



**DEPARTMENT OF THE ARMY
WILMINGTON DISTRICT, CORPS OF ENGINEERS**

P.O. BOX 1890
WILMINGTON, NORTH CAROLINA 28402-1890

IN REPLY REFER TO

October 4, 2002

Regulatory Division

Action ID. 199300570; U.S. 1, Transportation Improvements Project No. R-210

Mr. Roy C. Shelton, Staff Engineer
Project Development and Environmental Analysis Branch
North Carolina Department of Transportation
Division of Highways
1548 Mail Service Center
Raleigh, North Carolina 27699-1548

Dear Mr. Shelton:

In accordance with the written request of February 21, 2001, and the ensuing administrative record, enclosed is a permit to discharge dredged and/or fill material into Little River, Little Juniper Creek, Crane Creek and Little Crane Creek and their tributaries impacting a total of 4,880 linear feet of streams and 41.5 acres of wetlands to facilitate the construction of 12.8 miles of U.S. 1, Transportation Improvements Project (TIP) R-210, State Project Number 8.T560302. The proposed roadway project extends from the existing U.S. 1 four-lane facility south of Camp Easter Road (SR 1853) at Lakeview in Moore County to the existing four-lane facility at Wild Life Road (SR 1180) south of Sanford in Lee 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, 2005.
- 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.

DEPARTMENT OF THE ARMY PERMIT

SEP 27 2005

NC Department of Transportation

Permittee _____

199300570

Permit No. _____

CESAW-RG-L

Issuing Office _____

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 dredged and/or fill material into Little River, Little Juniper Creek, Crane Creek and Little Crane Creek and their tributaries impacting a total of 4,880 linear feet of streams and 41.5 acres of wetlands to facilitate the construction of 12.8 miles of U.S. 1, Transportation Improvements Project (TIP) R-210, State Project Number 8.T560302. . This authorization also includes the installation of Fiber Optic Cable in the mainline road right-of-way from centerline station 23+20 to 29+25.

Project Location:

In the Cape Fear River basin, from the existing U.S. 1 four-lane facility south of Camp Easter Road (SR 1853) at Lakeview in Moore County to the existing four-lane facility at Wild Life Road (SR 1180) south of Sanford in Lee County, North Carolina

Permit Conditions:

General Conditions:

1. The time limit for completing the work authorized ends on December 31, 2005. 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.

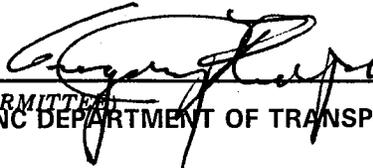
b. The information provided by you in support of your permit application proves to have been false, incomplete, or inaccurate (See 4 above).

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.

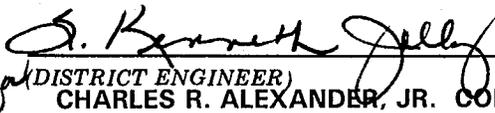


(PERMITTEE)
NC DEPARTMENT OF TRANSPORTATION

26 Sept 02

(DATE)

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



for (DISTRICT ENGINEER)
CHARLES R. ALEXANDER, JR. COLONEL

4 Oct 02

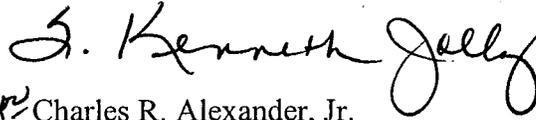
(DATE)

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)

Should you have questions, contact Mr. Richard K. Spencer of my Wilmington Field Office Regulatory staff at telephone (910) 251-4172.

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

SPECIAL CONDITIONS (Action ID. 1993-0-0570; NCDOT/TIP R-210)

1. All work authorized by this permit must be prepared in strict compliance with the attached plans, which are a part of this permit.

2. Stream Relocation Requirements:

a. The permittee will relocate 1154 linear feet of stream at the following locations:

i. The permittee shall mitigate for 174 linear feet of unavoidable impacts to an unnamed tributary to the Little River (Section A, Impact Site #10), an important stream channel, by completing 174 linear feet of onsite stream relocation; as described in the permit application

ii. The permittee shall mitigate for 980 linear feet of unavoidable impacts to an unnamed tributary to Little Crane Creek (Section C, Impact Site #4), an important stream channel, by completing 980 linear feet of onsite stream relocation, as described in the permit application.

b. The relocations will be performed subject to the following conditions.

i. The stream relocation shall be constructed in accordance with the North Carolina Wildlife Resources Commission's (NCWRC) "Stream Relocation Guidelines", and with the attached permit drawings. NCDOT shall consult with NCWRC on all stream relocations and implement all practicable recommendations in the design of specific site requirements for re-establishment of bank vegetation, and placement of meanders and habitat structures. Vegetation shall be used to the maximum extent practicable to stabilize banks, and riprap and other man-made structural measures shall be minimized.

ii. The permittee shall construct all channel relocations in a dry work area. The permittee shall stabilize the relocated channel before stream flows are directed into the new channel. Stream flows shall not be released into the new channel until approved by the Corps of Engineers, Wilmington District. Whenever possible, channel relocations shall be allowed to stabilize for an entire growing season. Upon completion of the project, an as-built channel survey shall be conducted. It is recommended that stream surveys, for both project construction and project monitoring, follow the methodology contained in the USDA Forest Service Manual, *Stream Channel Reference Sites* (Harrelson, et.al, 1994). The survey shall document the dimension, pattern and profile of the relocated channel.

iii. The permittee shall identify a stable reference reach that is close to the proposed relocation site and will not be impacted by the proposed highway construction. The applicant will coordinate a field meeting with the Corps of Engineers

to approve the reference reach selection prior to channel design and relocation of the existing stream. Baseline data on the reference reach channel dimension, pattern, and profile shall be collected and used as a blueprint for the relocation channel design. A detailed design plan of the relocation stream shall be submitted to this office for review prior to construction, including clearing activities.

iv. Vegetation used to stabilize banks shall be limited to native woody species, and will include establishment of a 50 foot wide vegetated buffer on the relocated channel. Stream banks will be planted with native vegetation that represents both woody (trees and shrubs) and herbaceous species. Species selection will be based on a survey of the vegetation from the approved reference reach. Survival of woody species planted at the stream mitigation sites must be at least 320 trees/acre through year three. A ten percent mortality rate will be accepted in year four (288 trees/acre) and another ten percent in year five, resulting in a required survival rate of 260 trees/acre through year five.

v. The permittee shall monitor the stream relocation site for a period of five years starting the year following construction. Monitoring data at the site should include the following: reference photos, plant survival and channel stability. Data shall be collected each year for 5 years at the same time of year. No less than two (2) bankfull flow events must be documented through the required 5-year monitoring period. If less than 2 bankfull events occur during the first 5 years, monitoring will continue until the second bankfull event is documented. The bankfull events must occur during separate monitoring years.

vi. If within any monitoring year, bank or stream stability is not acceptable as determined by the Corps of Engineers, and remedial action required by the Corps of Engineers is performed, the five-year monitoring period of the affected portions of the stream will start again at monitor year one. The permittee will coordinate all remedial activities with the Corps of Engineers, Wilmington District, prior to taking any remedial action. The permittee will submit a brief written report with representative photographs within 90 days after the monitoring year is completed.

vii. The permittee shall provide the Corps of Engineers, Wilmington District with a stream mitigation construction sequencing schedule within 30 days following the project preconstruction meeting. The plan, shall at a minimum, indicate a date of start of construction at the relocation site, grading schedule, planting schedule, completion of construction, monitoring schedule, and a date of potential diversion into the new channel. All stream mitigation construction must be completed within one year from the date of issuance of this permit.

viii. The permittee and/or current and subsequent property owners shall maintain the mitigation site in its natural condition, as altered by work in the mitigation plan, in perpetuity. Prohibited activities within the mitigation site specifically include, but are not limited to: the construction or placement of roads, walkways, buildings, signs, or structures of any kind (i.e., billboards, interior fences, etc.); filling, grading,

excavation, leveling, or any other earth moving activity or activity that may alter the drainage patterns on the property; the cutting, mowing, destruction, removal, or other damage of any vegetation; disposal or storage of any debris, trash, garbage, or other waste material; except as may be authorized by the mitigation plans, or subsequent modifications that are approved by the Corps of Engineers. In addition, the permittee shall take no action, whether on or off the mitigation property, which will adversely impact the wetlands or streams on the mitigation property, except as specifically authorized by this permit, or subsequent modifications that are approved by the Corps of Engineers, Wilmington District.

ix. Condition 2.b.viii, above, runs with the land. The permittee shall not sell, lease, or otherwise convey any interest in the mitigation property without subjecting the property to legally enforceable restrictions on the use of the property, to ensure its preservation in perpetuity. The instrument utilized to meet this condition must be approved in writing by the Wilmington District Corps of Engineers before execution.

3. The permittee shall mitigate for 3726 linear feet of unavoidable impacts to important stream channel associated with this project by payment to the North Carolina Wetlands Restoration Program (NCWRP) in an amount determined by the NCWRP sufficient to perform 7452 linear feet of warm water stream mitigation, or the equivalent water quality improvement projects, as approved by the Corps of Engineers, in the Cape Fear River basin (Cataloging Unit 03030004). Construction within streams on the permitted highway project shall begin only after the permittee has made full payment to the NCWRP, and the NCWRP has made written confirmation to the District Engineer, that it agrees to accept responsibility for the mitigation work required, pursuant to Paragraph IV.D. of the Memorandum of Understanding between the North Carolina Department of Environment and Natural Resources and the U.S. Army Corps of Engineers, Wilmington District, dated November 4, 1998.

4. The permittee shall mitigate for 4.7 acres of unavoidable impacts to High Quality riverine wetlands at the Little River (Section A, Impact Site #1) by providing 4.7 acres of on-site restoration and 8.4 acres of on-site preservation as identified in the Little River On-site Restoration Plan, dated February 2001. In addition, the following stipulations shall apply to this mitigation site:

a. The permittee shall identify a reference site that is adjacent to the proposed restoration site and will not be impacted by the proposed highway construction. The applicant will coordinate a field meeting with the Corps of Engineers to approve the reference site selection prior to mitigation design and restoration of the mitigation site. Baseline data on the reference site hydrology, surface elevations, and vegetation shall be collected and used as a blueprint for the wetland restoration design. A detailed design plan of the wetland restoration shall be submitted to this office for review prior to construction, including clearing activities, at this site (Section A, Impact Site #1).

b. To meet the success criteria, the monitoring data must show that for each normal precipitation year within the monitoring period, the site exhibits saturation within the upper 12 inches of the soil surface for a minimum of 12.5% or 29 days, or greater consecutive day duration during the growing season and inundation must occur 5 out of 10 years or 50% of the years monitored, at a minimum frequency. Baseline hydrologic data shall be obtained from the reference site, which can be used to support the mitigation site's hydrology success. WETS tables for Moore County will be utilized as appropriate to determine normal precipitation years.

c. If there are no normal precipitation years during the first five years of monitoring, to meet performance criteria, the permittee will continue to monitor hydrology on the site until it shows that the site has been inundated or saturated as described above during a normal precipitation year.

d. The mitigation site shall be suitably graded to promote the establishment of planted wetland vegetation, generally to the adjacent wetland reference site elevations. If mineral soil is exposed at the desired restoration grade, the site should be graded to at least minus one-foot and brought back to grade by providing at least one foot of wetland topsoil. If organic soil is exposed at the desired restoration grade, the soil should be disked or suitability prepared for planting. Every effort must be made to utilize the topsoil from the impacted wetlands on this project to promote wetland re-vegetation.

e. The mitigation site will be planted with native vegetation that represents both woody (trees and shrubs) and herbaceous species. Species selection will be based on a survey of the vegetation from the approved reference site. Survival of woody species planted at the mitigation site must be at least 320 trees/acre through year three. A ten percent mortality rate will be accepted in year four (288 trees/acre) and another ten percent in year five resulting in a required survival rate of 260 trees/acre through year five.

f. Vegetation monitoring must begin in the spring just after leaf-out. Permanent randomly located sample plots shall be established at the mitigation site. Plot size should be based on established standards for sampling vegetation planted at the target densities, usually 0.1 acre. The number of plots shall be established by providing combined sample coverage of 2% of the mitigation site, or for small sites less than 15 acres in size, a minimum of three plots shall be established. The planted tree stock shall be marked by use of tree marking paint and/or tree tags for identification and sampling. Plants that have colonized the sample plot shall be identified and noted in the monitoring report but not used in the planted vegetation monitoring calculations. Plant recruitment shall be calculated as a separate item and corrective measures may need to be taken if the volunteers are undesirable or are jeopardizing the survival of the planted stock. The measurement of planted stock survival using stem density will be acceptable provided that only planted stock is counted. In addition, in order to measure health and vigor of the planted stock, height measurements of the plants in each plot shall be taken, compared and provided in the yearly monitoring report. General observations of lateral plant growth, leaf and bud development should also be annotated in the reports.

g. Continually recording monitoring wells, surface gauges and/or piezometers shall be developed in the reference site and restoration site and be of sufficient numbers and adequately spaced to measure the extent, frequency and duration of the site inundation/saturation. This will aid in quickly identifying problem areas for remediation and determine the hydrologic success of the mitigation effort. The permittee must comply with USACE WRP Technical Note HY-IA3.1 for installation and development of the monitor wells and/or piezometers. Monitor wells shall be visited frequently to avoid lengthy down time of non-functioning wells and maintenance shall be scheduled in such a way as to minimize any down time for repairs or replacement. Lengthy down time of wells during the growing season may result in the extension of the monitoring period in order to fill in gaps in the data.

h. The permittee and/or current and subsequent property owners shall maintain the mitigation site in its natural condition, as altered by work in the mitigation plan, in perpetuity. Prohibited activities within the mitigation site specifically include, but are not limited to: the construction or placement of roads, walkways, buildings, signs, or structures of any kind (i.e., billboards, interior fences, etc.); filling, grading, excavation, leveling, or any other earth moving activity or activity that may alter the drainage patterns on the property; the cutting, mowing, destruction, removal, or other damage of any vegetation; disposal or storage of any debris, trash, garbage, or other waste material; except as may be authorized by the mitigation plan, or subsequent modifications that are approved by the Corps of Engineers, Wilmington District. In addition, the permittee shall take no action, whether on or off the mitigation property, which will adversely impact the wetlands or streams on the mitigation property, except as specifically authorized by this permit, or subsequent modifications that are approved by the Corps of Engineers, Wilmington District.

i. Condition 4.h., above, runs with the land. The permittee shall not sell, lease, or otherwise convey any interest in the mitigation property without subjecting the property to legally enforceable restrictions on the use of the property, to ensure its preservation in perpetuity. The instrument utilized to meet this condition must be approved in writing by the Wilmington District Corps of Engineers before execution.

5. The permittee shall mitigate for 36.8 acres of unavoidable impacts to riverine wetlands associated with this project by restoring, at a minimum, 36.8 acres of wetlands, preserving 176 acres of wetlands, and preserving 102 acres of uplands at the 327-acre Sandhills Area Land Trust (SALT) Mitigation Site as described in the report entitled "Wetland Mitigation Plan – SALT Mitigation Site" dated August 16, 2000. In addition, the following stipulations shall apply to this mitigation site:

a. To meet the success criteria, the monitoring data must show that for each normal precipitation year within the monitoring period, the site exhibits saturation within the upper 12 inches of the soil surface for a minimum of 12.5% or 29 days, or greater consecutive day duration during the growing season and inundation must occur 5 out of 10 years or 50% of the years monitored, at a minimum frequency. Baseline hydrologic

data shall be obtained from the reference site, which can be used to support the mitigation site's hydrology success. WETS tables for Moore County will be utilized as appropriate to determine normal precipitation years.

b. The mitigation site will be planted with native vegetation that represents both woody (trees and shrubs) and herbaceous species. Species selection will be based on a survey of the vegetation from the reference sites. Survival of woody species planted at the mitigation site should be at least 320 trees/acre through year three. A ten percent mortality rate will be accepted in year four (288 trees/acre) and another ten percent in year five resulting in a required survival rate of 260 trees/acre through year five.

c. Vegetation monitoring must begin in the spring just after leaf-out. Permanent randomly located sample plots shall be established at the mitigation site. Plot size shall be based on established standards for sampling vegetation planted at the target densities, usually 0.1 acre. The number of plots shall be established by use of statistical methods used to identify adequate sample size and, at a minimum, provide combined sample coverage of 2% of the mitigation site. The planted tree stock shall be marked by use of tree marking paint and/or tree tags for identification and sampling. Plants that have colonized the sample plot should be identified and noted in the monitoring report but not used in the planted vegetation monitoring calculations. Plant recruitment should be calculated as a separate item and corrective measures may need to be taken if the volunteers are undesirable or are jeopardizing the survival of the planted stock. The measurement of planted stock survival using stem density will be acceptable provided that only planted stock is counted. In addition, in order to measure health and vigor of the planted stock, height measurements of the plants in each plot shall be taken, compared and provided in the yearly monitoring report. General observations of lateral plant growth, leaf and bud development should also be annotated in the reports.

d. Continually recording monitoring wells, surface gauges and/or piezometers shall be developed in the reference sites (four wells) and restoration site (eight wells) and be adequately spaced to measure the extent, frequency and duration of the site inundation/saturation. This will aid in quickly identifying problem areas for remediation and determine the hydrologic success of the mitigation effort. The permittee must comply with USACE WRP Technical Note HY-IA3.1 for installation and development of the monitor wells and/or piezometers. Monitor wells shall be visited frequently to avoid lengthy down time of non-functioning wells and maintenance shall be scheduled in such a way as to minimize any down time for repairs or replacement. Lengthy down time of wells during the growing season may result in the extension of the monitoring period in order to fill in gaps in the data.

e. A detailed design plan of the wetland restoration site shall be submitted to this office for review prior to any construction, including clearing activities in the project's permitted areas.

f. No improvements shall be initiated on the logging road that bisects the SALT Mitigation Site. This includes changing the existing grade, maintenance grading,

widening, and/or paving. Stabilization of the road embankments to prevent erosion shall be accomplished by re-vegetation measures only. No structural armoring shall be initiated.

g. Except as described in the mitigation plan, no activities shall be initiated, conducted or allowed on the SALT Mitigation Site that may disturb, impair, alter, and/or modify the hydrology, vegetation and/or hydric soils of any of the existing wetland areas, including any restored wetlands. Periodic controlled burning will be allowed provided no fire brakes are placed in any wetlands and the prescribed burn is in accordance with a NC Forest Service authorized burning plan.

h. No amendments to the existing Conservation Easement dated July 13, 1998 and recorded in Deed Book 1400 at Page 329 shall be undertaken without prior written approval by the Corps of Engineers, Wilmington District.

i. Permittee may not transfer its conservation easement in the SALT mitigation property without the prior approval of the Corps of Engineers.

j. No trails or interpretive exhibits shall be constructed on the SALT Mitigation property subject to the Conservation Easement without the written approval of the Corps of Engineers, Wilmington District.

k. The permittee shall enforce the terms of the conservation easement in the mitigation property recorded in Book 1400, Page 329 of the Moore County Registry.

6. When final design plans are completed for TIP R-210, any necessary permit modification requests shall be submitted to the Corps of Engineers and the North Carolina Division of Water Quality (NCDWQ). If necessary, a public notice describing the modifications and any additional impacts associated with the modifications will be circulated for public review and comment. Final design plans shall reflect all appropriate avoidance and minimization measures taken to lessen the project impacts on aquatic resources. The permittee shall submit a compensatory mitigation plan for proposed additional impacts within streams and wetlands associated with the proposed modifications. Construction within streams and wetlands on TIP R-210 shall begin only after approval by the Corps of Engineers of the modified impacts.

7. Prior to commencing construction within jurisdictional waters of the United States for any portion of the proposed highway project, the permittee shall forward the latest version of project construction drawings to the Corps of Engineers, Wilmington Regulatory Field Office NCDOT Regulatory Project Manager. Half-size drawings will be acceptable.

8. The permittee shall schedule a 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 meetings in order to provide that individual with ample opportunity to schedule and participate in the required meetings.

9. The permittee and its contractors and/or agents shall not excavate, fill, or perform mechanized land clearing at any time in the construction or maintenance of this project within waters and/or wetlands, except as authorized by this permit, or any modification to this permit. There shall be no excavation from, or waste disposal into, 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.

10. To ensure that all borrow and waste activities occur on high ground, except as authorized by this permit, the permittee shall require its contractors and/or agents to identify all areas to be used for borrow material, or to dispose of dredged, fill, or waste material. The permittee shall ensure that all such areas comply with the preceding condition (6) 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 (6). All information will be available to the Corps of Engineers upon request.

11. The permittee shall comply with the conditions specified in the water quality certification, No. 3344, issued by the North Carolina Division of Water Quality on July 19, 2002.

12. In compliance with NHPA, Section 106, the permittee shall comply with all stipulations identified in the Memorandum of Agreement (MOA) between Federal Highway Administration, Advisory Council on Historic Preservation and the NC Historic Preservation Officer (SHPO) on this project.

13. The permittee shall place the inverts of culverts and other structures in waters, streams, and wetlands one foot below the elevation of the streambed to allow low flow passage of water and aquatic life, unless providing passage would be impractical and the Corps of Engineers has waived this requirement. Design and placement of culverts and other structures including temporary erosion control measures shall not be conducted in a manner that may result in dis-equilibrium of wetlands or streambeds or banks, adjacent to, upstream or downstream of the structures.

14. The permittee shall use appropriate sediment and erosion control practices which equal or exceed those outlined in the most recent version of the "North Carolina Sediment and Erosion Control Planning and Design Manual" to assure compliance with the appropriate turbidity water quality standard (50 NTU's in all streams and rivers, and 25 NTU's in all lakes).

15. The permittee shall remove all sediment and erosion control measures placed in wetlands or waters, and shall restore natural grades in those areas, prior to project completion.

16. The permittee shall take measures to prevent live or fresh concrete from coming into contact with any surface waters until the concrete has hardened.

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

18. No excavated or fill material shall be placed at any time in waters or wetlands outside the authorized permit area, nor will it be placed in any location or in any manner so as to impair surface water flow into or out of any wetland area.

19. The permittee shall 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 transferring it to a third party.

20. All fill material shall be clean and free of any pollutants except in trace quantities. Metal products, organic materials, or unsightly debris will not be used.

21. This Department of the Army permit does not obviate the need to obtain other Federal, State, or local authorizations required by law.

22. In issuing this permit, the Federal Government does not assume any liability for:

a. Damages to the permitted project or uses thereof as a result of other permitted or unpermitted activities or from natural causes.

b. Damages to the permitted project or uses thereof as a result of current or future Federal activities initiated on behalf of the general public.

c. Damages to other permitted or un-permitted activities or structures caused by the authorized activity.

d. Design and construction deficiencies associated with the permitted work.

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



July 19, 2002

Mr. William D. Gilmore, P.E., Manager
NCDOT Planning and Environmental Branch
1548 Mail Service Center
Raleigh, NC, 27699-1548

Dear Mr. Gilmore:

Re: Water Quality Certification Pursuant to §401 of the Federal Clean
Water Act, US 1 from north of Lakeview to south of Sanford
(Vass Bypass), Moore/Lee Counties
TIP No. R-210
DWQ Project No. 010404

Attached hereto is a copy of Certification No. 3344 issued to The North Carolina Department of
Transportation dated July 19, 2002.

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

Sincerely,

Alan W. Klimek, P.E.

Attachments

cc: Richard Spencer, USACE Wilmington Field Office
Ken Averitte, NCDWQ Fayetteville Regional Office
Public Hearing Attendees
Central Files
File Copy

NORTH CAROLINA 401 WATER QUALITY CERTIFICATION

THIS 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 incur the following permanent impacts: 41.5 acres of jurisdictional wetlands through permanent fill, excavation, and mechanized clearing; 14.50 acres of surface waters (anthropogenically-created ponds) fill; and 4,880 linear feet of stream channels in Moore and Lee Counties, as described in the Application dated 19 February 2001, and additional information dated 12 February 2002 and 15 March 2002. The project shall be constructed pursuant to the application dated February 19 filed to construct improvements to US 1 from north of Lakeview to south of Sanford (Vass Bypass, TIP Project No. R-210).

The application provides adequate assurance that the discharge of fill material into the waters of the state 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. Should your project change, you are required to notify the DWQ *in writing*, 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 this project incurs additional wetland or stream impacts, additional compensatory mitigation may 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, Non-discharge and Water Supply watershed regulations. This Certification shall expire three (3) 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. The applicant must follow the appropriate sediment and erosion control practices which equal or exceed those outlined in the most recent version of *the North Carolina Sediment and Erosion Control Planning and Design Manual* or *the North Carolina Surface Mining Manual*, whichever is more appropriate (available from the Division of Land Resources (DLR) in the DENR Regional or Central Offices) and shall 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 (50 NTUs in all fresh water streams and rivers not designated as trout waters; 25 NTUs in all lakes and reservoirs, and all saltwater classes; and 10 NTUs in trout waters);
2. NCDOT shall use *Best Management Practices for the Protection of Surface Waters* (NCDOT March 1997), specifically using all applicable preventive and control measures during the design, construction and maintenance of this project. These measures shall be implemented prior to any ground-disturbing activities to minimize impacts to downstream aquatic resources.

3. During the construction of the project, the applicant shall strictly adhere to North Carolina regulations entitled, *Design Standards in Sensitive Watersheds* [15A NCAC 4B .0124(a)-(d)], within the entire project corridor.
4. Storm water shall be directed to buffer areas or retention basins and shall not be routed directly into streams. Existing vegetated buffers shall not be mowed in order to utilize it for storm water diffuse flow.
5. Temporary or permanent herbaceous vegetation shall be planted on all bare soil *within 10 days* of ground-disturbing activities (due to the presence of High Quality Waters) to provide long term erosion control.
6. NCDOT shall adhere to the requirements for High Quality Waters [15A NCAC 2B .0224].
7. Hazardous Spill Catch Basins shall be required for *all stream crossings*. The final designs for the Hazardous Spill Catch Basins shall be submitted to the North Carolina Division of Water Quality 401 Wetlands Unit prior to beginning construction in the Water Supply watershed. As-built drawings for the basins shall be submitted to the North Carolina Division of Water Quality 401 Wetlands Units no later than 30 days after the construction is completed.
8. The bridge(s) required for this project shall be designed according to *Best Management Practices for the Protection of Surface Waters* (NCDOT March 1997). Specifically, the bridge decking shall not discharge storm water directly into the receiving water.
9. Prior to any construction activities, the NCDOT shall submit a maintenance plan for all storm water management facilities and hazardous spill catch basins associated with the project. The NCDOT shall be required to implement the maintenance plan for the life of this road. Sediment and erosion control devices 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.
10. Any bridge demolition work required by this project shall adhere to NCDOT's *Best Management Practices for Bridge Demolition and Removal*.
11. Live or fresh concrete shall not come into contact with waters of the state until the concrete has hardened.
12. There shall be no excavation from or waste disposal into jurisdictional wetlands or waters associated with this permit without appropriate modification of this Certification. If this occurs, compensatory mitigation will be required since it is a direct impact from road construction activities.
13. Placement of culverts and other structures in waters, streams, and wetlands shall be placed below the elevation of the streambed to allow low flow passage of water and aquatic life unless it can be shown to DWQ that providing passage would be impractical. Design and placement of culverts and other structures including temporary erosion control measures shall not be conducted in a manner that may result in dis-equilibrium of wetlands or stream beds or banks, adjacent to or upstream and down stream of the above structures. The applicant is required to provide evidence that the equilibrium shall be maintained if requested in writing by DWQ.
14. NCDOT shall mitigate for the loss of two water supply wells for the Town of Cameron by constructing a municipal supply well or wells capable of yielding a minimum of 70 gallons per

minute (gpm). The Utility Relocation Agreement was entered with the Town of Cameron on October 26, 1998.

15. *Mitigation*: Compensatory mitigation shall be the same as that approved by the US Army Corps of Engineers as long as the mitigation required equals a ratio of 1:1 restoration or creation of lost wetland acres as described in 15A NCAC 2H.0506 (h)(6). A report must be submitted to the NC Division of Water Quality that describes the final approved wetland and stream mitigation for this project within two (2) months of the issuance of the 404 permit issued by the Army Corps of Engineers.

a. Wetland impacts of 41.5 acres include riverine wetlands. NCDOT will mitigate these impacts by providing the following:

- 4.8 acres of on-site restoration (1:1 ratio) in the floodplain of the Little River as described in Appendix C of the Application.

The monitoring plan shall be followed and reports shall be submitted to this Office after the first year and every other year afterwards for a total of five (5) years.

- 8.4 acres of on-site preservation as described in Appendix C of the Application.

- Sandhills Area Land Trust (SALT) Mitigation Site (a 327-acre site in Moore County) being offered in total to offset the remainder of wetland impacts (36.8 acres) associated with the project. This site includes a maximum of 49 acres of wetland restoration.

NCDOT shall place groundwater gauges on the site such that they will accurately measure the drainage effect of the existing ditches at the SALT site. Before the additional monitoring and re-modeling of the groundwater table of the SALT Site occurs, NCDOT shall meet with DWQ personnel to agree upon the details of additional studies. If the resulting hydrological modeling demonstrates that less than 36.8 acres can actually be restored, NCDOT shall obtain wetland mitigation through in-lieu payments to Wetlands Restoration Program (WRP).

b. Stream impacts total 4,880 linear feet in the Cape Fear River Basin (Hydrologic Unit 03030004). NCDOT proposes to provide compensatory mitigation at a 2:1 ratio except where on-site mitigation will be provided. The on-site mitigation sites will be mitigated at a 1:1 ratio as detailed in Table 4, Appendix A of the February 19, 2001 Application. Compensatory mitigation consists of the following:

- 1,154 linear feet of on-site stream relocation/restoration, with 50-foot buffers, using *natural channel design*. The natural channel design specifications shall be calculated from field measurements of an unimpacted section of stream (reference reach). The plans must include reference reach data including a sketch map, the range of values (pattern data), and all calculations (including the determination of bankfull). The channel design should include a floodplain terrace at stream bankfull.

The stream relocation shall be built and maintained according to approved plans before any mitigation credit is given. If this Office determines that the stream restoration or associated riparian area has become unstable, the stream shall be repaired or stabilized using only natural channel design techniques if possible. Additionally, the vegetation in the riparian shall be maintained and/or replaced according to the approved plans. Rip-rap and other hard structures may *only* be used if required by the Division of Land Resources or a Delegated Local Program. Additionally, all repair designs must be submitted to and receive written approval from this Office before the repair work is performed.

Since the restored stream is proposed as compensatory mitigation for stream impacts, the restored portion and associated riparian area shall be preserved in perpetuity through a preservation easement or some other legally binding mechanism or agreement. The above easement or other legally binding mechanism or agreement must be in place before any mitigation credit shall be given. Additionally, the stream physical and biological monitoring plan shall be followed and reports shall be submitted to this Office after the first year and every other year afterwards for a total of five (5) years.

- The remaining 8,068 linear feet of stream mitigation shall be provided via in-lieu payments to Wetlands Restoration Program as agreed on April 1, 1999.

In accordance with 15A NCAC 2R.0500, this contribution will satisfy our compensatory mitigation requirements under 15A NCAC 2H.0506(h). Until plans are received and approved for the stream relocation using natural channel design, wetland or stream fill shall not occur.

16. 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.
17. The Applicant shall require its contractors (and/or agents) to comply with all of the terms of this Certification, and shall provide each of its contractors (and/or agents) a copy of this Certification.

Violations of any condition herein set forth shall 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 Permit.

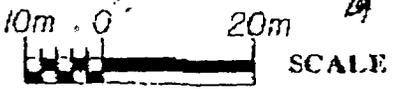
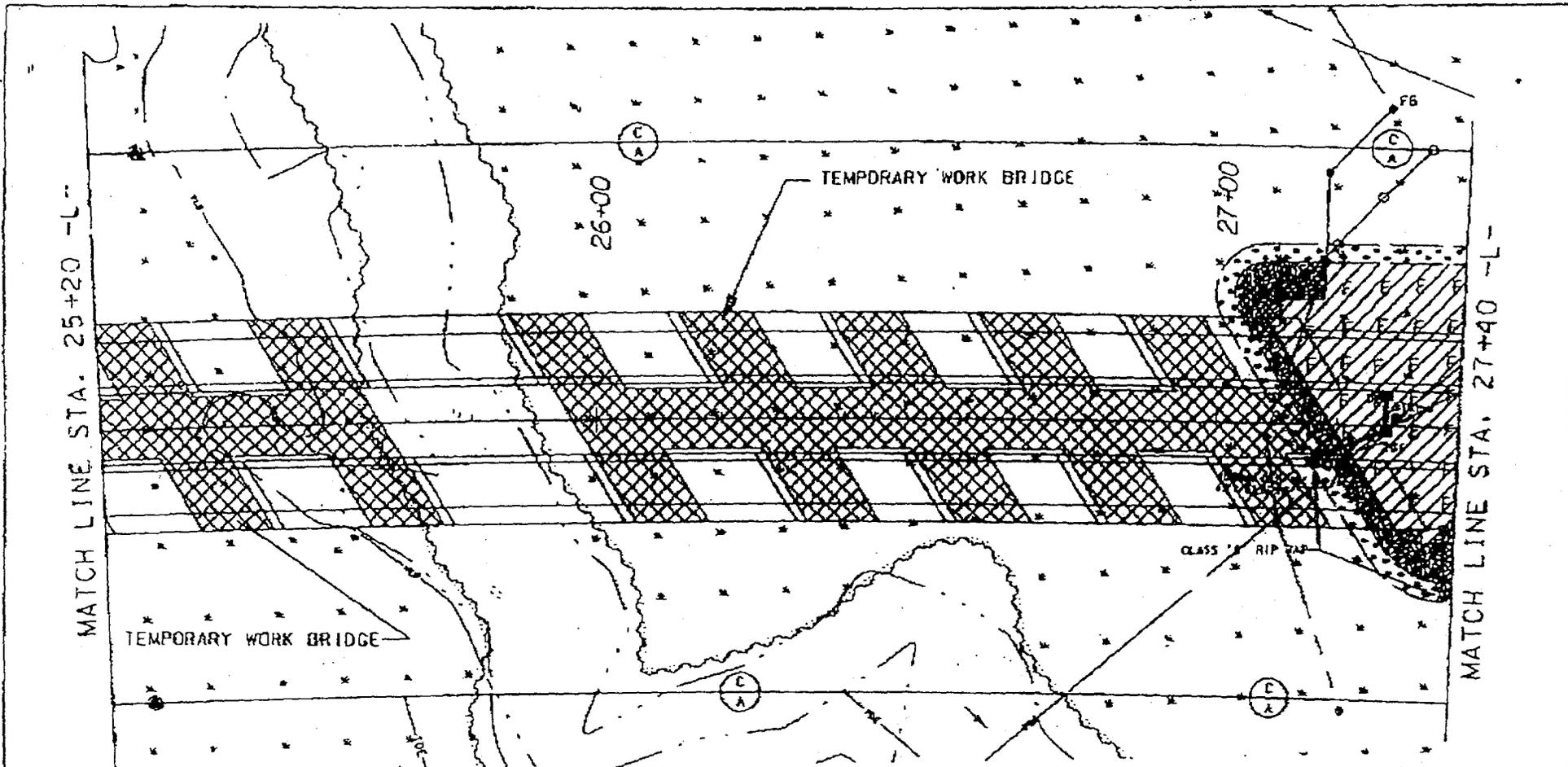
If you do not accept any of the conditions of this certification, you may ask for an adjudicatory hearing. You must act within 60 days of the date that you receive this letter. To ask for a hearing, send a written petition that conforms to Chapter 150B of the North Carolina General Statutes to the Office of Administrative Hearings, 6714 Mail Service Center, Raleigh, N.C. 27699-6714. This certification and its conditions are final and binding unless you ask for a hearing.

This the 19th day of July 2002

DIVISION OF WATER QUALITY



Alan W. Klimek, P.E.

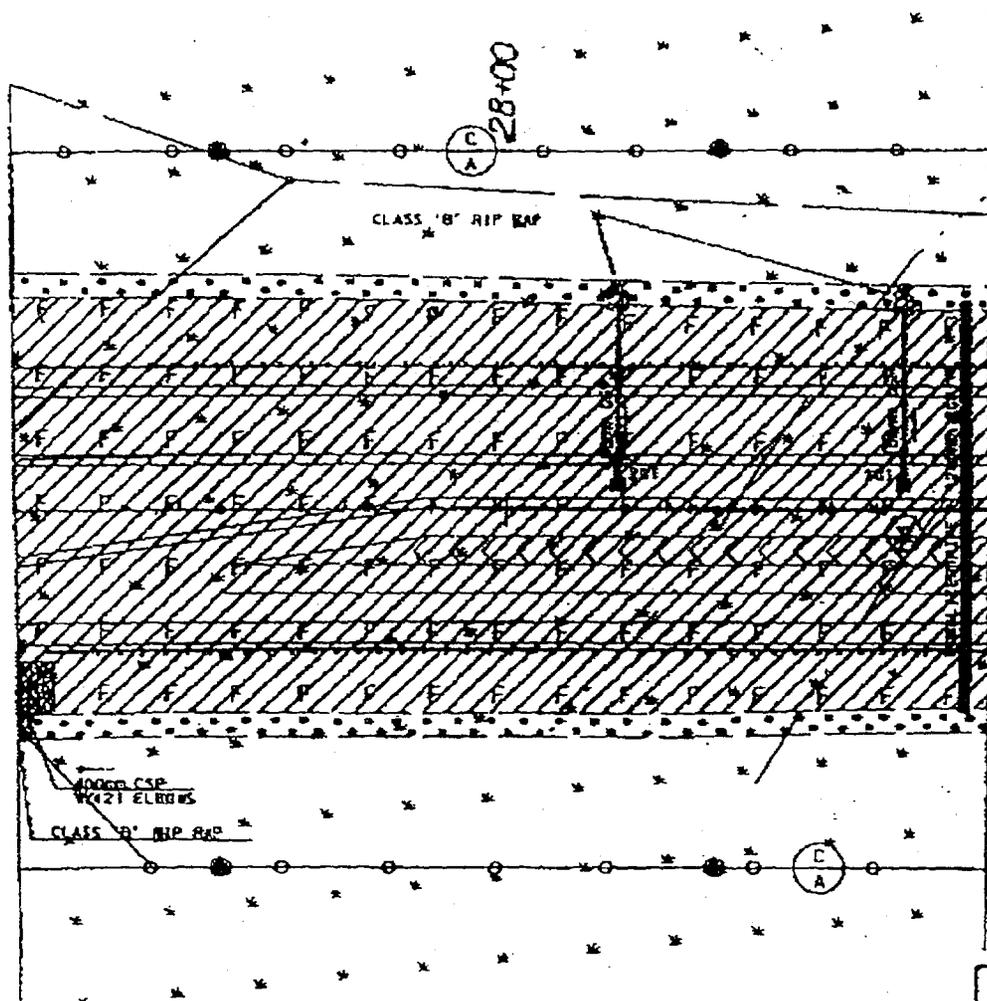


-  DENOTES FILL IN WETLANDS
-  DENOTES MECHANIZED CLEARING IN WETLANDS

N. C. DEPT. OF TRANSPORTATION
 DIVISION OF HIGHWAYS
 MOORE COUNTY
 PROJECT: 8.T560302 (R-210A)
 US 1 BYPASS FROM SR 2175
 AT LAKEVIEW TO
 NORTHEAST OF SR 1825
 SHEET 5 OF 53 1/10/01



MATCH LINE STA. 27+40 -L-

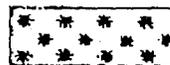


MATCH LINE STA. 28+60 -L-

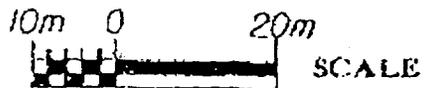
PLAN VIEW SITE 1



DENOTES FILL IN WETLANDS



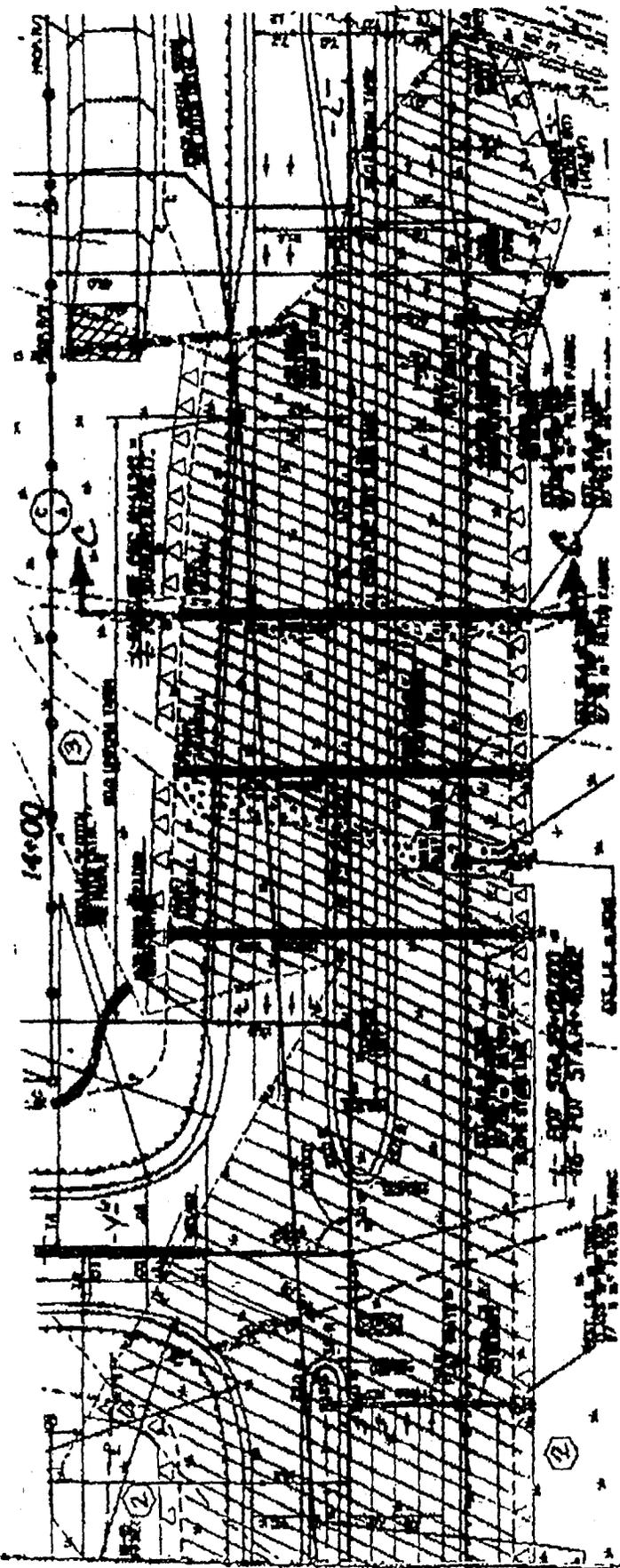
DENOTES MECHANIZED CLEARING
IN WETLANDS



N. C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
MOORE COUNTY

PROJECT: S.TS60302 (R-210A)
US 1 BYPASS FROM SR 2175
AT LAKEVIEW TO
NORTHEAST OF SR 1825

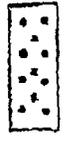
SHEET 6 OF 55 01/10/01



MATCHLINE STA 28+60-L

30+00

29+00

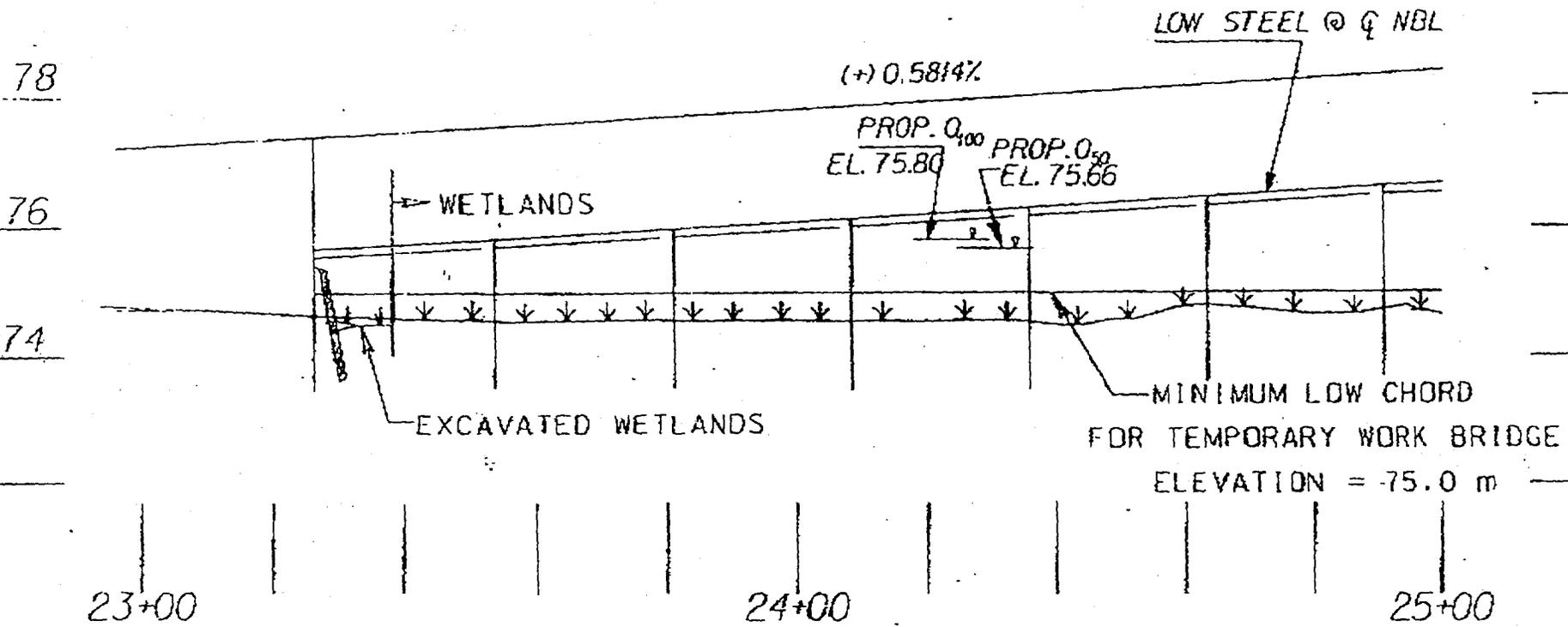
-  DENOTES FILL IN WETLAND
-  DENOTES EXCAVATION IN WETLANDS
-  DENOTES TEMP. IMPACT IN WETLAND DUE TO MECHANIZED CLEARING BEYOND CONSTRUCTION LIMITS.
-  DENOTES FILL IN SURFACE WATER

SITE# 1

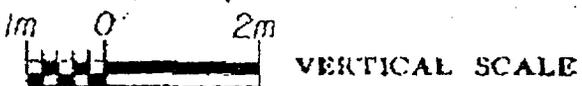
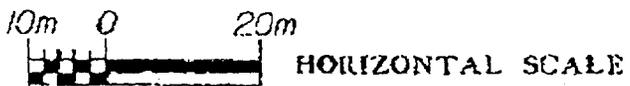


NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
 DIVISION OF HIGHWAYS
 MOORE COUNTY
 B.7560302 R-2:GA
 PROPOSED GRADING, PAVING, DRAINAGE, FENCING, CULVERTS, STRUCTURES, SIGNING, PAVEMENT MARKINGS, AND SIGNALS ON PROPOSED U.S. 1 BYPASS FROM SR 2175 AT LAKEVIEW TO NORTHEAST OF SR 1825.
 SCALE AS SHOWN
 SHEET 7 OF 53
 JULY 1999

(11 @ 27.4m, 4 @ 24.3m)
 C BRIDGE @ -L- 25+19.70 (GP EL. = 78.49)
 SKEW = 61°17'05"



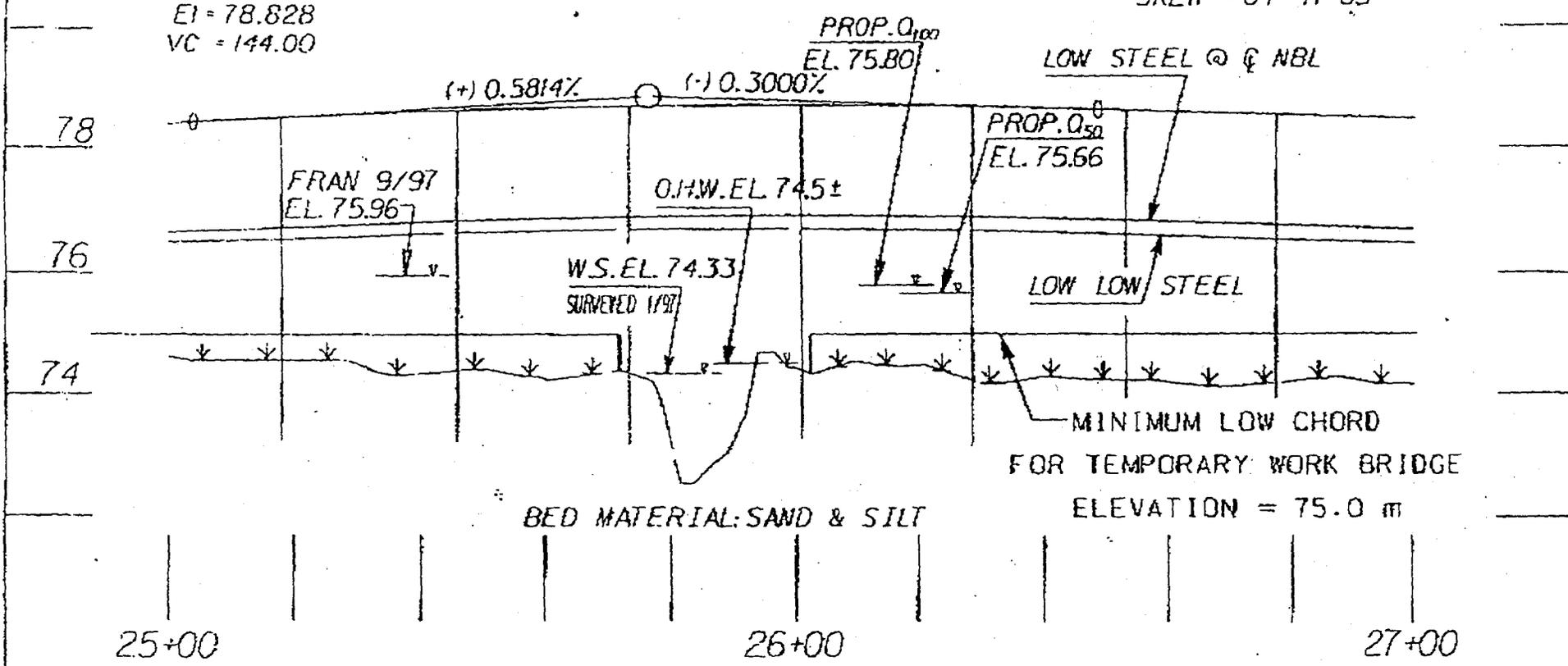
PROFILE NORTH BOUND LANE



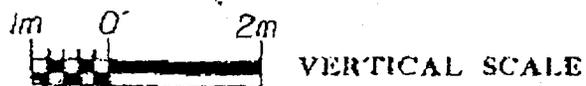
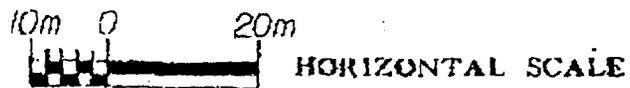
N. C. DEPT. OF TRANSPORTATION
 DIVISION OF HIGHWAYS
 MOORE COUNTY
 PROJECT: &T560302 (R-210A)
 US 1 BYPASS FROM SR 2175
 AT LAKEVIEW TO
 NORTHEAST OF SR 1825
 SHEET 7A OF 1/11/01

PI STA 25+76.00
 EI = 78.828
 VC = 144.00

(11 @ 27.4m, 4 @ 24.3m)
 C/B BRIDGE @ -L- 25+19.70 (GP EL. = 78.49)
 SKEW = 61° 17' 05"

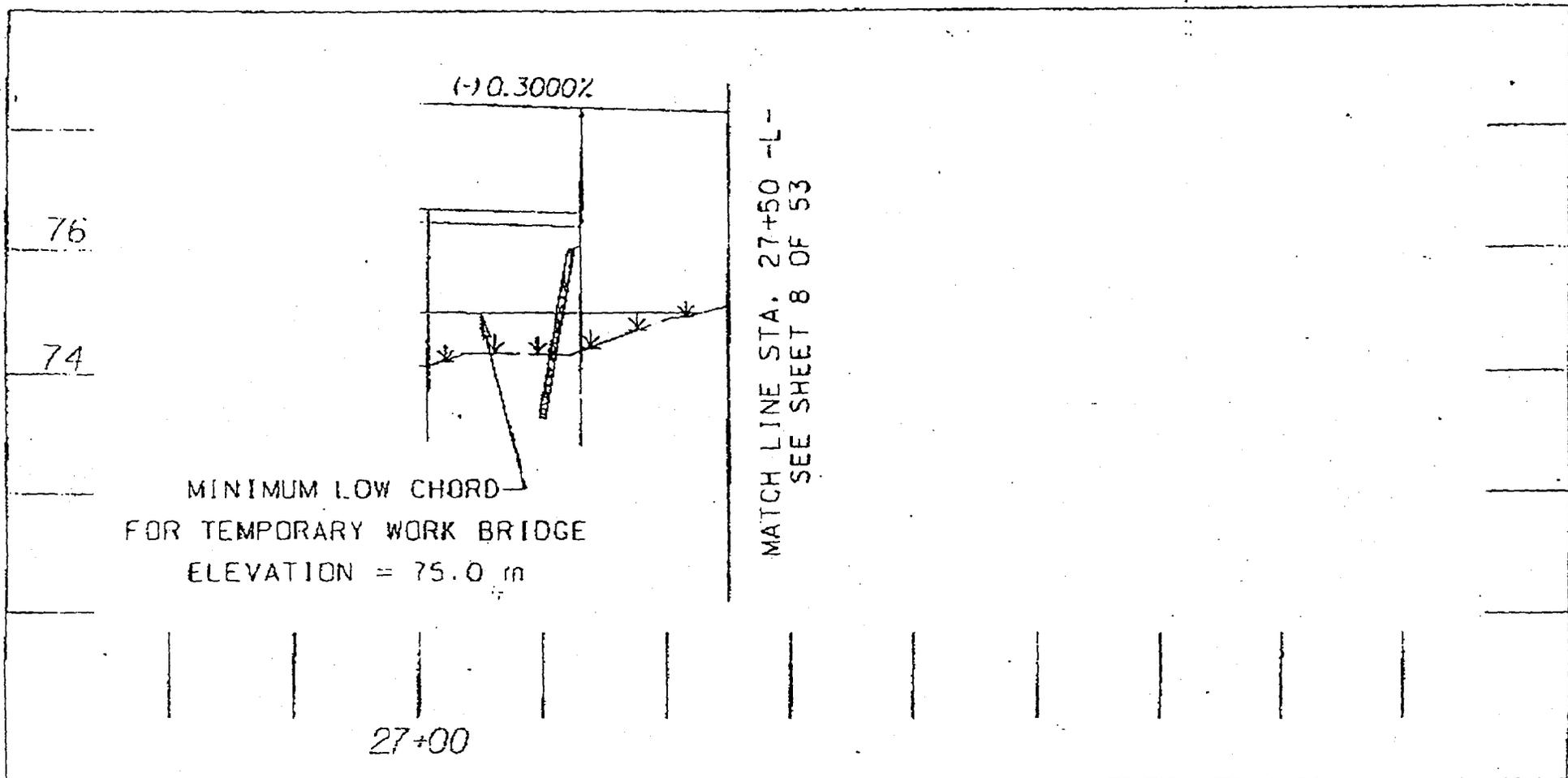


PROFILE NORTH BOUND LANE

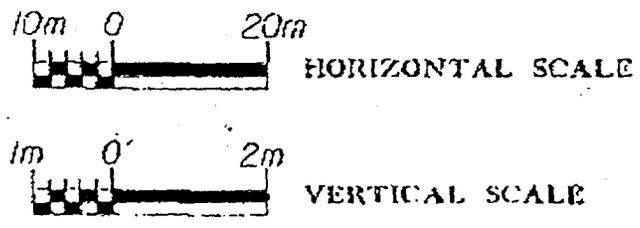


N. C. DEPT. OF TRANSPORTATION
 DIVISION OF HIGHWAYS
 MOORE COUNTY
 PROJECT: 8.T560302 (R-210A)
 US 1 BYPASS FROM SR 2175
 AT LAKEVIEW TO
 NORTHEAST OF SR 1825

SHEET 78 OF 1/11/01



PROFILE NORTH BOUND LANE



N. C. DEPT. OF TRANSPORTATION
 DIVISION OF HIGHWAYS
 MOORE COUNTY
 PROJECT: 8TS60302 (R-210A)
 US 1 BYPASS FROM SR 2175
 AT LAKEVIEW TO
 NORTHEAST OF SR 1825

SHEET ~~76~~ OF 81 1/11/01

P. 08/14

(11 @ 27.4m, 4 @ 24.3m)
 @ BRIDGE @ -L- 25+19.70 (GP EL. 78.49)
 SKEW = 61°17'05"

(+) 0.5814%

LOW STEEL @ C SBL

WETLANDS

LOW LOW STEEL

PROP. 0₁₀₀
 EL. 75.80

PROP. 0₅₀
 EL. 75.66

EXCAVATED WETLANDS

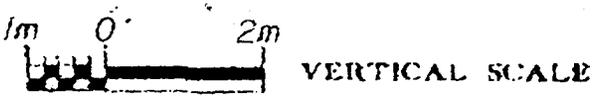
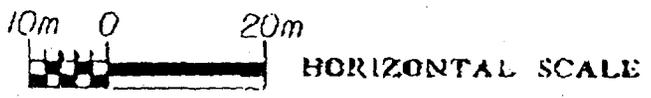
MINIMUM LOW CHORD
 FOR TEMPORARY WORK BRIDGE
 ELEVATION = 75.0 m

23+00

24+00

25+00

PROFILE SOUTH BOUND LANE

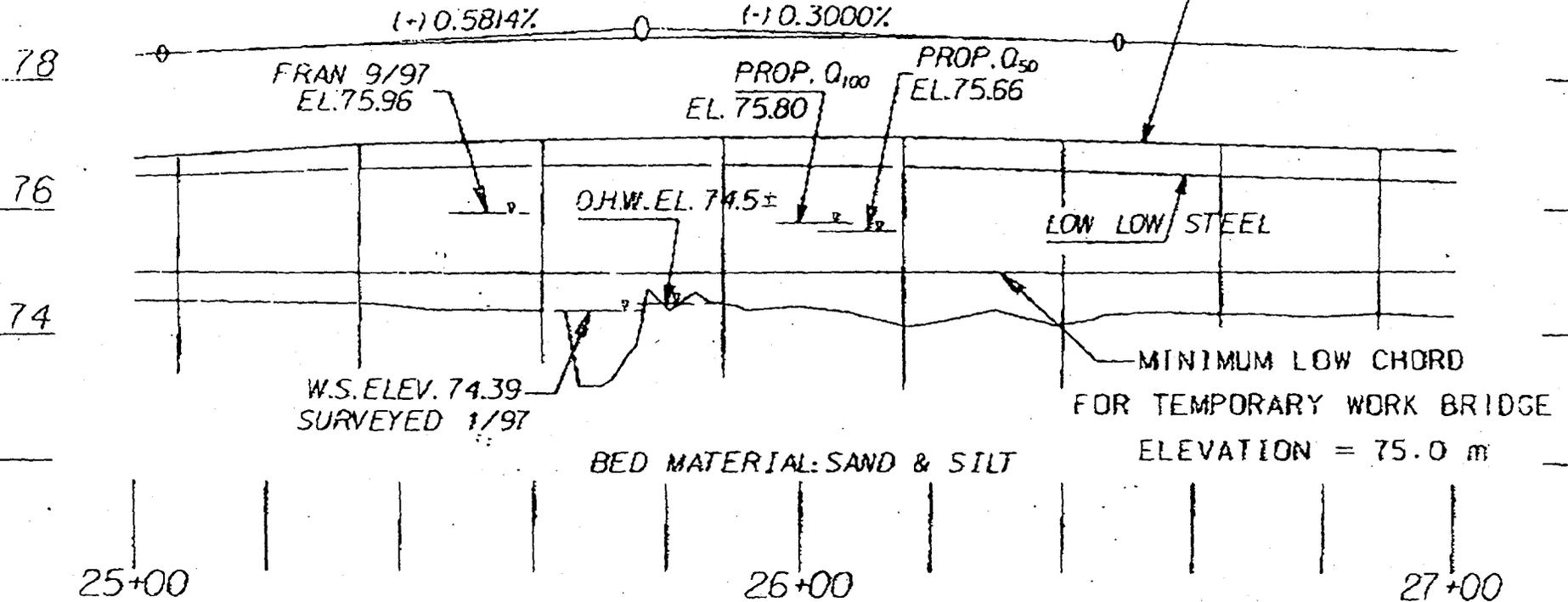


N. C. DEPT. OF TRANSPORTATION
 DIVISION OF HIGHWAYS
 MOORE COUNTY
 PROJECT: &T560302 (R-210A)
 US 1 BYPASS FROM SR 2175
 AT LAKEVIEW TO
 NORTHEAST OF SR 1825

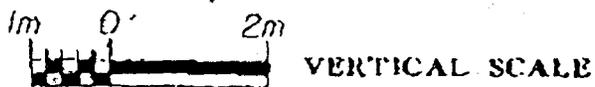
PI STA 25+76.00
EI = 78.828
VC = 144.00

(11 @ 27.4m, 4 @ 24.3m)
C BRIDGE @ -L- 25+19.70 (GP EL. = 78.49)
SKEW = 61°17'05"

LOW STEEL @ C SBL

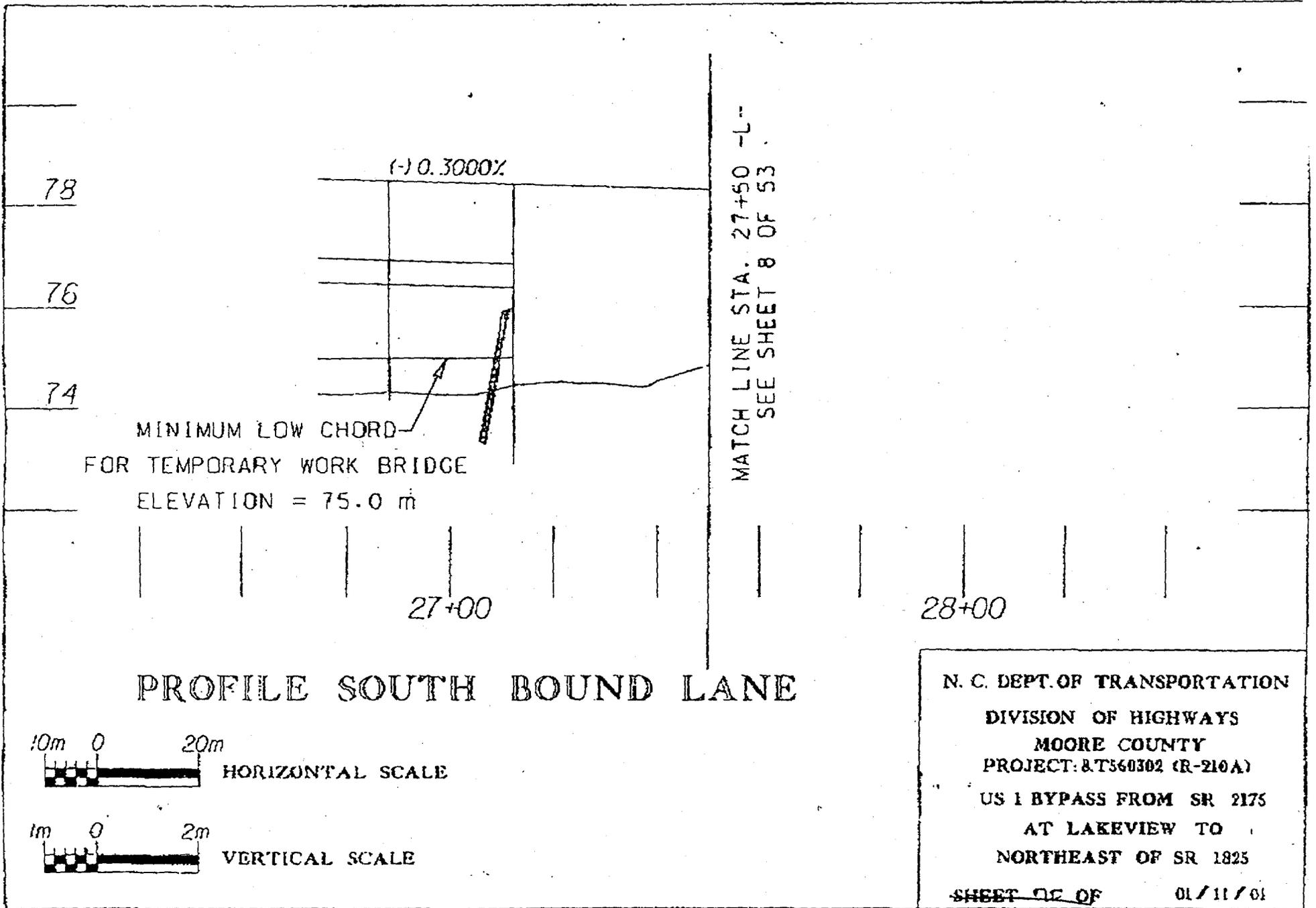


PROFILE SOUTH BOUND LANE



N. C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
MOORE COUNTY
PROJECT: B.T560302 (R-210A)
US 1 BYPASS FROM SR 2175
AT LAKEVIEW TO
NORTHEAST OF SR 1825

SHEET 26 OF 01/11/01



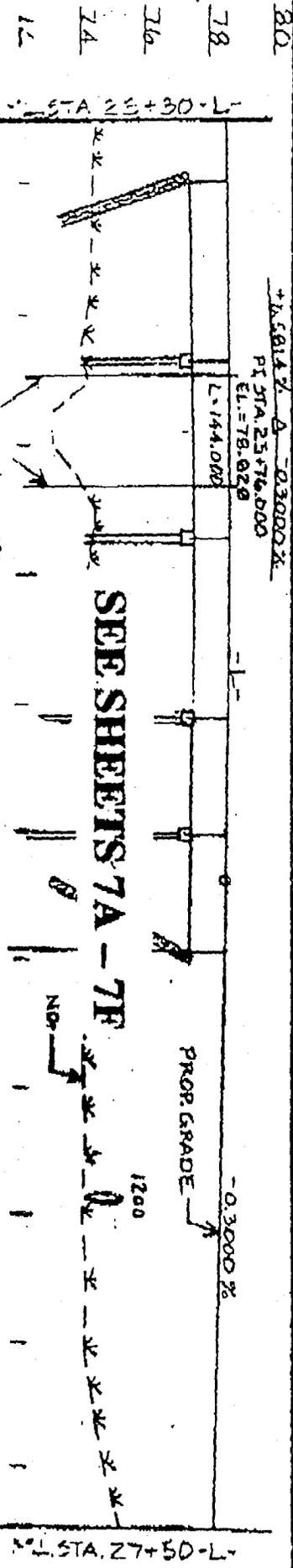
PROFILE SOUTH BOUND LANE

N. C. DEPT. OF TRANSPORTATION
 DIVISION OF HIGHWAYS
 MOORE COUNTY
 PROJECT: 8T560302 (R-210A)
 US 1 BYPASS FROM SR 2175
 AT LAKEVIEW TO
 NORTHEAST OF SR 1825
 SHEET 02 OF 01 / 11 / 01

11/11/01 02/11/01

-L-PROFILE

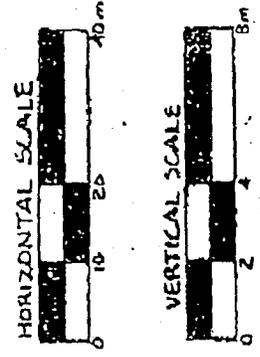
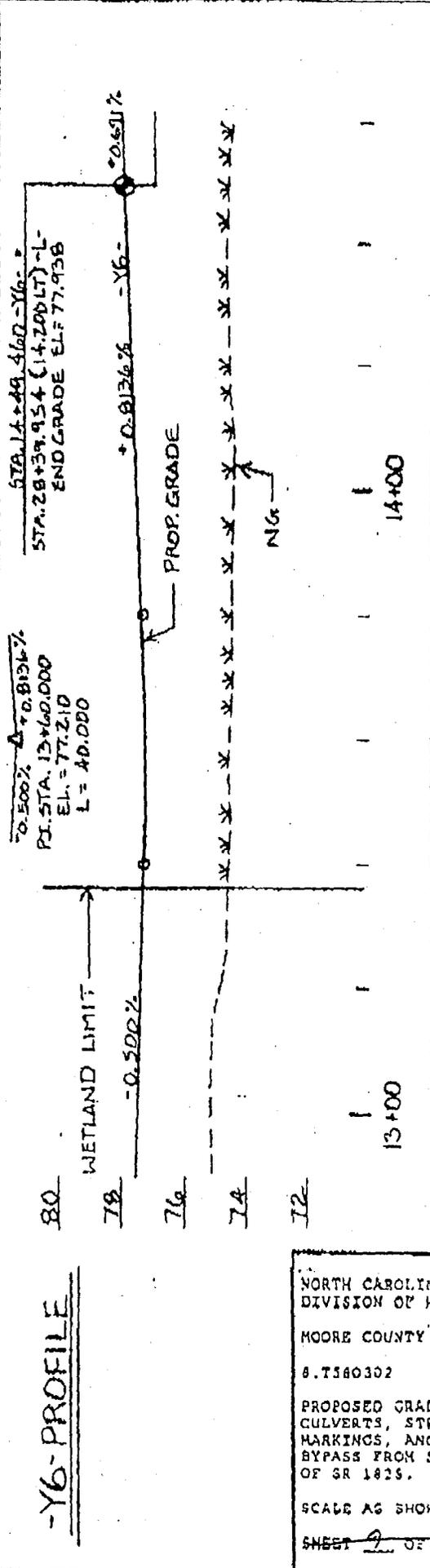
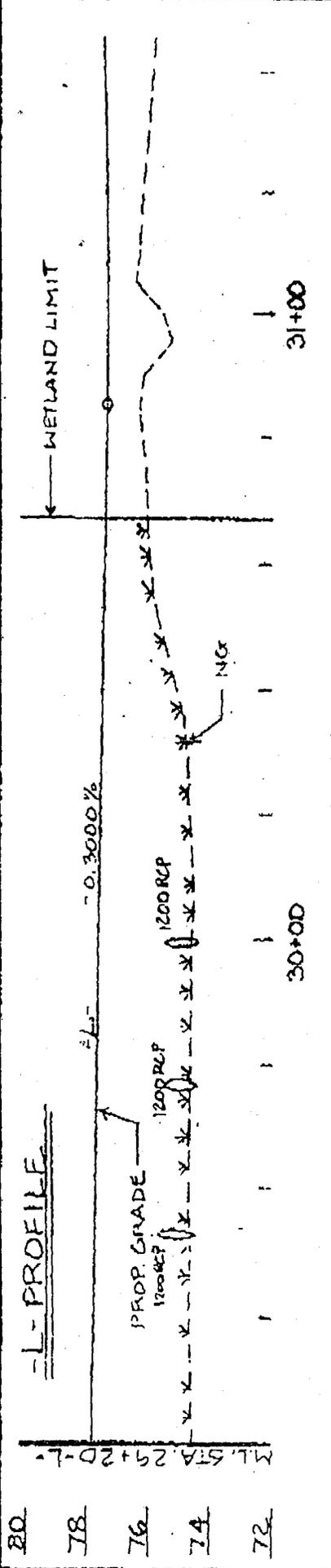
SEE SHEETS 7A-7F



NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
 DIVISION OF HIGHWAYS
 MOORE COUNTY
 R. 5560302
 A-210A
 PROPOSED GRADING, PAVING, DRAINAGE, FENCING
 CULVERTS, STRUCTURES, SIGNING, PAVEMENT
 MARKINGS, AND SIGNALS ON PROPOSED U.S. 1
 BYPASS FROM SR 2175 AS TAKEN TO NORTHEAST
 OF SR 1025.
 SCALE AS SHOWN
 SHEET 1 OF 1
 NOVEMBER 1971



DENOTES WETLAND



***** DENOTES WETLAND

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

MOORE COUNTY

8.7580302 R-2:0A

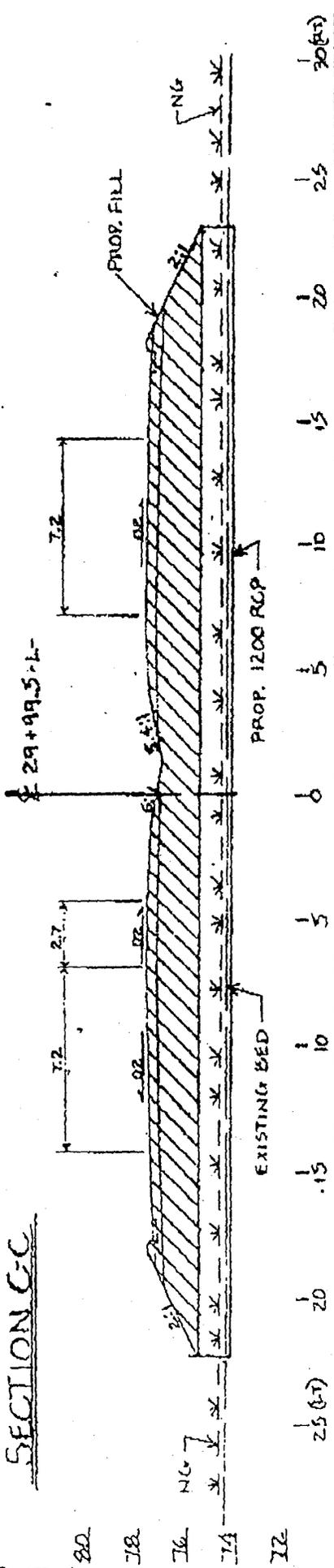
PROPOSED GRADING, PAVING, DRAINAGE, FENCING
CULVERTS, STRUCTURES, SIGNING, PAVEMENT
MARKINGS, AND SIGNALS ON PROPOSED U.S. 1
BYPASS FROM SR 2175 AT LAKEVIEW TO NORTHEAST
OF SR 1825.

SCALE AS SHOWN

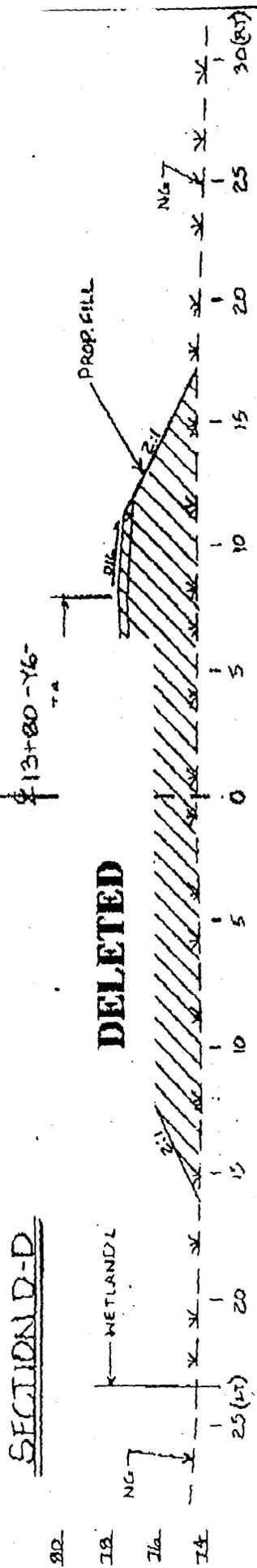
SHEET 9 OF 10

NOVEMBER 1997

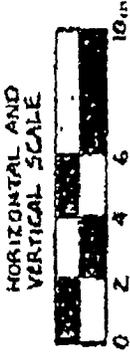
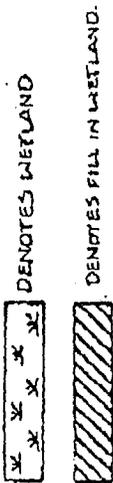
SECTION C-C



SECTION D-D



DELETED



NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

MOORE COUNTY

8.7560302

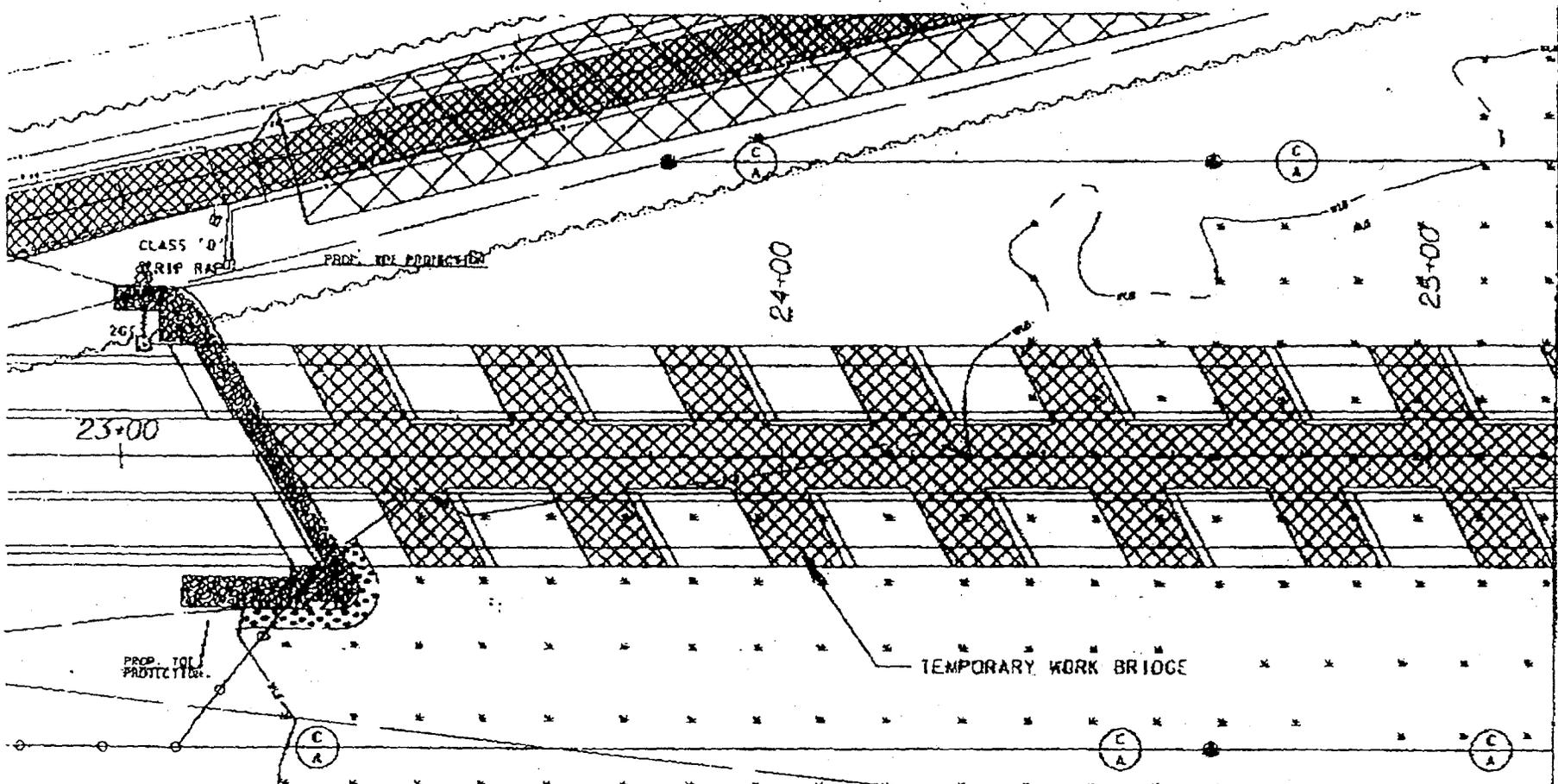
B-210A

PROPOSED GRADING, PAVING, DRAINAGE, FENCING
CULVERTS, STRUCTURES, SIGNING, PAVEMENT
MARKINGS, AND SIGNALS ON PROPOSED U.S. 1
BYPASS FROM SR 2175 AT LAKEVIEW TO NORTHEAST
OF SR 1025.

SCALE AS SHOWN

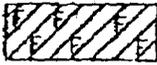
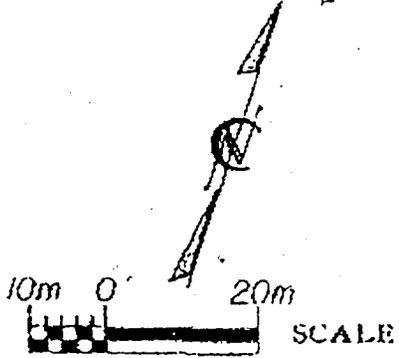
SHEET 11 OF 11

NOVEMBER 1997



MATCH LINE STA. 25+20 -L-

PLAN VIEW
SITE 1

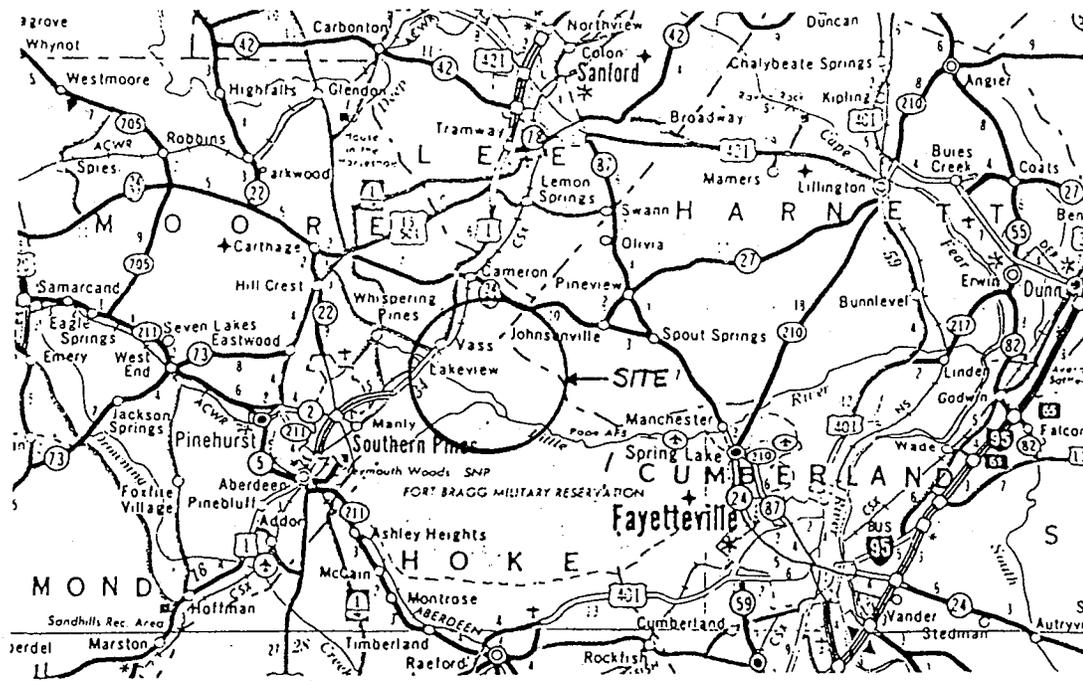


DENOTES FILL IN WETLANDS

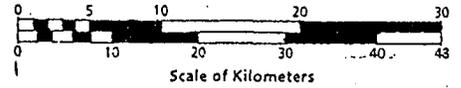


DENOTES MECHANIZED CLEARING
IN WETLANDS

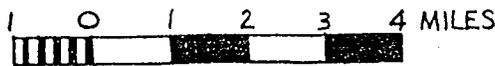
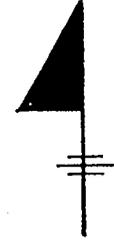
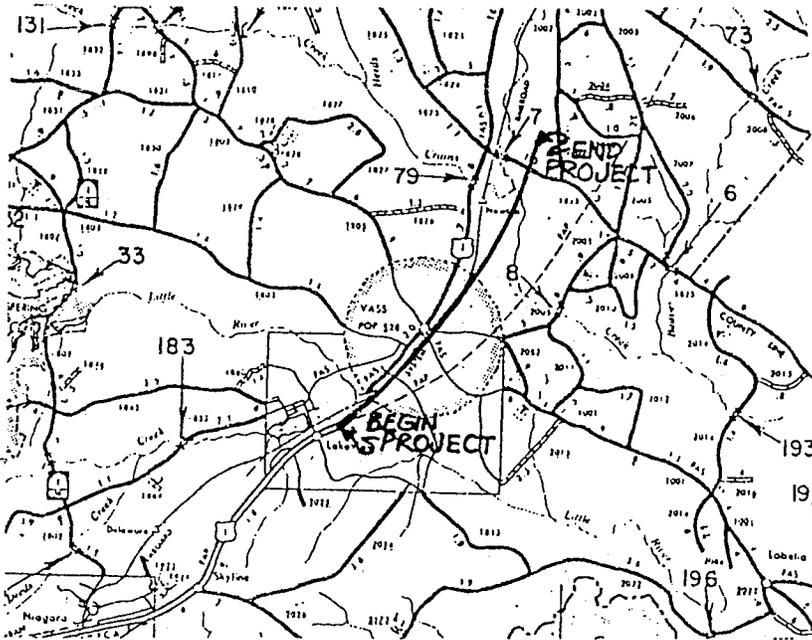
N. C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
MOORE COUNTY
PROJECT: B.T560302 (R-210A)
US 1 BYPASS FROM SR 2175
AT LAKEVIEW TO
NORTHEAST OF SR 1825
SHEET ~~4~~ OF 53 1/10/01



Scale of Miles



VICINITY MAP



SCALE

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

MOORE COUNTY

B.T560302

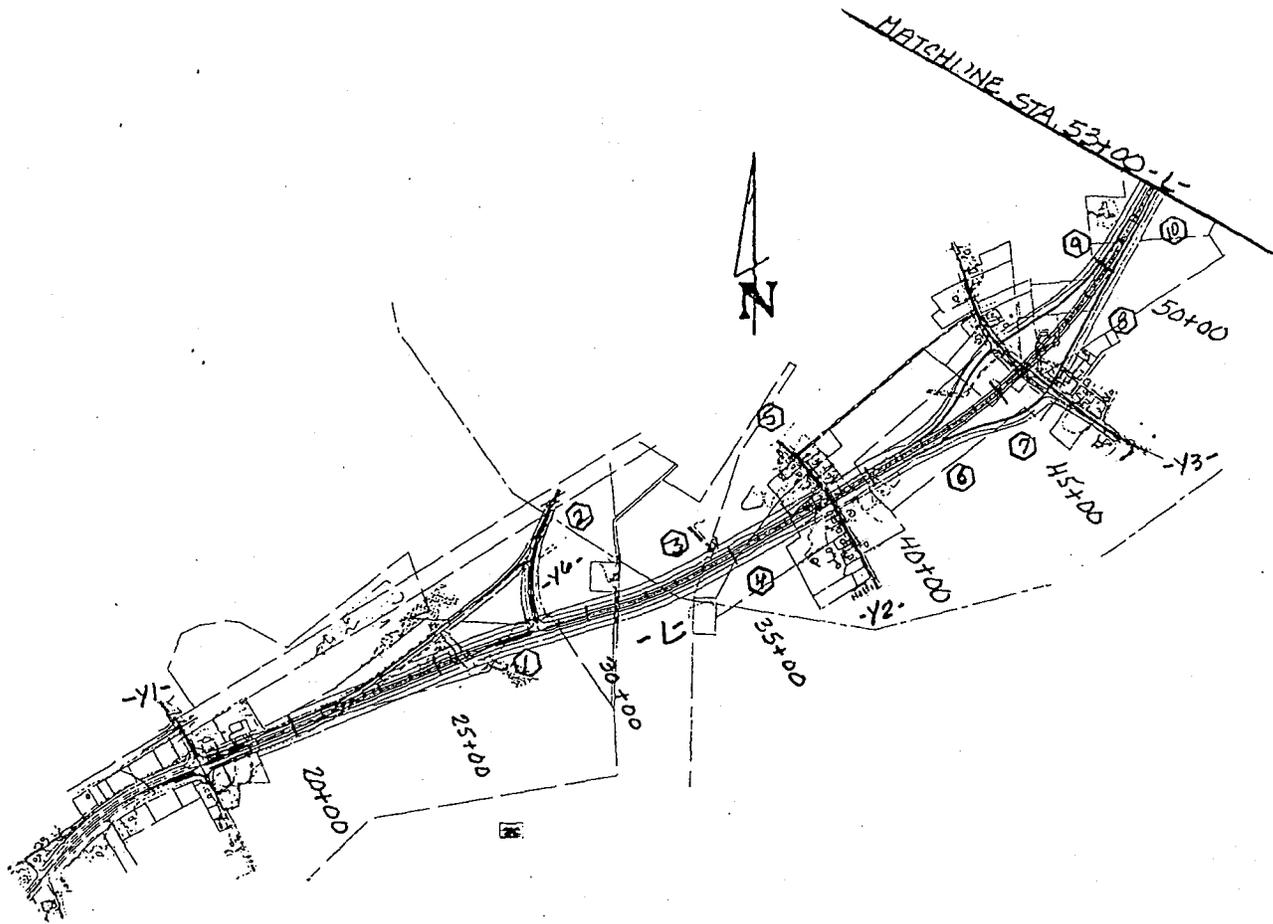
R-210A

PROPOSED GRADING, PAVING, DRAINAGE, FENCING
CULVERTS, STRUCTURES, SIGNING, PAVEMENT
MARKINGS, AND SIGNALS ON PROPOSED U.S. 1
BYPASS FROM SR 2175 AT LAKEVIEW TO NORTHEAST
OF SR 1825.

SCALE AS SHOWN

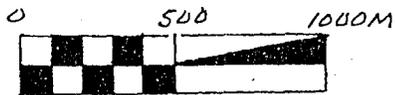
SHEET 1 OF 50

NOVEMBER 1997



SITE MAP

SCALE



1:25,000

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

MOORE COUNTY

8.T560302

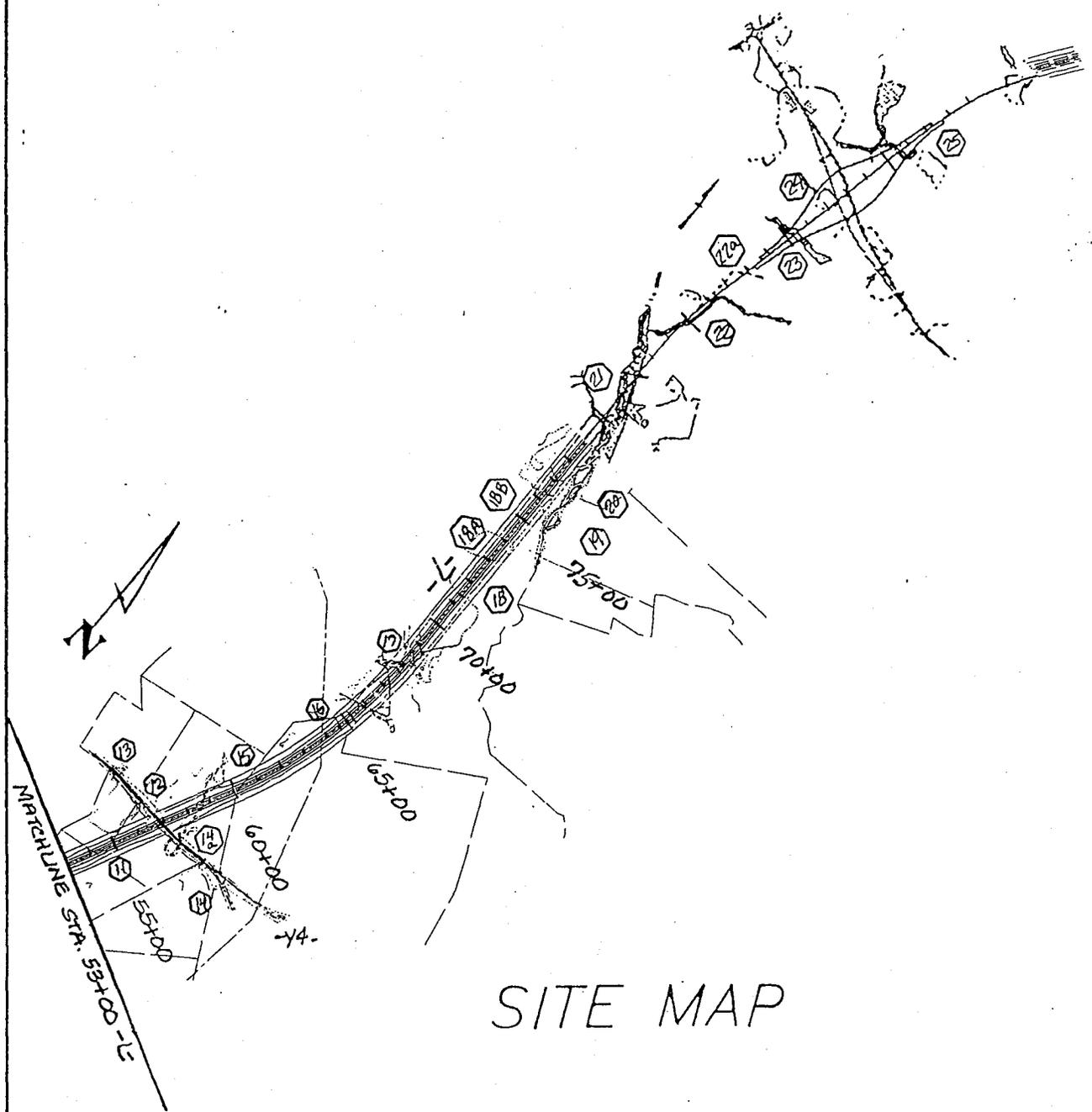
R-210A

PROPOSED GRADING, PAVING, DRAINAGE, FENCING
CULVERTS, STRUCTURES, SIGNING, PAVEMENT
MARKINGS, AND SIGNALS ON PROPOSED U.S. 1
BYPASS FROM SR 2175 AT LAKEVIEW TO NORTHEAST
OF SR 1825.

SCALE AS SHOWN.

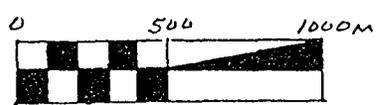
SHEET 2 OF 58

NOVEMBER 1997



SITE MAP

SCALE



1:25,000

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
 DIVISION OF HIGHWAYS
 MOORE COUNTY
 8.T560302 R-210A
 PROPOSED GRADING, PAVING, DRAINAGE, FENCING
 CULVERTS, STRUCTURES, SIGNING, PAVEMENT
 MARKINGS, AND SIGNALS ON PROPOSED U.S. 1
 BYPASS FROM SR 2175 AT LAKEVIEW TO NORTHEAST
 OF SR 1825.
 SCALE AS SHOWN
 SHEET 3 OF 58 NOVEMBER 1997

23.029 -Y6-REV
 BEGIN PROP. C/A
 BEGIN PROP. FENCE
 5.000 (LT)

SITE Z

150.00 FULL

-Y6-REV CS

60.0 UNIFORM TRANSITION - LT. & RT.
 & MEDIAN
 PROP. R/W (CHORD)

DITCH

CAT-1

+96.074

7.2
 3.6

09.9

88.18

49.835

UNIFORM TRANS.

- LT. &

26

80.3150

+25.0
 END P
 END P
 23.00

MAIN
 X-SECTIONS

1.00

0.027

5 =
 940 RT.

.048
 -REV
 255 (RT)

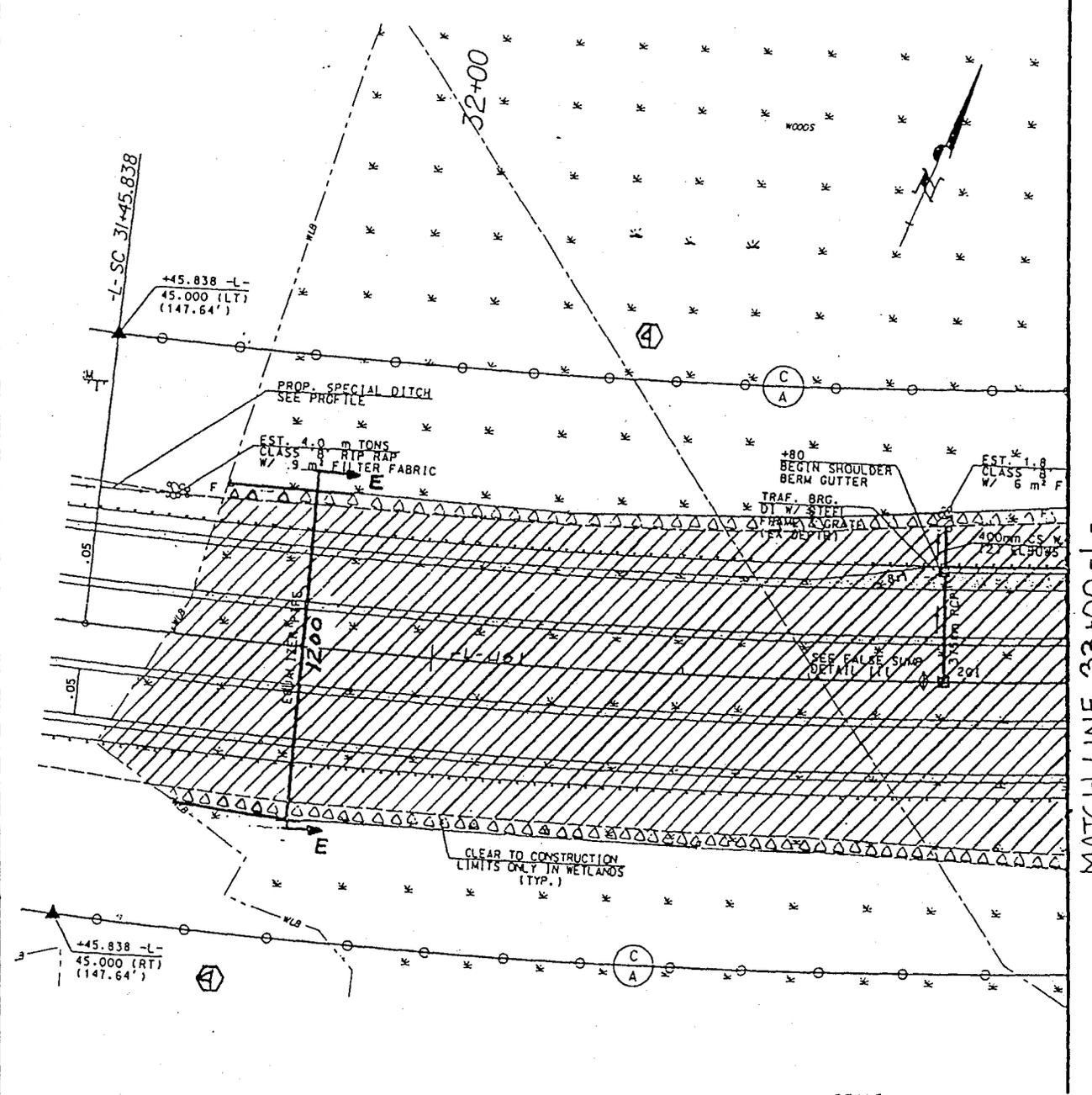
+00.135
 -Y6-REV
 49.535 (RT)



NORTH CAROLINA DEPARTMENT OF
 TRANSPORTATION

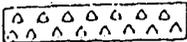
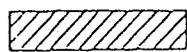
DIVISION OF HIGHWAYS
 PROJECT DEVELOPMENT &
 ENVIRONMENTAL ANALYSIS BRANCH

MOORE / LEE COUNTY
 PROJECT 8.T560302
 US 1 FROM NORTH OF SR 2175 AT LAKEVIEW
 to North of SR 1825, R-210 A

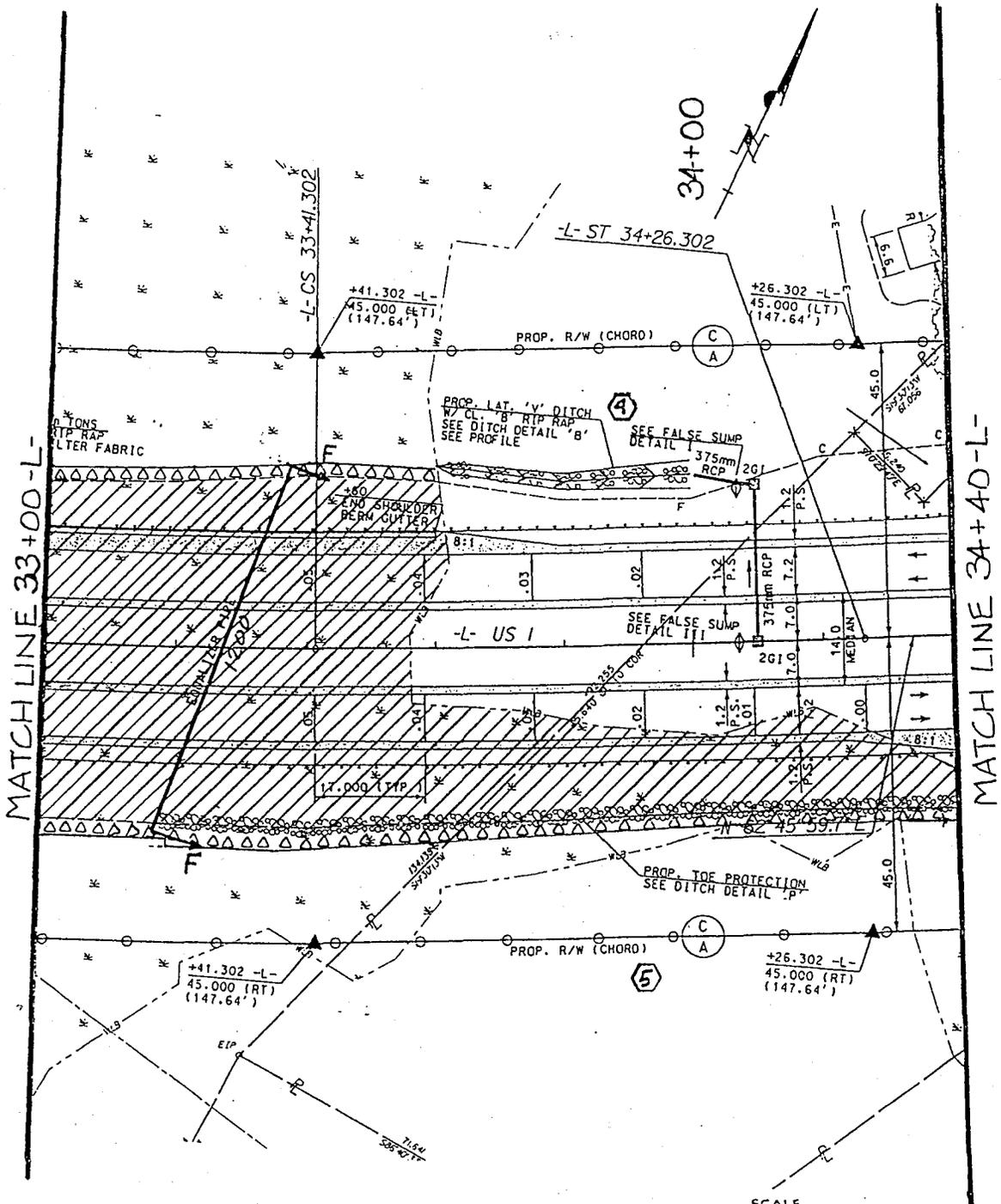


MATCH LINE 33+00-L

SITE #3

-  DENOTES TEMP. IMPACT IN WETLAND DUE TO MECHANICAL CLEARING BEYOND CONSTRUCTION LIMITS
-  DENOTES FILL IN WETLAND

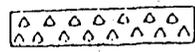
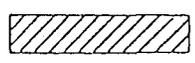
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
 DIVISION OF HIGHWAYS
 MOORE COUNTY
 B. T560302 R-210A
 PROPOSED GRADING, PAVING, DRAINAGE, FENCING
 CULVERTS, STRUCTURES, SIGNING, PAVEMENT
 MARKINGS, AND SIGNALS ON PROPOSED U.S. 1
 BYPASS FROM SR 2175 AT LAKEVIEW TO NORTHEAST
 OF SR 1825.
 SCALE AS SHOWN
 SHEET ~~48~~ OF 58
 NOVEMBER 1997

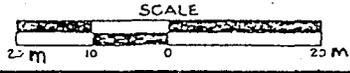


MATCH LINE 33+00-L-

MATCH LINE 34+40-L-

SITE #3

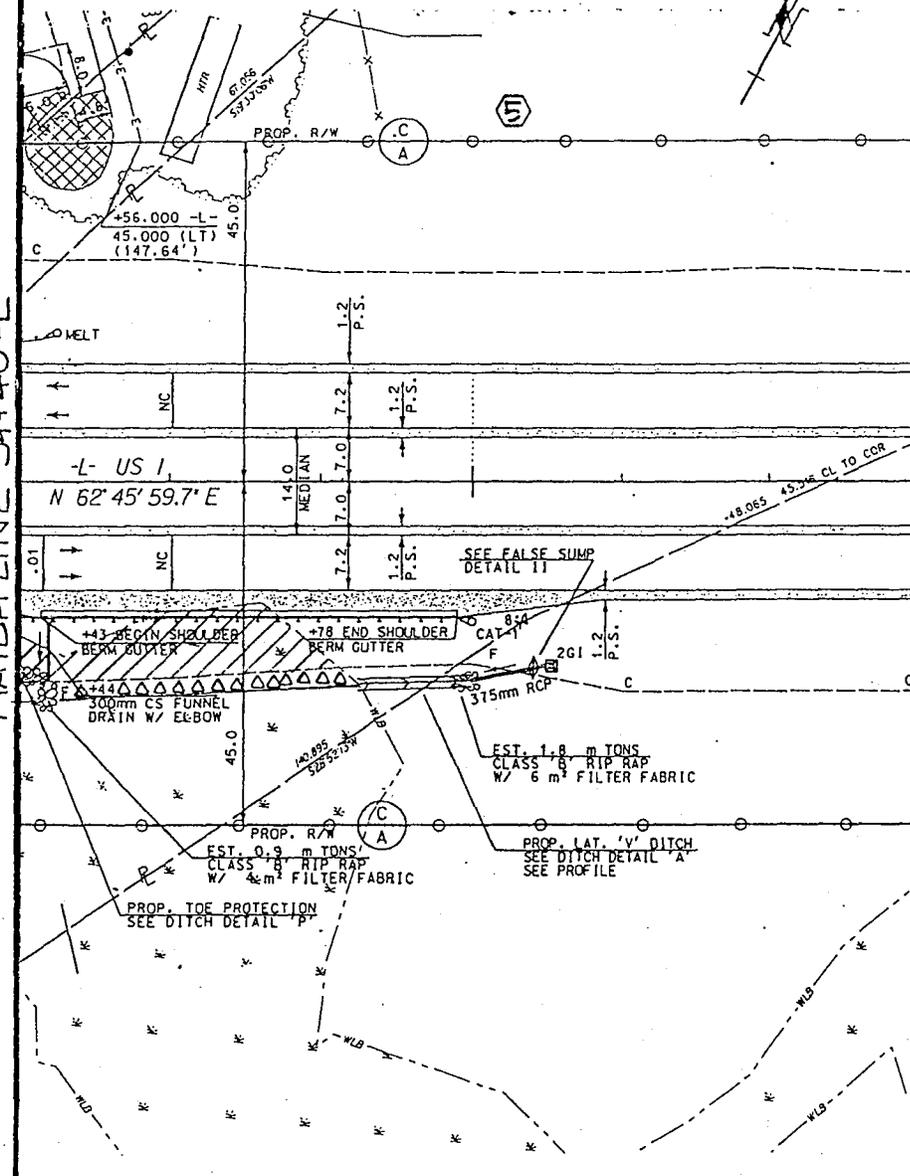
-  DENOTES TEMP. IMPACT IN WETLAND DUE TO MECHANICAL CLEARING BEYOND CONSTRUCTION LIMITS
-  DENOTES FILL IN WETLAND.



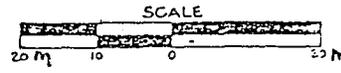
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
 DIVISION OF HIGHWAYS
 MOORE COUNTY
 8.T560302 R-210A
 PROPOSED GRADING, PAVING, DRAINAGE, FENCING
 CULVERTS, STRUCTURES, SIGNING, PAVEMENT
 MARKINGS, AND SIGNALS ON PROPOSED U.S. 1
 BYPASS FROM SR 2175 AT LAKEVIEW TO NORTHEAST
 OF SR 1825.
 SCALE AS SHOWN
 SHEET 6 OF 58
 NOVEMBER 1997

35+00

MATCH LINE 34+40-L-



SITE #3



-  DENOTES TEMP. IMPACT IN WETLAND DUE TO MECHANICAL CLEARING BEYOND CONSTRUCTION LIMITS
-  DENOTES FILL IN WETLAND.

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
 DIVISION OF HIGHWAYS

MOORE COUNTY

8.T560302 R-210A

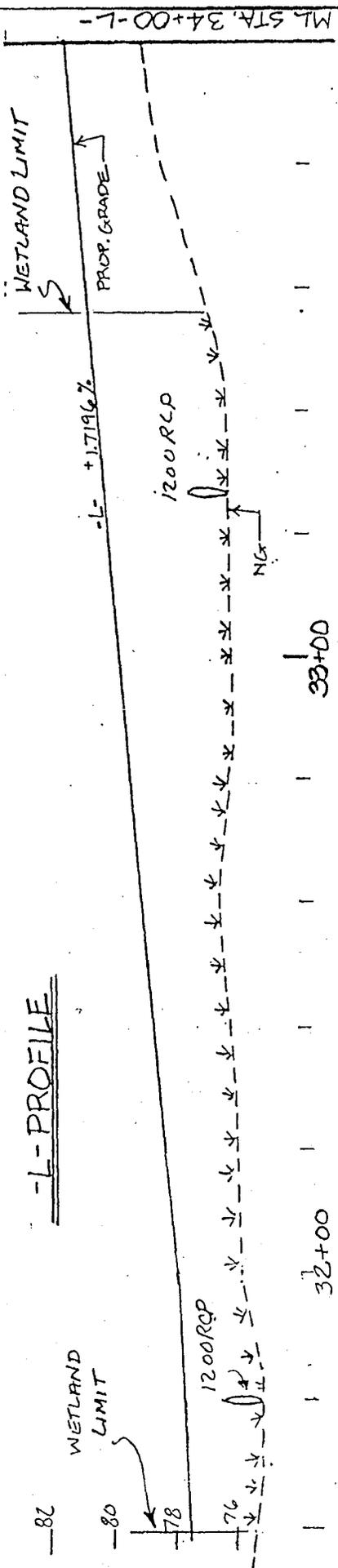
PROPOSED GRADING, PAVING, DRAINAGE, FENCING
 CULVERTS, STRUCTURES, SIGNING, PAVEMENT
 MARKINGS, AND SIGNALS ON PROPOSED U.S. 1
 BYPASS FROM SR 2175 AT LAKEVIEW TO NORTHEAST
 OF SR 1825.

SCALE AS SHOWN

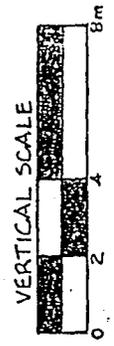
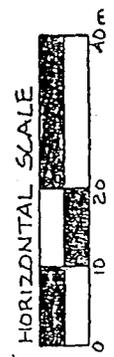
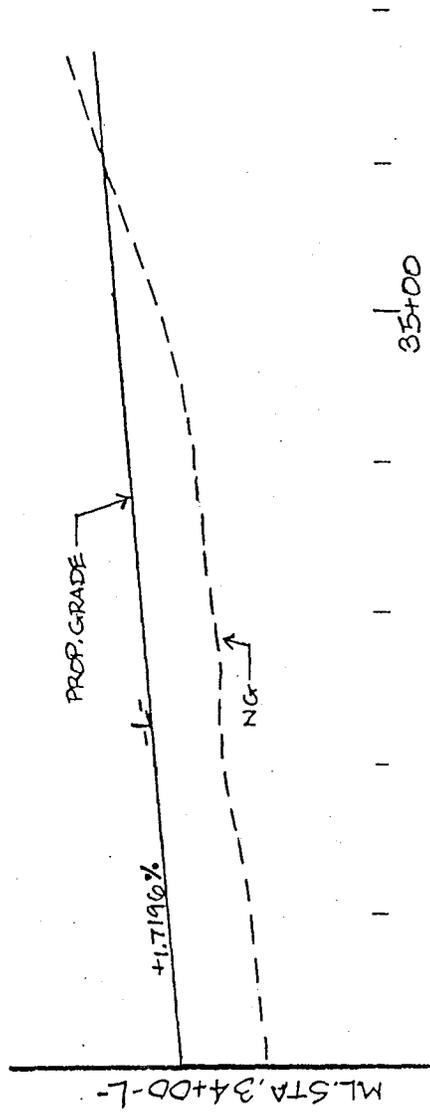
SHEET 7 OF 58

NOVEMBER 1997

-L-PROFILE



816
814
812
810
808



Wetland symbol DENOTES WETLAND

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

MOORE COUNTY

8.T560302 R-210A

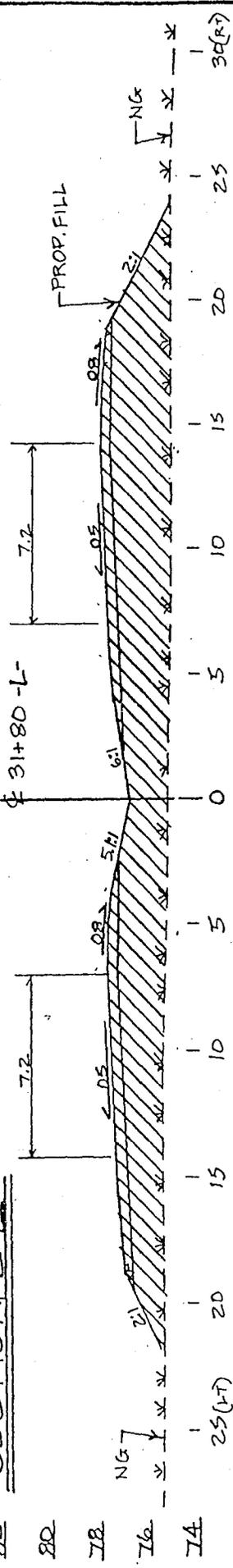
PROPOSED GRADING, PAVING, DRAINAGE, FENCING
CULVERTS, STRUCTURES, SIGNING, PAVEMENT
MARKINGS, AND SIGNALS ON PROPOSED U.S. 1
BYPASS FROM SR 2175 AT LAKEVIEW TO NORTHEAST
OF SR 1825.

SCALE AS SHOWN

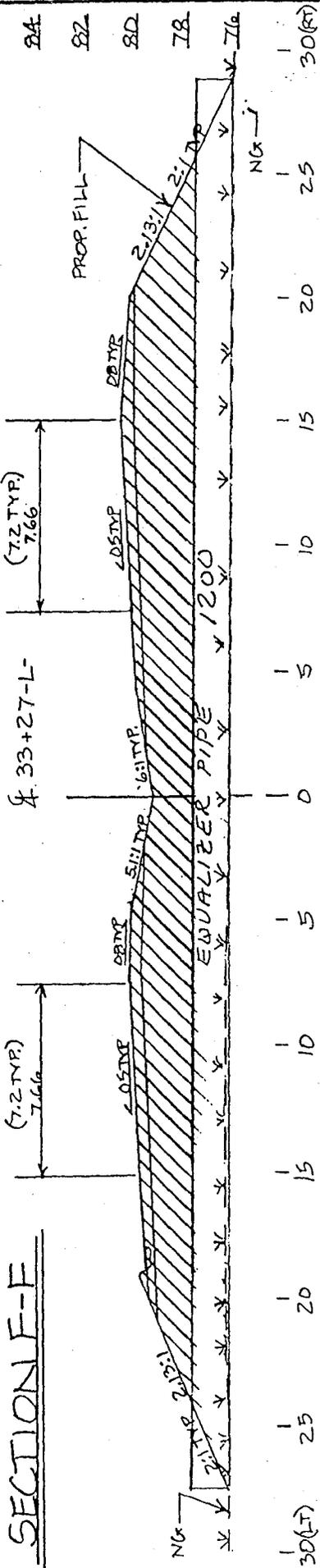
SHEET 8 OF 58

NOVEMBER 1997

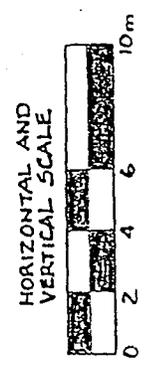
SECTION E-E



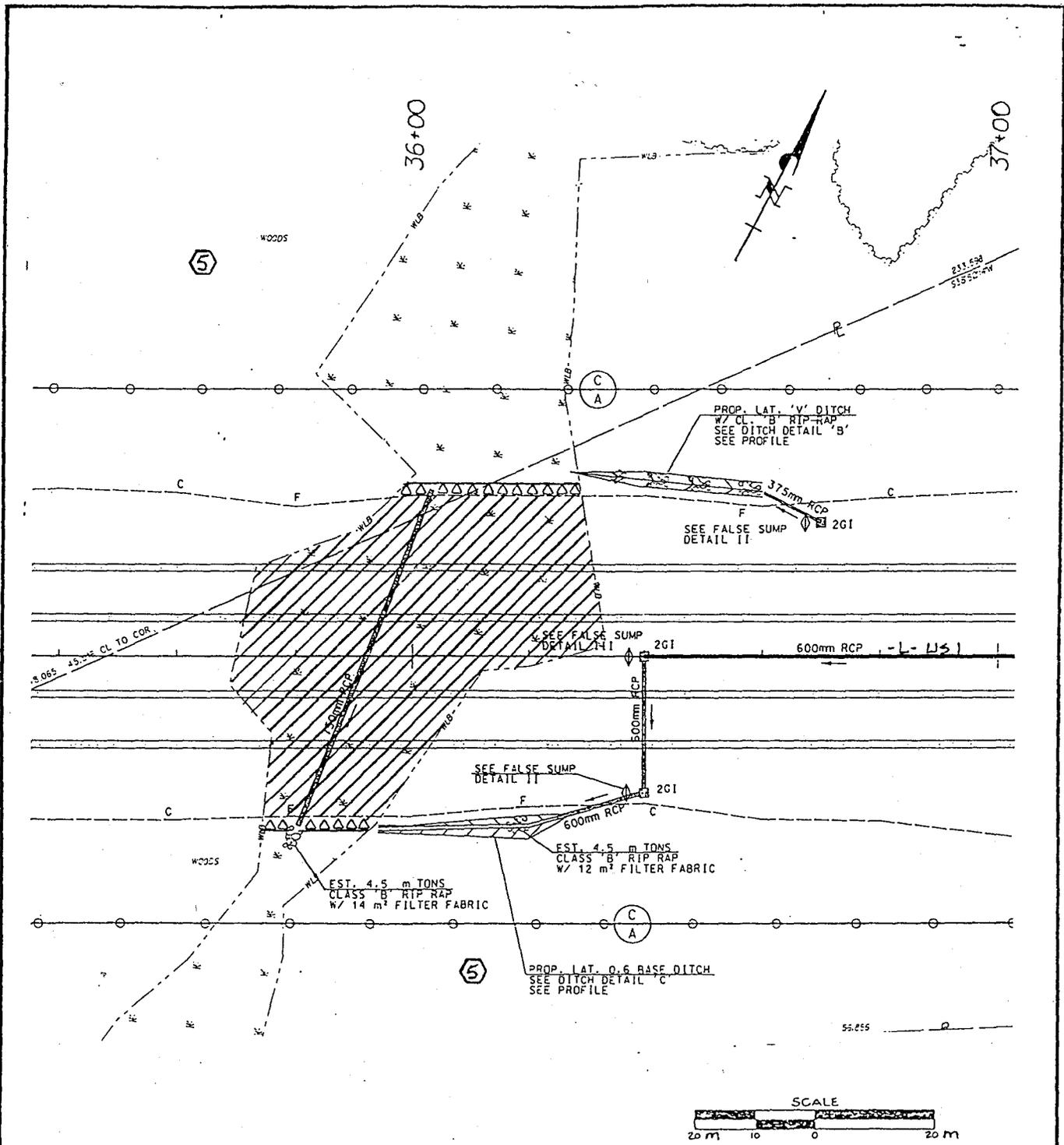
SECTION F-F



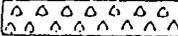
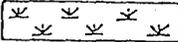
 DENOTES WETLAND
 DENOTES FILL IN WETLAND.



NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
 DIVISION OF HIGHWAYS
 MOORE COUNTY
 8.T560302 R-210A
 PROPOSED GRADING, PAVING, DRAINAGE, FENCING
 CULVERTS, STRUCTURES, SIGNING, PAVEMENT
 MARKINGS, AND SIGNALS ON PROPOSED U.S. 1
 BYPASS FROM SR 2175 AT LAKEVIEW TO NORTHEAST
 OF SR 1825.
 SCALE AS SHOWN
 SHEET 9 OF 58
 NOVEMBER 1997



SITE #4

- 
 DENOTES TEMP. IMPACT IN WETLAND DUE TO MECHANICAL CLEARING BEYOND CONSTRUCTION LIMITS
- 
 DENOTES WETLAND
- 
 DENOTES FILL IN WETLAND.

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
 DIVISION OF HIGHWAYS
 MOORE COUNTY
 8.T560302 R-210A
 PROPOSED GRADING, PAVING, DRAINAGE, FENCING
 CULVERTS, STRUCTURES, SIGNING, PAVEMENT
 MARKINGS, AND SIGNALS ON PROPOSED U.S. 1
 BYPASS FROM SR 2175 AT LAKEVIEW TO NORTHEAST
 OF SR 1825.
 SCALE AS SHOWN
 SHEET 10 OF 58
 NOVEMBER 1997

SITE 5

-Y2-BASELINE POT 5+00.000 =
-Y2-POS 10+72.996, 7.312 LT.

ARCHIE L. BLUE
DB 1115 PG 54

(57)

WOODS

+55.871 -Y2-
13.000 (LT)

+83.750 -Y2-
13.000 (LT)

+74.342 -Y2-
13.000 (LT)

EST. 10.0 m TONS
CLASS B RIP RAP
W/ 5 m² FILTER FABRIC
PROP. SPECIAL DITCH
SEE PROFILE

BLEND TO
EXIST.
LT. & RT.)

PROP. R/W

SLOPE STAKE LINE

9.500
(TYP.)

REMOVE

SR 1864

152 MM (6") WL

GRAVEL DRIVE PIPE
268 375mm PIPE

SLOPE STAKE LINE

PROP. R/W
PROP. SPECIAL

+15.000 -Y2-
13.000 (RT)

CANOPY

ISF BUS

HC/LD 9.0 x 9.0

BASE
NOUT
DETAIL 'DD'

WOODS

132.892
S52°10'11"W
EXIST. R/W

63.873
S52°10'11"W
EXIST. R/W

9.144 (30')

JOHNSON ST

14.4

152mm CONVE

375mm PIPE

900mm CONC

WALL

+80.868
0.9 CL TO EIP

DB

10+72.996, 7.312

(270)

JAMES S

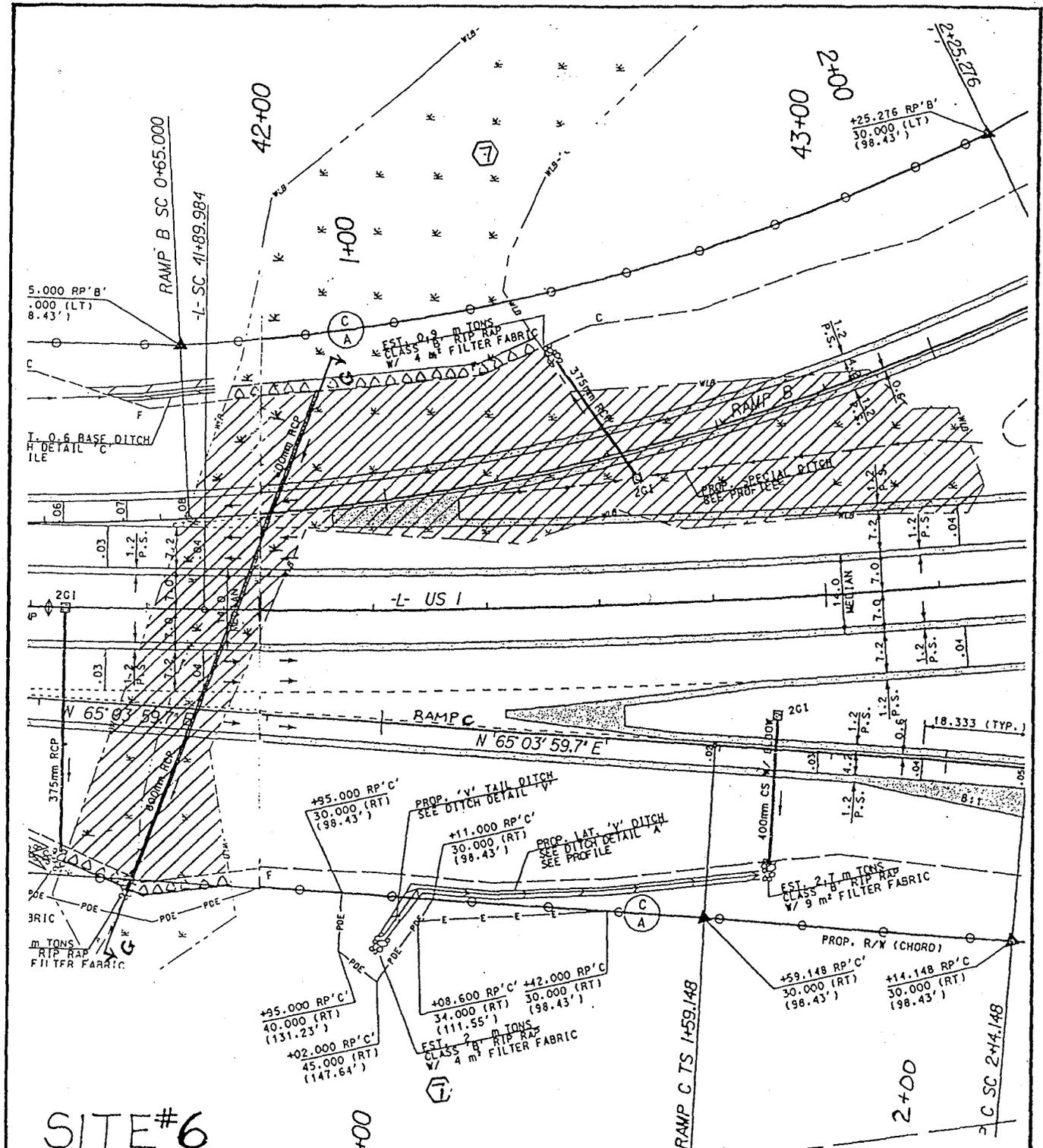
EIP

CONC. DRIVE PIPE

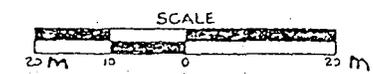
WALL

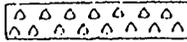
+80.868
0.9 CL TO EIP

	NORTH CAROLINA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS PROJECT DEVELOPMENT & ENVIRONMENTAL ANALYSIS BRANCH
	MOORE / LEE COUNTY PROJECT 8.T560302 US 1 FROM NORTH OF SR 2175 AT LAKEVIEW to North of SR 1825, R-210 A
SHEET 11 OF 58	



SITE #6



 DENOTES TEMP. IMPACT IN WETLAND DUE TO MECHANICAL CLEARING BEYOND CONSTRUCTION LIMITS
 DENOTES FILL IN WETLAND.

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

MOORE COUNTY

B.T560302

R-210A

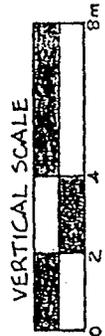
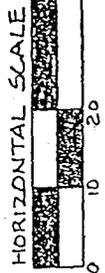
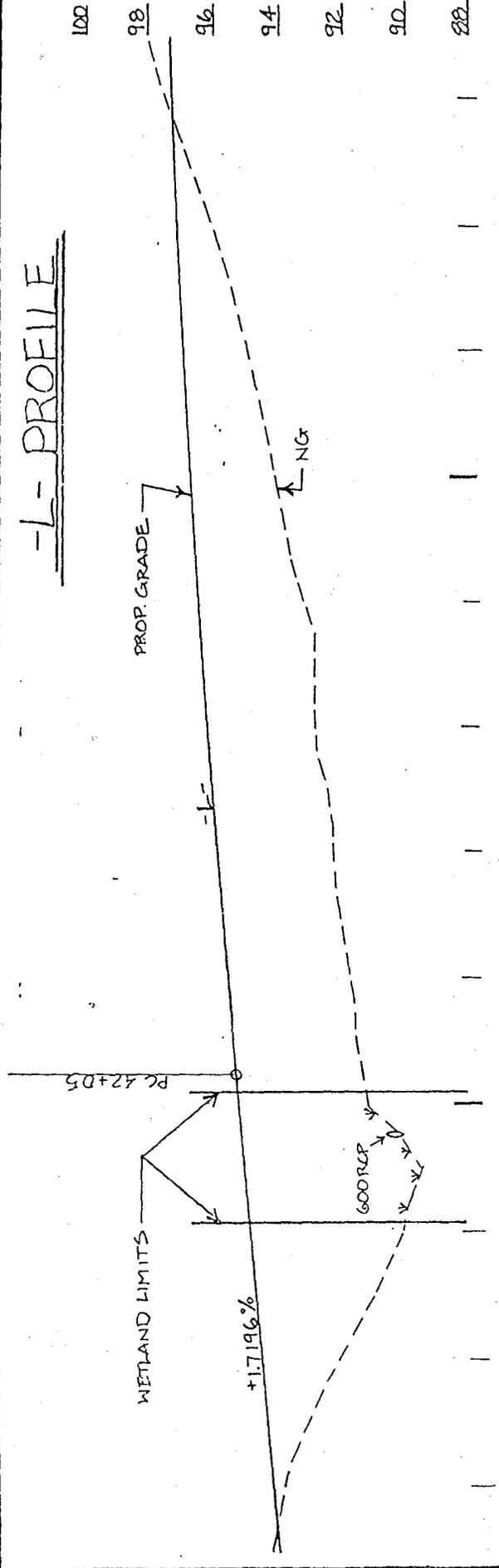
PROPOSED GRADING, PAVING, DRAINAGE, FENCING
CULVERTS, STRUCTURES, SIGNING, PAVEMENT
MARKINGS, AND SIGNALS ON PROPOSED U.S. 1
BYPASS FROM SR 2175 AT LAKEVIEW TO NORTHEAST
OF SR 1825.

SCALE AS SHOWN

SHEET ~~10~~ OF 58
12

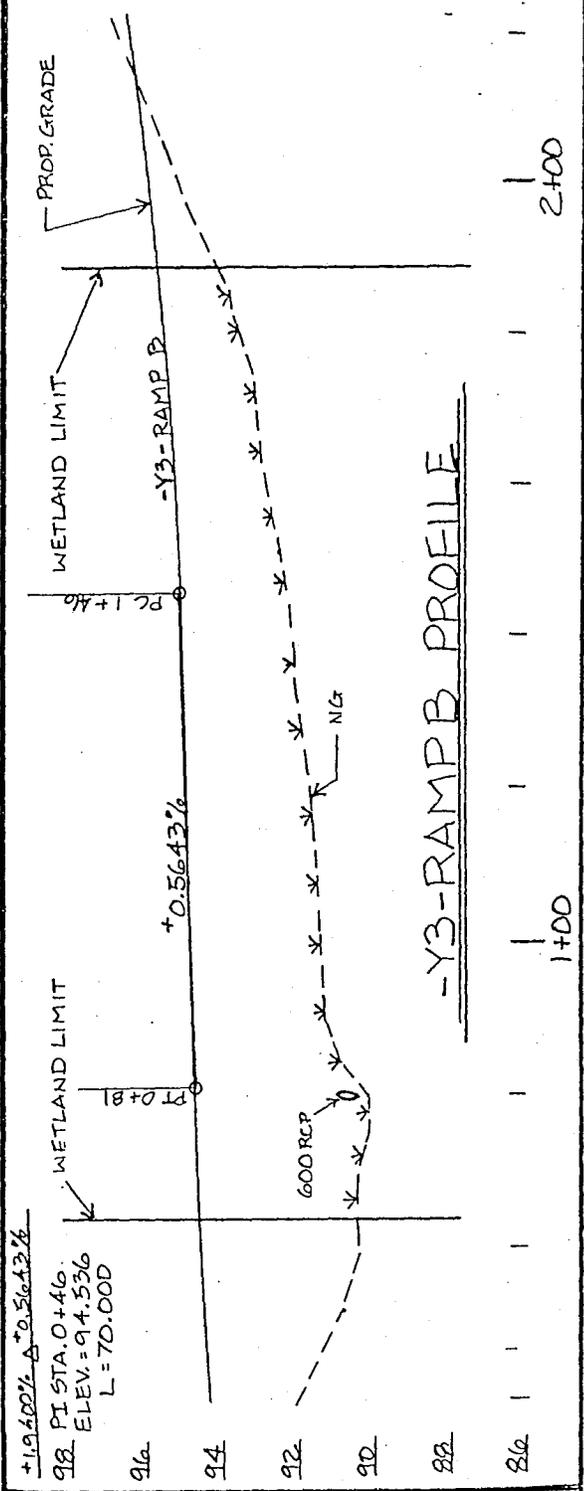
NOVEMBER 1997

-L- PROFILE



Wavy line symbol DENOTES WETLAND

-Y3-RAMP B PROFILE



+1.9400% Δ +0.5643%
 98 PI STA. 0+46
 ELEV. = 94.536
 L = 70.000

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
 DIVISION OF HIGHWAYS

MOORE COUNTY

8.T560302

R-210A

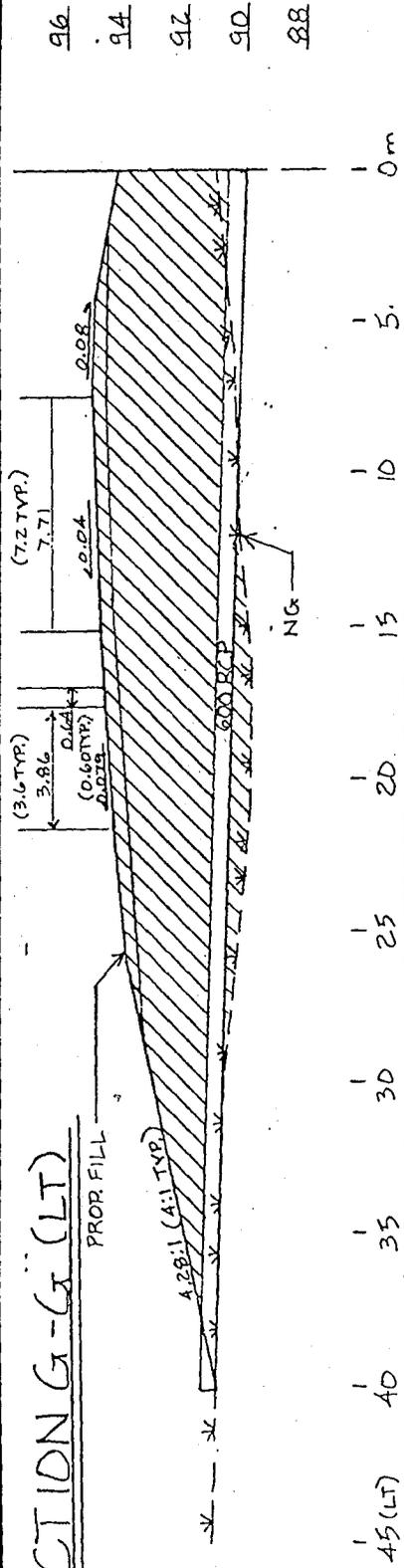
PROPOSED GRADING, PAVING, DRAINAGE, FENCING
 CULVERTS, STRUCTURES, SIGNING, PAVEMENT
 MARKINGS, AND SIGNALS ON PROPOSED U.S. 1
 BYPASS FROM SR 2175 AT LAKEVIEW TO NORTHEAST
 OF SR 1825.

SCALE AS SHOWN

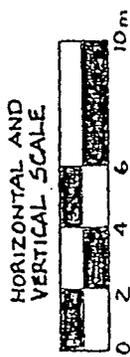
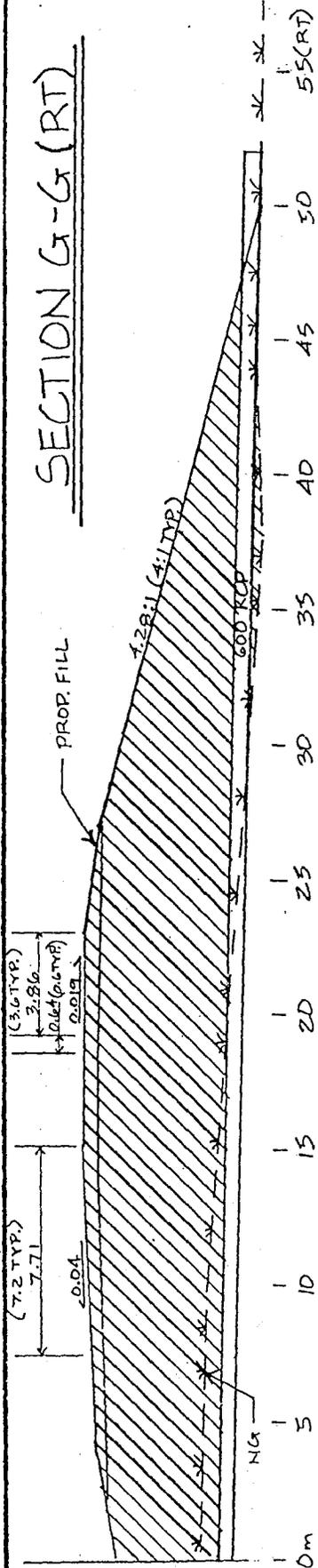
SHEET 13 OF 58

NOVEMBER 1997

SECTION G-G (LT)



SECTION G-G (RT)



DENOTES WETLAND
 DENOTES FILL IN WETLAND.

SITE #6

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

MOORE COUNTY

B.T560302

R-210A

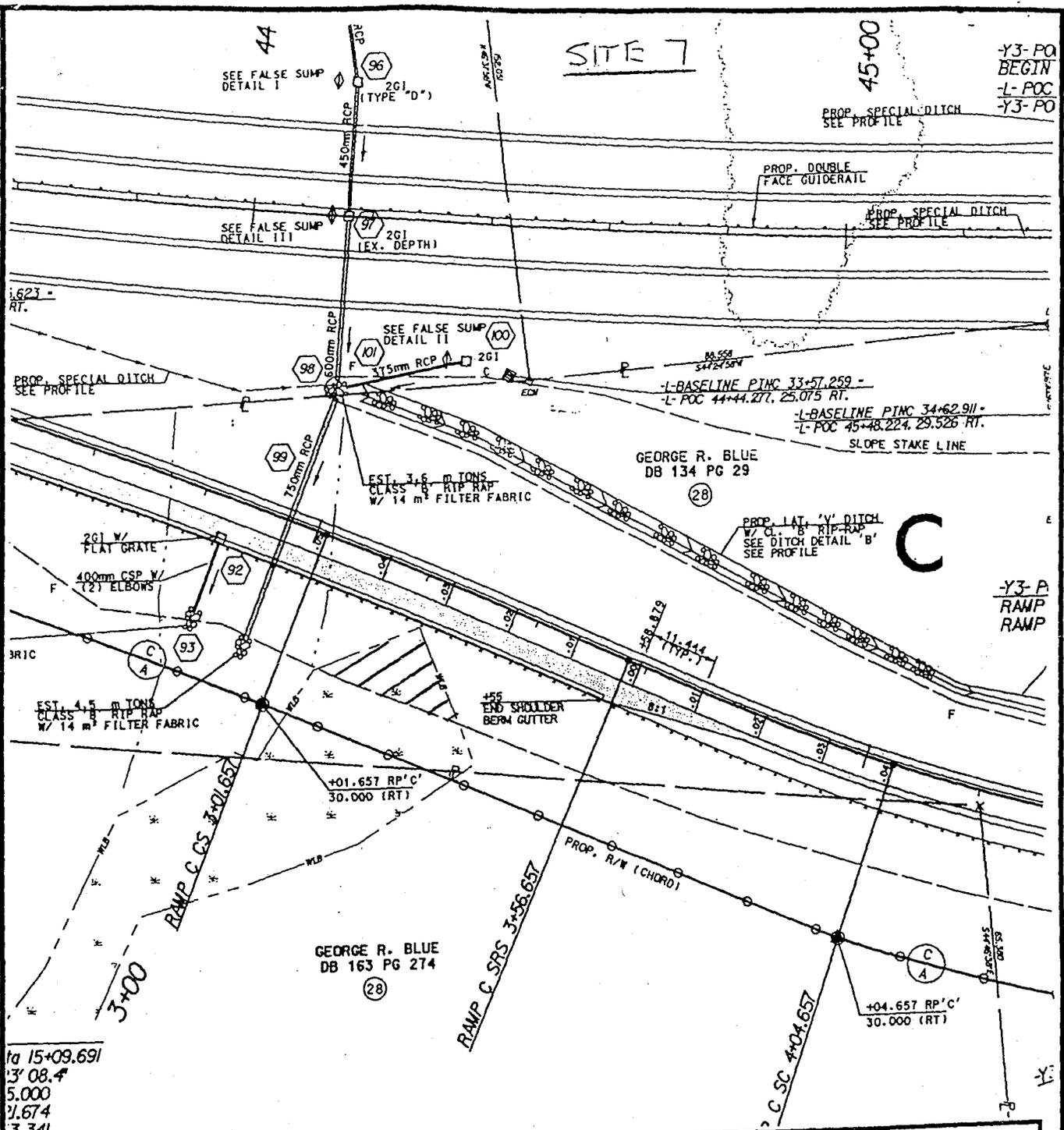
PROPOSED GRADING, PAVING, DRAINAGE, FENCING
CULVERTS, STRUCTURES, SIGNING, PAVEMENT
MARKINGS, AND SIGNALS ON PROPOSED U.S. 1
BYPASS FROM SR 2175 AT LAKEVIEW TO NORTHEAST
OF SR 1825.

SCALE AS SHOWN

SHEET 14 OF 58

NOVEMBER 1997

SITE 7



Sta 15+09.691
 13' 08.4"
 5.000
 21.674
 3.341

RAMP B

28	PIs Sta 2+46.956	PIs Sta 3+26.953	PI Sta 3+94.4
7 (LT)	$\theta = 4' 39'' 19.0''$	$\theta = 4' 22'' 36.3''$	$\Delta = 15' 33'' 24.5''$
	Ls = 65.000	Ls = 55.000	L = 97.747
	ST = 21.680	ST = 18.344	T = 49.176
	LT = 43.348	LT = 36.678	R = 360.000
			So = 0.04
			D.S. = 80 km/h

12	PIs Sta 3+88.668	PI Sta 4+41.213
	$\theta = 4' 35'' 01.2''$	$\Delta = 13' 53'' 41.9''$ (LT)
	Ls = 48.000	L = 72.754
	ST = 16.010	T = 36.556
	LT = 32.011	R = 300.000
		So = 0.04



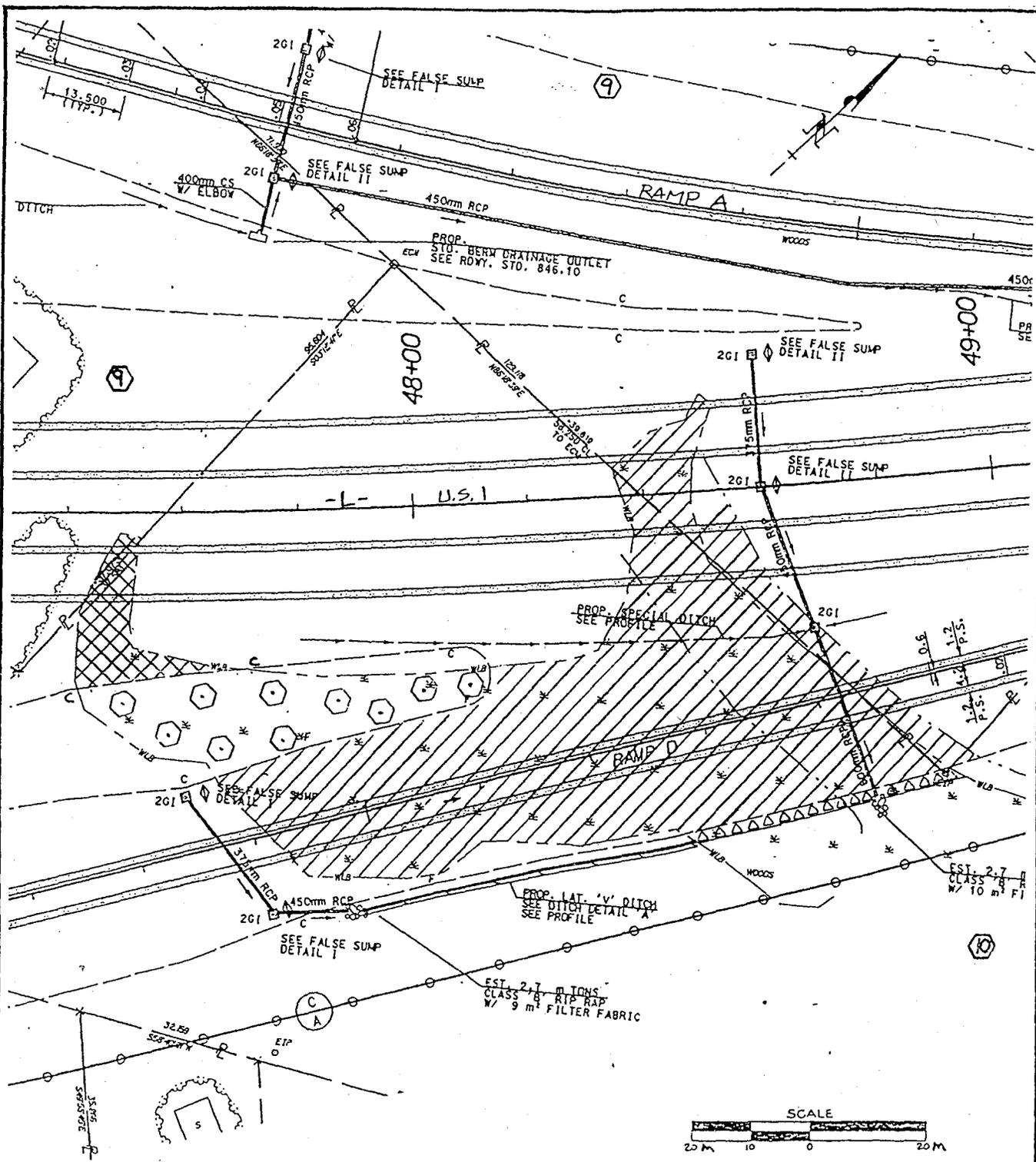
**NORTH CAROLINA DEPARTMENT OF
TRANSPORTATION**

DIVISION OF HIGHWAYS
PROJECT DEVELOPMENT &
ENVIRONMENTAL ANALYSIS BRANCH

**MOORE / LEE COUNTY
PROJECT 8.T560302**

US 1 FROM NORTH OF SR 2175 AT LAKEVIEW
to North of SR 1825, R-210 A

SHEET 15 OF 58



SITE #8

- 
 DENOTES ADDITIONAL WETLAND IMPACT DUE TO ADJACENT IMPACTS
- 
 DENOTES FILL IN WETLAND.
- 
 DENOTES EXCAVATION IN WETLAND.

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
 DIVISION OF HIGHWAYS
 MOORE COUNTY
 8.T560302 R-210A
 PROPOSED GRADING, PAVING, DRAINAGE, FENCING
 CULVERTS, STRUCTURES, SIGNING, PAVEMENT
 MARKINGS, AND SIGNALS ON PROPOSED U.S. 1
 BYPASS FROM SR 2175 AT LAKEVIEW TO NORTHEAST
 OF SR 1825.
 SCALE AS SHOWN
 SHEET ~~16~~ OF 58 NOVEMBER 1997
16

SITE 9

KEITH BYRD
DB 510 PG 444

(42)

2+00

50+00

C
A

EST. 2.7 m TONS
CLASS 'B' RIP RAP
W/ 10 m² FILTER FABRIC

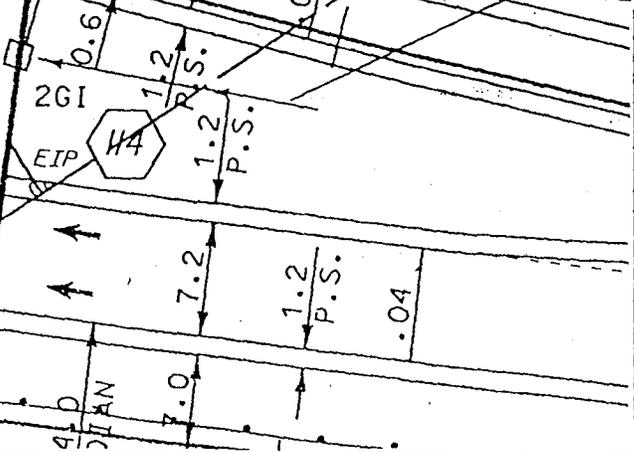
115

600mm RCP

211.189
S033651°E

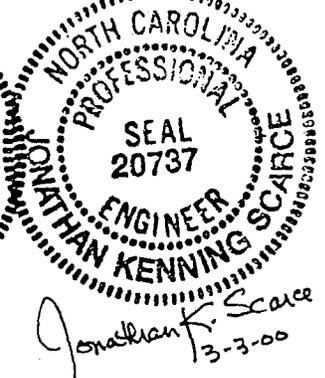
PROP. SPECIAL DITCH
SEE PROFILE

JN 49+60
12



	<p>NORTH CAROLINA DEPARTMENT OF TRANSPORTATION</p> <p>DIVISION OF HIGHWAYS PROJECT DEVELOPMENT & ENVIRONMENTAL ANALYSIS BRANCH</p>
<p>MOORE / LEE COUNTY PROJECT 8.T560302 US 1 FROM NORTH OF SR 2175 AT LAKEVIEW to North of SR 1825, R-210 A</p>	
<p>SHEET 17 OF 58</p>	

CONST. REV.
R/W REV.



SITE 9

KEITH BYRD
DB 510 PG 444

(42)

D OLDHAM
13 PG 95

(31)

3+00

SLOPE STAKE LINE

RAMP A

450mm RCP

49+00

PROP. SPECIAL DITCH
SEE PROFILE

ET

STAKE LINE

SEE FALSE SUMP
DETAIL II

2G1
(TYPE "D")

SEE FALSE SUMP
DETAIL II

2G1
(EX. DEPTH)

-L- US 1

PROP. SPECIAL DITCH
SEE PROFILE

-L-BASELINE PTMC 38+38.896 -
-L- POC 49+48.516, 14.258 RT.

PROP. SPECIAL DITCH
SEE PROFILE

RAMP D

EST. 2:1
CLASS "B"
W/ 10 m

13

MATCHLINE TO SHEET 13
TO SHEET 49+60

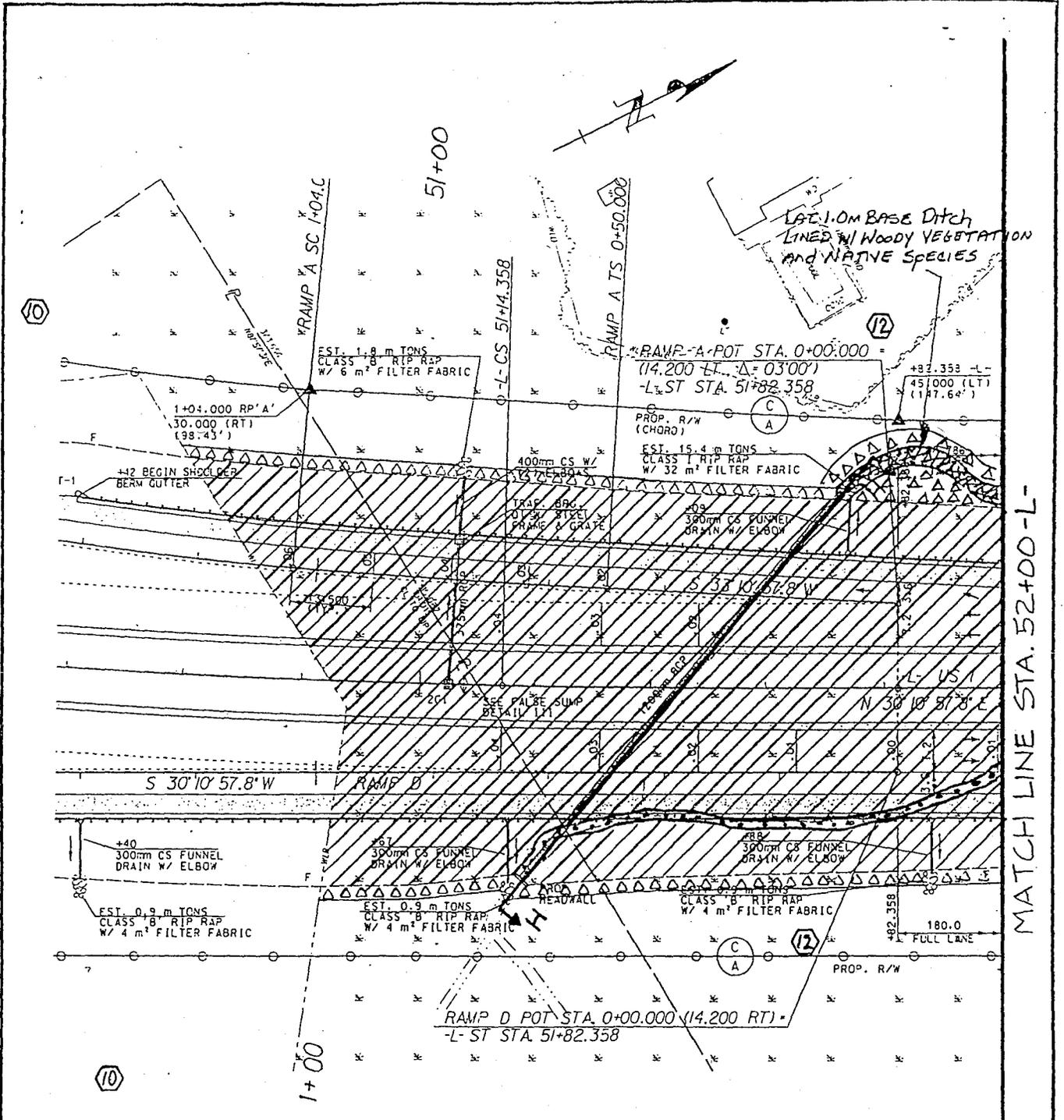


NORTH CAROLINA DEPARTMENT OF
TRANSPORTATION

DIVISION OF HIGHWAYS
PROJECT DEVELOPMENT &
ENVIRONMENTAL ANALYSIS BRANCH

MOORE / LEE COUNTY
PROJECT 8.T560302
US 1 FROM NORTH OF SR 2175 AT LAKEVIEW
to North of SR 1825, R-210 A

SHEET 18 OF 58

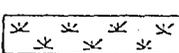


 DENOTES EXCAVATION IN WETLANDS

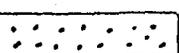


SITE # 10

 DENOTES TEMP. IMPACT IN WETLAND DUE TO MECHANICAL CLEARING BEYOND CONSTRUCTION LIMITS

 DENOTES WETLAND

 DENOTES FILL IN WETLAND.

 DENOTES FILL IN SURFACE WATERS

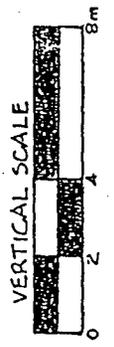
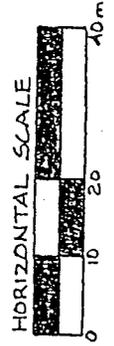
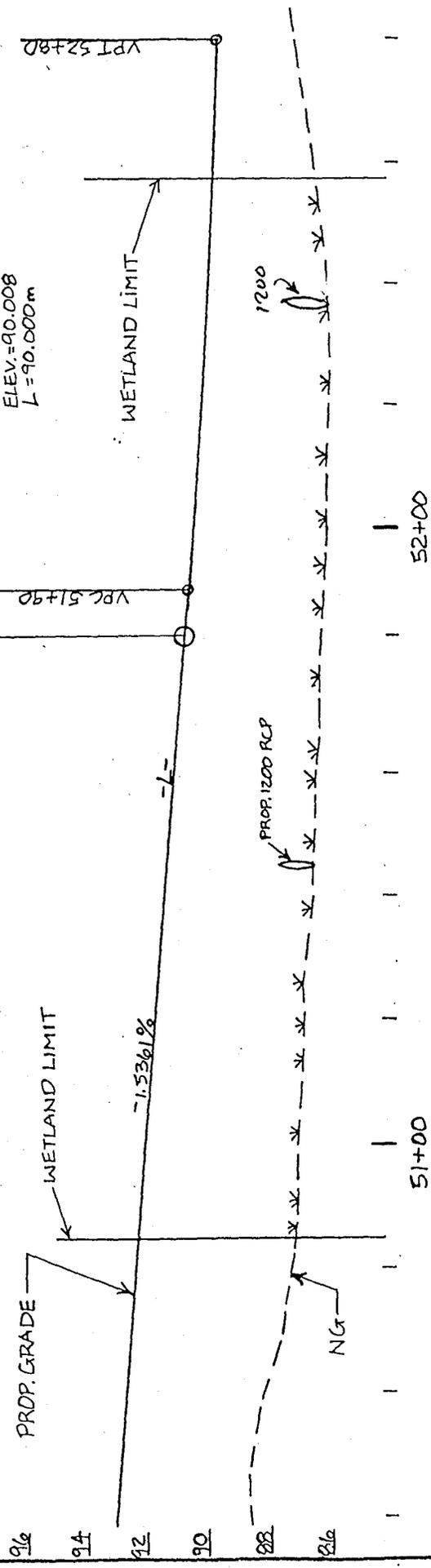
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
 DIVISION OF HIGHWAYS
 MOORE COUNTY
 8.T560302 R-210A
 PROPOSED GRADING, PAVING, DRAINAGE, FENCING
 CULVERTS, STRUCTURES, SIGNING, PAVEMENT
 MARKINGS, AND SIGNALS ON PROPOSED U.S. 1
 BYPASS FROM SR 2175 AT LAKEVIEW TO NORTHEAST
 OF SR 1825.
 SCALE AS SHOWN
 SHEET ~~58~~ OF 58 NOVEMBER 1997
 19

MATCH LINE STA. 52+00-L

-L- PROFILE

-1.5361% Δ D=1498.2%
 PI STA. 52+35.000
 ELEV.=90.008
 L=90.000m

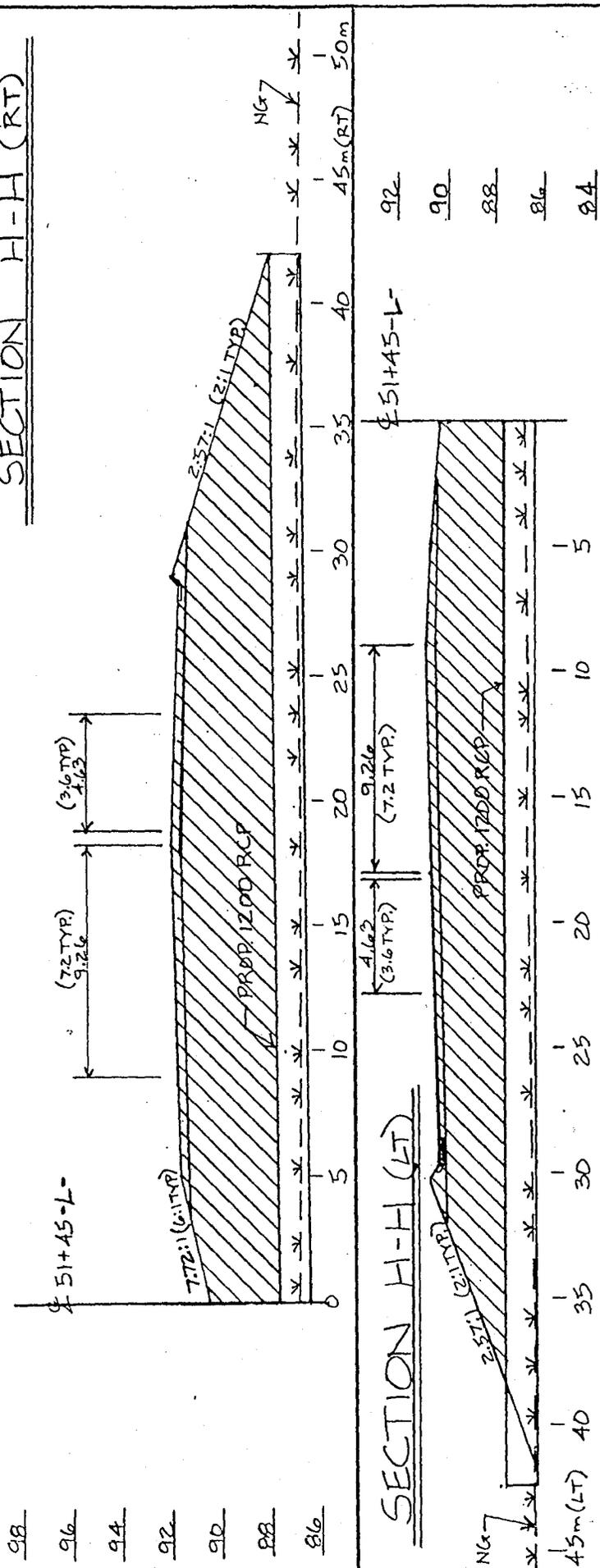
STA 51+00.350 -L- =
 STA. 0+00-RAMPA-(14.2LT)



DENOTES WETLAND

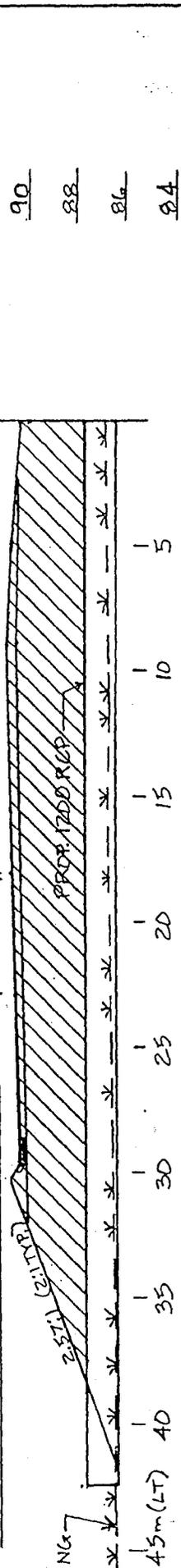
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
 DIVISION OF HIGHWAYS
 MOORE COUNTY
 8.T560302 R-210A
 PROPOSED GRADING, PAVING, DRAINAGE, FENCING
 CULVERTS, STRUCTURES, SIGNING, PAVEMENT
 MARKINGS, AND SIGNALS ON PROPOSED U.S. 1
 BYPASS FROM SR 2175 AT LAKEVIEW TO NORTHEAST
 OF SR 1625.
 SCALE AS SHOWN
 SHEET 24 OF 58
 NOVEMBER 1997

SECTION H-H (RT)

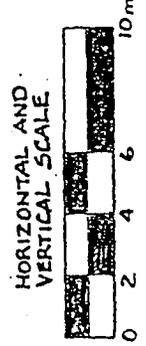


98
96
94
92
90
88
86

SECTION H-H (LT)

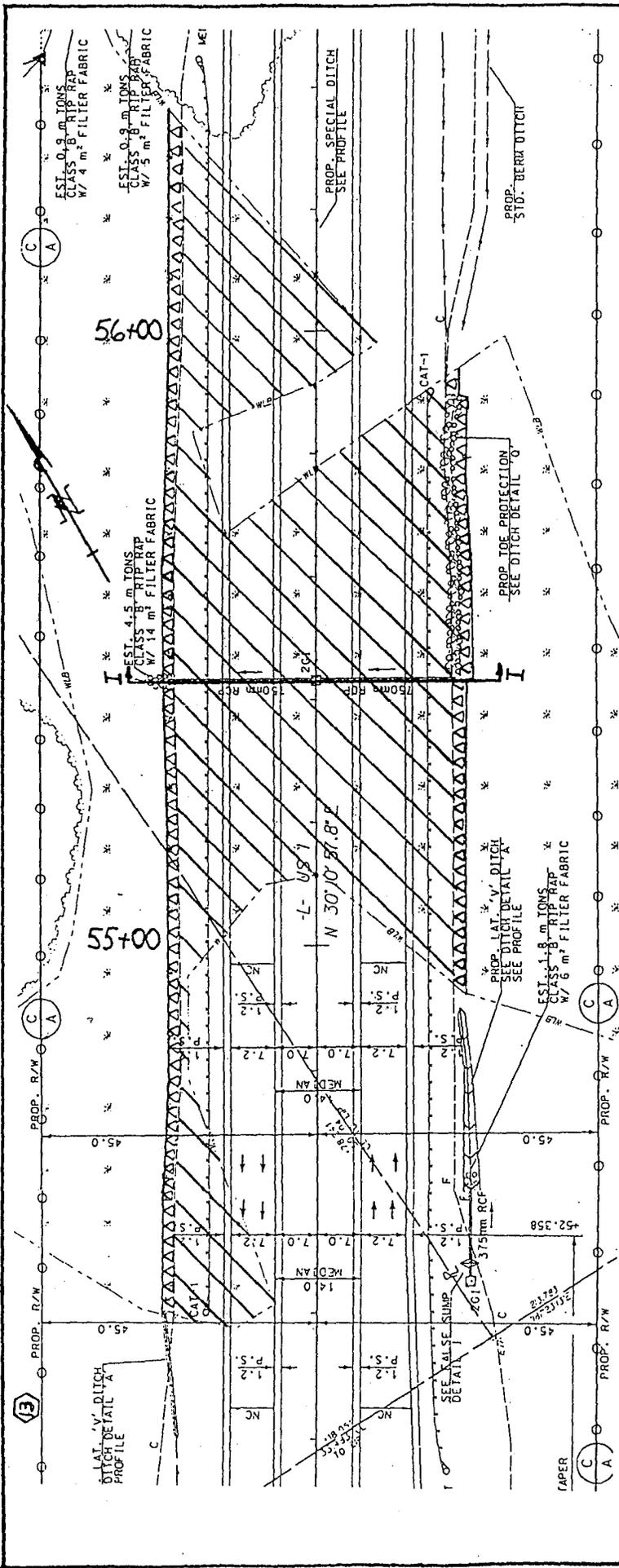


92
90
88
86
84



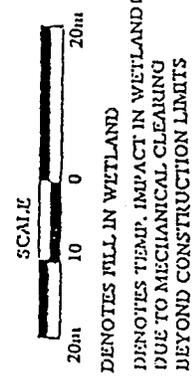
 DENOTES WETLAND
 DENOTES FILL IN WETLAND

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
 DIVISION OF HIGHWAYS
 MOORE COUNTY
 8.T560302 R-210A
 PROPOSED GRADING, PAVING, DRAINAGE, FENCING
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 MARKINGS, AND SIGNALS ON PROPOSED U.S. 1
 BYPASS FROM SR 2175 AT LAKEVIEW TO NORTHEAST
 OF SR 1825.
 SCALE AS SHOWN
 SHEET ~~22~~ OF ~~58~~
 NOVEMBER 1997



13

SITE #11



NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
 DIVISION OF HIGHWAYS

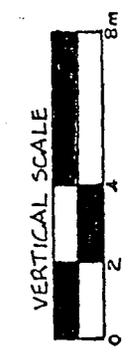
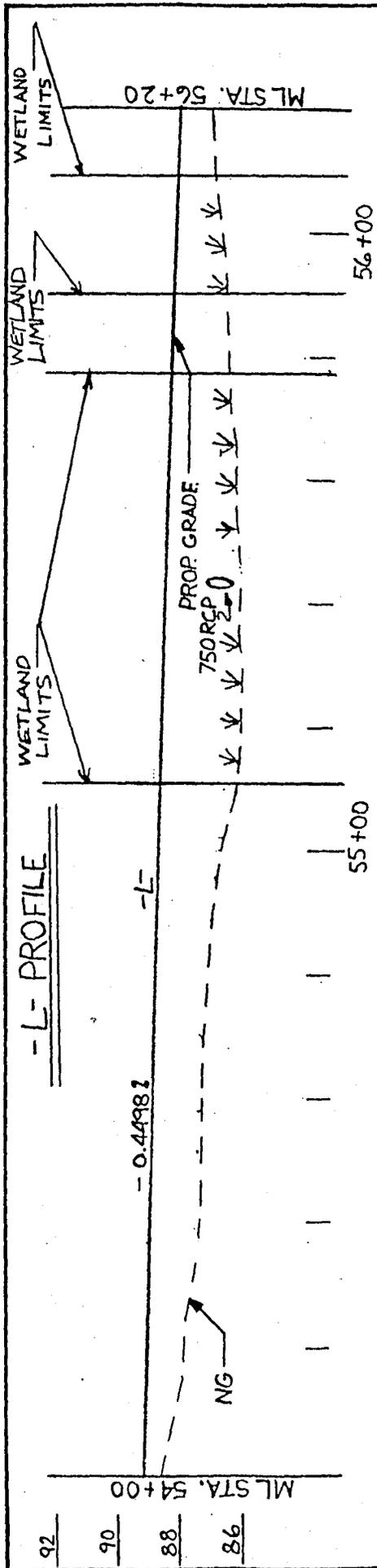
MOORE COUNTY

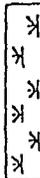
8.T560302 R-210A

PROPOSED GRADING, PAVING, DRAINAGE, FENCING
 CULVERTS, STRUCTURES, SIGNING, PAVEMENT
 MARKINGS, AND SIGNALS ON PROPOSED U.S. 1
 BYPASS FROM SR 2175 AT LAKEVIEW TO NORTHEAST
 OF SR 1825.

SCALE AS SHOWN

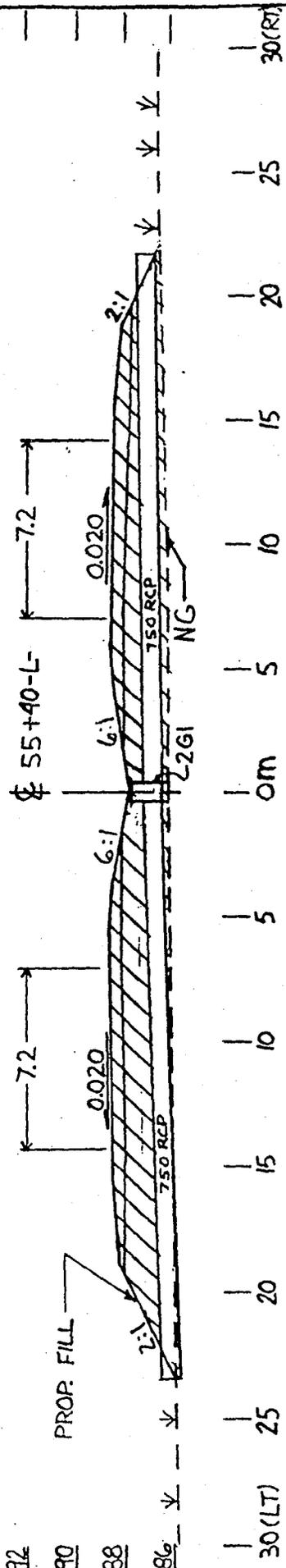
SHEET 23 OF 58 NOVEMBER 1997



 DENOTES WETLAND

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
 DIVISION OF HIGHWAYS
 MOORE COUNTY
 8.T560302 R-210A
 PROPOSED GRADING, PAVING, DRAINAGE, FENCING
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 MARKINGS, AND SIGNALS ON PROPOSED U.S. 1
 BYPASS FROM SR 2175 AT LAKEVIEW TO NORTHEAST
 OF SR 1825.
 SCALE AS SHOWN
 SHEET 24 OF 58
 NOVEMBER 1997

SECTION I-I



HORIZONTAL AND VERTICAL SCALE



DENOTES WETLAND



DENOTES FILL IN WETLAND

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

MOORE COUNTY

8.T560302

R-210A

PROPOSED GRADING, PAVING, DRAINAGE, FENCING
CULVERTS, STRUCTURES, SIGNING, PAVEMENT
MARKINGS, AND SIGNALS ON PROPOSED U.S. 1
BYPASS FROM SR 2175 AT LAKEVIEW TO NORTHEAST
OF SR 1825.

SCALE AS SHOWN

SHEET ~~58~~ OF 58
25

NOVEMBER 1997

SITE 12

391.023
505.3640E

PROP. SPECIAL BERM DITCH
SEE DITCH DETAIL 'AA'
SEE PROFILE

-Y4-
(LT)

PROP. R/W

STAKE LINE

W/SB

F

EXISTING R/W

31.7" E

SR 2005

CYPRESS CH RD

5.4 BST

18.288 (60')

W

NC

AB

5.9

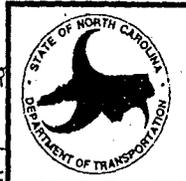
TO SHEET 15
ON 12+60

STAKE LINE

EXISTING R

PROP. R/W

PROP. LAT. 'V' DITCH
SEE DITCH DETAIL 'A'
SEE PROFILE



NORTH CAROLINA DEPARTMENT OF
TRANSPORTATION

DIVISION OF HIGHWAYS
PROJECT DEVELOPMENT &
ENVIRONMENTAL ANALYSIS BRANCH

MOORE / LEE COUNTY
PROJECT 8.T560302
US 1 FROM NORTH OF SR 2175 AT LAKEVIEW
to North of SR 1825, R-210 A

SHEET 26 OF 58

SITE 12

MATCHLINE TO SHEET 31
STATION 12+60

EST. 10.0 m
CLASS 'B' RIP
W/ 24 m² FIL

AT. 'V' DITCH
CH DETAIL 'A'
FILE

243.709
S03°36'40"E

18.288 (60)

3.63.0

REMOVE
600mm CONC

303

PRDP. R/W
SLOPE STAKE LINE

PR
SO
SEE
SEE

PROP.
HEADWALL

PROP. R/W
SLOPE STAKE LINE

S 79°44' 31.8" E

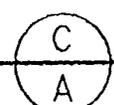
x 0.6 CREEK

+42
BEGIN SHOULDER
BERM GUTTER

+43
400mm CSP
W/ (2) ELBOWS

+45.074 -L-
45.000 (LT)

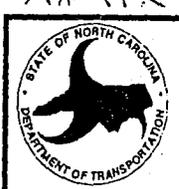
TRAF. BRG.
DI W/ ANGLE
VANE GRATE



EST. 0.9 m TONS
CLASS 'B' RIP RAP
W/ 4 m² FILTER FABRIC

PROP.
'V' TAIL DITCH
SEE DITCH DETAIL 'V'

EST. 0.9 m TONS
CLASS 'B' RIP RAP
W/ 5 m² FILTER FABRIC



NORTH CAROLINA DEPARTMENT OF
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PROJECT DEVELOPMENT &
ENVIRONMENTAL ANALYSIS BRANCH

MOORE / LEE COUNTY
PROJECT 8.T560302
US 1 FROM NORTH OF SR 2175 AT LAKEVIEW
to North of SR 1825, R-210.A

SHEET 27 OF 58

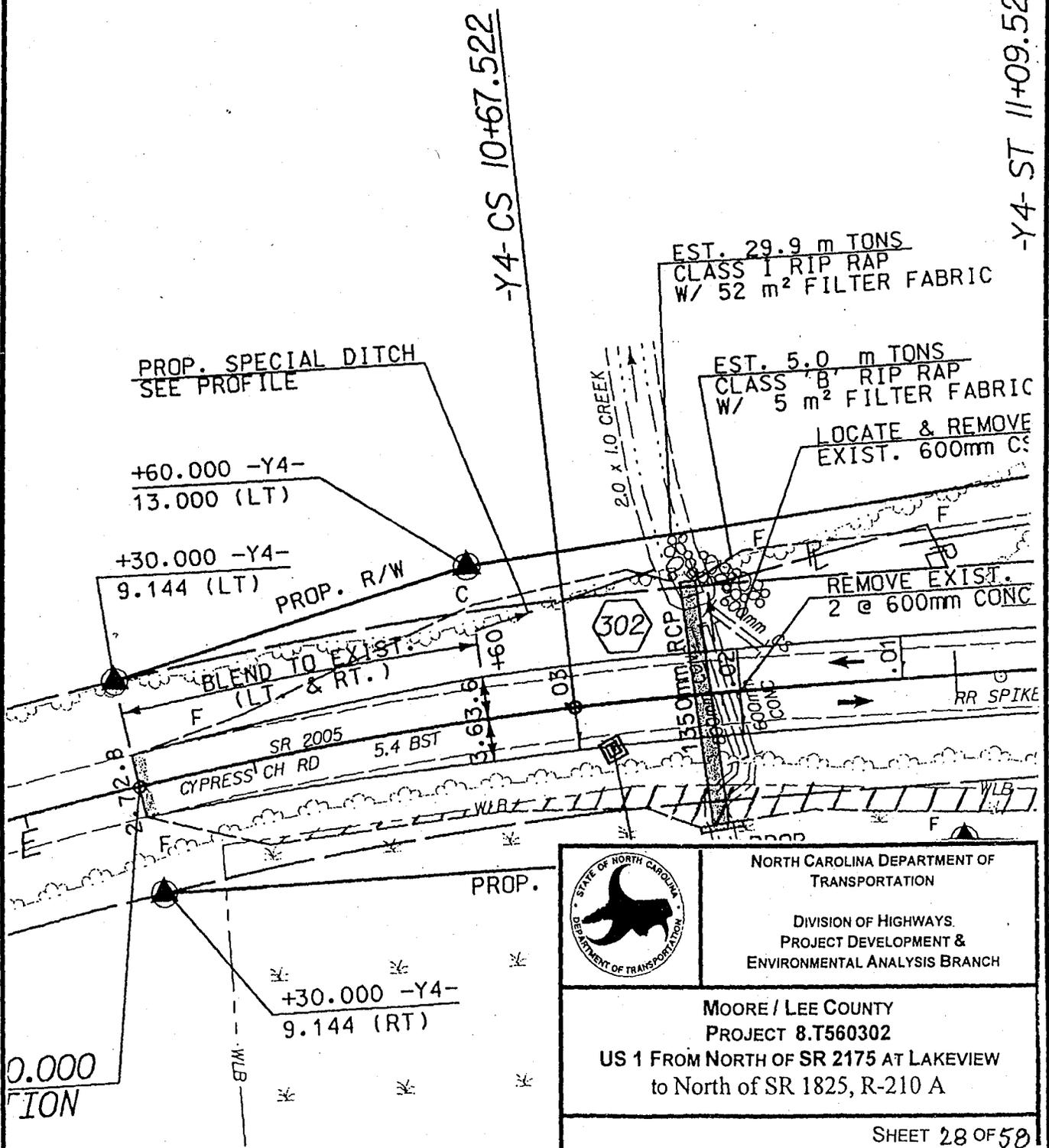
GRAL
350

11+00

SITE 13

-Y4-CS 10+67.522

-Y4-ST 11+09.522



NORTH CAROLINA DEPARTMENT OF
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DIVISION OF HIGHWAYS,
PROJECT DEVELOPMENT &
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MOORE / LEE COUNTY
PROJECT 8.T560302
US 1 FROM NORTH OF SR 2175 AT LAKEVIEW
to North of SR 1825, R-210 A



16+0

IARD

SITE 14

-Y4- ST 16+01.351

EST. 13.6 m TONS
CLASS 'B' RIP RAP
W/ 31 m² FILTER FABRIC

1.5 x 0.2 DITCH

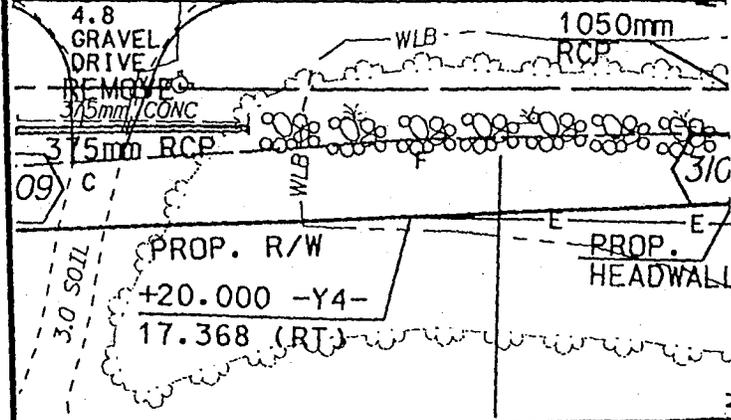
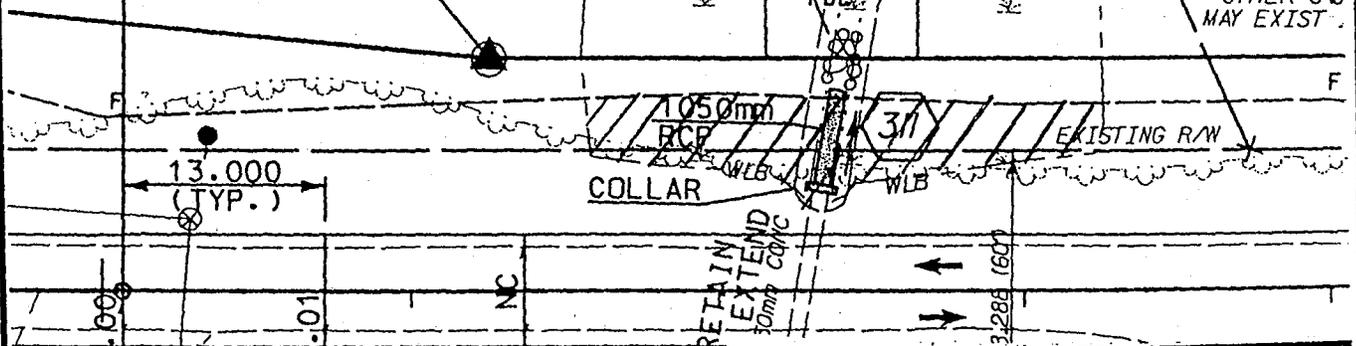
246.213
N 25.4212N

+53.000 -Y
15.000 (LT)
19.000 (LT)

+43.000 -Y4-
15.000 (LT) &
19.000 (LT)

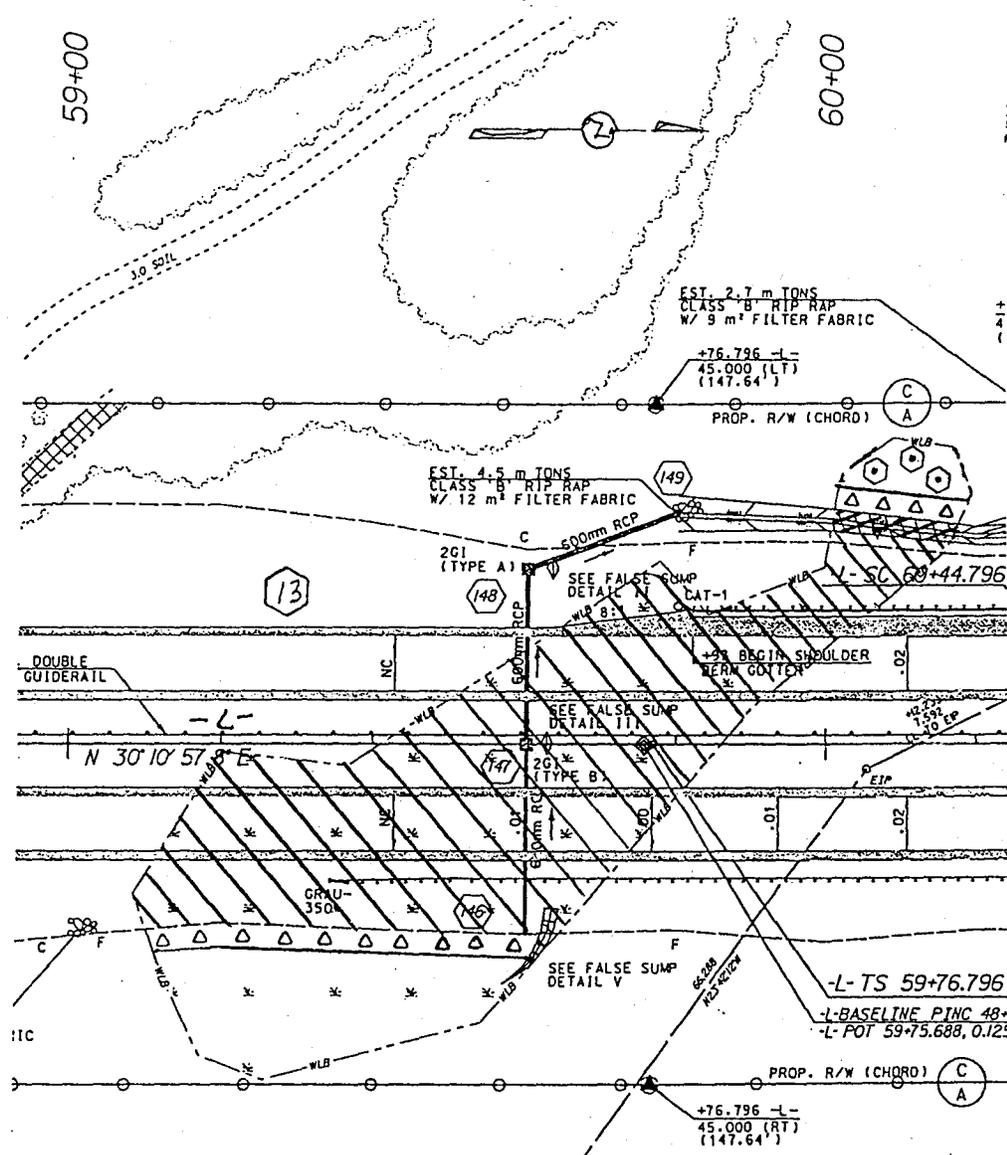
+25.000 -Y4-
15.000 (LT)

UNABLE
ALL U/G
OTHER U/G
MAY EXIST

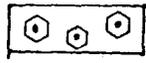
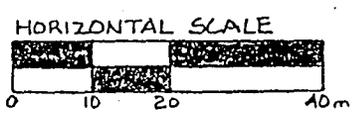


NORTH CAROLINA DEPARTMENT OF
TRANSPORTATION
DIVISION OF HIGHWAYS
PROJECT DEVELOPMENT &
ENVIRONMENTAL ANALYSIS BRANCH

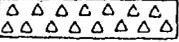
MOORE / LEE COUNTY
PROJECT 8.T560302
US 1 FROM NORTH OF SR 2175 AT LAKEVIEW
to North of SR 1825, R-210 A



SITE 14a



DENOTES ADDITIONAL WETLAND IMPACT DUE TO ADJACENT IMPACTS

-  DENOTES FILL IN WETLAND.
-  DENOTES TEMP IMPACT IN WETLAND DUE TO MECHANICAL CLEARING BEYOND CONSTRUCTION LIMITS.
-  DENOTES EXCAVATION IN WETLAND.

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

MOORE COUNTY

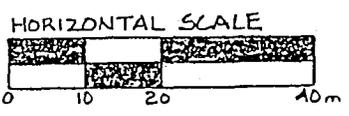
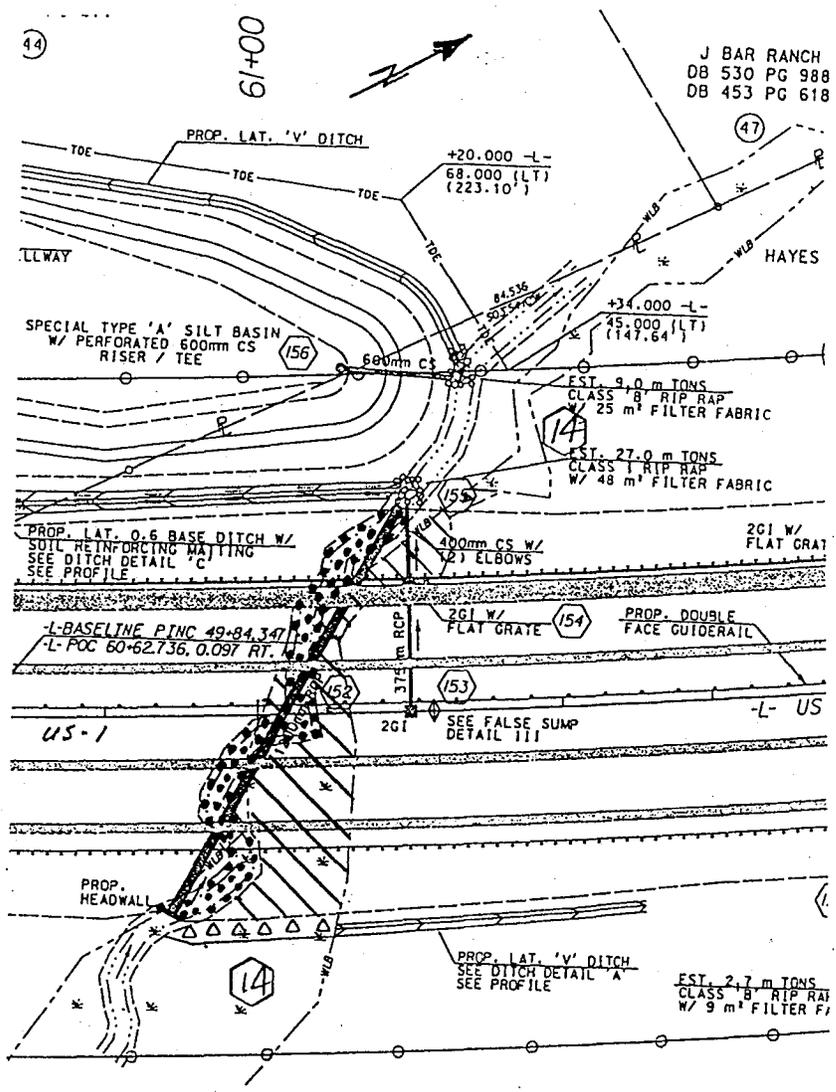
8.T560302 R-210A

PROPOSED GRADING, PAVING, DRAINAGE, FENCING
CULVERTS, STRUCTURES, SIGNING, PAVEMENT
MARKINGS, AND SIGNALS ON PROPOSED U.S. 1
BYPASS FROM SR 2175 AT LAKEVIEW TO NORTHEAST
OF SR 1825.

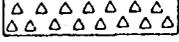
SCALE AS SHOWN

SHEET ~~28~~ OF 58
30

NOVEMBER 1997



SITE No. 15

-  DENOTES FILL IN WETLAND.
-  DENOTES FILL IN SURFACE WATER.
-  DENOTES TEMP. IMPACT IN WETLAND DUE TO MECHANICAL CLEARING BEYOND CONSTRUCTION LIMITS.

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

MOORE COUNTY

8.T560302 R-210A

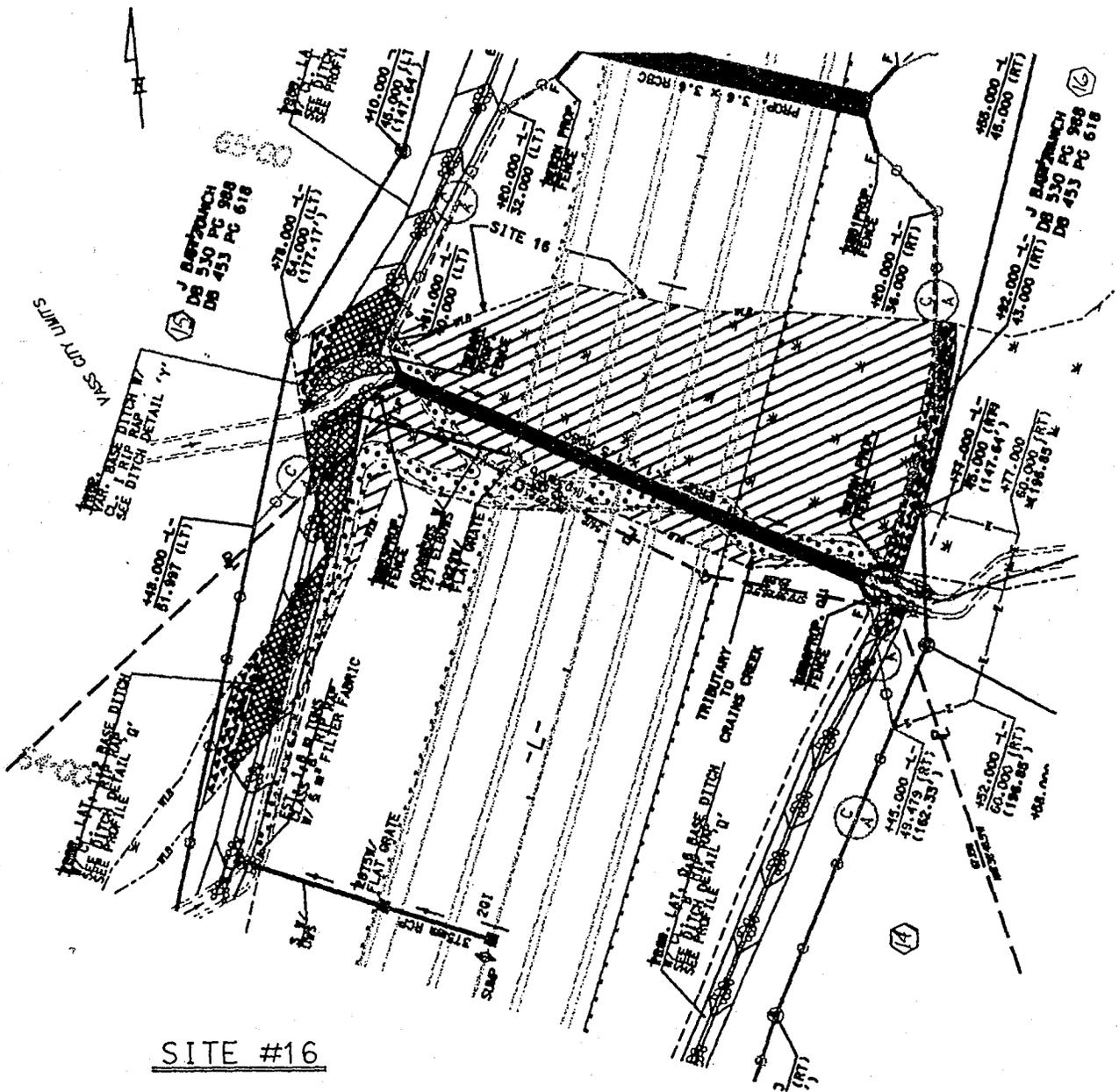
PROPOSED GRADING, PAVING, DRAINAGE, FENCING
CULVERTS, STRUCTURES, SIGNING, PAVEMENT
MARKINGS, AND SIGNALS ON PROPOSED U.S. 1
BYPASS FROM SR 2175 AT LAKEVIEW TO NORTHEAST
OF SR 1825.

SCALE AS SHOWN

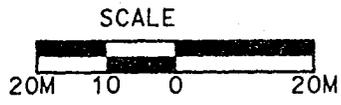
SHEET  OF 58

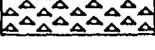
31

NOVEMBER 1997

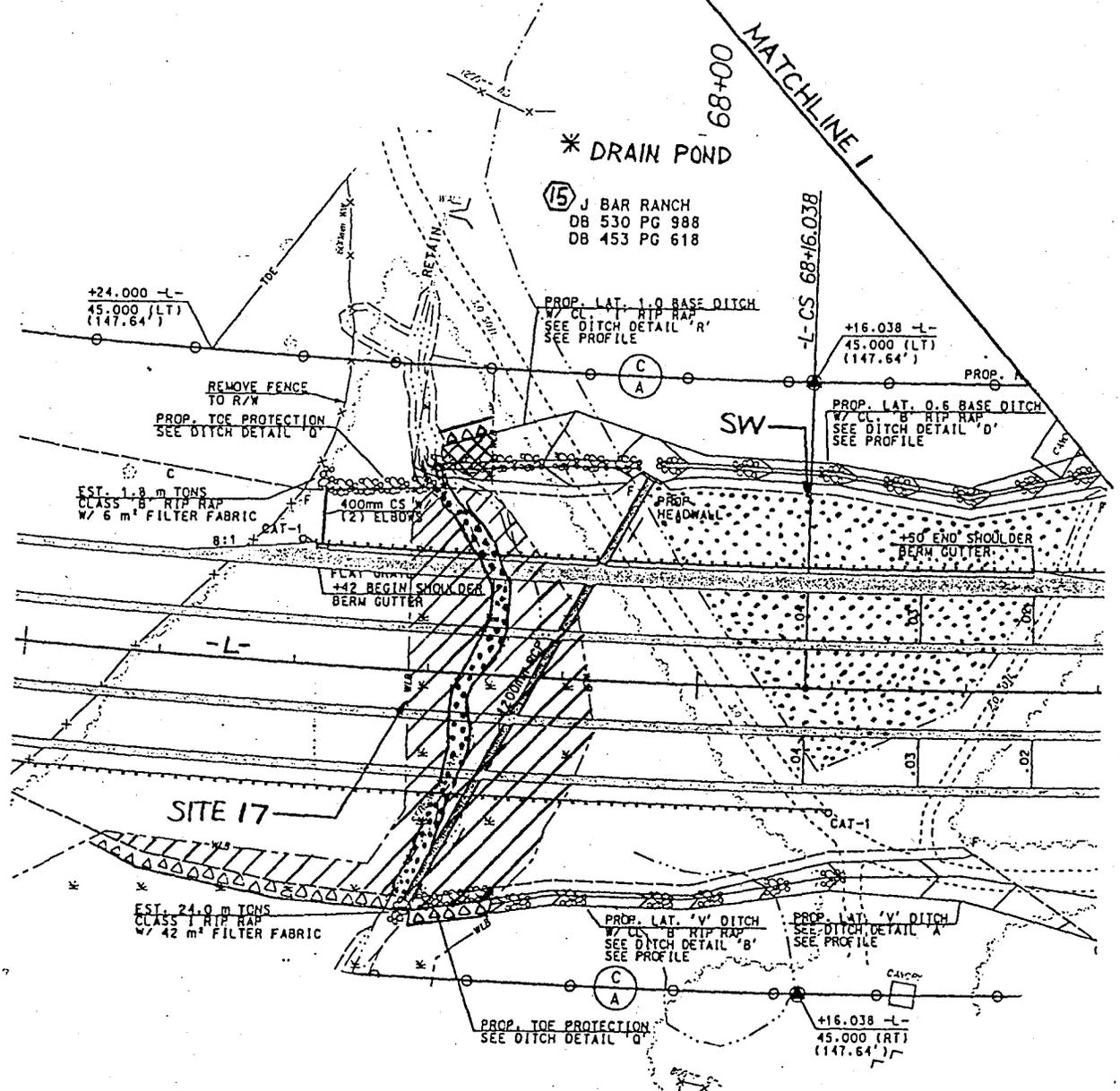


SITE #16



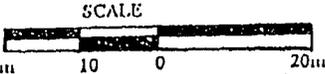
-  DENOTES FILL IN WETLAND
-  DENOTES EXCAVATION IN WETLANDS
-  DENOTES FILL IN SURFACE WATER
-  DENOTES TEMP. IMPACT IN WETLAND DUE TO MECHANICAL CLEARING BEYOND CONSTRUCTION LIMITS

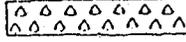
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
 DIVISION OF HIGHWAYS
 MOORE COUNTY
 8. T560302
 PROPOSED GRADING, PAVING, DRAINAGE, FENCING
 CULVERTS, STRUCTURES, SIGNING, PAVEMENT
 MARKINGS, AND SIGNALS ON PROPOSED U.S. 1
 BYPASS FROM SR 2175 AT LAKEVIEW TO NORTHEAST
 OF SR 1825
 SCALE AS SHOWN
 SHEET 32 OF 58



SITE # 17

15 J BAR RANCH
DB 530 PG 988
DB 453 PG 618



-  DENOTES FILL IN WETLAND
-  DENOTES EXCAVATION IN WETLANDS
-  DENOTES FILL IN SURFACE WATER
-  DENOTES TEMP. IMPACT IN WETLAND DUE TO MECHANICAL CLEARING BEYOND CONSTRUCTION LIMITS

*TOTAL OF 2.36ha. OF IMPACT TO SURFACE WATER DUE TO DRAINING POND.

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

MOORE COUNTY

8.T560302

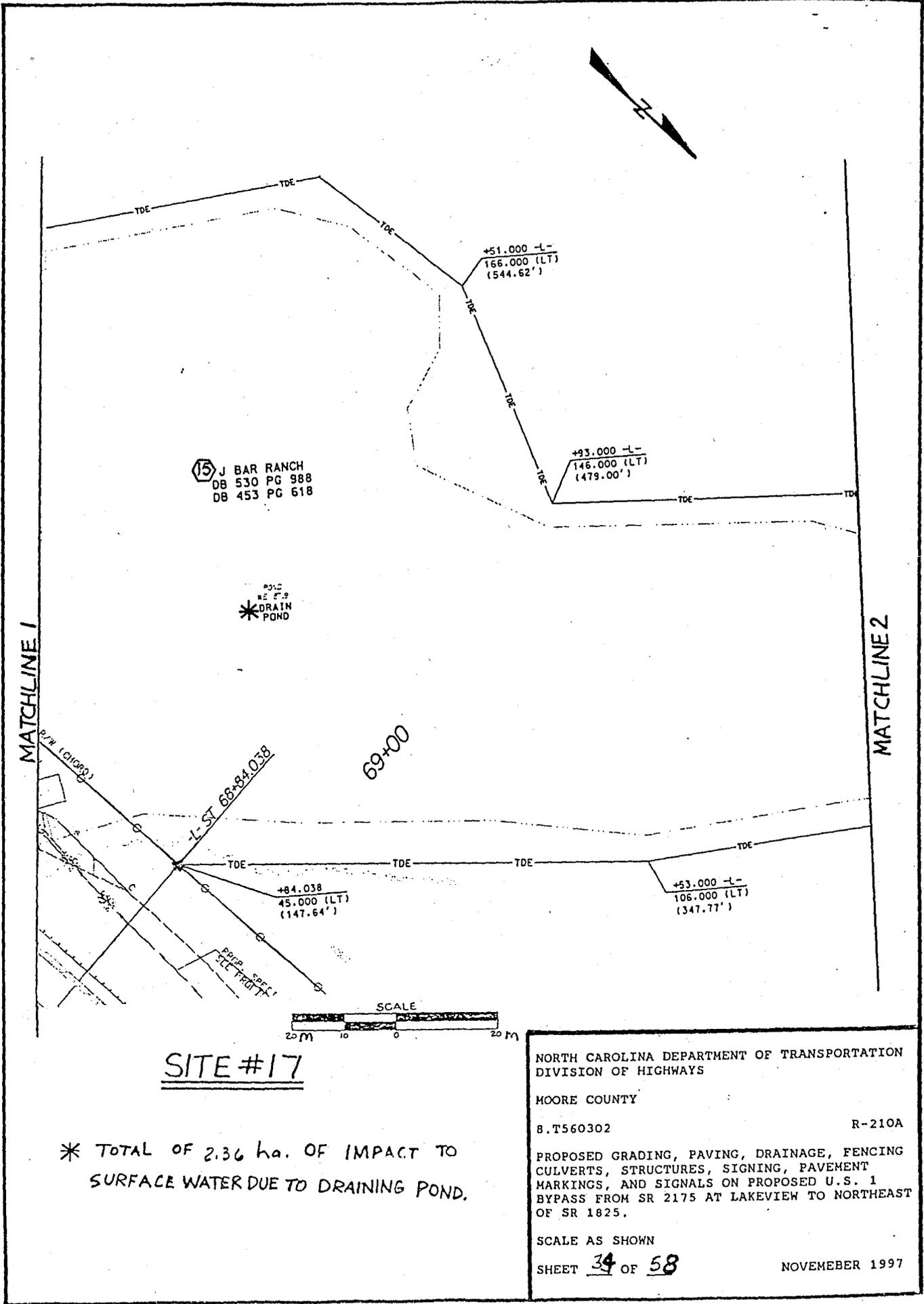
R-210A

PROPOSED GRADING, PAVING, DRAINAGE, FENCING
CULVERTS, STRUCTURES, SIGNING, PAVEMENT
MARKINGS, AND SIGNALS ON PROPOSED U.S. 1
BYPASS FROM SR 2175 AT LAKEVIEW TO NORTHEAST
OF SR 1825.

SCALE AS SHOWN

SHEET 33 OF 58

NOVEMBER 1997



15 J BAR RANCH
 DB 530 PG 988
 DB 453 PG 618

POINT
 NE F.S.
 * DRAIN
 POND

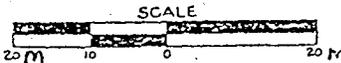
MATCHLINE 1

MATCHLINE 2

69+00

SITE #17

* TOTAL OF 2.36 ha. OF IMPACT TO
 SURFACE WATER DUE TO DRAINING POND.



NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
 DIVISION OF HIGHWAYS

MOORE COUNTY

B.T560302

R-210A

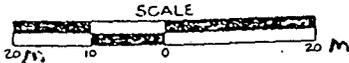
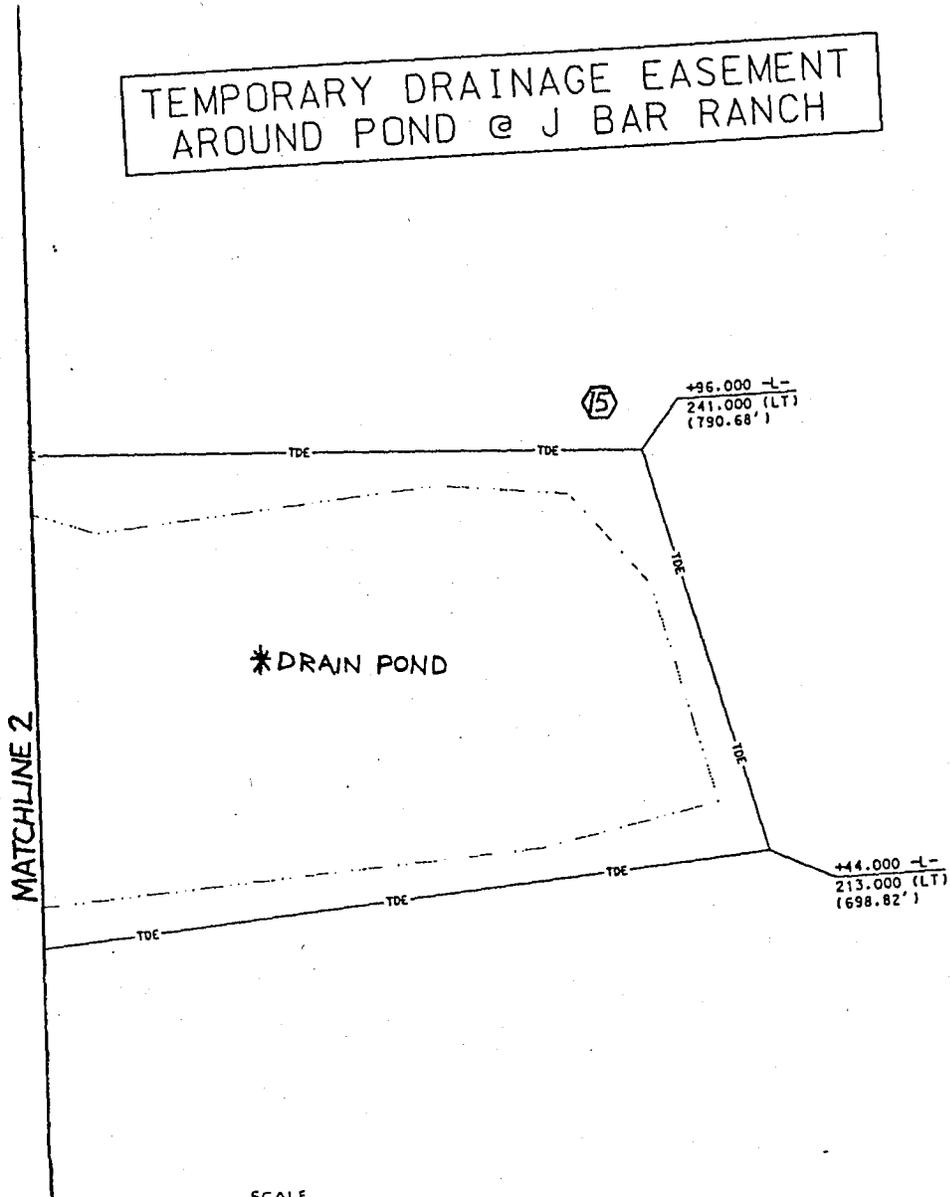
PROPOSED GRADING, PAVING, DRAINAGE, FENCING
 CULVERTS, STRUCTURES, SIGNING, PAVEMENT
 MARKINGS, AND SIGNALS ON PROPOSED U.S. 1
 BYPASS FROM SR 2175 AT LAKEVIEW TO NORTHEAST
 OF SR 1825.

SCALE AS SHOWN

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NOVEMBER 1997

TEMPORARY DRAINAGE EASEMENT
AROUND POND @ J BAR RANCH



SITE #17

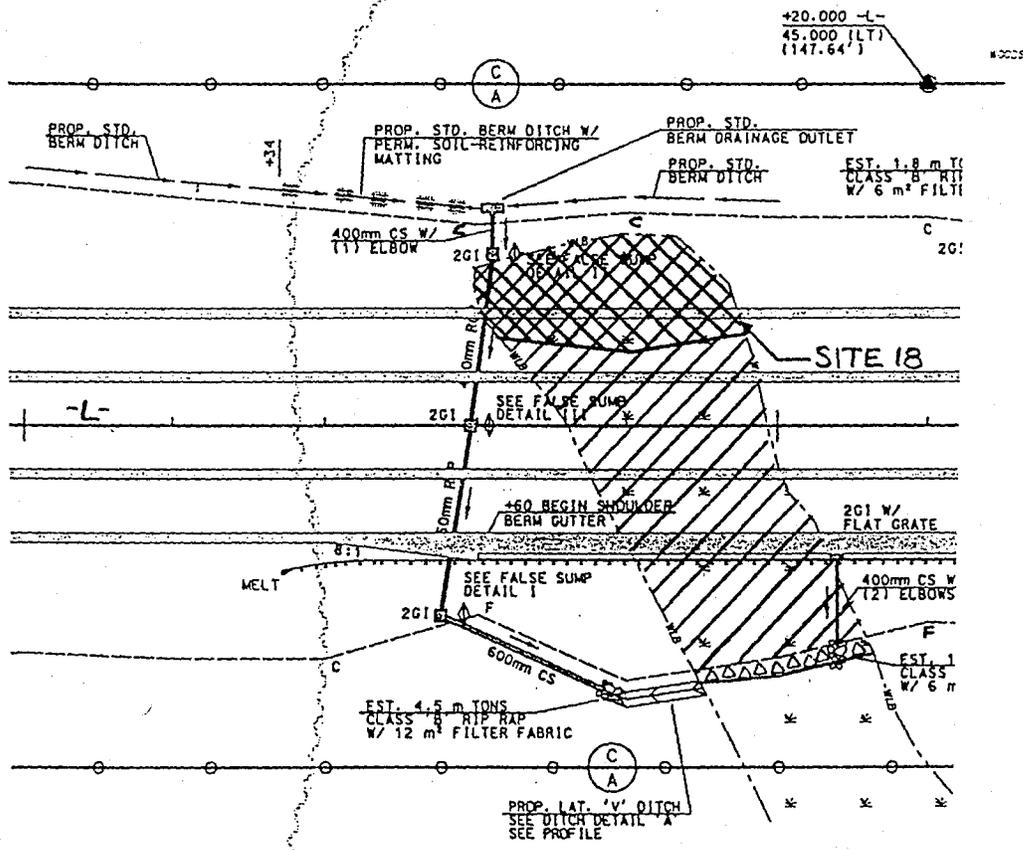
* TOTAL OF 2.36 ha. OF IMPACT TO
SURFACE WATER DUE TO DRAINING POND.

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
MOORE COUNTY
8.T560302 R-210A
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MARKINGS, AND SIGNALS ON PROPOSED U.S. 1
BYPASS FROM SR 2175 AT LAKEVIEW TO NORTHEAST
OF SR 1825.
SCALE AS SHOWN
SHEET 35 OF 58
NOVEMBER 1997

71+00

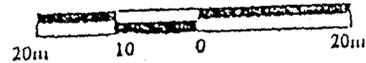
15 J BAR RANCH
DB 530 PG 988
DB 453 PG 618

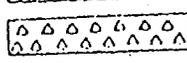
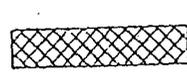
72+00



SITE #18

15 J BAR RANCH
DB 530 PG 988
DB 453 PG 618



-  DENOTES FILL IN WETLAND
-  DENOTES TEMP. IMPACT IN WETLAND DUE TO MECHANICAL CLEARING BEYOND CONSTRUCTION LIMITS
-  DENOTES EXCAVATION IN WETLAND

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

MOORE COUNTY

8.T560302

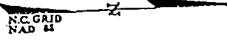
R-210A

PROPOSED GRADING, PAVING, DRAINAGE, FENCING
CULVERTS, STRUCTURES, SIGNING, PAVEMENT
MARKINGS, AND SIGNALS ON PROPOSED U.S. 1
BYPASS FROM SR 2175 AT LAKEVIEW TO NORTHEAST
OF SR 1825.

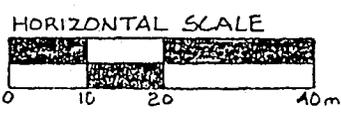
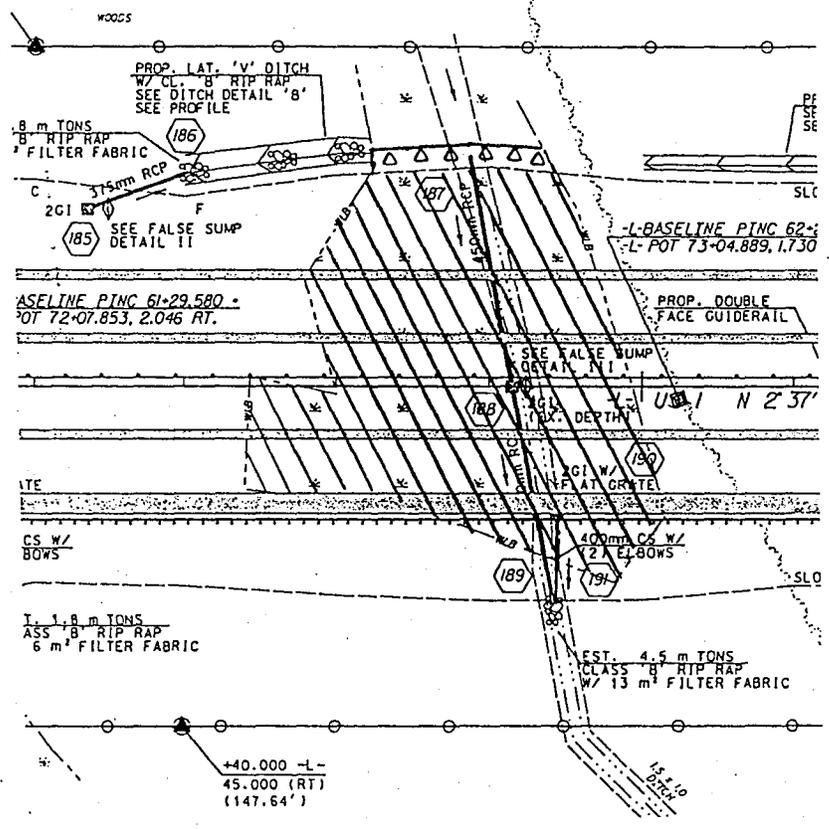
SCALE AS SHOWN

SHEET 36 OF 58

NOVEMBER 1997



73+00



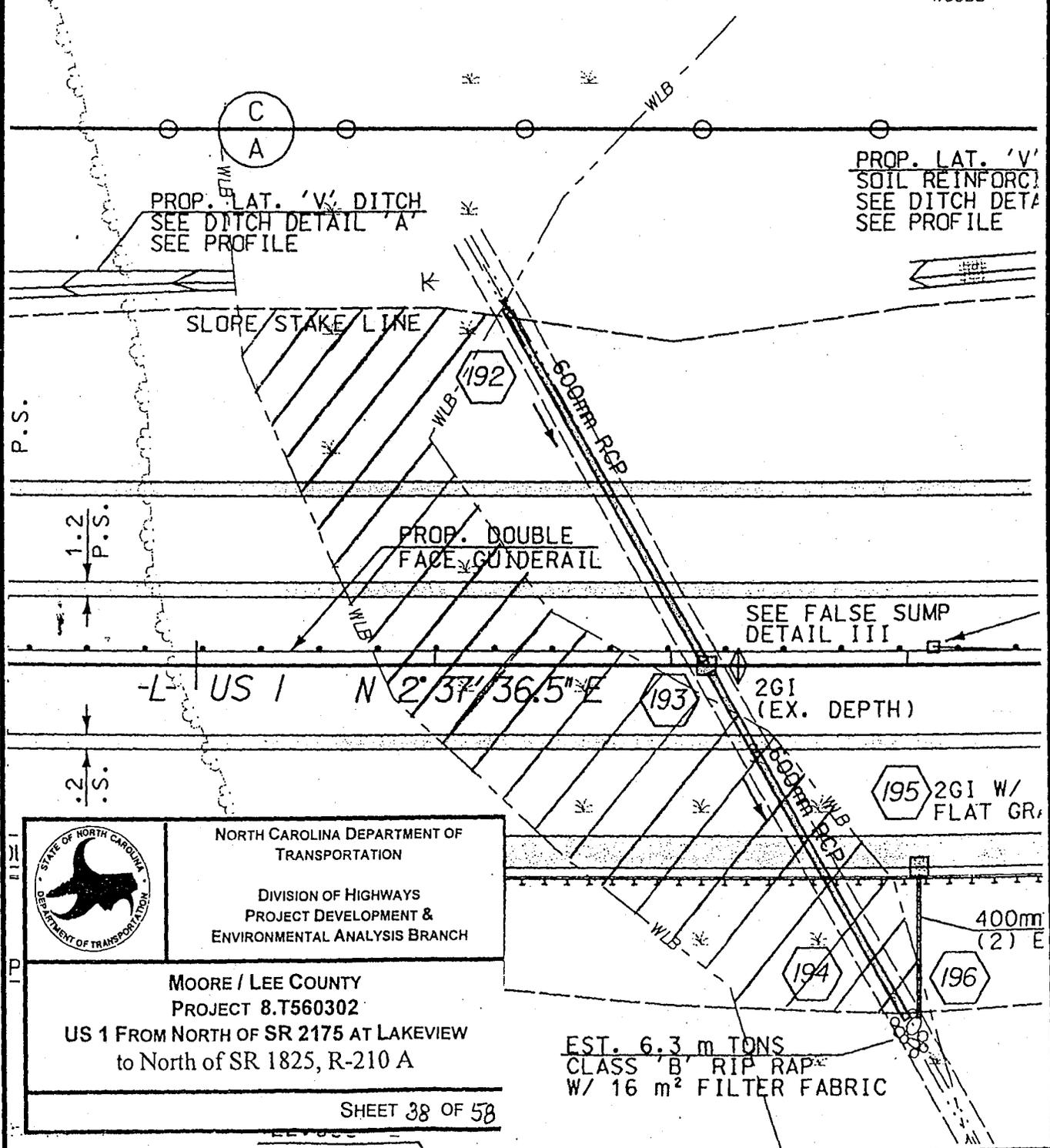
- DENOTES FILL IN WETLAND.
- DENOTES TEMP. IMPACT IN WETLAND DUE TO MECHANICAL CLEARING BEYOND CONSTRUCTION LIMITS.

SITE 18a

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
 DIVISION OF HIGHWAYS
 MOORE COUNTY
 8.T560302 R-210A
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 CULVERTS, STRUCTURES, SIGNING, PAVEMENT
 MARKINGS, AND SIGNALS ON PROPOSED U.S. 1
 BYPASS FROM SR 2175 AT LAKEVIEW TO NORTHEAST
 OF SR 1825.
 SCALE AS SHOWN
 SHEET ~~58~~ OF 58
 37
 NOVEMBER 1997

SITE 186

WOODS



NORTH CAROLINA DEPARTMENT OF
TRANSPORTATION

DIVISION OF HIGHWAYS
PROJECT DEVELOPMENT &
ENVIRONMENTAL ANALYSIS BRANCH

MOORE / LEE COUNTY
PROJECT 8.T560302
US 1 FROM NORTH OF SR 2175 AT LAKEVIEW
to North of SR 1825, R-210 A

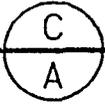
SHEET 38 OF 58

EST. 6.3 m TONS
CLASS 'B' RIP RAP
W/ 16 m² FILTER FABRIC

SITE 20

PROP.
'V' HEAD DITCH
SEE DITCH DETAIL 'V'

LAT. 'V' DITCH
DITCH DETAIL 'A'
PROFILE

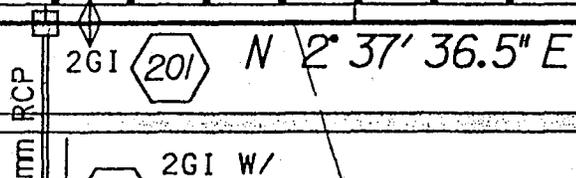


SLOPE STAKE LINE

PROP. LAT. 'V' DITCH
SEE DITCH DETAIL 'A'
SEE PROFILE

PROP. DOUBLE
FACE GUIDERAIL

SEE FALSE SUMP
DETAIL III



-L- US 1



NORTH CAROLINA DEPARTMENT OF
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to North of SR 1825, R-210 A

SHEET 40 OF 58

LEADER BERM GUTTER

STAKE LINE

400m
(2)

1.2
P.S.

600m

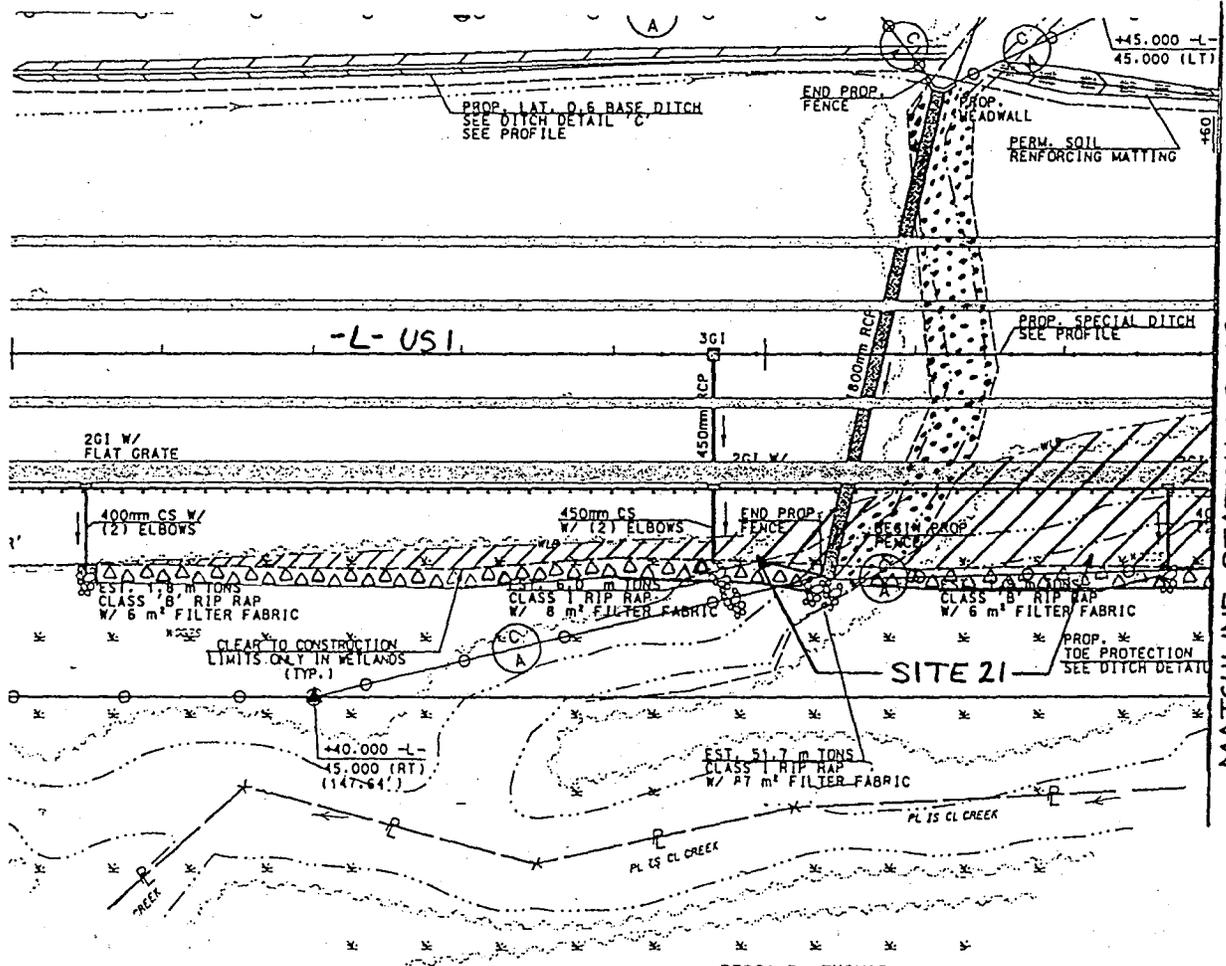
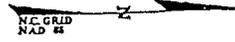
O. M. LUNS
D. D. DAD

EST. 4.5 m TONS
CLASS 'B' RIP RAP
W/ 12 m² FILTER FABRIC EST. 1.8

78+00

79+00

(15)



MATCHLINE STATION 79+60 -L-

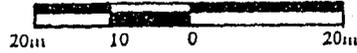
-L- US 1

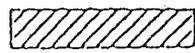
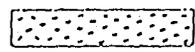
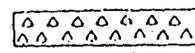
SITE 21

REDGA R. THOMAS
DB 133 PG 406

SITE #21

SCALE



-  DENOTES FILL IN WETLAND
-  DENOTES FILL IN SURFACE WATER
-  DENOTES TEMP. IMPACT IN WETLAND DUE TO MECHANICAL CLEARING BEYOND CONSTRUCTION LIMITS

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

MOORE COUNTY

8.T560302 R-210A

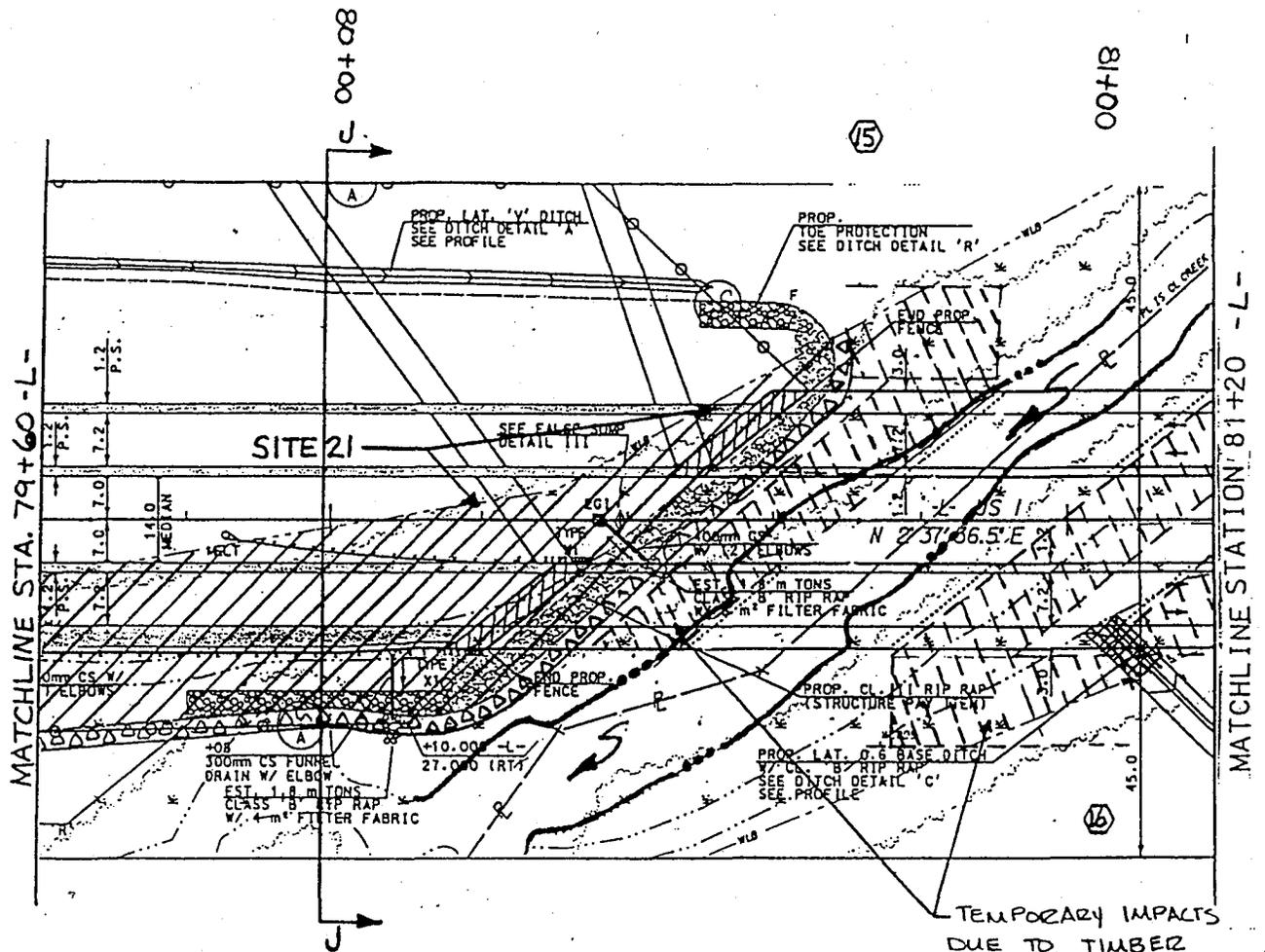
PROPOSED GRADING, PAVING, DRAINAGE, FENCING
CULVERTS, STRUCTURES, SIGNING, PAVEMENT
MARKINGS, AND SIGNALS ON PROPOSED U.S. 1
BYPASS FROM SR 2175 AT LAKEVIEW TO NORTHEAST
OF SR 1825.

SCALE AS SHOWN

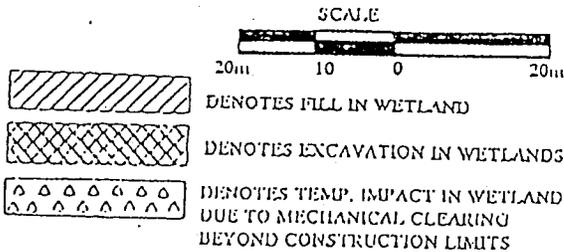
SHEET  OF 58

41

NOVEMBER 1997



SITE # 21



TEMP. IMPACT DUE TO
TIMBER BLOCK MATS = 0.2 ha
At SITE 21

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

MOORE COUNTY

S.T560302 R-210A

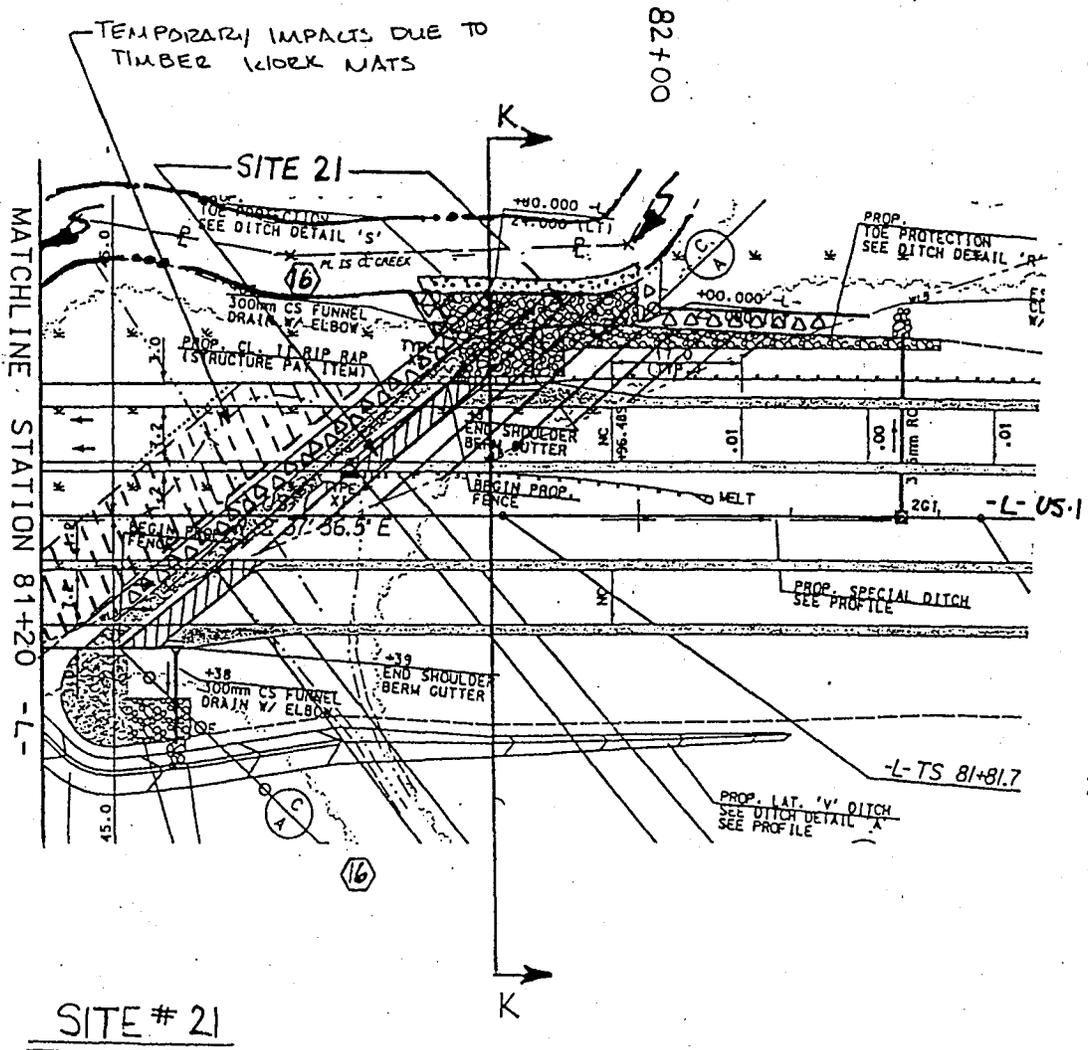
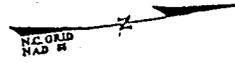
PROPOSED GRADING, PAVING, DRAINAGE, FENCING
CULVERTS, STRUCTURES, SIGNING, PAVEMENT
MARKINGS, AND SIGNALS ON PROPOSED U.S. 1
BYPASS FROM SR 2175 AT LAKEVIEW TO NORTHEAST
OF SR 1825.

SCALE AS SHOWN

SHEET 42 OF 58

NOVEMBER 1997

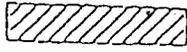
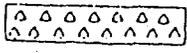
REV. 01/10/01



SITE # 21

SCALE



-  DENOTES FILL IN WETLAND
-  DENOTES TEMP. IMPACT IN WETLAND DUE TO MECHANICAL CLEARING BEYOND CONSTRUCTION LIMITS
-  DENOTES FILL IN SURFACE WATER

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

MOORE COUNTY

8.T560302

R-210A

PROPOSED GRADING, PAVING, DRAINAGE, FENCING
CULVERTS, STRUCTURES, SIGNING, PAVEMENT
MARKINGS, AND SIGNALS ON PROPOSED U.S. 1
BYPASS FROM SR 2175 AT LAKEVIEW TO NORTHEAST
OF SR 1825.

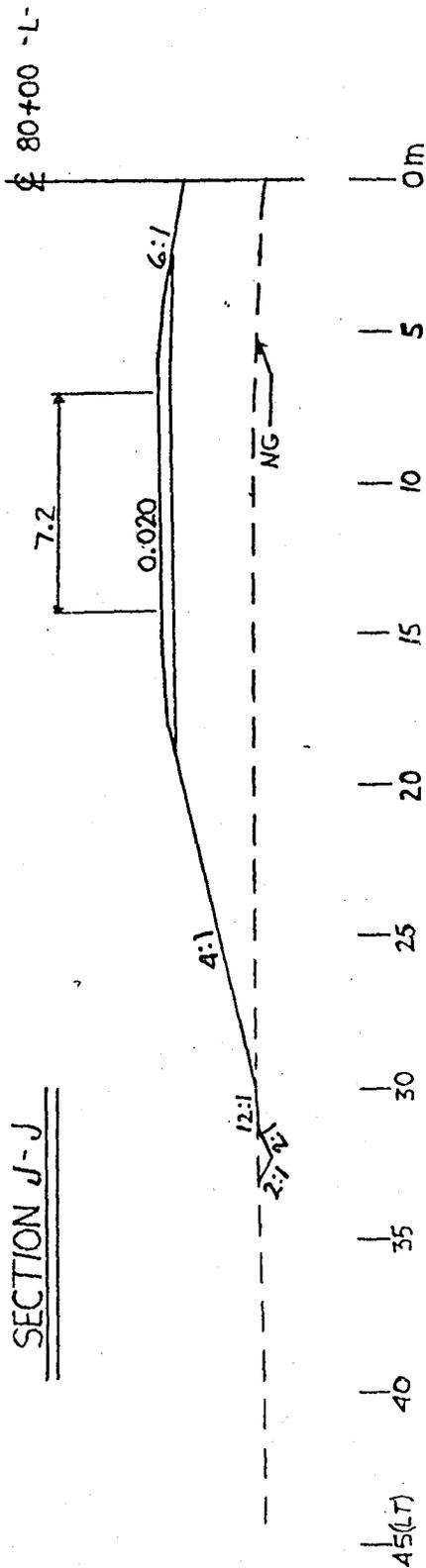
SCALE AS SHOWN

SHEET 43 OF 58

NOVEMBER 1997

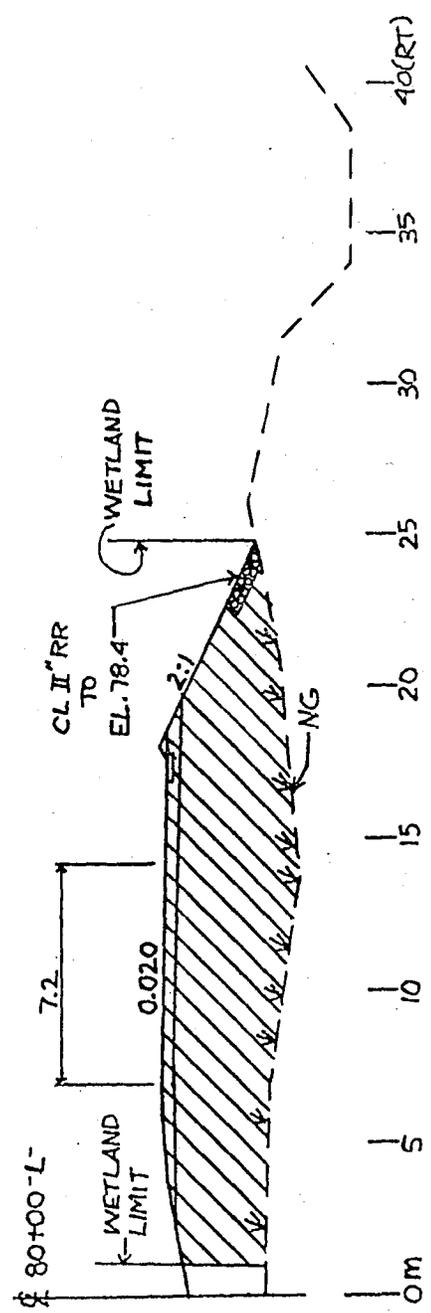
REV. 01/10/01

SECTION J-J

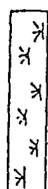


84
82
80
78
76

86
84
82
80
78
76



HORIZONTAL AND VERTICAL SCALE



DENOTES WETLAND



DENOTES FILL IN WETLAND

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

MOORE COUNTY

8.T560302

R-210A

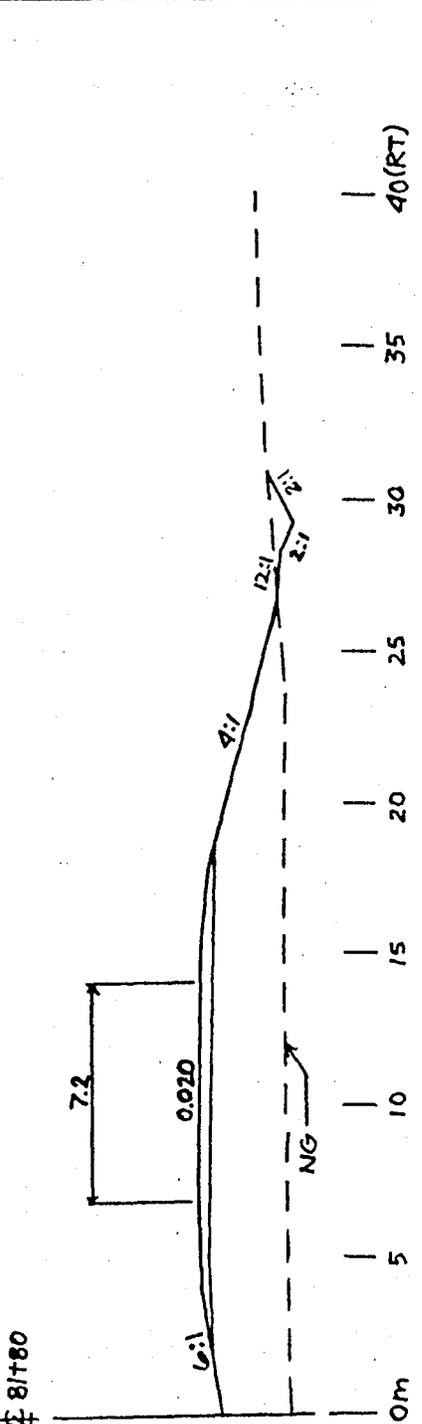
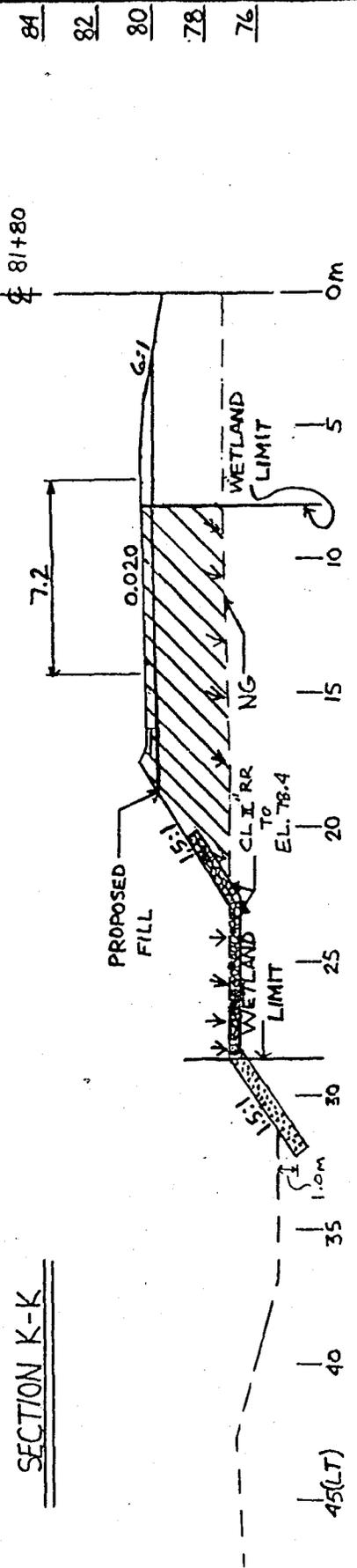
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CULVERTS, STRUCTURES, SIGNING, PAVEMENT
MARKINGS, AND SIGNALS ON PROPOSED U.S. 1
BYPASS FROM SR 2175 AT LAKEVIEW TO NORTHEAST
OF SR 1825.

SCALE AS SHOWN

SHEET 45 OF 58

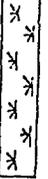
NOVEMBER 1997

SECTION K-K

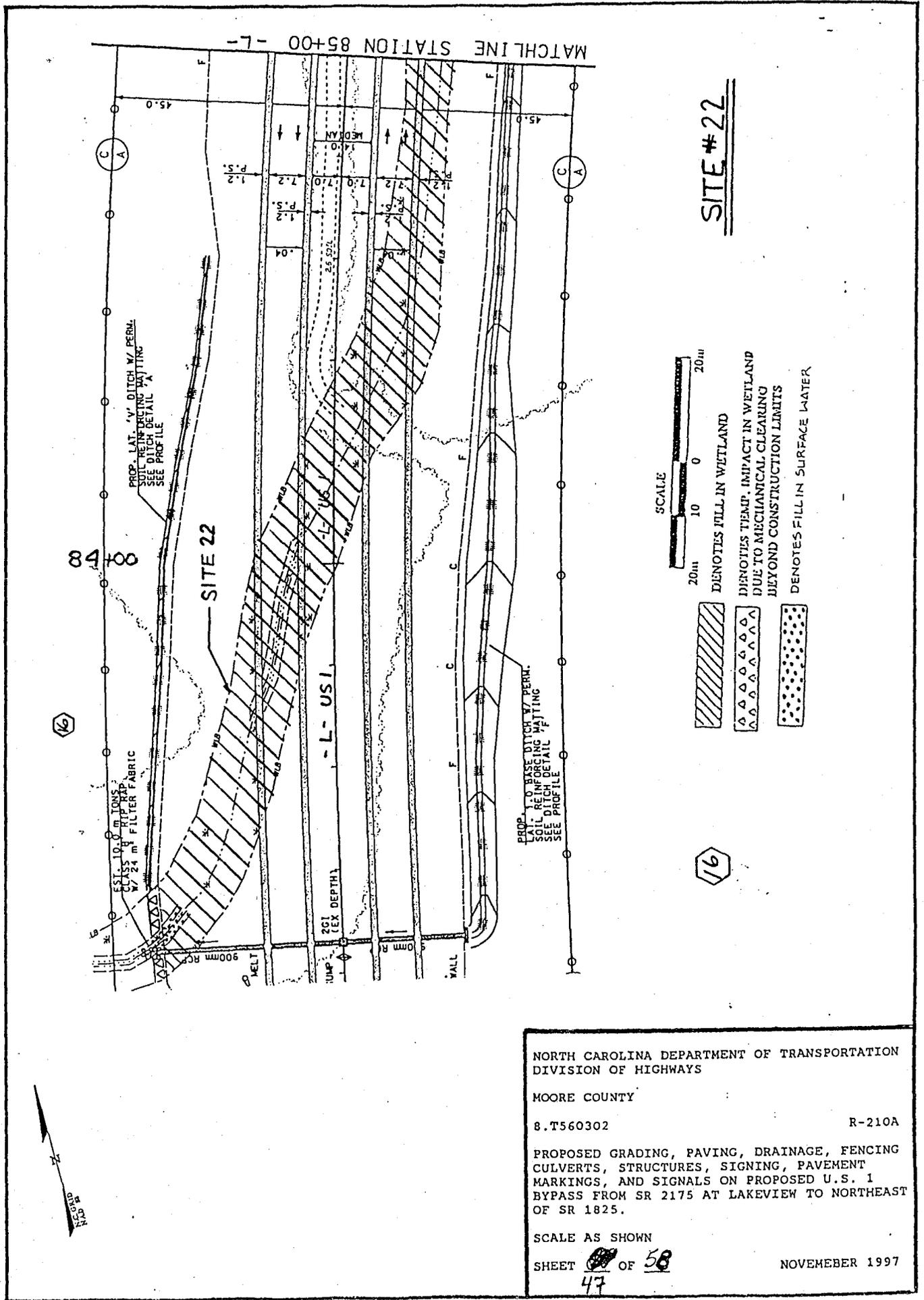


HORIZONTAL AND VERTICAL SCALE



-  DENOTES WETLAND
-  DENOTES FILL IN WETLAND.
-  DENOTES FILL IN SURFACE WATER.

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
 DIVISION OF HIGHWAYS
 MOORE COUNTY
 B.T560302 R-210A
 PROPOSED GRADING, PAVING, DRAINAGE, FENCING
 CULVERTS, STRUCTURES, SIGNING, PAVEMENT
 MARKINGS, AND SIGNALS ON PROPOSED U.S. 1
 BYPASS FROM SR 2175 AT LAKEVIEW TO NORTHEAST
 OF SR 1825.
 SCALE AS SHOWN
 SHEET 46 OF 58
 NOVEMBER 1997



SITE #22

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
 DIVISION OF HIGHWAYS

MOORE COUNTY

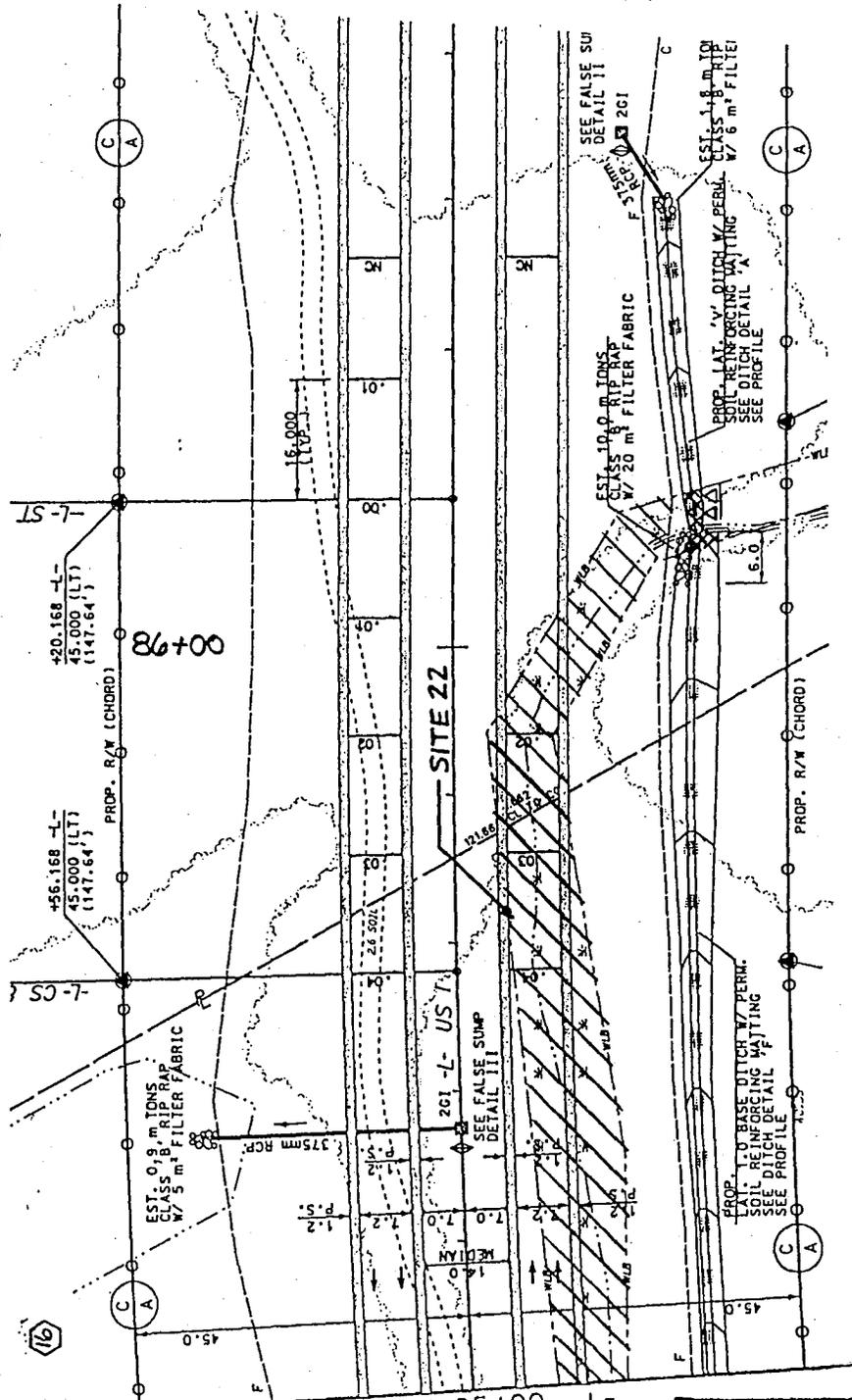
8.T560302 R-210A

PROPOSED GRADING, PAVING, DRAINAGE, FENCING
 CULVERTS, STRUCTURES, SIGNING, PAVEMENT
 MARKINGS, AND SIGNALS ON PROPOSED U.S. 1
 BYPASS FROM SR 2175 AT LAKEVIEW TO NORTHEAST
 OF SR 1825.

SCALE AS SHOWN

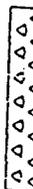
SHEET **47** OF **58**

NOVEMBER 1997



SITE # 22



-  DENOTES FILL IN WETLAND
-  DENOTES EXCAVATION IN WETLANDS
-  DENOTES TEMP. IMPACT IN WETLAND DUE TO MECHANICAL CLEARING BEYOND CONSTRUCTION LIMITS

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

MOORE COUNTY

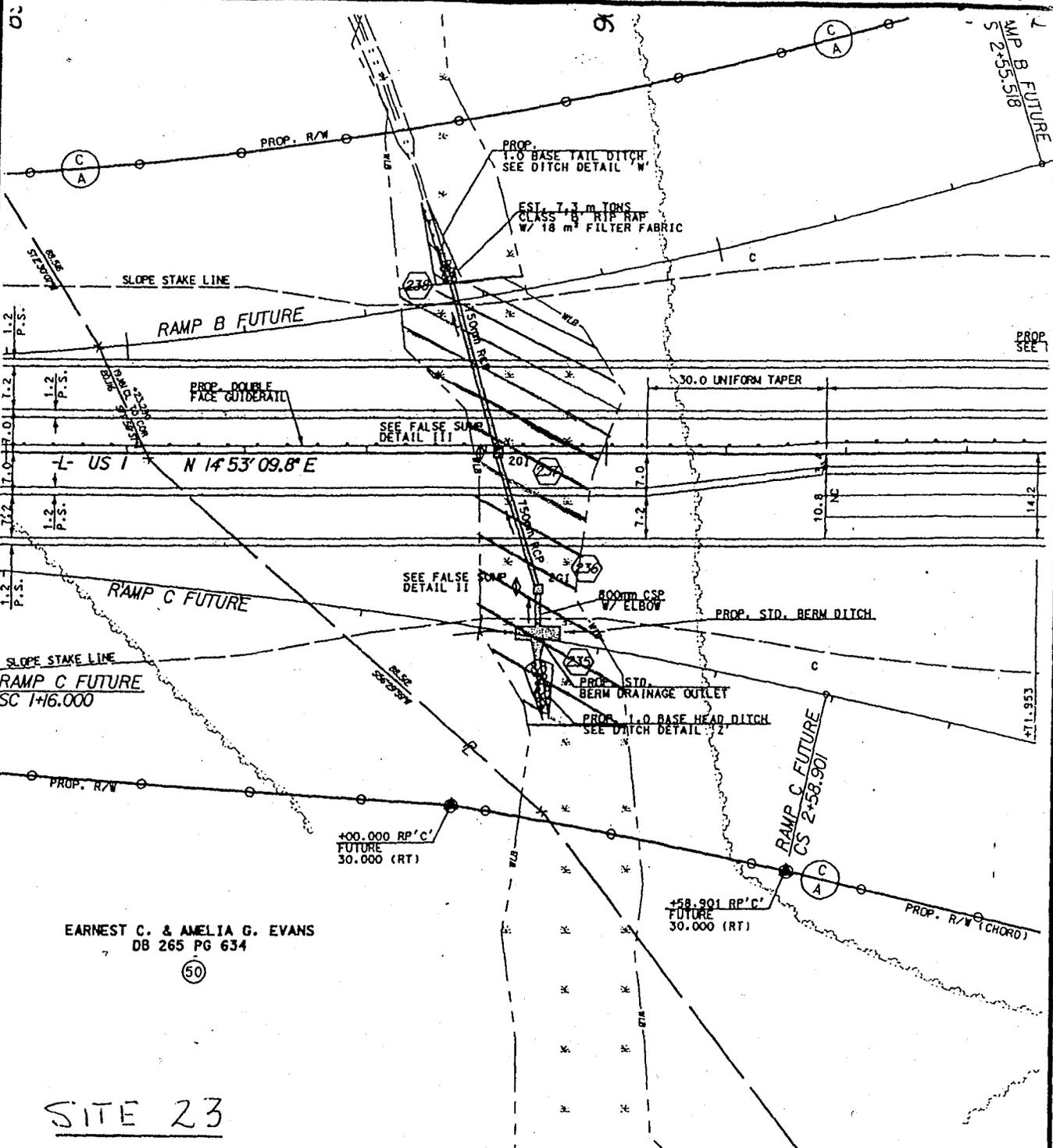
8. T560302 R-210A

PROPOSED GRADING, PAVING, DRAINAGE, FENCING
CULVERTS, STRUCTURES, SIGNING, PAVEMENT
MARKINGS, AND SIGNALS ON PROPOSED U.S. 1
BYPASS FROM SR 2175 AT LAKEVIEW TO NORTHEAST
OF SR 1825.

SCALE AS SHOWN

SHEET 48 OF 58

NOVEMBER 1997



EARNEST C. & AMELIA G. EVANS
DB 265 PG 634

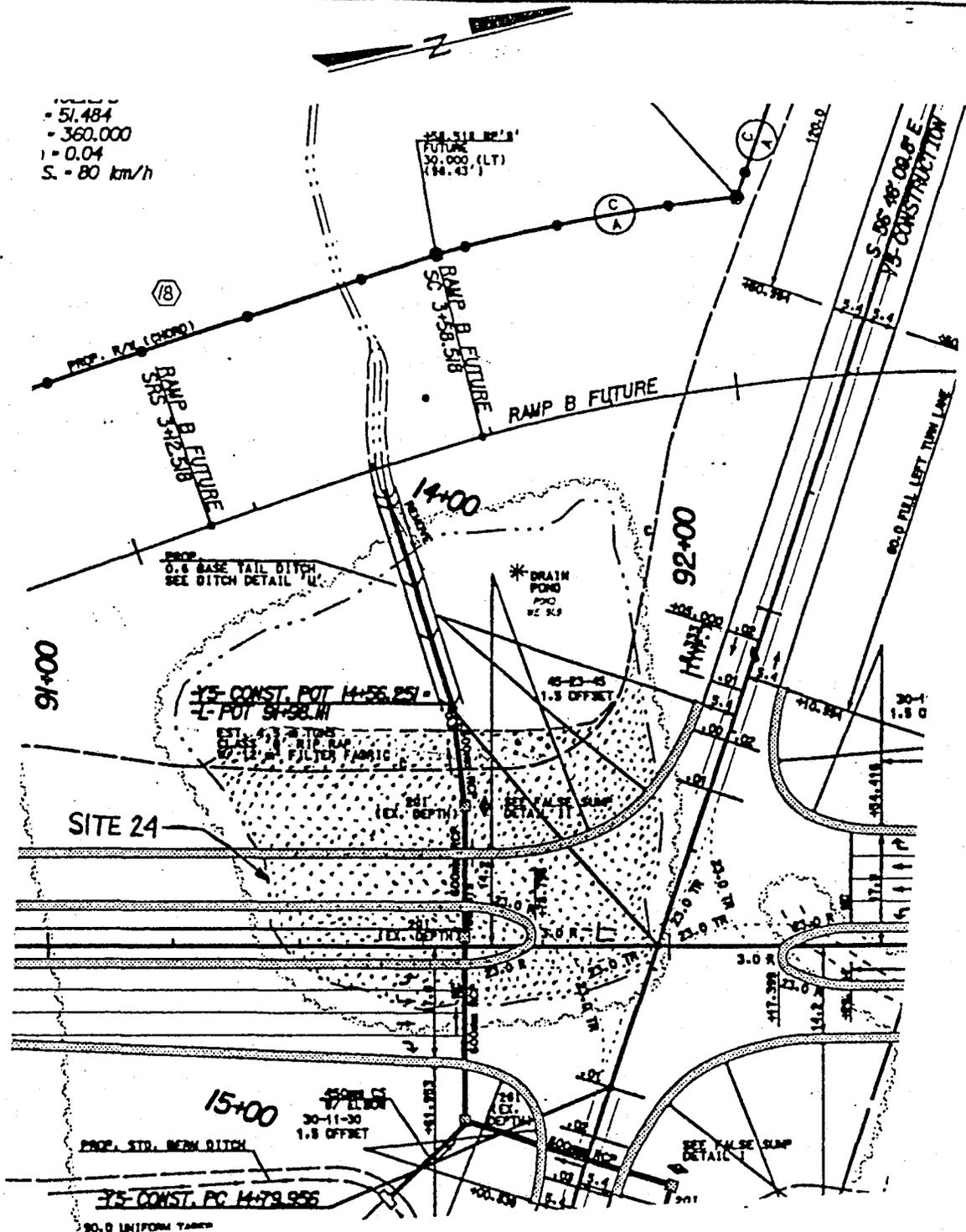
(50)

SITE 23

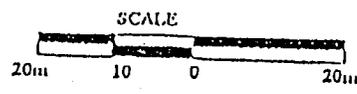
	NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
	DIVISION OF HIGHWAYS PROJECT DEVELOPMENT & ENVIRONMENTAL ANALYSIS BRANCH

MOORE / LEE COUNTY
PROJECT 8.T560302
US 1 FROM NORTH OF SR 2175 AT LAKEVIEW
to North of SR 1825, R-210 A

- 51.484
 - 360.000
 1 = 0.04
 S. = 80 km/h



SITE #24



DENOTES FILL IN SURFACE WATER

* TOTAL OF .46 ha. OF IMPACT TO SURFACE WATER DUE TO DRAINING POND.

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
 DIVISION OF HIGHWAYS
 MOORE COUNTY
 8.T560302 R-210A
 PROPOSED GRADING, PAVING, DRAINAGE, FENCING
 CULVERTS, STRUCTURES, SIGNING, PAVEMENT
 MARKINGS, AND SIGNALS ON PROPOSED U.S. 1
 BYPASS FROM SR 2175 AT LAKEVIEW TO NORTHEAST
 OF SR 1825.
 SCALE AS SHOWN
 SHEET **51** OF **58**
 NOVEMBER 1997

SUMMARY TABLE - R210A

SITE NO.	PROJECT STATION	STREAM NAME	TRIBUTARY TO	STRUCTURE SIZE (mm)	FILL IN SURFACE WATER (ha)	LENGTH OF EXISTING CHANNEL LOST (m)	LENGTH OF CHANNEL CREATED (m)	FILL IN WETLANDS (ha)	EXCAVATION IN WETLANDS (ha)	TEMP. IMPACT IN WETLANDS DUE TO MECHANICAL CLEARING BEYOND CONSTRUCTION LIMITS (ha)
1	23+19 - 31+05 (LT+RT) -L-	LITTLE RIVER	CAPE FEAR RIVER	3@27,4,2@18.0 SPAN BRIDGE	0.03	104	0	2.09	<0.01	0.24
2	12+20 - 12+57(LT+RT) -Y6-	TRIB. TO	LITTLE RIVER	450 RCP	0.00	0	0	0.14	0.00	<0.01
3	31+50(RT+LT) - 34+83(RT) -L-	TRIB. TO	LITTLE RIVER	1200 RCP	0.00	0	0	1.12	0.00	0.16
4	35+70 - 38+28(LT+RT) -L-	TRIB. TO	LITTLE RIVER	750 RCP	0.00	0	0	0.23	0.00	0.02
5	10+09(RT+LT) - 10+29(LT) -Y2-	TRIB. TO	LITTLE RIVER	450 RCP	<0.01	2	0	<0.01	0.00	<0.01
6	41+81(LT+RT) - 43+29(LT) -L-	TRIB. TO	CRANE CREEK	600 RCP	0.00	0	0	0.46	0.00	0.02
7	3+08(RT) - 3+34(RT) RAMP C	TRIB. TO	CRANE CREEK	750 RCP	0.00	0	0	0.02	0.00	<0.01
8	47+41(RT) - 47+69(RT) -L- 4+24(RT+LT) RAMP D	TRIB. TO	CRANE CREEK	600 RCP	0.00	0	0	0.38***	0.03	<0.01
9	1+86(RT) - 2+82(RT) RAMP A	TRIB. TO	CRANE CREEK	600 RCP	0.00	0	0	0.05	0.01	0.02
10	50+59 - 52+60(RT+LT) -L-	TRIB. TO	CRANE CREEK	1200 RCP	0.07	175	53	1.04	<0.01	0.14
11	54+37(LT) - 58+09(RT+LT) -L-	TRIB. TO	CRANE CREEK	750 RCP	0.00	0	0	0.47	0.00	0.10
12	12+35(LT) - 12+81(LT+RT) - 13+37(RT) -Y4-	TRIB. TO	CRANE CREEK	900 RCP CLASS IV	<0.01	42	0	0.10	0.00	0.01
13	10+39(RT) - 11+11(RT) -Y4-	TRIB. TO	CRANE CREEK	1350 RCP	<0.01	8	0	0.01	0.00	0.02

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
 DIVISION OF HIGHWAYS
 MOORE COUNTY
 B.1560302
 R-210A
 PROPOSED GRADING, PAVING, DRAINAGE, FENCING
 CULVERTS, STRUCTURES, SIGNING, PAVEMENT
 MARKINGS, AND SIGNALS ON PROPOSED U.S. 1
 BYPASS FROM SR 2175 AT LAKEVIEW TO
 NORTHEAST OF SR 1825.
 SCALE AS SHOWN
 SHEET 58 OF 58
 AUG 1999

53

SUMMARY TABLE - R210A

SITE NO.	PROJECT STATION	STREAM NAME	TRIBUTARY TO	STRUCTURE SIZE	FILL IN SURFACE WATER	LENGTH OF EXISTING CHANNEL LOST	LENGTH OF CHANNEL CREATED	FILL IN WETLANDS	EXCAVATION IN WETLANDS	TEMP. IMPACT IN WETLANDS DUE TO MECHANICAL CLEARING BEYOND CONSTRUCTION LIMITS
14	16+13(RT) - 16+65(LT) -Y4-	TRIB. TO	CRANE CREEK	1050 RCP	<0.01	12	0	0.04	0.00	0.02
14a	59+10 (RT) - 60+20(LT) -L-	TRIB. TO	CRANE CREEK	600 RCP	0	0	0	.24	<.01	0.02
15	60+85(RT) - 61+39(LT) -L-	TRIB. TO	CRANE CREEK	1200 RCP	0.02	78	0	0.08	0	<0.01
16	64+35 - 65+05(LT+RT) -L-	TRIB. TO	CRANE CREEK	2.1X1.5 RCBC	0.04	183	0	0.28	<0.01	0.02
17	67+15(RT) - 68+50(LT) -L-	TRIB. TO	CRANE CREEK	1200 RCP	.18'	68	0	0.13	<.01	0.02
18	71+59(LT) - 72+12(RT) -L-	TRIB. TO	CRANE CREEK	450 RCP	0	0	0	0.16	0	<0.01
18a	72+48 -73+00 -L-	TRIB. TO	CRANE CREEK	450 RCP	0	0	0	.21	0	<.01
18b	74+05 (LT) - 74+60 (RT) -L-	TRIB. TO	CRANE CREEK	600 RCP	0	0	0	.12	0	<.01
19	76+25(RT) - 76+57(RT) -L-	TRIB. TO	CRANE CREEK	1050 RCP	<0.01	79	0	0.02	0.00	<0.01
20	76+62(RT) - 77+11(RT) -L-	TRIB. TO	CRANE CREEK	600 RCP	0.00	0	0	0.04	0.00	0.02
21	78+20(RT) - 80+68(RT) -L- 81+16(RT) - 82+22(LT) -L-	CRANE CREEK	LITTLE CREEK	1 @ 22m, 1 @ 30m, & 2 @ 28m SPAN BRIDGE	0.03	68	0	0.47	<0.01	0.07
22	83+26(LT) - 86+20(RT) -L-	TRIB. TO	CRANE CREEK	900 RCP	<0.01	13	0	0.33	0.00	<0.01
22a	87+50(LT) - 87+78(LT) -L-	TRIB. TO	CRANE CREEK	600 RCP	0	0	0	0.07	<.01	<.01
23	89+66 - 90+03(LT+RT) -L-	TRIB. TO	LITTLE CREEK	750 RCP	0.00	0	0	0.12	<0.01	<0.01

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
 DIVISION OF HIGHWAYS
 MOORE COUNTY
 8:1560302
 R-210A
 PROPOSED GRADING, PAVING, DRAINAGE, FENCING
 CULVERTS, STRUCTURES, SIGNING, PAYMENT
 MARKINGS, AND SIGNALS ON PROPOSED U.S. 1
 BYPASS FROM SR 2175 AT LAKEVIEW TO
 NORTHEAST OF SR 1825.
 SCALE AS SHOWN
 SHEET 58 OF 58
 AUG 1999

SUMMARY TABLE - R210A

SITE NO.	PROJECT STATION	STREAM NAME	TRIBUTARY TO	STRUCTURE SIZE	FILL IN SURFACE WATER	LENGTH OF EXISTING CHANNEL LOST	LENGTH OF CHANNEL CREATED	FILL IN WETLANDS	EXCAVATION IN WETLANDS	TEMP. IMPACT IN WETLANDS DUE TO MECHANICAL CLEARING BEYOND CONSTRUCTION LIMITS
					(ha)	(m)	(m)	(ha)	(ha)	(ha)
24	91+21 - 91+99(LT+RT) -L-	TRIB. TO	LITTLE CREEK	600 RCP	0.25**	0	0	0.00	0.00	0.00
25	94+70 - 95+20(LT+RT) -L-	TRIB. TO	LITTLE CREEK	1200 CS	0.03	155	0	0.25	0.01	0.02
TOTALS					.65ha.	987m	53 m	8.65ha.	0.08 ha.	.92 ha.

* TOTAL OF 2.38 ha. OF IMPACT TO SURFACE WATERS DUE TO DRAINING POND. (INCLUDES FILL)

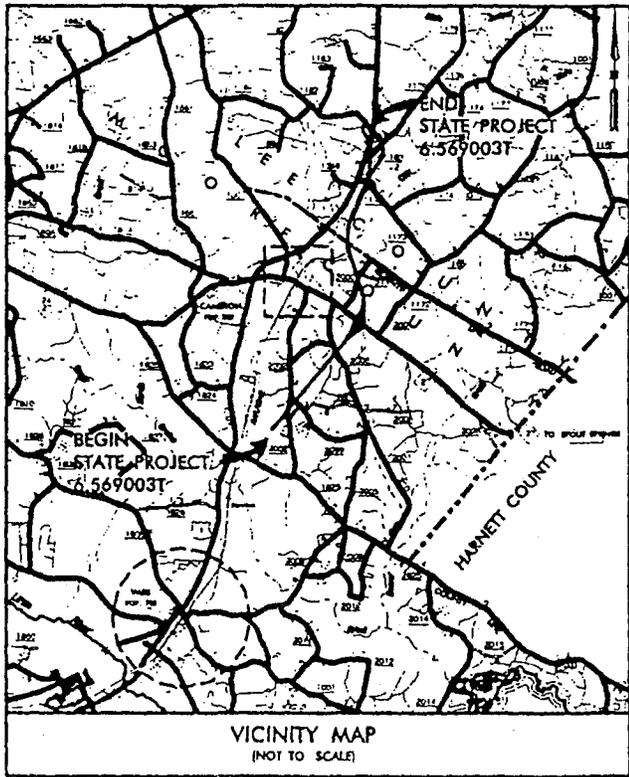
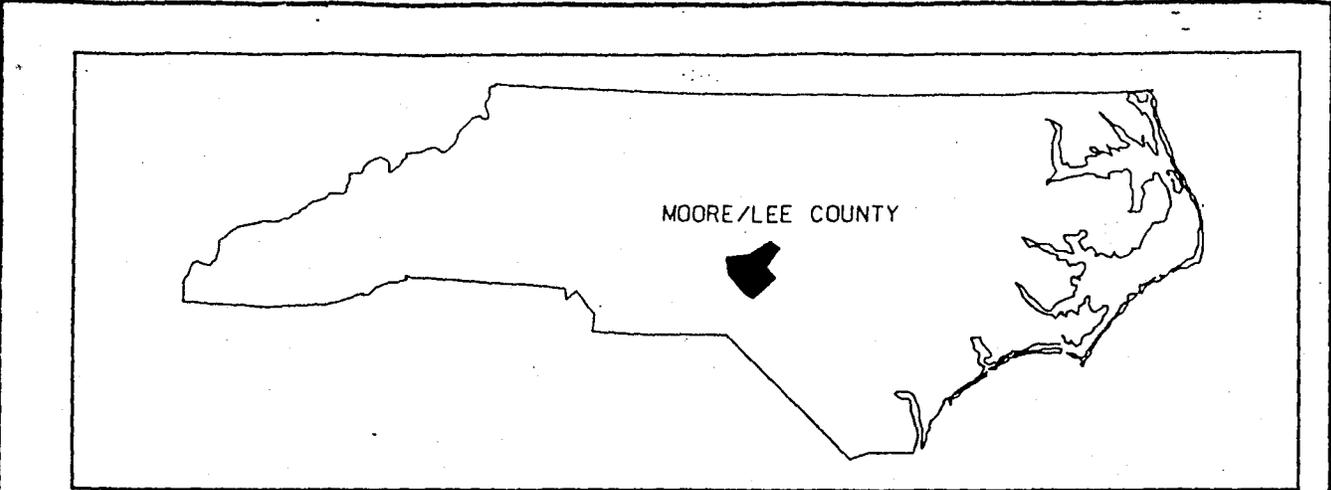
** TOTAL OF .46 ha. OF IMPACT TO SURFACE WATERS DUE TO DRAINING POND. (INCLUDES FILL)

***ADDITIONAL 0.08 ha. OF IMPACT TO WETLANDS DUE TO DRAINING ADJACENT WETLANDS

Site No.1 and Site No. 21 are both below Headwaters

****ADDITIONAL 0.01 ha. OF IMPACT TO WETLANDS DUE TO DRAINING ADJACENT WETLANDS

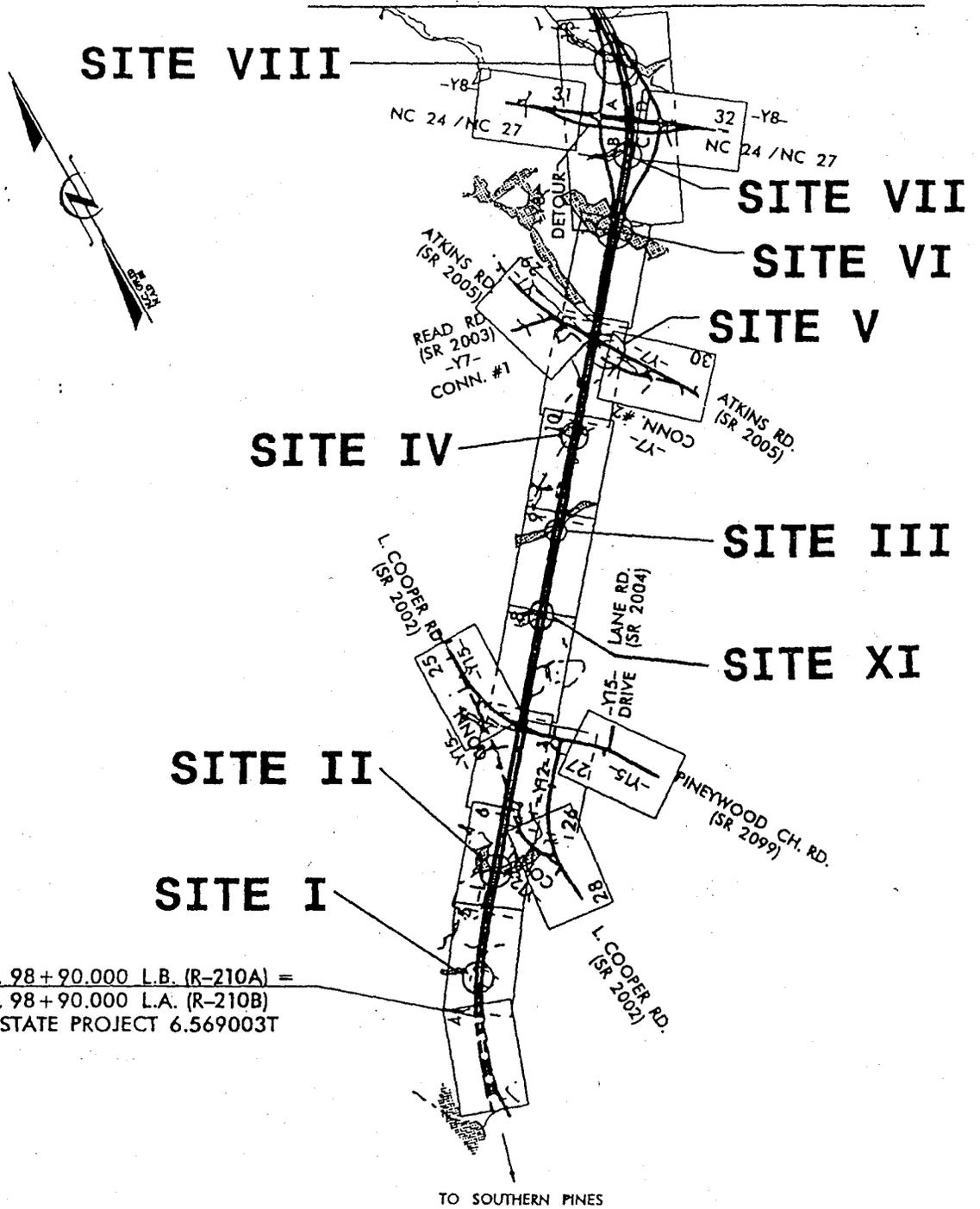
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
 DIVISION OF HIGHWAYS
 MOORE COUNTY
 8.1560302
 R-210A
 PROPOSED GRADING, PAVING, DRAINAGE, FENCING
 CULVERTS, STRUCTURES, SIGNING, PAVEMENT
 MARKINGS, AND SIGNALS ON PROPOSED U.S. 1
 BYPASS FROM SR 2175 AT LAKEVIEW TO
 NORTHEAST OF SR 1825.
 SCALE AS SHOWN
 SHEET 58 OF 58
 AUG 1999



VICINITY
MAPS

N. C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
MOORE/LEE COUNTY
PROJECT: 6.569003T (R-210B)
US 1 FROM NORTH OF SR 1825
TO NORTH OF SR 1182

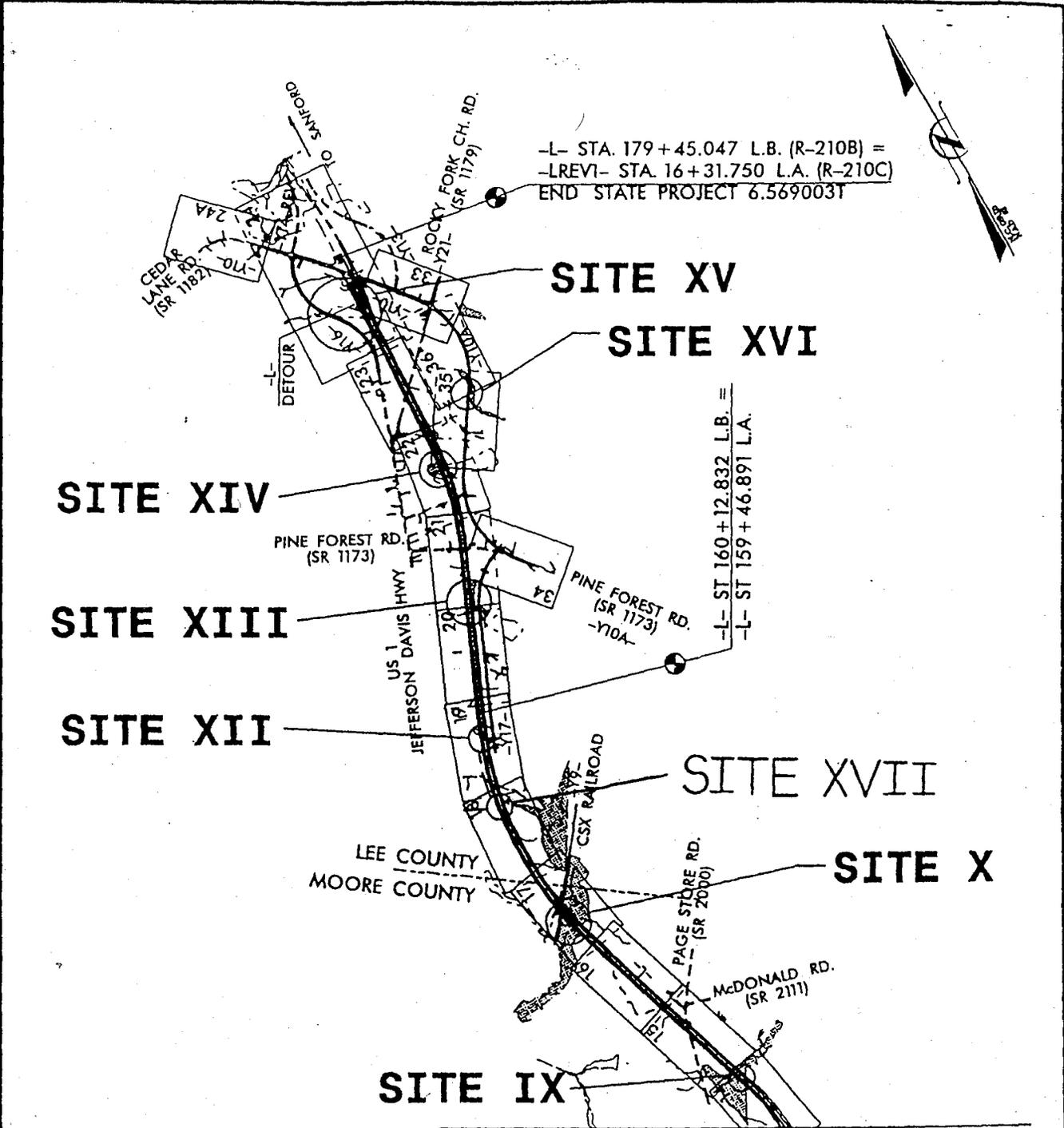
MATCHLINE SITE MAP 2



-L- STA. 98+90.000 L.B. (R-210A) =
 -L- STA. 98+90.000 L.A. (R-210B)
 BEGIN STATE PROJECT 6.569003T

SITE MAP 1

N. C. DEPT. OF TRANSPORTATION
 DIVISION OF HIGHWAYS
 MOORE/LEE COUNTY
 PROJECT: 6.569003T (R-210B)
 US 1 FORM NORTH OF SR 1825
 TO NORTH OF SR 1182
 SHEET 2 OF 37 8/2/99



-L- STA. 179+45.047 L.B. (R-210B) =
 -LREVI- STA. 16+31.750 L.A. (R-210C)
 END STATE PROJECT 6.569003T

SITE XV
SITE XVI
SITE XIV
SITE XIII
SITE XII
SITE XVII
SITE X
SITE IX

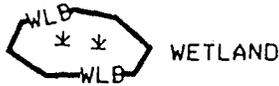
MATCHLINE SITE MAP 1

SITE MAP 2

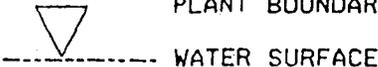
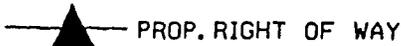
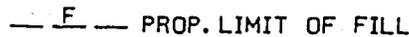
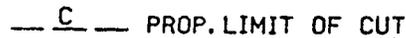
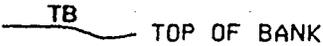
N. C. DEPT. OF TRANSPORTATION
 DIVISION OF HIGHWAYS
 MOORE/LEE COUNTY
 PROJECT: 6.569003T (R-210B)
 US 1 FROM NORTH OF SR 1825
 TO NORTH OF SR 1182
 SHEET 3 OF 37 8/2/99

LEGEND

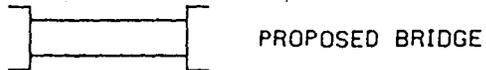
—WLB— WETLAND BOUNDARY



—>—> FLOW DIRECTION



LIVE STAKES



(DASHED LINES DENOTE EXISTING STRUCTURES)



WOODS LINE



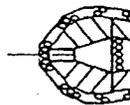
ROOTWAD



VANE



RIP RAP

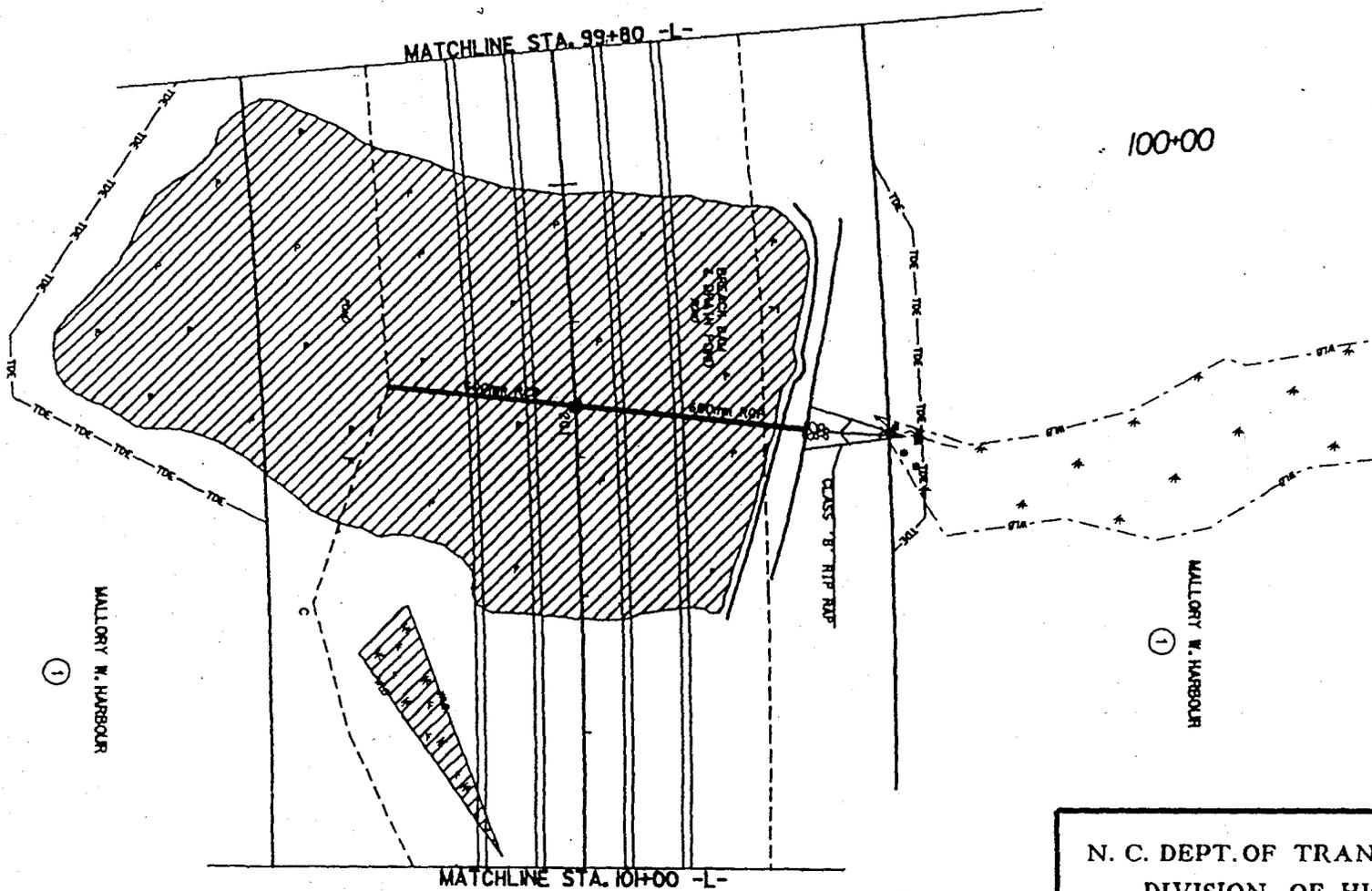


RIP RAP ENERGY DISSIPATOR BASIN

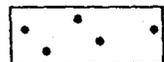
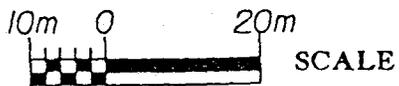
N. C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS

MOORE/LEE COUNTY

PROJECT: 6.569003T (R-210B)



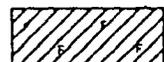
PLAN VIEW
SITE I



DENOTES MECHANIZED CLEARING



DENOTES FILL IN SURFACE WATERS (POND)



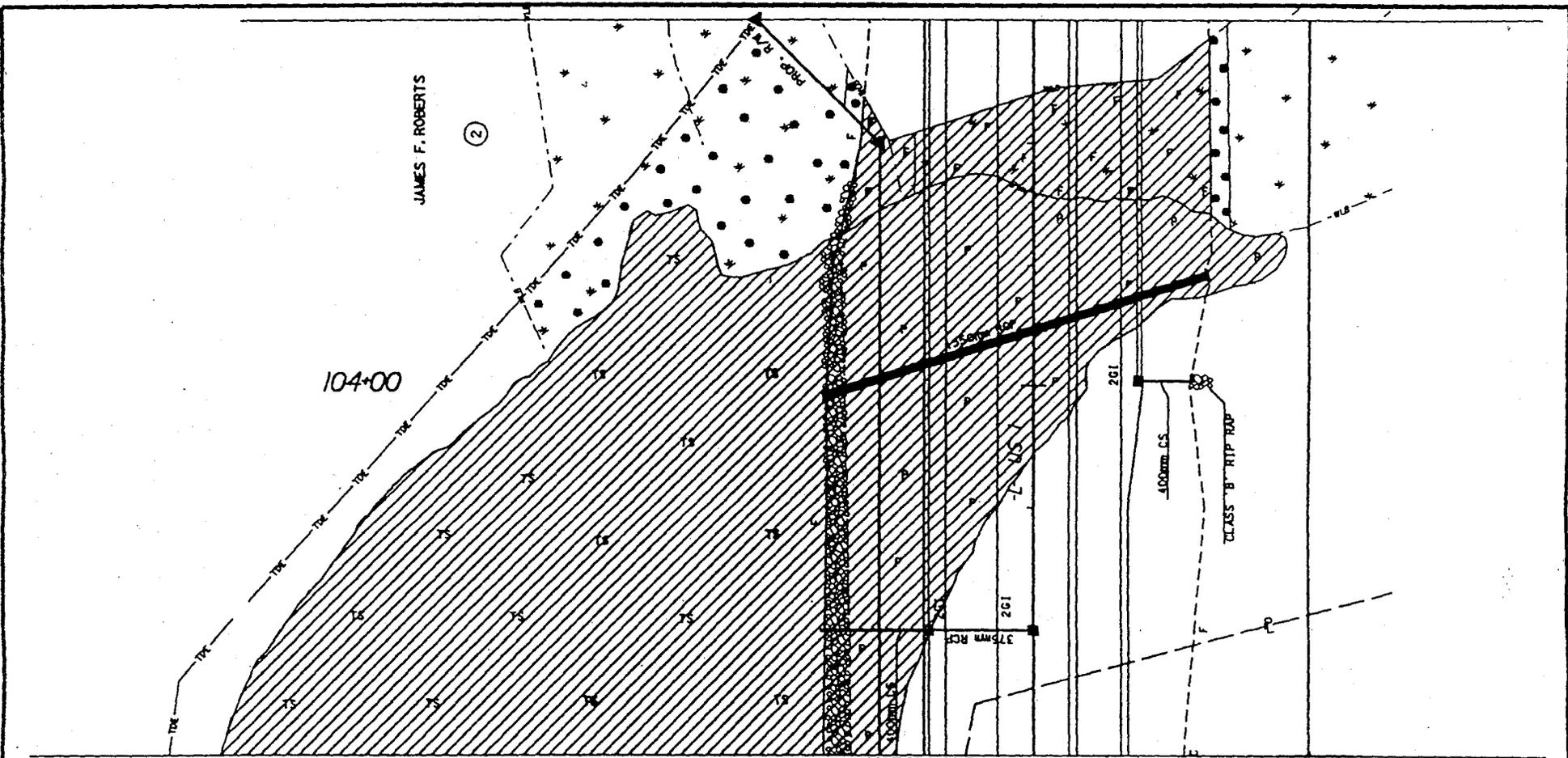
DENOTES FILL IN WETLANDS

N. C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
MOORE/LEE COUNTY

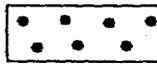
PROJECT: 6.569003T (R-210B)

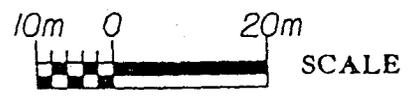
US 1 FROM NORTH OF SR. 1825
TO NORTH OF SR 1182

SHEET 5 OF 37 8/2/99



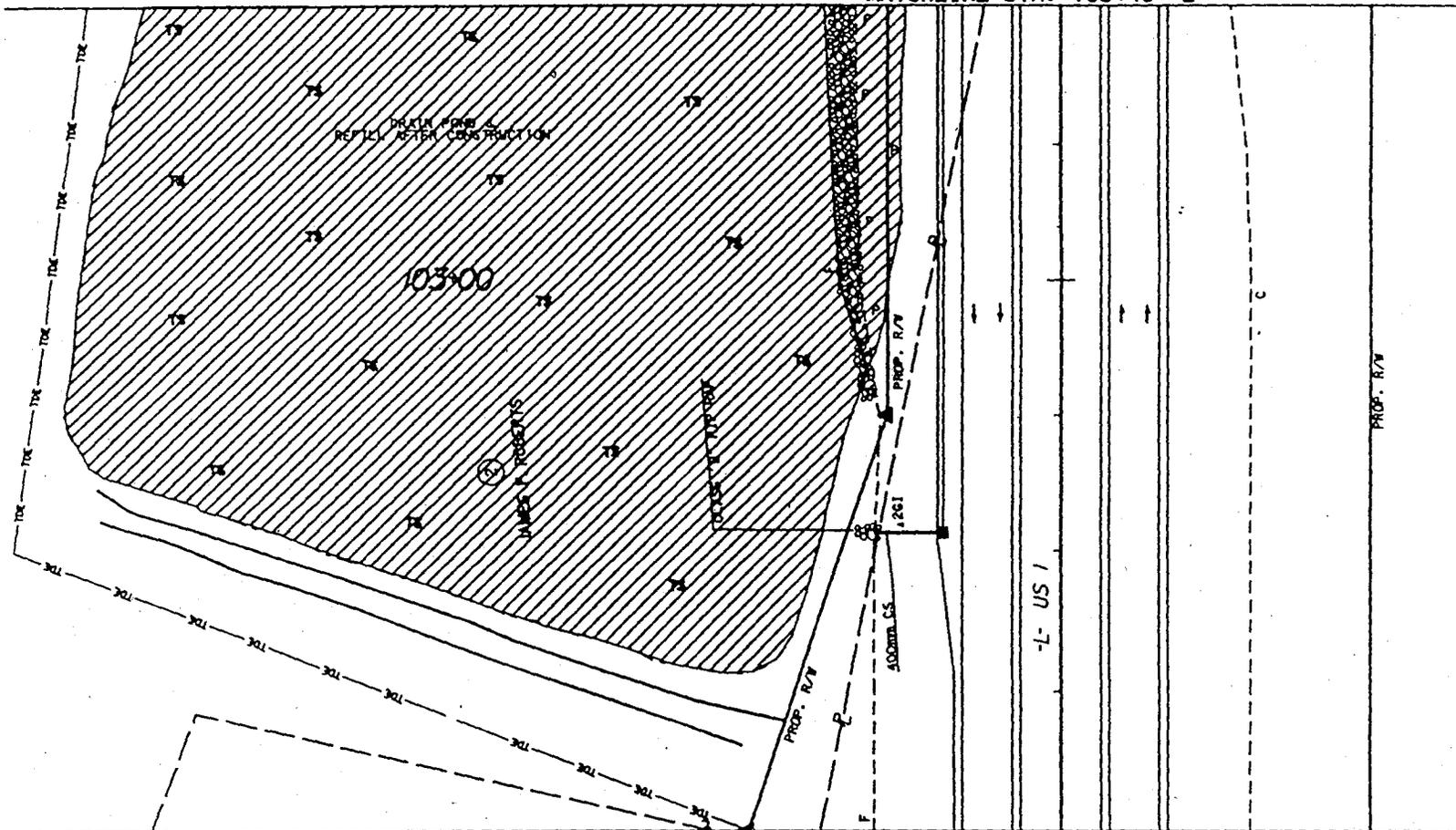
PLAN VIEW
SITE II CONT.

-  DENOTES TEMP. SURFACE WATER IMPACTS
-  DENOTES FILL IN SURFACE WATERS (POND)
-  DENOTES MECHANIZED CLEARING
-  DENOTES FILL IN WETLANDS



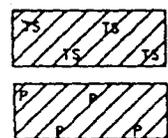
N. C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
MOORE/LEE COUNTY
PROJECT: 6.569003T (R-210B)
US 1 FROM NORTH OF SR 1825
TO NORTH OF SR 1182
SHEET 6 OF 37 8/2/99

MATCHLINE STA. 103+40 -L-



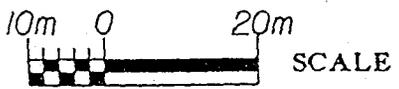
MATCHLINE STA. 102+20 -L-

PLAN VIEW SITE II



DENOTES SURFACE TEMP.
WATER IMPACTS

DENOTES FILL IN SURFACE WATERS (POND)

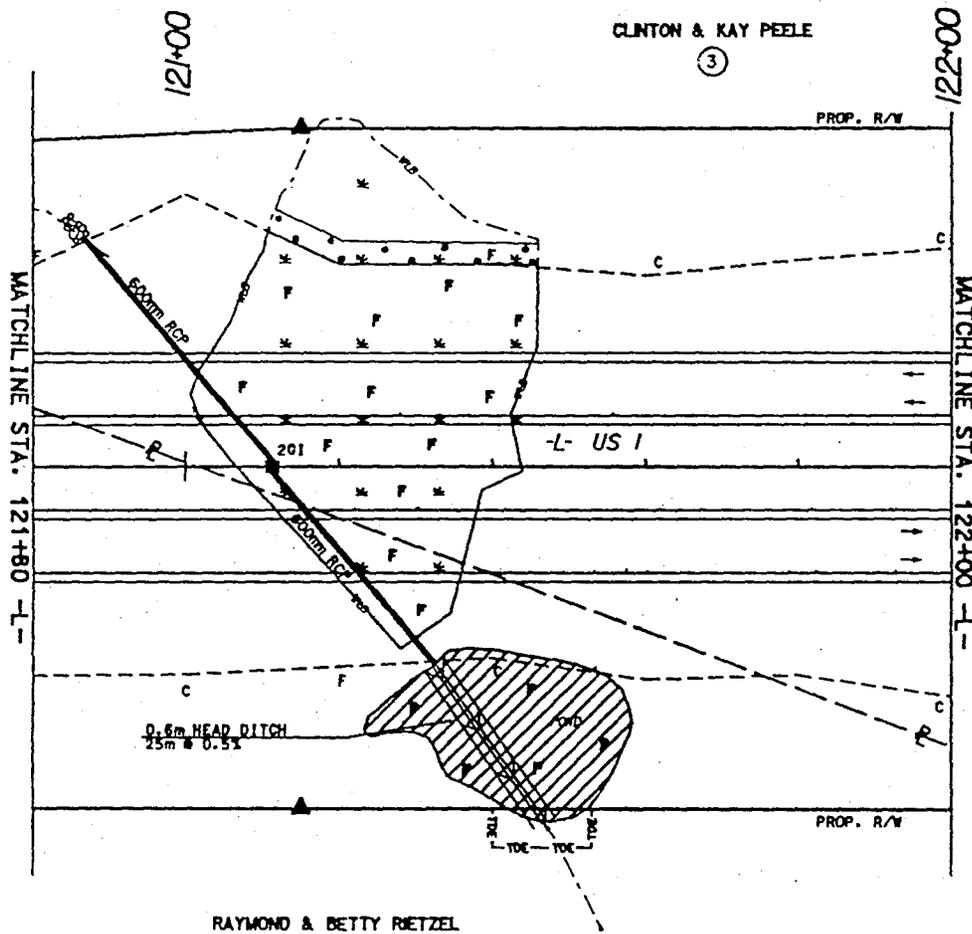


N. C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
MOORE/LEE COUNTY

PROJECT: 6.569003T (R-210B)

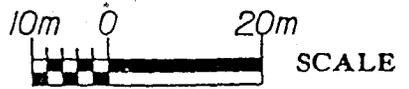
US 1 FROM NORTH OF SR 1825
TO NORTH OF SR 1182

SHEET 7 OF 37 8/2/99



RAYMOND & BETTY RIETZEL
 (6)

PLAN VIEW
 SITE IV



-  DENOTES MECHANIZED CLEARING
-  DENOTES FILL IN SURFACE WATERS (POND)
-  DENOTES FILL IN WETLANDS

N. C. DEPT. OF TRANSPORTATION
 DIVISION OF HIGHWAYS
 MOORE/LEE COUNTY

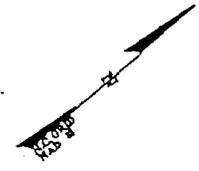
PROJECT: 6.569003T (R-210B)

US 1 FROM NORTH OF SR 1825
 TO NORTH OF SR 1182

SHEET 8 OF 37 8/2/99

ROBERT C. MARTIN

④



118+00

117+00

MATCHLINE STA. 117+00

MATCHLINE STA. 118+80

PROP. R/W

CLINTON & KAY PEELE

ALBERT & DEBRA HALL

US 1

CLINTON & KAY PEELE

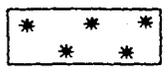
PLAN VIEW SITE III

N. C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
MOORE / LEE COUNTY

PROJECT: 6.569003T (R-210B)

US 1 FROM NORTH OF SR 1825
TO NORTH OF SR 1182

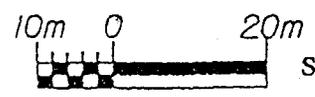
SHEET 9 OF 37 8/2/99



DENOTES MECHANIZED CLEARING



DENOTES FILL IN WETLANDS

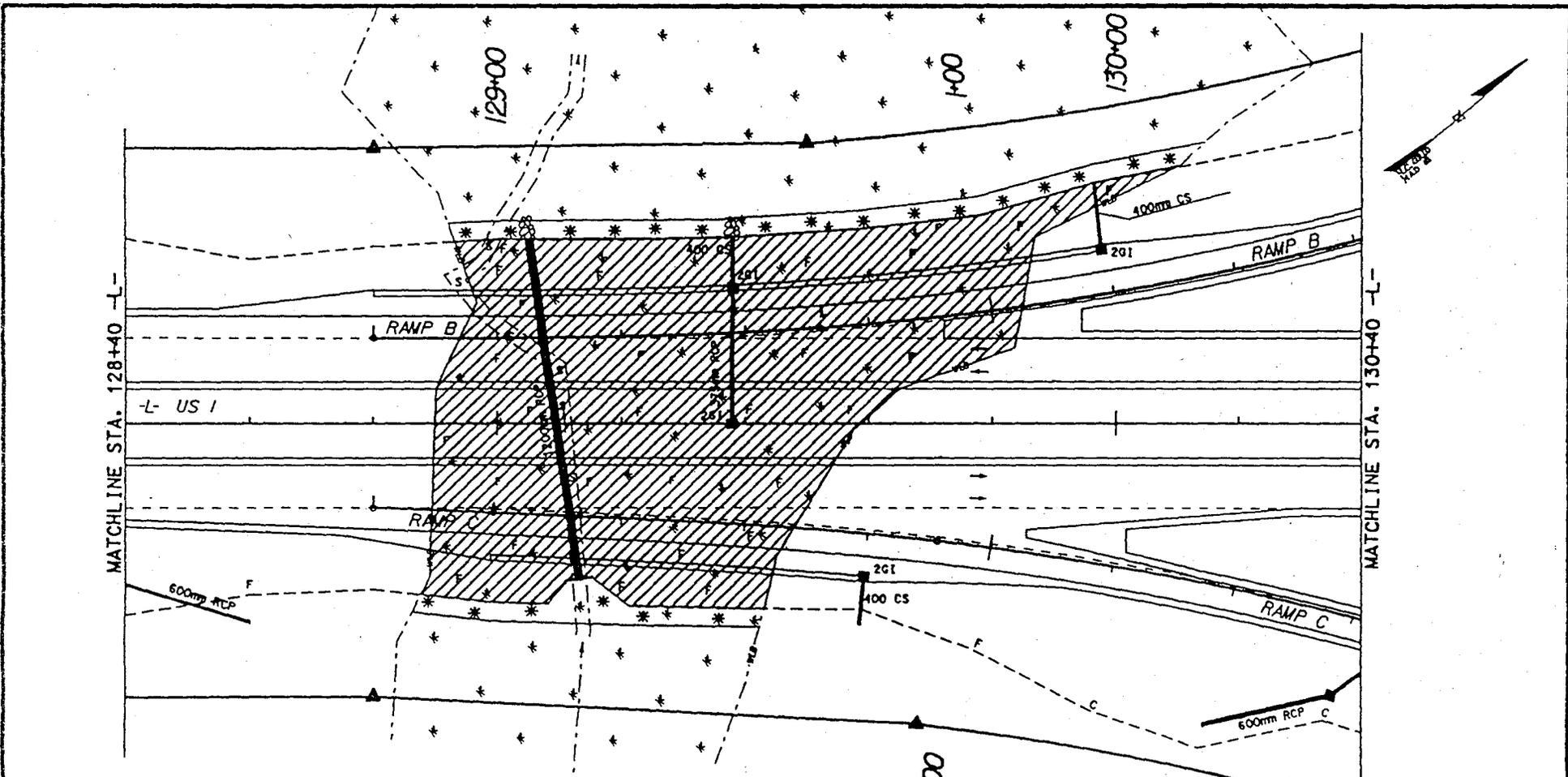


SCALE

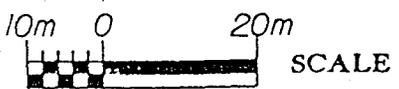
③

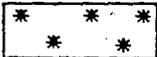
⑤

③



PLAN VIEW
SITE VI



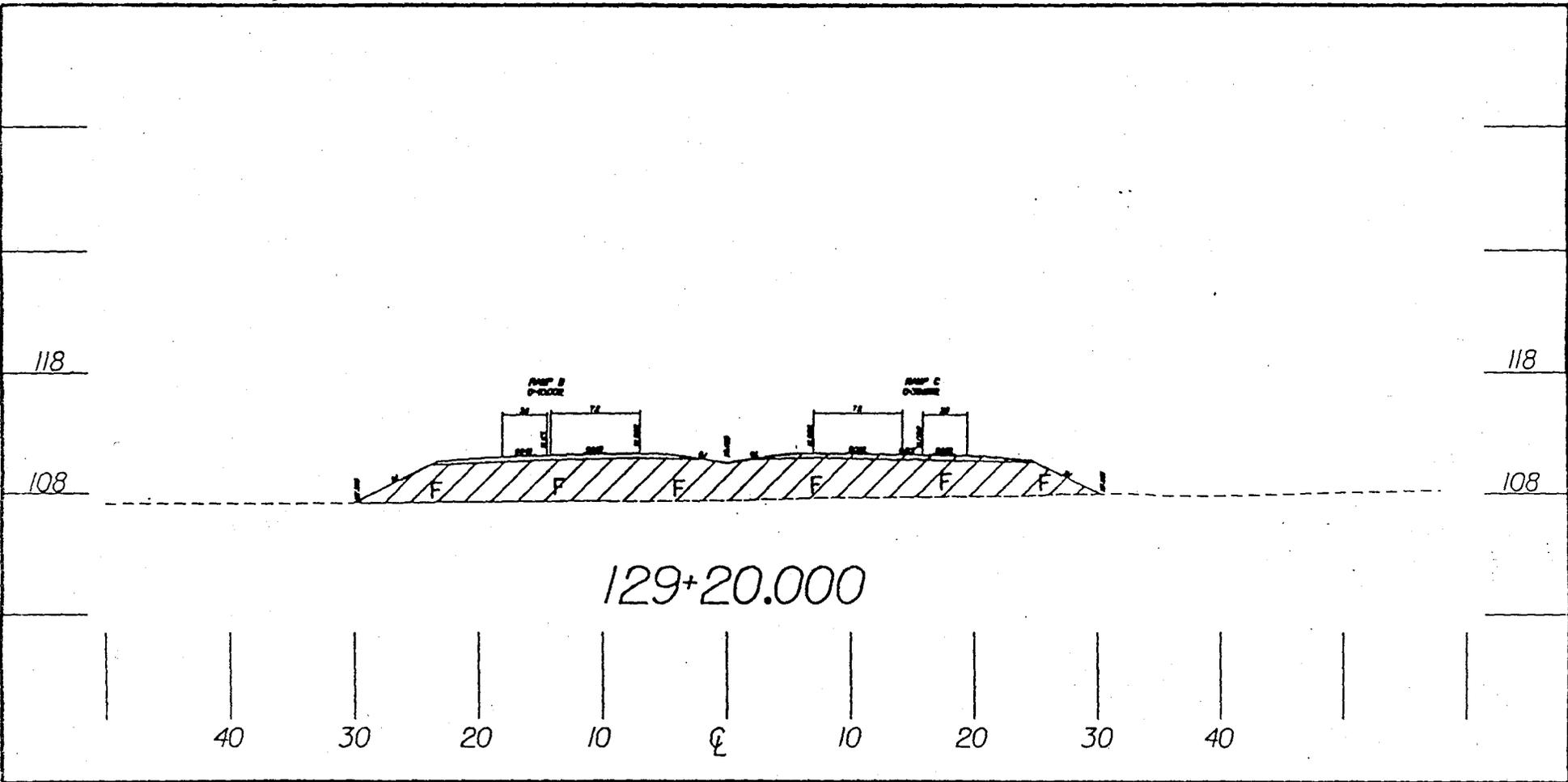
-  DENOTES MECHANIZED CLEARING
-  DENOTES FILL IN SURFACE WATERS
-  DENOTES FILL IN WETLANDS

N. C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
MOORE/LEE COUNTY

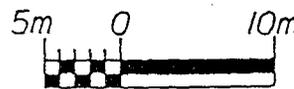
PROJECT: 6.569003T (R-210B)

US 1 FROM NORTH OF SR 1825
TO NORTH OF SR 1182

SHEET 11 OF 37 8/2/99



SECTION



HORIZONTAL SCALE



VERTICAL SCALE

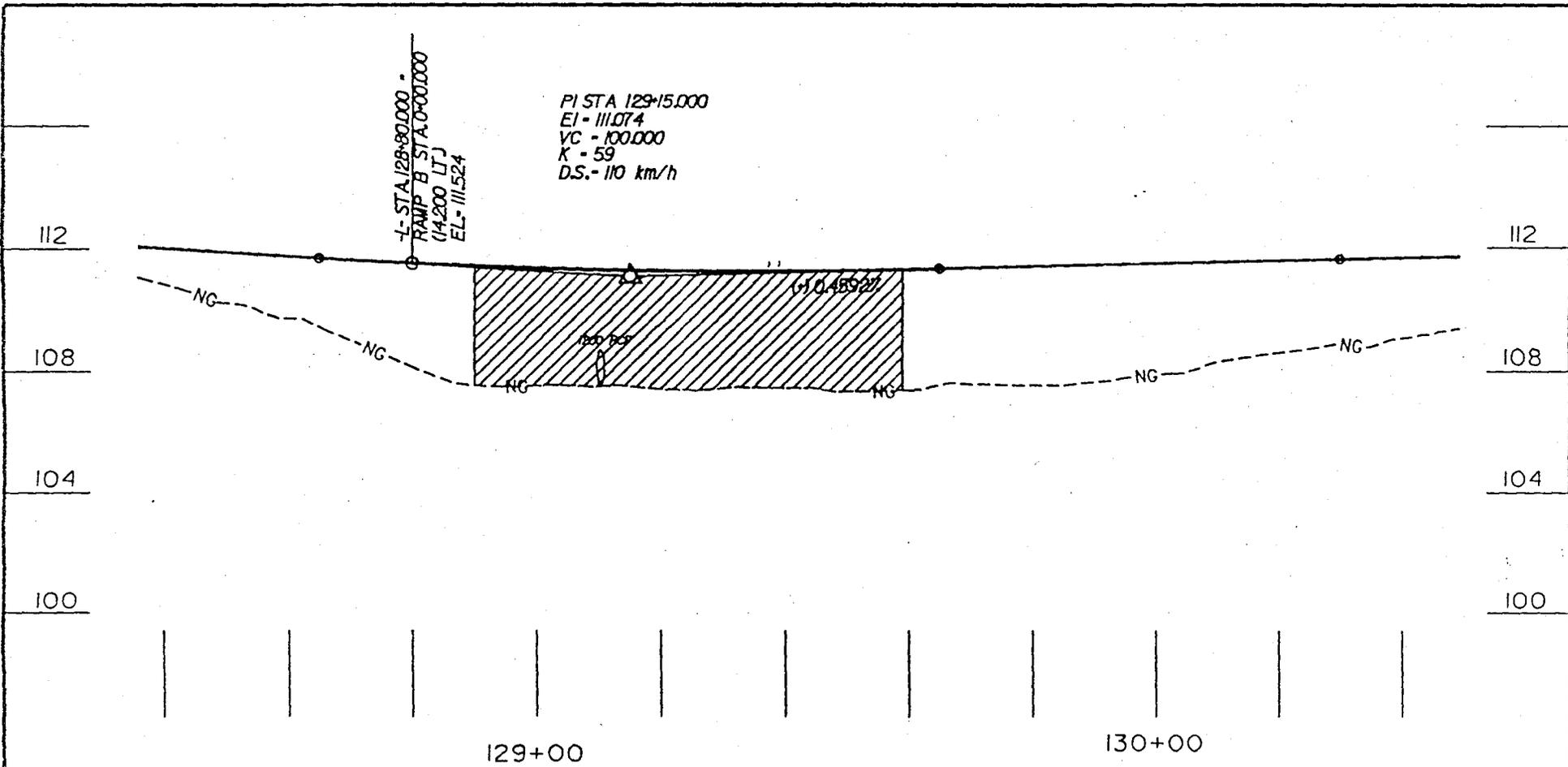


DENOTES FILL
IN WETLANDS

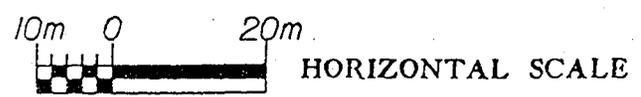
N. C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
MOORE/LEE COUNTY

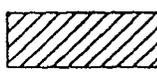
PROJECT: 6.569003T (R-210B)
US 1 FROM NORTH OF SR 1825
TO NORTH OF SR 1182

SHEET 12 OF 37 8/2/99

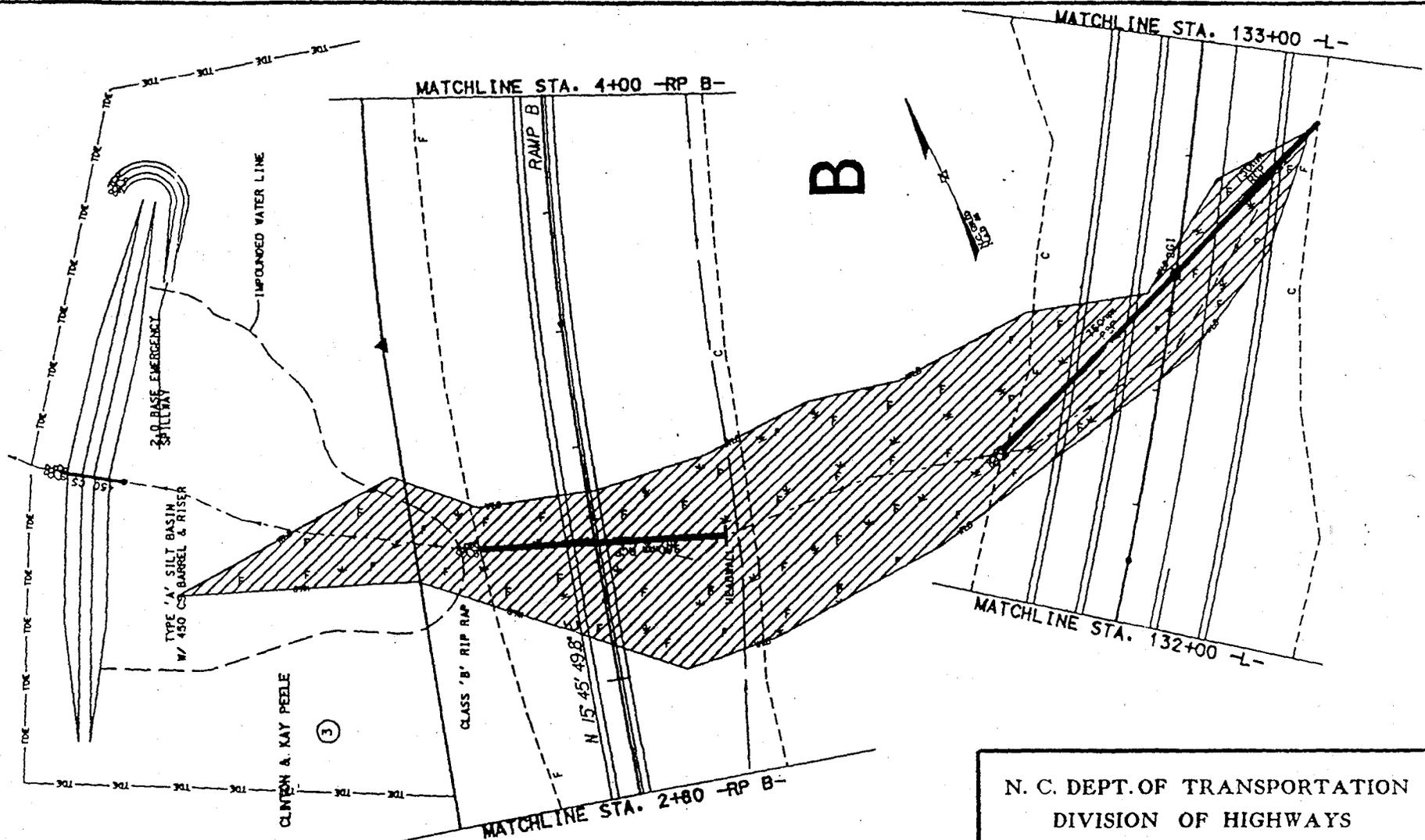


PROFILE



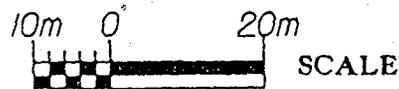
 DENOTES FILL IN WETLANDS

N. C. DEPT. OF TRANSPORTATION
 DIVISION OF HIGHWAYS
 MOORE/LEE COUNTY
 PROJECT: 6.569003T (R-210B)
 US 1 FROM NORTH OF SR 1825
 TO NORTH OF SR 1182
 SHEET 13 OF 37 8/2/99



B

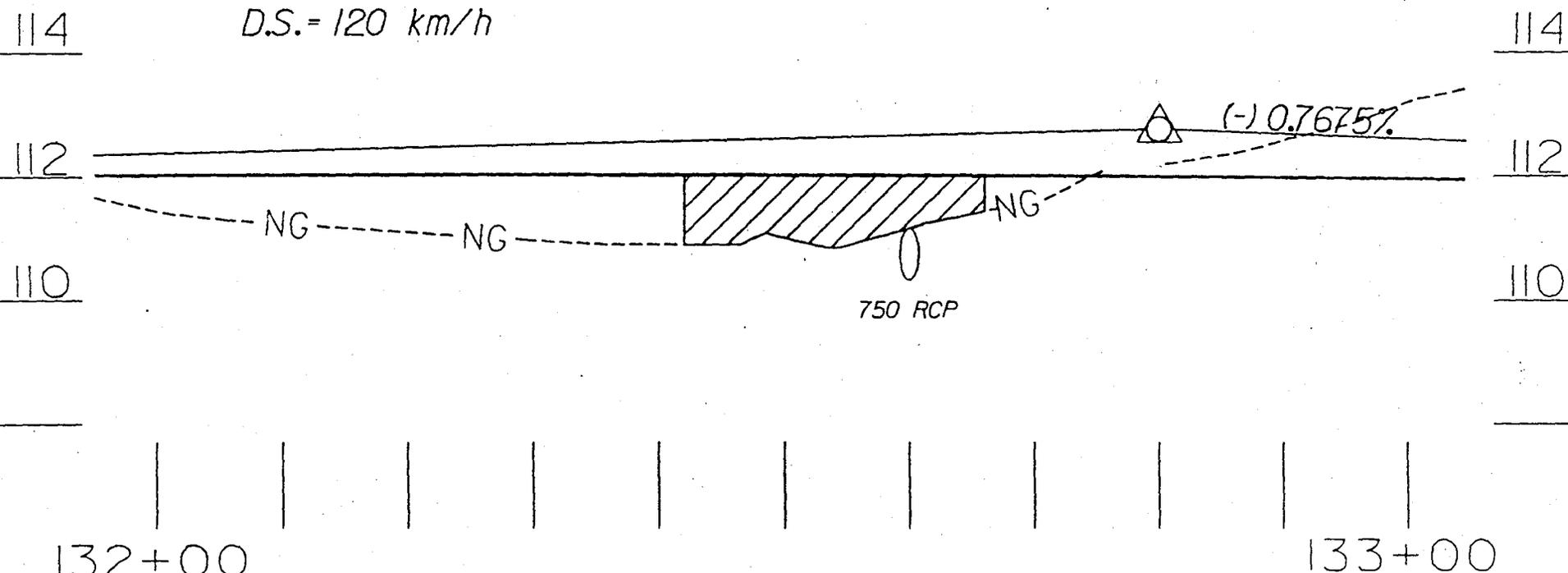
PLAN VIEW
SITE VII



DENOTES FILL IN WETLANDS

N. C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
MOORE/LEE COUNTY
PROJECT: 6.569003T (R-210B)
US 1 FROM NORTH OF SR 1825
TO NORTH OF SR 1182
SHEET 14 OF 37 8/2/99

PI STA 132+80.000
EI = 112.750
VC = 500.000
K = 408
D.S. = 120 km/h



PROFILE



HORIZONTAL SCALE

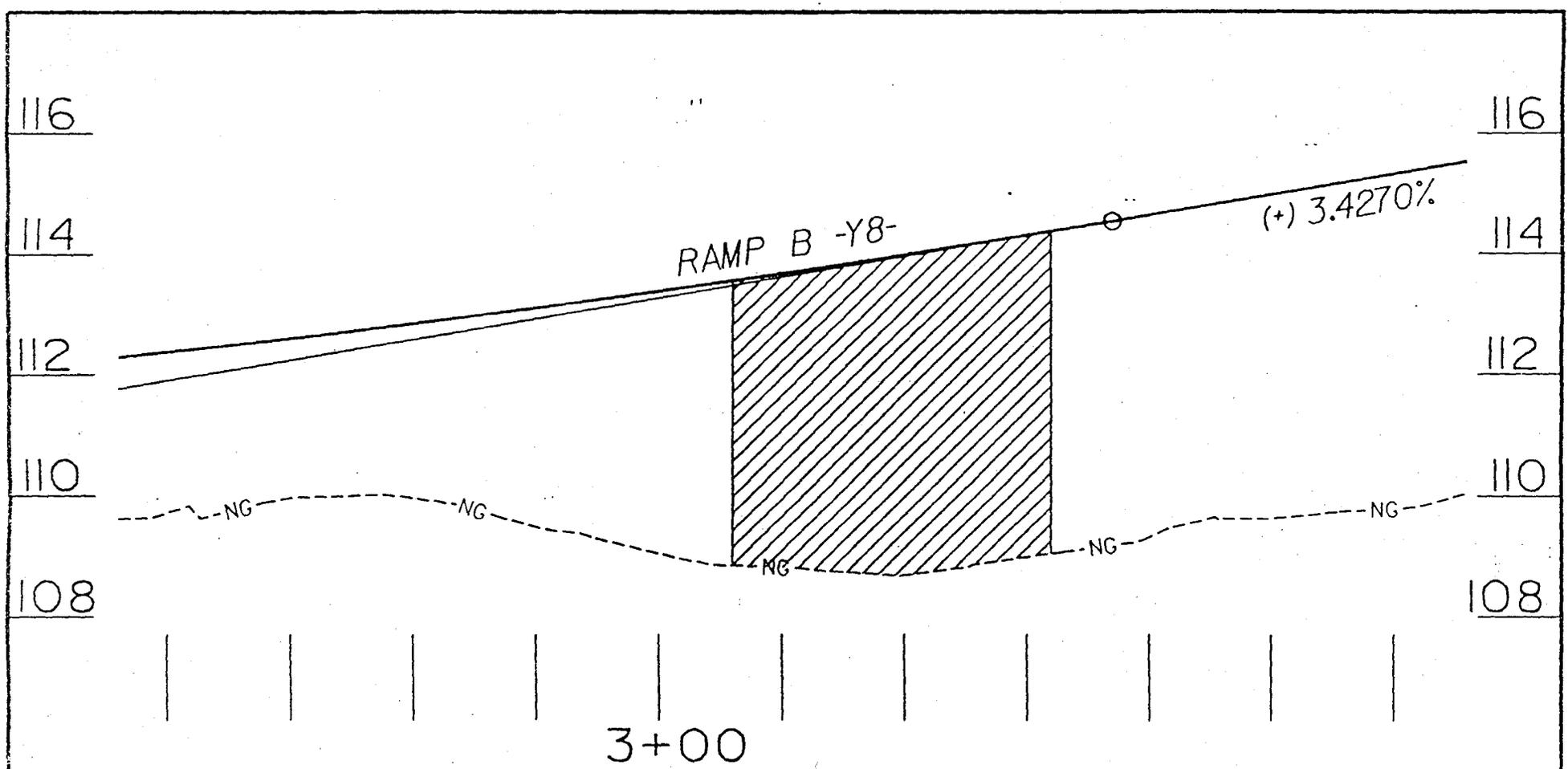


VERTICAL SCALE

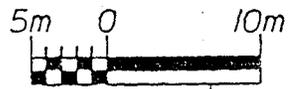


DENOTES FILL
IN WETLANDS

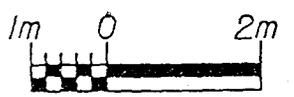
N. C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
MOORE/LEE COUNTY
PROJECT: 6.569003T (R-210B)
US 1 FROM NORTH OF SR 1825
TO NORTH OF SR 1182
SHEET 15 OF 37 8/2/99



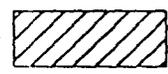
PROFILE



HORIZONTAL SCALE

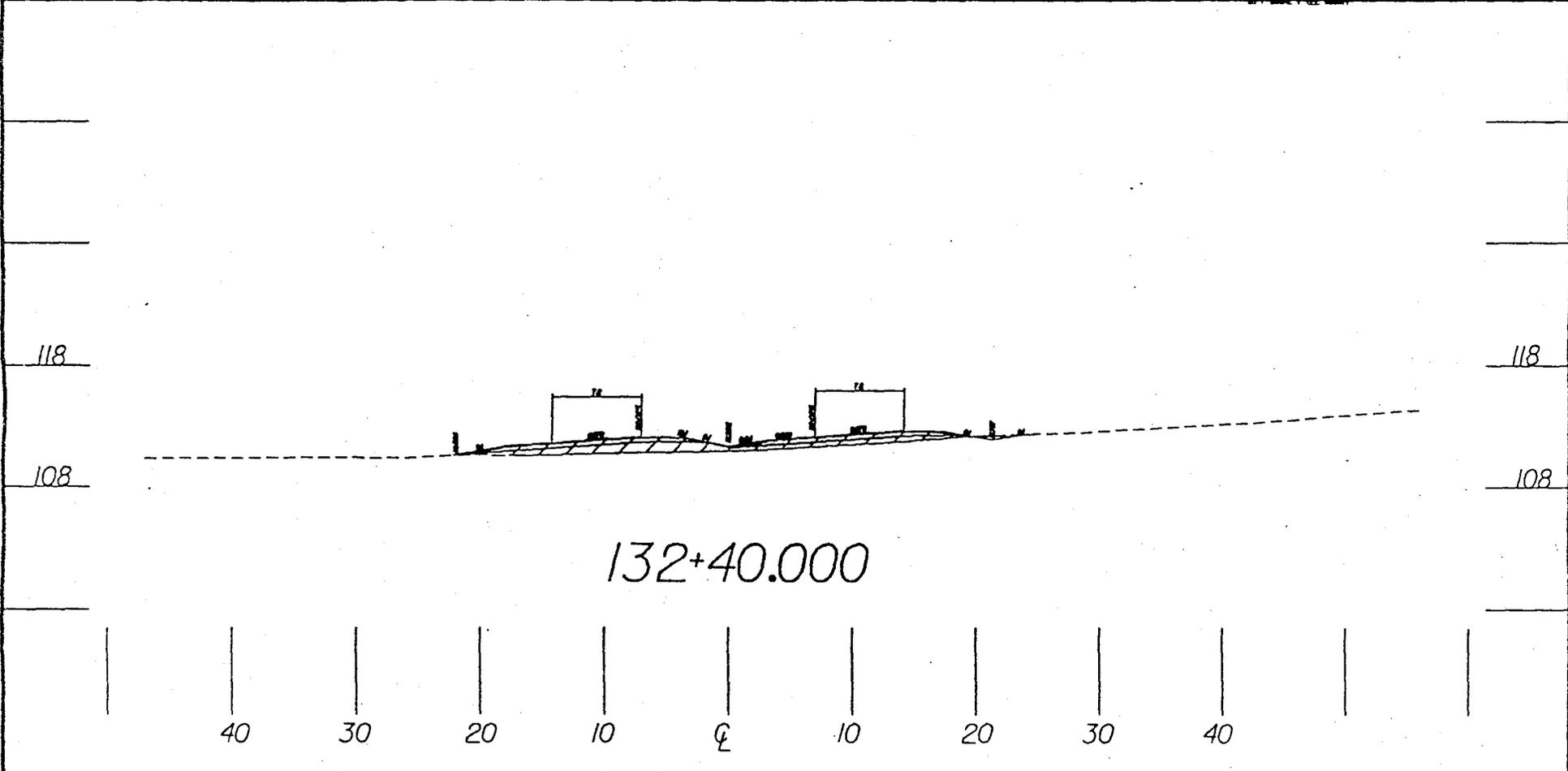


VERTICAL SCALE



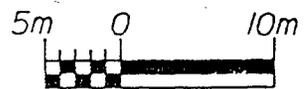
DENOTES FILL
IN WETLANDS

N. C. DEPT. OF TRANSPORTATION
 DIVISION OF HIGHWAYS
 MOORE/LEE COUNTY
 PROJECT: 6.569003T (R-210B)
 US 1 FROM NORTH OF SR 1825
 TO NORTH OF SR 1182
 SHEET 16 OF 37 8/2/99

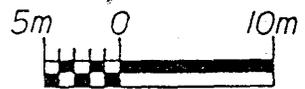


132+40.000

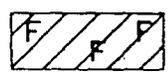
SECTION



HORIZONTAL SCALE



VERTICAL SCALE

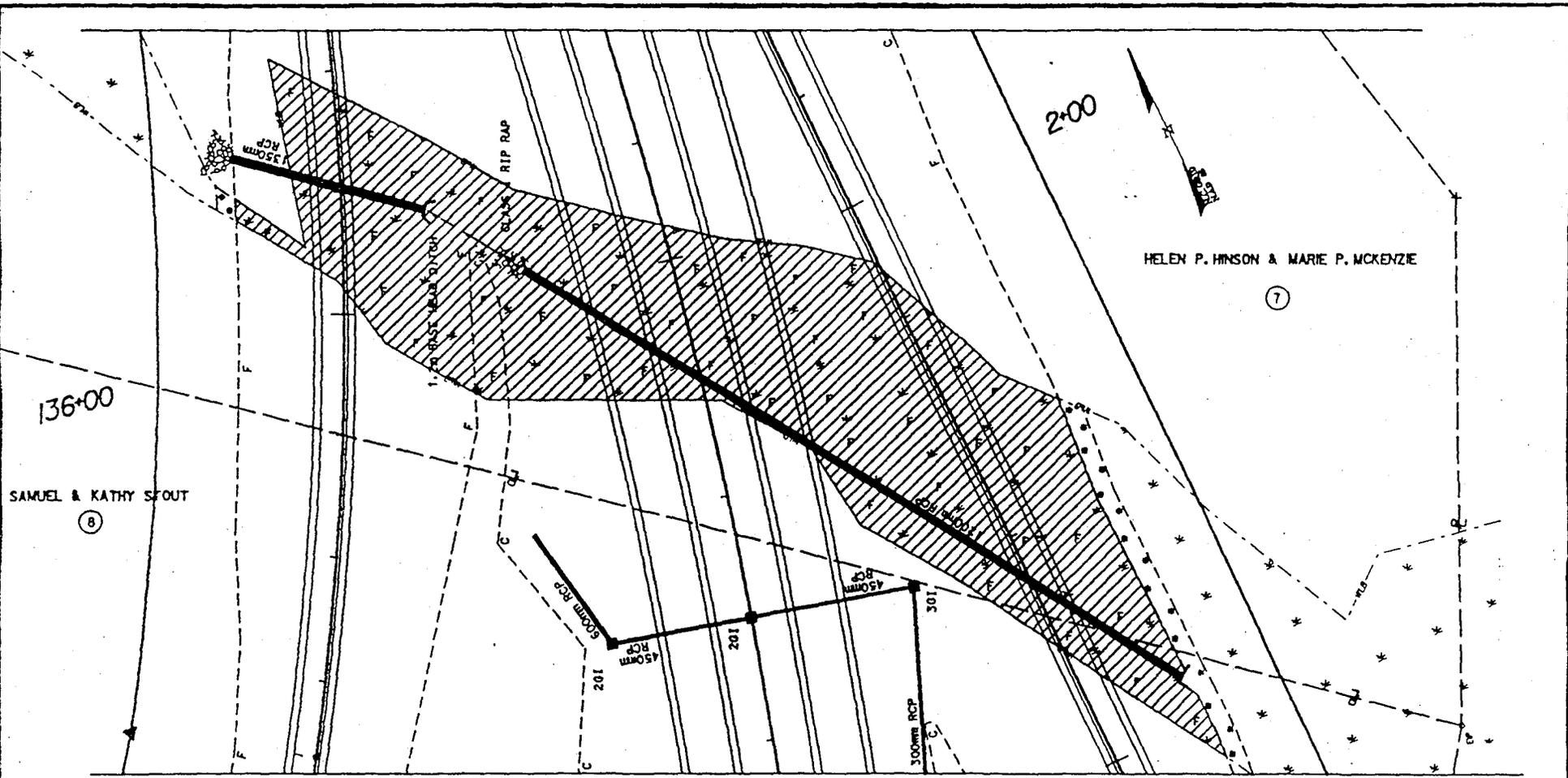


DENOTES FILL
IN WETLANDS

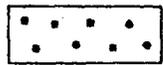
N. C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
MOORE / LEE COUNTY

PROJECT: 6.569003T (R-210B)
US 1 FROM NORTH OF SR 1825
TO NORTH OF SR 1182

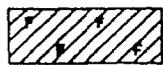
SHEET 17 OF 37 8/2/99



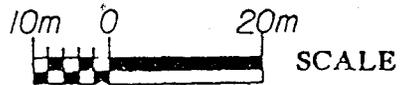
PLAN VIEW
SITE VIII



DENOTES MECHANIZED CLEARING



DENOTES FILL IN WETLANDS

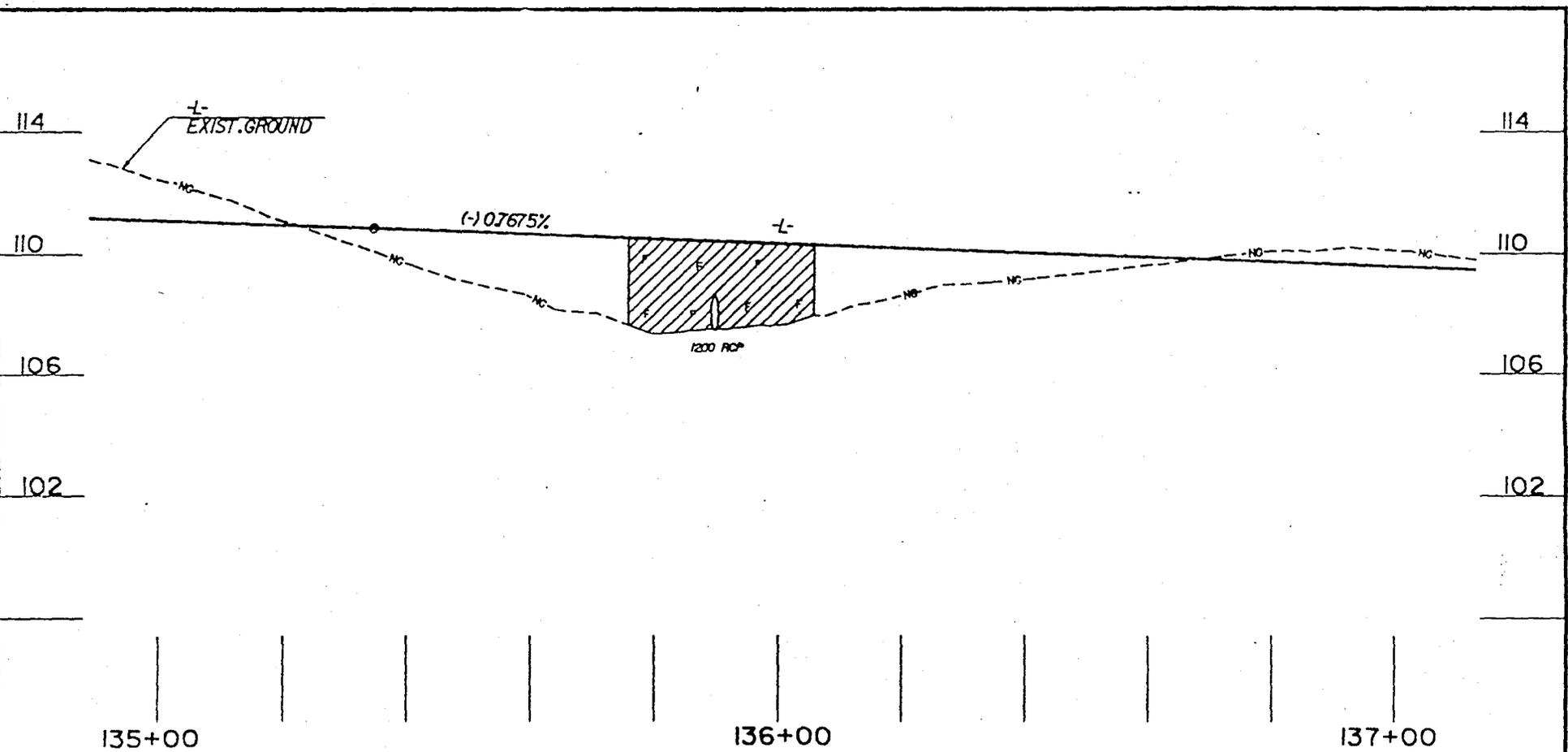


N. C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
MOORE/LEE COUNTY

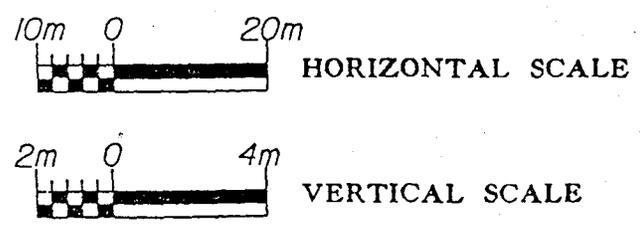
PROJECT: 6.569003T (R-210B)

US 1 FROM NORTH OF SR 1825
TO NORTH OF SR 1182

SHEET 10 OF 37 8/2/99

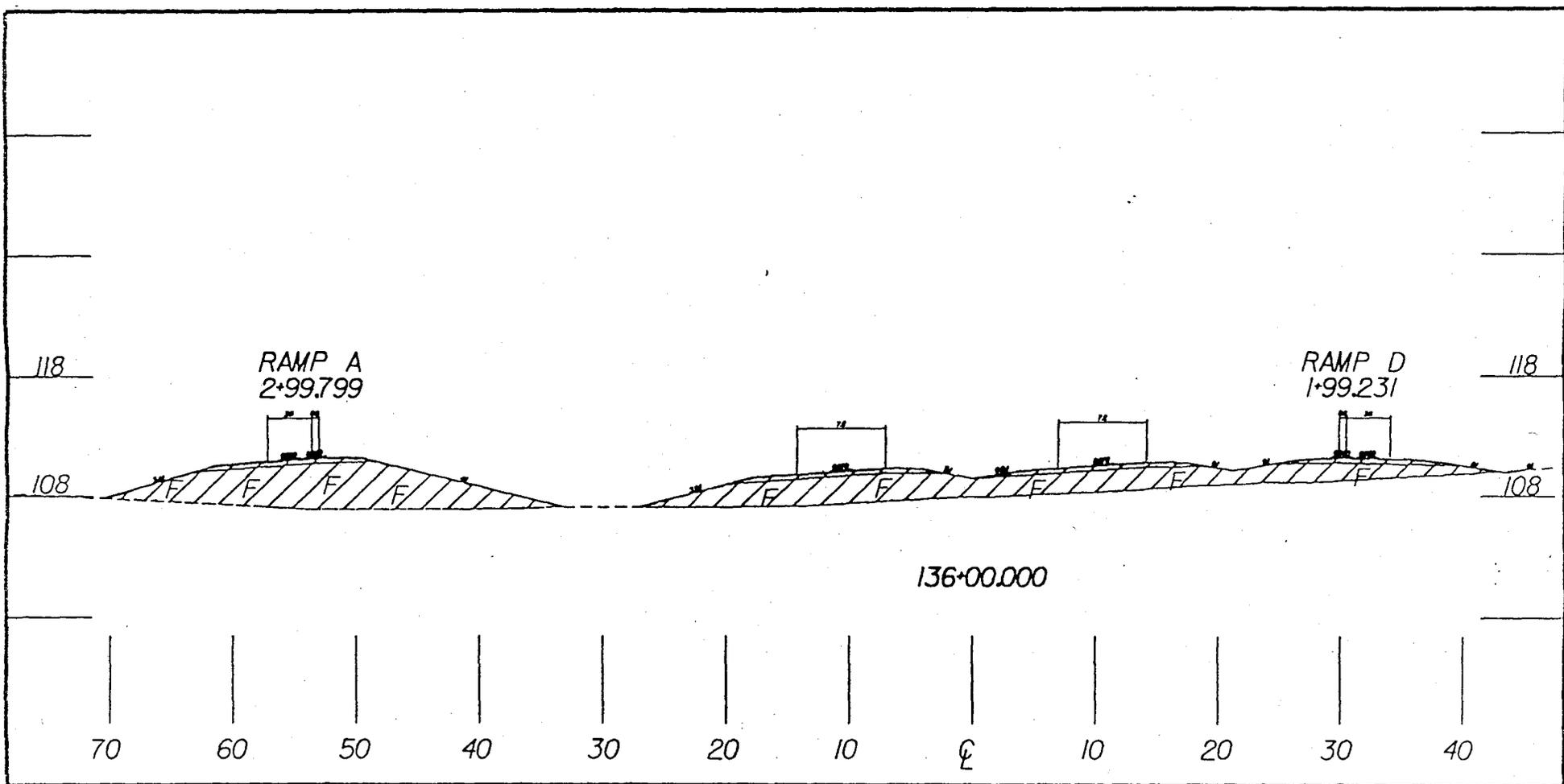


PROFILE

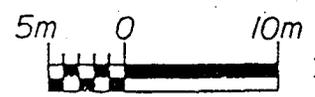


 DENOTES FILL IN WETLANDS

N. C. DEPT. OF TRANSPORTATION
 DIVISION OF HIGHWAYS
 MOORE / LEE COUNTY.
 PROJECT: 6.569003T (R-210B)
 US 1 FROM NORTH OF SR 1825
 TO NORTH OF SR 1182
 SHEET 19 OF 37 8/2/99



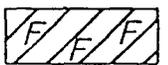
SECTION



HORIZONTAL SCALE

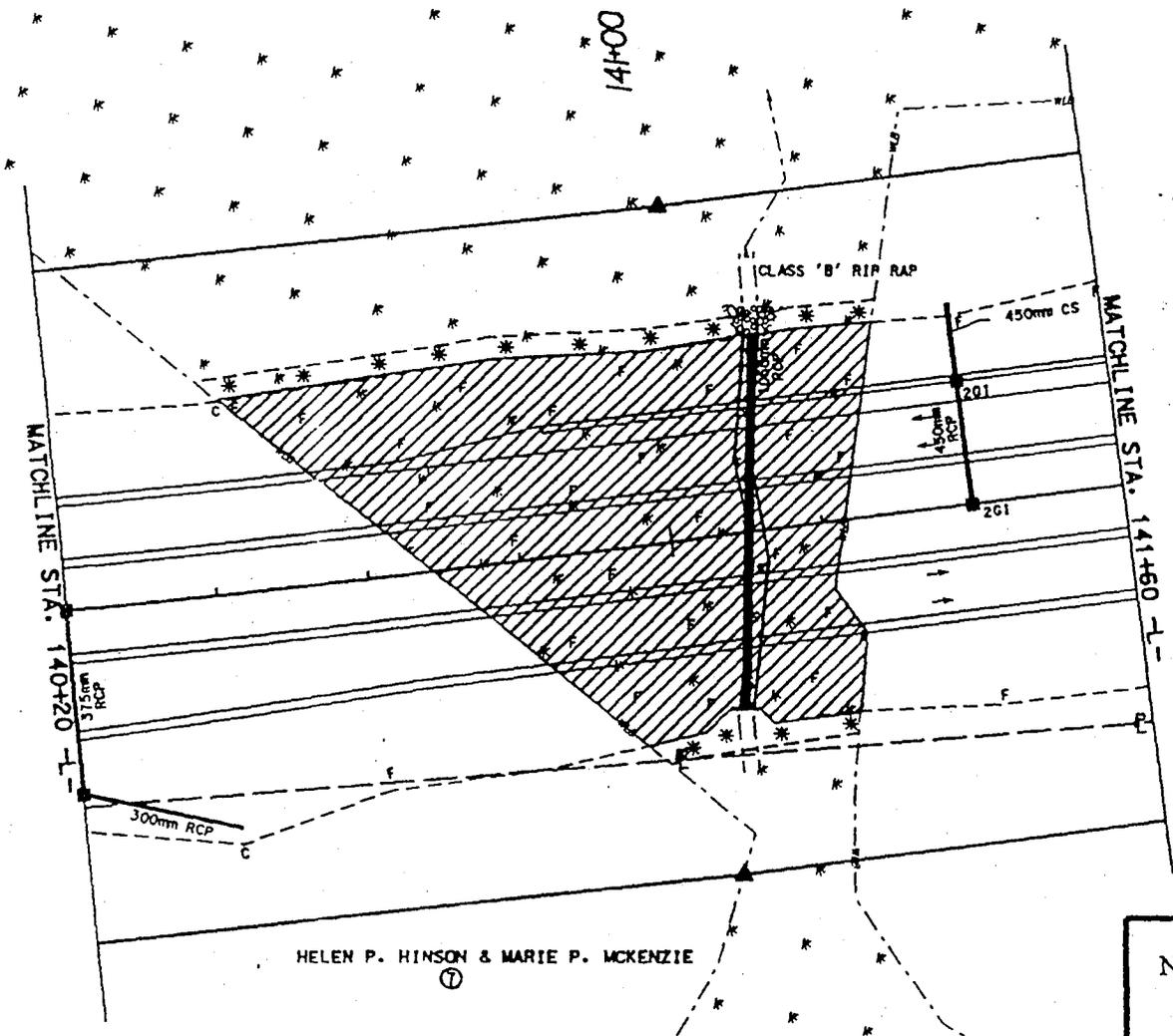


VERTICAL SCALE



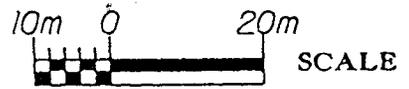
DENOTES FILL
IN WETLANDS

N. C. DEPT. OF TRANSPORTATION
 DIVISION OF HIGHWAYS
 MOORE/LEE COUNTY
 PROJECT: 6.569003T (R-210B)
 US 1 FROM NORTH OF SR 1825
 TO NORTH OF SR 1182
 SHEET 20 OF 37 8/2/99

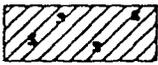


HELEN P. HINSON & MARIE P. MCKENZIE
 ①

PLAN VIEW SITE IX



DENOTES MECHANIZED CLEARING

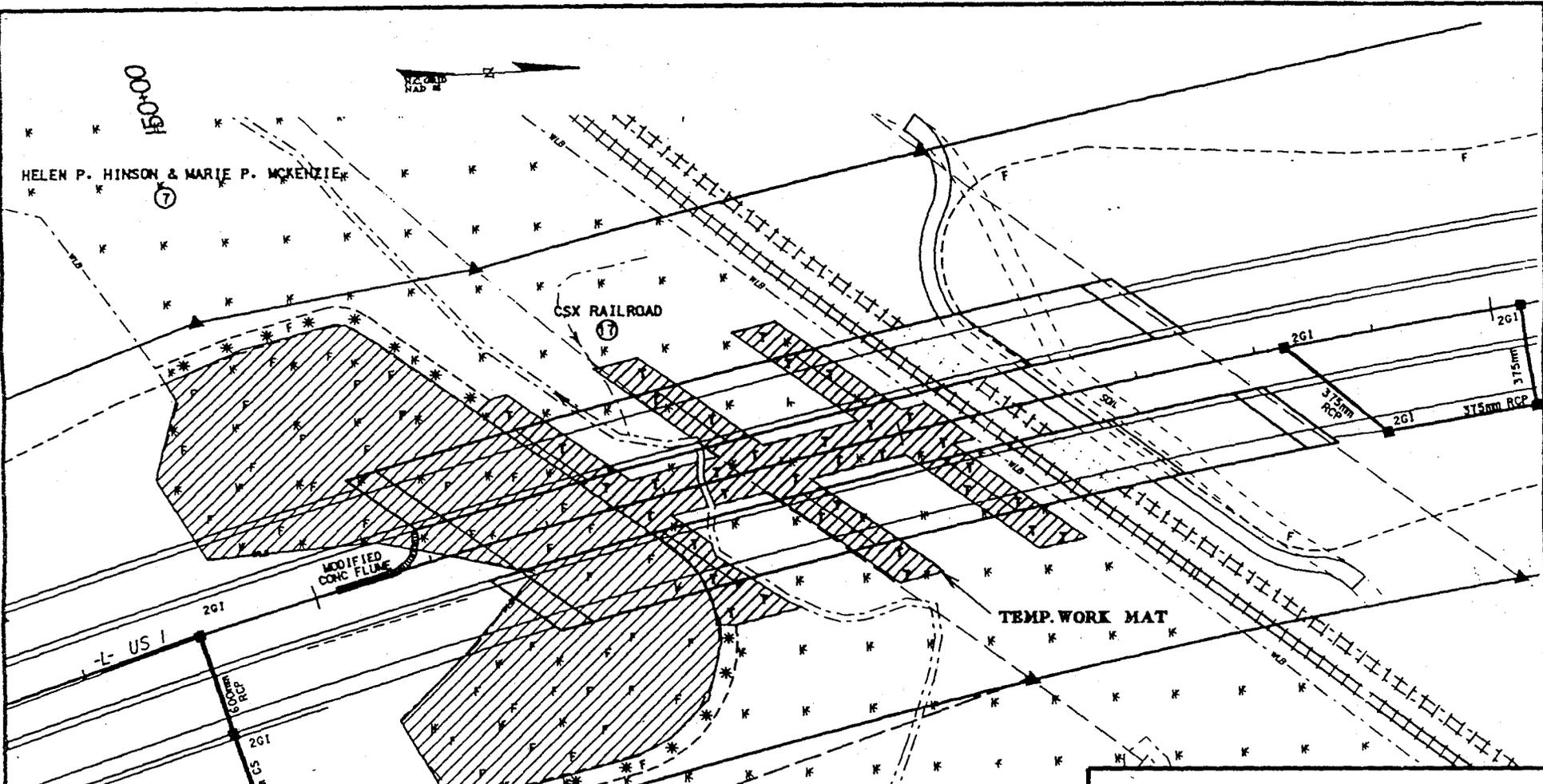


DENOTES FILL IN SURFACE WATERS

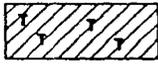
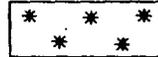


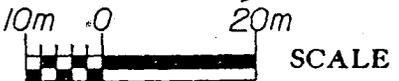
DENOTES FILL IN WETLANDS

N. C. DEPT. OF TRANSPORTATION
 DIVISION OF HIGHWAYS
 MOORE/LEE COUNTY
 PROJECT: 6.569003T (R-210B)
 US 1 FROM NORTH OF SR 1825
 TO NORTH OF SR 1182
 SHEET 21 OF 37 8/2/99



**PLAN VIEW
SITE X**

-  DENOTES TEMP. FILL IN WETLANDS (WORK MAT)
-  DENOTES MECHANIZED CLEARING
-  DENOTES FILL IN WETLANDS



N. C. DEPT. OF TRANSPORTATION
 DIVISION OF HIGHWAYS
 MOORE/LEE COUNTY

PROJECT: 6.569003T (R210B)

US 1 FROM NORTH OF SR 1825'
 TO NORTH OF SR 1182

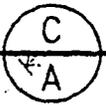
SHEET 23 OF 37 8/2/99

SITE II

LAT. 'V' DITCH
SEE DITCH DETAIL 'A'
SEE PROFILE

+85.000 -L-
45.000 (LT)

PROP. R/W



EST. 10.0 m TONS
CLASS 'B' RIP RAP
W/ 24 m² FILTER FABRIC

0.6 x 0.3
DITCH

45.0

SUMP -L- US 1

N 40° 31' 52.7" E

1.2
P.S.

1.2
P.S.

7.2

NC

14.0
MEDIAN

7.0

NC

1.2
P.S.

1.2
P.S.

7.0

NC

900mm RCP



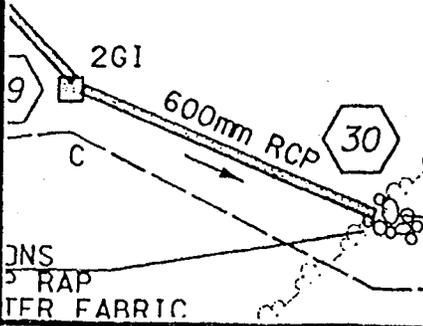
NORTH CAROLINA DEPARTMENT OF
TRANSPORTATION

DIVISION OF HIGHWAYS
PROJECT DEVELOPMENT &
ENVIRONMENTAL ANALYSIS BRANCH

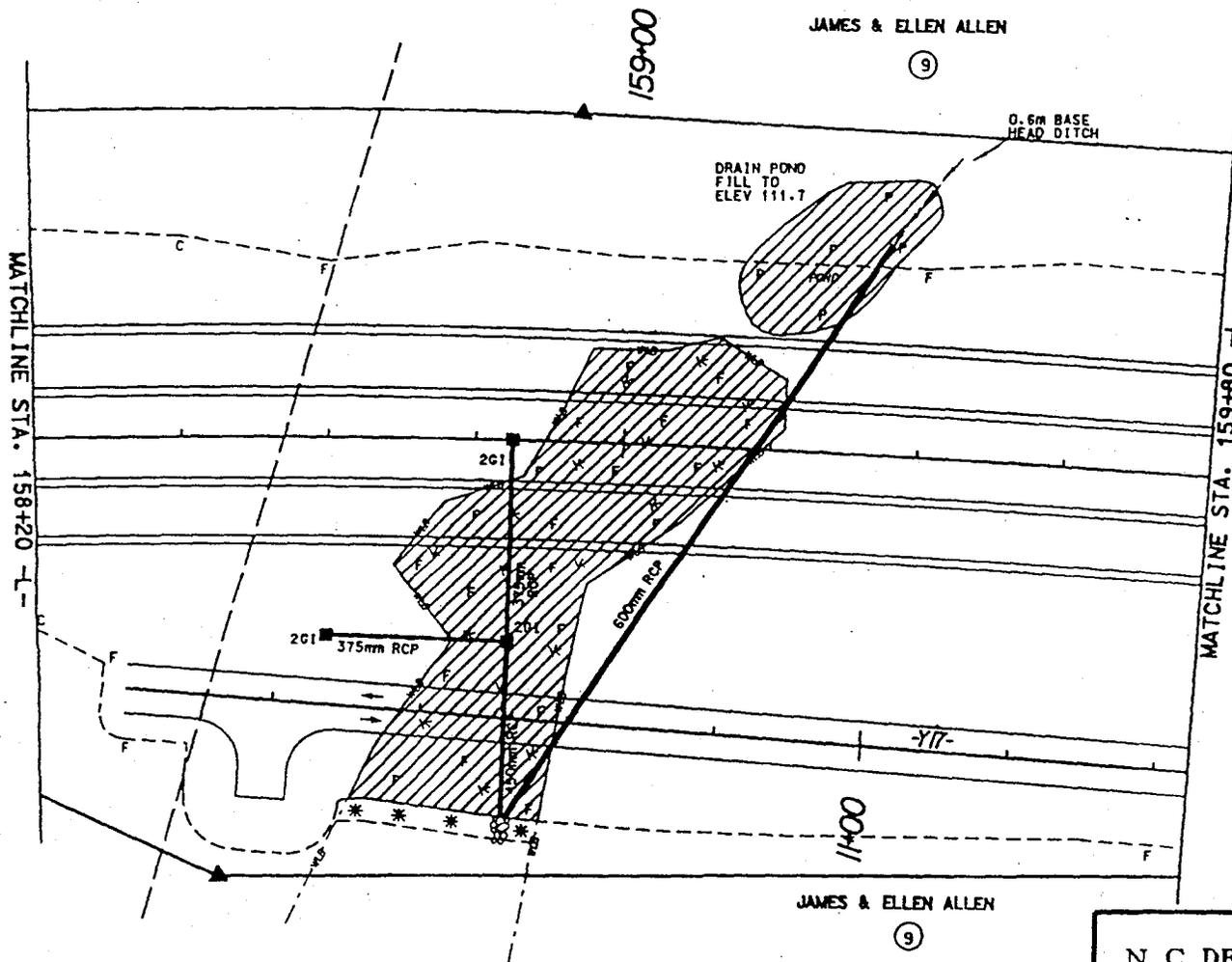
MOORE / LEE COUNTY
PROJECT 8.T560302
US 1 FROM NORTH OF SR 1825 TO
NORTH OF SR 1182, R-210 B

SHEET 24 OF 37

MATCHLINE TO SHEET 9



ONS
RAP
FILTER FABRIC



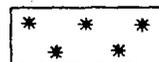
PLAN VIEW
SITE XII

N. C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
MOORE/LEE COUNTY

PROJECT: 6.569003T (R-210B)

US 1 FROM NORTH OF SR 1825
TO NORTH OF SR 1182

SHEET 25 OF 37 8/2/99



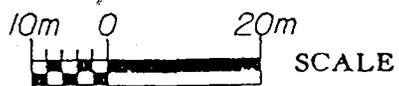
DENOTES MECHANIZED CLEARING

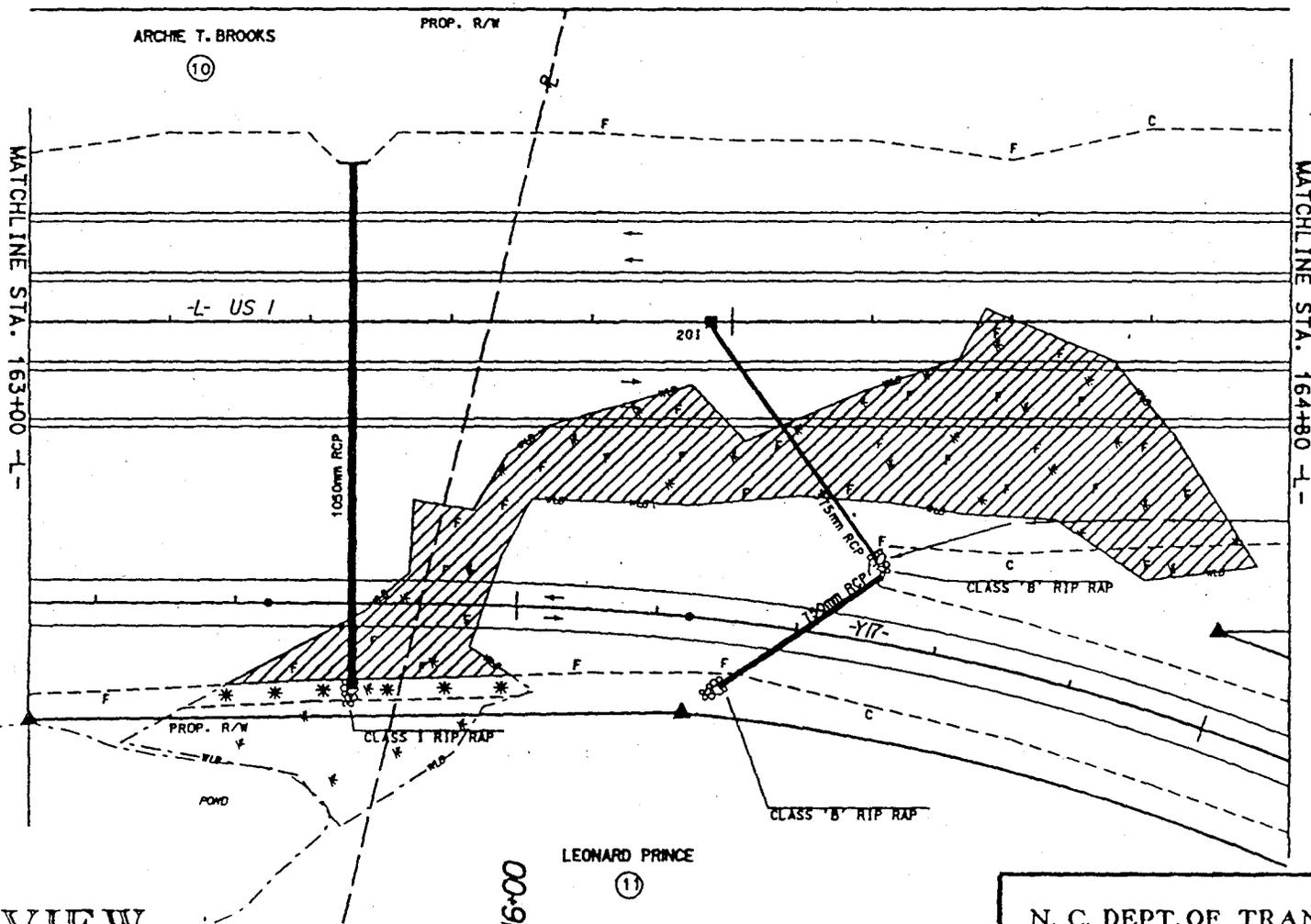


DENOTES FILL IN SURFACE WATERS (POND)

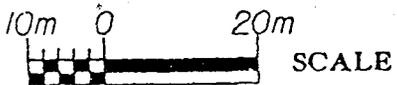


DENOTES FILL IN WETLANDS





PLAN VIEW
SITE XIII



DENOTES MECHANIZED CLEARING



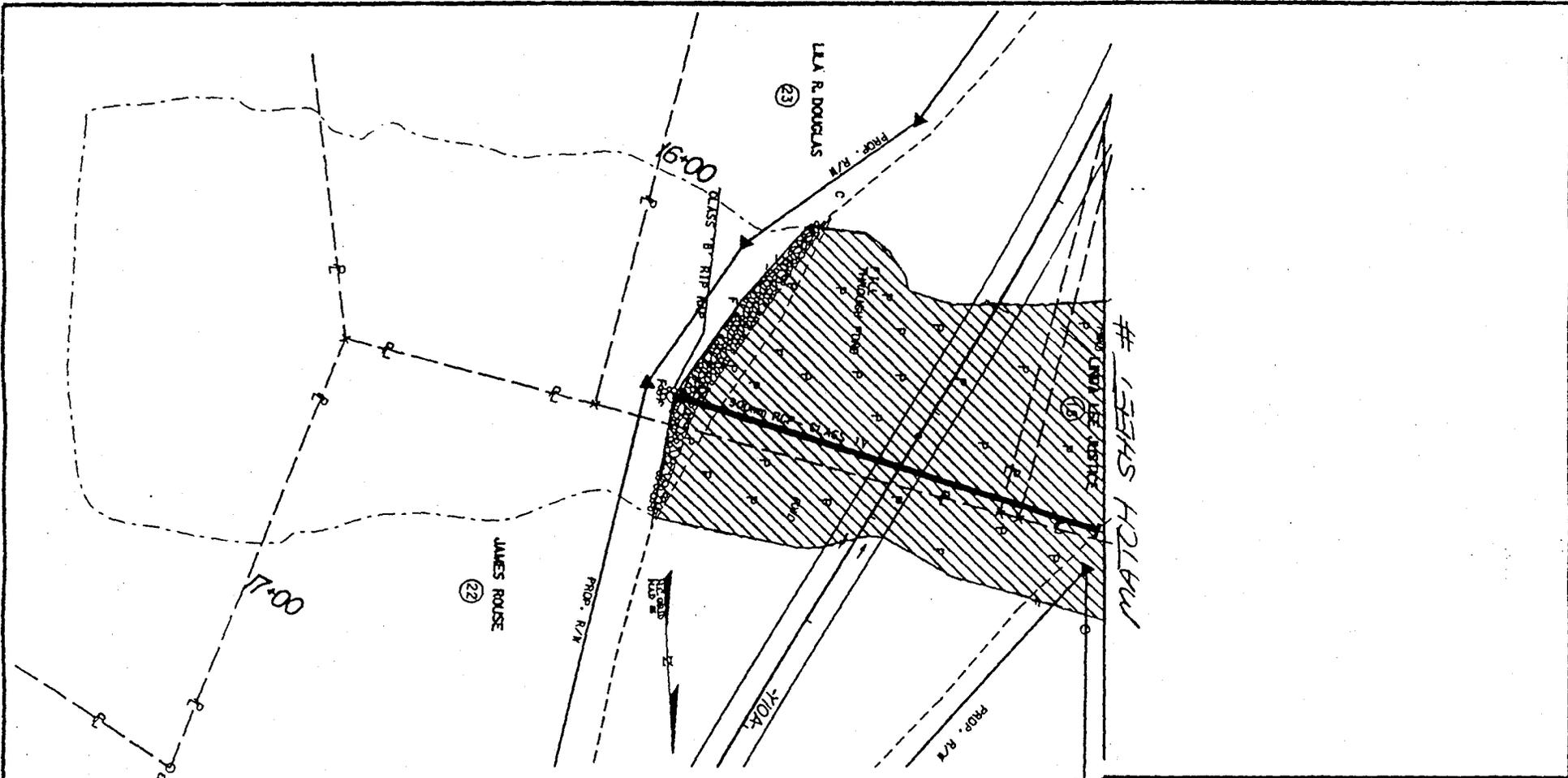
DENOTES FILL IN WETLANDS

N. C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
MOORE/LEE COUNTY

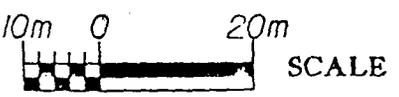
PROJECT: 6.569003T (R-210B)

US 1 FORM NORTH OF SR 1825
TO NORTH OF SR 1182

SHEET 26 OF 37 8/2/99



PLAN VIEW
SITE XIV CONT.



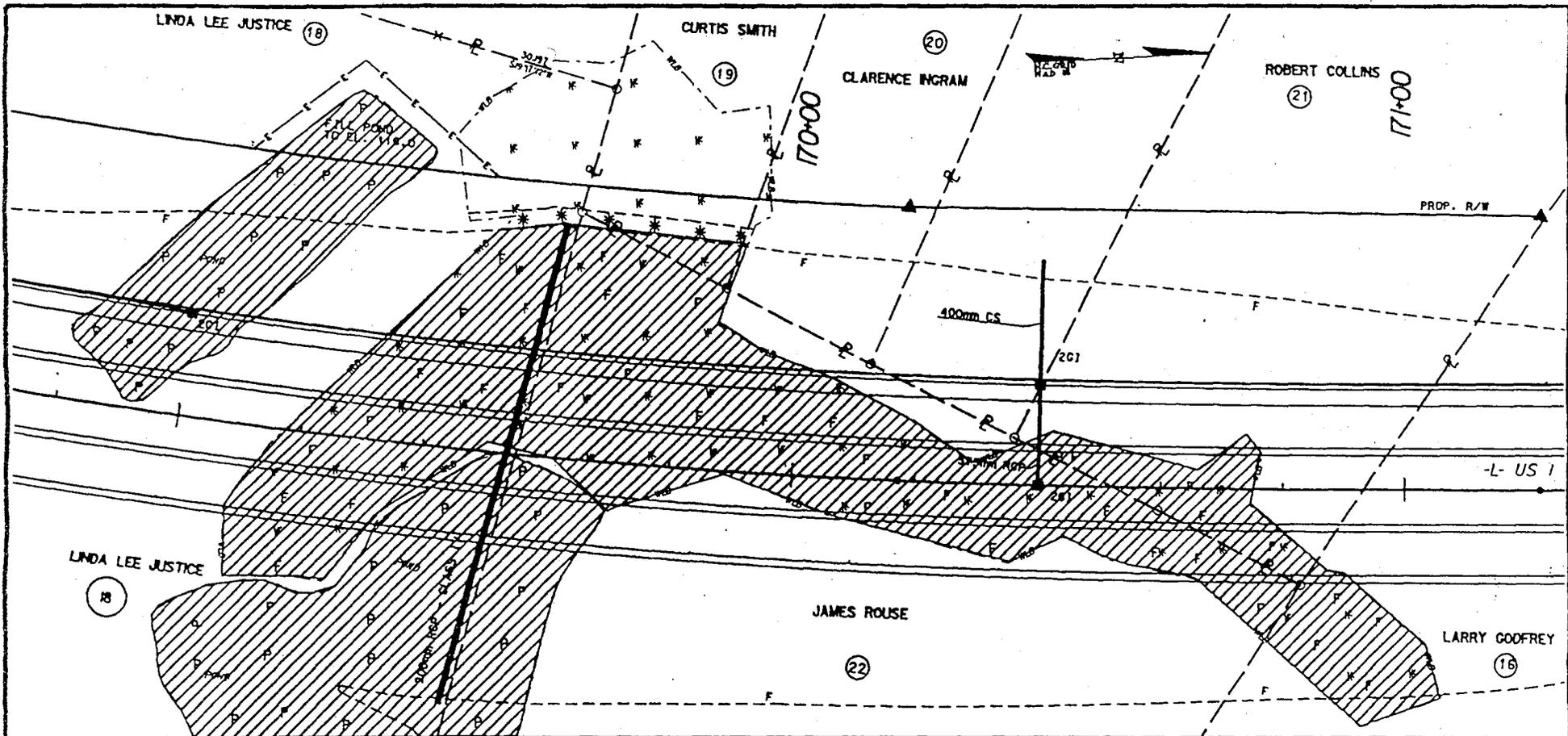
- DENOTES FILL IN SURFACE WATERS (POND)
- DENOTES FILL IN WETLANDS

N. C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
EDGECOMBE COUNTY

PROJECT: 8.2990401 (U2218)

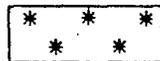
NC 43 BYPASS FROM
NC 43 TO US 64 ALT.

SHEET 27 OF 37 8/2/99



MATCH SHEET #

PLAN VIEW SITE XIV



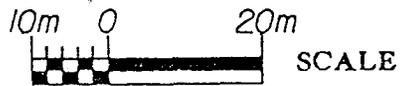
DENOTES MECHANIZED CLEARING



DENOTES FILL IN SURFACE WATERS
(POND)



DENOTES FILL IN WETLANDS



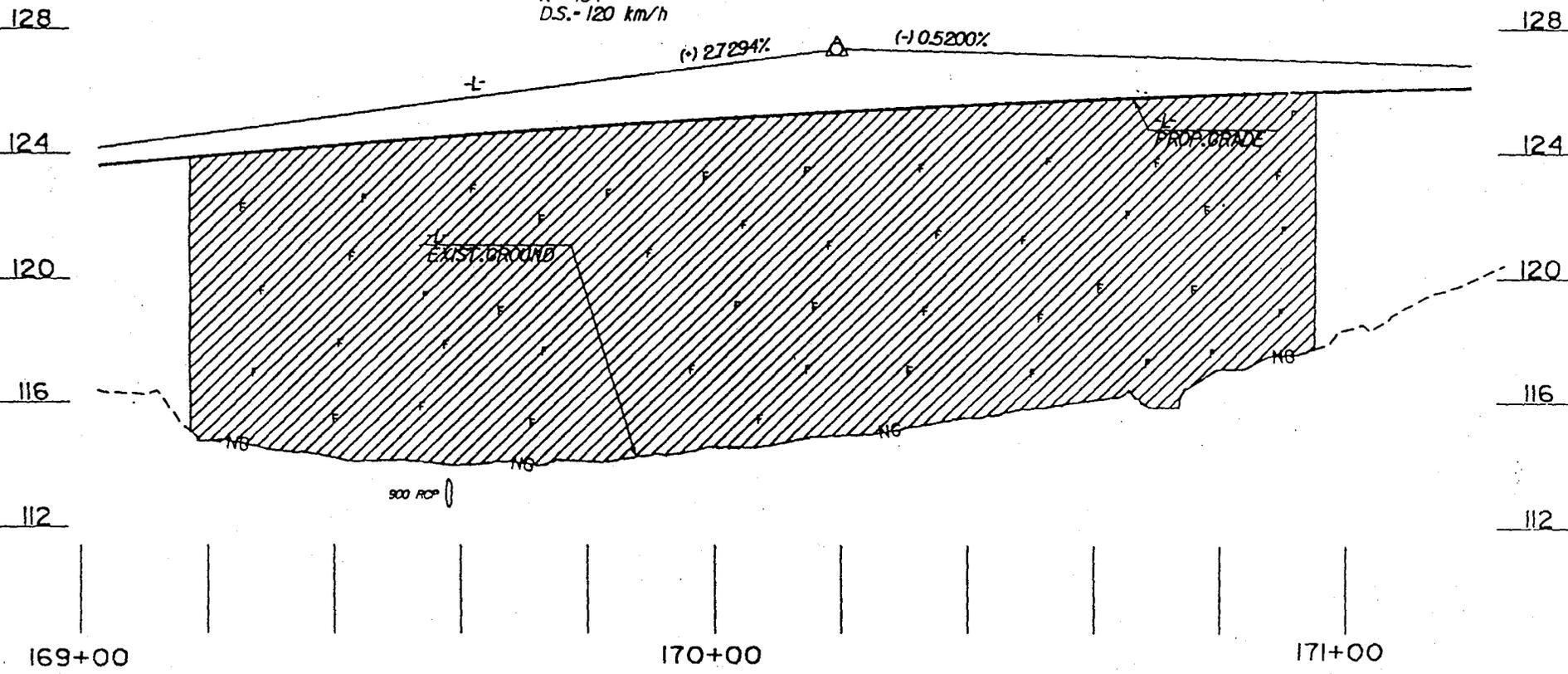
N. C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
MOORE/LEE COUNTY

PROJECT: 6.569003T (R210B)

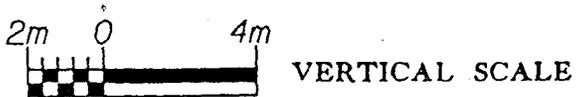
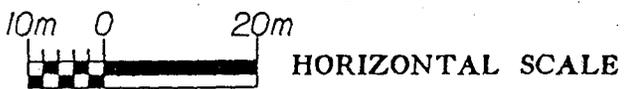
US 1 FROM NORTH OF SR 1825
TO NORTH OF SR 1182

SHEET 28 OF 37 8/2/99

PI STA 170+15.000
 EI - 127.362
 VC - 500.000
 K - 154
 D.S. - 120 km/h

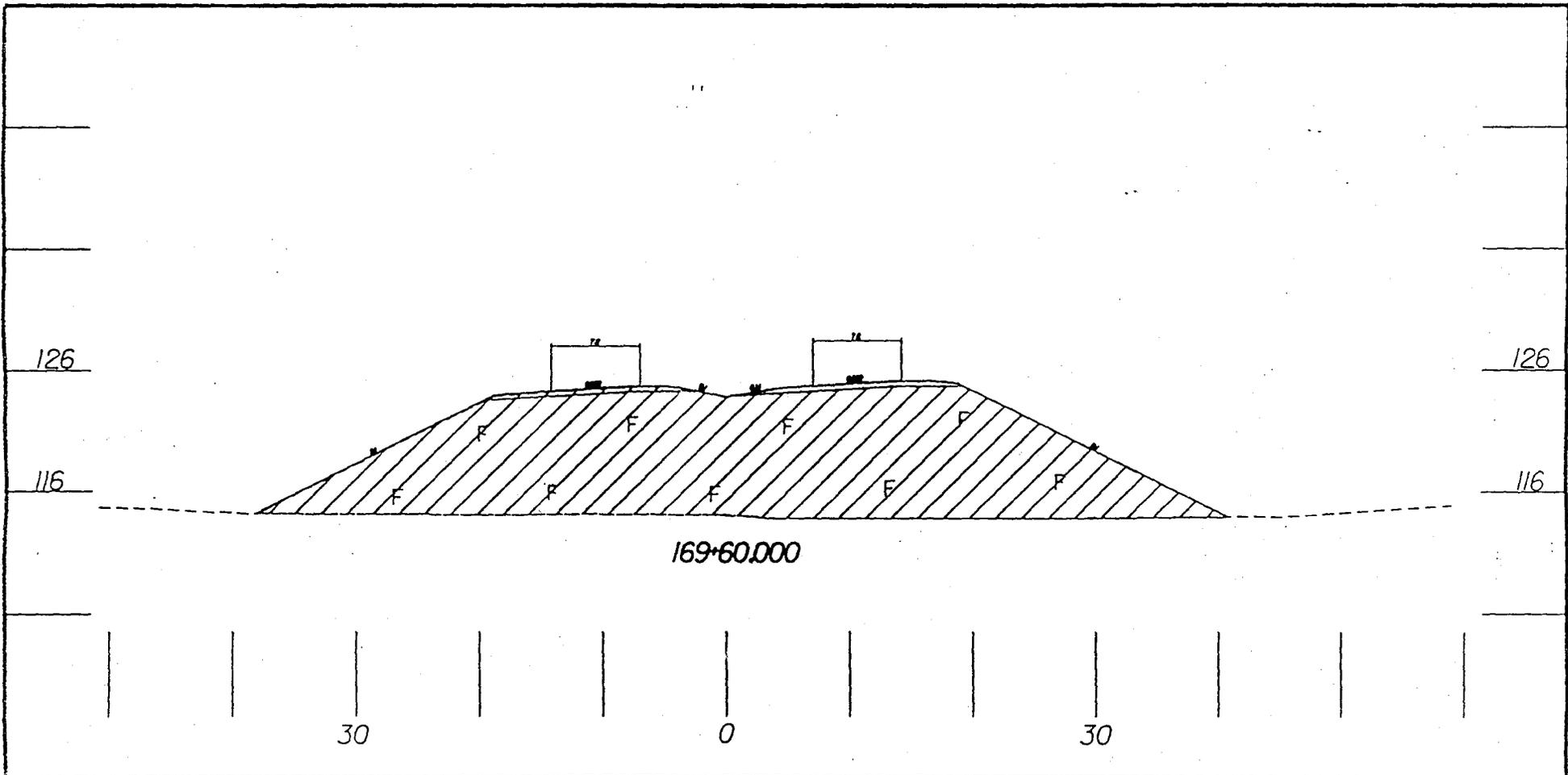


PROFILE

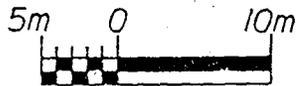


 DENOTES FILL IN WETLANDS

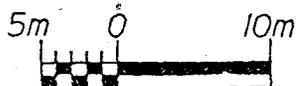
N. C. DEPT. OF TRANSPORTATION
 DIVISION OF HIGHWAYS
 MOORE/LEE COUNTY
 PROJECT: 6.569003T (R-210B)
 US 1 FROM NORTH OF SR 1825
 TO NORTH OF SR 1182
 SHEET 29 OF 37 8/2/99



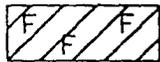
SECTION



HORIZONTAL SCALE



VERTICAL SCALE

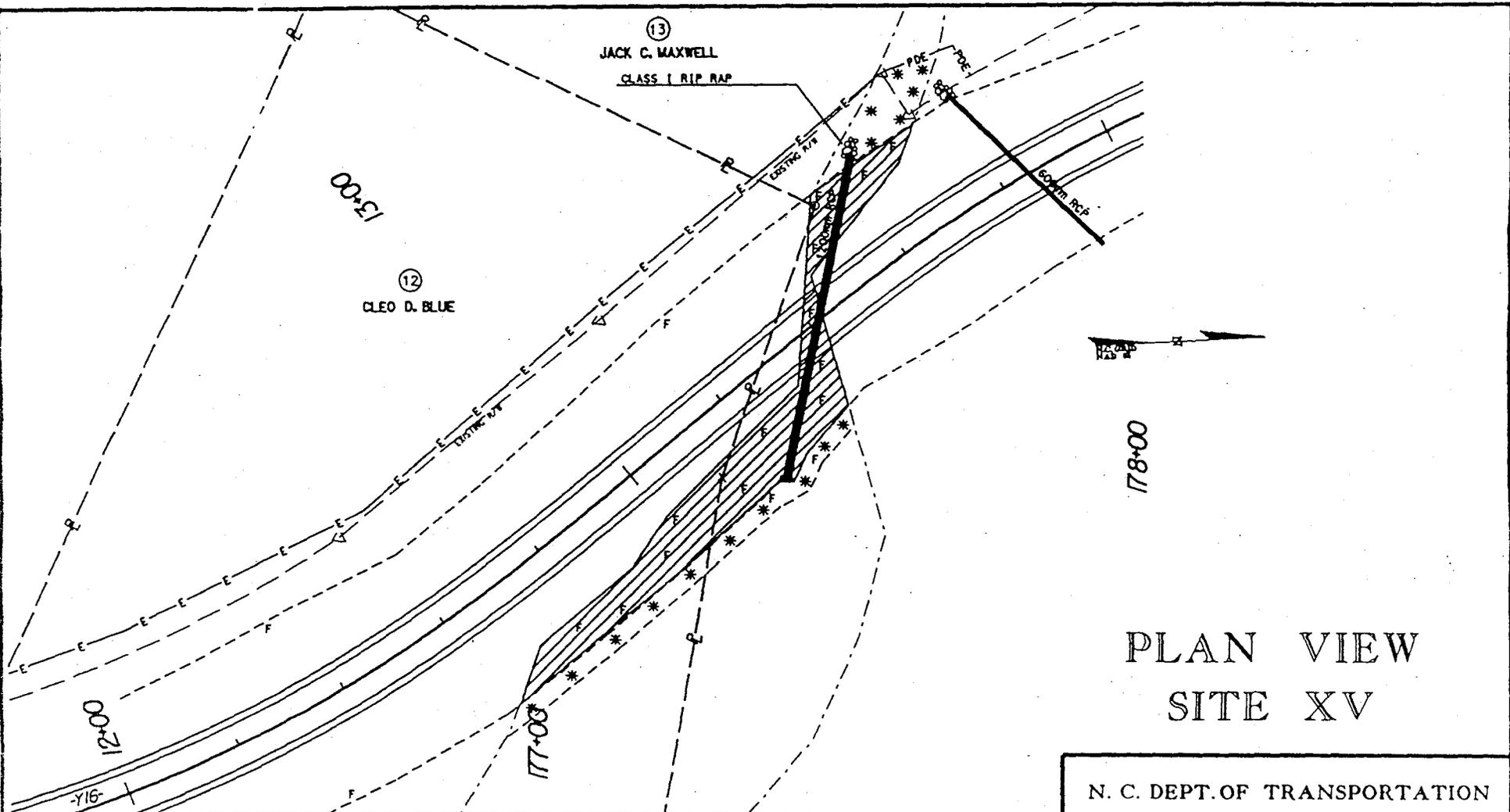


DENOTES FILL
IN WETLANDS

N. C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
MOORE/LEE COUNTY

PROJECT: 6.569003T (R-210B)
US 1 FROM NORTH OF SR 1825
TO NORTH OF SR 1182

SHEET 30 OF 37 8/2/99



13
 JACK C. MAXWELL
 CLASS I RIP RAP

12
 CLEO D. BLUE

178+00

PLAN VIEW
 SITE XV

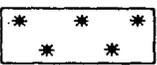
MATCH SHEET

N. C. DEPT. OF TRANSPORTATION
 DIVISION OF HIGHWAYS
 MOORE/LEE COUNTY

PROJECT: 6.569003T (R210B)

US 1 FROM NORTH OF SR 1825
 TO NORTH OF SR 1182

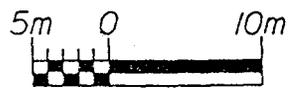
SHEET 31 OF 37 8/2/99



DENOTES MECHANIZED CLEARING

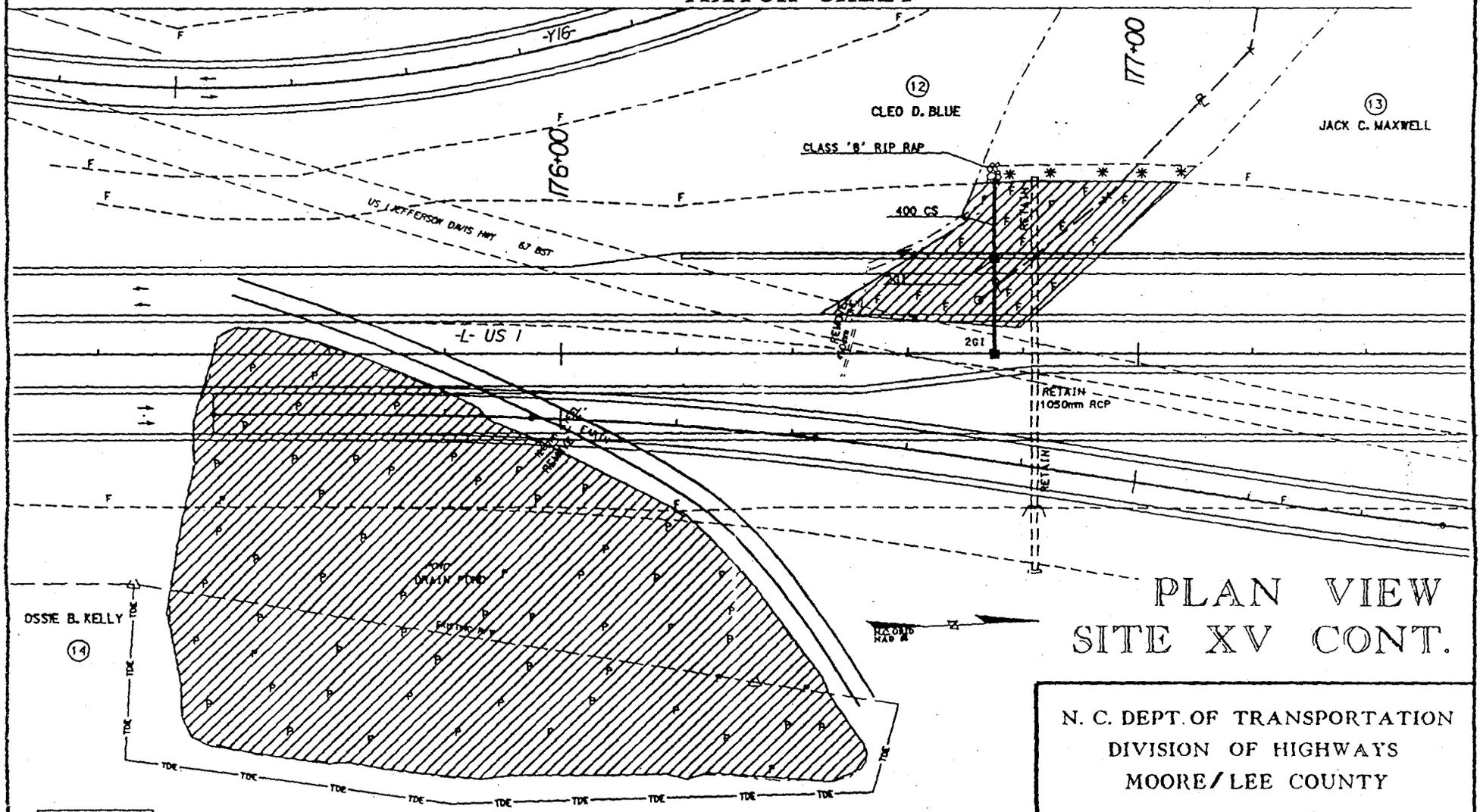


DENOTES FILL IN WETLANDS



SCALE

MATCH SHEET



PLAN VIEW SITE XV CONT.

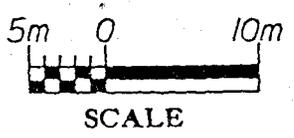
N. C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
MOORE/LEE COUNTY

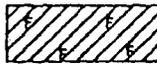
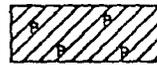
PROJECT: 6.569003T (R210B)

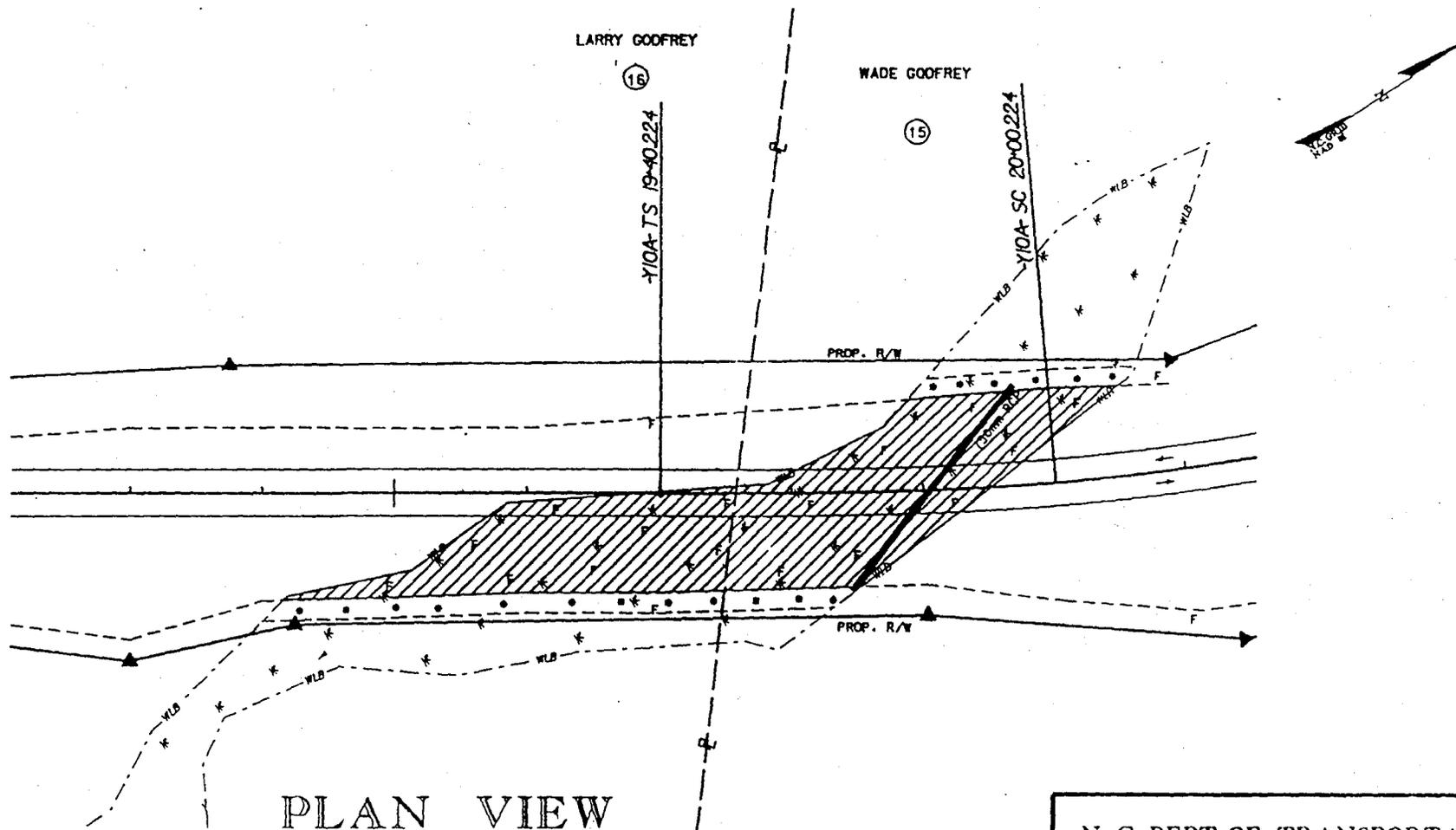
US 1 FROM NORTH OF SR 1825
TO NORTH OF SR 1182.

SHEET 32 OF 37 8/2/99

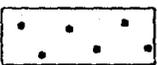
* * *
* * * DENOTES MECHANIZED CLEARING

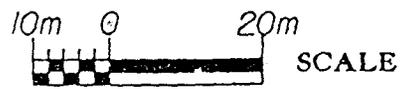


 DENOTES FILL IN WETLANDS
 DENOTES FILL IN SURFACE WATERS (POND)



PLAN VIEW
SITE XVI

-  DENOTES MECHANIZED CLEARING
-  DENOTES FILL IN WETLANDS

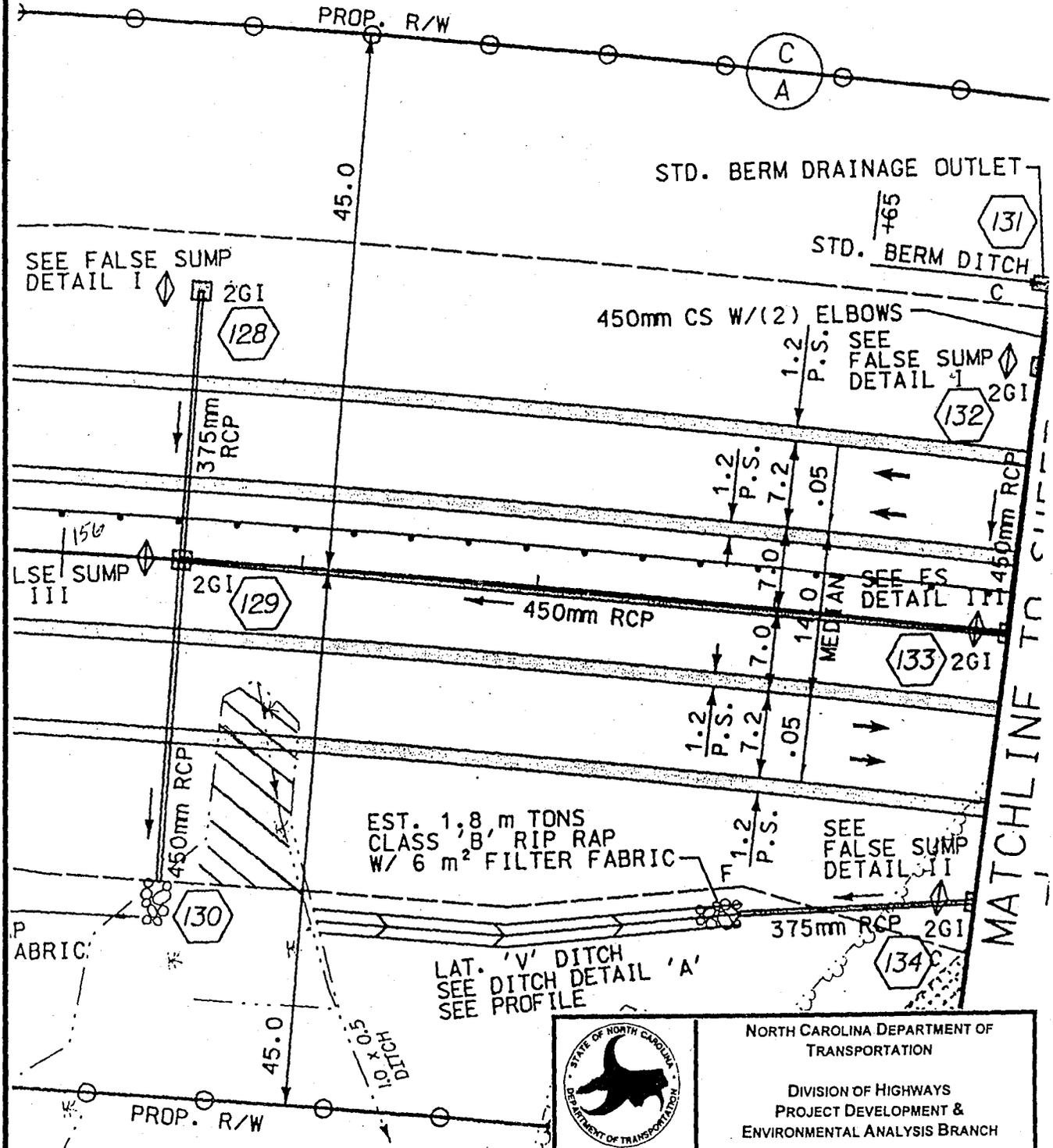


N. C. DEPT. OF TRANSPORTATION
 DIVISION OF HIGHWAYS
 MOORE/LEE COUNTY

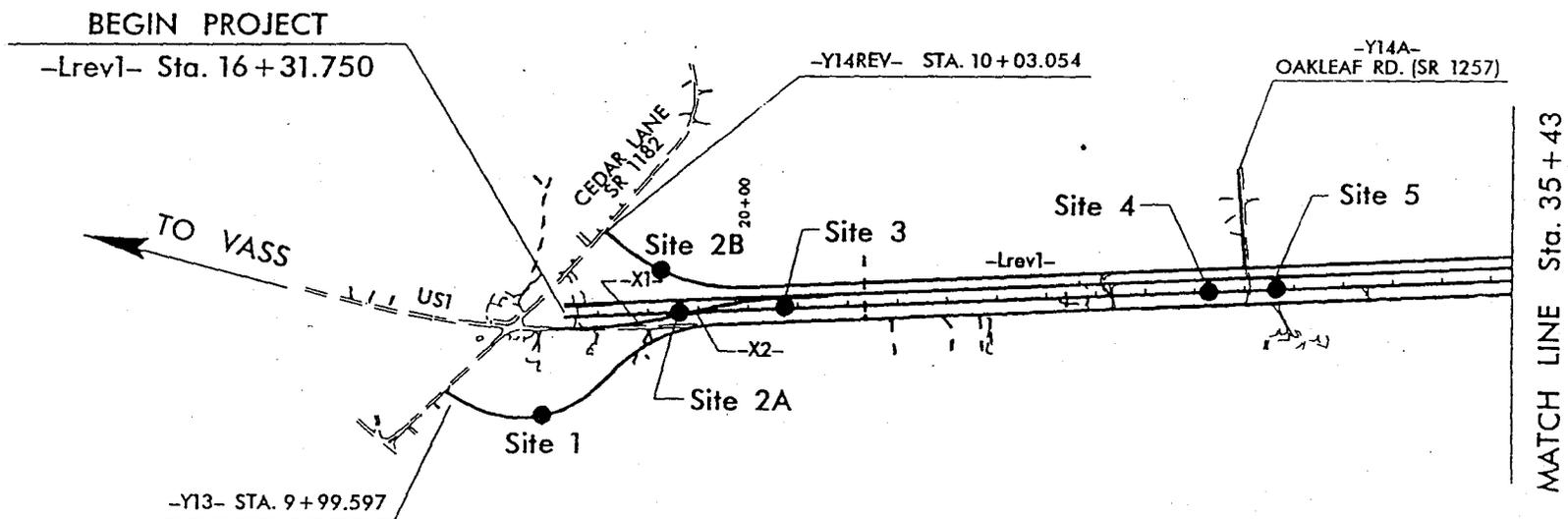
PROJECT: 6.569003T (R-210B)
 US 1 FROM NORTH OF SR 1825
 TO NORTH OF SR 1182

SHEET 33 OF 37 8/2/99

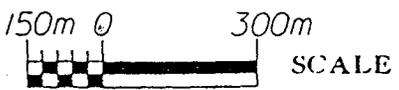
SITE 17



	<p>NORTH CAROLINA DEPARTMENT OF TRANSPORTATION</p> <p>DIVISION OF HIGHWAYS PROJECT DEVELOPMENT & ENVIRONMENTAL ANALYSIS BRANCH</p>
<p>MOORE / LEE COUNTY PROJECT 8.T560302 US 1 FROM NORTH OF SR 1825 TO NORTH OF SR 1182, R-210 B</p>	
<p>SHEET 34 OF 37</p>	



SITE MAP



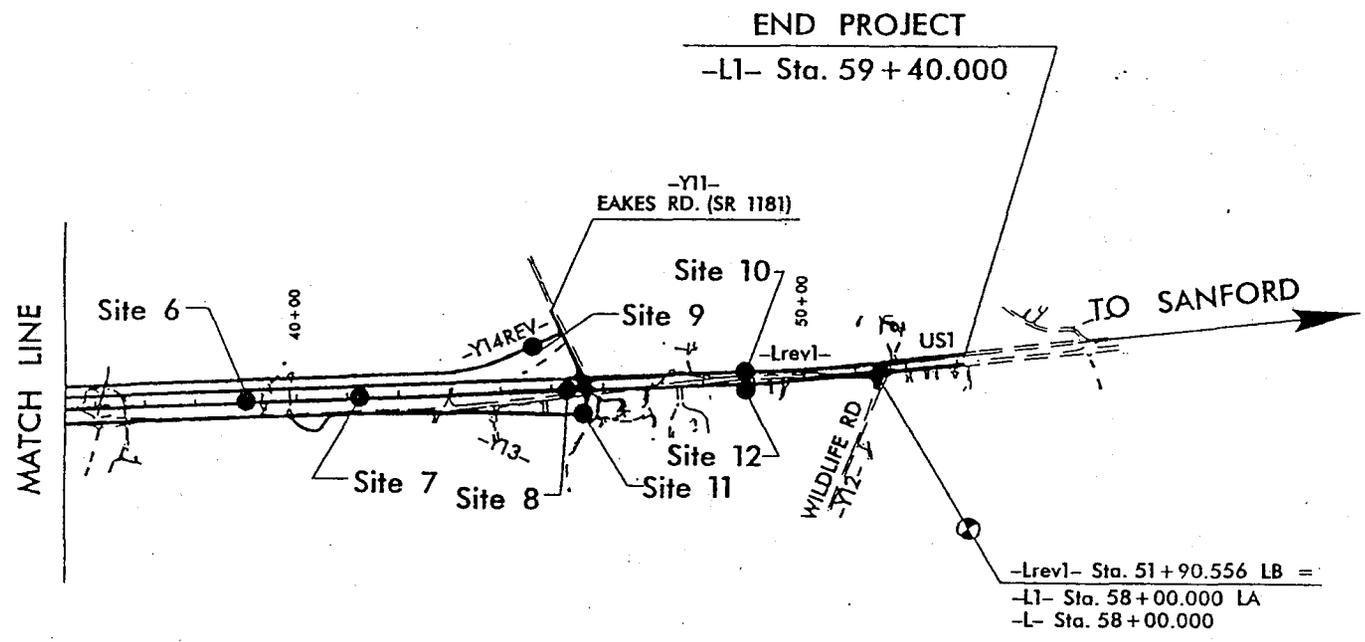
N. C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
LEE COUNTY

PROJECT: 8.T560302 (R-0210C)

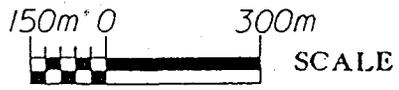
US 1 FROM SR 1182 TO SR 1180
SOUTH OF SANFORD

JAN 1998 REVISED JUNE 1999

SHEET 2 OF 25



SITE MAP



N. C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
LEE COUNTY

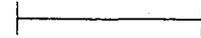
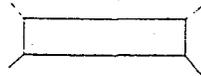
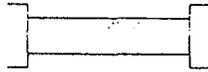
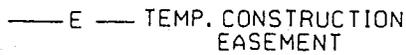
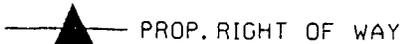
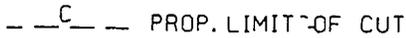
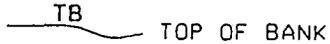
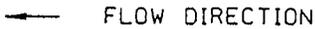
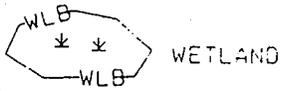
PROJECT: 8.T560302 (R-0210C)

US 1 FROM SR 1182 TO SR 1180'
SOUTH OF SANFORD

JAN 1998 REVISED JUNE 25 1999
SHEET 3 OF 25

LEGEND

— WLB — WETLAND BOUNDARY



(DASHED LINES DENOTE EXISTING STRUCTURES)

12"-48" PIPES
54" PIPES & ABOVE

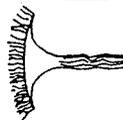


SINGLE TREE

WOODS LINE



DRAINAGE INLET



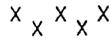
ROOTWAD



RIP RAP



ADJACENT PROPERTY OWNER OR PARCEL NUMBER IF AVAILABLE



LIVE STAKES



BOULDER



COIR FIBER ROLLS

N. C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS

LEE COUNTY

PROJECT: 8.T560302 (R-0210C)

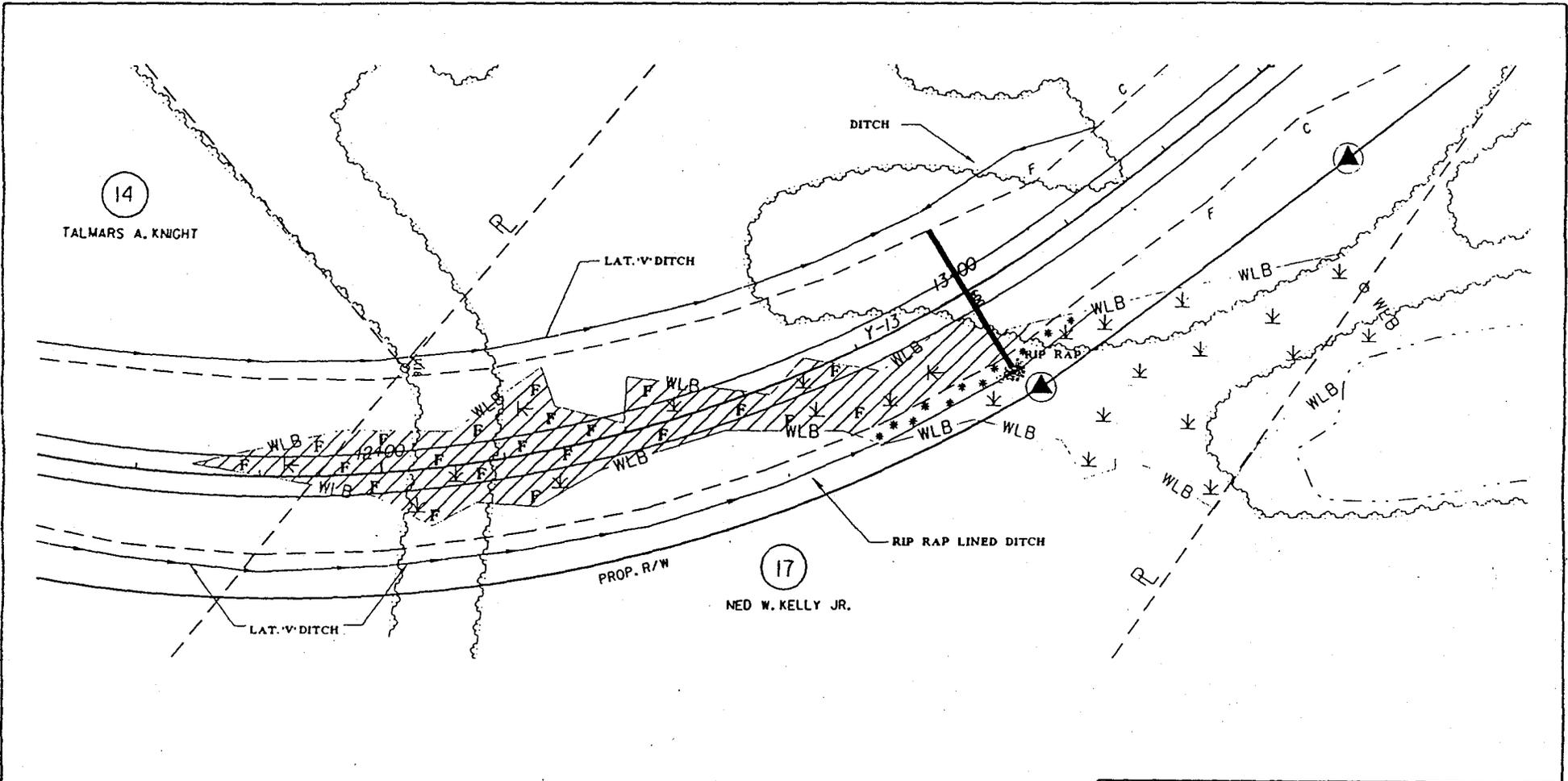
US 1 FROM SR 1182 TO SR 1180

SOUTH OF SANFORD.

JAN 1998

REVISED JUNE 1999

SHEET 4 OF 25



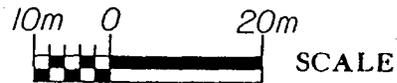
PLAN VIEW
SITE 1



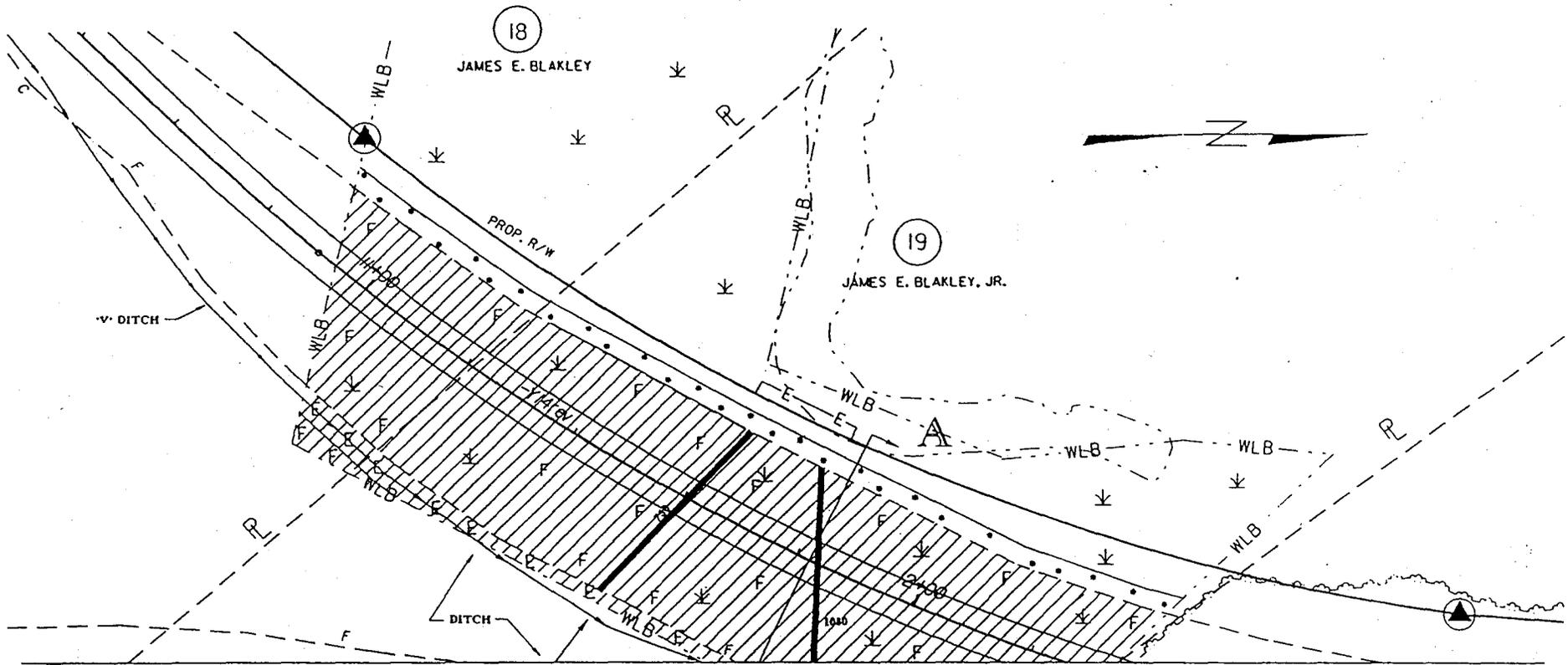
DENOTES FILL IN WETLANDS



DENOTES MECHANIZED CLEARING



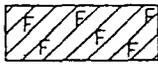
N. C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
LEE COUNTY
PROJECT: 8.T560302 (R-0210C)
US 1 FROM SR 1182 TO SR 1180
SOUTH OF SANFORD
JAN 1998 REVISED JUNE 1999
SHEET 5 OF 25



MATCH LINE SITE 2 SHEET 7 OF 25

PLAN VIEW

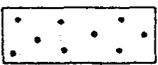
SITE 2



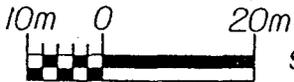
DENOTES FILL IN WETLANDS



DENOTES EXCAVATION IN WETLANDS



DENOTES MECHANIZED CLEARING

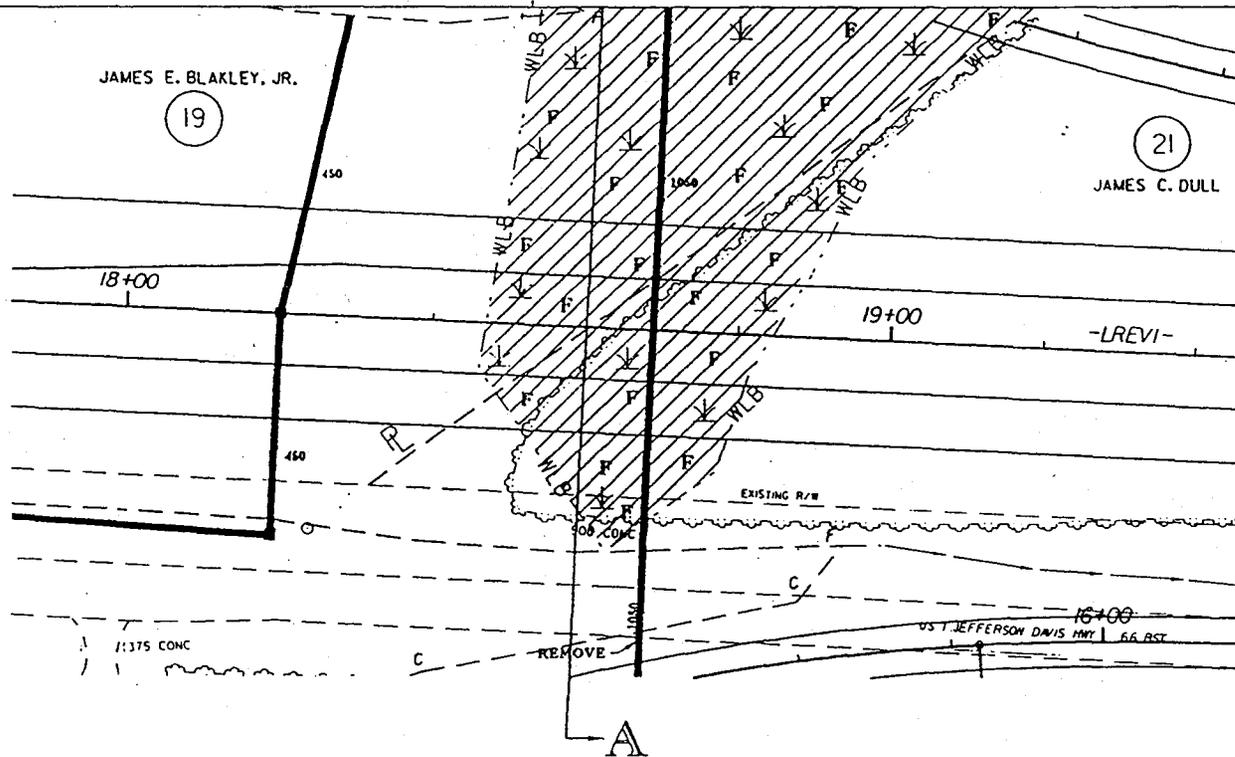


SCALE

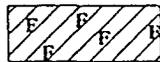
N. C. DEPT. OF TRANSPORTATION
 DIVISION OF HIGHWAYS
 LEE COUNTY
 PROJECT: 8.T560302 (R-0210C)
 US 1 FROM SR 1182 TO SR 1180
 SOUTH OF SANFORD
 JAN 1998 REVISED JUNE 1999
 SHEET 6 OF 25



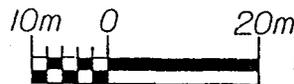
MATCH LINE SITE 2 SHEET 6 OF 25



PLAN VIEW SITE 2



DENOTES FILL IN WETLANDS



SCALE

N. C. DEPT. OF TRANSPORTATION
 DIVISION OF HIGHWAYS
 LEE COUNTY

PROJECT: 8.T560302 (R-0210C)

US 1 FROM SR 1182 TO SR 1180
 SOUTH OF SANFORD

JAN 1998 REVISED JUNE 1999

SHEET 7 OF 25

132

122

112

102

92

11+80.00 -YI4REV-

18+60.00 -LREVI-

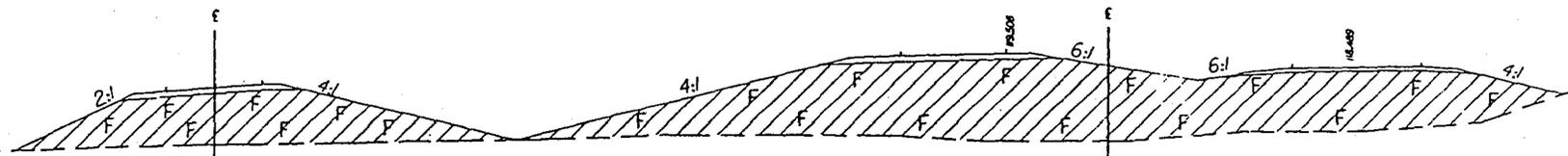
132

122

112

102

92



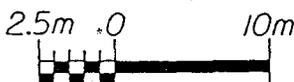
SITE 2



SECTION A-A



HORIZONTAL SCALE



VERTICAL SCALE



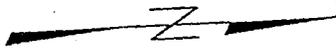
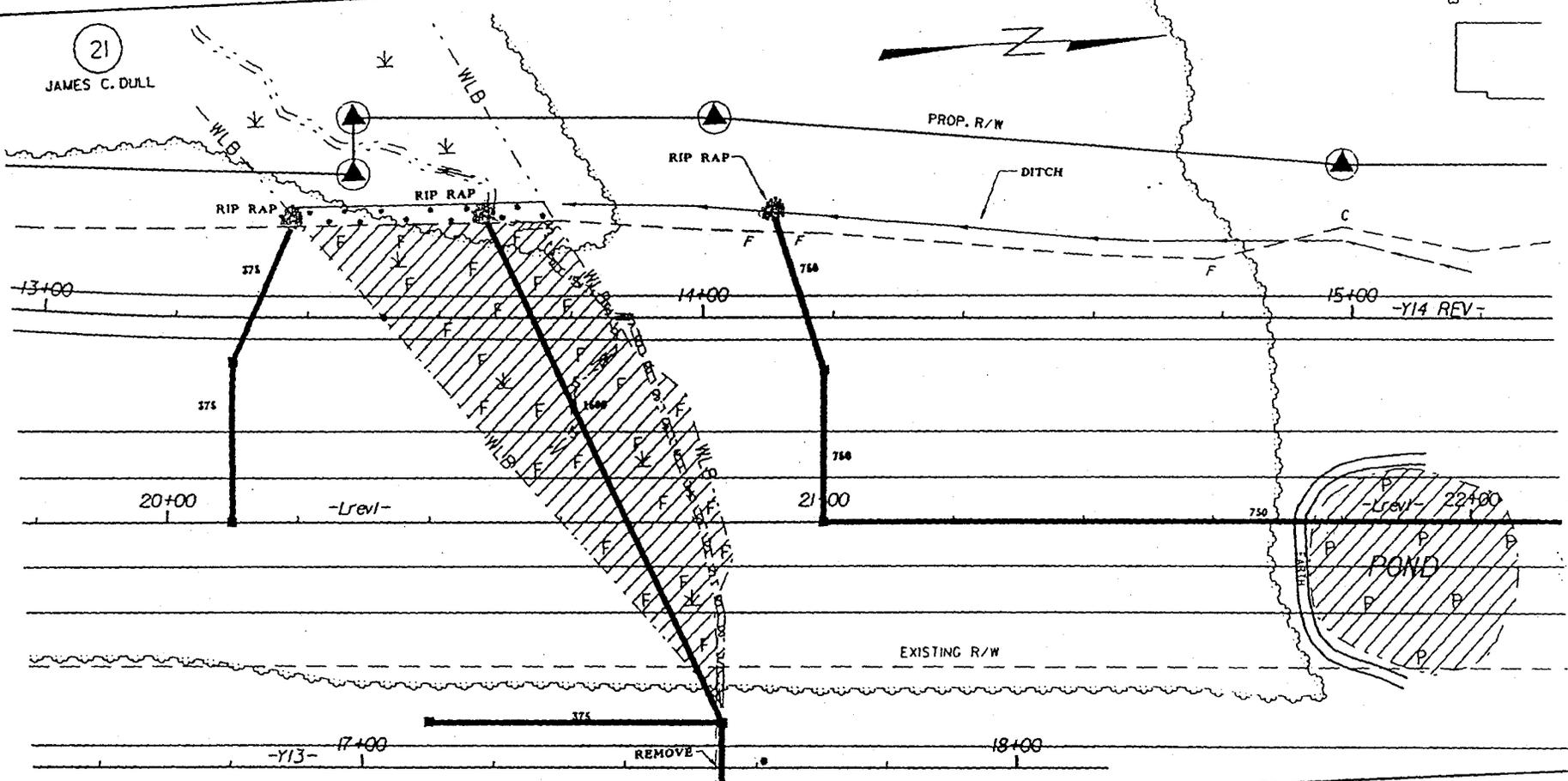
DENOTES FILL IN WETLANDS

N. C. DEPT. OF TRANSPORTATION
 DIVISION OF HIGHWAYS
 LEE COUNTY

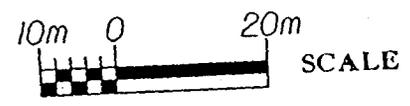
PROJECT: 8.T560302 (R-0210C)
 US 1 FROM SR 1182 TO SR 1180'
 SOUTH OF SANFORD
 JAN 1998 REVISED JUNE 1999
 SHEET 8 OF 25

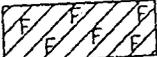
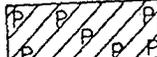
21

JAMES C. DULL

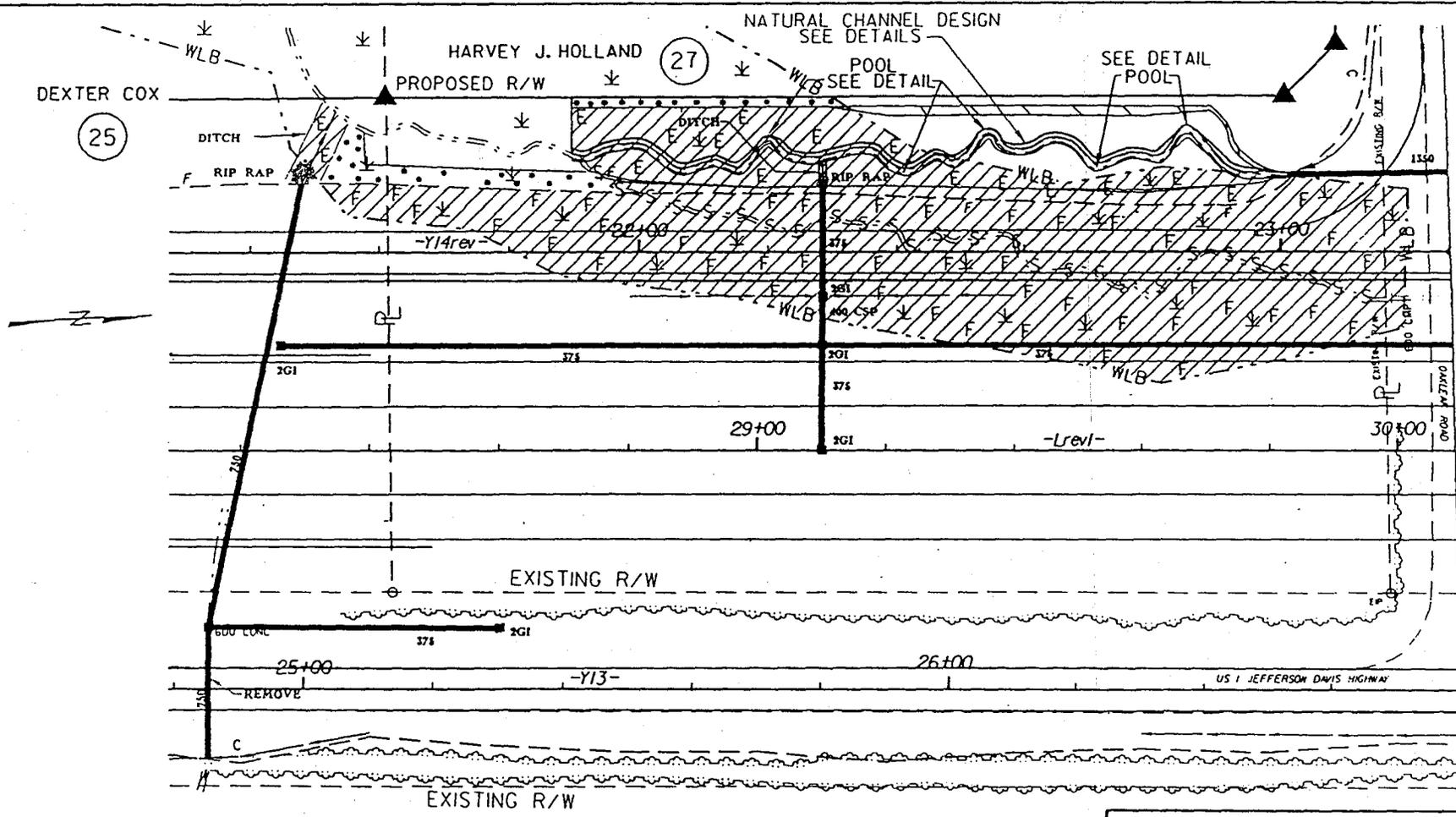


PLAN VIEW SITE 3

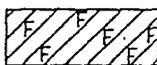
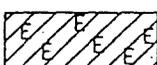
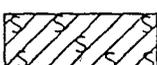
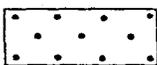


-  DENOTES FILL IN WETLANDS
-  DENOTES FILL IN SURFACE WATERS
-  DENOTES FILL IN SURFACE WATERS (POND)
-  DENOTES MECHANIZED CLEARING

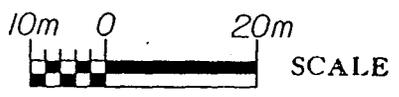
N. C. DEPT. OF TRANSPORTATION
 DIVISION OF HIGHWAYS
 LEE COUNTY
 PROJECT: 8.T560302 (R-0210C)
 US 1 FROM SR 1182 TO SR 1180,
 SOUTH OF SANFORD
 JAN 1998 REVISED JUNE 1999
 SHEET 9 OF 25



MATCH LINE SITE 5 SHEET 11 OF 25

-  DENOTES FILL IN WETLANDS
-  DENOTES EXCAVATION IN WETLANDS
-  DENOTES FILL IN SURFACE WATERS
-  DENOTES MECHANIZED CLEARING

PLAN VIEW SITE 4



N. C. DEPT. OF TRANSPORTATION
 DIVISION OF HIGHWAYS
 LEE COUNTY
 PROJECT: 8.T560302 (R-0210C)
 US 1 FROM SR 1182 TO SR 1180'
 SOUTH OF SANFORD
 JAN 1998 REVISED JUNE 1999
 SHEET 10 OF 25

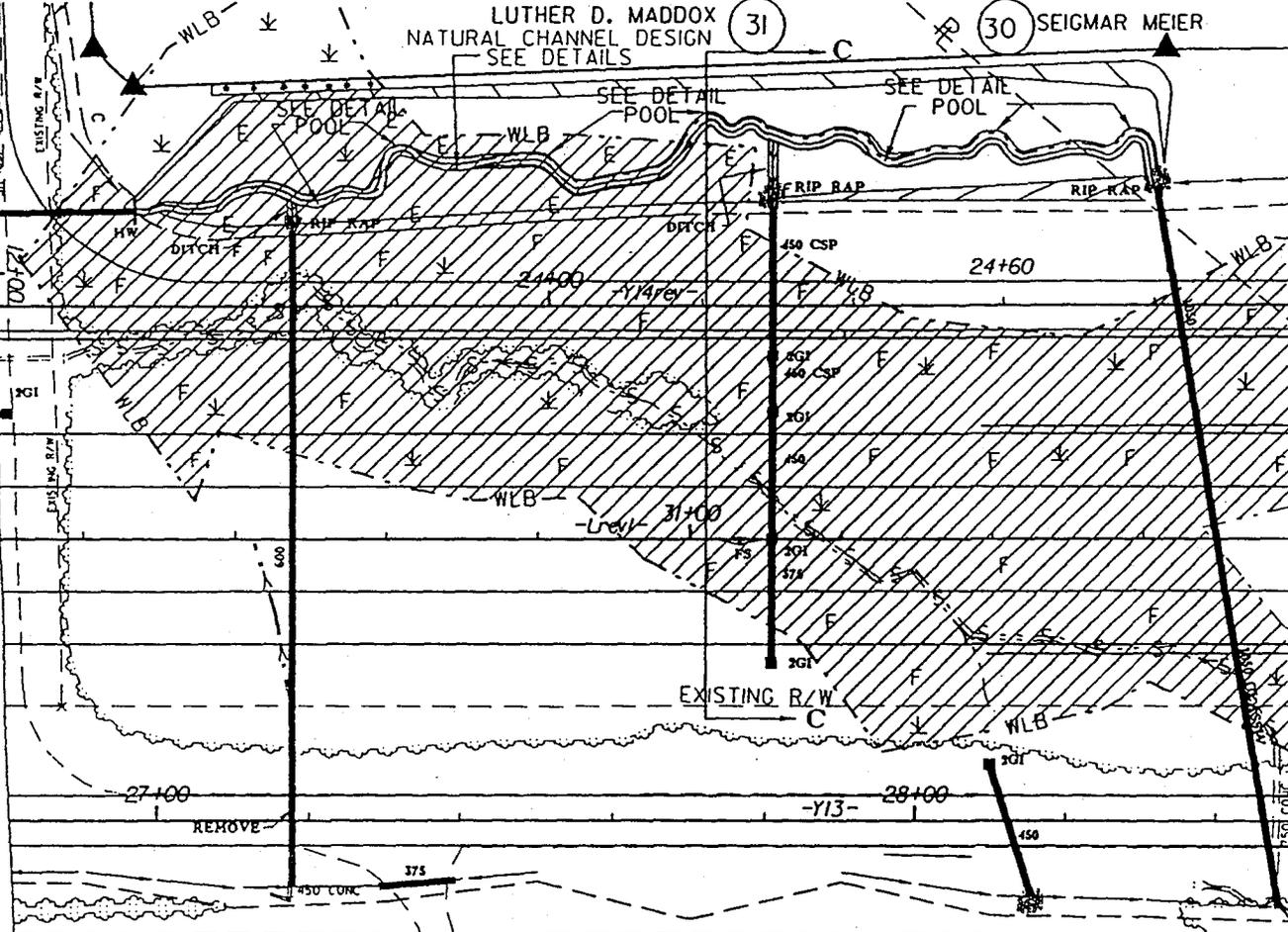
MATCH LINE SITE 4 SHEET 10 OF 25

MATCH LINE SITE 5 SHEET 12 OF 25

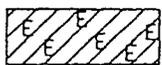
LUTHER D. MADDOX
NATURAL CHANNEL DESIGN
SEE DETAILS

(30) SEIGMAR MEIER

(31)



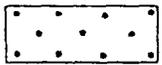
DENOTES FILL IN WETLANDS



DENOTES EXCAVATION IN WETLANDS

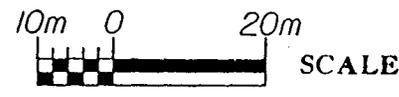


DENOTES FILL IN SURFACE WATERS



DENOTES MECHANIZED

PLAN VIEW SITE 5



N. C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
LEE COUNTY

PROJECT: 8.T560302 (R-0210C)

US 1 FROM SR 1182 TO SR 1180'
SOUTH OF SANFORD

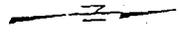
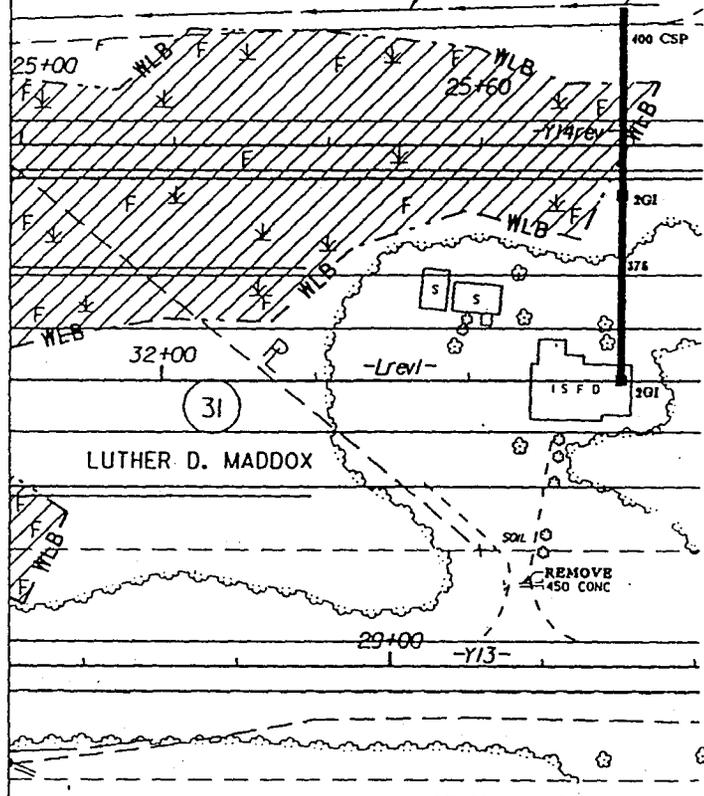
JAN 1998 REVISED JUNE 1999
SHEET 11 OF 25

SEIGMAR MEIER

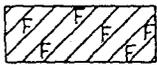
30

RIP RAP LINED DITCH

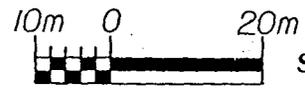
MATCH LINE SITE 5 SHEET 11 OF 25



PLAN VIEW
SITE 5



DENOTES FILL IN WETLANDS



SCALE

N. C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
LEE COUNTY

PROJECT: 8.T560302 (R-0210C)

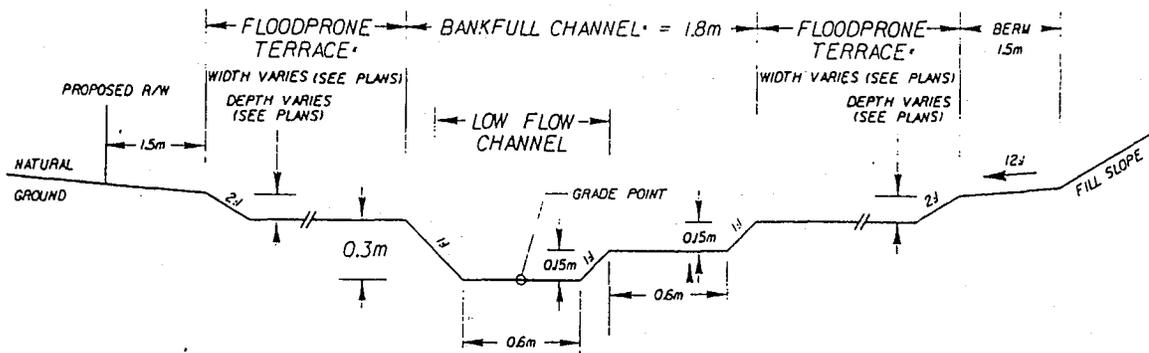
US 1 FROM SR 1182 TO SR 1180,
SOUTH OF SANFORD

JAN 1998 REVISED JUNE 1999

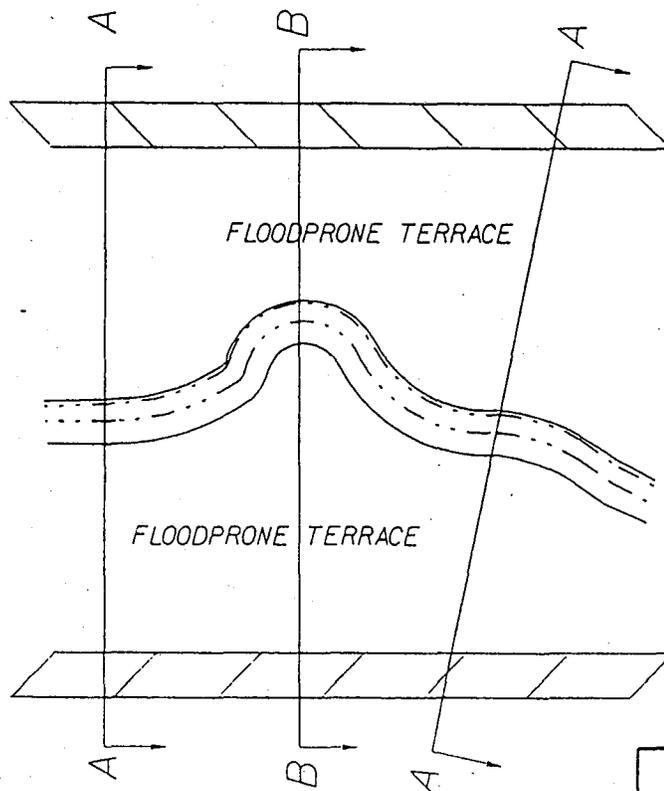
SHEET 12 OF 25

RIFFLE SECTION (A-A)

(Not to Scale)



NOTE: STABILIZE BANKFULL CHANNEL BANKS AND FLOODPRONE TERRACE WITH SODDING AND NATIVE VEGETATION. BED MATERIAL OF LOW FLOW CHANNEL SHALL CONSIST OF NATIVE SOILS.



A-A: RIFFLE SECTION

B-B: POOL SECTION

(Not to Scale)

SITES 4 & 5
NATURAL CHANNEL
DESIGN DETAILS

N. C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
LEE COUNTY

PROJECT: 8.T560302 (R-0210C)

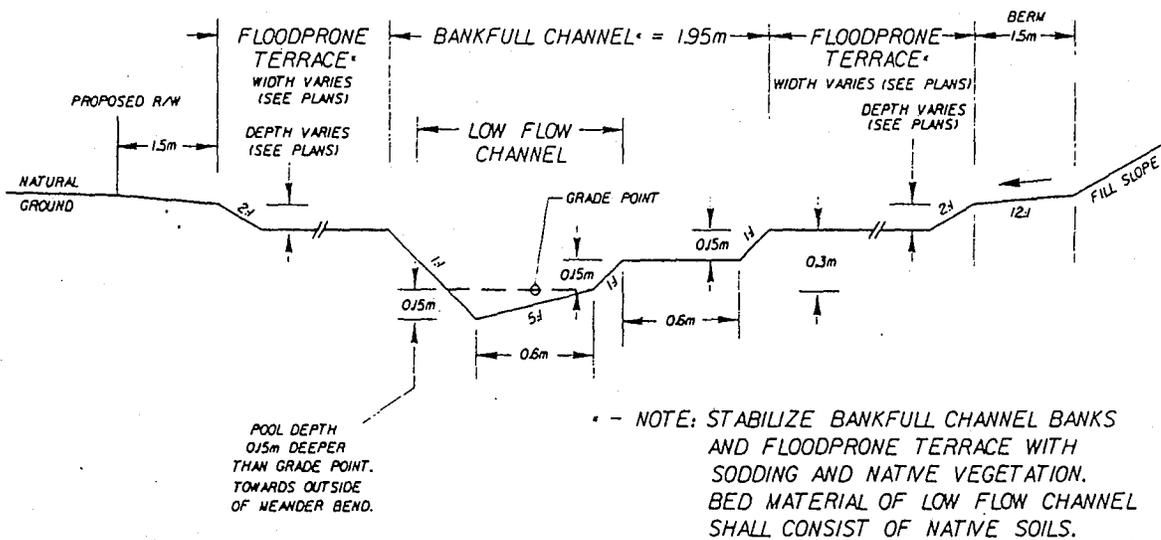
US 1 FROM SR 1182 TO SR 1180
SOUTH OF SANFORD

JAN 1998 REVISED JUNE 1999

SHEET 14 OF 25

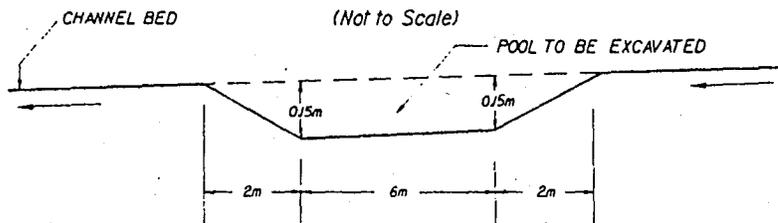
POOL SECTION (B-B)

(Not to Scale)



POOL PROFILE

(Not to Scale)



SEE PLAN VIEW FOR POOL SPACING

SITES 4 & 5
NATURAL CHANNEL
DESIGN DETAILS

N. C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
LEE COUNTY

PROJECT: 8.T560302 (R-0210C)

US 1 FROM SR 1182 TO SR 1180
SOUTH OF SANFORD

JAN 1998 REVISED JUNE 1999

SHEET 15 OF 25

ITEM	EXISTING STREAM*	REFERENCE STREAM	PROPOSED RELOCATION
STREAM NAME	Tributary to Little Crane Creek	Tributary to Little Crane Creek	Tributary to Little Crane Creek
DRAINAGE AREA (DA)	76 ha	76 ha	76 ha
CHANNEL SLOPE (S)	1.1%	1.1%	0.9%
BANKFUL WIDTH (W_{bkr})	1.7m - VAR.	1.7m	1.8m
MEAN DEPTH (d_{bkr})	0.2m	0.2m	0.18m
BANKFUL X-SECTION AREA (A_{bkr})	0.33m ² - VAR.	0.33m ²	0.36m ²
WIDTH/DEPTH RATIO (W_{bkr}/d_{bkr})	8.5 - VAR.	8.5	10
Maximum DEPTH (d_{mbkr})	0.31m	0.31m	0.3m
WIDTH Flood-Prone Area (W_{fpa})	45m	45m	15m
ENTRENCHMENT RATIO (ER)	26.5 - VAR.	26.5	8.3
CHANNEL MATERIALS: D50	sand	sand	sand
SINUOSITY (K)	1.1 - VAR.	1.1	1.2
MEANDERS:			
AVG. LENGTH	VAR.	13.8m	14.0m
AVG. AMPLITUDE	VAR.	2.6m	2.6m
AVG. RADIUS	VAR.	5.1m	5.0m
DISCHARGES:			
Q BANKFULL	0.2 cms	0.2 cms	0.3 cms
Q2	1.7 cms	1.7 cms	1.7 cms
Q10	3.1 cms	3.1 cms	3.1 cms
VELOCITY:			
V BANKFULL	0.56 m/s	0.56 m/s	0.35 m/s
V2	0.61 m/s	0.61 m/s	0.80 m/s
V10	0.71 m/s	0.71 m/s	1.01 m/s
CLASSIFICATION	D5/E5	E5	E5

* - EXISTING STREAM IS BRAIDED THROUGH MOST OF ITS LENGTH, SOME DATA IS HIGHLY VARIABLE.

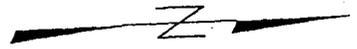
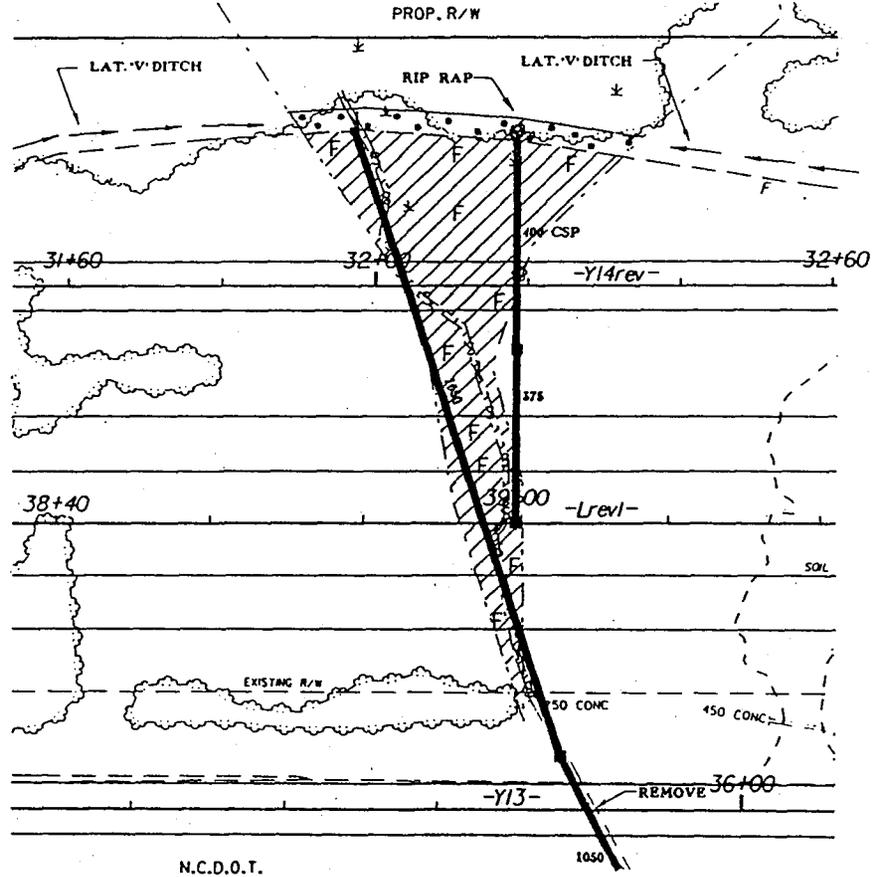
NATURAL CHANNEL
DESIGN DATA
SITES 4 & 5

N. C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
LEE COUNTY
PROJECT: 8.T560302
US 1 FROM SR 1182 TO SR 1180
SOUTH OF SANFORD

JAN 1998 REVISED JUNE 1999
SHEET 16 OF 25

CENTRAL CAROLINA AVIATION

34

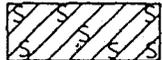


N.C.D.O.T.

PLAN VIEW SITE 6



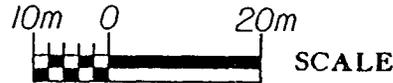
DENOTES FILL IN WETLANDS



DENOTES FILL IN SURFACE WATERS



DENOTES MECHANIZED CLEARING

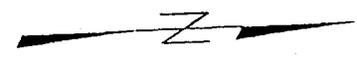
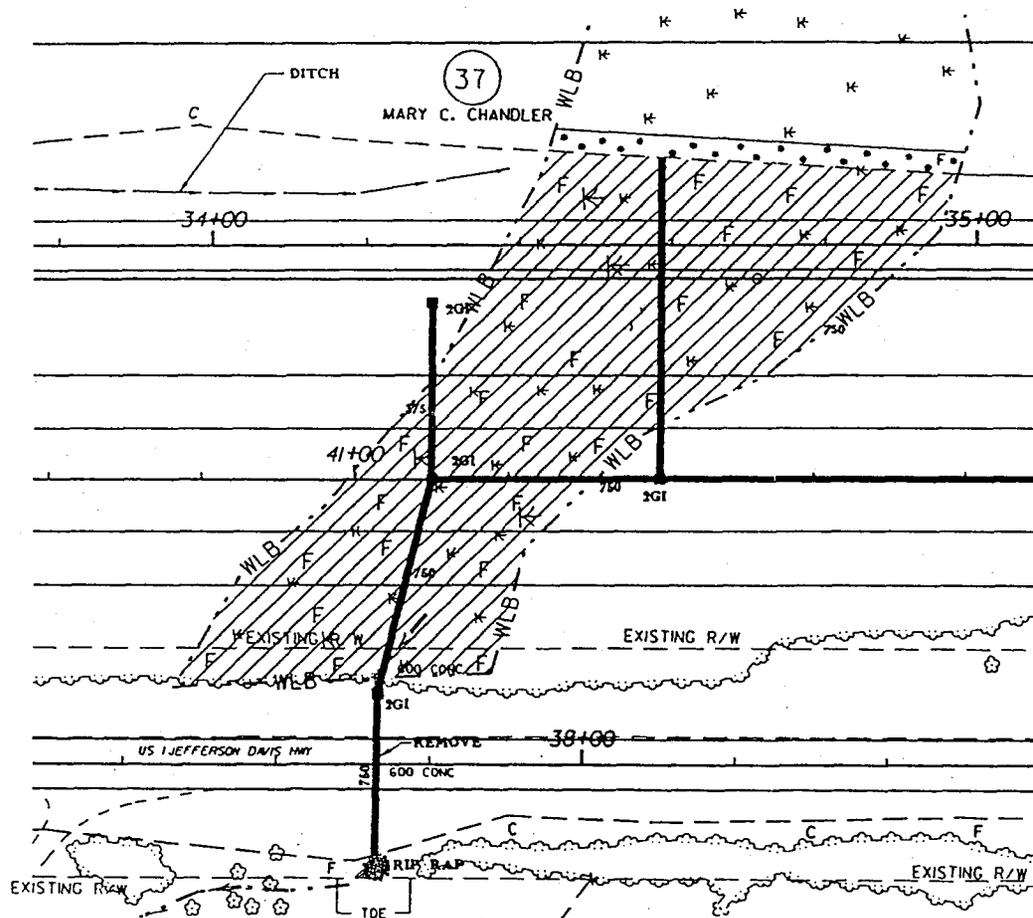


N. C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
LEE COUNTY

PROJECT: 8.T560302 (R-0210C)

US 1 FROM SR 1182 TO SR 1180'
SOUTH OF SANFORD

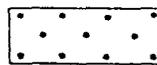
JAN 1998 REVISED JUNE 1999
SHEET 17 OF 25



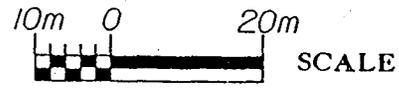
PLAN VIEW SITE 7



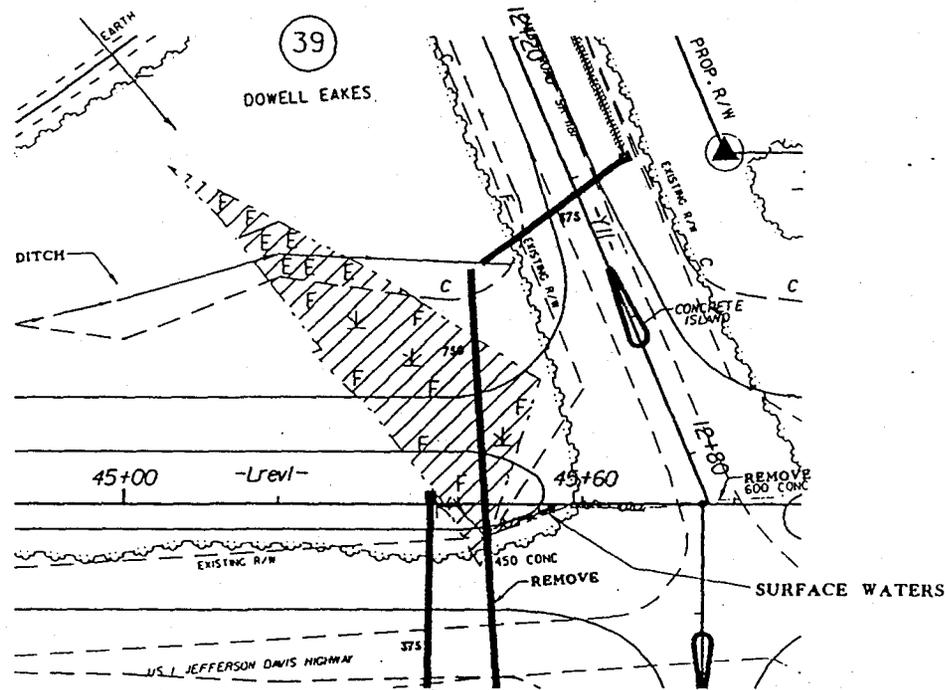
DENOTES FILL IN WETLANDS



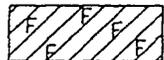
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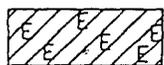
N. C. DEPT. OF TRANSPORTATION
 DIVISION OF HIGHWAYS
 LEE COUNTY
 PROJECT: 8.T560302 (R-0210C)
 US 1 FROM SR 1182 TO SR 1180
 SOUTH OF SANFORD
 JAN 1998 REVISED JUNE 1999
 SHEET 13 OF 25



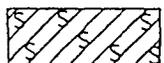
PLAN VIEW
SITE 8



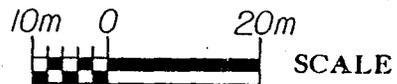
DENOTES FILL IN WETLANDS



DENOTES EXCAVATION
IN WETLANDS



DENOTES FILL IN
SURFACE WATERS

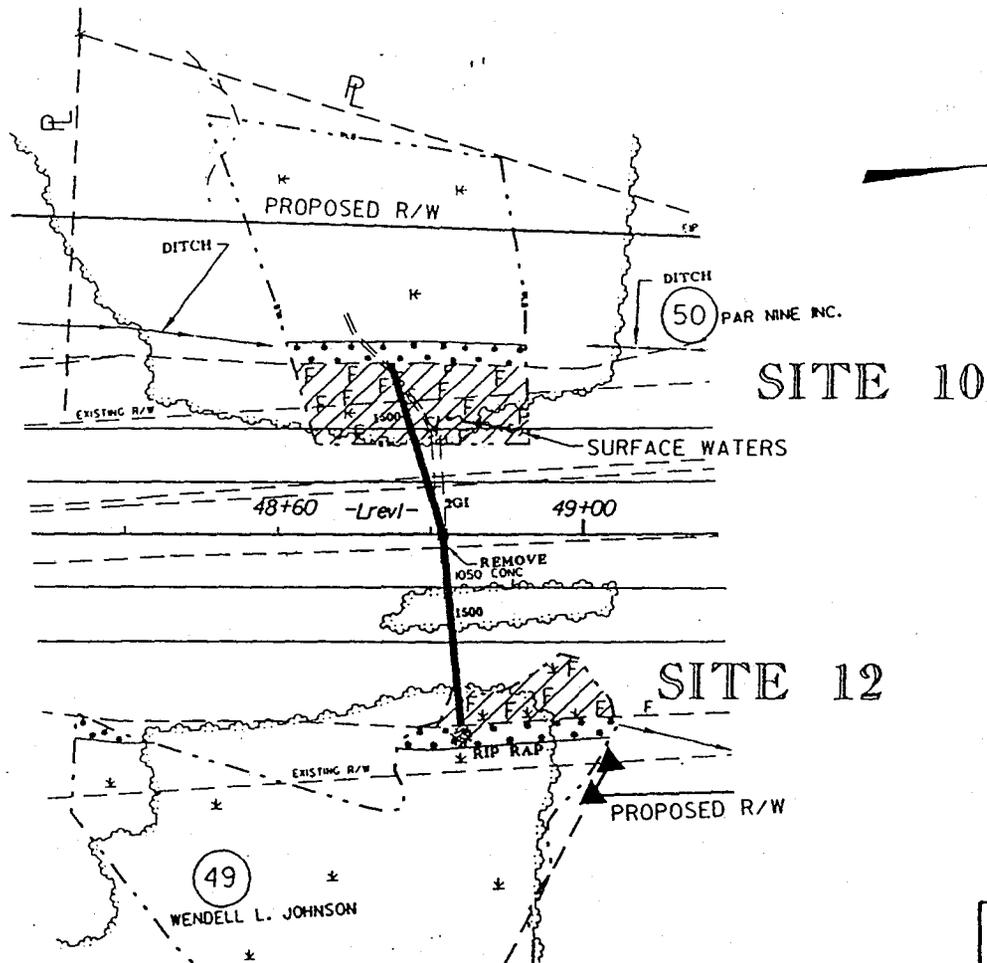


N. C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
LEE COUNTY

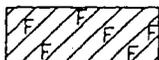
PROJECT: 8.T560302 (R-0210C)

US 1 FROM SR 1182 TO SR 1180,
SOUTH OF SANFORD

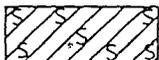
JAN 1998 REVISED JUNE 1999
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PLAN VIEW
SITE 10 & 12



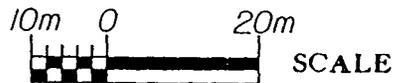
DENOTES FILL IN WETLANDS



DENOTES FILL IN SURFACE WATERS



DENOTES MECHANIZED CLEARING



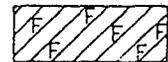
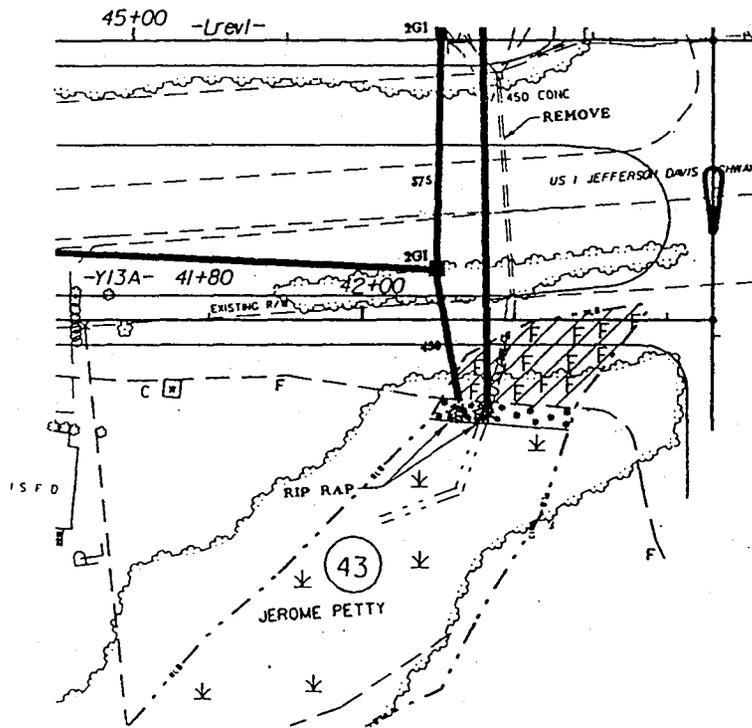
N. C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
LEE COUNTY

PROJECT: 8.T560302 (R-0210C)

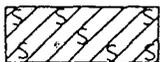
US 1 FROM SR 1182 TO SR 1180'
SOUTH OF SANFORD

JAN 1998 REVISED JUNE 25 1999

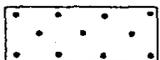
SHEET 21 OF 25



DENOTES FILL IN WETLANDS

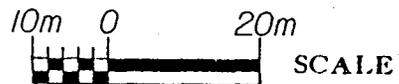


DENOTES FILL IN SURFACE WATERS



DENOTES MECHANIZED CLEARING

PLAN VIEW SITE 11



SCALE

N. C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
LEE COUNTY

PROJECT: 8.T560302 (R-0210C)

US 1 FROM SR 1182 TO SR 1180
SOUTH OF SANFORD

JAN 1998 REVISED JUNE 25 1999

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SUMMARY

Site No.	Station (From/To)	Structure Size	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)	Relocated Channel (m)	Enclosed Channel (m)
1	12+00 -Y13-		0.14			0.01						
2	18+60 -LRev1-	1050mm Pipe	0.68		0.02	0.04						
3	20+70 -LRev1-	1500mm Pipe	0.19			0.01	0.01	0.08		110		85
4	29+20 -LRev1- Lt.		0.33		0.11	0.03	0.02			144	137	16
5	31+00 -LRev1-	1050mm Pipe	0.97		0.14	<0.01	0.04			197	162	87
6	39+00 -LRev1-	1050mm Pipe	0.10			0.01	0.01			84		88
7	41+20 -LRev1-		0.30			0.02						
8	45+40 -LRev1-		0.06		0.01		<0.01			21		
9	38+00 -Y14Rev-							0.27				
10	48+70 -LRev1- Lt.	1500mm Pipe	0.03			0.01	<0.01			12		12
11	10+35 -Y13B- Rt.		0.02			<0.01	<0.01			17		14
12	48+90 -LRev1- Rt.	1500mm Pipe	0.01			0.01						
TOTALS:			2.83		0.28	0.14	0.08	0.35		585	299	302

N.C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
LEE COUNTY

PROJECT: 8.T560302 (R-0210C)

US 1 FROM SR 1182 TO SR 1180
SOUTH OF SANFORD

JAN 1998

REVISED JUNE 25, 1999

SHEET 25

OF 25

APPENDIX C

Little River On-site Restoration Plan

Monday, April 14, 2003

Crane's Creek Watershed Technical Assessment
Moore County, Lee County, Harnett County, North Carolina
BLWI Projects: 010287 / 020289

US Highway #1 NCDOT R-210 Cameron/Vass Bypass
Engineering Plan / Water Quality / Environmental Permit
Review Summary

The following is a summary of findings from an engineering review of the engineering / construction plans for the US Highway #1 NCDOT R-210 Cameron/Vass Bypass project in Moore and Lee Counties relative to water quality and environmental permits. No calculations, formal analysis, or mathematical simulation modeling was undertaken for this review. Findings are based on the observations, conversations, education, and experience of the reviewer, Thomas S. Blue, PE, PLS. Construction operations for this project began some weeks prior to the preparation of this document.

- A. No evidence of approval from County of Moore government officials or Town of Vass government officials for impervious surfaces relative to North Carolina Water Supply Watershed regulations was found. It would seem that both government entities would need to review and approve the increase in impervious surfaces in their jurisdictions prior to construction. What is the allowable % impervious surface under current Water Supply Watershed regulations administered by the County of Moore and Town of Vass?
- B. Permit condition #1 of the Clean Water Act Section 401 Water Quality Certification (401 WQC) issued by the Division of Water Quality (DWQ) indicates that Best Management Practices (BMPs) shall be implemented to ensure streams and rivers do not exceed turbidity levels greater than 10 NTU (nephelometric turbidity units). Recent sediment sampling conducted by the Moore County Soil and Water Conservation Service (CSWS) and personal observations indicate pre-construction turbidity from existing stormwater management exceeded 50 NTU in some surface waters in the project area. No procedures were found to account for compliance with this condition.
- C. Need 1992 NCDOT Surface Water BMP Manual to check compliance. Is this for forestry operations and were these implemented prior to construction?
- D. Need Design Standards and Specifications for Watersheds [15A NCAC 4B .0124(a)-(d)] to check compliance. Does this require disturbance not to exceed 20 acres at a time?
- E. Permit condition #4 of the 401 WQC indicates all stormwater runoff, "shall be directed to buffer areas or retention basins and shall not be routed directly into streams". Detention basins are indicated on the plans for temporary erosion and sedimentation control. No evidence of stormwater being routed to buffer areas or retention basins was found to be indicated on the plans. In all instances where streams or defined surface water drainage features were found to be indicated on the plans, stormwater was routed directly to such features. In no portion of the plans were permanent stormwater management measures found which appeared to be intended for water quality protection. Direct discharge of stormwater runoff from the project to adjacent lands and waters was found in all cases.
- F. Need High Quality Waters [15A NCAC 2B .0224] to check compliance. Does this require reduced impervious area, stormwater BMPs, and/or minimum E&SC settling efficiency?
- G. Permit condition #7 of the 401 WQC requires Hazardous Spill Catch Basins (HSCBs) at all stream crossings and final designs for such HSCBs shall be submitted to the DWQ 401 Wetlands Unit (DWQ401) prior to the beginning of construction. It seems that these HSCBs have not been designed nor such designs submitted to the DWQ401.
- H. Permit condition #8 of the 401 WQC indicates, "bridge decking shall not discharge stormwater directly into the receiving water". It appears that stormwater runoff from the bridge decking will be routed to a collection system and then discharged directly into surface waters.

- I. Permit condition #9 of the 401WQC indicates that a maintenance plan for all stormwater management facilities and HSCBs be submitted to the DWQ401. It appears that no stormwater facility maintenance plan has been developed. It also seems that no maintenance plan could have been developed for the HSCBs as these appear yet to be designed.
- J. Permit condition #13 of the 401WQC indicates, "design and placement of culverts and other structures including temporary erosion control measures shall not be conducted in such a manner that may result in dis-equilibrium of wetlands or stream beds or banks, adjacent to or upstream and downstream of the above structures". It appears that no analyses to assesses such potential dis-equilibrium has been undertaken. Such analyses would include integrated hydraulic, hydrologic, and sediment mathematical response modeling relative to each structure over a multi-year (generally 20+ years) simulated time span.
- K. Permit condition #15b of the 401WQC indicates that 1,154 linear feet of on-site stream relocation/restoration shall be designed based on "field measurements of an unimpacted section of stream (reference reach)." As the project construction will alter the hydrologic and hydraulic response of the stream system, this methodology likely oversimplifies the system analysis and design relative to various stream reaches affected by the project. The design methodology for stream relocation/restoration (analog, empirical, or analytical) should be site specific.
- L. Permit condition #15b of the 401WQC further indicates, "until plans are received and approved for the stream relocation using natural channel design, wetland or stream fill shall not occur". It seems that these plans have not been received and approved by the DWQ401.
- M. The background water quality parameters for streams affected by the project are estimated as follows: **Pb, X.XX mg/L; Cu, X.XX mg/L; TSS, X.XX mg/L; NO₃-N, X.XX mg/L; etc**
- N. The estimated pollutant loadings from the current US Highway route are estimated as follows: **Pb, X.XX mg/L; Cu, X.XX mg/L; TSS, X.XX mg/L; NO₃-N, X.XX mg/L; etc**
- O. The estimated pollutant loadings from the proposed US Highway route (R-210 bypass project) are estimated as follows: **Pb, X.XX mg/L; Cu, X.XX mg/L; TSS, X.XX mg/L; NO₃-N, X.XX mg/L; etc**
- P. The proposed impervious surface for this project is approximately X.XX acres. This is equivalent to approximately X.X Super Wal-Mart store lots of the size currently located in Southern Pines, Moore County.

Wednesday, May 21, 2003

Crane's Creek Watershed Technical Assessment

Moore County, Lee County, Harnett County, North Carolina

BLWI Projects: 010287 / 020289



US Highway #1 NCDOT R-210 Cameron/Vass Bypass
Engineering Plan / Water Quality / Environmental Permit
Review Summary

The following is a summary of findings from an engineering review of the construction plans for the US Highway #1 North Carolina Department of Transportation (NCDOT) R-210 Cameron/Vass Bypass project in Moore and Lee Counties relative to water quality and environmental permits. This review was undertaken as part of the Crane's Creek Watershed Technical Assessment to assess protection of water quality relative to project implementation. This document is based on the most recent construction plans for the project as provided by the North Carolina Department of Transportation. No design calculations were made available from the North Carolina Department of Transportation for review of these plans. No mathematical simulation modeling was undertaken for this review. Findings are based solely on the observations, conversations, education, and experience of the reviewer, Thomas S. Blue, PE, PLS. Construction operations for this project began some weeks prior to the preparation of this document.

- A. The Crane's Creek Watershed is designated as a WS-III Water Supply Watershed by the State of North Carolina. County of Moore, County of Lee, Town of Cameron, and Town of Vass have not received any applications relative to impervious surfaces pursuant to the North Carolina Water Supply Watershed regulations. Likewise, these government entities have not granted any approvals relative to impervious surfaces pursuant to the North Carolina Water Supply Watershed regulations. The project as designed appears to possible exceed the maximum allowable built-upon limit (impervious surface limit) of 24% in a WS-III Water Supply Watershed. If this limit is exceeded, each government entity would need to review and approve the increase in impervious surfaces in their jurisdictions prior to construction through issuance of a Special Intensity Allocation (SIA). The issuance of Special Intensity Allocations allows up to 70% impervious surface in a maximum of 10% of the total WS-III Water Supply Watershed area. The Water Supply Watershed regulations may require that stormwater runoff be diverted away from surface waters and Best Management Practices (BMPs) be implemented to minimize water quality impacts. The plans indicate that stormwater runoff is not being diverted away from surface waters in most, if not all, outfall locations. Similarly, the plans indicate that Best Management Practices are not being implemented to minimize water quality impacts.
- It is recommended that officials from the North Carolina Department of Transportation meet with officials from the County of Moore, County of Lee, Town of Cameron, and Town of Vass to discuss the project relative to the North Carolina Water Supply Watershed regulations. The meeting should include discussions of available Special Intensity Allocations within each jurisdiction as needed.

- B. Permit condition #1 of the Clean Water Act Section 401 Water Quality Certification (401WQC) issued by the North Carolina Division of Water Quality (DWQ) indicates Best Management Practices shall be implemented to ensure streams and rivers do not exceed turbidity levels greater than 50 NTUs (Nephelometric Turbidity Units). Recent stream sampling conducted by the Division of Water Quality as well as personal observations indicate pre-construction turbidity levels during storm events exceed 50 NTUs in some surface waters in the project area. No procedures were found to account for compliance or noncompliance in this situation.
- It is recommended that turbidity be monitored both upstream and downstream of the project at all surface water channelization locations. The relative contribution of the project to turbidity levels can then be estimated from this information. As opposed to a 50 NTU maximum allowable turbidity level, project compliance should be assessed relative to any turbidity changes between upstream and downstream locations.
- C. Permit condition #3 of the 401WQC indicates the project must comply with Design Standards in Sensitive Watersheds [15A NCAC 4B .0124(a)-(d)]. This regulation requires that land disturbance not exceed more than 20 acres per project phase. Each phase (20 acres maximum area) must be fully stabilized before the next phase is initiated. Nearly the entirety of the project area has been disturbed to date, which far exceeds the 20 acres maximum.
- It is recommended that a phasing plan for the project be developed such that no more than 20 acres of land disturbance will occur per project phase. All currently disturbed area outside the first phase should be fully stabilized.
- D. Permit condition #4 of the 401WQC indicates all stormwater runoff, "shall be directed to buffer areas or retention basins and shall not be routed directly into streams". Detention basins are indicated on the plans for temporary erosion and sedimentation control. No evidence of stormwater being routed to buffer areas or retention basins was found to be indicated on the plans. In all instances where streams or defined surface water drainage features were found to be indicated on the plans, stormwater was routed directly to such features. In no portion of the plans were permanent stormwater management measures found which appeared to be intended for water quality protection. Direct discharge of stormwater runoff from the project to adjacent lands and waters was found in all cases.
- It is recommended that a stormwater management system be developed for the project which includes Best Management Practices to minimize negative water quality impacts. This system should focus on stormwater detention and retention measures utilizing vegetation native to the Sandhills physiographic region in North Carolina. All instances of concrete and rip-rap as conveyance measures should be eliminated as possible. Compact Weir Outfalls (CWOs) should be utilized instead of rip-rap for outlet energy dissipation. Bioretention areas, constructed wetlands, and vegetated swales (all utilizing native shrubs) should be implemented throughout the project. Nonnative vegetation outside of the immediate shoulder should be eliminated from the design to minimize (and generally eliminate) herbicide, pesticide, fertilizer, and other installation maintenance amendment requirements. Mowing should only be undertaken along the immediate shoulder except as needed to control the growth of large trees in the shrub fringe. Mowing heights in all areas should be maximized.

DRAFT

- E. Permit condition #5 of the 401WQC indicates the project must comply with High Quality Waters [15A NCAC 2B .0224]. This regulation requires both temporary and permanent Best Management Practices for erosion and sedimentation control as well as stormwater management. The plans indicate that the relevant erosion and sedimentation control measures (particularly suspended particulate removal) have not been incorporated into the project design. Additionally, the plans indicate that no stormwater Best Management Practices (permanent systems to minimize negative water quality impacts) have been incorporated into the project design.
- It is recommended that temporary and permanent Best Management Practices for erosion and sedimentation control as well as stormwater management be developed and implemented for the project. Temporary sedimentation control measures should be chambered and utilize flocculants as needed to remove suspended sediments.
- F. Permit condition #7 of the 401WQC requires Hazardous Spill Catch Basins (HSCBs) at all stream crossings and final designs for such Hazardous Spill Catch Basins shall be submitted to the Division of Water Quality 401 Wetlands Unit (DWQ401) prior to the beginning of construction. It seems that these Hazardous Spill Catch Basins have not been designed nor such designs submitted to the Division of Water Quality 401 Wetlands Unit.
- It is recommended that Hazardous Spill Catch Basins be designed in coordination with the Division of Water Quality and implemented in the project at the appropriate time.
- G. Permit condition #8 of the 401WQC indicates, "bridge decking shall not discharge stormwater directly into the receiving water". It appears that stormwater runoff from the bridge decking will be routed to a collection system and then discharged directly into surface waters.
- It is recommended that stormwater runoff from bridge decking be routed to appropriate Best Management Practice measures as part of the overall stormwater management system.
- H. Permit condition #9 of the 401WQC indicates that a maintenance plan for all stormwater management facilities and Hazardous Spill Catch Basins be submitted to the Division of Water Quality 401 Wetlands Unit. It appears that no stormwater facility maintenance plan has been developed. It also seems that no maintenance plan could have been developed for the Hazardous Spill Catch Basins as these appear yet to be designed.
- It is recommended that a management plan be developed for all stormwater management facilities and Hazardous Spill Catch Basins in coordination with the Division of Water Quality.

- I. Permit condition #13 of the 401WQC indicates, "design and placement of culverts and other structures including temporary erosion control measures shall not be conducted in such a manner that may result in dis-equilibrium of wetlands or stream beds or banks, adjacent to or upstream and downstream of the above structures". It appears that no analyses to assess such potential dis-equilibrium has been undertaken.
- It is recommended that analyses to assess potential dis-equilibrium of streams and wetlands be undertaken. Such analyses should include integrated hydraulic, hydrologic, and sediment mathematical response modeling relative to each structure over a multi-year (generally 20+ years) simulated time span.
- J. Permit condition #15b of the 401WQC indicates that 1,154 linear feet of on-site stream relocation/restoration shall be designed based on "field measurements of an unimpacted section of stream (reference reach)." As the project construction will alter the hydrologic and hydraulic response of the stream system, this methodology likely oversimplifies the system analysis and design relative to various stream reaches affected by the project.
- It is recommended that the design methodology for stream relocation/restoration (analog, empirical, or analytical) should be site specific. All such designs should incorporate an analysis of watershed hydrologic and sedimentologic response over the lifetime of the project.
- K. Permit condition #15b of the 401WQC further indicates, "until plans are received and approved for the stream relocation using natural channel design, wetland or stream fill shall not occur". It seems that these plans have not been received and approved by the Division of Water Quality 401 Wetlands Unit.
- It is recommended that stream relocation plans be developed in conjunction with a stormwater management system for the project. These should be developed in coordination with the Division of Water Quality.

Little River On-Site Restoration Plan

Improvements and Widening to US 1
From North of Lakeview to South of Sanford
TIP No. R-210



North Carolina Department of Transportation
Division of Highways
Project Development and Environmental Analysis Branch
Natural Systems Unit

February 2001

1.0 Introduction

The North Carolina Department of Transportation (NCDOT) proposes to construct a four-lane divided freeway tying into the existing US 1 four-lane facility south of Camp Easter Road (SR 1853)/ Aiken Road (SR 2175) in Moore County to Wild Life Road (SR 1180) in Lee County. As part of the project mitigation, a restoration effort will be undertaken at the current US 1 crossing of the Little River.

1.1 Wetland Resources

Wetlands were delineated by NCDOT consultants using the "Corps of Engineers Wetlands Delineation Manual" (1987). Mr. Jeff Richter, of the U.S. Army Corps of Engineers Wilmington office, verified the delineation on March 2, 1995.

The Little River and the associated wetlands within the floodplain are very high quality. Despite the construction of a 1308-foot bridge, the proposed project will impact 4.7 acres of these wetlands. A temporary bridge will be used to construct the bridge over the Little River and the wetlands.

1.2 Summary of Mitigation

Construction of the 1308-foot bridge over the Little River and floodplain coupled with the removal of the existing US 1 bridge and causeway will allow NCDOT to restore 6.4 acres of floodplain and wetlands. The 6.4 acres includes 4.3 acres of fill that currently makes up the existing causeway (areas 1a, 2a, 2b, 2c) and 2.1 acres of remnant fill (areas 1c, 1b, 3) that was likely deposited during construction of the existing road. Besides restoring this 6.4 acres back to its original elevation, the hydraulic connectivity of the active floodplain, which is currently blocked by the existing road and causeway, will be restored. In addition, 8.4 acres of adjacent, remnant wetland parcels are being included as a preservation component.

2.1 Site Description

There are many parcels making up the site. Each parcel, as well as some other areas, has been assigned a circled number and the acreage calculated as shown on Figure 1. Following is a description of each area:

- 1a – Existing road bed on the west side of the bridge and extending back to the wetland boundary and proposed end bent
- 1b – Filled area within DOT right-of-way that will be restored to existing floodplain elevation
- 1c – Filled area beyond DOT right-of-way that will be restored to existing floodplain elevation

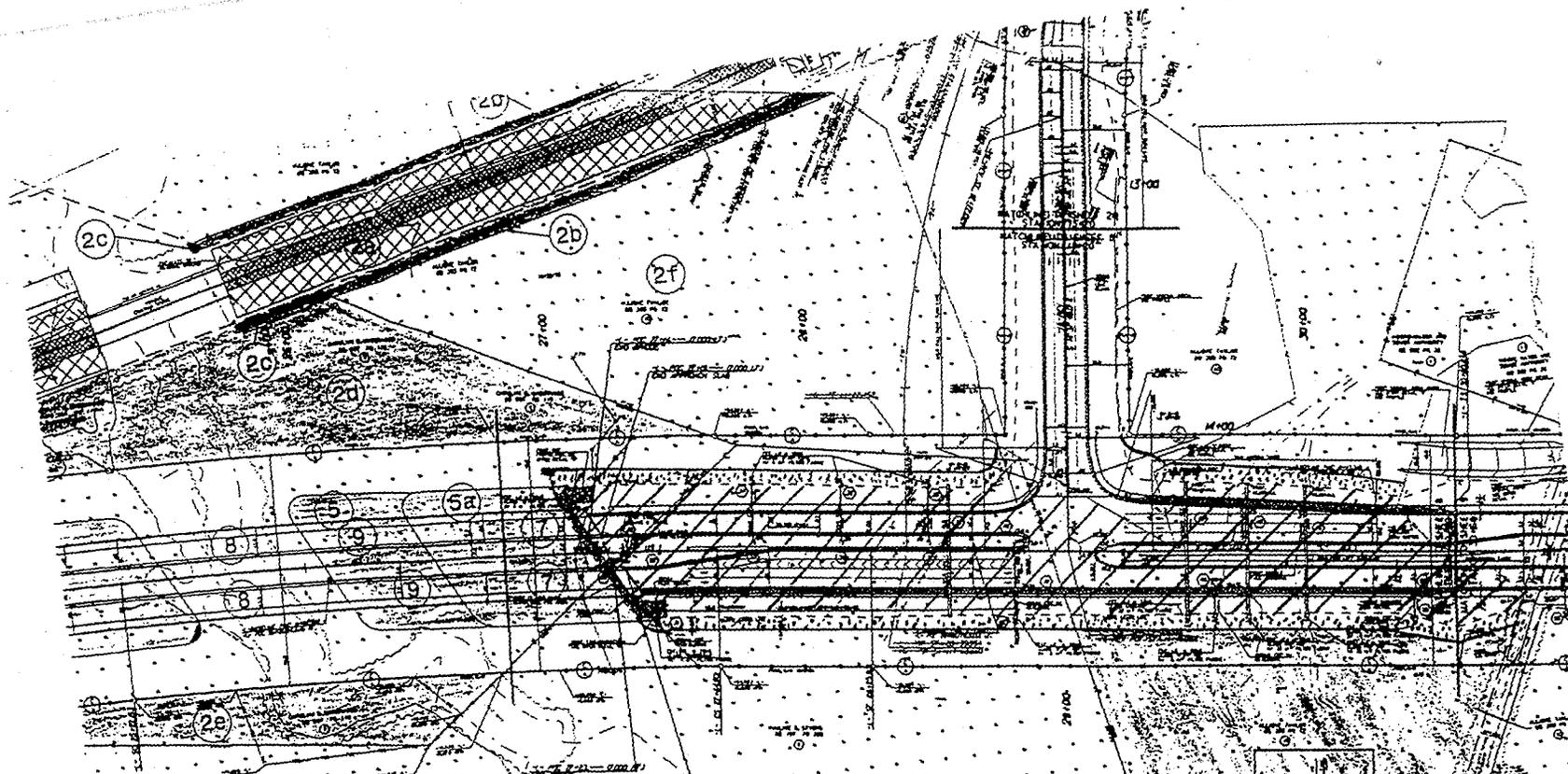
- 2a - Existing road bed on the east side of the bridge and extending back to the wetland boundary on either side of the old road bed.
- 2b - Small sliver of road fill that is beyond DOT right-of-way that will be restored to existing floodplain elevation
- 2c - Small sliver of road fill that is beyond DOT right-of-way that will be restored to existing floodplain elevation
- 2d - Remnant parcel of existing wetlands and a portion of the Little River that will be preserved
- 2e - Remnant parcel of existing wetlands and a portion of the Little River that will be preserved
- 3 - Filled area within DOT right-of-way that will be restored to existing floodplain elevation
- 4 - Wetland impacts that will be avoided by construction of the elongated bridge
- 5 - Wetland impacts that will be avoided by construction of the elongated bridge
- 5a - Wetland impacts that will be avoided by construction of the elongated bridge
- 6 - Remnant parcel of existing wetlands that will be preserved

The floodplain wetland adjacent to the Little River is characterized as bottomland hardwood according to the North Carolina Department of Environment, Health, and Natural Resources, Division of Environmental Management; Field Guide to North Carolina Wetlands (Report No. 96-01, 1996) but also has many trees typical of swamp forests. Dominant vegetation includes water tupelo (*Nyssa aquatica*), willow oak (*Quercus phellos*), sycamore (*Platanus occidentalis*), loblolly pine (*Pinus taeda*), red maple (*Acer rubrum*) and bald cypress (*Taxodium distichium*). The soils are mapped by the Soil Survey of Moore County, (NRCS, 1995) as the Wehadkee series, which is a hydric mineral soil that forms from recent alluvial sediment and is frequently flooded.

2.2 Methodology

The goal of the mitigation plan is to re-establish a wetland community as described in the Field Guide to North Carolina Wetlands. The 6.4 acres identified above and shown in Figure 1 will be graded down to an elevation of 74.5 feet, which is an average elevation from the surrounding floodplain wetland. The area will then be planted as detailed in the Wetland Reforestation Detail Sheet, which is attached. It is anticipated that this will restore 6.4 acres of high quality floodplain wetlands and restore much of the historical sheet flow of floodwaters across the flood plain.

Most of the grading work is expected to be performed in Spring 2004 since traffic will have to be maintained on the existing road until the new facility is completed. Therefore, the planting and monitoring will not take place until the 2005 growing season.



- 1a = 2.338 ACRE
- 1b = 0.581 ACRE
- 1c = 0.589 ACRE
- 2a = 1.602 ACRE
- 2b = 0.368 ACRE
- 2c = 0.043 ACRE
- 2d = 1.752 ACRE
- 2e = 1.025 ACRE
- 2f = 4.874 ACRE
- 3 = 0.900 ACRE
- 4 = 1.97 ACRE
- 5 = 0.586 ACRE

- 7 BRIDGE - PROPOSED EXTENSION REQUIRED TO OBTAIN 3, 4 & 5a
- 8 BRIDGE - ORIGINAL BRIDGE LOCATION REQUIRED CHANNEL CHANGE OF LITTLE RIVER
- 9 BRIDGE - EXTENDED ORIGINAL STRUCTURE TO ELIMINATE CHANNEL CHANGE AND OBTAIN 5

1. Scale of drawing: 1" = 100' (Horizontal) 1" = 20' (Vertical)
 2. Date of drawing: 11/1/58
 3. Project Name: Little River Bridge
 4. Drawing No.: 100-100-100-100
 5. Revision: 1
 6. Author: J. H. Smith
 7. Check: J. H. Smith
 8. Title: Bridge Plan
 9. Notes: See notes on sheet 100-100-100-100-100

2.3 Monitoring

Hydrologic monitoring will occur throughout the growing season in the wetland area. Two groundwater gauges will be placed on either side of the river in the restored wetland. Hydrology will be monitored by using 40-inch groundwater gauges. Success will be based on saturation or inundation within 12 inches of the soil surface for a consecutive 12.5% of the growing season during years of normal rainfall.

Vegetation monitoring will be based on visual observation of plant establishment and recorded using photo reference points. Stem count, species composition, and plant health will be recorded annually at the end of the growing season. Success will be based on survival of 320 trees per acre in year three with a target survival of 260 trees per year in year five.

3.0 Mitigation Credit

The site is expected to generate 6.4 acres of restoration and 8.4 acres of preservation. All of the wetland preservation and 4.7 acres of the restoration are going to be used to compensate for the 4.7 acres of high quality impact that will result from construction of US 1 (TIP R-210) across this floodplain. The remaining 1.7 acres of restoration is anticipated to be used to compensate for impacts associated with the Sanford Bypass (R-2417).

3.1 Final Dispensation of Property

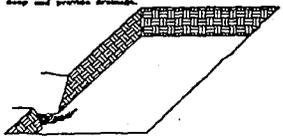
NCDOT will retain ownership of the mitigation site until all monitoring requirements are fulfilled and an appropriate recipient is identified. If and when the deed is transferred, restrictions will be placed on the property to ensure protection in perpetuity.

PLANTING DETAILS

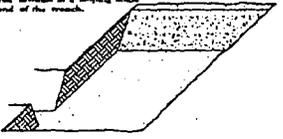
SEEDLING / LINER BAREROOT PLANTING DETAIL

HEALING IN

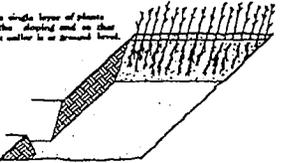
1. Locate a healing-in site in a shady, well protected area.
2. Excavate a flat bottom trench 300mm deep and provide drainage.



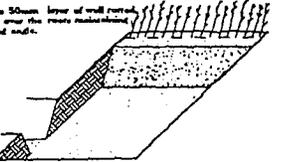
3. Backfill the trench with 50mm well sorted gravel. Place a 50mm layer of well sorted gravel at a sloping angle at one end of the trench.



4. Place a single layer of plants against the sloping end so that the root collar is at ground level.

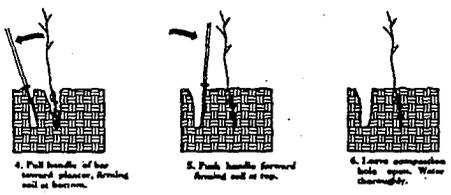


5. Place a 50mm layer of well sorted gravel over the roots maintaining a sloping angle.



6. Repeat layers of plants and gravel as necessary and water thoroughly.

DIBBLE PLANTING METHOD USING THE KBC PLANTING BAR



PLANTING NOTES:

PLANTING BAG
Living plantling seedlings shall be kept in a plastic nursery bag or similar container to prevent the roots from drying.



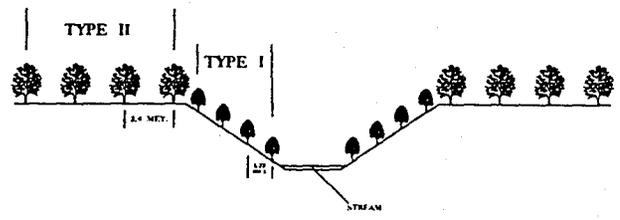
KBC PLANTING BAR
Planting bar shall have a blade with a triangular cross section, and shall be 300mm long, 100mm wide and 25mm thick at center.



ROOT PRUNING
All seedlings shall be root pruned, if necessary, so that no roots extend more than 250mm below the root collar.

- TYPE 1 STREAMBANK REFORESTATION SHALL BE PLANTED 0.9m TO 1.52m ON CENTER, RANDOM SPACING, AVERAGING 1.22m ON CENTER, APPROXIMATELY 6726 PLANTS PER HECTARE.
- TYPE 2 STREAMBANK REFORESTATION SHALL BE PLANTED 1.8m TO 3.0m ON CENTER, RANDOM SPACING, AVERAGING 2.4m ON CENTER, APPROXIMATELY 1680 PLANTS PER HECTARE.
- NOTE: TYPE 1 AND TYPE 2 STREAMBANK REFORESTATION SHALL BE PAID FOR AS "STREAMBANK REFORESTATION"

STREAMBANK REFORESTATION TYPICAL



STREAMBANK REFORESTATION

MIXTURE, TYPE, SIZE, AND FURNISH SHALL CONFORM TO THE FOLLOWING:

TYPE 1			
50% SALIX NIGRA	BLACK WILLOW	300mm - 460mm	BR
50% CORNUS AMOMUM	SILKY DOGWOOD	300mm - 460mm	BR
TYPE 2			
25% LIQUIDAMBAR STYRACIFLUA	SWEETGUM	300mm - 460mm	BR
25% PLATANUS OCCIDENTALIS	SYCAMORE	300mm - 460mm	BR
25% PRUNUS SEROTINA	BLACK CHERRY	300mm - 460mm	BR
25% BETULA NIGRA	RIVER BIRCH	300mm - 460mm	BR

- SEE PLAN SHEETS FOR AREAS TO BE PLANTED