then compared to values for critical velocity and shear stress for fine sand in the HEC-15 and HDS-5 manuals from the FHA. The Shields Diagram was also used to observe the size of particle moved by the stream energy. The comparison showed the proposed stream to be within acceptable velocity and shear stress limits that would allow proper sediment transport under bankfull conditions.

# Appendix B

# Morphological Measurement Table

Variables	Existing Channel	Proposed Reach	USGS Station	** Reference Reach
1. Stream type	E6	E6	N/A	E6
2. Drainage area	110 Ac (44.5 Ha)	110 Ac (44.5 Ha)		110 Ac (44.5 Ha)
3. Bankfull width	7.0' (2.1m)	7.0' (2.1m)		7.0' (2.1m)
4. Bankfull mean depth	0.8' (0.24m)	0.8' (0.24m)		0.8' (0.24m)
5. Width/depth ratio	8.8	8.8		8.8
6. Bankfull cross-sectional area	5.8 ft <sup>2</sup> (0.54m <sup>2</sup> )	5.5 ft <sup>2</sup> (0.51m <sup>2</sup> )		5.8 ft <sup>2</sup> (0.54m <sup>2</sup> )
7. Bankfull mean velocity	1.7 ft/s (0.52 m/s)	1.8 ft/s (0.55 m/s)		1.7 ft/s (0.52 m/s)
8. Bankfull discharge, cfs	10 cfs (0.28 cms)	10 cfs (0.28 cms)		10 cfs (0.28 cms)
9. Bankfull max depth	1.3' (0.40m)	1.2' (0.37m)		1.3' (0.40 m)
10. Width of floodprone area	14.5' (4.4m)	19.2' (5.9m)		14.5' (4.4m)
11. Entrenchment ratio	2.1	2.7		2.1
12. Meander length	50'-75'	50'		50'-75'
13. Ratio of meander length to bankfull width	7.1-10.7	7.1		7.1-10.7
14. Radius of curvature	102' (31m)	50' (15m)		102' (31m)
15. Ratio of radius of curvature to bankfull width	14.6	7.1		14.6
16. Belt width	36' (11m)	33' (10m)		36' (11m)
17. Meander width ratio	5.1	4.7		5.1
18. Sinuosity (stream length/valley length)	1.10	1.10		1.10
19. Valley slope	0.24%	0.24%		0.24%
20. Average slope	0.22%	0.22%		0.22%
21. Pool slope	0.00%	0.00%		0.00%
22. Ratio of pool slope to average slope	0.00	0.00		0.00
23. Maximum pool depth	1.8' (0.55m)	1.7' (0.52m)		1.8' (0.55 m)
24. Ratio of pool depth to average bankfull depth	2.3	2.1		2.3
25. Pool width	7.0' (2.1m)	7.0' (2.1m)		7.0' (2.1m)
26. Ratio of pool width to bankfull width	1.00	1.50		1.00
27. Pool to pool spacing	25'-40'	30'-40'		25'-40'
28. Ratio of pool to pool spacing to bankfull width	3.6-5.7	4.3-5.0		3.6-5.7
29. Ratio of lowest bank height to bankfull height (or max bankfull depth)	0.77	1.0		0.77

Military Cutoff Stream Mitigation Site (U-2734)  
Sta 21+46 -L- (Rt) - Sta 23+44 -L- (Rt)

SEDIMENT TRANSPORT ANALYSIS

Station/Description	Flow Depth (ft)	Flow Slope (ft/ft)	Shear Stress (lb/ft <sup>2</sup> )	Bed Material	Velocity (ft/s)
Proposed	1.2	0.0022	0.099	Sand/Silt	1.8
Reference	1.3	0.0022	0.105	Sand/Silt	1.7

Note: Velocities determined from HEC-RAS Model

Proposed Morphology

\*\* Critical Shear Stress 0.10 lb/ft<sup>2</sup>

\*\*\* Permissible Velocity 1.5-2.2 ft/s

Clear Water Fine Sand - Firm Loam w/ Fine Sand

\* Shields:

Particle Size	5.0 mm
Dimensionless Shear Stress	0.0590 lb/ft <sup>2</sup>
Kinematic Viscosity	0.00001400 ft <sup>2</sup> /s
Mass Density	1.94 slugs/ft <sup>3</sup>
Unit Weight (Particle)	165.0 lb/ft <sup>3</sup>
Unit Weight (Water)	62.4 lb/ft <sup>3</sup>
Reynolds Number	265.2
Dimensionless Shear Stress from Shields Diagram	0.054 lb/ft <sup>2</sup>

References:

- \* Shields Diagram
- \*\* Hydraulic Engineering (HEC) 15 - Chart 1
- \*\*\* Hydraulic Design Series (HDS) 3 - Table 2

Proposed

Q <sub>BKF</sub>	10.0	ft <sup>3</sup> /s
W/D	8.8	
Side Slope	2.0	
Mannings n	0.032	
Valley Slope	0.0024	ft/ft
Sinuosity	1.10	

Valley Slope/Sinuosity	0.0022	ft/ft
Velocity	1.8	ft/s
Area	5.5	ft <sup>2</sup>
W <sub>BKF</sub>	7.0	ft
Base Width	2.2	ft
Mean Depth	0.8	ft
Wetted Perimeter	7.6	ft
Hydraulic Radius	0.72	ft

Shear Stress	0.10	lb/ft <sup>2</sup>
Particle Moved	5.0	mm

Reference

Q <sub>BKF</sub>	10.0	ft <sup>3</sup> /s
W/D	8.8	
Side Slope	1.0	
Mannings n	0.003	
Valley Slope	0.0024	ft/ft
Sinuosity	1.10	

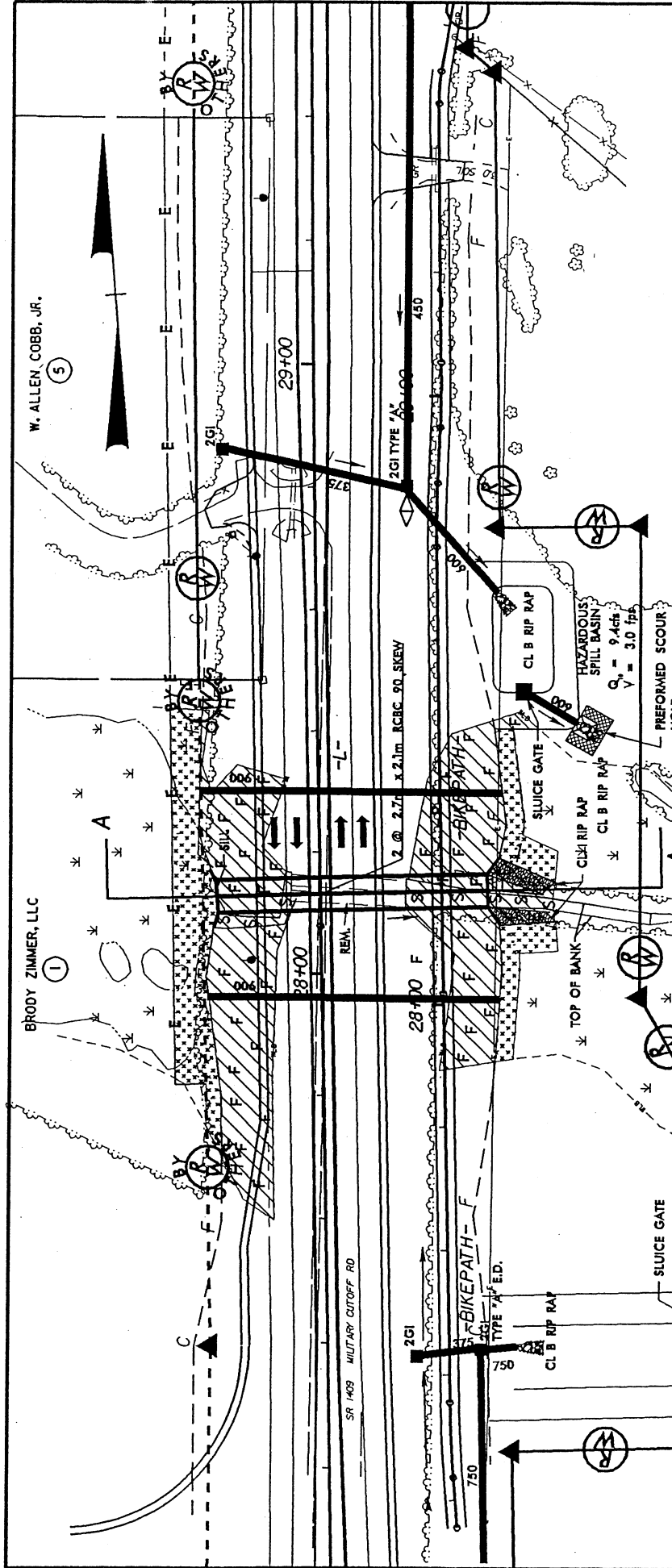
Valley Slope/Sinuosity	0.0022	ft/ft
Velocity	1.7	ft/s
Area	5.8	ft <sup>2</sup>
W <sub>BKF</sub>	7.0	ft
Base Width	2.5	ft
Mean Depth	0.8	ft
Wetted Perimeter	7.6	ft
Hydraulic Radius	0.76	ft

Shear Stress	0.10	lb/ft <sup>2</sup>
Particle Moved	5.0	mm

Stream Power:

Reference:  
stream power = 0.025 lb/ft/sec

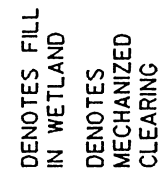
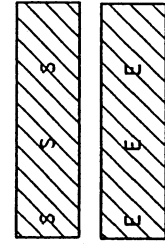
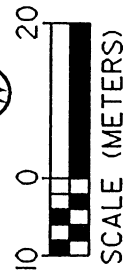
Proposed:  
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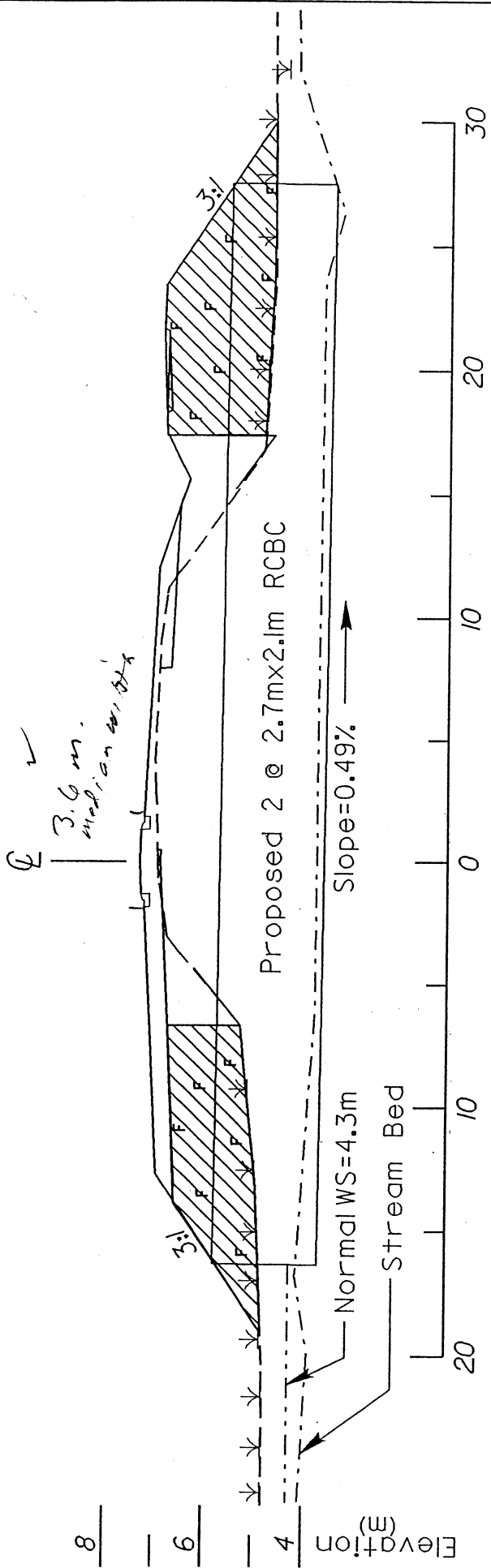


**PLAN VIEW**  
**SITE 2**

N.C. DEPT. OF TRANSPORTATION  
DIVISION OF HIGHWAYS  
NEW HANOVER COUNTY  
PROJECT 34857.1.1 (U-2734)  
MILITARY CUT-OFF ROAD  
IN WILMINGTON, NC

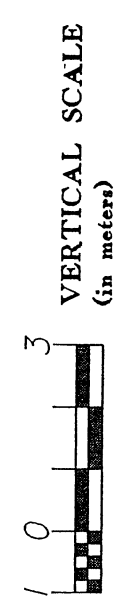
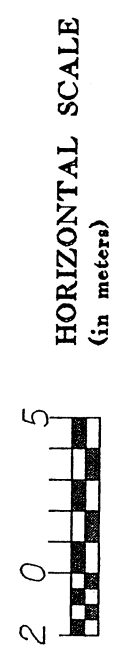
SHEET 16 OF 34 9/03





**SITE 2**  
**SECTION A-A**

N.C. DEPT. OF TRANSPORTATION  
 DIVISION OF HIGHWAYS  
 NEW HANOVER COUNTY  
 PROJECT 34857.1.1 - U-2734  
 MILITARY CUT-OFF ROAD  
 IN WILMINGTON, NC  
 SHEET 17 OF 34 9/03



**DENOTES FILL  
 IN WETLAND**

+20 | +40 | +60 | +80 | +20 | +40 | +60 | +80 | +20 | +40 | +60 | +80 | +20 | +40 | +60 | +80 |

PI = 28+00.000  
EL = 7.180  
VC = 120m

PI = 28+90.000  
EL = 7.630  
VC = 60

LIMIT OF WETLAND

+0.5000%

+0.5000%

+0.2500%

EXISTING GRADE

N.G.

N.G.

900mm

900mm

SILL

2 - 2.7m X 2.1m  
RCBC

HORIZONTAL SCALE  
(in meters)

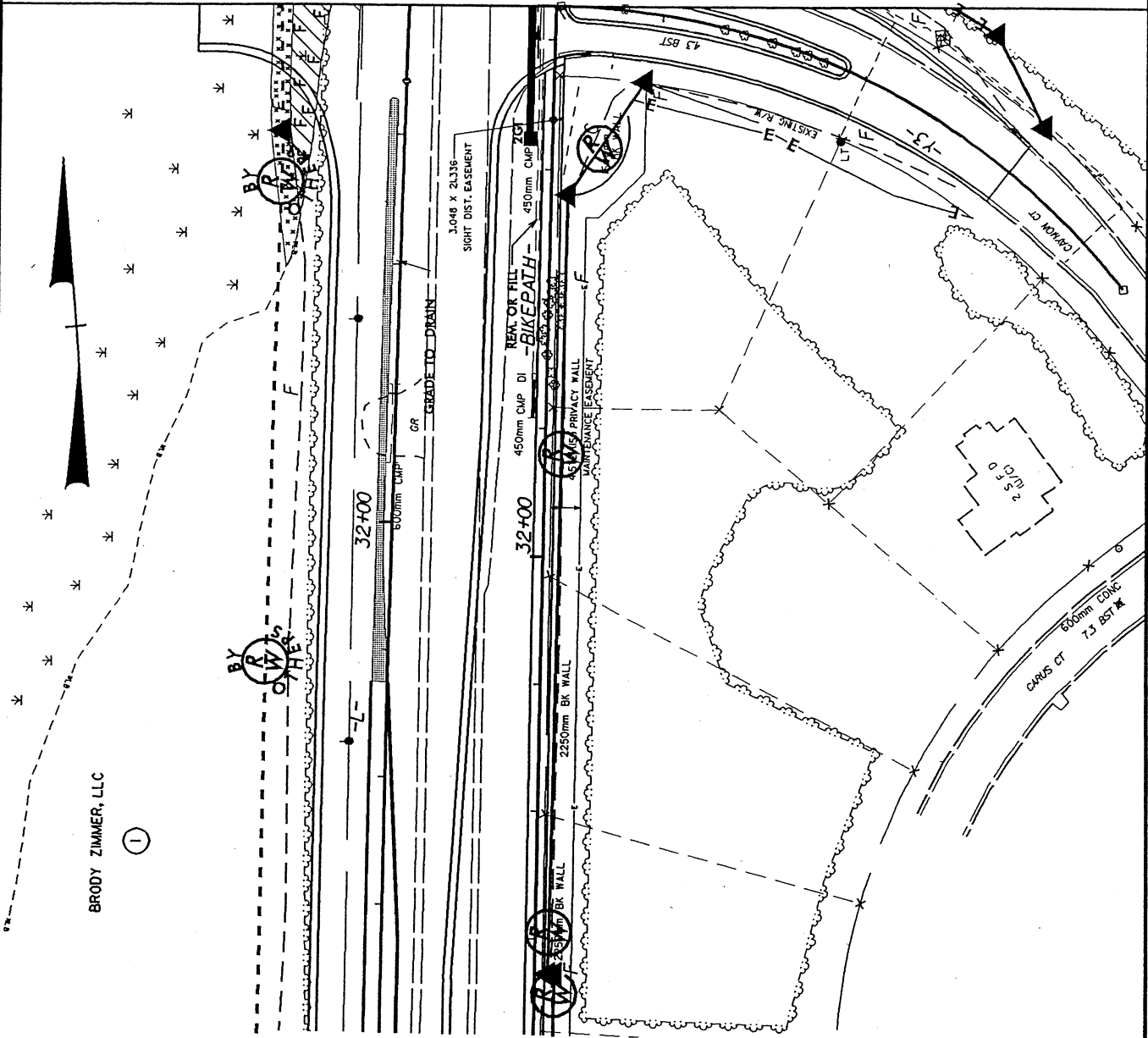
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DENOTES FILL  
IN WETLAND

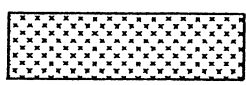
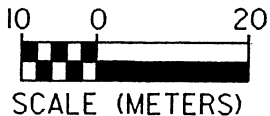
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IN SURFACE WATER

**PROFILE VIEW**  
**SITE 2**

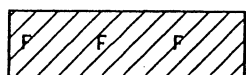
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DIVISION OF HIGHWAYS  
NEW HANOVER COUNTY  
PROJECT: 34857.1.1 - U-2734  
MILITARY CUT-OFF ROAD  
IN WILMINGTON, NC



BRODY ZIMMER, LLC  
①



DENOTES  
MECHANIZED  
CLEARING

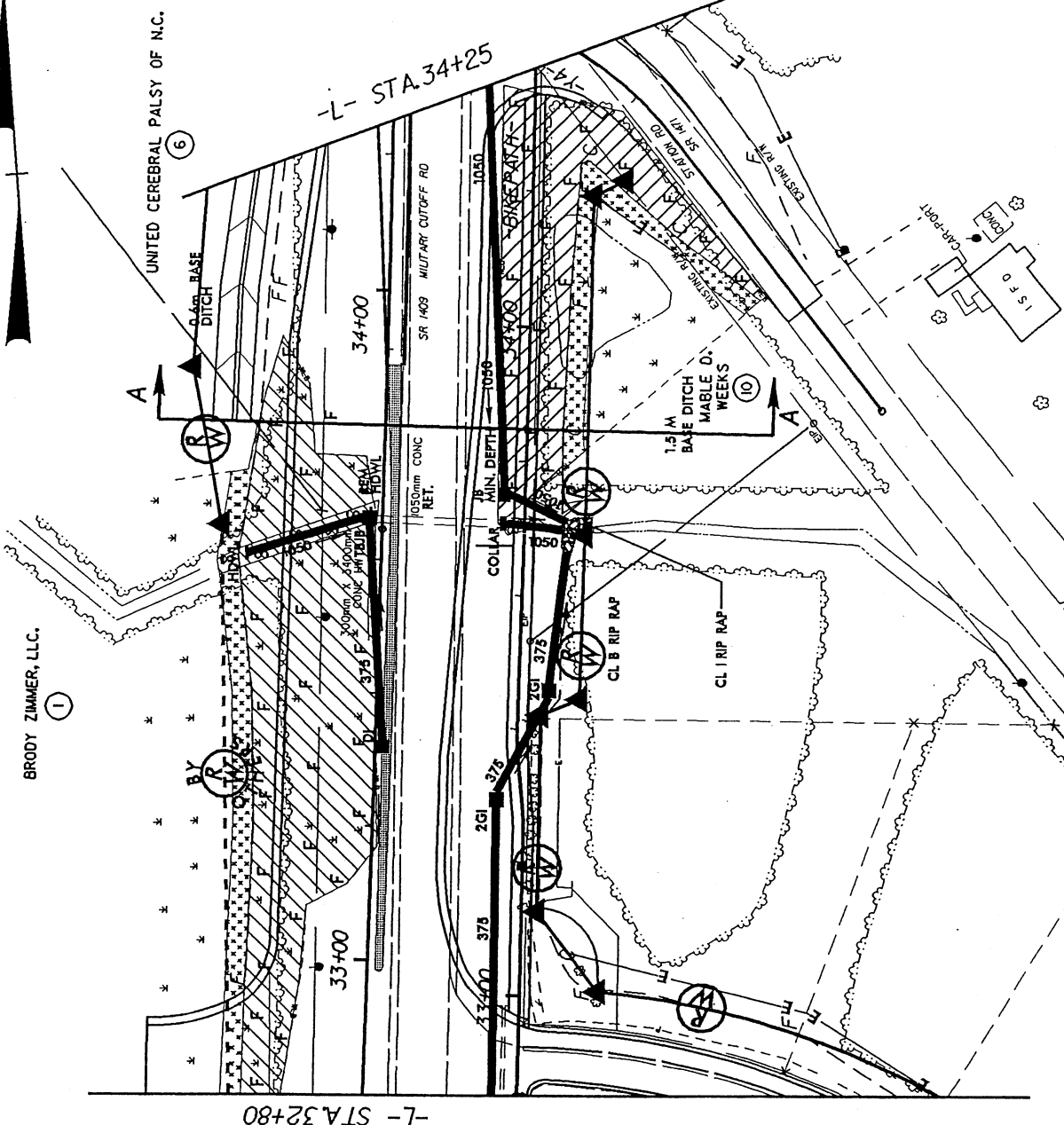


DENOTES FILL  
IN WETLAND

**PLAN VIEW**  
**SITE 3**

N.C. DEPT. OF TRANSPORTATION  
DIVISION OF HIGHWAYS  
NEW HANOVER COUNTY  
PROJECT 34857.1.1 - U-2734  
MILITARY CUT-OFF ROAD  
IN WILMINGTON, NC



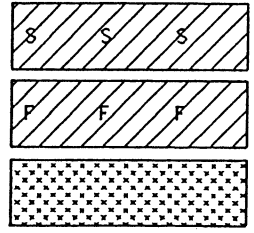
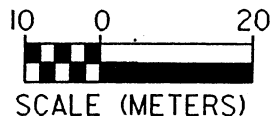


-L- STA. 32+80

-L- STA. 34+25

**PLAN VIEW  
SITE 3**

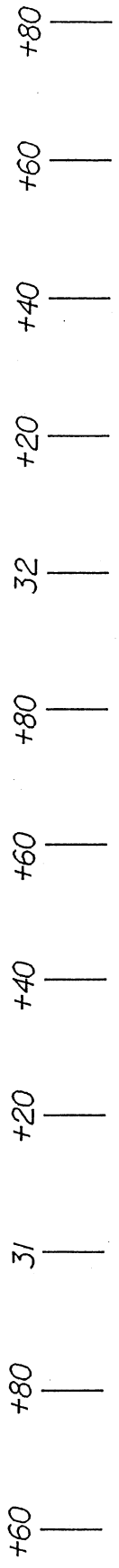
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PROJECT 34857.1.1 - U-2734  
MILITARY CUT-OFF ROAD  
IN WILMINGTON, NC



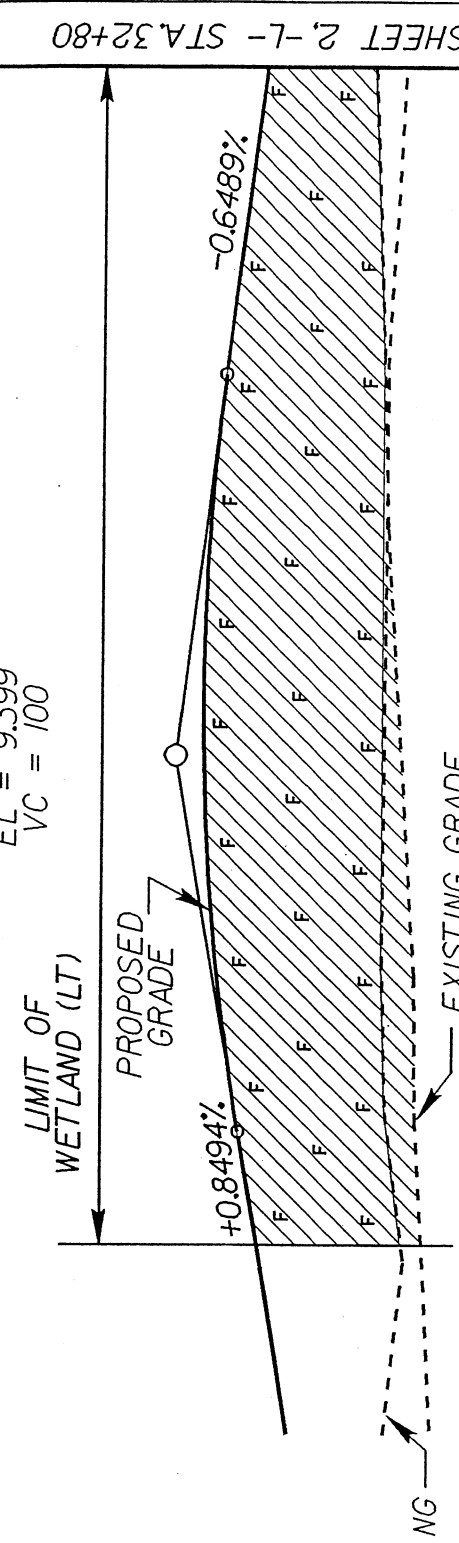
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IN SURFACE WATER

DENOTES FILL  
IN WETLAND

DENOTES  
MECHANIZED  
CLEARING



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 $EL = 9.399$   
 $VC = 100$



SEE SHEET 2-L- STA. 32+80

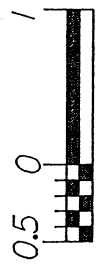
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**PROFILE VIEW**  
**SITE 3**

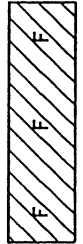
HORIZONTAL SCALE  
 (in meters)



VERTICAL SCALE  
 (in meters)

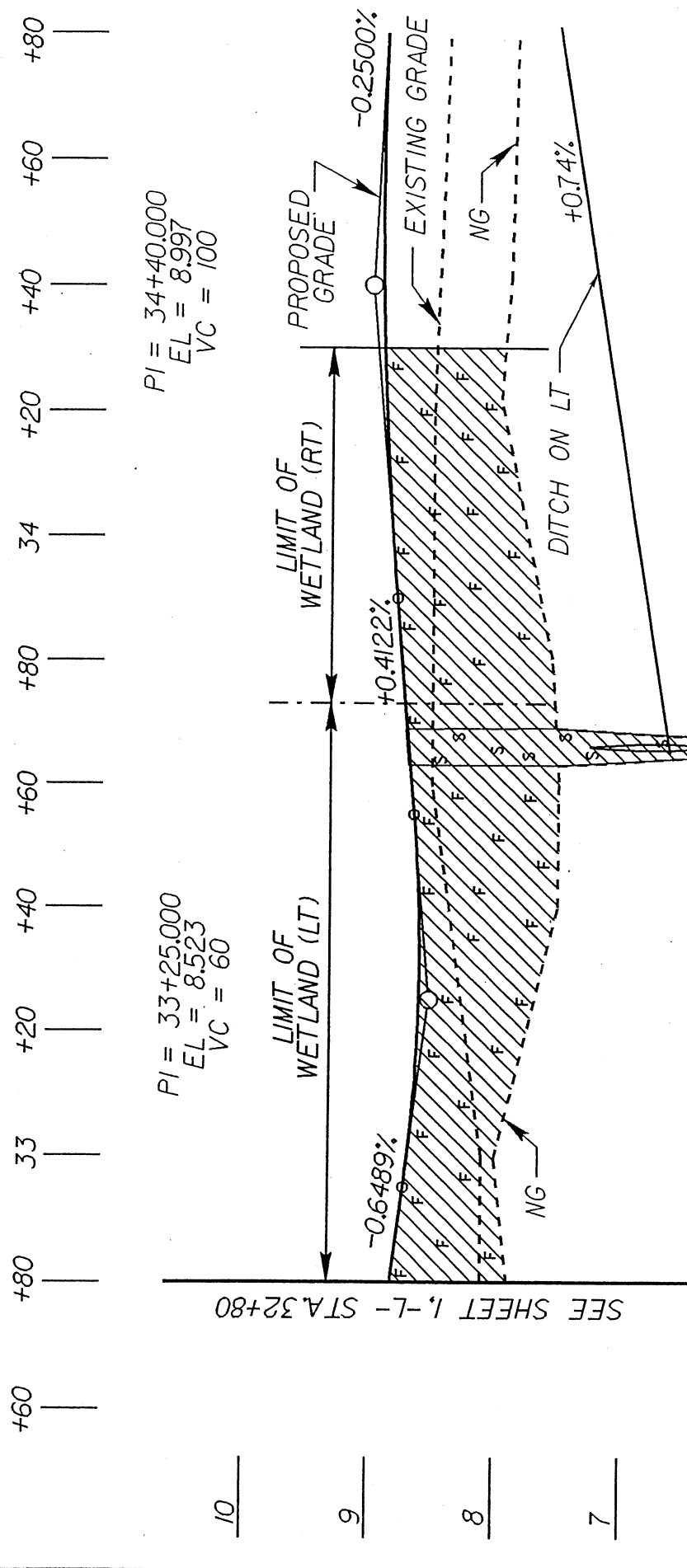


DENOTES FILL  
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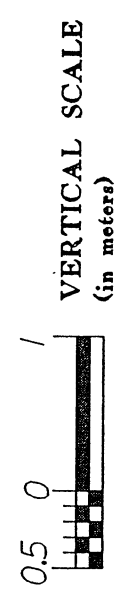
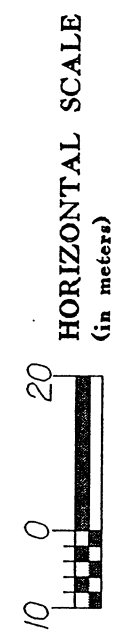
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 DIVISION OF HIGHWAYS  
 NEW HANOVER COUNTY  
 PROJECT: 34857.1.1 - U-2734  
 MILITARY CUT-OFF ROAD  
 IN WILMINGTON, NC

SHEET 21 OF 34 9/03

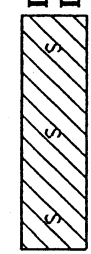


**PROFILE VIEW**  
**SITE 3**

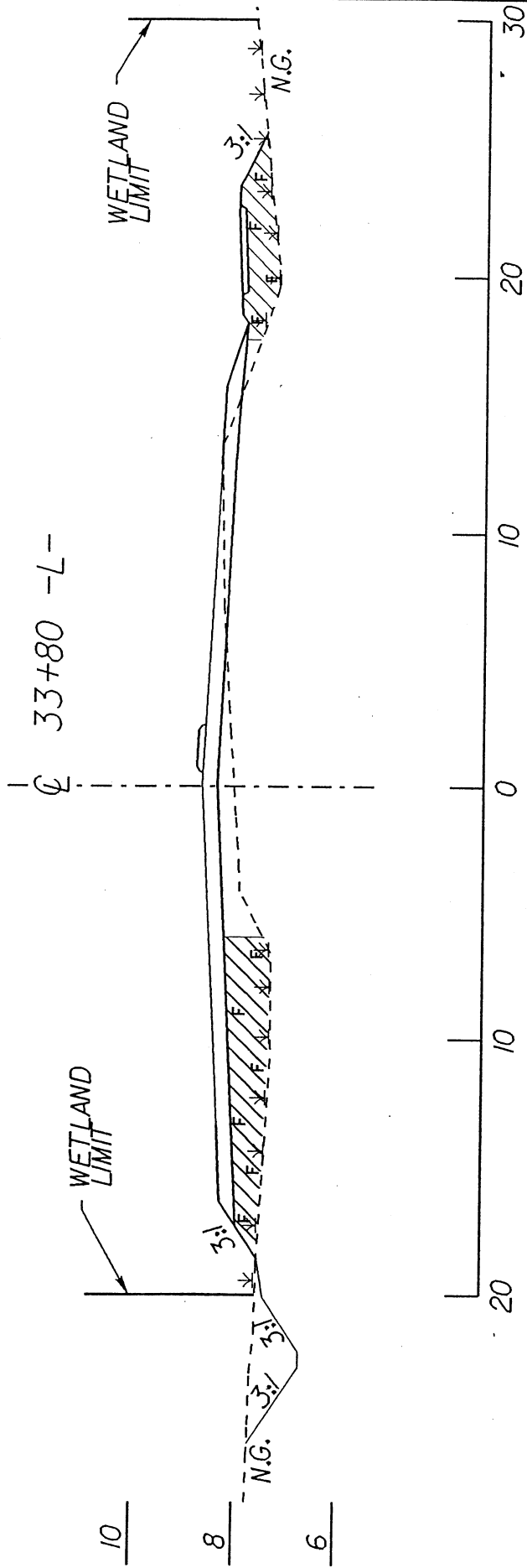
N.C. DEPT. OF TRANSPORTATION  
 DIVISION OF HIGHWAYS  
 NEW HANOVER COUNTY  
 PROJECT 34857.1.1 - U-2754  
 MILITARY CUT-OFF ROAD  
 IN WILMINGTON, NC  
 SHEET 22 OF 34 9/03



DENOTES FILL  
IN WETLAND



DENOTES FILL  
IN SURFACE WATER

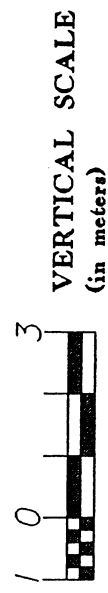
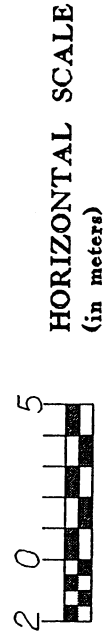


**SITE 3**

**SECTION A-A**

N.C. DEPT. OF TRANSPORTATION  
 DIVISION OF HIGHWAYS  
 NEW HANOVER COUNTY  
 PROJECT: 34857.1.1 - U-2734  
 MILITARY CUT-OFF ROAD  
 IN WILMINGTON, NC

SHEET 23 OF 34 9/03



UNITED CEREBRAL PALSY OF N.C.

6

LIFT STATION

ACCESS EASEMENT

0.6m BALL DITCH

L- STA 34+25

34+40

35+00

1050

MILITARY CUTOFF RD

SR 1409

1050 RCP


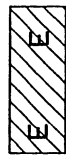
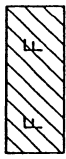
BIKEPATH

CB

PLAN VIEW

SITE 4



-  DENOTES DRAINED WETLANDS
-  DENOTES EXCAVATION IN WETLAND
-  DENOTES FILL IN WETLAND

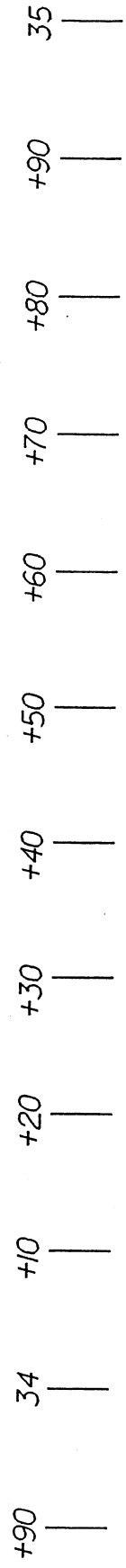
JOHN W. BRIDGES

N.C. DEPT. OF TRANSPORTATION  
DIVISION OF HIGHWAYS

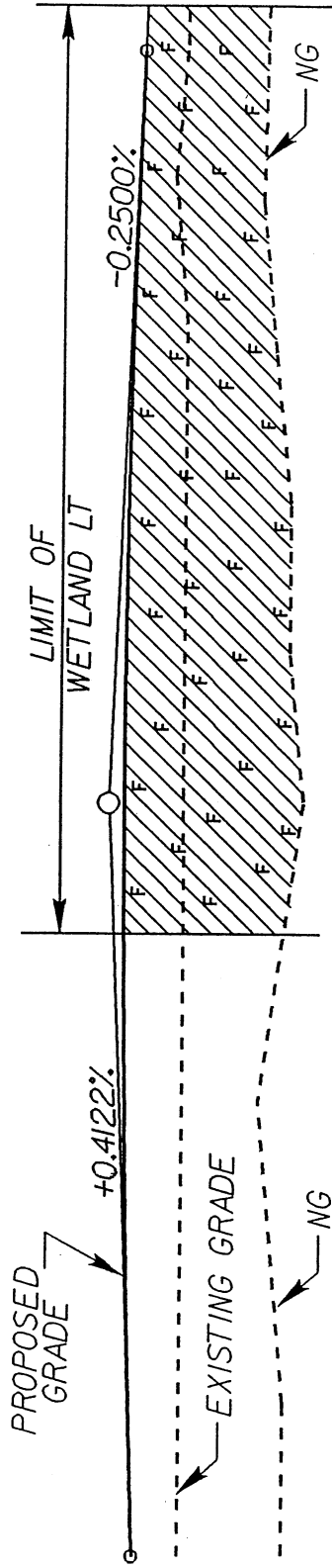
NEW HANOVER COUNTY  
PROJECT 34857.1.1 - U-2734

MILITARY CUT-OFF ROAD  
IN WILMINGTON, NC

SHEET 24 OF 34 9/03



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 $VC = 100$



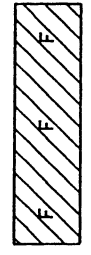
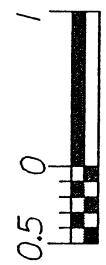
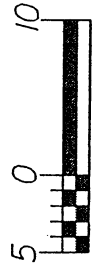
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**PROFILE VIEW**  
**SITE 4**

HORIZONTAL SCALE  
(in meters)

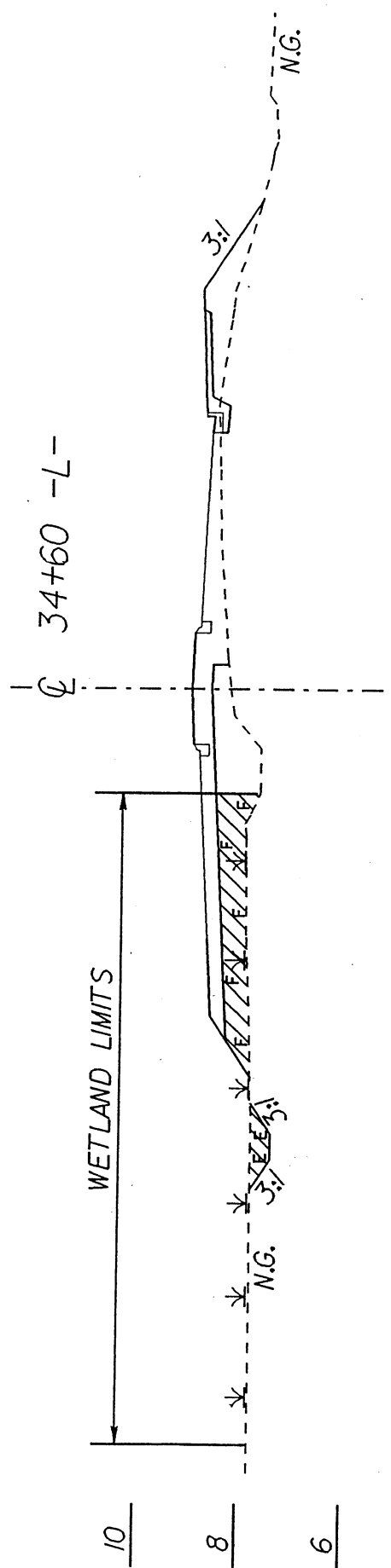
VERTICAL SCALE  
(in meters)

DENOTES FILL  
 IN WETLAND

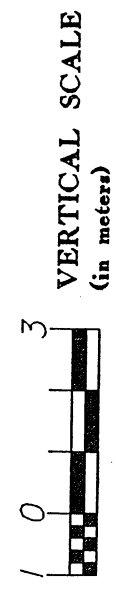
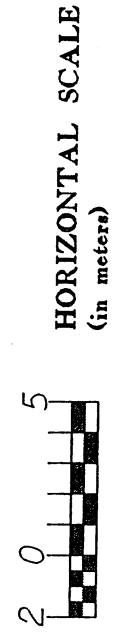
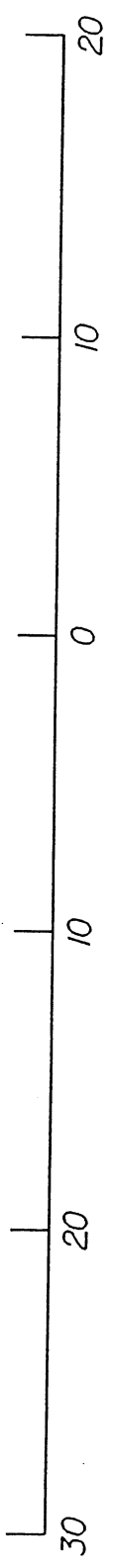


N.C. DEPT. OF TRANSPORTATION  
 DIVISION OF HIGHWAYS  
 NEW HANOVER COUNTY  
 PROJECT 34857.1.1 - U-2734  
 MILITARY CUT-OFF ROAD  
 IN WILMINGTON, NC

SHEET 25 OF 34  
 9/03



10  
8  
6

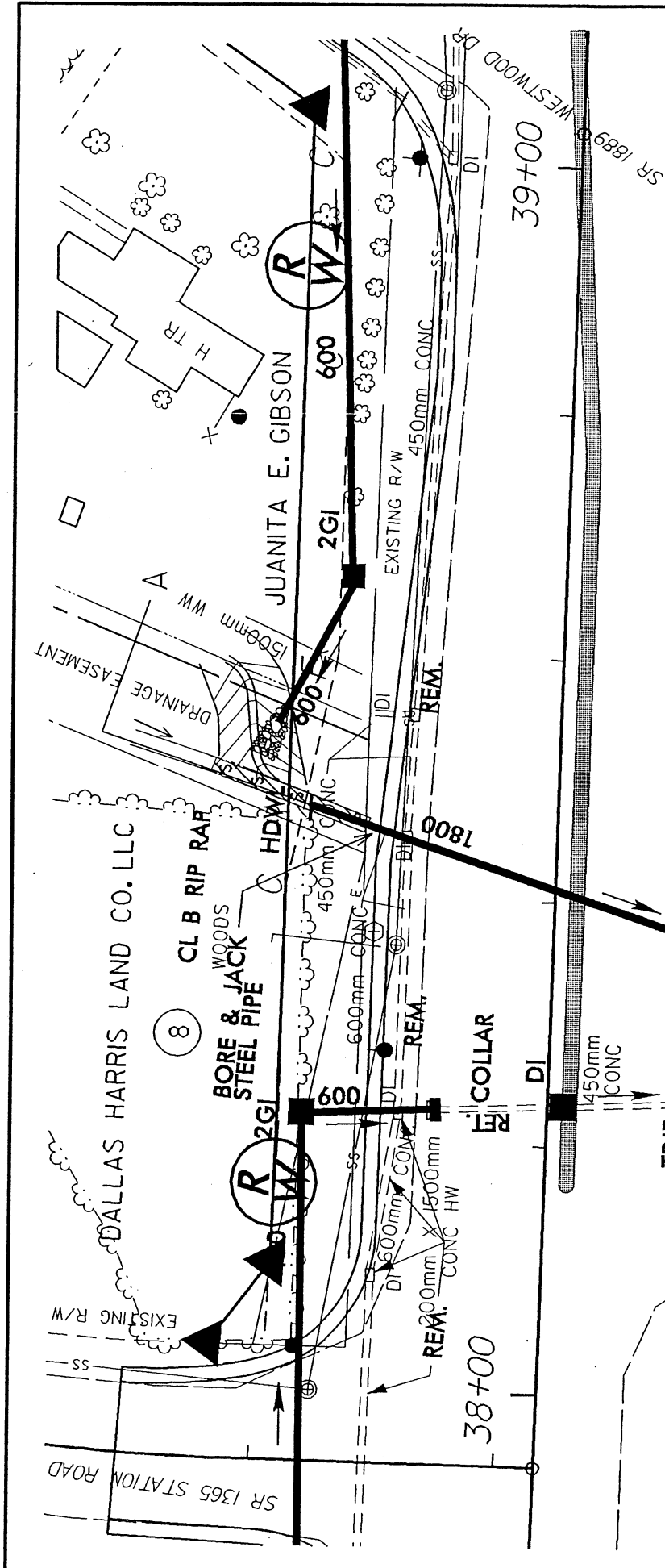


SITE 4

SECTION A-A

N.C. DEPT. OF TRANSPORTATION  
DIVISION OF HIGHWAYS  
NEW HANOVER COUNTY  
PROJECT: 34857.1.1 - U-2734  
MILITARY CUT-OFF ROAD  
IN WILMINGTON, NC

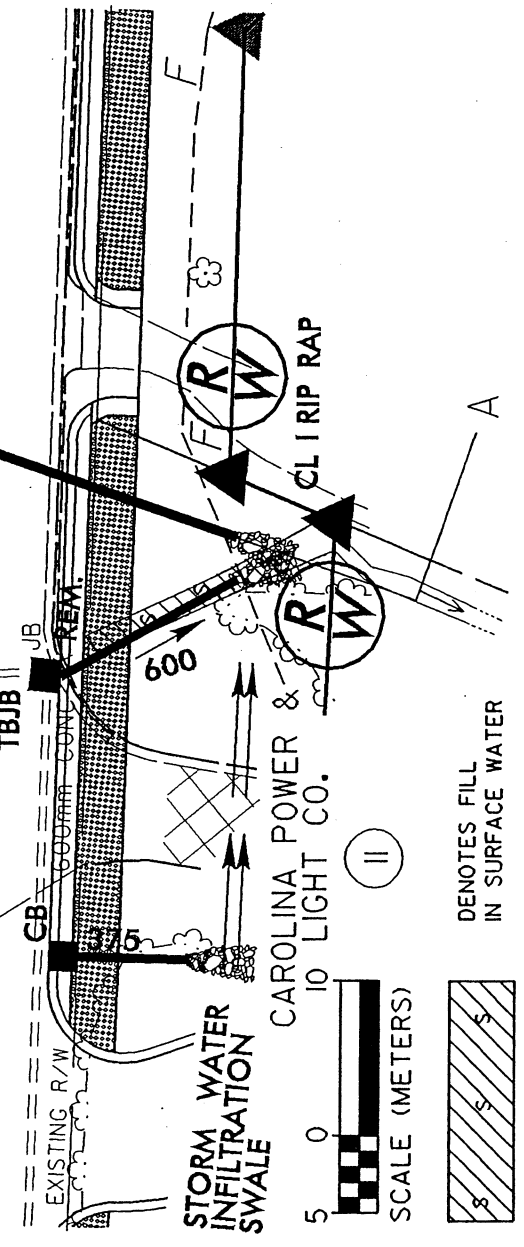
SHEET 26 OF 34 9/03



**PLAN VIEW**  
**SITE 5**

N.C. DEPT. OF TRANSPORTATION  
DIVISION OF HIGHWAYS  
NEW HANOVER COUNTY  
PROJECT: 34857.1.1 - U-2734  
MILITARY CUT-OFF ROAD  
IN WILMINGTON, NC

SHEET 27 OF 34 9/03



**STORM WATER INFILTRATION SWALE**

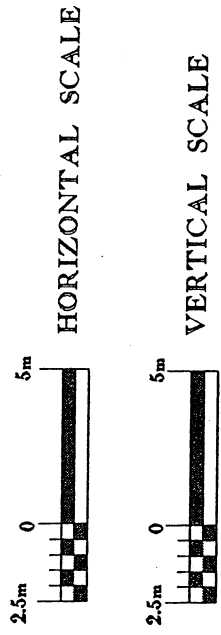
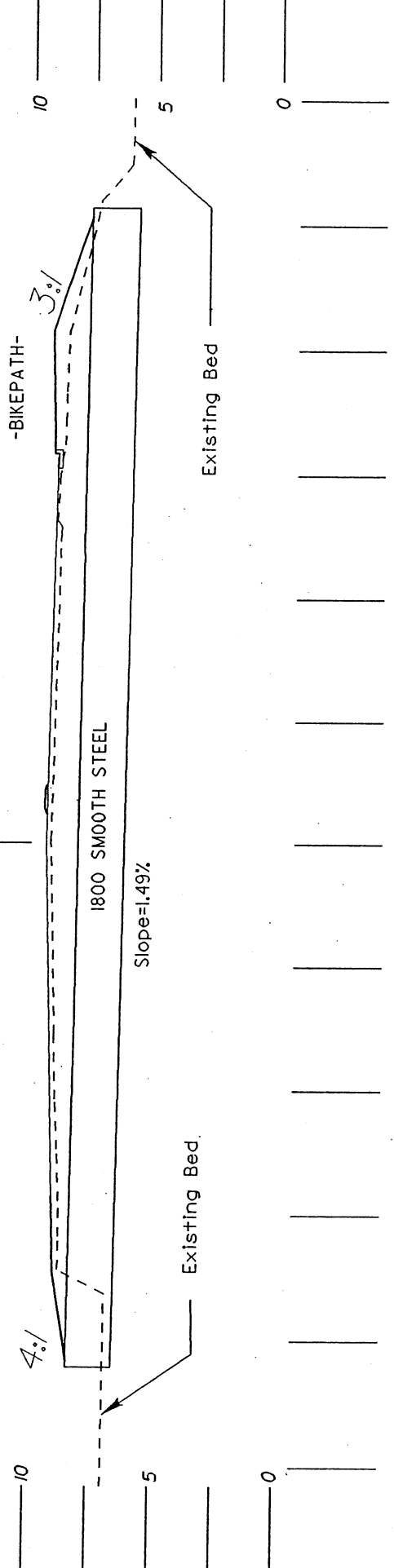
5 0 SCALE (METERS)

**CAROLINA POWER & LIGHT CO.**

**DENOTES FILL IN SURFACE WATER**



-L-

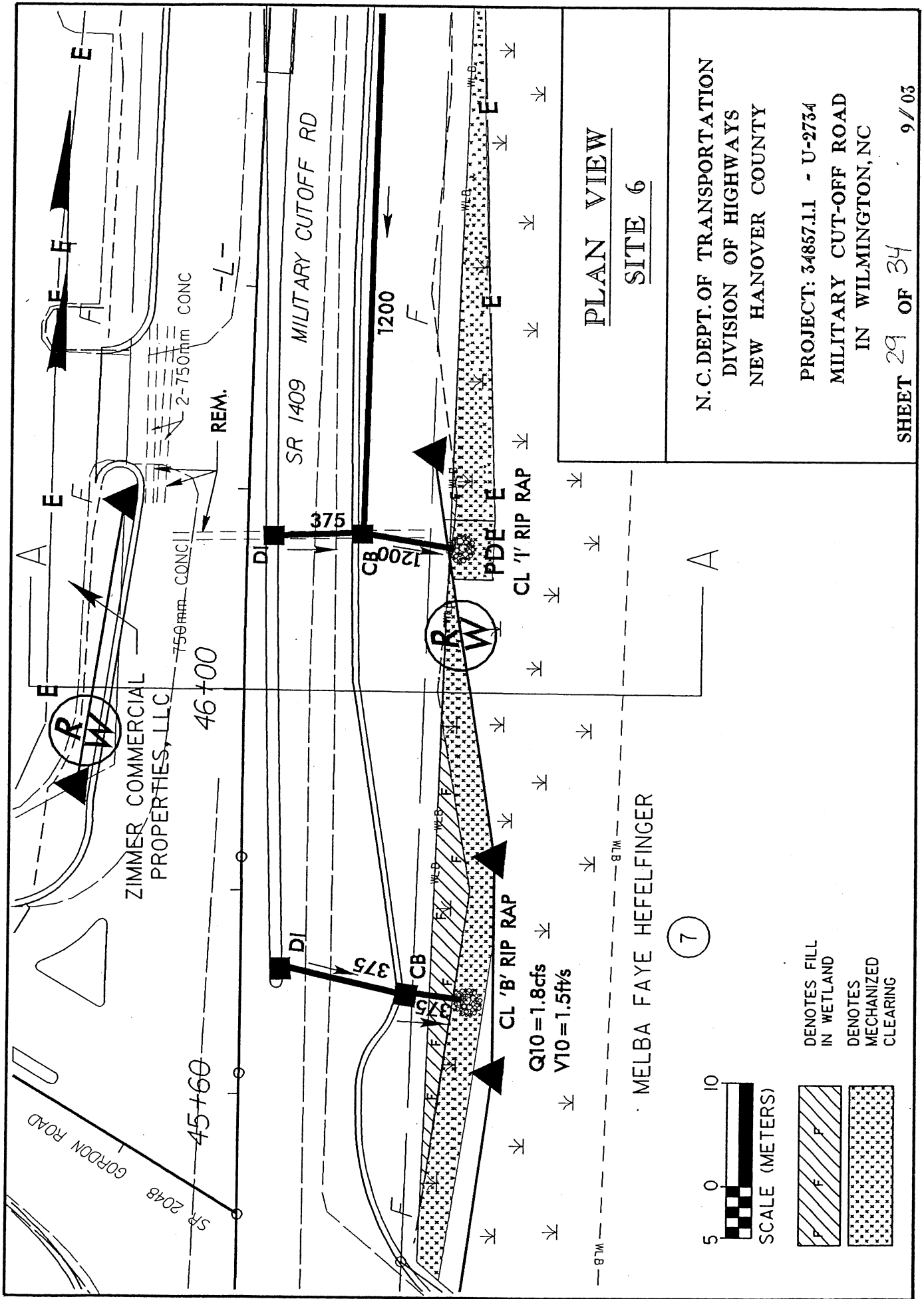


SITE 5  
SECTION A-A

NCDOT  
DIVISION OF HIGHWAYS  
NEW HANOVER COUNTY

PROJECT: 34857.1.1 (U-2734)  
MILITARY CUTOFF ROAD  
IN WILMINGTON, NC

SHEET 28 OF 34 9/03



**PLAN VIEW**  
**SITE 6**

N.C. DEPT. OF TRANSPORTATION  
DIVISION OF HIGHWAYS  
NEW HANOVER COUNTY

PROJECT: 34857.1.1 - U-2734  
MILITARY CUT-OFF ROAD  
IN WILMINGTON, NC

7

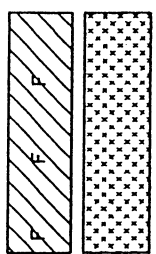
MELBA FAYE HEFELFINGER

Q10 = 1.8cfs  
V10 = 1.5ft/s



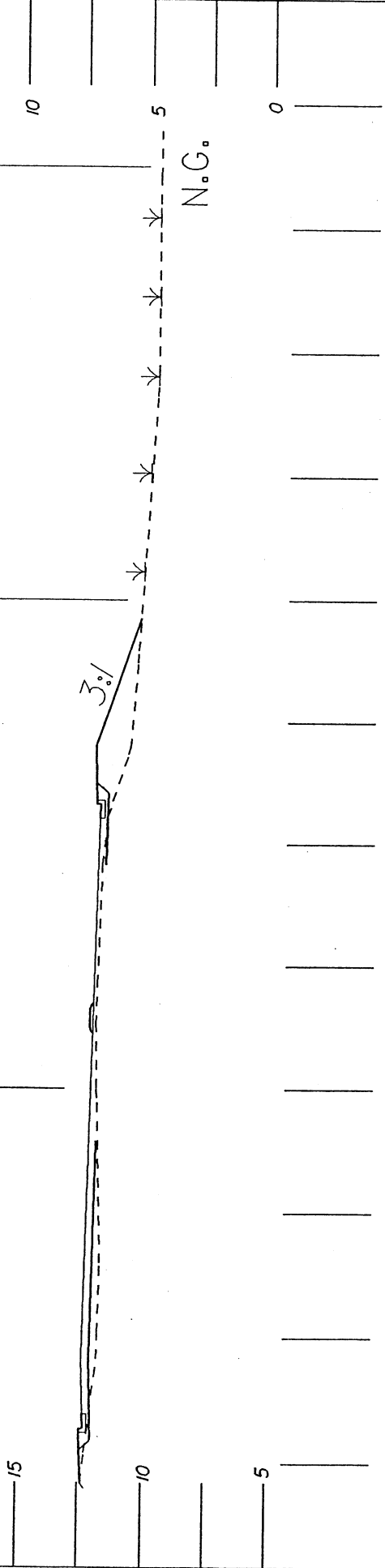
DENOTES FILL  
IN WETLAND

DENOTES  
MECHANIZED  
CLEARING



-L-

WETLAND LIMITS



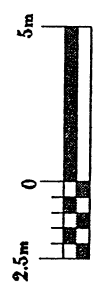
SITE 6  
SECTION A-A

NC DOT

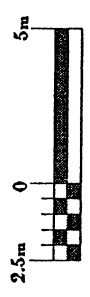
DIVISION OF HIGHWAYS  
NEW HANOVER COUNTY

PROJECT: 34857.1.1 (U-2734)  
MILITARY CUTOFF ROAD  
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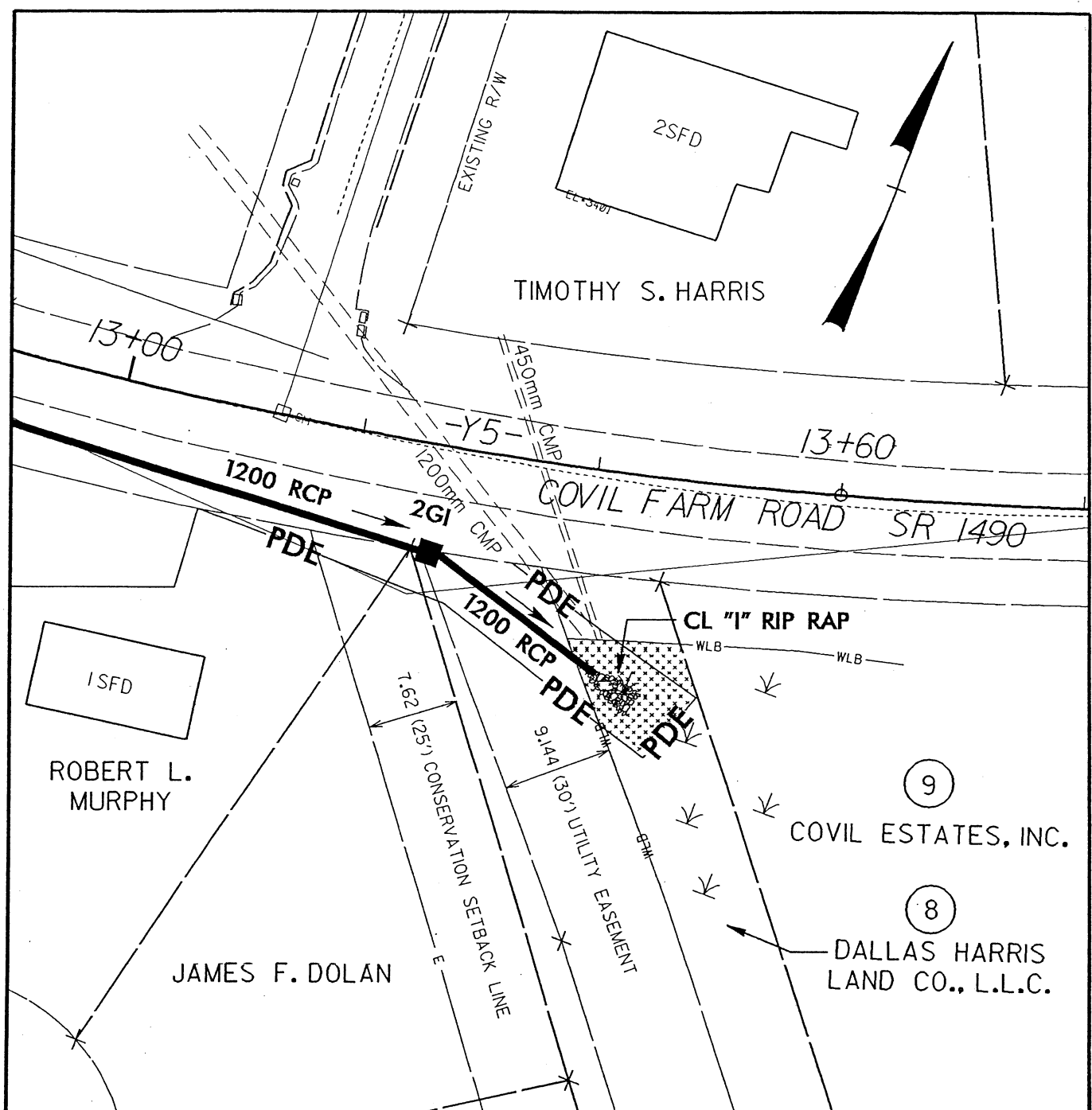
SHEET 30 OF 34 9/03



HORIZONTAL SCALE

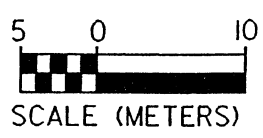


VERTICAL SCALE



PLAN VIEW  
SITE 7

N. C. DEPT. OF TRANSPORTATION  
DIVISION OF HIGHWAYS  
NEW HANOVER COUNTY  
PROJECT: 34857.1.1 - U-2734  
MILITARY CUT-OFF ROAD  
IN WILMINGTON, NC



 DENOTES MECHANIZED CLEARING

**WETLAND PERMIT IMPACT SUMMARY**

Site No.	Station (From/To)	Structure Size / Type	WETLAND IMPACTS				SURFACE WATER IMPACTS					
			Fill In Wetlands (ac)	Temp. Fill In Wetlands (ac)	Excavation In Wetlands (ac)	Mechanized Clearing (Method III) (ac)	Fill In SW (Natural) (ac)	Fill In SW (Pond) (ac)	Temp. Fill In SW (ac)	Existing Channel Impacted (ft)	Natural Stream Design (ft)	
1A	13+60 -L- (Lt)	Extend 48" RCP					0.01				30	
1	21+00 (Lt) to 23+44 (Rt) -L-	2 @ 54" Steel Pipe	0.04			0.02	0.081				1099	*1070
2	27+76 to 28+45 (Lt & Rt) -L-	2 @ 9' x 7' RCBC w/ 2' sill	0.031		0.02	0.14	0.03				131	
3	31+25 to 34+30 (Lt & Rt) -L-	Extend 42" RCP	0.6			0.15	0.02				128	
4	34+40 to 34+70 (Lt) -L-		0.12		** 0.20							
5	38+26 (Rt) to 38+50 (Lt) -L-	72" RCP					0.01				92	
6	45+40 to 46+30 (Rt) -L-		0.02			0.09						
7	13+40 (Rt) -Y5-	48" RCP				0.02						
<b>TOTALS:</b>			<b>0.81</b>	<b>0</b>	<b>0.22</b>	<b>0.42</b>	<b>0.151</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1480</b>	<b>1070</b>

\* Includes 456' of relocated natural stream design + 614' of preserved (in RW) stream = 1070' Total

\*\* 0.16 Ac Drained + 0.04 Ac Excavated = 0.20 Ac Total

NC DEPARTMENT OF TRANSPORTATION  
 DIVISION OF HIGHWAYS  
 PROJECT: 34857.1.1 (U-2734)  
 NEW HANOVER COUNTY  
 MILITARY CUTOFF ROAD

SHEET 32 OF 34

**WETLAND PERMIT IMPACT SUMMARY**

Site No.	Station (From/To)	Structure Size / Type	WETLAND IMPACTS				SURFACE WATER IMPACTS					
			Fill In Wetlands (ha)	Temp. Fill In Wetlands (ha)	Excavation In Wetlands (ha)	Mechanized Clearing (Method III) (ha)	Fill In SW (Natural) (ha)	Fill In SW (Pond) (ha)	Temp. Fill In SW (ha)	Existing Channel Impacted (m)	Natural Stream Design (m)	
1A	Sta 13+60 -L- (Lt)	Extend 1200 RCP					0.004				9	
1	21+00 (Lt) to 24+50 (Rt) -L-	2 @ 1350 Steel Pipe	0.015			0.006	0.034				335	*326
2	27+76 to 28+45 (Lt & Rt) -L-	2 @ 2.7m x 2.1m RCBC w/ 0.6m sill	0.127		0.008	0.058	0.011				40	
3	31+25 to 34+30 (Lt & Rt) -L-	Extend 1050 RCP	0.242			0.060	0.008				39	
4	34+40 to 34+70 (Lt) -L-		0.047		** 0.080							
5	38+26 (Rt) to 38+50 (Lt) -L-	1800 RCP					0.004				28	
6	45+40 to 46+30 (Rt) -L-		0.009			0.035						
7	13+40 (Rt) -Y5-	1200 RCP				0.008						
<b>TOTALS:</b>			<b>0.440</b>		<b>0.088</b>	<b>0.167</b>	<b>0.061</b>				<b>451</b>	<b>326</b>

\* Includes 139m of relocated natural stream design + 187m of preserved (in RW) stream = 326m Total

\*\* 0.064 Ha Drained + 0.016 Excavated = 0.080 Ha Total

**NCDOT**

DIVISION OF HIGHWAYS  
NEW HANOVER COUNTY  
PROJECT: 34857.1.1 (U-2734)

MILITARY CUTOFF ROAD  
IN WILMINGTON, NC

SHEET **33** OF **34**

Form Revised 3/22/01

Oct-03

# PROPERTY OWNER

PROP. NO.	SITE NO.	OWNER'S NAME	ADDRESS
1	1,2,3	BRODY ZIMMER, L.L.C.	3111 PRINCESS ST. WILMINGTON, NC 28401
2	1	TCT OF WILMINGTON, L.L.C.	P.O. BOX 1810 WILMINGTON, NC 28401
3	1	THE GREENWOOD GROUP, INC.	1122 OBERLIN RD. RALEIGH, NC 27605
4	1,2	RAIFORD G. TRASK, JR.	1202 EASTWOOD RD. WILMINGTON, NC 28403
5	3	W. ALLEN COBB, JR.	P.O. BOX 1064 WILMINGTON, NC 28402
6	4	UNITED CEREBRAL PALSEY OF N.C.	P.O. BOX 27707 RALEIGH, NC 27611
7	6	MELBA HEFELFINGER	62 PELICAN DRIVE WRIGHTSVILLE BEACH, NC 28480
8	1A, 5, 7	DALLAS HARRIS LAND CO., L.L.C.	P.O. BOX 531 WRIGHTSVILLE BEACH, NC 28480
9	7	COVIL ESTATES, INC.	7158 MARKET ST. WILMINGTON, NC 28405
10	3	MABLE D. WEEKS	3413 BELLEVUE RD. RALEIGH, NC 27609
11	5	CP & L (PROGRESS ENERGY)	P.O. BOX 1551 RALEIGH, NC 27602

N.C. DEPT. OF TRANSPORTATION  
DIVISION OF HIGHWAYS

NEW HANOVER COUNTY

PROJECT: 34857.1.1 (U-2734)  
MILITARY CUT-OFF ROAD  
IN WILMINGTON, NC