

PROJECT SPECIAL PROVISION

(10-18-95)

Z-1

PERMITS

The Contractor's attention is directed to the following permits, which have been issued to the Department of Transportation by the authority granting the permit.

PERMIT

AUTHORITY GRANTING THE PERMIT

Dredge and Fill and/or Work in Navigable Waters (404)	U. S. Army Corps of Engineers
Water Quality (401)	Division of Environmental Management, DENR State of North Carolina

The Contractor shall comply with all applicable permit conditions during construction of this project. Those conditions marked by * are the responsibility of the department and the Contractor has no responsibility in accomplishing those conditions.

Agents of the permitting authority will periodically inspect the project for adherence to the permits.

The Contractor's attention is also directed to Articles 107-10 and 107-14 of the *Standard Specifications* and the following:

Should the Contractor propose to utilize construction methods (such as temporary structures or fill in waters and/or wetlands for haul roads, work platforms, cofferdams, etc.) not specifically identified in the permit (individual, general, or nationwide) authorizing the project it shall be the Contractor's responsibility to coordinate with the Engineer to determine what, if any, additional permit action is required. The Contractor shall also be responsible for initiating the request for the authorization of such construction method by the permitting agency. The request shall be submitted through the Engineer. The Contractor shall not utilize the construction method until it is approved by the permitting agency. The request normally takes approximately 60 days to process; however, no extensions of time or additional compensation will be granted for delays resulting from the Contractor's request for approval of construction methods not specifically identified in the permit.

Where construction moratoriums are contained in a permit condition which restricts the Contractor's activities to certain times of the year, those moratoriums will apply only to the portions of the work taking place in the waters or wetlands provided that activities outside those areas is done in such a manner as to not affect the waters or wetlands.

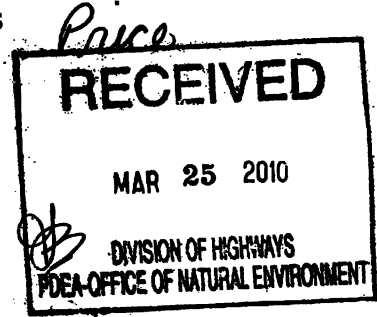
277

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



REPLY TO
ATTENTION OF:

March 18, 2010



Regulatory Division

Subject: Action ID No. SAW-2002-20899

Gregory J. Thorpe, Ph.D.
Environmental Management Director
Project Development & Environmental Analysis
1598 Mail Service Center
Raleigh, North Carolina 27699-1598

Dear Dr. Thorpe:

I am responding to your requests dated July 24, 2009 and November 6, 2009 for modifications to the existing Department of the Army (DA) permit issued May 8, 2002, with modifications for the individual sections issued through March 25, 2009 for the construction of the Sanford Bypass (U.S. 421/NC 87 from west of SR 1400 to west of U.S. 1/15/501) in Lee County, North Carolina. Your November 6, 2009 letter is requesting additional impacts associated with a lengthening of a service road at Site 9 to accommodate access for an adjacent property owner. Your July 24, 2009 letter is requesting a permit extension and approval of final design for Section AA.

The referenced Section 404 permit authorized permanent impacts to 11.06 acres of jurisdictional wetlands, 23,640 linear feet of tributaries and 6.32 acres of open water. Due to access problems, conditions in the field and required stabilization measures, permanent impacts for Section C have increased by 0.04 acres of jurisdictional wetlands and Section AA has increased by 0.20 acres of jurisdictional wetlands and 169 linear feet of tributaries and temporary impacts increased to 477 linear feet of tributaries. Coupled with impacts in the previously issued permit and modifications, the total permanent impacts authorized for R-2417, are 12.03 acres of jurisdictional wetlands, 24,209 linear feet of tributaries and 6.32 acres of open water. All impacts described in the March 25, 2009 permit modification for Section C are valid with the addition of 0.04 acres of jurisdictional wetlands at Site 9. The authorized impact areas for Section AA are described in the table below and depicted on the attached plans:

Site Number	Station Number	Impact Type	Permanent Wetland Impacts (acres)	Permanent Open Water Impacts (acres)	Permanent Tributary Impacts (linear feet)	Temporary Tributary Impacts (linear feet)
1	L 22+30/26+80 (LT)	Roadway embankment	0.04			
1	L 23+32 (RT)	Bank Stabilization			10	20
2	L 33+00/33+65 (LT)	Roadway embankment	0.42			
2a	L 33+00/33+65 (LT)	42" CMP w/52" STL suppl			816	14
2b	L 33+00/33+65 (RT)	42" CMP w/52" STL suppl			274	15
3	L 35+20/36+30 (RT)	Roadway embankment	0.12			
4	L 52+08 (LT/RT) & L 63+00 (RT)	Bank Stabilization			44	57
5	L 87+90 (LT/RT)	54" RCP			265	47
5	L 87+90 (LT/RT)	Bank Stabilization			30	
6	L 120+20 (LT)	36" RCP			140	55
6	L 120+57 (LT/RT)	8' by 6' RCBC			216	83
6	L 120+57 (LT/RT)	Bank Stabilization			104	
7	L 142+67 (LT/RT)	8' by 6' RCBC			351	66
8	L 153+50/160+00 (RT)	54" RCP	0.82			
9	L 177+29 (LT/RT)	(2) 9' by 7" RCBC	0.18		375	60
9	L 177+29 (LT/RT)	Bank Stabilization			50	
9	L 178+82 (LT)	54" RCP			80	30
10	L 194+60/196+10 (LT/RT)	36" RCP		0.66		
10	L 195+65 (RT)	36" RCP			16	30
Total Permanent Impacts			1.58	0.66	2771	477

The referenced Section 404 permit is scheduled to expire on December 31, 2013. Two sections remain to be constructed and require a time extension until January 31, 2015 to complete construction on these remaining sections.

I have determined that the proposed project modifications described above are not contrary to the public interest and therefore, the DA permit is hereby modified with the attached Special Conditions.

Please note that all unmodified terms and conditions of your original Department of the Army permit and all previous modifications shall remain in effect.

Should you have any questions, please contact Ms. Kimberly Garvey, Wilmington Field Office, Regulatory Division, at telephone (910) 251-4482.

Sincerely,



For Jefferson M. Ryscavage
Colonel, U. S. Army
District Commander

Enclosure

Copies furnished (with enclosures):

Mr. Greg Price
NCDOT, PDEA ✓
1548 Mail Service Center
Raleigh, North Carolina, 27699-1548

Mr. Brian Wrenn
NCDENR DWQ
1650 Mail Service Center
Raleigh, NC 27699-1650

Mr. Travis W. Wilson
NC Wildlife Resource Commission
1142 I-85 Service Rd.
Creedmoor, North Carolina 27522

Mr. Pete Benjamin
U.S. Fish and Wildlife Service
Raleigh Field Office
Post Office Box 33726
Raleigh, North Carolina 27636-3726

Mr. Chris Militcher
United States Environmental Protection Agency
c/o Federal Highway Administration
310 New Bern Avenue
Raleigh, North Carolina 27601

Mr. Art King
Division Environmental Officer, Division 8
North Carolina Department of Transportation
P.O. Box 1067
Aberdeen, North Carolina 28315

SPECIAL CONDITIONS; SAW-2002-20899

1. Failure to institute and carry out the details of the following special conditions below will result in a directive to cease all ongoing and permitted work within waters of the United States, including wetlands, associated with the permitted project, or such other remedies and/or fines as the U.S. Army Corps of Engineers District Commander or his authorized representatives may seek.
2. In accordance with 33 U.S.C. 1341 (d), all conditions of the North Carolina Division of Water Quality 401 Certification are incorporated as part of the Department of the Army permit. Therefore, they are not listed as special conditions. The following Special Conditions will be added to the permit.
3. All work authorized by this permit must be prepared in strict compliance with the attached plans, which are part of this permit.
- * 4. Special Condition b shall be modified to include: "The permittee shall mitigate for the additional 0.79 acres of unavoidable impacts to wetlands, and for the additional 259 linear feet of impact to important streams, associated with section R-2417C of the project. Mitigation shall be provided by the North Carolina Ecosystem Enhancement Program (NCEEP) within the Cape Fear River Basin (Cataloging Unit 03030004). The EEP will provide 1.58 acres of riparian wetland credits and 518 linear feet of warm water stream credits, pursuant to Section X of Amendment Number 2 to the Memorandum of Agreement (MOA) signed 8 March 2007."
5. The permittee and current and subsequent property owners shall maintain the Sandy Creek, Blue Tract, and Deaton Mitigation sites in their natural condition, as altered by work in the mitigation plans, in perpetuity. Prohibited activities within the mitigation sites 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 properties, which will adversely impact the wetlands or streams on the mitigation properties, except as specifically authorized by this permit, or subsequent modifications that are approved by the Corps of Engineers.
6. The permittee shall not sell or otherwise convey any interest in the mitigation properties used to satisfy mitigation requirements for this permit, to any third party, without written approval from the Wilmington Corps of Engineers.
7. Any sale, lease, or other conveyance of the wetland mitigation site properties shall include restrictions on the use of the properties as described in Special Condition 5 above, which conditions shall be enforced by the NCDOT. Such restrictions shall include language providing for third party enforcement rights in favor of the Corps. Such restrictions must be approved by the Corps prior to conveyance.

- * 8. Special Condition ff shall be modified to read: "The permittee shall schedule a preconstruction meeting between its representatives, the contractor's representatives, and the Corps of Engineers, Wilmington Regulatory Field Office, prior to any work within jurisdictional waters and wetlands within Section R-2417AA 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. One copy of the final half-size construction drawings shall be furnished to the Corps of Engineers Project Manager prior to the pre-construction meeting."
9. The time limit for completing the work authorized ends on December 31, 2015. 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.
10. The permittee shall employ "High Quality Waters" sediment and erosion control measures for all portions of the project west of SR 1415.
11. Prior to commencing construction within jurisdictional waters of the United States for any section, the permittee shall forward the latest version of the project construction drawings for that section to the Corps of Engineers Project Manager, Wilmington Field Office. Half-size drawings are acceptable.
12. Except as authorized by this permit or any USACE approved modification to this permit, no excavation, fill, or mechanized land-clearing activities shall take place at any time in the construction or maintenance of this project, within waters or wetlands, or shall any activities take place that cause the degradation of waters or wetlands. There shall be no excavation from, waste disposal into, or degradation of, jurisdictional wetlands or waters associated with this permit without appropriate modification of this permit, including appropriate compensatory mitigation. This prohibition applies to all borrow and fill activities connected with this project. In addition, except as specified in the plans attached to this permit, no excavation, fill or mechanized land-clearing activities shall take place at any time in the construction or maintenance of this project, in such a manner as to impair normal flows and circulation patterns within, into, or out of waters or wetlands or to reduce the reach of waters or wetlands.
13. To ensure that all borrow and waste activities occur on high ground and do not result in loss or the degradation of adjacent wetlands and streams, except as authorized by this permit, the permittee shall require its contractors and/or agents to identify all areas to be used to borrow material, or to dispose of dredged, fill, or waste material. The permittee shall ensure that all such areas comply with the preceding condition (#12) 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 (#12). All information will be available to the Corps of Engineers upon request. NCDOT shall require its contractors to complete and execute reclamation plans for each waste and borrow site and provide written documentation that the reclamation plans have been implemented and all work is completed. This documentation will be provided to the Corps of Engineers within 30 days of the completion of the reclamation work.

14. Design and placement of culverts and other structures including temporary erosion control measures shall not be conducted in a manner that may result in disequilibrium of wetlands or streambeds or banks, adjacent to, upstream or downstream of the structures. Culverts shall be placed so that the openings match the natural stream channel wherever possible. Riprap armoring of streams at culvert outlets shall be minimized, including riprap placed above the ordinary high water elevation, in favor of bioengineering techniques such as bank sloping, erosion control matting and revegetation with deep-rooted, woody plants.

* 15. The permittee shall ensure that the construction design plans for this project do not deviate from the permit plans attached to this authorization. Written verification shall be provided that the final construction drawings comply with the attached permit drawings prior to any active construction in waters of the United States, including wetlands. Any deviation in the construction design plans will be brought to the attention of the Corps of Engineers Project Manager, Wilmington Regulatory Field Office prior to any active construction in waters or wetlands.

16. The permittee shall require its contractors and/or agents to comply with the terms and conditions of this permit in the construction and maintenance of this project, and shall provide each of its contractors and/or agents associated with the construction or maintenance of this project with a copy of this permit and any authorized modifications. Copies of this permit and any modifications authorized by the USACE shall be available for review at the construction site at all times. All violations, including non-compliance of these conditions, of the authorized permit shall be reported to the District Engineer within 24 hours of the violation.

17. This permit does not authorize temporary placement or double handling of excavated or fill material within waters or wetlands outside the permitted area.

18. 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. Erosion and sediment control practices must be in full compliance with all specifications governing the proper design, installation and operation and maintenance of such Best Management Practices in order to assure compliance with the appropriate turbidity water quality standards. This shall include, but is not limited to, the immediate installation of silt fencing or similar appropriate devices around all areas subject to soil disturbance or the movement of earthen fill, and the immediate stabilization of all disturbed areas. Additionally, the project must remain in full compliance with all aspects of the Sedimentation Pollution Control Act of 1973 (North Carolina General Statutes Chapter 113A Article 4). Adequate sedimentation and erosion control measures must be implemented prior to any ground disturbing activities to minimize impacts to downstream aquatic resources. These measures must be inspected and maintained regularly, especially following rainfall events. All fill material must be adequately stabilized at the earliest practicable date to prevent sediment from entering into adjacent waters or wetlands.

19. 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.

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

21. The permittee shall install barrier fencing or other acceptable forms of barrier around all wetlands that are not to be disturbed to make them readily visible and prevent construction equipment from inadvertently entering and disturbing the wetland areas that are to remain undisturbed.

22. All mechanized equipment will be regularly inspected and maintained to prevent contamination of waters and wetlands from fuels, lubricants, hydraulic fluids, or other toxic materials. No equipment staging or storage of construction material will occur in wetlands. Hydro-seeding equipment will not be discharged or washed out into any surface waters or wetlands. In the event of a spill of petroleum products or any other hazardous waste, the permittee shall immediately report it to the N.C. Division of Water Quality at (919) 733-5083 or (800) 662-7956 and provisions of the North Carolina Oil Pollution and Hazardous Substances Control Act will be followed.

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

24. 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.

25. Unless otherwise authorized by this permit, all fill material placed in waters or wetlands shall be generated from an upland source and will be clean and free of any pollutants except in trace quantities. Metal products, organic materials (including debris from land clearing activities), or unsightly debris will not be used.

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

27. 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.



November 5, 2009

Ms. Kimberly Garvey
 U. S. Army Corps of Engineers
 Wilmington Regulatory Field Office
 Post Office Box 1890
 Wilmington, North Carolina 28402-1890

Dear Ms. Garvey:

Subject: EEP Mitigation Acceptance Letter:

R-2417AA, US 421/NC 87 (Sanford Bypass) from west of SR 1400 to near US 1/15/501, Lee County;
 Cape Fear River Basin (Cataloging Unit 03030003); Southern Piedmont (SP) Eco-Region

The purpose of this letter is to notify you that the Ecosystem Enhancement Program (EEP) will provide the stream and riparian wetland mitigation for the unavoidable impact associated with the above referenced project. This mitigation acceptance letter replaces the mitigation acceptance letter issued on May 4, 2009. Based on the information supplied by the NCDOT on November 3, 2009, the impacts are located in CU 03030003 of the Cape Fear River Basin in the Southern Piedmont (SP) Eco-Region, and the anticipated mitigation credits needed to offset the impacts are as follows:

Cape Fear 03030003 SP	Stream			Wetlands			Buffer (Sq. Ft.)	
	Cold	Cool	Warm	Riparian	Non-Riparian	Coastal Marsh	Zone 1	Zone 2
Impacts (feet/acres)	0	0	15 (2:1) 184 (1:1)	0.20	0	0	0	0
Mitigation Units Credits-up to 2:1 Credits at 1:1	0	0	30 184	0.40	0	0	0	0

Mitigation associated with this project will be provided in accordance with Section X of Amendment No. 2 to the Memorandum of Agreement between the N. C. Department of Environment and Natural Resources, the N. C. Department of Transportation, and the U. S. Army Corps of Engineers fully executed on March 8, 2007 (Tri-Party MOA). EEP commits to implement sufficient stream and riparian wetland mitigation in the appropriate cataloging unit in the amount listed in the above table to offset the impacts associated with this project by the end of the MOA year in which this project is permitted. If the above referenced impact amounts are revised, then this mitigation acceptance letter will no longer be valid and a new mitigation acceptance letter will be required from EEP.

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

Sincerely,

William D. Gilmore, P.E.
 EEP Director

cc: Mr. Gregory J. Thorpe, Ph.D., NCDOT-PDEA
 Mr. Brian Wrenn, Division of Water Quality, Wetlands/401 Unit
 File: R-2417AA Revised

Restoring... Enhancing... Protecting Our State





November 5, 2009

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

Dear Dr. Thorpe:

Subject: EEP Mitigation Acceptance Letter:

R-2417AA, US 421/NC 87 (Sanford Bypass) from west of SR 1400 to near US 1/15/501, Lee County

The purpose of this letter is to notify you that the Ecosystem Enhancement Program (EEP) will provide the stream and riparian wetland mitigation for the subject project. This mitigation acceptance letter replaces the mitigation acceptance letter issued on May 4, 2009. Based on the information supplied by you on November 3, 2009, the impacts are located in CU 03030003 of the Cape Fear River Basin in the Southern Piedmont (SP) Eco-Region, and are as follows:

Cape Fear 03030003 SP	Stream			Wetlands			Buffer (Sq. Ft.)	
	Cold	Cool	Warm	Riparian	Non-Riparian	Coastal Marsh	Zone 1	Zone 2
Impacts (feet/acres)	0	0	15 (at 2:1) 184 (at 1:1)	0.20	0	0	0	0
Mitigation Units Credits-up to 2:1 Credits at 1:1	0	0	30 (2:1) 184 (1:1)	0.40	0	0	0	0

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

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

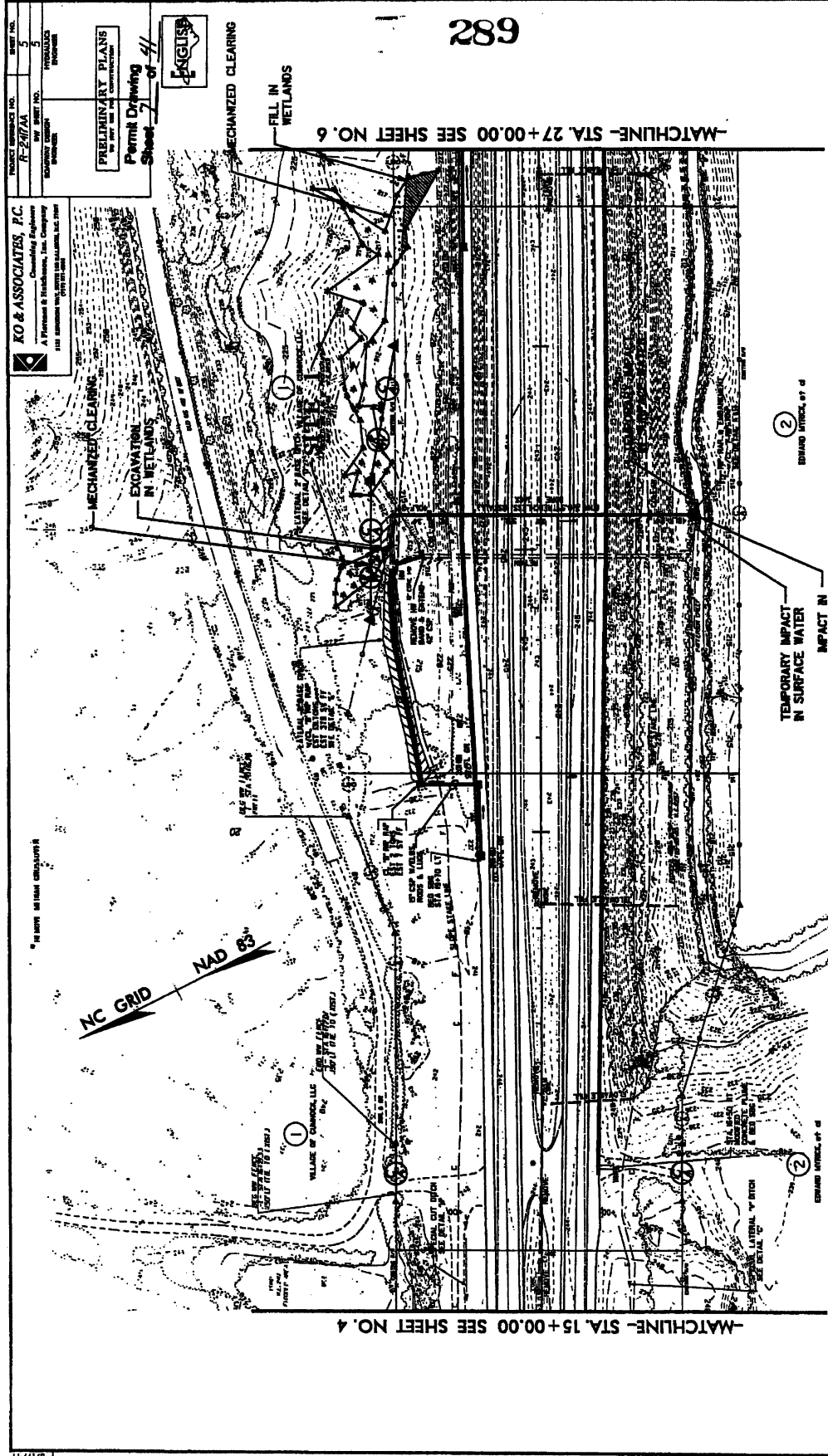
Sincerely,

William D. Gilmore, P.E.
 EEP Director

cc: Ms. Kimberly Garvey, USACE – Wilmington Regulatory Field Office
 Mr. Brian Wrenn, Division of Water Quality, Wetlands/401 Unit
 File: R-2417AA

Restoring... Enhancing... Protecting Our State





NC DOT
 DIVISION OF HIGHWAYS
 LEE COUNTY
 PROJECT: I-85 CORRIDOR
 US 40-NC BY PASSENGER
 BYPASS FROM WEST
 OF BR 1400 TO WEST
 OF BR 1415-481

LEGEND

- WETLAND
- TEMPORARY IMPACTS IN SURFACE WATER
- IMPACTS IN SURFACE WATER
- MECHANIZED CLEARING
- EXCAVATION IN WETLAND
- FILL IN WETLAND
- TEMPORARY IMPACTS IN SURFACE WATER (BANK STABILIZATION)
- IMPACT IN SURFACE WATER
- EMBANKMENT, FT d

PLAN VIEW SITE 1

0 50 100
 SCALE: 1" = 100' HORIZ.

PROJECT NUMBER: R-2011AA
 SHEET NO. 5
 DATE: 10/20/11
 DRAWN BY: J. HARRIS
 CHECKED BY: J. HARRIS

PRELIMINARY PLANS
 Permit Drawing
 Sheet 2 of 4

KO & ASSOCIATES, P.C.
 Consulting Engineers
 A Division of HICKOKS, Inc. Company
 111 EASTMAN WAY
 WARRINGTON, NC 27888

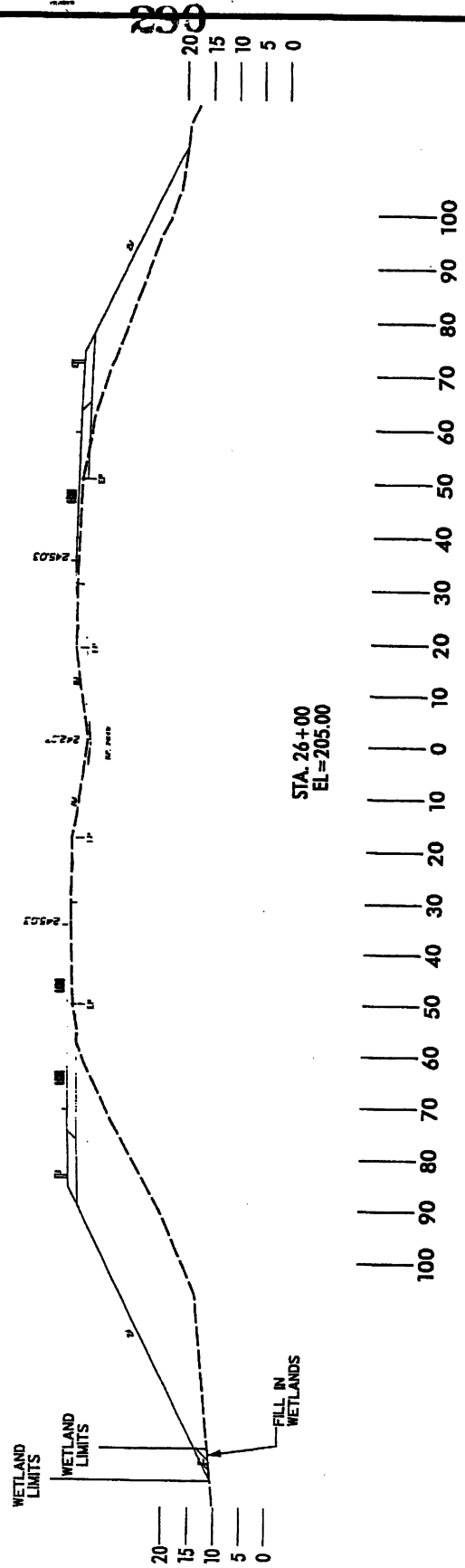
1/17/11

2-4-11 Permit & Name Change
 2-4-11 Added CA to existing access points - parcels 1 & 2

PROJECT NUMBER: 14-241/AA
 SHEET NO. 7-374
 CONTRACT NUMBER: 14-241/AA
 DRAWING NUMBER: 7-374
 PRELIMINARY PLANS
 IN PREP. FOR CONSTRUCTION



Permit Drawing
 Sheet 9 of 41



NC DOT
 DIVISION OF HIGHWAYS
 LEE COUNTY
 PROJECT: 1446112 (R-241/AA)
 US 421-NC BY SANFORD
 BYPASS FROM WEST
 OF SR 1400 TO WEST

**TYPICAL X-SECTIONS
 SITE 1**

LEGEND
 --- WLB --- WETLAND
 DENOTES FILL
 IN WETLAND

KO & ASSOCIATES, P.C.
 Consulting Engineers
 1111 W. PINE AVE. SUITE 111
 CHICAGO, ILL. 60607
 PHONE: 312.467.1111
 FAX: 312.467.1111

PRELIMINARY PLANS
 FOR THE
 CONSTRUCTION

PROJECT NUMBER: **R-2471A**
 HYDRAULIC
 DRAWING

DATE: 11/11/03
 BY: [Signature]
 CHECKED: [Signature]

* MILL EXISTING PAVEMENT ADJACENT TO BRIDGE
 * SEE MILLING IN PLAN SHEET 111.2

15' OVERLAY
 1" & 1" LAYERS

* BEGIN OVERLAY
 STA. 9+69.00

BEGIN GRADE RT. LN.
 STA. 12+00.00

BEGIN GRADE LT. LN.
 STA. 12+00.00

BEGIN GRADE RT. LN.
 STA. 14+00.00

BEGIN GRADE LT. LN.
 STA. 14+00.00

BEGIN GRADE RT. LN.
 STA. 16+00.00

BEGIN GRADE LT. LN.
 STA. 16+00.00

BEGIN GRADE RT. LN.
 STA. 18+00.00

BEGIN GRADE LT. LN.
 STA. 18+00.00

BEGIN GRADE RT. LN.
 STA. 20+00.00

BEGIN GRADE LT. LN.
 STA. 20+00.00

BEGIN GRADE RT. LN.
 STA. 22+00.00

BEGIN GRADE LT. LN.
 STA. 22+00.00

PI = 22+50.00
 EL = 242.25
 K = 1.50
 DS = 70 MPH

PI = 13+50.00
 EL = 242.25
 K = 1.50
 DS = 70 MPH

PI = 15+50.00
 EL = 242.25
 K = 1.50
 DS = 70 MPH

PI = 17+50.00
 EL = 242.25
 K = 1.50
 DS = 70 MPH

PI = 19+50.00
 EL = 242.25
 K = 1.50
 DS = 70 MPH

PI = 21+50.00
 EL = 242.25
 K = 1.50
 DS = 70 MPH

PI = 23+50.00
 EL = 242.25
 K = 1.50
 DS = 70 MPH

Pipe Hydraulic Data
 STA. 11+00.00
 CHANGE AREA: 150' x 150'
 DESIGN FLOW: 150 CFS
 DESIGN VELOCITY: 1.50 FPS
 DESIGN HEAD LOSS: 0.50 FT
 DESIGN POWER: 150 HP
 DESIGN TORQUE: 150 FT-LB
 DESIGN MOMENT: 150 FT-LB
 DESIGN STRESS: 150 PSI
 DESIGN STRAIN: 150 IN/IN
 DESIGN DEFLECTION: 150 IN
 DESIGN SETTLEMENT: 150 IN
 DESIGN CRACKING: 150 IN
 DESIGN CURVATURE: 150 1/IN
 DESIGN TORSION: 150 FT-LB
 DESIGN VIBRATION: 150 IN/IN
 DESIGN ACCELERATION: 150 G
 DESIGN WIND SPEED: 150 MPH
 DESIGN SNOW LOAD: 150 PSF
 DESIGN ICE LOAD: 150 PSF
 DESIGN TEMPERATURE: 150 F
 DESIGN HUMIDITY: 150 %
 DESIGN SOLAR RADIATION: 150 BTU/HR-FT²
 DESIGN SOUND LEVEL: 150 DB
 DESIGN VIBRATION: 150 IN/IN
 DESIGN ACCELERATION: 150 G
 DESIGN WIND SPEED: 150 MPH
 DESIGN SNOW LOAD: 150 PSF
 DESIGN ICE LOAD: 150 PSF
 DESIGN TEMPERATURE: 150 F
 DESIGN HUMIDITY: 150 %
 DESIGN SOLAR RADIATION: 150 BTU/HR-FT²
 DESIGN SOUND LEVEL: 150 DB

Pipe Hydraulic Data
 STA. 13+00.00
 CHANGE AREA: 150' x 150'
 DESIGN FLOW: 150 CFS
 DESIGN VELOCITY: 1.50 FPS
 DESIGN HEAD LOSS: 0.50 FT
 DESIGN POWER: 150 HP
 DESIGN TORQUE: 150 FT-LB
 DESIGN MOMENT: 150 FT-LB
 DESIGN STRESS: 150 PSI
 DESIGN STRAIN: 150 IN/IN
 DESIGN DEFLECTION: 150 IN
 DESIGN SETTLEMENT: 150 IN
 DESIGN CRACKING: 150 IN
 DESIGN CURVATURE: 150 1/IN
 DESIGN TORSION: 150 FT-LB
 DESIGN VIBRATION: 150 IN/IN
 DESIGN ACCELERATION: 150 G
 DESIGN WIND SPEED: 150 MPH
 DESIGN SNOW LOAD: 150 PSF
 DESIGN ICE LOAD: 150 PSF
 DESIGN TEMPERATURE: 150 F
 DESIGN HUMIDITY: 150 %
 DESIGN SOLAR RADIATION: 150 BTU/HR-FT²
 DESIGN SOUND LEVEL: 150 DB

Pipe Hydraulic Data
 STA. 15+00.00
 CHANGE AREA: 150' x 150'
 DESIGN FLOW: 150 CFS
 DESIGN VELOCITY: 1.50 FPS
 DESIGN HEAD LOSS: 0.50 FT
 DESIGN POWER: 150 HP
 DESIGN TORQUE: 150 FT-LB
 DESIGN MOMENT: 150 FT-LB
 DESIGN STRESS: 150 PSI
 DESIGN STRAIN: 150 IN/IN
 DESIGN DEFLECTION: 150 IN
 DESIGN SETTLEMENT: 150 IN
 DESIGN CRACKING: 150 IN
 DESIGN CURVATURE: 150 1/IN
 DESIGN TORSION: 150 FT-LB
 DESIGN VIBRATION: 150 IN/IN
 DESIGN ACCELERATION: 150 G
 DESIGN WIND SPEED: 150 MPH
 DESIGN SNOW LOAD: 150 PSF
 DESIGN ICE LOAD: 150 PSF
 DESIGN TEMPERATURE: 150 F
 DESIGN HUMIDITY: 150 %
 DESIGN SOLAR RADIATION: 150 BTU/HR-FT²
 DESIGN SOUND LEVEL: 150 DB

Pipe Hydraulic Data
 STA. 17+00.00
 CHANGE AREA: 150' x 150'
 DESIGN FLOW: 150 CFS
 DESIGN VELOCITY: 1.50 FPS
 DESIGN HEAD LOSS: 0.50 FT
 DESIGN POWER: 150 HP
 DESIGN TORQUE: 150 FT-LB
 DESIGN MOMENT: 150 FT-LB
 DESIGN STRESS: 150 PSI
 DESIGN STRAIN: 150 IN/IN
 DESIGN DEFLECTION: 150 IN
 DESIGN SETTLEMENT: 150 IN
 DESIGN CRACKING: 150 IN
 DESIGN CURVATURE: 150 1/IN
 DESIGN TORSION: 150 FT-LB
 DESIGN VIBRATION: 150 IN/IN
 DESIGN ACCELERATION: 150 G
 DESIGN WIND SPEED: 150 MPH
 DESIGN SNOW LOAD: 150 PSF
 DESIGN ICE LOAD: 150 PSF
 DESIGN TEMPERATURE: 150 F
 DESIGN HUMIDITY: 150 %
 DESIGN SOLAR RADIATION: 150 BTU/HR-FT²
 DESIGN SOUND LEVEL: 150 DB

Pipe Hydraulic Data
 STA. 19+00.00
 CHANGE AREA: 150' x 150'
 DESIGN FLOW: 150 CFS
 DESIGN VELOCITY: 1.50 FPS
 DESIGN HEAD LOSS: 0.50 FT
 DESIGN POWER: 150 HP
 DESIGN TORQUE: 150 FT-LB
 DESIGN MOMENT: 150 FT-LB
 DESIGN STRESS: 150 PSI
 DESIGN STRAIN: 150 IN/IN
 DESIGN DEFLECTION: 150 IN
 DESIGN SETTLEMENT: 150 IN
 DESIGN CRACKING: 150 IN
 DESIGN CURVATURE: 150 1/IN
 DESIGN TORSION: 150 FT-LB
 DESIGN VIBRATION: 150 IN/IN
 DESIGN ACCELERATION: 150 G
 DESIGN WIND SPEED: 150 MPH
 DESIGN SNOW LOAD: 150 PSF
 DESIGN ICE LOAD: 150 PSF
 DESIGN TEMPERATURE: 150 F
 DESIGN HUMIDITY: 150 %
 DESIGN SOLAR RADIATION: 150 BTU/HR-FT²
 DESIGN SOUND LEVEL: 150 DB

Pipe Hydraulic Data
 STA. 21+00.00
 CHANGE AREA: 150' x 150'
 DESIGN FLOW: 150 CFS
 DESIGN VELOCITY: 1.50 FPS
 DESIGN HEAD LOSS: 0.50 FT
 DESIGN POWER: 150 HP
 DESIGN TORQUE: 150 FT-LB
 DESIGN MOMENT: 150 FT-LB
 DESIGN STRESS: 150 PSI
 DESIGN STRAIN: 150 IN/IN
 DESIGN DEFLECTION: 150 IN
 DESIGN SETTLEMENT: 150 IN
 DESIGN CRACKING: 150 IN
 DESIGN CURVATURE: 150 1/IN
 DESIGN TORSION: 150 FT-LB
 DESIGN VIBRATION: 150 IN/IN
 DESIGN ACCELERATION: 150 G
 DESIGN WIND SPEED: 150 MPH
 DESIGN SNOW LOAD: 150 PSF
 DESIGN ICE LOAD: 150 PSF
 DESIGN TEMPERATURE: 150 F
 DESIGN HUMIDITY: 150 %
 DESIGN SOLAR RADIATION: 150 BTU/HR-FT²
 DESIGN SOUND LEVEL: 150 DB

SITE 1
 CUT -1-

SITE 1
 CUT -1-

SITE 1
 CUT -1-

SITE 1
 CUT -1-

SITE 1
 CUT -1-

SITE 1
 CUT -1-

SITE 1
 CUT -1-

WETLAND LIMITS

WETLAND LIMITS

WETLAND LIMITS

WETLAND LIMITS

WETLAND LIMITS

WETLAND LIMITS

WETLAND LIMITS

NCDOT
 DIVISION OF HIGHWAYS
 LEE COUNTY
 PROJECT: 4610-10-01
 US 401-NC BY BAYFORD
 BYPASS FROM WEST
 FOR 50' FROM 700' MARK



PROJECT REFERENCE NO. R-3717A
 SHEET NO. 6
 PRELIMINARY PLANS
 IN PART FOR THE CONSTRUCTION
 OF THE
 BYPASS FROM WEST
 OF SR 1400 TO WEST

KO & ASSOCIATES, P.C.
 CONSULTING ENGINEERS
 A FIRM OF B. BRIDGES, INC. COMPANY
 1000 W. WASHINGTON ST., SUITE 100
 RICHMOND, VA 23260
 PHONE (804) 353-1100

WILSON & COMPANY, INC.
 CIVIL ENGINEERS
 1215 W. MAIN ST.
 RICHMOND, VA 23260
 PHONE (804) 353-1100

PERMIT DRAWING
 SHEET 10 OF 41

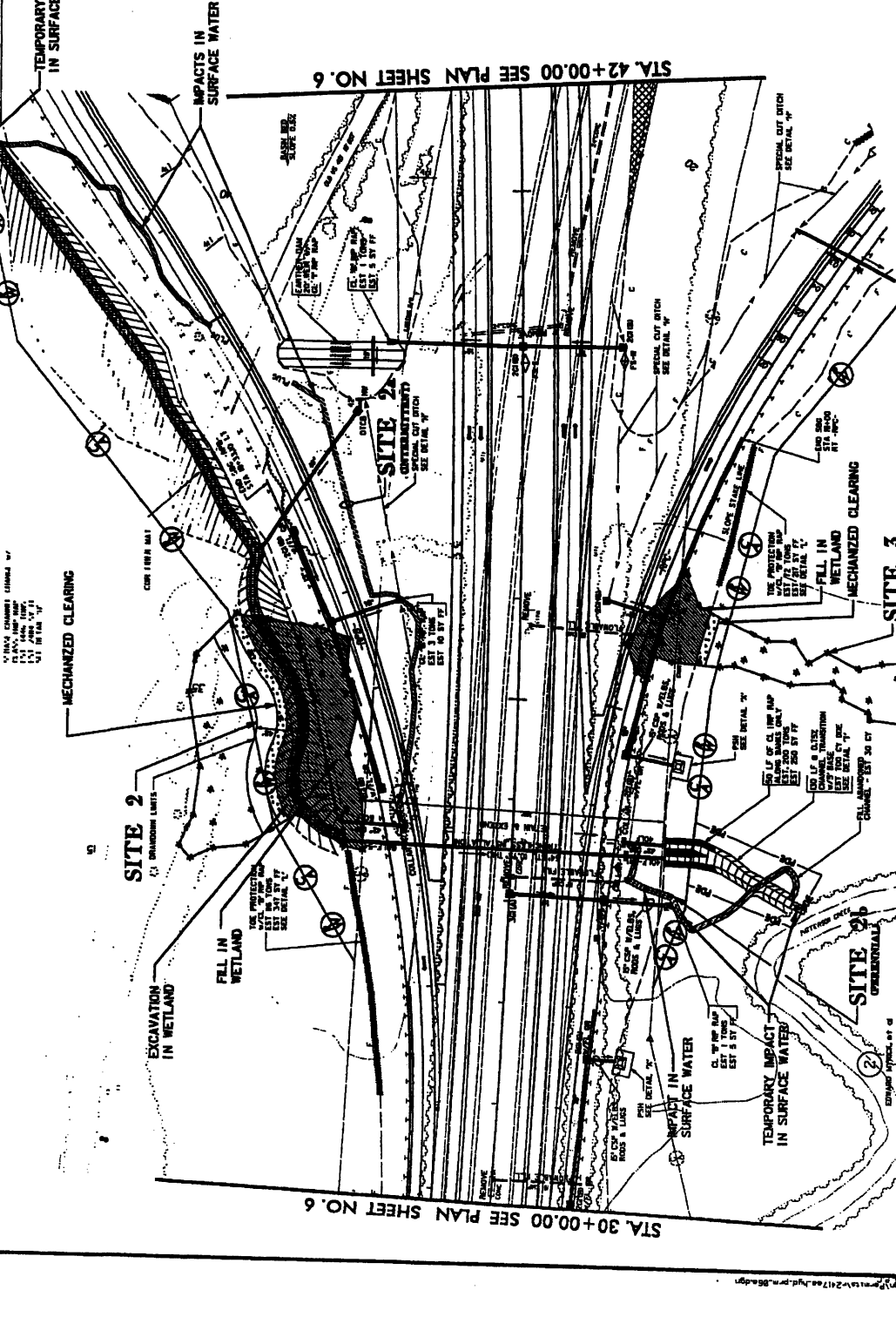
LEGEND
 -H2O- WETLAND
 DENOTES FILL IN WETLAND
 DENOTES EXCAVATION IN WETLAND
 DENOTES IMPACTS IN SURFACE WATER
 DENOTES TEMPORARY IMPACTS IN SURFACE WATER
 DENOTES MECHANIZED CLEARING

292

NC GRID
 MAD 83

SCALE: 1" = 100' HORIZ.
 0 50 100

NCDOT
 DIVISION OF HIGHWAYS
 LEE COUNTY
 PROJECT 14-6115 (R-3717A)
 US 42-NC BY DANFORD
 BYPASS FROM WEST
 OF SR 1400 TO WEST



PLAN VIEW
 SITES 2, 3, 6

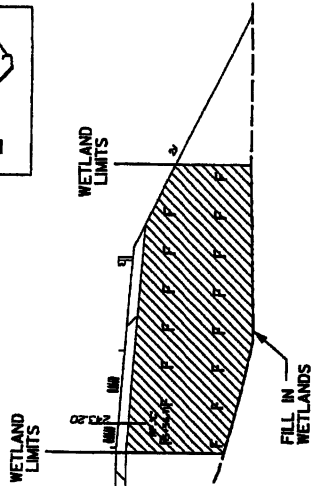
8/17/99

PROJECT SERVICE NO. **A-287(A)**
 CONTRACT NUMBER **28-3-271**
 DRAWING NUMBER **28-3-271**
 SHEET NO. **28-3-271**



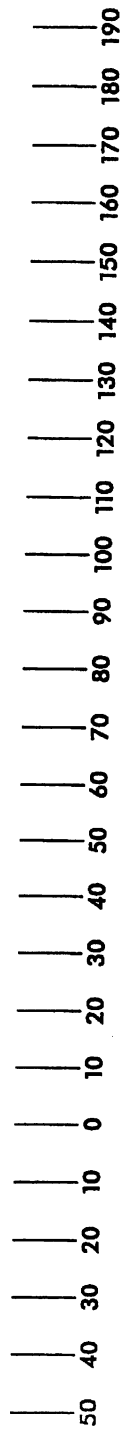
PRELIMINARY PLANS
 AS SHOWN FOR CONSTRUCTION

Permit Drawing
 Sheet 2 of 4

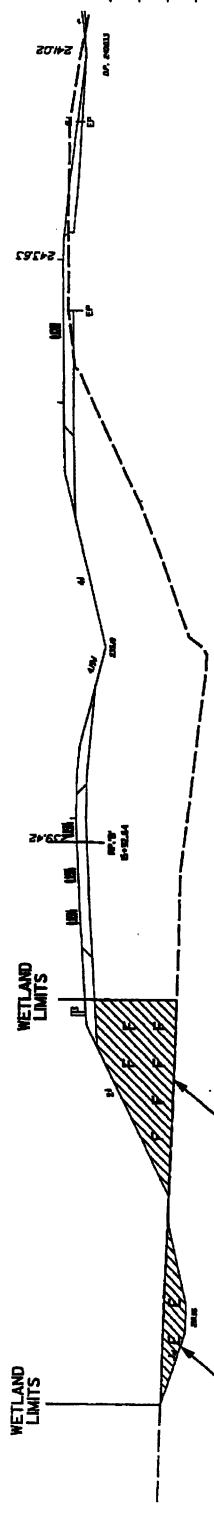


STA. 35+50 RT
 EL = 217.00

20
15
10
5
0

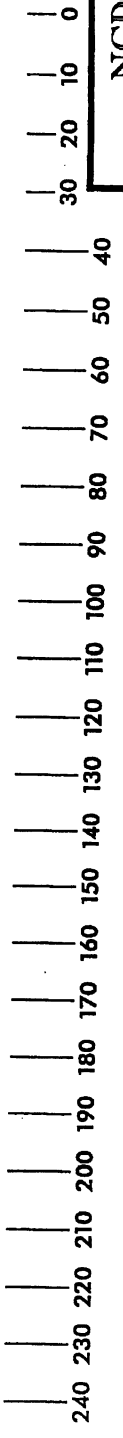


294



STA. 35+00 LT
 EL = 216.00

20
15
10
5
0



LEGEND

- WLB — WETLAND
- ▨ DENOTES FILL IN WETLAND
- ▩ DENOTES EXCAVATION IN WETLAND

TYPICAL X-SECTIONS
 SITES 2 & 3

NC DOT
 DIVISION OF HIGHWAYS
 LEE COUNTY
 PROJECT: 448L13 (R-2417AA)
 US 421-NC BY SANFORD
 BYPASS FROM WEST
 OF SR 1400 TO WEST
 OF US 1-15-501

KO & ASSOCIATES, P.C.
 Consulting Engineers
 A Division of K&H Associates, Inc. Company
 4411 LANTANA BLVD., SUITE 200
 BOCA RATON, FL 33433
 PHONE: (561) 991-1100
 FAX: (561) 991-1101

PROJECT NUMBER NO. **R-271AA**
 SHEET NO. **6**
 CONTRACT NO. **10000000000000000000**

PRELIMINARY PLANS
 TO BE USED FOR PERMITTING PURPOSES

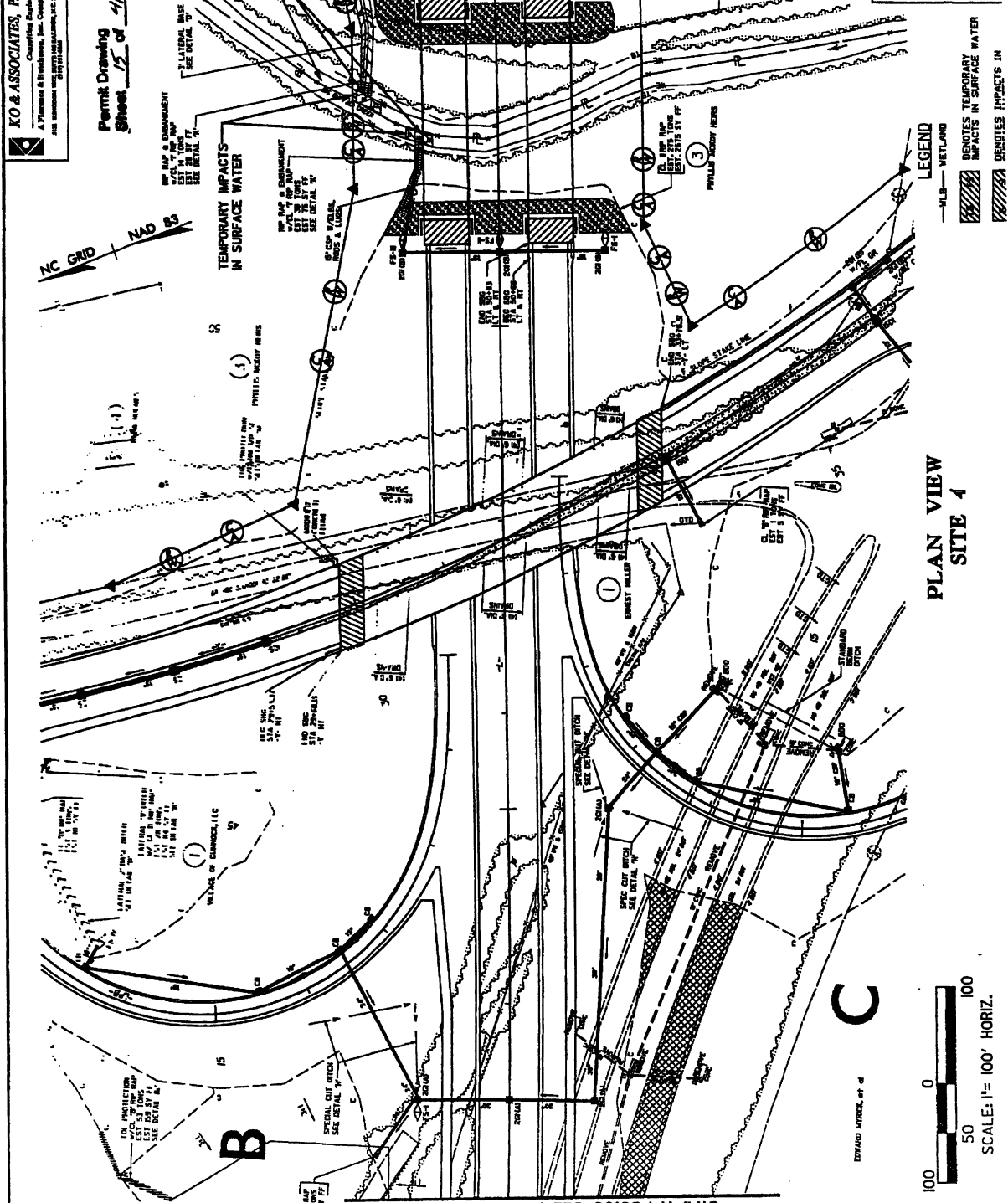
Permit Drawing
 Sheet **15** of **41**

ENCLOSURE

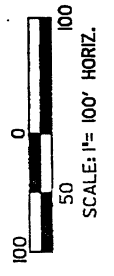
LEGEND

- HLB — WETLAND
- ▨ DENOTES TEMPORARY IMPACTS IN SURFACE WATER
- ▩ DENOTES IMPACTS IN

NCDOT
 DIVISION OF HIGHWAYS
 LEE COUNTY
 PROJECT NO. 06-047AA
 US 42-NC BY BAYFORD
 BYPASS FROM WEST
 OF SR 1400 TO WEST
 OF US 1-140A



PLAN VIEW
SITE 4

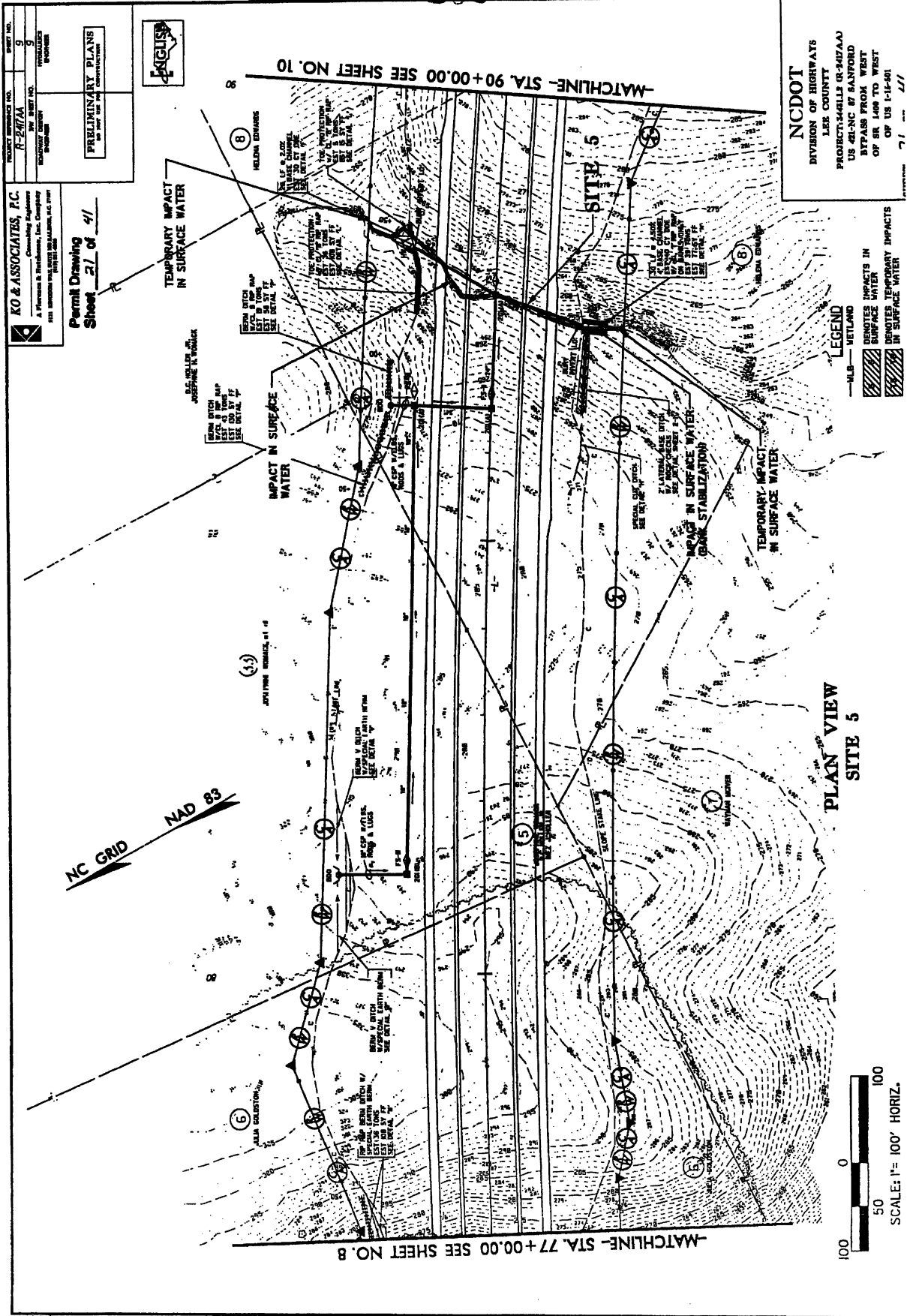


STA. 55+00.00 SEE PLAN SHEET NO. 7

STA. 41+00.00 SEE PLAN SHEET NO. 6

8/17/98

5/6/2009
 P:\Projects\10000000000000000000\Drawings\10000000000000000000\10000000000000000000.dwg



NCDOT
 DIVISION OF HIGHWAYS
 LEE COUNTY
 PROJECT: 344113 (R-247AA)
 US 48-NC BY BAYFORD
 BYPASS FROM WEST
 OF SR 1409 TO WEST
 OF US 1-1-01
 7/1 2/1

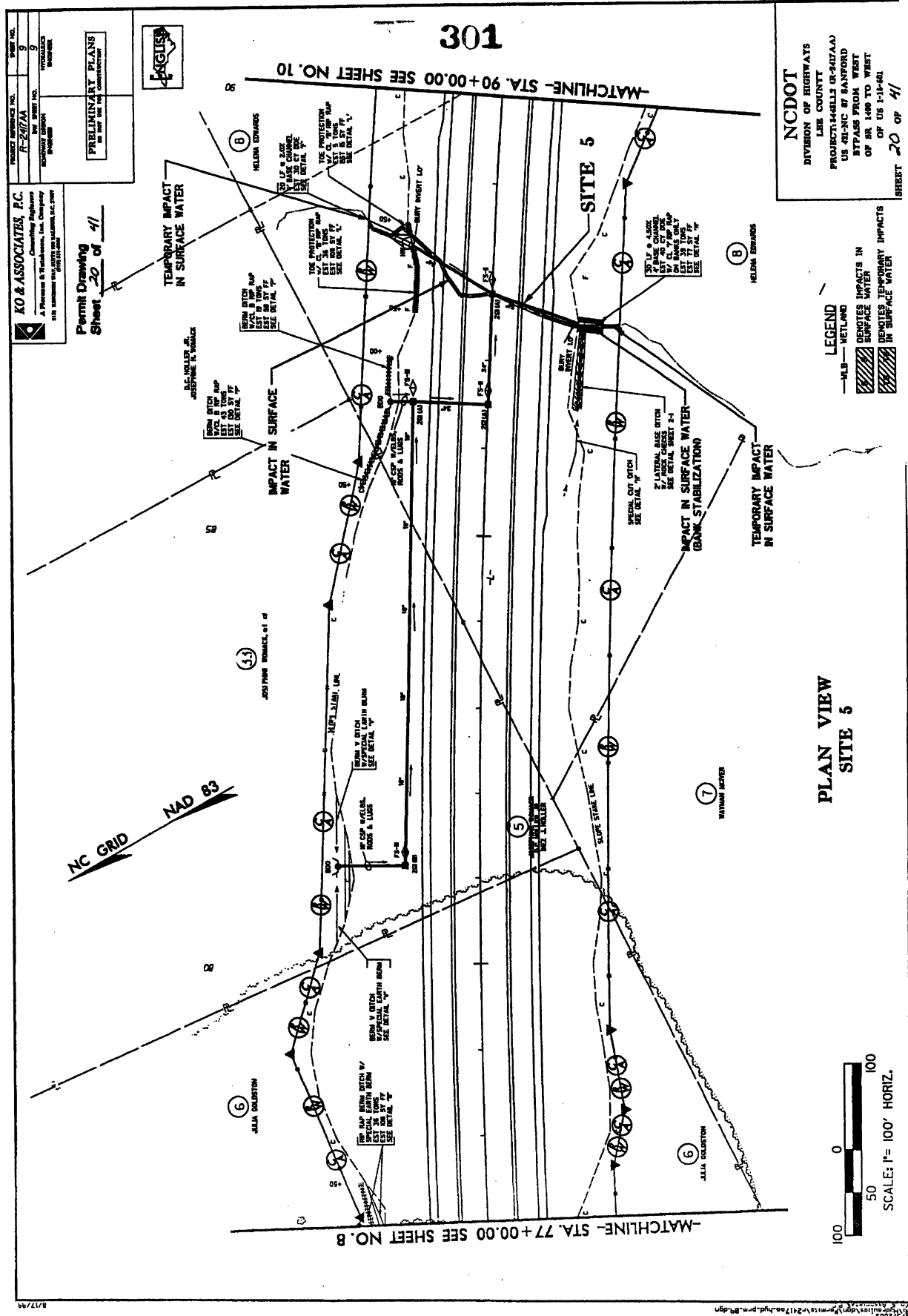
KO & ASSOCIATES, P.C.
 Consulting Engineers
 A. Phares & Associates, Inc. Designer
 2211 WILSON ROAD, WELLSVILLE, N.C. 27884
 (703) 733-1111

Permit Drawing
 Sheet 21 of 41

PRELIMINARY PLANS
 FOR THE STATE OF NORTH CAROLINA
 EXPIRES 12/31/2011

PROJECT NUMBER: 344113
 SHEET NO.: 21
 DATE: 11/11/09
 DRAWN BY: [Name]
 CHECKED BY: [Name]
 APPROVED BY: [Name]

12-4-03 Changed Permit No. 5 in Permit No. 23 - Inland Drive Name
 8/17/99



301

MATCHLINE- STA. 90+00.00 SEE SHEET NO. 10

MATCHLINE- STA. 77+00.00 SEE SHEET NO. 8

KO & ASSOCIATES, P.C.
 A. K. Williams & Associates, Inc. Company
 115 S. Independence Way, Suite 100, Raleigh, N.C. 27607
 919.833.0000

Permit Drawing
 Sheet 20 of 41

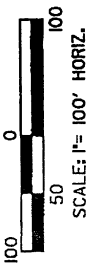
PROJECT REFERENCE NO. R-2017A
 SHEET NO. 20
 DATE 08/14/2017
 PRELIMINARY PLANS
 FOR THE STATE OF NORTH CAROLINA



NC DOT
 DIVISION OF HIGHWAYS
 LEE COUNTY
 PROJECT: 1446LL3 (R-247/AA)
 US 421-NC 87 SANFORD
 BYPASS FROM WEST
 OF SR 1480 TO WEST
 OF US 1-14-81

LEGEND
 -HLS- WETLAND
 DENOTES IMPACTS IN SURFACE WATER
 DENOTES TEMPORARY IMPACTS IN SURFACE WATER

**PLAN VIEW
 SITE 5**



SHEET 20 OF 41

B17749

2025 08/14/2017 11:21:17 am hvd.prm.br.dgn

PROJECT REFERENCE NO. H-247A
 SHEET NO. 7
 PRELIMINARY PLANS
 PERMIT DRAWING

KO & ASSOCIATES, P.C.
 Consulting Engineers
 A Firm of B. Brinkman, Inc. Company
 1111 BROADWAY, SUITE 1000, RALEIGH, NC 27601
 (919) 873-1100

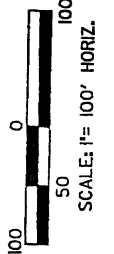
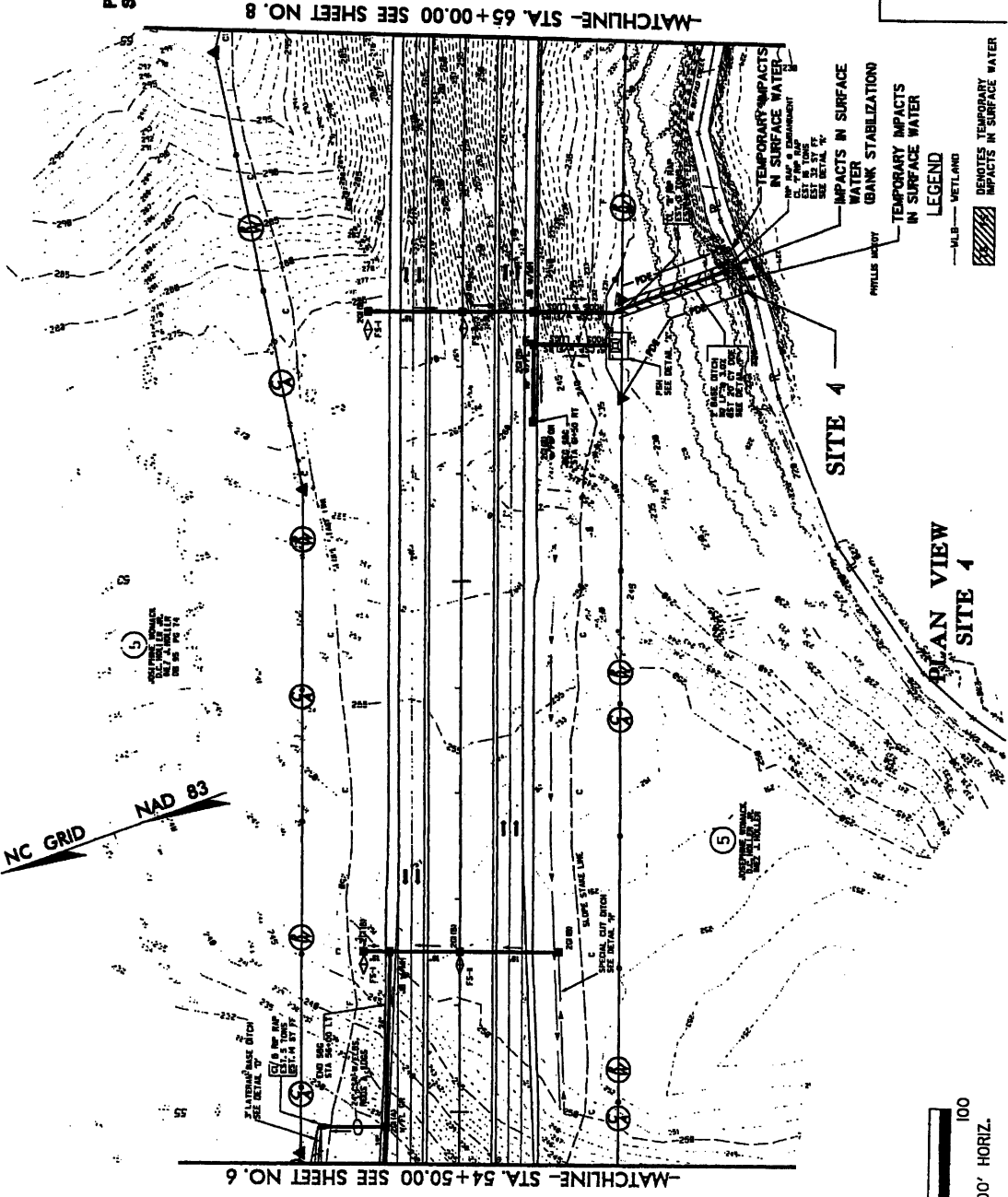
PERMIT NO. 17 OF 17



Permit Drawing
 Sheet 17 of 17

302

NCDOT
 DIVISION OF HIGHWAYS
 LEE COUNTY
 PROJECT: HILLS CR-247A
 US 42-NC BY SANFORD
 BYPASS FROM WEST
 OF SR 1400 TO WEST



NCDOT
 DIVISION OF HIGHWAYS
 LEE COUNTY
 PROJECT: ABLETS (R-2472AA)
 US 401-NC BY BANFORD
 BYPASS FROM WEST
 OF BR 1400 TO WEST
 OF US 1-14-401

1/8 OF 4/1

KO & ASSOCIATES, P.C.
 Consulting Engineers
 A Florence & Blakeslee, Inc. Company
 1111 LANTANA ROAD, SUITE 100
 FLORENCE, SC 29502

Permit Drawing
 Sheet 13 of 41

PRELIMINARY PLANS
 for use in the construction



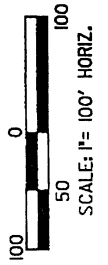
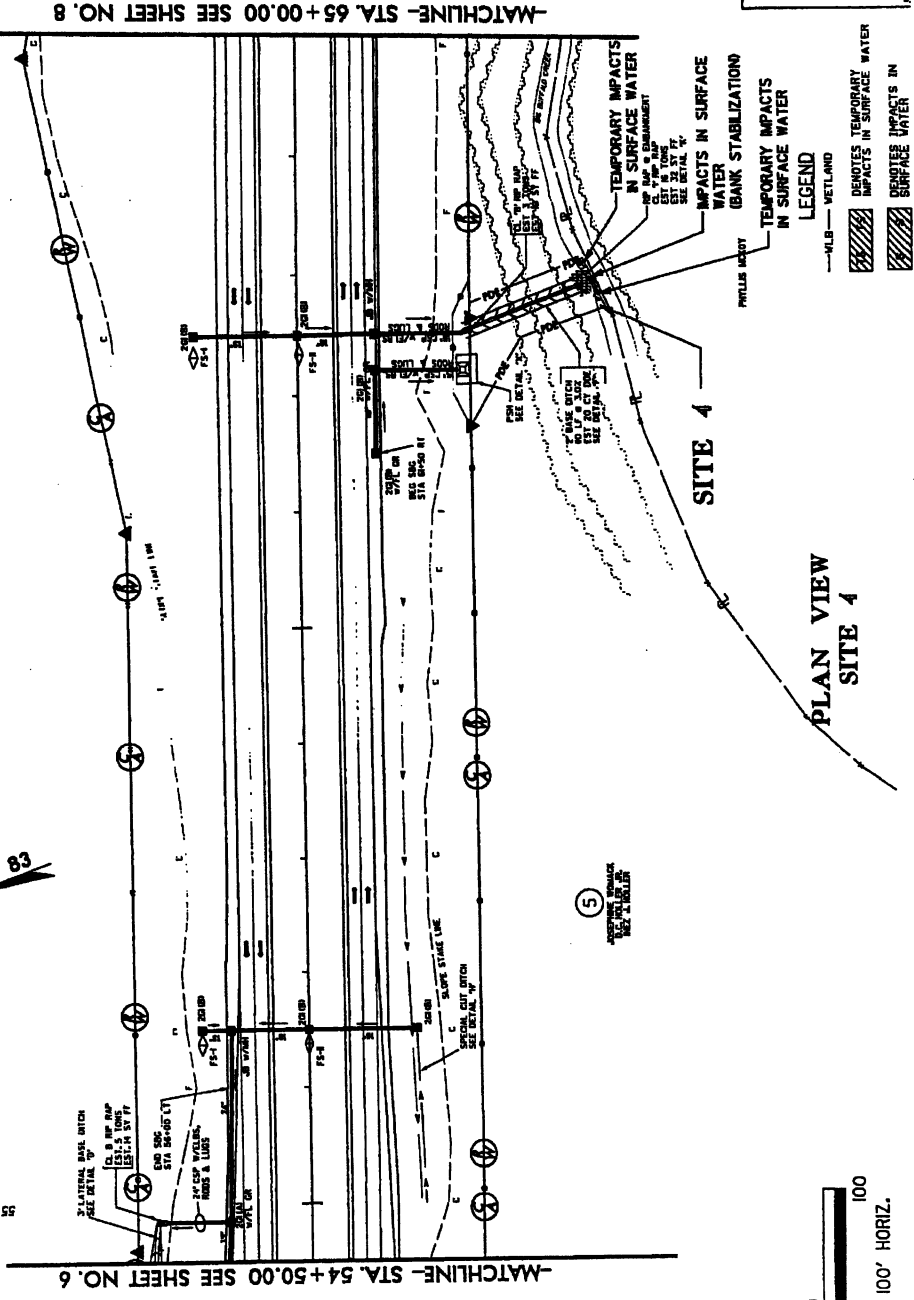
PROJECT NUMBER NO. R-2472AA	SHEET NO. 7
DATE 08/20/03	SCALE AS SHOWN

8/17/03

NC GRID
 NAD 83

(1)
 SEE DETAIL 'W'
 FOR ALL INFORMATION
 ON THIS SHEET

(5)
 SEE DETAIL 'W'
 FOR ALL INFORMATION
 ON THIS SHEET



PLAN VIEW
 SITE 4

LEGEND
 --- MILE --- WETLAND
 DENOTES TEMPORARY IMPACTS IN SURFACE WATER
 DENOTES IMPACTS IN SURFACE WATER

TEMPORARY IMPACTS IN SURFACE WATER
 IMPACTS IN SURFACE WATER (BANK STABILIZATION)
 PHILLIS DEBOT
 TEMPORARY IMPACTS IN SURFACE WATER
 IMPACTS IN SURFACE WATER

MATCHLINE - STA. 65+00.00 SEE SHEET NO. 8

MATCHLINE - STA. 54+50.00 SEE SHEET NO. 6

PROJECT REFERENCE NO. R-2017A
 PROJECT NO. 1700000000
 PROJECT NAME: HIGHWAY IMPROVEMENT

PRELIMINARY PLANS
 NO. 1700000000

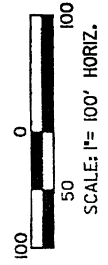
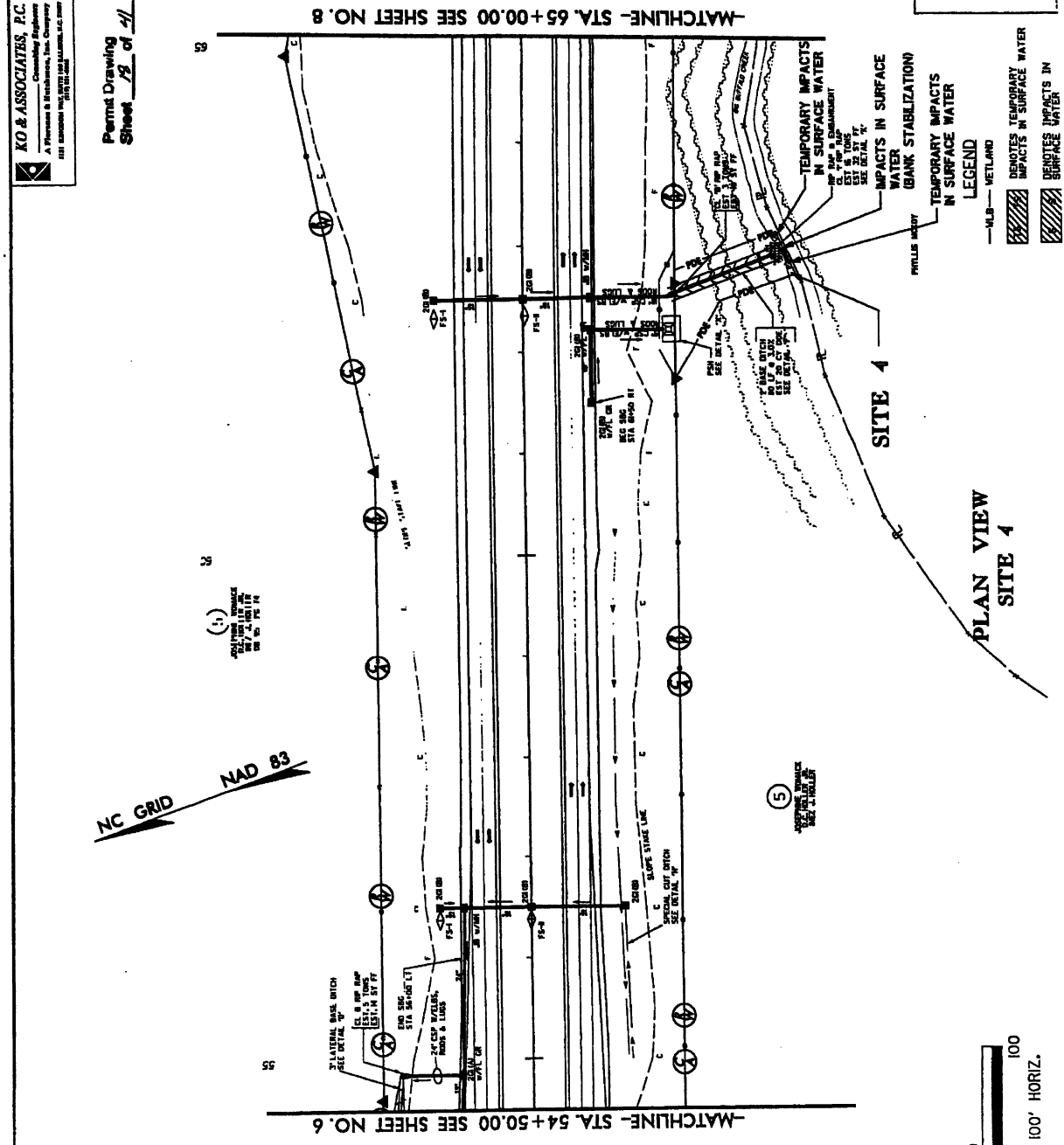
KO & ASSOCIATES, P.C.
 Consulting Engineers
 A Division of K&A Associates, Inc. Company
 1111 S. W. 11th St., Suite 100
 Fort Lauderdale, FL 33304

Permit Drawing
 Sheet 15 of 41



NCDOT
 DIVISION OF HIGHWAYS
 LEE COUNTY
 PROJECT: HALLS (R-2017A)
 US 481-NC 87 SANFORD
 BYPASS FROM WEST
 OF SR 1400 TO WEST
 OF US 1-14-01
 10 11

NC GRID
 NAD 83



PROJECT NUMBER NO. **F-217AA** SHEET NO. **9**

DATE **11/11/03** BY **WJG**

SCALE **AS SHOWN**

PROJECT LOCATION **US 421-NC BY SANFORD**

PRELIMINARY PLANS

FOR THE PROJECT

KO & ASSOCIATES, P.C.

Consulting Engineers

A Division of K&S Enterprises, Inc. Company

1411 W. HARRIS STREET, SUITE 100

WARRINGTON, NC 27579

Permit Drawing
Sheet **27** of **41**



NCDOT

DIVISION OF HIGHWAYS

LEE COUNTY

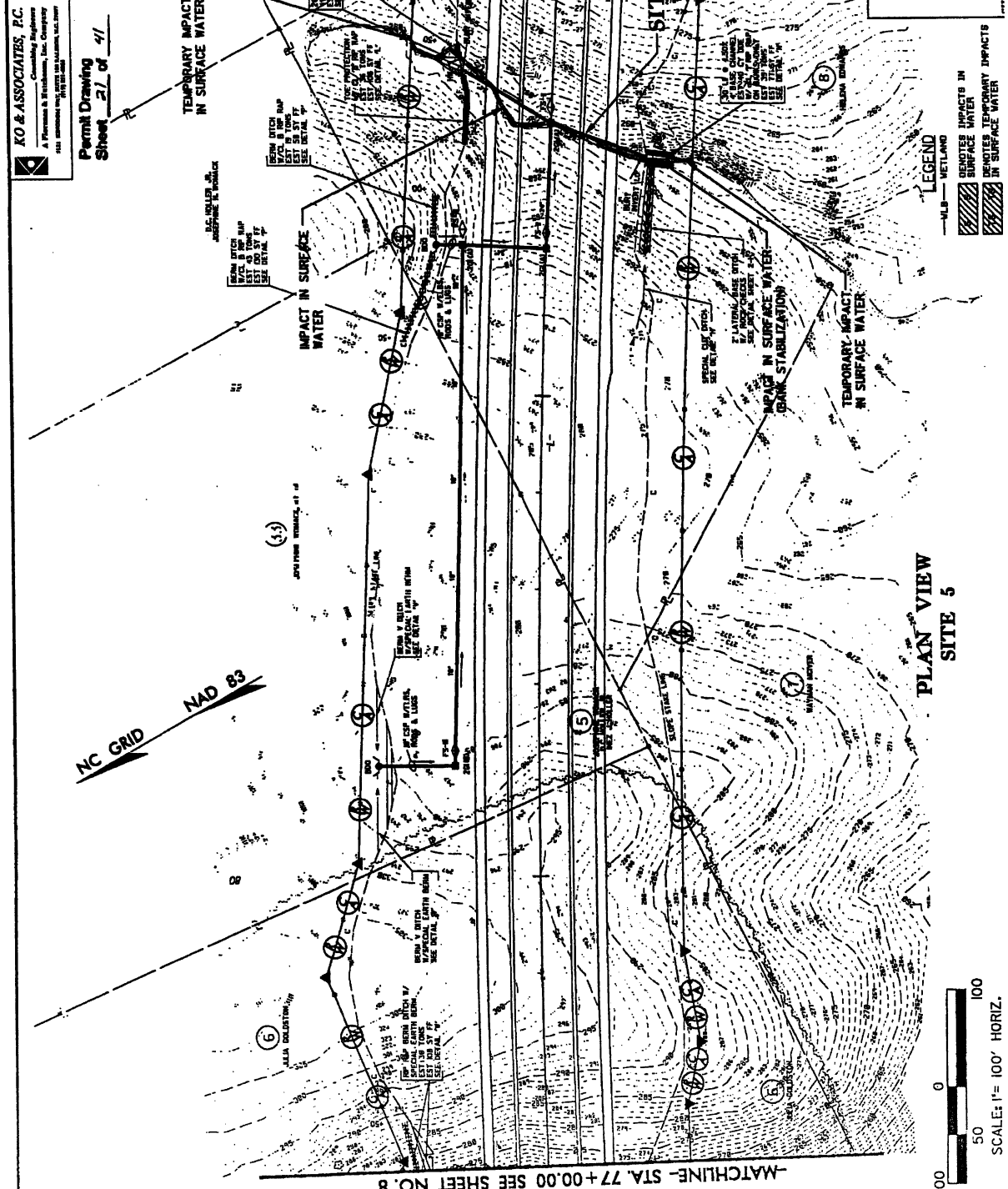
PROJECT: 146LLS (R-217AA)

US 421-NC BY SANFORD

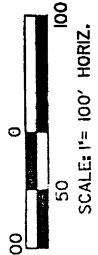
BYPASS FROM WEST

OF SR 1400 TO WEST

OF US 1-11-02



PLAN VIEW
SITE 5



KO & ASSOCIATES, P.C.
 Consulting Engineers
 A Florence & Branchburg, Inc. Company
 110 S. WILSON ST. FLORENCE, S.C. 29501
 TEL: 803/661-1111

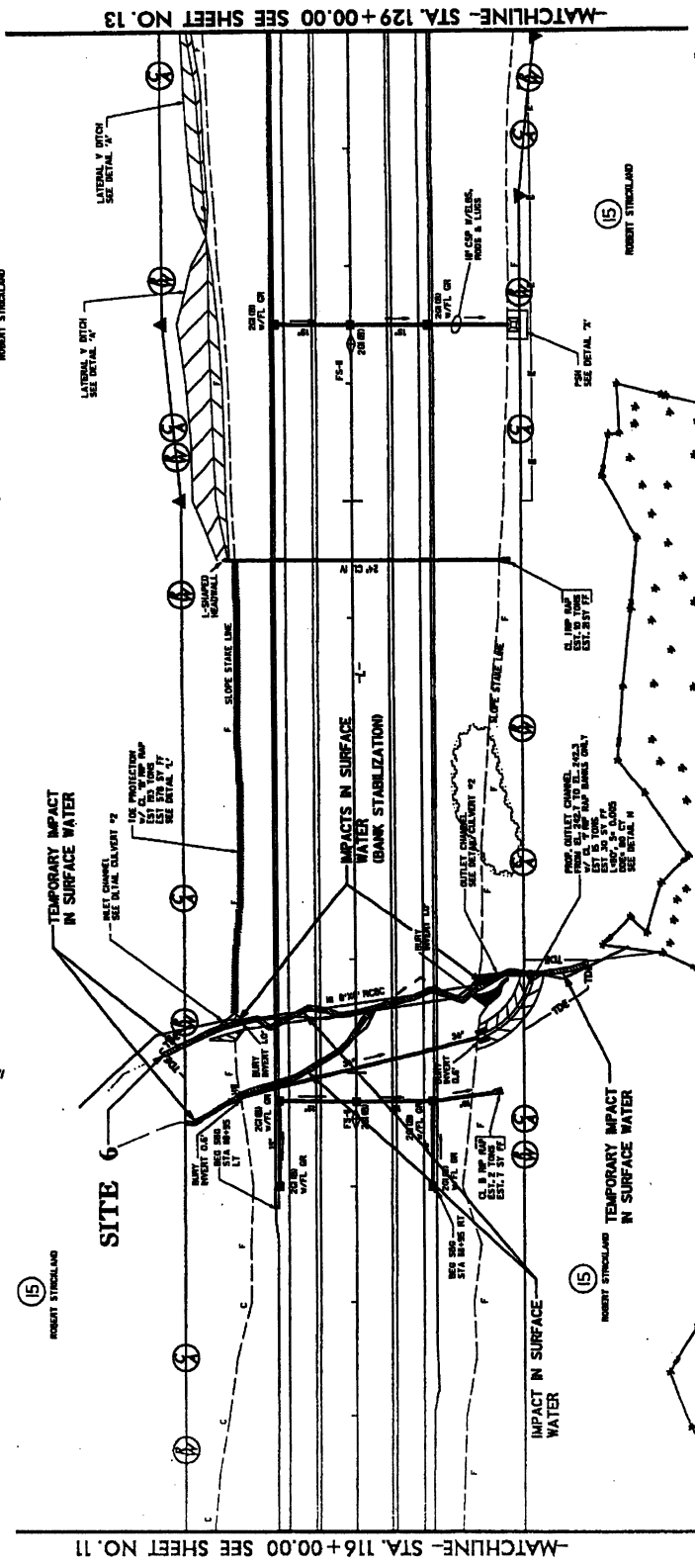
PROJECT NUMBER: **R-2474A**
 SHEET NO.: **12**
 DATE: **1/2**
 DRAWING TITLE: **PRELIMINARY PLANS**
 FOR **CONSTRUCTION**

Permit Drawing
 Sheet **23** of **41**

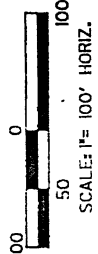


NC DOT
 DIVISION OF HIGHWAYS
 LEE COUNTY
 PROJECT # 4413 (R-2474A)
 US 91-NC BY SANFORD
 BYPASS FROM WEST
 OF OR LAN TO WEST
 OF US 1-14-81

NC GRID + NAD 83



PLAN VIEW
SITE 6



LEGEND
 -H/L- METLAND
 [Hatched pattern] IMPACTS IN SURFACE WATER
 [Dotted pattern] TEMPORARY IMPACTS IN SURFACE WATER

PROJECT NUMBER: 100-100-100-100
 DRAWING NO.: 100-100-100-100
 SHEET NO.: 100-100-100-100
 DATE: 10/1/2000

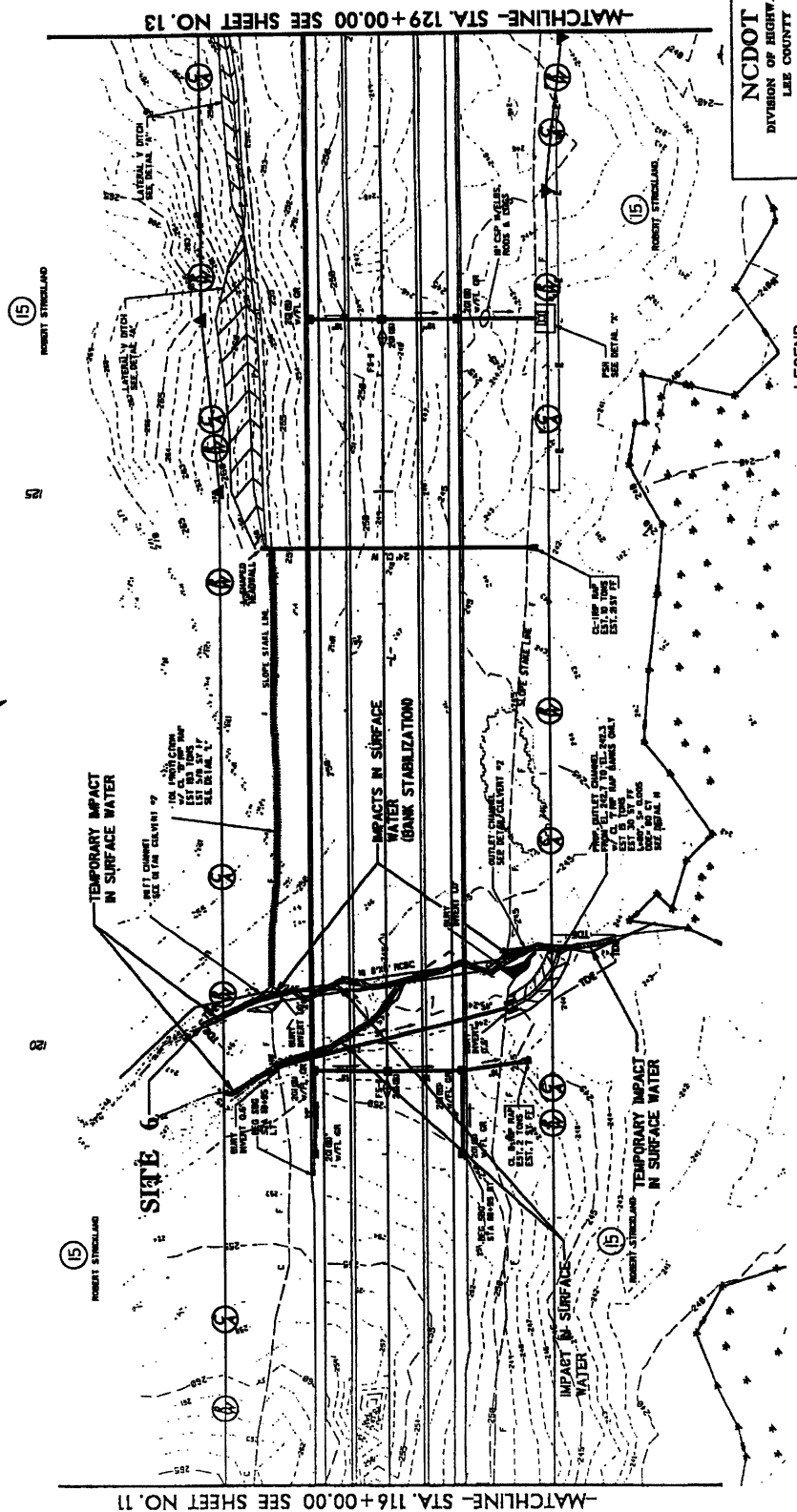
PRELIMINARY PLANS
 CONTRACT NO. 100-100-100-100

KO & ASSOCIATES, P.C.
 A Professional Engineering Firm
 100-100-100-100
 100-100-100-100

Permit Drawing
 Sheet 24 of 27



NC GRID NAD 83

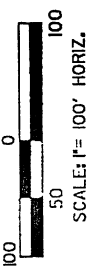


NC DOT
 DIVISION OF HIGHWAYS
 LEE COUNTY
 PROJECT: 144BLLS (1-24/744)
 US 401-NC 87 SANFORD
 BTPAS FROM WEST
 OF SR 1400 TO WEST
 OF US 1-14-80L
 74J 2/1

LEGEND

- ULB— WETLAND
- ▨ DENOTES IMPACTS IN SURFACE WATER
- ▩ DENOTES TEMPORARY IMPACTS IN SURFACE WATER

PLAN VIEW
SITE 6

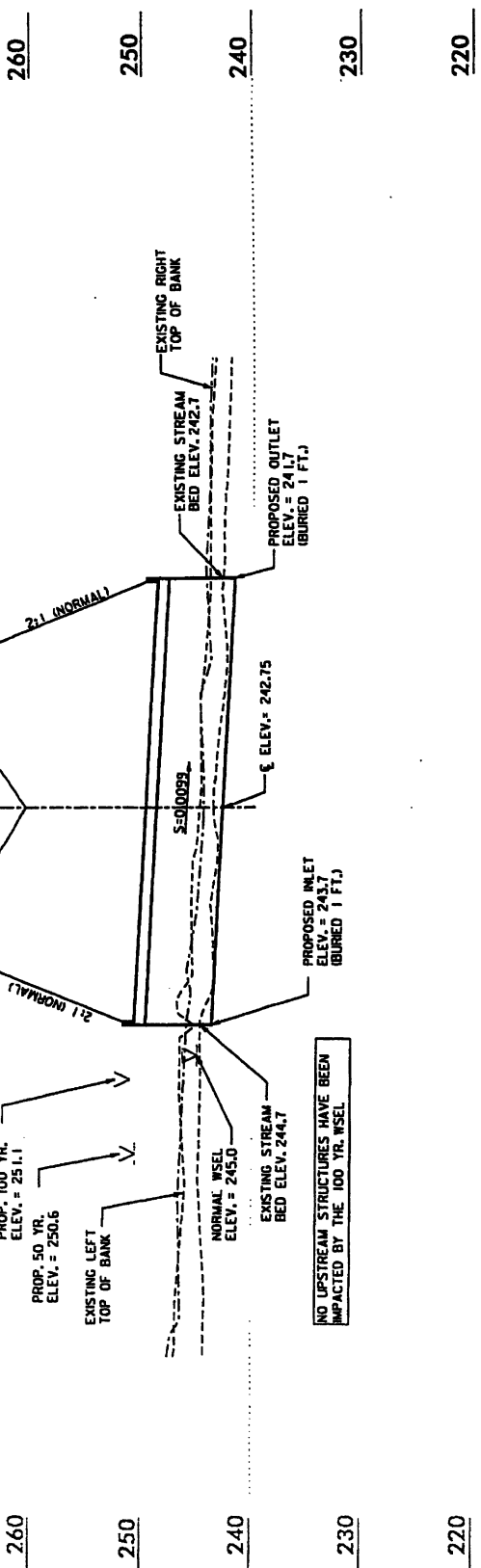
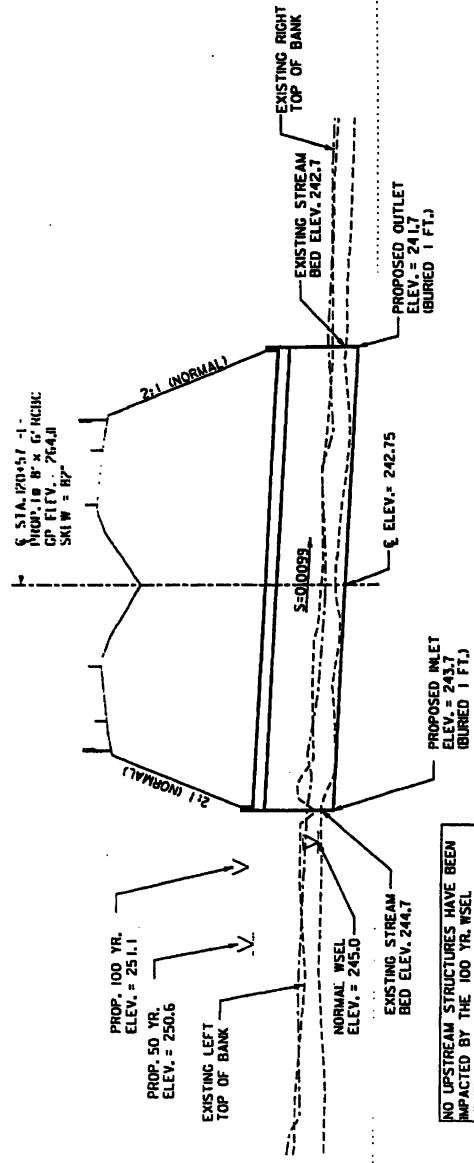


PROJECT NUMBER: NC 1-247AA
 COUNTY: SANFORD
 DRAWING NUMBER: 25-41

DATE: 8-24-09
 DESIGNED BY: [REDACTED]
 CHECKED BY: [REDACTED]
 APPROVED BY: [REDACTED]

PERMIT DRAWING

Permit Drawing
 Sheet 25 of 41

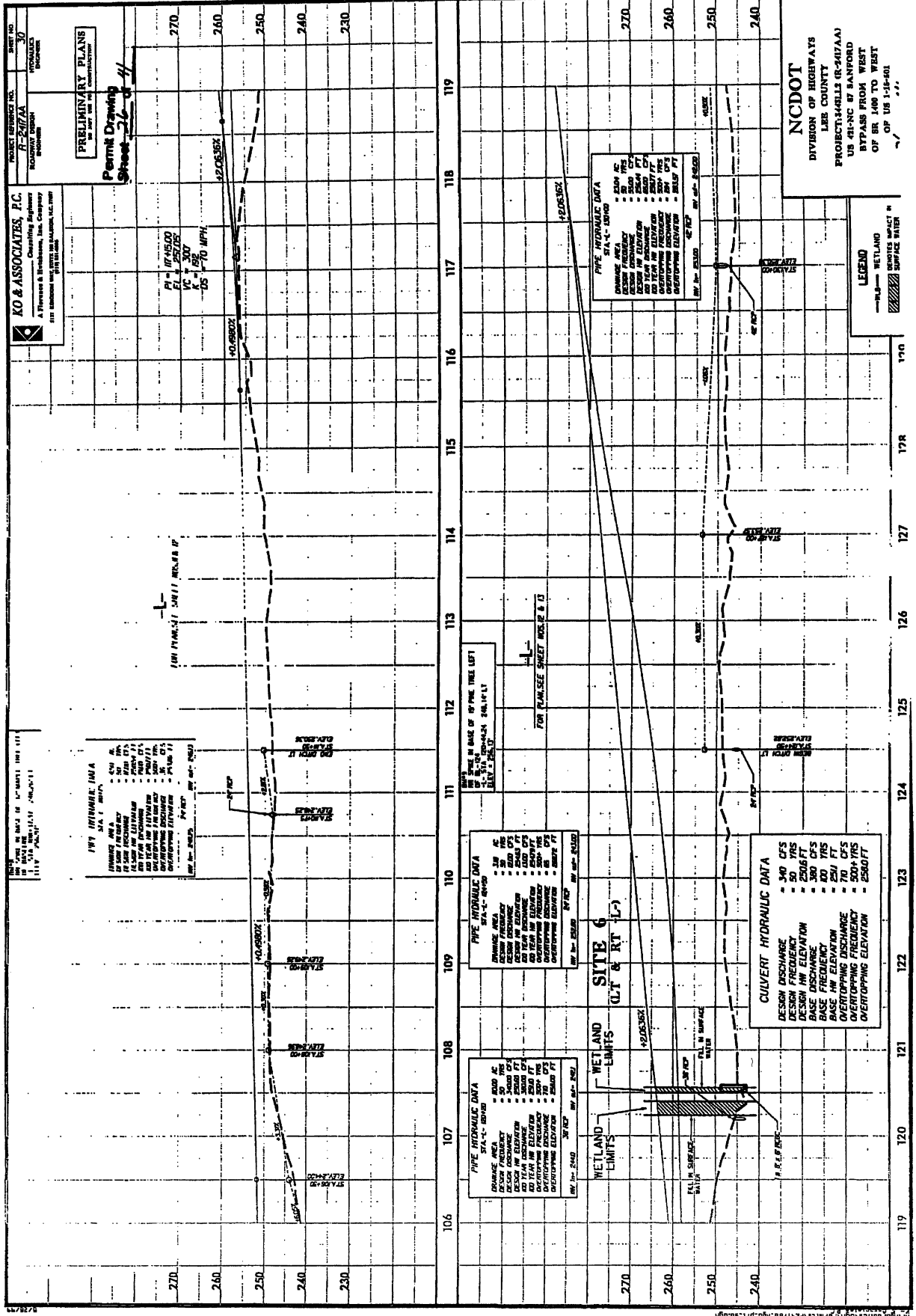


NC DOT
 DIVISION OF HIGHWAYS
 LEE COUNTY
 PROJECT: 346113 (R-2417AA)
 US 421-NC BY SANFORD
 BYPASS FROM WEST
 OF SR 1400 TO WEST
 OF US 1-15-501

**PROFILE ALONG STRUCTURE
 SITE 6**



SCALE:
 1" = 50' HORIZONTAL
 1" = 10' VERTICAL



PROJECT REFERENCE NO. R-2477AA
 SHEET NO. 30
 HYDRAULICS
 DIVISION

KO & ASSOCIATES, P.C.
 Consulting Engineers
 A. Thornton & Associates, Inc. Company
 1117 Eastman Avenue, Raleigh, NC 27601
 919-876-1111

PRELIMINARY PLANS
 Permit Drawing
 Sheet 30 of 41

1975 INTERMARK (M/A)
 STA. 1-100+00
 DESIGN SPEED = 50 MPH
 DESIGN FRICTION = 0.15
 DESIGN DISCHARGE = 300 CFS
 DESIGN HW ELEVATION = 250.00 FT
 DESIGN FREQ. = 100 YRS
 DESIGN OVERTOPPING DISCHARGE = 250 CFS
 DESIGN OVERTOPPING FREQ. = 500 YRS

270
260
250
240
230

119 118 117 116 115 114 113 112 111 110 109 108 107 106

PIPE HYDRAULIC DATA
 STA. 1-100+00
 DESIGN AREA = 2.00 SQ FT
 DESIGN FRICTION = 0.015
 DESIGN DISCHARGE = 300 CFS
 DESIGN HW ELEVATION = 250.00 FT
 DESIGN FREQ. = 100 YRS
 DESIGN OVERTOPPING DISCHARGE = 250 CFS
 DESIGN OVERTOPPING FREQ. = 500 YRS

WETLAND LIMITS (LT & RT)
 STA. 1-100+00
 DESIGN AREA = 2.00 SQ FT
 DESIGN FRICTION = 0.015
 DESIGN DISCHARGE = 300 CFS
 DESIGN HW ELEVATION = 250.00 FT
 DESIGN FREQ. = 100 YRS
 DESIGN OVERTOPPING DISCHARGE = 250 CFS
 DESIGN OVERTOPPING FREQ. = 500 YRS

CULVERT HYDRAULIC DATA
 DESIGN DISCHARGE = 300 CFS
 DESIGN HW ELEVATION = 250.00 FT
 DESIGN FREQ. = 100 YRS
 BASE DISCHARGE = 400 YRS
 BASE HW ELEVATION = 250.00 FT
 OVERTOPPING DISCHARGE = 700 CFS
 OVERTOPPING FREQ. = 500 YRS

PIPE HYDRAULIC DATA
 STA. 1-100+00
 DESIGN AREA = 2.00 SQ FT
 DESIGN FRICTION = 0.015
 DESIGN DISCHARGE = 300 CFS
 DESIGN HW ELEVATION = 250.00 FT
 DESIGN FREQ. = 100 YRS
 DESIGN OVERTOPPING DISCHARGE = 250 CFS
 DESIGN OVERTOPPING FREQ. = 500 YRS

NC DOT
 DIVISION OF HIGHWAYS
 LEE COUNTY
 PROJECT: HALLS (R-2477AA)
 US 40+NC BY SANFORD
 BYPASS FROM WEST
 OF BR 1400 TO WEST
 OF CP US 1-16-001

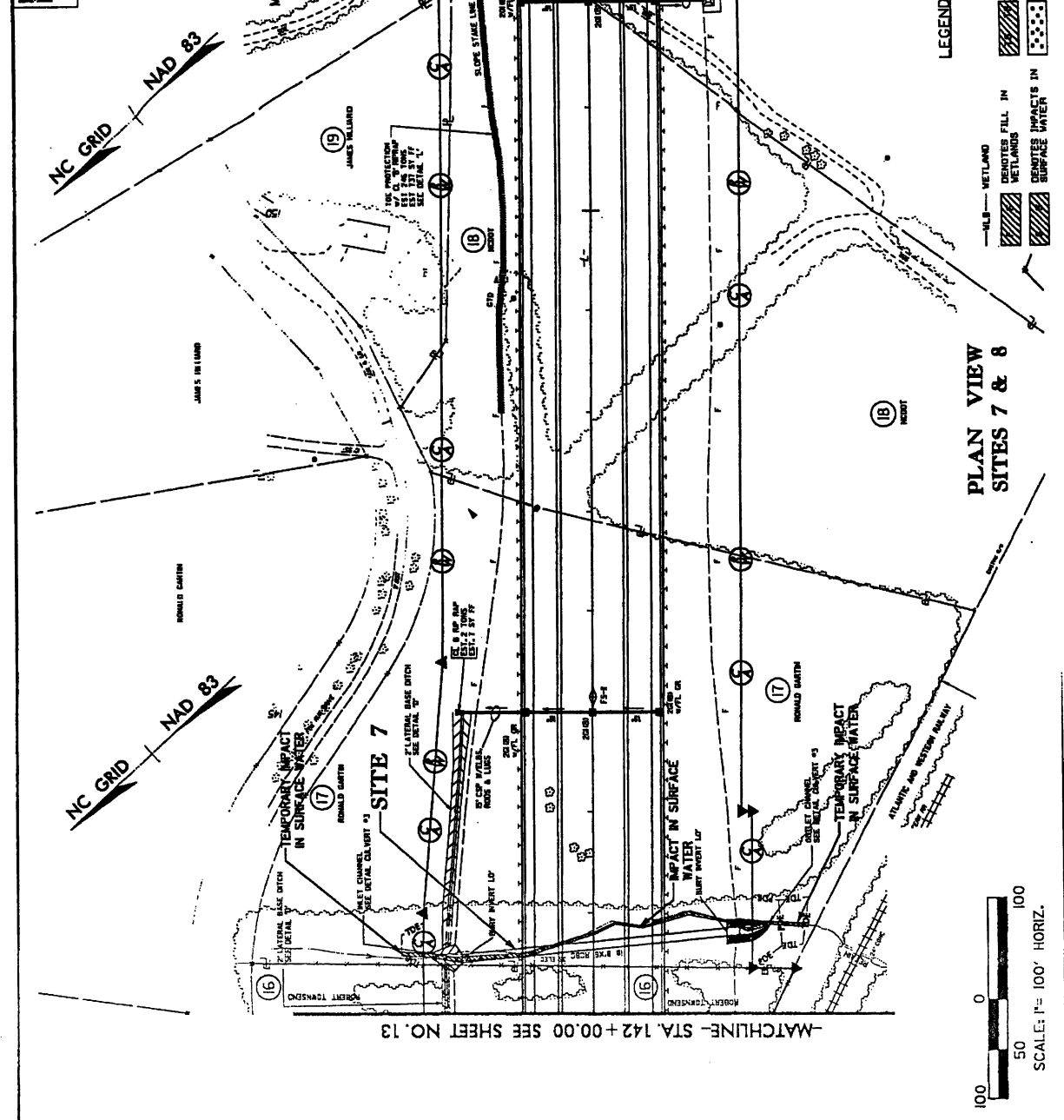
LEGEND
 WETLAND
 SURFACE WATER

PROJECT NUMBER NO. **R-217AA**
 SHEET NO. **14**
 DATE **1/17/98**
 DRAWN BY **W. J. HARRIS**
 CHECKED BY **W. J. HARRIS**
 APPROVED BY **W. J. HARRIS**

KO & ASSOCIATES, P.C.
 A Professional Engineering Firm
 1111 Greenway Way, Suite 200, Raleigh, N.C. 27606
 (919) 871-0200

PRELIMINARY PLANS
 FOR THE CONSTRUCTION OF
ROADWAY IMPROVEMENTS

Permit Drawing
 Sheet **27** of **41**



NCDOT
 DIVISION OF HIGHWAYS
 LEE COUNTY
 PROJECT 1448LLS (C-2127A)J
 US 62-NC @ BAINFORD
 BYPASS FROM WEST
 OF BK 140 TO WEST
 OF US 1-15-91
 27

LEGEND

- WETLAND
- WETLANDS DENOTES FILL IN WETLANDS
- TEMPORARY IMPACTS IN SURFACE WATER
- MECHANIZED CLEARING

PLAN VIEW
SITES 7 & 8



314

MATCHLINE- STA. 155+00.00 SEE SHEET NO. 15

MATCHLINE- STA. 142+00.00 SEE SHEET NO. 13

PROJECT NUMBER NO. **7-247A** SHEET NO. **14**

DATE **1/14**

DESIGNED BY **W. J. HARRIS**

CHECKED BY **W. J. HARRIS**

APPROVED BY **W. J. HARRIS**

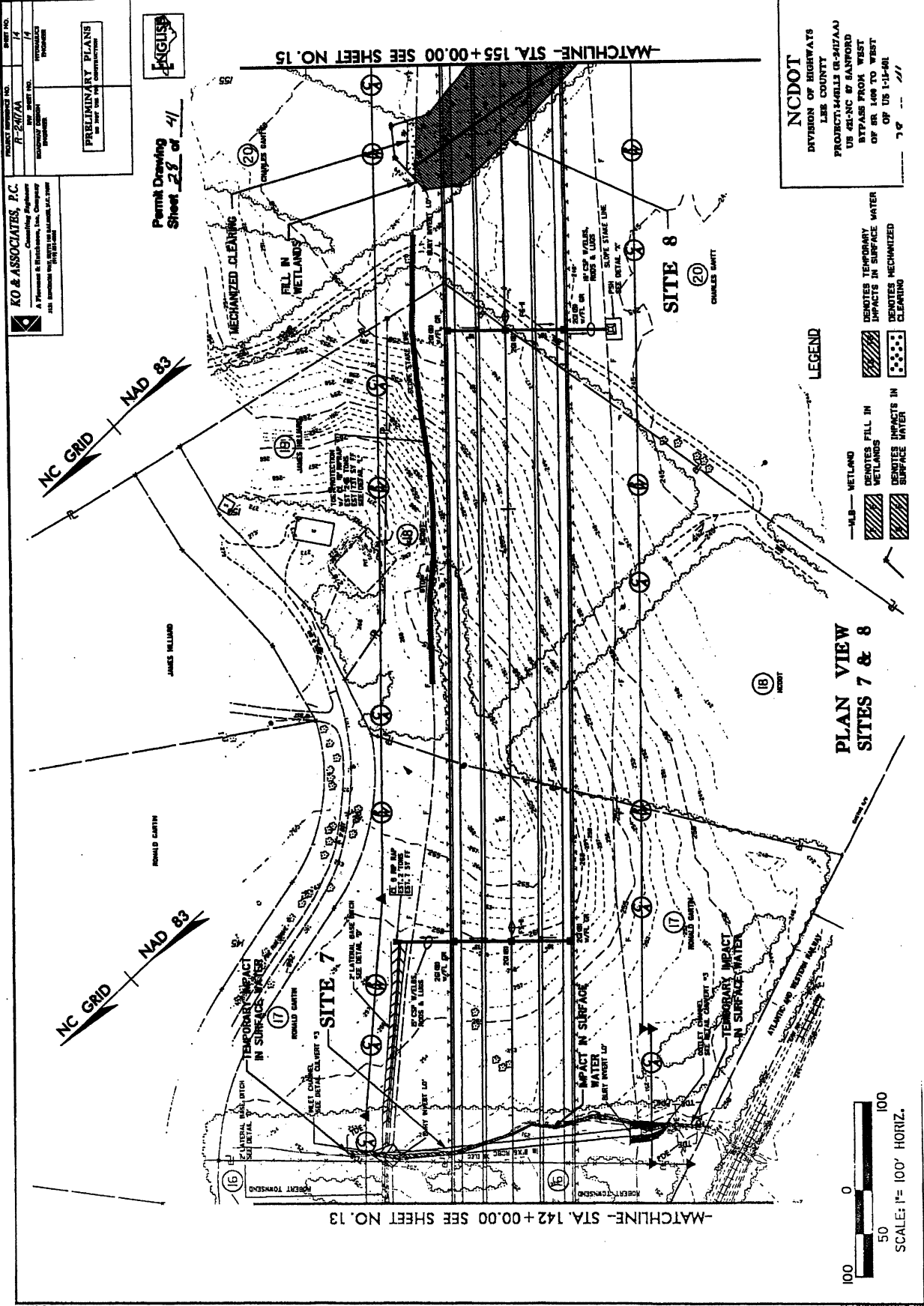
PRELIMINARY PLANS
NOT FOR CONSTRUCTION

KO & ASSOCIATES, P.C.
Civil Engineering
A Division of Earth Systems, Inc., Company
201 LANTANA WOODS DRIVE, SUITE 100
WEST PALM BEACH, FLORIDA 33411

Permit Drawing
Sheet 28 of 41

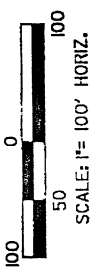


NCDOT
DIVISION OF HIGHWAYS
LEE COUNTY
PROJECT: 44RLLS (R-247A)A
US 155-NC BY SANFORD
BYPASS FROM WEST
OF BR 1406 TO WEST
OF US 1-1-401



LEGEND

PLAN VIEW
SITES 7 & 8



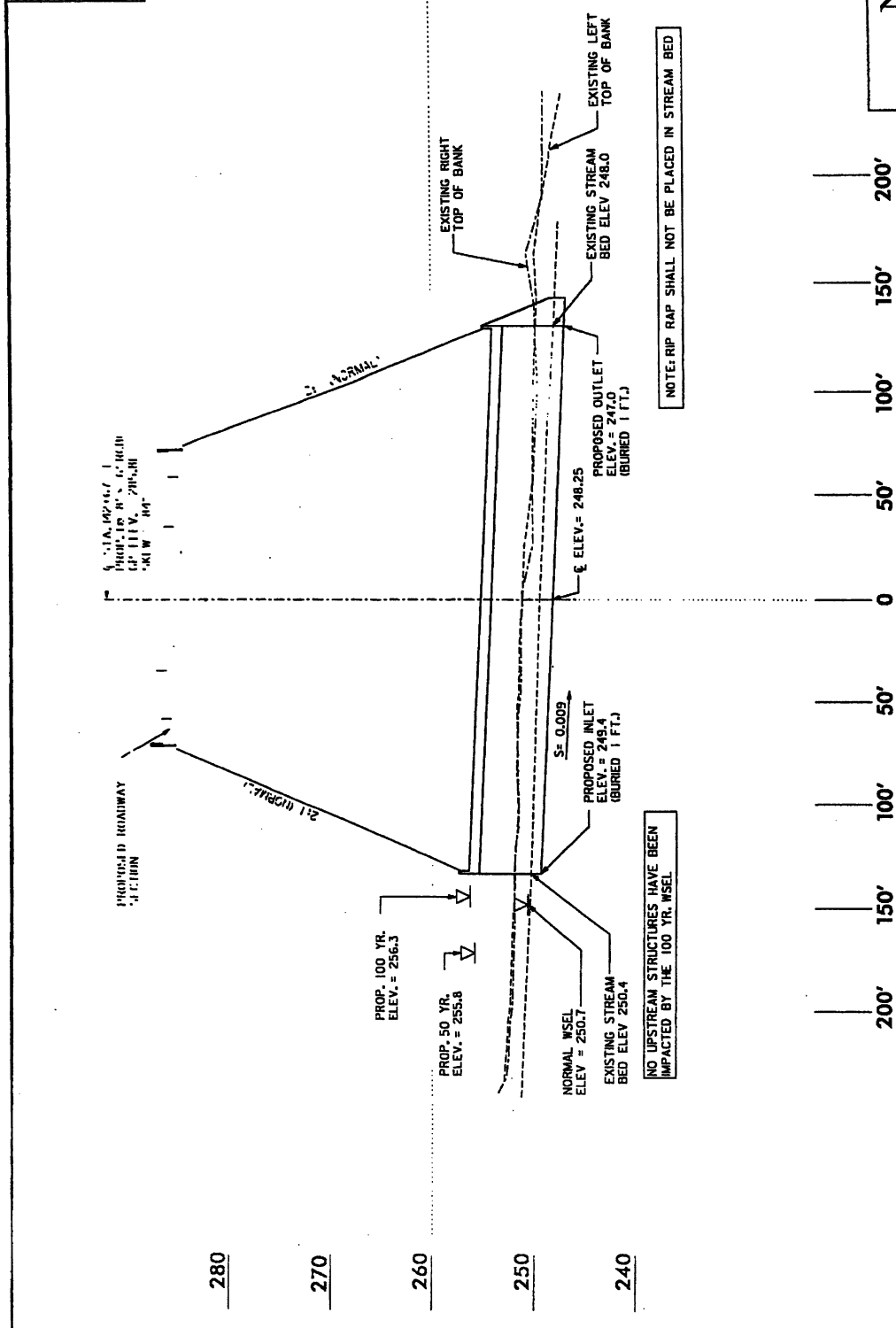
PROJECT NUMBER	11-24700
DATE	07/15/08
DESIGNER	W. J. HARRIS
CHECKER	W. J. HARRIS
APPROVED	W. J. HARRIS

PRELIMINARY PLANS
 TO BE USED FOR PERMITTING PURPOSES

Permit Drawing
 Sheet 29 of 41



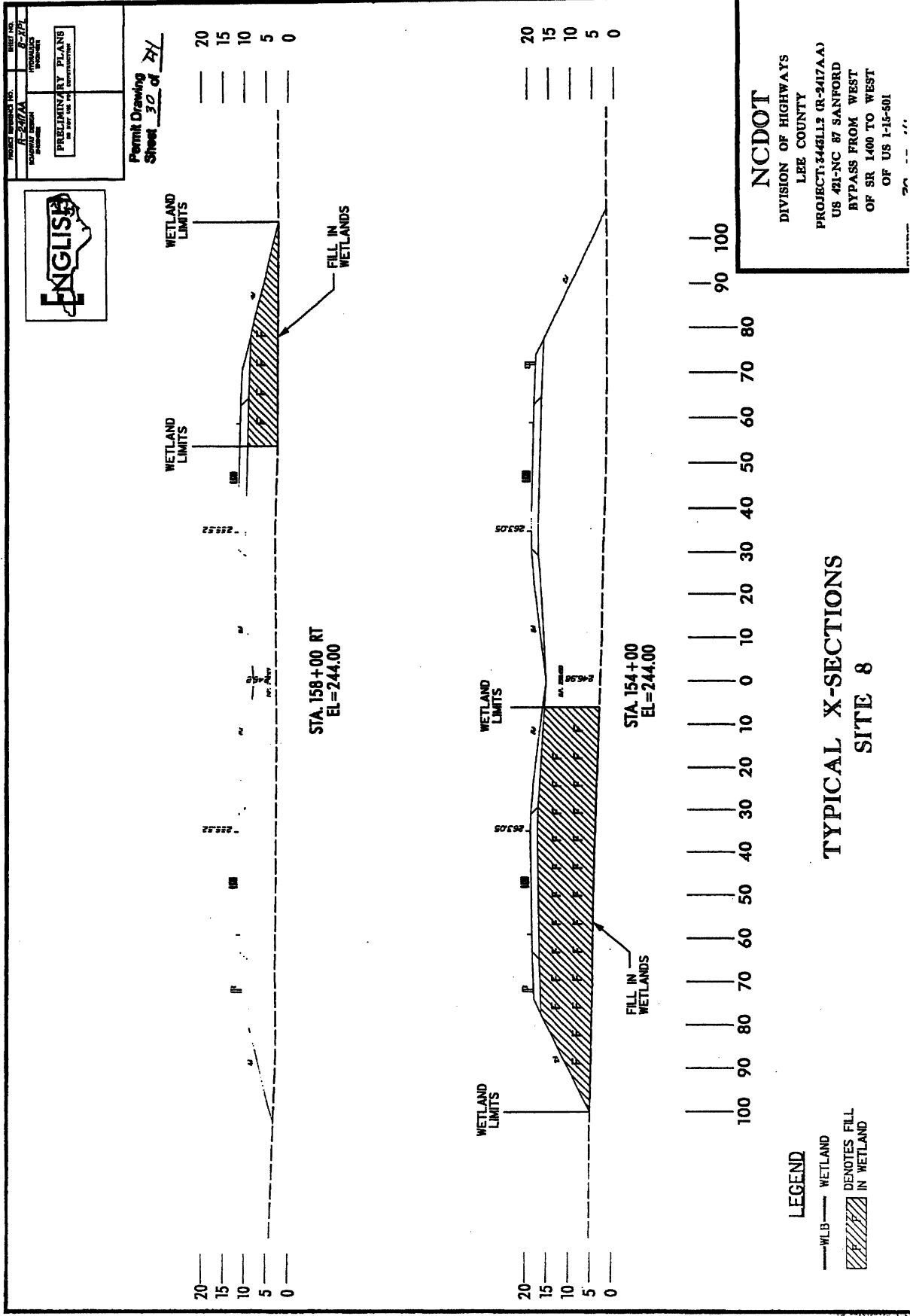
NCDOT
 DIVISION OF HIGHWAYS
 LEE COUNTY
 PROJECT: 446112 (R-24700A)
 US 421-NC AT SANFORD
 BYPASS FROM WEST
 OF SR 1400 TO WEST
 OF US 1-15-501



PROFILE ALONG STRUCTURE SITE 7

SCALE:
 1" = 50' HORIZONTAL
 1" = 10' VERTICAL

NOTE: RIP RAP SHALL NOT BE PLACED IN STREAM BED



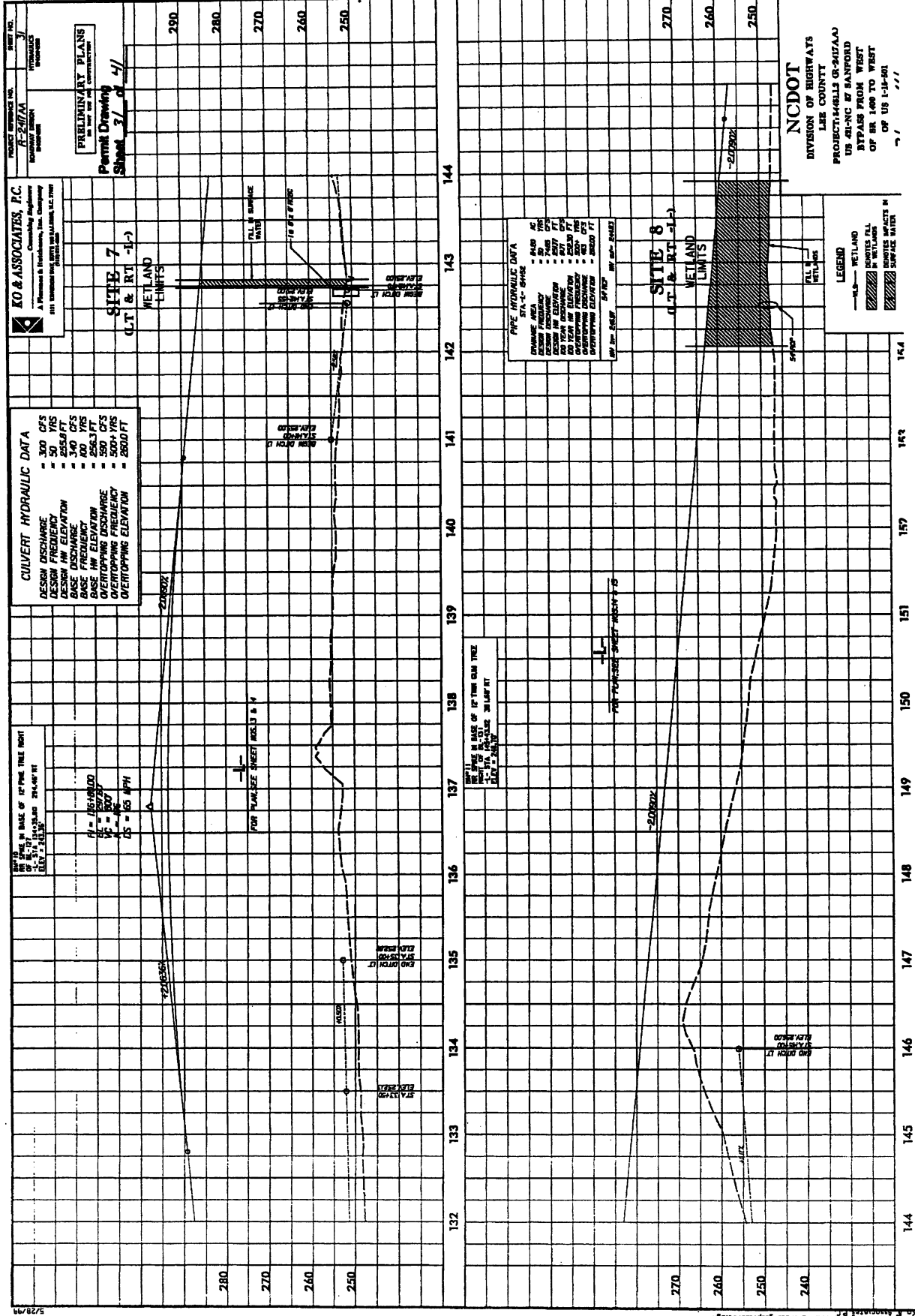
PROJECT NUMBER: 44611.2
 SHEET NO.: B-2417
 WETLANDS
 PRELIMINARY PLANS
 FOR THE WEST BYPASS FROM SR 1400 TO WEST OF SR 1400 TO WEST

Permit Drawing
 Sheet 30 of 34

NCDOT
 DIVISION OF HIGHWAYS
 LEE COUNTY
 PROJECT: 44611.2 (R-2417AA)
 US 421-NC BY SANFORD
 BYPASS FROM WEST
 OF SR 1400 TO WEST
 OF US 1-15-401

**TYPICAL X-SECTIONS
 SITE 8**

LEGEND
 — WETLAND LIMITS
 - - - WETLAND
 [Hatched Area] DENOTES FILL IN WETLAND



NC DOT
 DIVISION OF HIGHWAYS
 LEE COUNTY
 PROJECT 144-1000 (R-2417AA)
 IN ALIGNMENT OF BANFORD
 BYPASS FROM WEST
 OF SR 144 TO WEST
 OF US 1-14-01

KO & ASSOCIATES, P.C.
 A PROFESSIONAL CORPORATION
 101 HARRISON STREET, SUITE 200, RALEIGH, NC 27601
 TEL: 919-876-1234 FAX: 919-876-1235

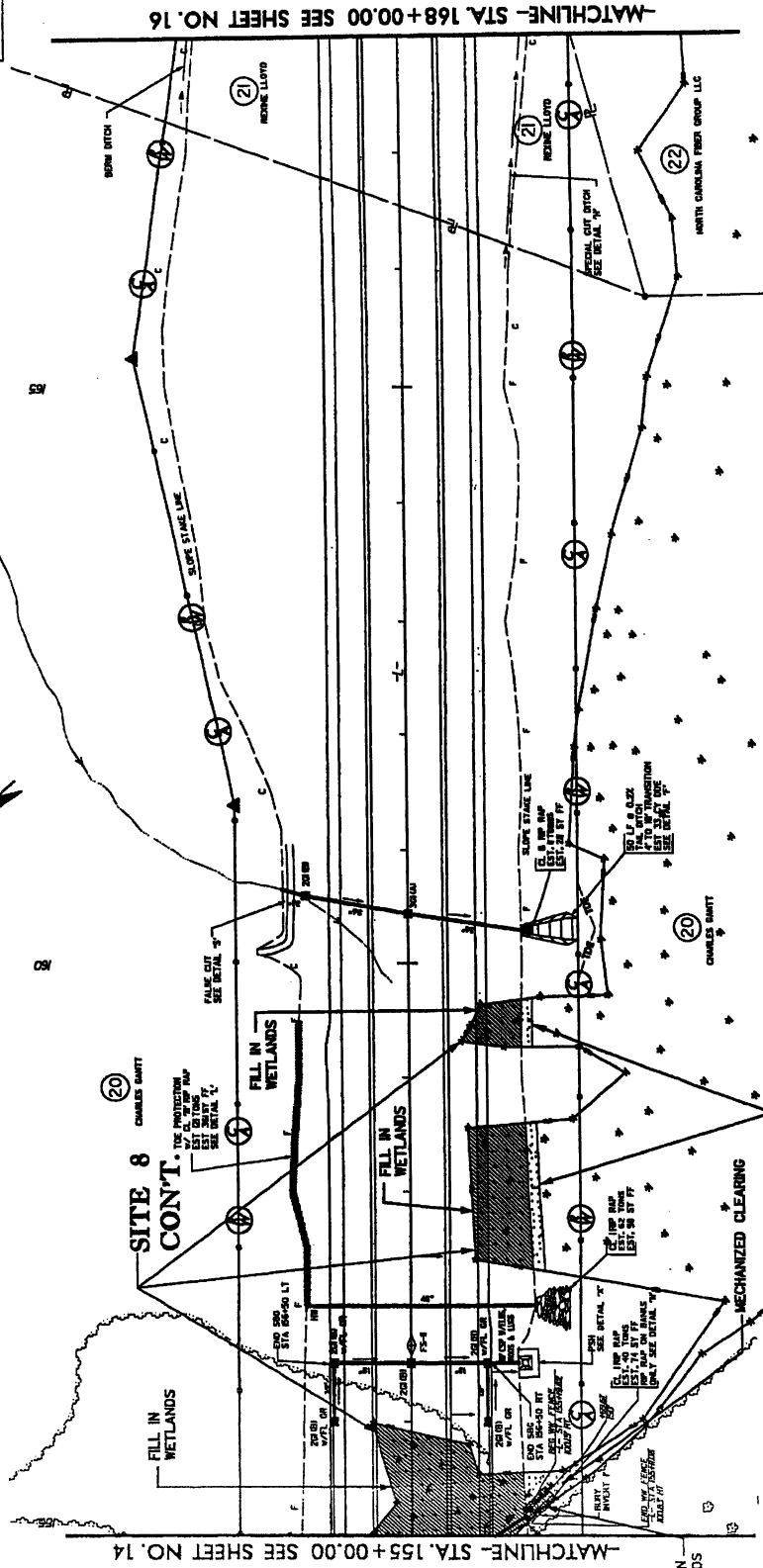
PROJECT APPROVED NO.
 R-2477AA
DATE
 1/5

PRELIMINARY PLANS
 FOR THE
 BYPASS FROM WEST
 OF SR 1409 TO WEST
 OF US 1-41-401

Permit Drawing
Sheet 32 of 41



NC GRID NAD 83

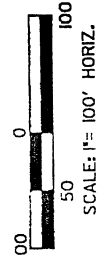


LEGEND

- HLS— WETLAND
- ▨ DENOTES FILL IN WETLAND
- ▩ DENOTES EXCAVATION IN WETLANDS
- ⊙ DENOTES MECHANIZED CLEARING

NC DOT
 DIVISION OF HIGHWAYS
 LEE COUNTY
 PROJECT#44113 U-2407AA
 US 401-NC BY SANFORD
 BYPASS FROM WEST
 OF SR 1409 TO WEST
 OF US 1-41-401
 DRAWING 22 OF 41

PLAN VIEW
SITE 8 CONT.



-MATCHLINE- STA. 155+00.00 SEE SHEET NO. 14

-MATCHLINE- STA. 168+00.00 SEE SHEET NO. 16

EXCAVATION
IN WETLANDS

SITE 8
CONT.

20 CHANGES UNIT

MECHANIZED CLEARING

MECHANIZED CLEARING

MECHANIZED CLEARING

FILL IN WETLANDS

FILL IN WETLANDS

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KO & ASSOCIATES, P.C.
 Consulting Engineers
 A. P. Koenig & P. H. Koenig, Inc. Company
 401 Lenoir Street, Raleigh, NC 27601
 (919) 833-1100

PROJECT NUMBER: 10-1000
 SHEET NO.: 15
 DATE: 10/15/99

PRELIMINARY PLANS
 FOR THE USE OF THE CONTRACTOR

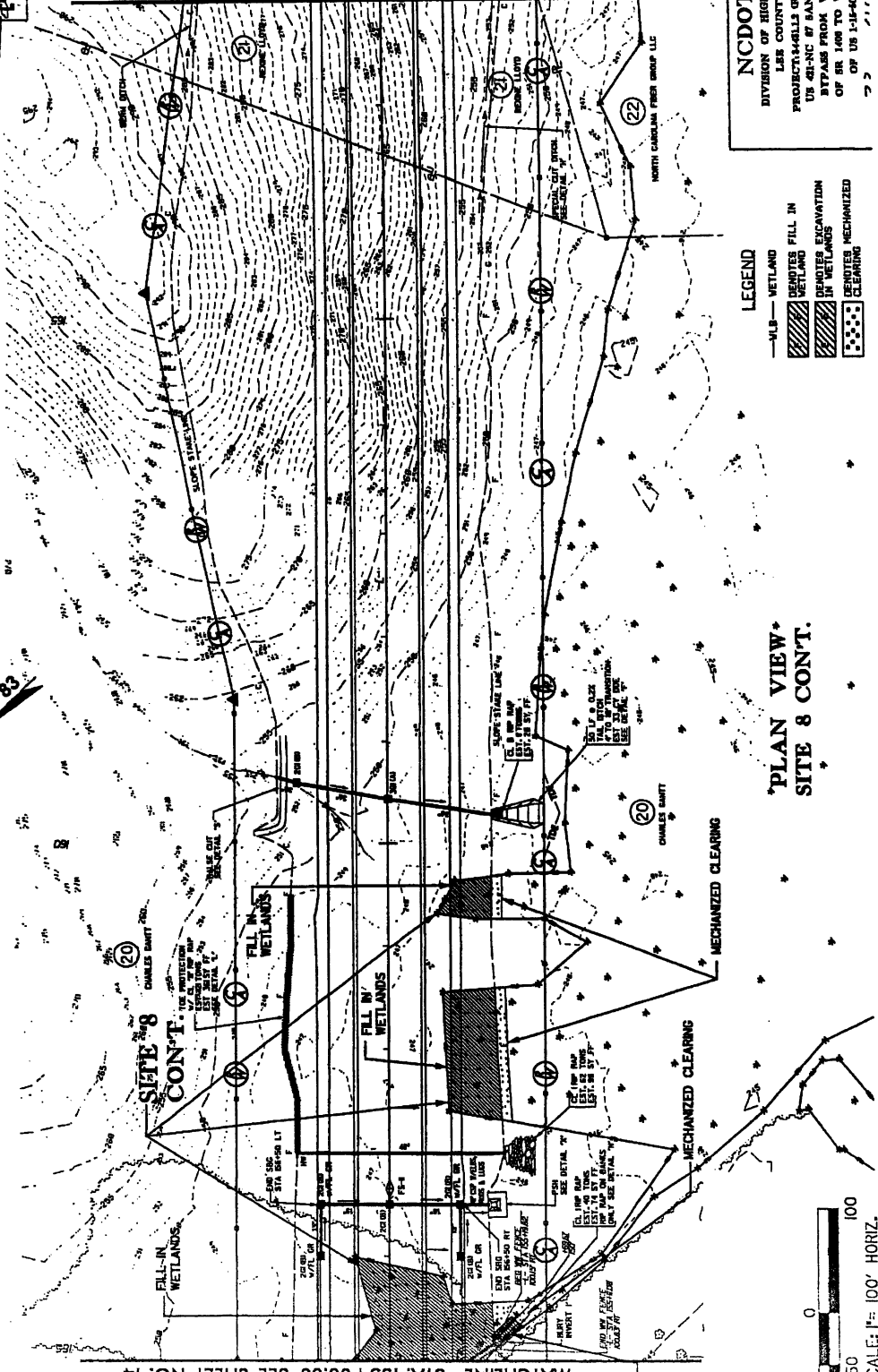
Permit Drawing
 Sheet 33 of 41



NC GRID
 NAD 83

MATCHLINE- STA. 168+00.00 SEE SHEET NO. 16

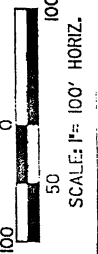
MATCHLINE- STA. 155+00.00 SEE SHEET NO. 14



LEGEND

- WETLAND
- WETLAND FILL IN
- EXCAVATION IN WETLANDS
- MECHANIZED CLEARING

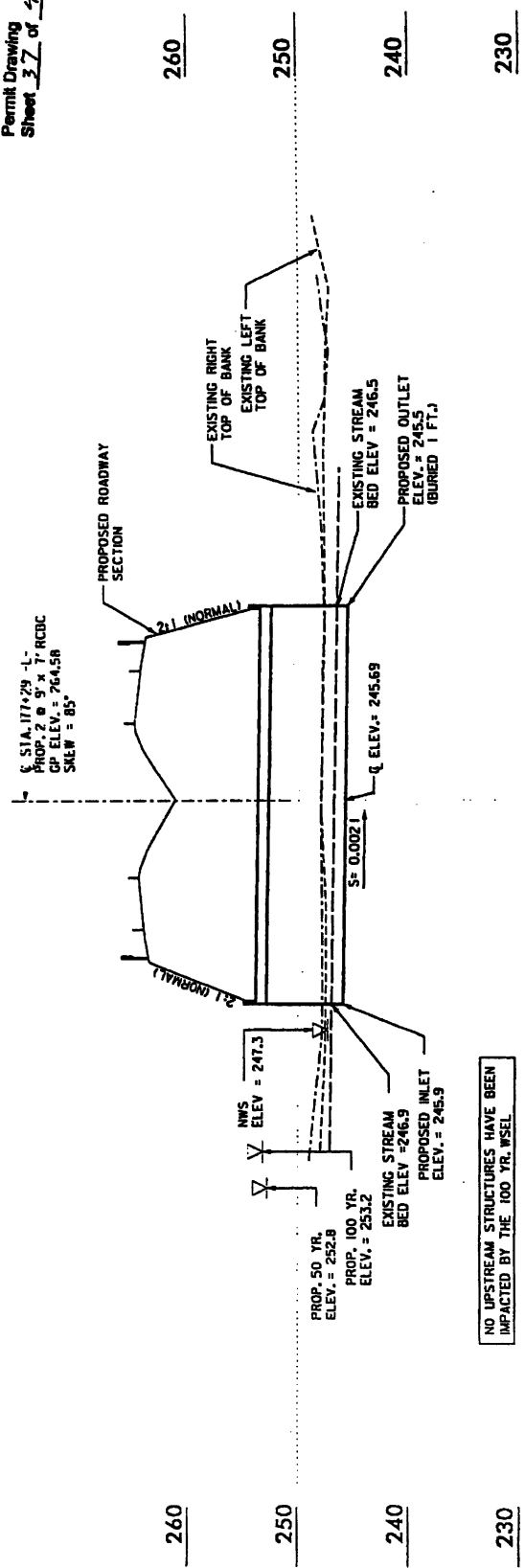
PLAN VIEW
 SITE 8 CONT.



NCDOT
 DIVISION OF HIGHWAYS
 LEE COUNTY
 PROJECT: 14-111 (R-1411A)
 US 421-NC BY RAINFORD
 BYPASS FROM WEST
 OF SR 1408 TO WEST
 OF US 1-14-01

PROJECT NUMBER: R-2471A
 SHEET NO.: SB-P15
 DATE: 8/1/09
 DRAWN BY: J. B. BROWN
 CHECKED BY: J. B. BROWN
 IN CHARGE: J. B. BROWN
 PRELIMINARY PLANS

Permit Drawing
 Sheet 37 of 41



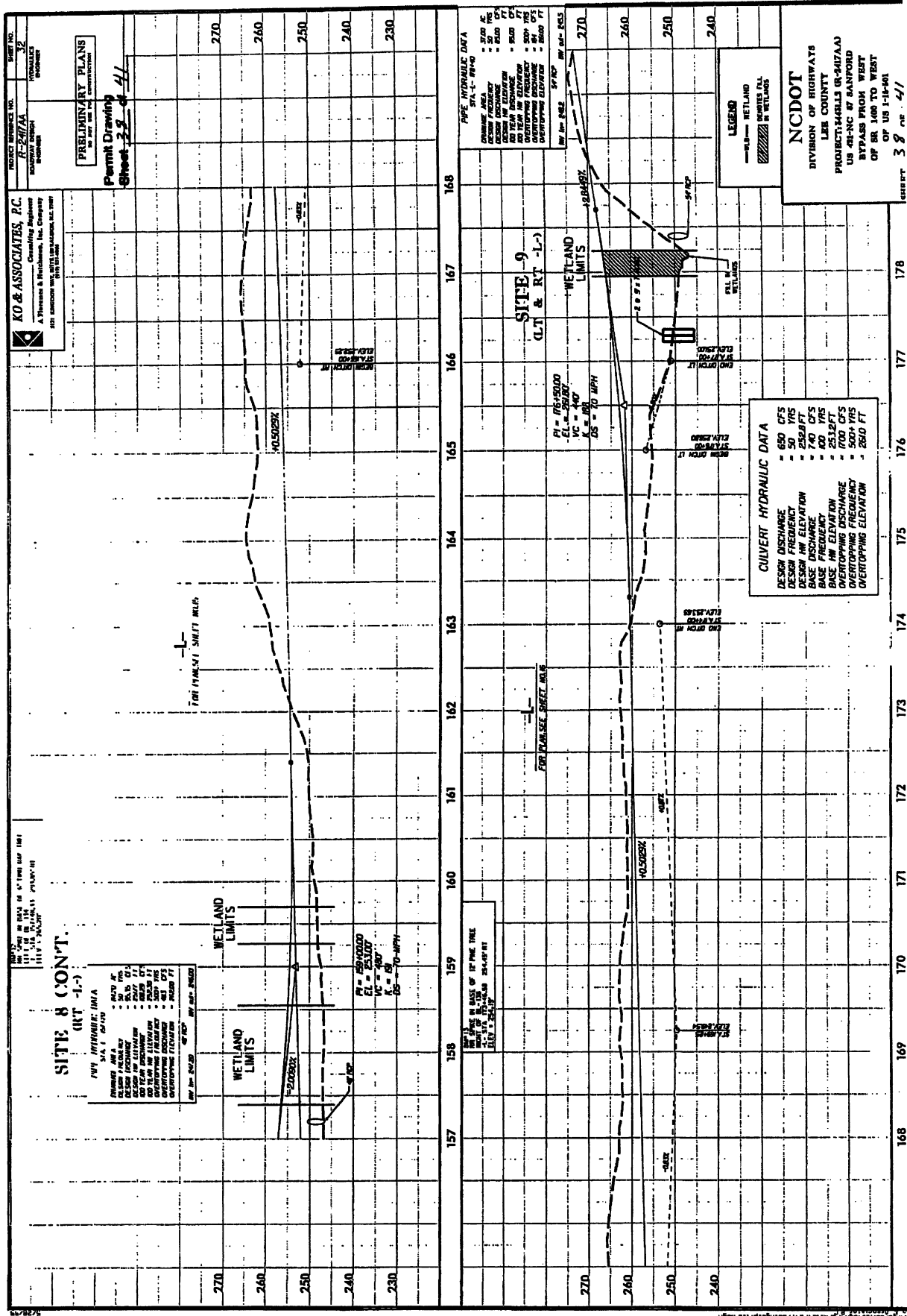
NO UPSTREAM STRUCTURES HAVE BEEN IMPACTED BY THE 100 YR. WSEL



NCDOT
 DIVISION OF HIGHWAYS
 LEE COUNTY
 PROJECT: 44813 (R-2471AA)
 US 421-NC 87 SANFORD
 BYPASS FROM WEST
 OF SR 1400 TO WEST
 OF US 1-15-601

PROFILE ALONG STRUCTURE
 SITE 9

SCALE:
 1" = 50' HORIZONTAL
 1" = 10' VERTICAL



PROJECT NUMBER: 10-2017A
 DRAWING NUMBER: 10-2017A-01
 SHEET NO.: 32

PRELIMINARY PLANS
 PERMIT DRAWING
 SHEET 32 of 41

CO & ASSOCIATES, P.C.
 Consulting Engineers
 A Thomas & Hutchinson, Inc. Company
 101 S. GARDNER WAY, SUITE 100, RALEIGH, NC 27601

WETLAND LIMITS
 WETLAND LIMITS
 WETLAND LIMITS

WETLAND LIMITS
 WETLAND LIMITS
 WETLAND LIMITS

WETLAND LIMITS
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 WETLAND LIMITS

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 R = 200
 DS = 70 MPH

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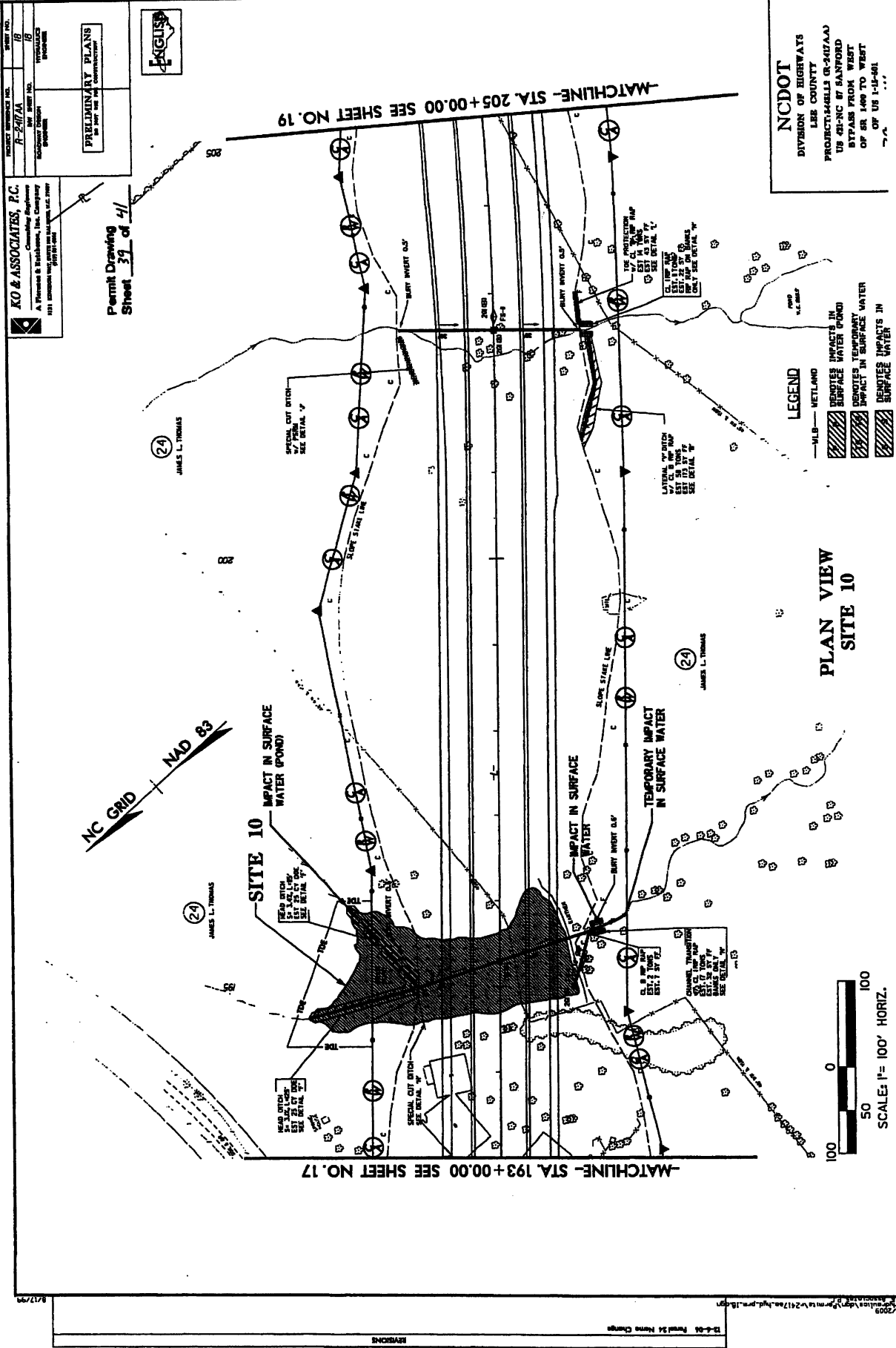
PI = 25400.00
 CL = 250.00
 R = 100
 DS = 70 MPH

PI = 25400.00
 CL = 250.00
 R = 100
 DS = 70 MPH

LEGEND
 WETLAND
 WETLAND
 WETLAND

CULVERT HYDRAULIC DATA
 DESIGN DISCHARGE = 650 CFS
 DESIGN FREQ. = 50 YRS
 DESIGN HW ELEVATION = 252.8 FT
 BASE DISCHARGE = 740 CFS
 BASE FREQ. = 60 YRS
 DESIGN ELEVATION = 253.0 CFS
 DESIGN W. DISCHARGE = 700 CFS
 OVERTOPPING FREQ. = 500+ YRS
 OVERTOPPING ELEVATION = 260.0 FT

NC DOT
 DIVISION OF HIGHWAYS
 LEE COUNTY
 PROJECT: 4413 (R-2417AA)
 US 41-NC AT RANFORD
 BYPASS FROM WEST
 OF SR 140 TO WEST
 OF US 1-14-01
 SHEET 38 of 41



NC DOT
 DIVISION OF HIGHWAYS
 LEE COUNTY
 PROJECT: I-40/87 SANFORD
 BYPASS FROM WEST
 OF SR 1400 TO WEST
 OF US 1-40-401

LEGEND

- WETLAND
- IMPACTS IN SURFACE WATER (POND)
- TEMPORARY IMPACTS IN SURFACE WATER
- IMPACTS IN SURFACE WATER

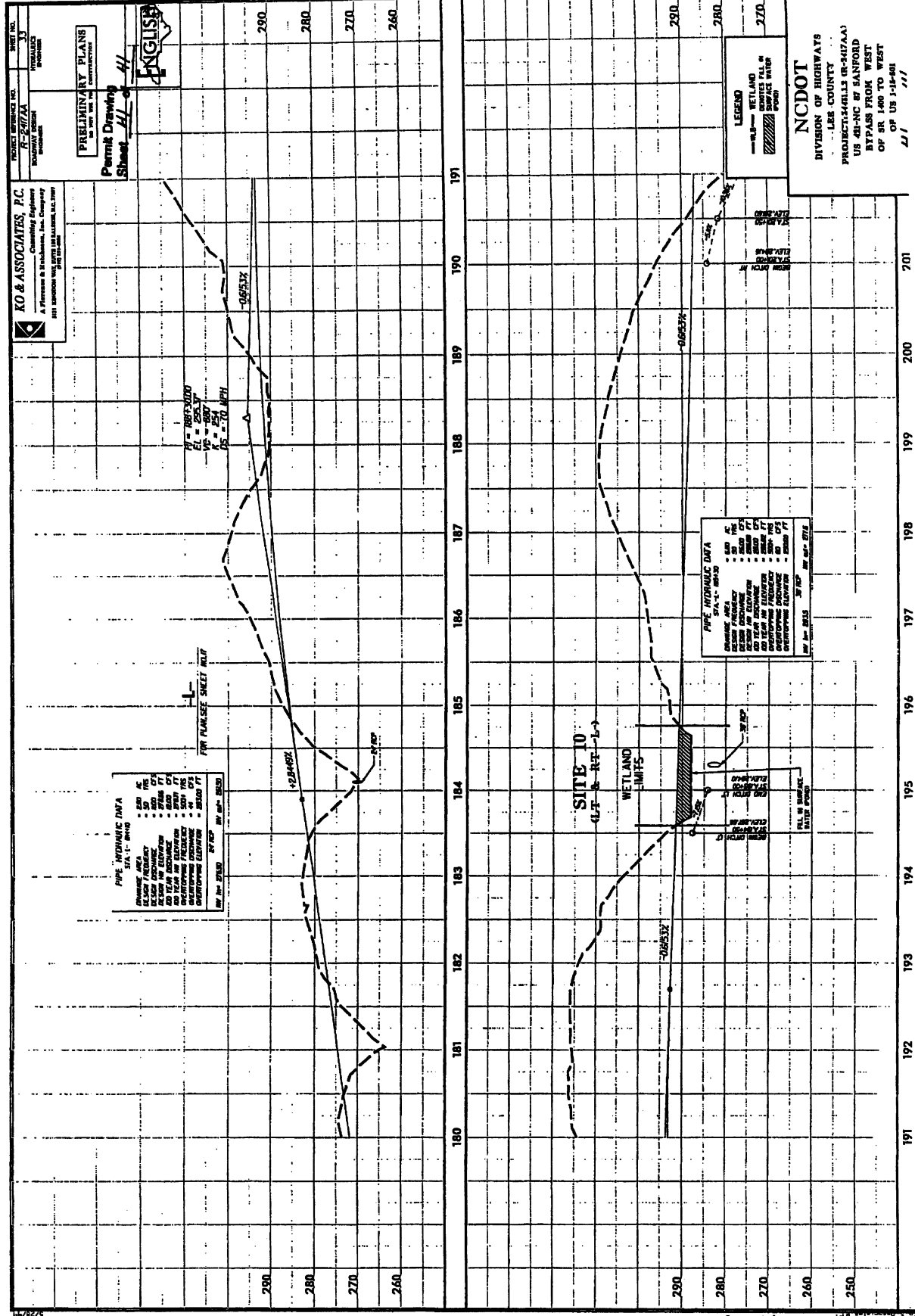
PLAN VIEW SITE 10

SCALE: 1" = 100' HORIZ.

KO & ASSOCIATES, P.C.
 A FLEMING & SMITH Consulting Engineers
 1211 Lenoir Street, Raleigh, NC 27601
 (919) 781-1000

PERMIT DRAWING
 Sheet 37 of 41





PROJECT NUMBER: NC 33
 R-2473A
 HYDRAULICS
 PRELIMINARY PLANS
 PERMIT DRAWING
 SHEET 41

KO & ASSOCIATES, P.C.
 Consulting Engineers
 A Firmness & Brinkman, Inc. Company
 201 SHERWOOD ROAD, SUITE 100, RALEIGH, NC 27609



Permit Drawing
 Sheet 41

PIPE HYDRAULIC DATA
 STA. 11-18140

PIPE AREA	1.50	FT ²
PIPE PERIMETER	4.71	FT
PIPE LENGTH	100.00	FT
PIPE WEIGHT	150.00	LB
PIPE TENSILE STRENGTH	1000.00	LB
PIPE TENSILE ELONGATION	10.00	%
PIPE TENSILE ELONGATION	10.00	%
PIPE TENSILE ELONGATION	10.00	%
PIPE TENSILE ELONGATION	10.00	%
PIPE TENSILE ELONGATION	10.00	%
PIPE TENSILE ELONGATION	10.00	%

REF: SEE SHEET 40

PI = 1885.0000
 US = 282.77
 K = 254
 FC = 7.70 MPH

FOR FLANGE SHEET 40

SITE 10
 (L-1 & R-1)

WETLAND LIMITS

PIPE HYDRAULIC DATA
 STA. 11-18145

PIPE AREA	1.50	FT ²
PIPE PERIMETER	4.71	FT
PIPE LENGTH	100.00	FT
PIPE WEIGHT	150.00	LB
PIPE TENSILE STRENGTH	1000.00	LB
PIPE TENSILE ELONGATION	10.00	%
PIPE TENSILE ELONGATION	10.00	%
PIPE TENSILE ELONGATION	10.00	%
PIPE TENSILE ELONGATION	10.00	%
PIPE TENSILE ELONGATION	10.00	%
PIPE TENSILE ELONGATION	10.00	%

REF: SEE SHEET 40

LEGEND
 --- WETLAND
 --- SURFACE WATER

NC DOT
 DIVISION OF HIGHWAYS
 LEE COUNTY
 PROJECT: 2473A (R-2473A)
 US 421-NC BY SANFORD
 BYPASS FROM WEST
 OF SR 140 TO WEST
 OF US 1-14-601
 2/1

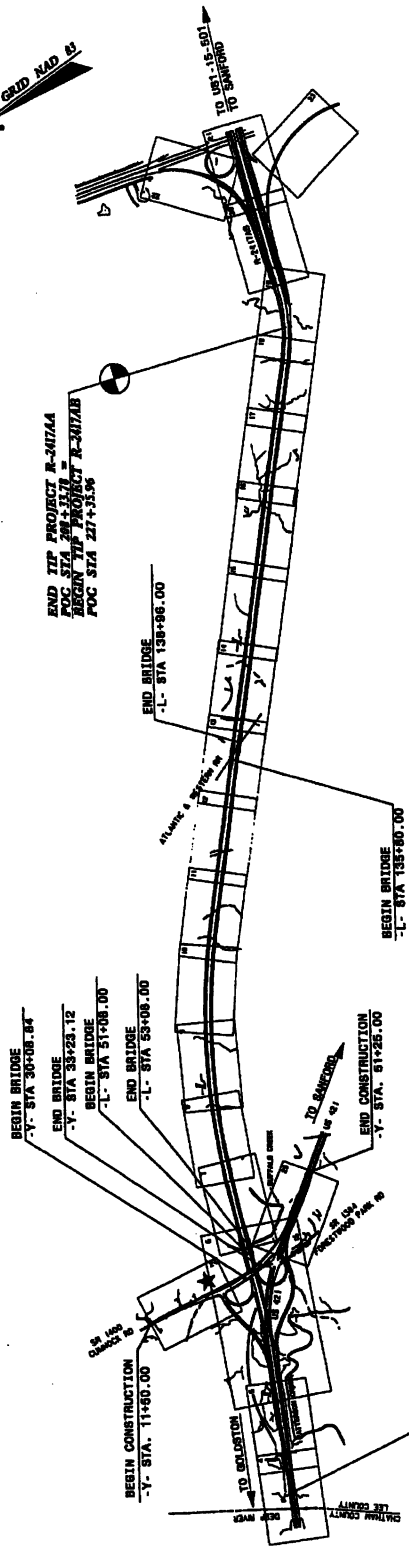
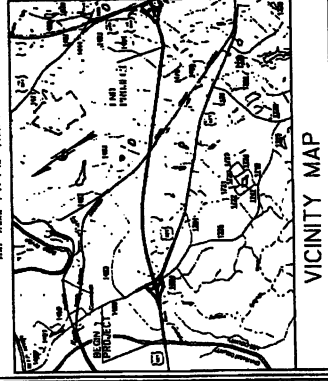
STATE	NC	PROJECT NUMBER	R-2417AA	SHEET	1
COUNTY	LEE	PLAN NUMBER	34451.12	DATE	P.E.
			34451.22		RW

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

LEE COUNTY

LOCATION: US 421 - NC 87 SANFORD BYPASS FROM WEST OF SR 1400 TO WEST OF US 1-15-501

TYPE OF WORK: GRADING, DRAINAGE, PAVING, STRUCTURES AND SIGNAL.



PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

HYDRAULICS ENGINEER

ROADWAY DESIGN ENGINEER

PROJECT MANAGER

David C. Waller, P.E.

THIS IS A CONTROLLED - ACCESS PROJECT WITH ACCESS BEING LIMITED TO INTERCHANGES. CHANGES ON THIS PROJECT SHALL BE PERFORMED TO THE LIMITS ESTABLISHED BY METEOD III

RIGHT OF WAY DATE: February 17, 2006

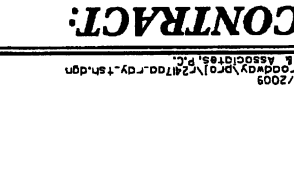
LETTING DATE: May 20, 2009

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT R-2417AA	3.64 MI
LENGTH STRUCTURES TIP PROJECT R-2417AA	0.94 MI
TOTAL LENGTH OF TIP PROJECT R-2417AA	1.26 MI

DESIGN DATA

ADT 2008	13,200
ADT 2028	20,800
DHV	10 %
D	60 %
T	9 %
V	70 MPH
* T1ST 5% DUAL 4%	



CONTRACT: TIP PROJECT: R-2417AA

NC DOT CONTACT: CATHY S. HOUSER, P.E. ENGINEERING COORDINATION
ROADWAY DESIGN

ADDITIONAL INFORMATION: PROJECT R-2417AA

Note: Not to Scale

*S.U.E. = Subsurface Utility Engineering

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

CONVENTIONAL PLAN SHEET SYMBOLS

PROJECT NO. _____
SHEET NO. _____
DATE _____

BOUNDARIES AND PROPERTY:

- State Line _____
- County Line _____
- Township Line _____
- City Line _____
- Reservation Line _____
- Property Line _____
- Existing Iron Pin _____
- Property Corner _____
- Property Monument _____
- Parcel/Sequence Number _____
- Existing Fence Line _____
- Proposed Women Wire Fence _____
- Proposed Chain Link Fence _____
- Proposed Barbed Wire Fence _____
- Existing Wetland Boundary _____
- Proposed Wetland Boundary _____
- Existing Endangered Animal Boundary _____
- Existing Endangered Plant Boundary _____

BUILDINGS AND OTHER CULTURE:

- Gas Pump Vent or UG Tank Cap _____
- Sign _____
- Well _____
- Small Mine _____
- Foundation _____
- Area Outline _____
- Cemetery _____
- Building _____
- School _____
- Church _____
- Deer _____

HYDROLOGY:

- Stream or Body of Water _____
- Hydro, Pool or Reservoir _____
- Jurisdictional Stream _____
- Buffer Zone 1 _____
- Buffer Zone 2 _____
- Flow Arrow _____
- Disappearing Stream _____
- Spring _____
- Wetland _____
- Proposed Lateral, Tail, Head Ditch _____
- Falsar Sump _____

RAILROADS:

- Standard Gauge _____
- RR Signal Milepost _____
- Switch _____
- RR Abandoned _____
- RR Dismantled _____

RIGHT OF WAY:

- Baseline Control Point _____
- Existing Right of Way Marker _____
- Existing Right of Way Line _____
- Proposed Right of Way Line _____
- Proposed Right of Way Line with Iron Pin and Cap Marker _____
- Proposed Right of Way Line with Concrete or Granite Marker _____
- Existing Control of Access _____
- Proposed Control of Access _____
- Existing Easement Line _____
- Proposed Temporary Construction Easement _____
- Proposed Temporary Drainage Easement _____
- Proposed Permanent Drainage Easement _____
- Proposed Permanent Utility Easement _____

ROADS AND RELATED FEATURES:

- Existing Edge of Pavement _____
- Existing Curb _____
- Proposed Slope Stakes Cut _____
- Proposed Slope Stakes Fill _____
- Proposed Wheel Chair Ramp _____
- Existing Metal Guardrail _____
- Proposed Guardrail _____
- Existing Cable Guidrail _____
- Proposed Cable Guidrail _____
- Equality Symbol _____
- Pavement Removal _____

VEGETATION:

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

EXISTING STRUCTURES:

- MAJOR:
 - Bridges, Tunnel or Box Culvert _____
 - Bridge Wing Wall, Head Wall and End Wall _____
- MINOR:
 - Head and End Wall _____
 - Pipe Culvert _____
 - Footbridge _____
 - Drainage Box: Catch Basin, DI or JB _____
 - Forward Ditch Gutter _____
 - Storm Sewer Manhole _____
 - Storm Sewer _____

UTILITIES:

- POWER:
 - Existing Power Pole _____
 - Proposed Power Pole _____
 - Existing Joint Use Pole _____
 - Proposed Joint Use Pole _____
 - Power Manhole _____
 - Power Line Tower _____
 - Power Transformer _____
 - UG Power Cable Hand Hole _____
 - H-Frame Pole _____
 - Recorded UG Power Line _____
 - Designated UG Power Line (S.U.E.)* _____
- TELEPHONE:
 - Existing Telephone Pole _____
 - Proposed Telephone Pole _____
 - Telephone Manhole _____
 - Telephone Booth _____
 - Telephone Pedestal _____
 - Telephone Call Tower _____
 - UG Telephone Cable Hand Hole _____
 - Recorded UG Telephone Cable _____
 - Designated UG Telephone Cable (S.U.E.)* _____
 - Recorded UG Telephone Conduit _____
 - Designated UG Telephone Conduit (S.U.E.)* _____
 - Recorded UG Fiber Optics Cable _____
 - Designated UG Fiber Optics Cable (S.U.E.)* _____

WATER:

- Water Manhole _____
- Water Meter _____
- Water Valve _____
- Water Hydrant _____
- Recorded UG Water Line _____
- Designated UG Water Line (S.U.E.)* _____
- Above Ground Water Line _____

TV:

- TV Satellite Dish _____
- TV Pedestal _____
- TV Tower _____
- UG TV Cable Hand Hole _____
- Recorded UG TV Cable _____
- Designated UG TV Cable (S.U.E.)* _____
- Recorded UG Fiber Optic Cable _____
- Designated UG Fiber Optic Cable (S.U.E.)* _____

GAS:

- Gas Valve _____
- Gas Meter _____
- Recorded UG Gas Line _____
- Designated UG Gas Line (S.U.E.)* _____
- Above Ground Gas Line _____

SANITARY SEWER:

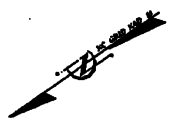
- Sanitary Sewer Manhole _____
- Sanitary Sewer Cleanout _____
- UG Sanitary Sewer Line _____
- Above Ground Sanitary Sewer _____
- Recorded SS Forced Main Line _____
- Designated SS Forced Main Line (S.U.E.)* _____

MISCELLANEOUS:

- Utility Pole _____
- Utility Pole with Base _____
- Utility Located Object _____
- Utility Traffic Signal Box _____
- Utility Unknown UG Line _____
- UG Tank: Water, Gas, Oil _____
- AG Tank: Water, Gas, Oil _____
- UG Test Hole (S.U.E.)* _____
- Abandoned According to Utility Records _____
- AAATUR _____
- E.O.I. _____

PROJECT NUMBER	R-2417AA
DATE	12/10/09
Location and Survey	

SURVEY CONTROL SHEET R-2417AA



-L- STA 268+33.78 END STATE PROJECT 3443LLI
 LOCALIZED PROJECT COORDINATES
 N = 642156.7956
 E = 1941099.8737



LOCALIZED PROJECT COORDINATES
 N = 1811399.3284
 E = 1941099.8737

-L- STA 12+50.00 BEGIN STATE PROJECT 3443LLI
 LOCALIZED PROJECT COORDINATES
 N = 653278.3728
 E = 1925183.1688

DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCOS FOR MONUMENT "CUMMICK2" WITH NAD 83 STATE PLANE GRID COORDINATES OF NORTHING 651651.285(4) EASTING 1928265.244(7) THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS 0.9999998545

THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "CUMMICK 2" TO 4- STATION 12+50.00 IS N 62°10'15.20" W 3,465.223'

ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES VERTICAL DATUM USED IS MVD 89

NOTES:

THIS CONTROL DATA FOR THIS PROJECT CAN BE FOUND ELECTRONICALLY BY SELECTING PROJECT CONTROL DATA AT:
[HTTP://WWW.DORHDOT.STATE.NC.US/PRECONSTRUCT/GHW/ALLOCATION/PROJECT/SITE CALIBRATION INFORMATION](http://www.dorhdot.state.nc.us/preconstruct/ghw/ALLOCATION/PROJECT/SITE%20CALIBRATION%20INFORMATION) HAS NOT BEEN PROVIDED FOR THIS PROJECT. IF FURTHER INFORMATION IS NEEDED, PLEASE CONTACT THE LOCATION AND SURVEYS UNIT.

INDICATES GEODESIC CONTROL MONUMENTS USED OR SET FOR HORIZONTAL PROJECT CONTROL BY THE NC DOT LOCATION AND SURVEYS UNIT.

NETWORK ESTABLISHED FROM EXISTING NCOS MADS MONUMENTATION.

NOTES

THE CONTROL DATA FOR THIS PROJECT CAN BE FOUND ELECTRONICALLY BY SELECTING PROJECT CONTROL DATA AT:
[HTTP://WWW.DORHDOT.STATE.NC.US/PRECONSTRUCT/GHW/ALLOCATION/PROJECT/SITE CALIBRATION INFORMATION](http://www.dorhdot.state.nc.us/preconstruct/ghw/ALLOCATION/PROJECT/SITE%20CALIBRATION%20INFORMATION) HAS NOT BEEN PROVIDED FOR THIS PROJECT. IF FURTHER INFORMATION IS NEEDED, PLEASE CONTACT THE LOCATION AND SURVEYS UNIT.

INDICATES GEODESIC CONTROL MONUMENTS USED OR SET FOR HORIZONTAL PROJECT CONTROL BY THE NC DOT LOCATION AND SURVEYS UNIT.

NETWORK ESTABLISHED FROM EXISTING NCOS MADS MONUMENTATION.

NOTE: DRAWING NOT TO SCALE

SURVEY CONTROL SHEET R-2417AA

PROJECT APPROVAL NO.	DATE NO.
R-2417AA	ID
Location and Surveys	

STATION	POINT	DESC.	NORTH	EAST	ELEVATION	L. STATION	OFFSET
101	BL-101		81795.7284	1527952.8779	278.25	43781.82	8.08 RT
102	BT-141		817284.8788	1528281.7418	288.84	37285.44	195.29 RT
103	BT-142		817284.8788	1528281.7418	288.84	37285.44	195.29 RT
104	BT-143		817284.8788	1528281.7418	288.84	37285.44	195.29 RT
105	BT-144		817284.8788	1528281.7418	288.84	37285.44	195.29 RT
106	BT-145		817284.8788	1528281.7418	288.84	37285.44	195.29 RT
107	BT-146		817284.8788	1528281.7418	288.84	37285.44	195.29 RT
108	BT-147		817284.8788	1528281.7418	288.84	37285.44	195.29 RT
109	BT-148		817284.8788	1528281.7418	288.84	37285.44	195.29 RT
110	BT-149		817284.8788	1528281.7418	288.84	37285.44	195.29 RT
111	BT-150		817284.8788	1528281.7418	288.84	37285.44	195.29 RT
112	BT-151		817284.8788	1528281.7418	288.84	37285.44	195.29 RT
113	BT-152		817284.8788	1528281.7418	288.84	37285.44	195.29 RT
114	BT-153		817284.8788	1528281.7418	288.84	37285.44	195.29 RT
115	BT-154		817284.8788	1528281.7418	288.84	37285.44	195.29 RT
116	BT-155		817284.8788	1528281.7418	288.84	37285.44	195.29 RT
117	BT-156		817284.8788	1528281.7418	288.84	37285.44	195.29 RT
118	BT-157		817284.8788	1528281.7418	288.84	37285.44	195.29 RT
119	BT-158		817284.8788	1528281.7418	288.84	37285.44	195.29 RT
120	BT-159		817284.8788	1528281.7418	288.84	37285.44	195.29 RT
121	BT-160		817284.8788	1528281.7418	288.84	37285.44	195.29 RT
122	BT-161		817284.8788	1528281.7418	288.84	37285.44	195.29 RT
123	BT-162		817284.8788	1528281.7418	288.84	37285.44	195.29 RT
124	BT-163		817284.8788	1528281.7418	288.84	37285.44	195.29 RT
125	BT-164		817284.8788	1528281.7418	288.84	37285.44	195.29 RT
126	BT-165		817284.8788	1528281.7418	288.84	37285.44	195.29 RT
127	BT-166		817284.8788	1528281.7418	288.84	37285.44	195.29 RT
128	BT-167		817284.8788	1528281.7418	288.84	37285.44	195.29 RT
129	BT-168		817284.8788	1528281.7418	288.84	37285.44	195.29 RT
130	BT-169		817284.8788	1528281.7418	288.84	37285.44	195.29 RT
131	BT-170		817284.8788	1528281.7418	288.84	37285.44	195.29 RT
132	BT-171		817284.8788	1528281.7418	288.84	37285.44	195.29 RT
133	BT-172		817284.8788	1528281.7418	288.84	37285.44	195.29 RT
134	BT-173		817284.8788	1528281.7418	288.84	37285.44	195.29 RT
135	BT-174		817284.8788	1528281.7418	288.84	37285.44	195.29 RT
136	BT-175		817284.8788	1528281.7418	288.84	37285.44	195.29 RT
137	BT-176		817284.8788	1528281.7418	288.84	37285.44	195.29 RT
138	BT-177		817284.8788	1528281.7418	288.84	37285.44	195.29 RT
139	BT-178		817284.8788	1528281.7418	288.84	37285.44	195.29 RT
140	BT-179		817284.8788	1528281.7418	288.84	37285.44	195.29 RT
141	BT-180		817284.8788	1528281.7418	288.84	37285.44	195.29 RT
142	BT-181		817284.8788	1528281.7418	288.84	37285.44	195.29 RT
143	BT-182		817284.8788	1528281.7418	288.84	37285.44	195.29 RT
144	BT-183		817284.8788	1528281.7418	288.84	37285.44	195.29 RT
145	BT-184		817284.8788	1528281.7418	288.84	37285.44	195.29 RT
146	BT-185		817284.8788	1528281.7418	288.84	37285.44	195.29 RT
147	BT-186		817284.8788	1528281.7418	288.84	37285.44	195.29 RT
148	BT-187		817284.8788	1528281.7418	288.84	37285.44	195.29 RT
149	BT-188		817284.8788	1528281.7418	288.84	37285.44	195.29 RT
150	BT-189		817284.8788	1528281.7418	288.84	37285.44	195.29 RT
151	BT-190		817284.8788	1528281.7418	288.84	37285.44	195.29 RT
152	BT-191		817284.8788	1528281.7418	288.84	37285.44	195.29 RT
153	BT-192		817284.8788	1528281.7418	288.84	37285.44	195.29 RT
154	BT-193		817284.8788	1528281.7418	288.84	37285.44	195.29 RT
155	BT-194		817284.8788	1528281.7418	288.84	37285.44	195.29 RT
156	BT-195		817284.8788	1528281.7418	288.84	37285.44	195.29 RT
157	BT-196		817284.8788	1528281.7418	288.84	37285.44	195.29 RT
158	BT-197		817284.8788	1528281.7418	288.84	37285.44	195.29 RT
159	BT-198		817284.8788	1528281.7418	288.84	37285.44	195.29 RT
160	BT-199		817284.8788	1528281.7418	288.84	37285.44	195.29 RT
161	BT-200		817284.8788	1528281.7418	288.84	37285.44	195.29 RT

DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY ADAS FOR MONUMENT "CUMNOCK 2" WITH MAD 83 STATE PLANE GRID COORDINATES OF NORTHING: 651651285(FT) EASTING: 192895524(FT) THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.999999545 THE NAD 83 UTM GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "CUMNOCK 2" TO "L" STATION 12-5000 IS N 62°10'15.20" W 3485.223' ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES VERTICAL DATUM USED IS MVD 28

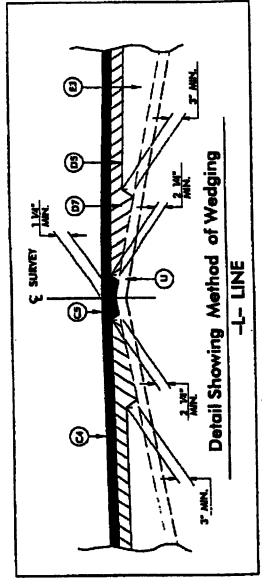
NOTES

1. THE CONTROL DATA FOR THIS PROJECT CAN BE FOUND ELECTRONICALLY BY SELECTING "PROJECT CONTROL DATA AT: HTTP://WWW.DOH.DOT.STATE.NC.US/PRECONSTRUCT/HIGHWAY/LOCATION/PROJECT/F241700.IS_CONTROL_050308.TXT" THE FILES TO BE FOUND ARE AS FOLLOWS: F241700.IS_CONTROL_050308.TXT

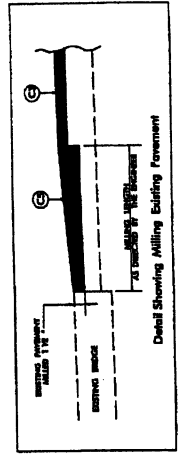
PROJECT REFERENCE NO. **A-2777AA**
 DRAWING NO. **PAVEMENT DESIGN**
 SHEET NO. **2**

PRELIMINARY PLANS
 NOT FOR CONSTRUCTION

KO & ASSOCIATES, P.C.
 Consulting Engineers
 A. Peterson & E. Wickstrom, Inc.
 1511 Commerce Street, Suite 100
 Minneapolis, MN 55402

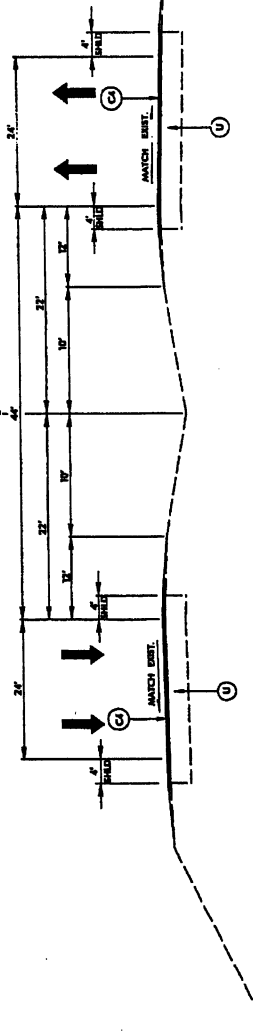


333



PAVEMENT SCHEDULE

C1	PROP. APPROX. 3" ASPHALT CONCRETE SURFACE COURSE, TYPE 89.0C, AT AN AVERAGE RATE OF 148 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.	E3	PROP. VAR. DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE 89.0C, IN EACH OF TWO LAYERS. PLACEMENT SHALL BE DIRECTED BY THE ENGINEER.
C2	PROP. VAR. DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE 89.0C, PLACED IN LAYERS NOT TO EXCEED 1 1/2" IN DEPTH.	J1	PROP. 10" AGGREGATE BASE COURSE.
C3	PROP. APPROX. 3" ASPHALT CONCRETE SURFACE COURSE, TYPE 89.0C, AT AN AVERAGE RATE OF 148 LBS. PER SQ. YD.	J2	PROP. 3" AGGREGATE BASE COURSE.
C4	PROP. APPROX. 3" ASPHALT CONCRETE SURFACE COURSE, TYPE 89.0C, AT AN AVERAGE RATE OF 148 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.	J3	PROP. 10" AGGREGATE BASE COURSE.
C5	PROP. VAR. DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE 89.0C, PLACED IN LAYERS NOT TO EXCEED 1 1/2" IN DEPTH.	J4	PROP. VAR. DEPTH AGGREGATE BASE COURSE.
D1	PROP. APPROX. 3 1/4" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE 119.0C, AT AN AVERAGE RATE OF 309 LBS. PER SQ. YD.	K1	BASE TO BE TREATED WITH LIME TO A DEPTH OF 8" AT A RATE OF 20 LBS. PER SQ. YD. AS DIRECTED BY THE ENGINEER.
D2	PROP. APPROX. 3 1/4" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE 119.0C, AT AN AVERAGE RATE OF 309 LBS. PER SQ. YD.	R1	BASE TO BE TREATED WITH LIME TO A DEPTH OF 8" AT A RATE OF 20 LBS. PER SQ. YD. AS DIRECTED BY THE ENGINEER.
D3	PROP. VAR. DEPTH ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE 119.0C, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1" DEPTH. PLACEMENT SHALL BE DIRECTED BY THE ENGINEER.	R2	2'-6" CONCRETE CURB AND GUTTER.
D4	PROP. APPROX. 3" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE 119.0C, AT AN AVERAGE RATE OF 309 LBS. PER SQ. YD.	R3	PROP. 3" MONOLITHIC CONCRETE ISLAND (SURFACE BOUNDED)
D5	PROP. APPROX. 3 1/4" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE 119.0C, AT AN AVERAGE RATE OF 309 LBS. PER SQ. YD.	T	PROP. SHOULDER BERM BUTTER.
D6	PROP. APPROX. 3" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE 119.0C, AT AN AVERAGE RATE OF 309 LBS. PER SQ. YD.	U	EARTH MATERIAL.
D7	PROP. VAR. DEPTH ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE 119.0C, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1" DEPTH. PLACEMENT SHALL BE DIRECTED BY THE ENGINEER.	W	EXISTING PAVEMENT.
E1	PROP. APPROX. 3" ASPHALT CONCRETE BASE COURSE, TYPE 89.0C, AT AN AVERAGE RATE OF 343 LBS. PER SQ. YD.		VARIABLE DEPTH ASPHALT PAVEMENT (SEE STANDARD REDGING DETAIL)
E2	PROP. APPROX. 3" ASPHALT CONCRETE BASE COURSE, TYPE 89.0C, AT AN AVERAGE RATE OF 343 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.		



TYPICAL SECTION NO. 1

USE TYPICAL SECTION NO. 1 AS FOLLOWS:

1'-0" STA. 9+49.00 TO 1'-0" STA. 10+00.00

L-LINE

1'-0" STA. 9+49.00 TO 1'-0" STA. 10+00.00

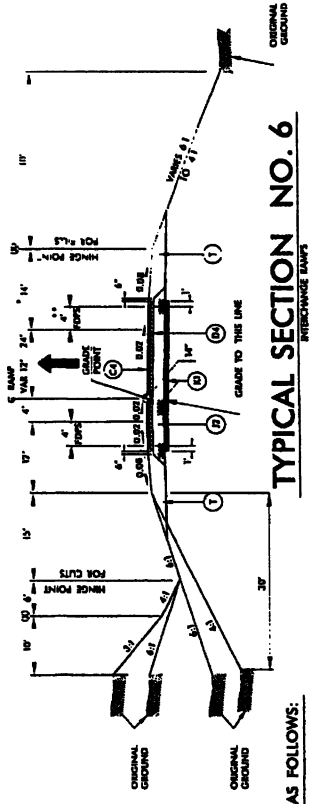
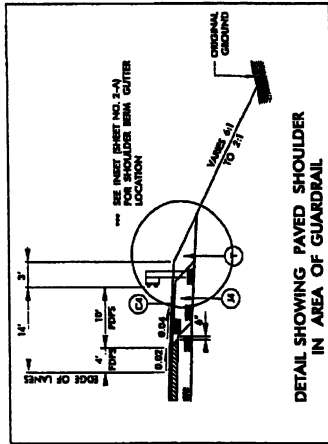
PROJECT REFERENCE NO. **R-241/A**
 DRAWING SECTION **PAVEMENT DESIGN**
 SHEET NO. **2-C**

PRELIMINARY PLANS
 AS NOTED AND AS SHOWN

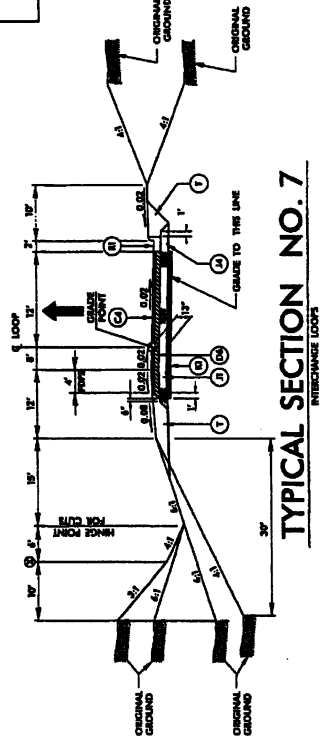
KO & ASSOCIATES, P.C.
 Consulting Engineers
 A Pittman & Blachford, Inc. Company
 121 Sanson Way, Suite 200, Raleigh, N.C. 27601
 919/876-1100

When these notations indicate shifts between the limits of the easement and the location of the structure, the structure shall be located within the easement.

PAVEMENT SCHEDULE	
C1	3" SF-5B
C2	VAL DEPTH SF-5B
C3	1 1/2" SF-5C
C4	3" SF-5C
C5	VAL DEPTH SF-5C
D1	2 1/2" SF-5B
D2	3 1/2" SF-5B
D3	VAL DEPTH SF-5B
D4	3" SF-5C
D5	3 1/2" SF-5C
D6	4" SF-5C
D7	VAL DEPTH SF-5C
E1	3" SF-5C
E2	4" SF-5C
E3	VAL DEPTH SF-5C
F1	6" ABC
F2	8" ABC
F3	10" ABC
F4	VAL DEPTH ABC
F5	8" LIME STABILIZATION OR 7" CEMENT STABILIZATION
F6	2'-0" CURB & GUTTER
F7	4" MONOLITHIC CONC ISLAND (SET IN CONC SHOULDER BEH GUTTER)
F8	CONC SHOULDER BEH GUTTER
T	SANDY MATERIAL
U	EST. PAVEMENT
W	WEDGING



USE TYPICAL SECTION NO. 6 AS FOLLOWS:
 -JPC- STA 14+00.00 TO -JPC- STA 27+40.00
 -JPC- STA 27+40.00 TO -JPC- STA 31+00.00
 -JPC- STA 31+00.00 TO -JPC- STA 33+77.10



USE TYPICAL SECTION NO. 7 AS FOLLOWS:
 -JPC- STA 11+38.50 TO -JPC- STA 17+63.70
 -JPC- STA 17+63.70 TO -JPC- STA 19+26.82

NOTE: SEE SHEET 2 FOR DETAILED DESCRIPTION OF PAVEMENT SCHEDULES.

NOTE: TYPICAL SECTIONS SHOWN ARE FOR TYPICAL SECTIONS ONLY. SEE PLANS AND STANDARD DRAWINGS FOR STABILIZATION, DRAINAGE, AND LANE AND SHOULDER WIDTHS. ALL DIMENSIONS ARE IN FEET AND INCHES. DIMENSIONS IN PARENTHESES INDICATE INTERMEDIATE COURSES, DO NOT INTERFERE WITH COURSE TYPES.

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

ALL SURFACE SLOPES (NORMAL TO PAVEMENT SURFACE SLOPES) ARE 2% UNLESS SHOWN OTHERWISE.

ALL 3'-0" CURB & GUTTER SHALL BE 3'-0" WITH OVERLAP.

SEE PLAN OF GUARDRAIL TYPE TO FACE OF GUARDRAIL FOR DETAIL.

PROJECT NUMBER NO. **R-242A**
 COUNTY ROAD DISTRICT
 COUNTY ROAD DISTRICT
 PROJECT NO. **2-D**

KO & ASSOCIATES, P.C.
 Consulting Engineers
 A Division of Blackman, Inc. Company
 1000 West 10th Street, Suite 100
 Oklahoma City, Oklahoma 73101
 TEL: (405) 521-1111 FAX: (405) 521-1112

PRELIMINARY PLANS
 FOR ROADWAY CONSTRUCTION

ITEM	DESCRIPTION
C1	3" 95.5R
C2	VAL DEPTH 95.5R
C3	1 1/2" 95.5C
C4	3" 95.5C
C5	VAL DEPTH 95.5C
D1	2 1/2" 117.0R
D2	3 1/2" 117.0R
D3	VAL DEPTH 117.0R
D4	3" 117.0C
D5	3 1/2" 117.0C
D6	4" 117.0C
D7	VAL DEPTH 117.0C
E1	3" 85.0C
E2	8" 85.0C
E3	VAL DEPTH 85.0C
F1	6" ABC
F2	6" ABC
F3	12" ABC
F4	VAL DEPTH ABC
G1	8" CURB STABILIZATION OR
G2	7" CONCRETE STABILIZATION
H1	2"-4" CURB & GUTTER
H2	6" MONOLITHIC CONCRETE ISLAND SETTS IN CONCRETE SHOULDERS
H3	CONCRETE SHOULDERS
H4	SEAL GUTTER
Y	EARTH MATERIAL
U	ROCK PAVEMENT
W	WEEDINGS

NOTE: SEE SHEET 2 FOR DETAILED DESCRIPTION OF PAYMENT SCHEDULE

NOTE: TYPICAL SECTIONS SHOWN ARE FOR TANGENT SECTIONS ONLY. SEE PLANS AND STANDARD DRAWINGS FOR SUPERELEVATION DETAILS AND LANE AND SHOULDER WIDTHS. ALL DIMENSIONS ARE IN FEET AND INCHES. DIMENSIONS ARE TO FACE UNLESS OTHERWISE NOTED. DIMENSIONS TO FACE OF GUARDRAIL, SEE DRAWING 9-8.

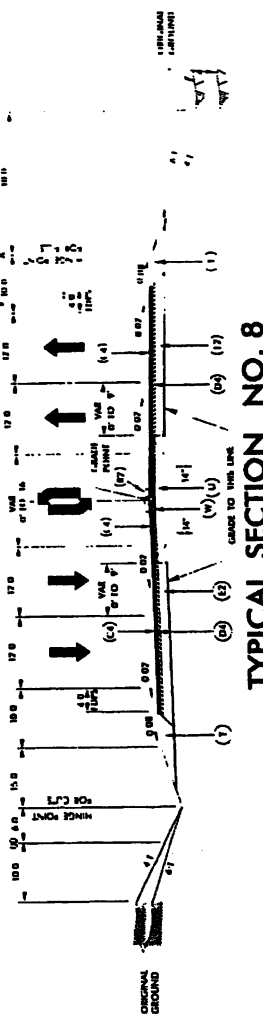
ALL TYPICAL BIRD SLOPES ARE 1:1 UNLESS SHOWN OTHERWISE.

ALL SURFACE SLOPES SHALL BE TO FINISH SURFACE SLOPES.

POVS - FULL DEPTH TYPING SHOULDERS SHALL BE 2'-0" WITH GUARDRAIL AND 2'-0" WITH GUARDRAIL.

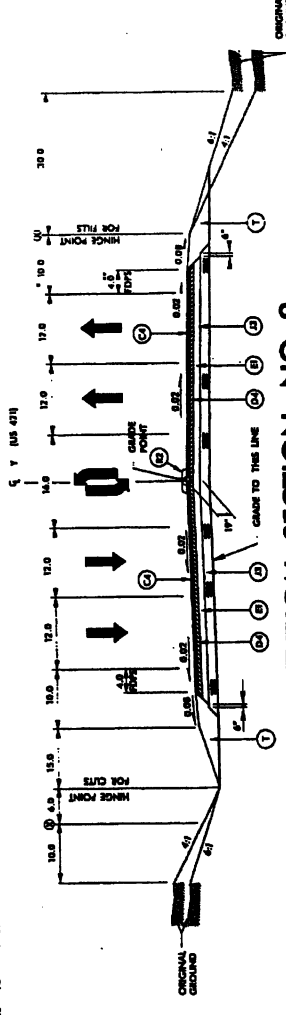
9-8 IN AREA OF GUARDRAIL, SEE TO FACE OF GUARDRAIL, SEE DRAWING 9-8.

X. WHERE TYPICAL SECTIONS ARE SHOWN, THE TANGENT SECTION SHALL BE USED UNLESS OTHERWISE INDICATED.



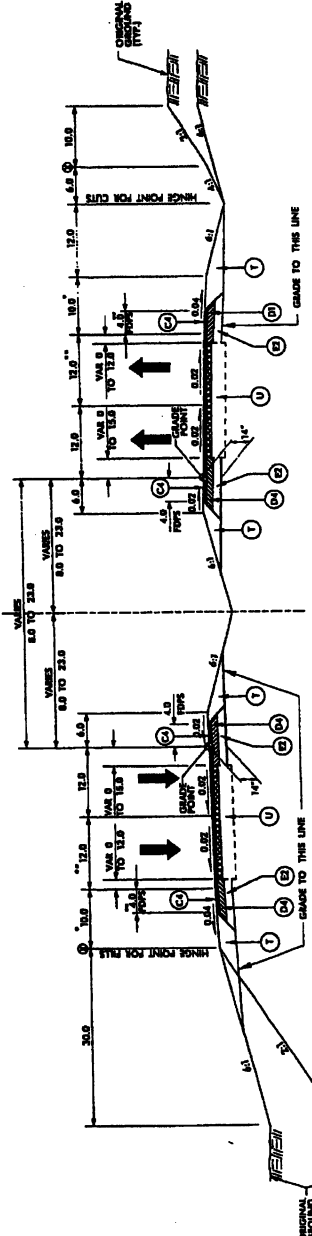
TYPICAL SECTION NO. 8
 CAMINO ROAD (DE 1400)

USE TYPICAL SECTION NO. 8 AS FOLLOWS:
 - STA. 11+50.00 TO - STA. 21+00.00



TYPICAL SECTION NO. 9
 US 421 (POOVE TRAIL)

USE TYPICAL SECTION NO. 9 AS FOLLOWS:
 - STA. 21+00.00 TO - STA. 29+23.54 (APPROACH SUMP)
 - STA. 31+50.00 (APPROACH SUMP) TO - STA. 40+00.00



TYPICAL SECTION NO. 10
 US 421 (POOVE TRAIL)

USE TYPICAL SECTION NO. 10 AS FOLLOWS:
 - STA. 40+00.00 TO - STA. 49+00.00

PRELIMINARY PLANS

PROJECT: 446115 (R-247) / 446115 (R-247) / 446115 (R-247)

DATE: 10/1/77

BY: [Signature]

CHECKED: [Signature]

SCALE: AS SHOWN

DETAIL F

STANDARD BASE DITCH

Sheet No. 1
Station: 10+00 to 10+20

DETAIL G

STANDARD BASE DITCH

Sheet No. 2
Station: 10+20 to 10+40

DETAIL H

SPECIAL O.U. DITCH

Sheet No. 3
Station: 10+40 to 10+60

DETAIL I

SPECIAL O.U. DITCH

Sheet No. 4
Station: 10+60 to 10+80

DETAIL J

SPECIAL O.U. DITCH

Sheet No. 5
Station: 10+80 to 11+00

DETAIL K

SPECIAL O.U. DITCH

Sheet No. 6
Station: 11+00 to 11+20

DETAIL L

SPECIAL O.U. DITCH

Sheet No. 7
Station: 11+20 to 11+40

DETAIL M

SPECIAL O.U. DITCH

Sheet No. 8
Station: 11+40 to 11+60

DETAIL N

SPECIAL O.U. DITCH

Sheet No. 9
Station: 11+60 to 11+80

DETAIL O

SPECIAL O.U. DITCH

Sheet No. 10
Station: 11+80 to 12+00

DETAIL P

SPECIAL O.U. DITCH

Sheet No. 11
Station: 12+00 to 12+20

DETAIL Q

SPECIAL O.U. DITCH

Sheet No. 12
Station: 12+20 to 12+40

DETAIL R

SPECIAL O.U. DITCH

Sheet No. 13
Station: 12+40 to 12+60

DETAIL S

SPECIAL O.U. DITCH

Sheet No. 14
Station: 12+60 to 12+80

DETAIL T

SPECIAL O.U. DITCH

Sheet No. 15
Station: 12+80 to 13+00

DETAIL U

SPECIAL O.U. DITCH

Sheet No. 16
Station: 13+00 to 13+20

DETAIL V

SPECIAL O.U. DITCH

Sheet No. 17
Station: 13+20 to 13+40

DETAIL W

SPECIAL O.U. DITCH

Sheet No. 18
Station: 13+40 to 13+60

DETAIL X

SPECIAL O.U. DITCH

Sheet No. 19
Station: 13+60 to 13+80

DETAIL Y

SPECIAL O.U. DITCH

Sheet No. 20
Station: 13+80 to 14+00

DETAIL Z

SPECIAL O.U. DITCH

Sheet No. 21
Station: 14+00 to 14+20

DETAIL AA

SPECIAL O.U. DITCH

Sheet No. 22
Station: 14+20 to 14+40

DETAIL AB

SPECIAL O.U. DITCH

Sheet No. 23
Station: 14+40 to 14+60

DETAIL AC

SPECIAL O.U. DITCH

Sheet No. 24
Station: 14+60 to 14+80

DETAIL AD

SPECIAL O.U. DITCH

Sheet No. 25
Station: 14+80 to 15+00

DETAIL AE

SPECIAL O.U. DITCH

Sheet No. 26
Station: 15+00 to 15+20

DETAIL AF

SPECIAL O.U. DITCH

Sheet No. 27
Station: 15+20 to 15+40

DETAIL AG

SPECIAL O.U. DITCH

Sheet No. 28
Station: 15+40 to 15+60

DETAIL AH

SPECIAL O.U. DITCH

Sheet No. 29
Station: 15+60 to 15+80

DETAIL AI

SPECIAL O.U. DITCH

Sheet No. 30
Station: 15+80 to 16+00

DETAIL AJ

SPECIAL O.U. DITCH

Sheet No. 31
Station: 16+00 to 16+20

DETAIL AK

SPECIAL O.U. DITCH

Sheet No. 32
Station: 16+20 to 16+40

DETAIL AL

SPECIAL O.U. DITCH

Sheet No. 33
Station: 16+40 to 16+60

DETAIL AM

SPECIAL O.U. DITCH

Sheet No. 34
Station: 16+60 to 16+80

DETAIL AN

SPECIAL O.U. DITCH

Sheet No. 35
Station: 16+80 to 17+00

DETAIL AO

SPECIAL O.U. DITCH

Sheet No. 36
Station: 17+00 to 17+20

DETAIL AP

SPECIAL O.U. DITCH

Sheet No. 37
Station: 17+20 to 17+40

DETAIL AQ

SPECIAL O.U. DITCH

Sheet No. 38
Station: 17+40 to 17+60

DETAIL AR

SPECIAL O.U. DITCH

Sheet No. 39
Station: 17+60 to 17+80

DETAIL AS

SPECIAL O.U. DITCH

Sheet No. 40
Station: 17+80 to 18+00

DETAIL AT

SPECIAL O.U. DITCH

Sheet No. 41
Station: 18+00 to 18+20

NCDOT

DIVISION OF HIGHWAYS

LERE COUNTY

PROJECT: 446115 (R-247) / 446115 (R-247) / 446115 (R-247)

US 421-NC 87 SANFORD

BYPASS FROM WEST

OF SR 1409 TO WEST

OF US 1-81-401

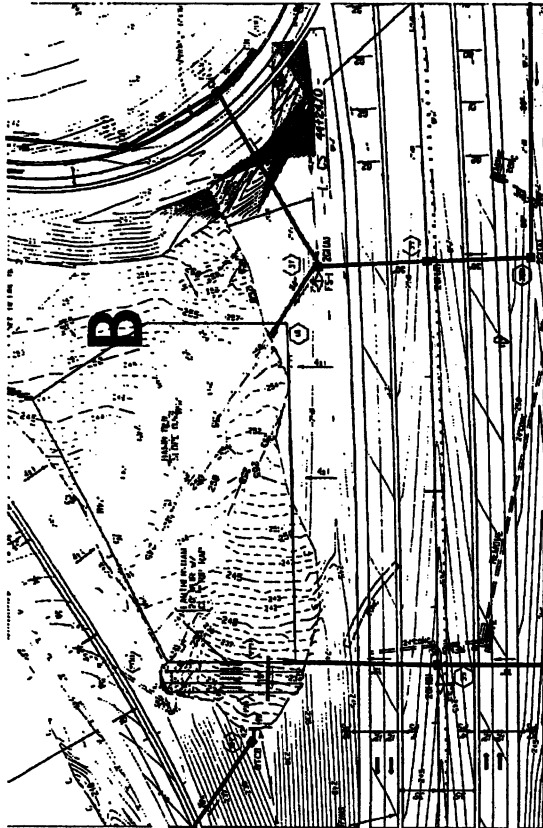
SHEET NO. 338

PROJECT NUMBER: R-247A	SHEET NO: 2-H
DATE: 11/11/88	DESIGNED BY: HYDRAULICS
DRAWN BY: HYDRAULICS	CHECKED BY: HYDRAULICS

KO & ASSOCIATES, P.C.
 Consulting Engineers
 A Florence & Brackman, Inc. Company
 211 Commerce Center
 Raleigh, N.C. 27601
 (919) 781-2222



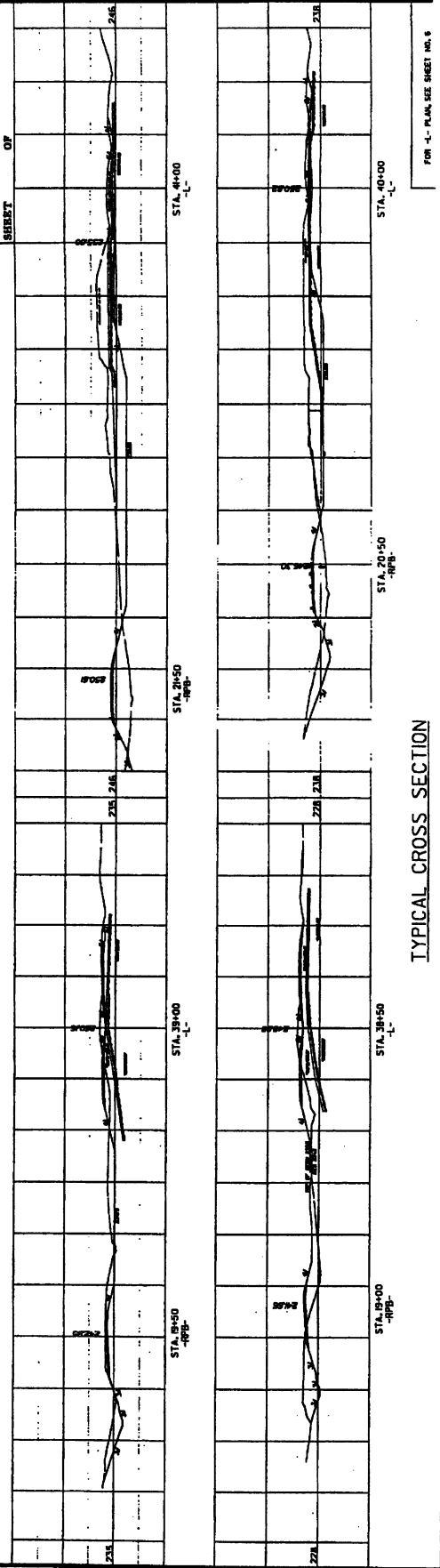
DETAIL



PLAN VIEW

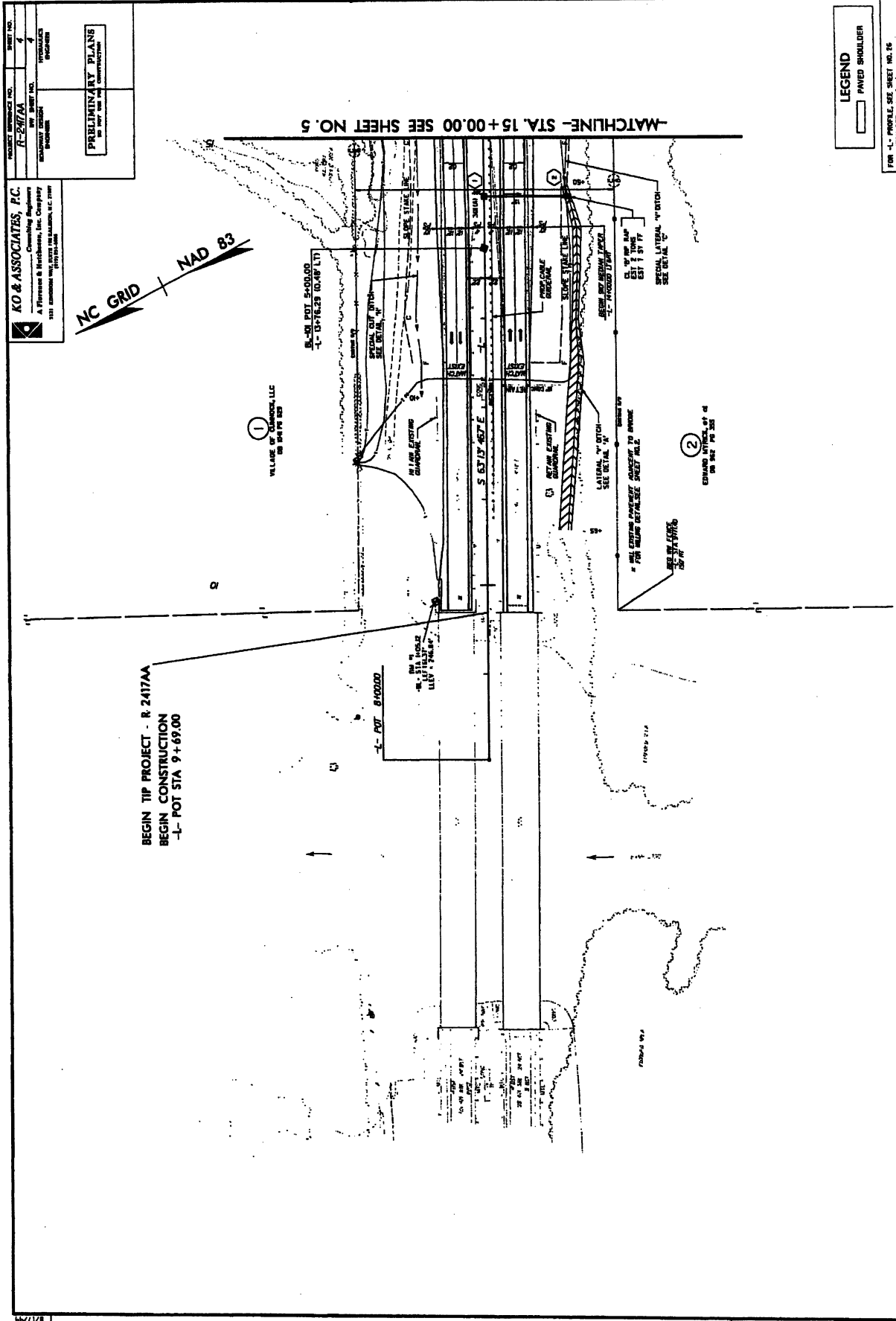
NCDOT
 DIVISION OF HIGHWAYS
 LEE COUNTY
 PROJECT: HALLS (R-247A)
 US 21-NC AT SANFORD
 BYPASS FROM WEST
 OF SR 1400 TO WEST
 OF US 1-31-841

SW TREATMENT BASIN



TYPICAL CROSS SECTION

FOR 4- PLAN, SEE SHEET NO. 8



12-4-06 Project & Name Change

REVISIONS

8/17/99

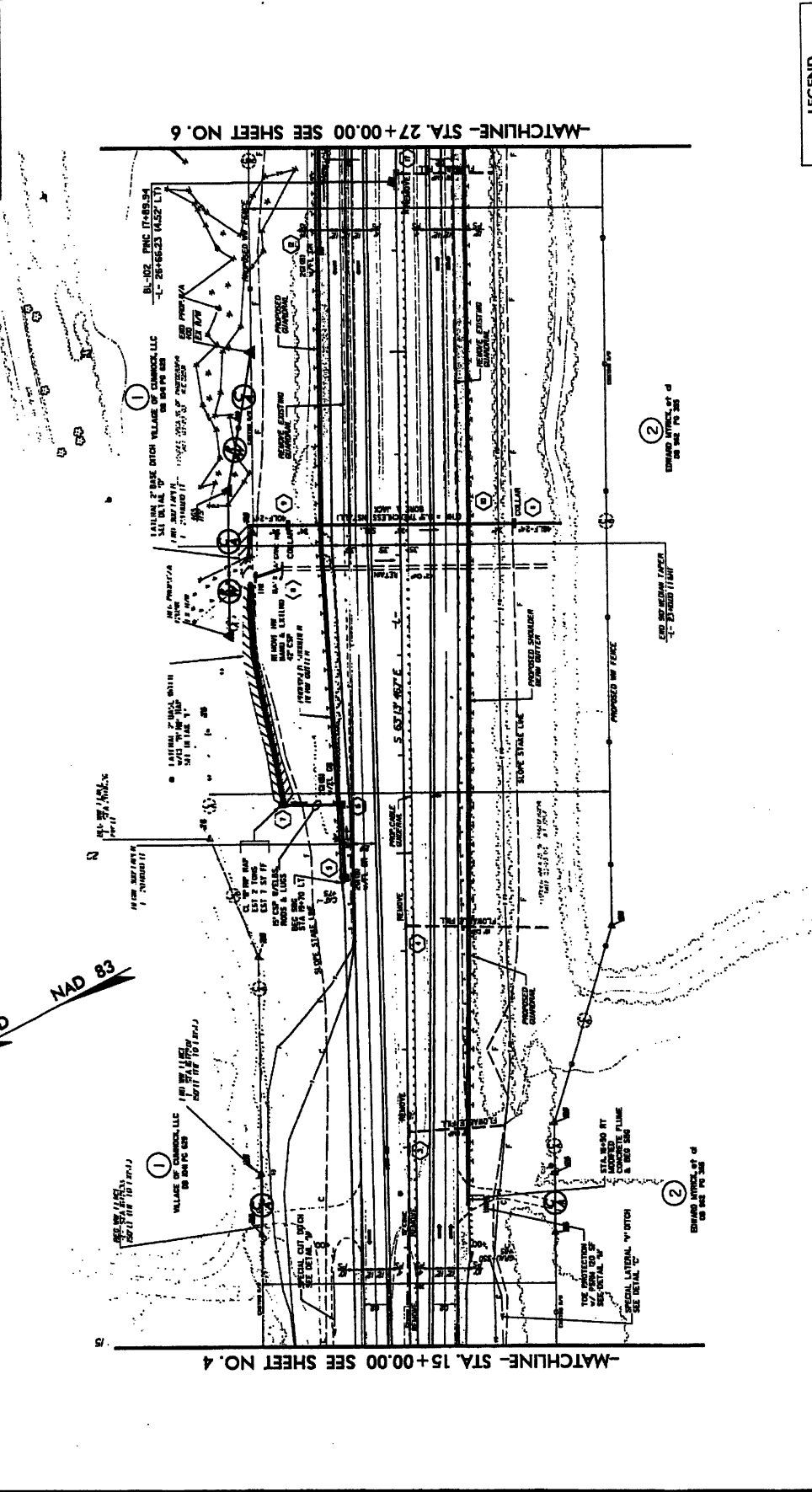
PROJECT NUMBER: 17-247A
 SHEET NO. 5
 DATE: 11/11/11
 DRAWN BY: J. H. HARRIS
 CHECKED BY: J. H. HARRIS
 APPROVED BY: J. H. HARRIS

PRELIMINARY PLANS
 NOT FOR CONSTRUCTION

KO & ASSOCIATES, P.C.
 Consulting Engineers
 A Wharton & Harshbarger, Inc. Company
 1111 W. BROADWAY, SUITE 1000, DALLAS, TEXAS 75201
 (214) 751-1111

PROJECT NUMBER: 17-247A
 SHEET NO. 5
 DATE: 11/11/11
 DRAWN BY: J. H. HARRIS
 CHECKED BY: J. H. HARRIS
 APPROVED BY: J. H. HARRIS

PRELIMINARY PLANS
 NOT FOR CONSTRUCTION

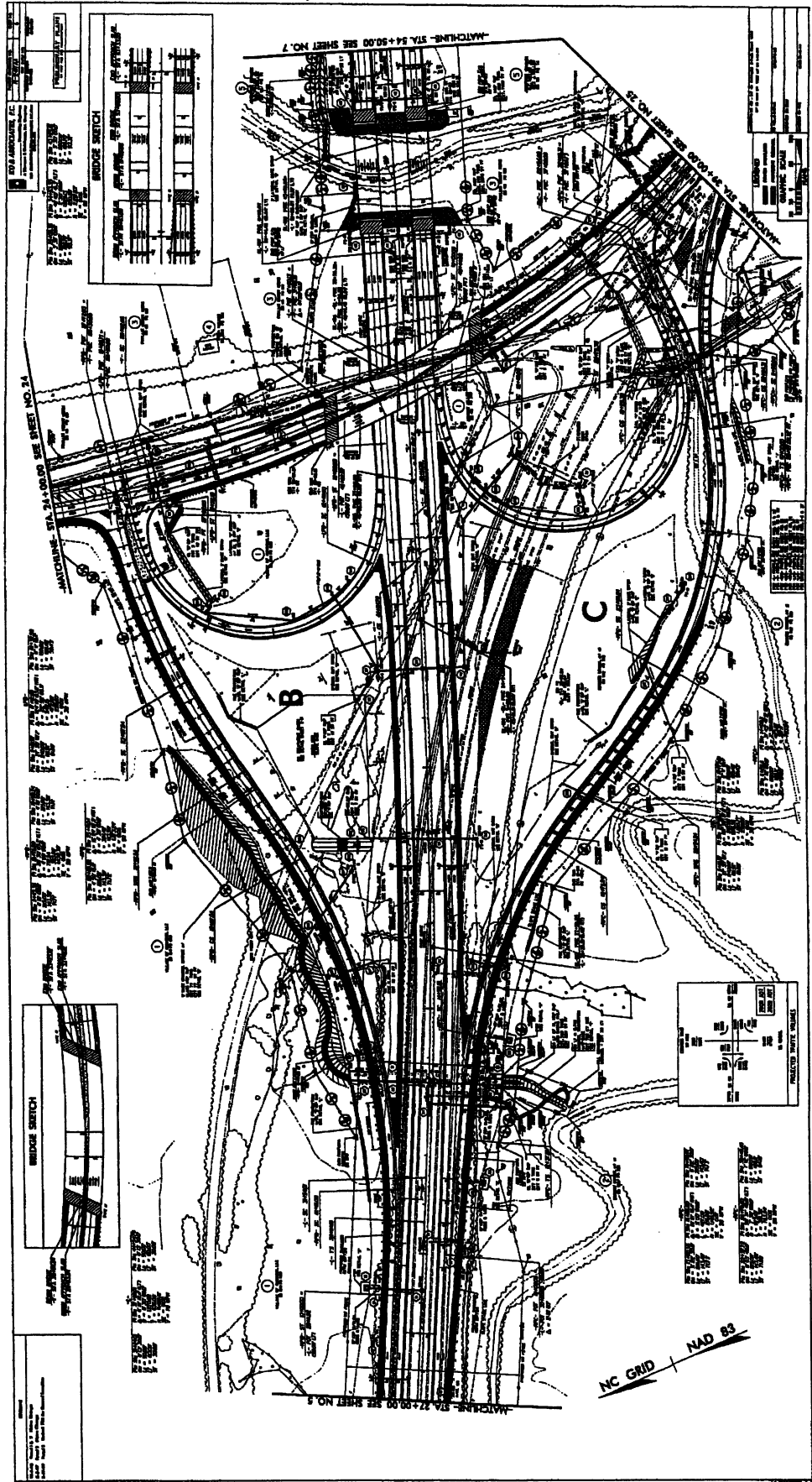


LEGEND
 [Symbol] PAVED SHOULDER

ENCLOSURE SHEET 4 of 5
 ON 11/11/11

ENCLOSURE SHEET 6 of 5
 ON 11/11/11

12-4-04 Permit 3 Name Change
 12-2-08 Add Ch 4 to existing access points - permits 1 & 2

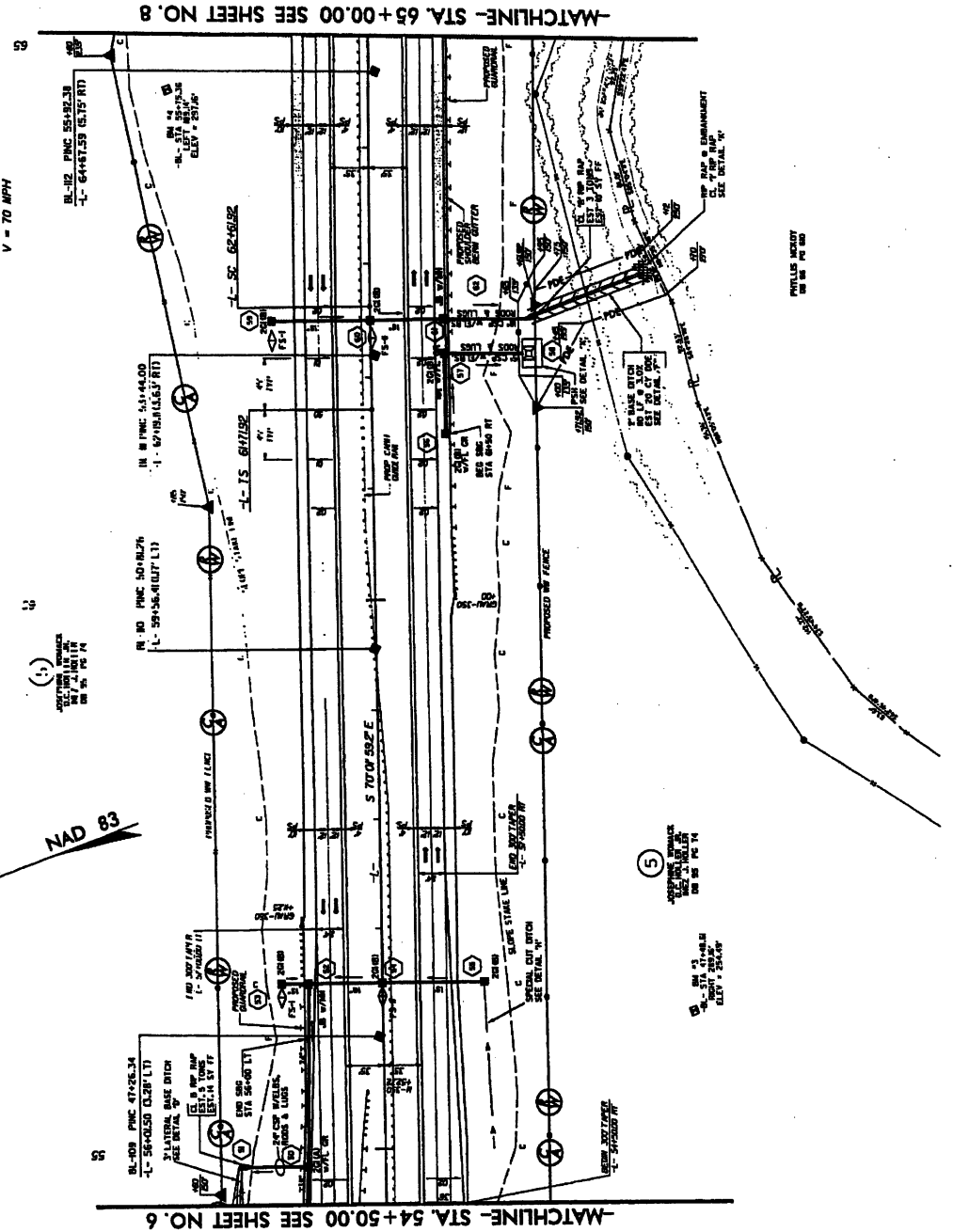


PROJECT NUMBER	7
PROJECT NAME	7
DATE	7
BY	7
CHECKED BY	7
APPROVED BY	7
SCALE	AS SHOWN
PROJECT LOCATION	7
PROJECT DESCRIPTION	7
PROJECT OWNER	7
PROJECT ENGINEER	7
PROJECT ARCHITECT	7
PROJECT CONTRACTOR	7
PROJECT SUBCONTRACTOR	7
PROJECT CONSULTANT	7
PROJECT SPECIALIST	7
PROJECT MATERIALS	7
PROJECT EQUIPMENT	7
PROJECT SERVICES	7
PROJECT NOTES	7
PROJECT COMMENTS	7
PROJECT REVISIONS	7
PROJECT RECORDS	7
PROJECT DRAWINGS	7
PROJECT SPECIFICATIONS	7
PROJECT STANDARDS	7
PROJECT REGULATIONS	7
PROJECT PERMITS	7
PROJECT INSURANCE	7
PROJECT BONDING	7
PROJECT FINANCING	7
PROJECT LEGAL	7
PROJECT TAX	7
PROJECT ACCOUNTING	7
PROJECT HR	7
PROJECT IT	7
PROJECT COMMUNICATIONS	7
PROJECT SAFETY	7
PROJECT ENVIRONMENTAL	7
PROJECT HISTORICAL	7
PROJECT CULTURAL	7
PROJECT SOCIAL	7
PROJECT ECONOMIC	7
PROJECT POLITICAL	7
PROJECT LEGISLATIVE	7
PROJECT JUDICIAL	7
PROJECT EXECUTIVE	7
PROJECT BOARD	7
PROJECT COMMITTEE	7
PROJECT TASK FORCE	7
PROJECT WORKING GROUP	7
PROJECT ADVISORY BOARD	7
PROJECT REVIEW BOARD	7
PROJECT CONSULTING BOARD	7
PROJECT ADVISORY COMMITTEE	7
PROJECT REVIEW COMMITTEE	7
PROJECT CONSULTING COMMITTEE	7
PROJECT ADVISORY PANEL	7
PROJECT REVIEW PANEL	7
PROJECT CONSULTING PANEL	7
PROJECT ADVISORY GROUP	7
PROJECT REVIEW GROUP	7
PROJECT CONSULTING GROUP	7
PROJECT ADVISORY TEAM	7
PROJECT REVIEW TEAM	7
PROJECT CONSULTING TEAM	7
PROJECT ADVISORY BOARD OF ADVISORS	7
PROJECT REVIEW BOARD OF ADVISORS	7
PROJECT CONSULTING BOARD OF ADVISORS	7
PROJECT ADVISORY COUNCIL	7
PROJECT REVIEW COUNCIL	7
PROJECT CONSULTING COUNCIL	7
PROJECT ADVISORY COMMITTEE OF ADVISORS	7
PROJECT REVIEW COMMITTEE OF ADVISORS	7
PROJECT CONSULTING COMMITTEE OF ADVISORS	7
PROJECT ADVISORY BOARD OF ADVISORS	7
PROJECT REVIEW BOARD OF ADVISORS	7
PROJECT CONSULTING BOARD OF ADVISORS	7
PROJECT ADVISORY COUNCIL OF ADVISORS	7
PROJECT REVIEW COUNCIL OF ADVISORS	7
PROJECT CONSULTING COUNCIL OF ADVISORS	7
PROJECT ADVISORY BOARD OF ADVISORS	7
PROJECT REVIEW BOARD OF ADVISORS	7
PROJECT CONSULTING BOARD OF ADVISORS	7
PROJECT ADVISORY COUNCIL OF ADVISORS	7
PROJECT REVIEW COUNCIL OF ADVISORS	7
PROJECT CONSULTING COUNCIL OF ADVISORS	7

KO & ASSOCIATES, P.C.
 Consulting Engineers
 A. Primm & Associates, Inc. Company
 313 S. Main Street, Suite 200
 Raleigh, NC 27601

STA 54+00.00
 PVI = 54+00.00
 Δ = 2.25' (0.69m)
 D = 0.30' (0.09m)
 L = 100.00'
 T = 10.00'
 R = 100.00'
 SE = 0.00'
 V = 10.00'

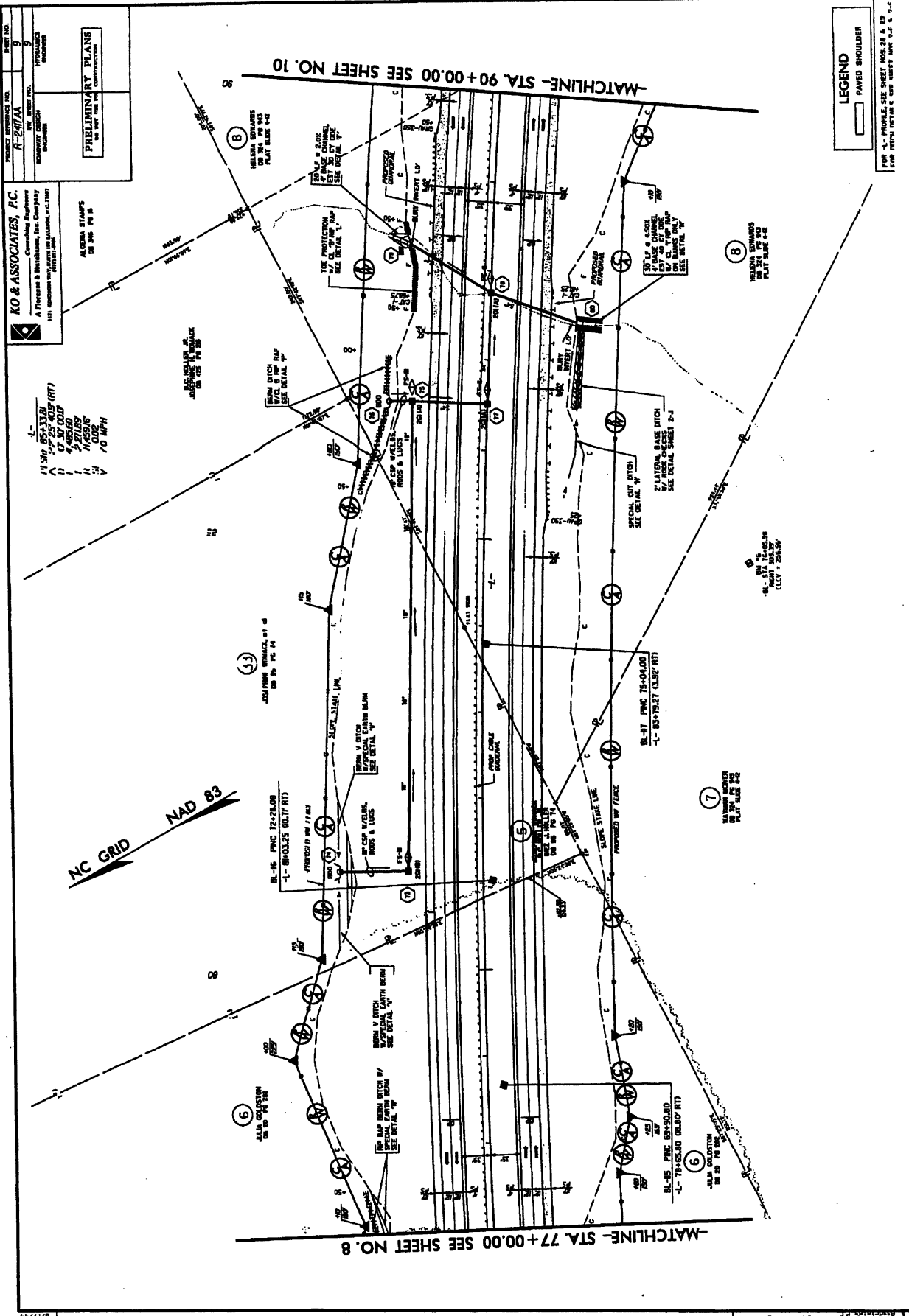
NC GRID
 NAD 83

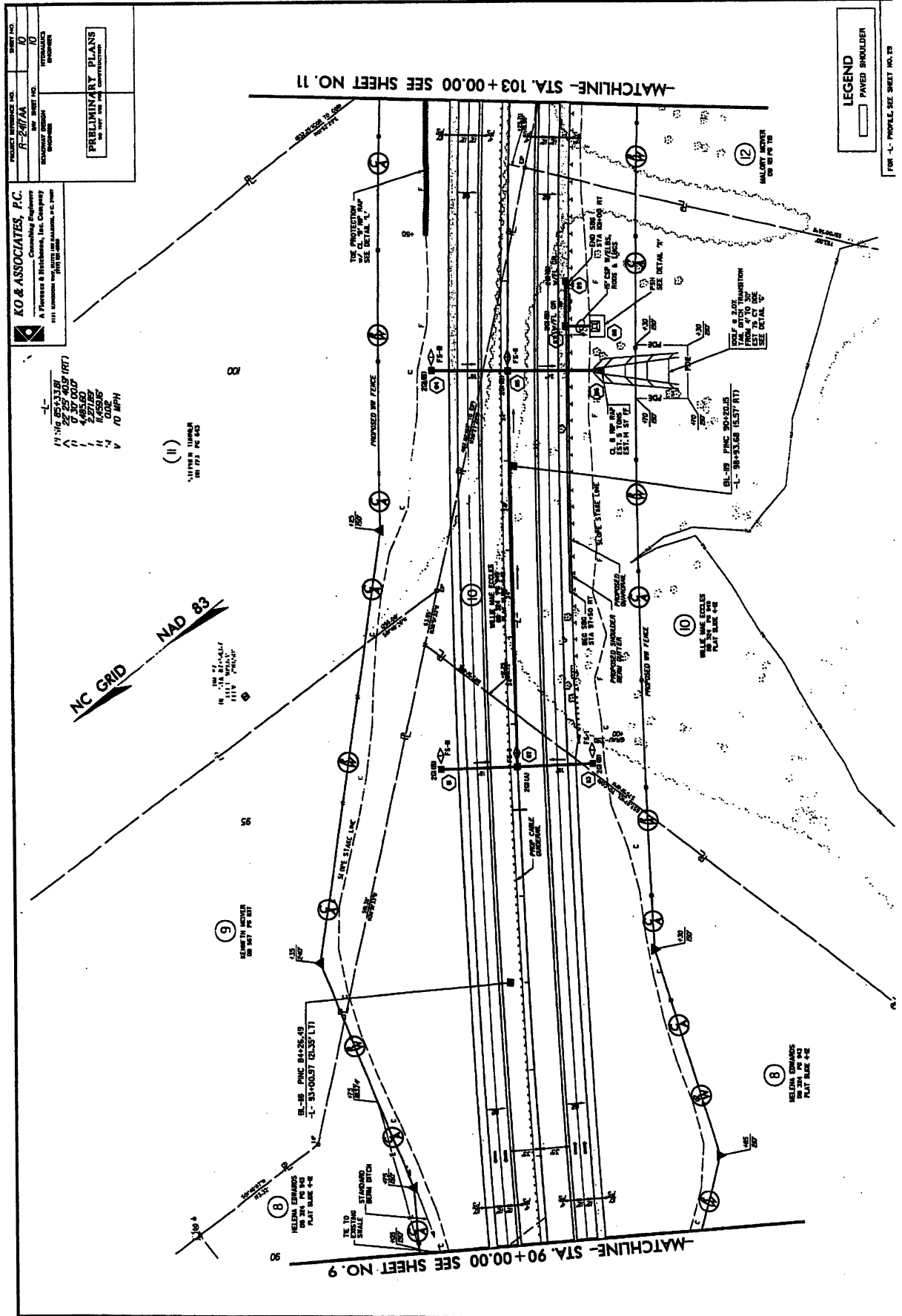


LEGEND

[Symbol]	PAVED SHOULDER
----------	----------------

FORM 1-1 PROFILE SEE SHEET NOS. 27 & 28





PROJECT REFERENCE NO. **F-217/A**
 SHEET NO. **348**
 CONTRACT NO. **100-100-100-100**
 DRAWING TITLE **ROADWAY IMPROVEMENT**

PRELIMINARY PLANS
 NOT FOR CONSTRUCTION

KO & ASSOCIATES, P.C.
 Consulting Engineers
 A. Florence & Brichemont, Inc. Company
 2111 LEXINGTON WAY, SUITE 100, RALEIGH, N.C. 27601
 (919) 876-8888

- 1- 11/28/83
 - 2- 12/15/83
 - 3- 01/05/84
 - 4- 02/01/84
 - 5- 02/01/84
 - 6- 02/01/84
 - 7- 02/01/84
 - 8- 02/01/84
 - 9- 02/01/84
 - 10- 02/01/84
- (11)
 11/15/83 10:00 AM
 02/17/84 02:00

NC GRID NAD 83

IN THE WALKWAY EXCISES PLANT MARK 4+2
 11/15/83 10:00 AM
 02/17/84 02:00

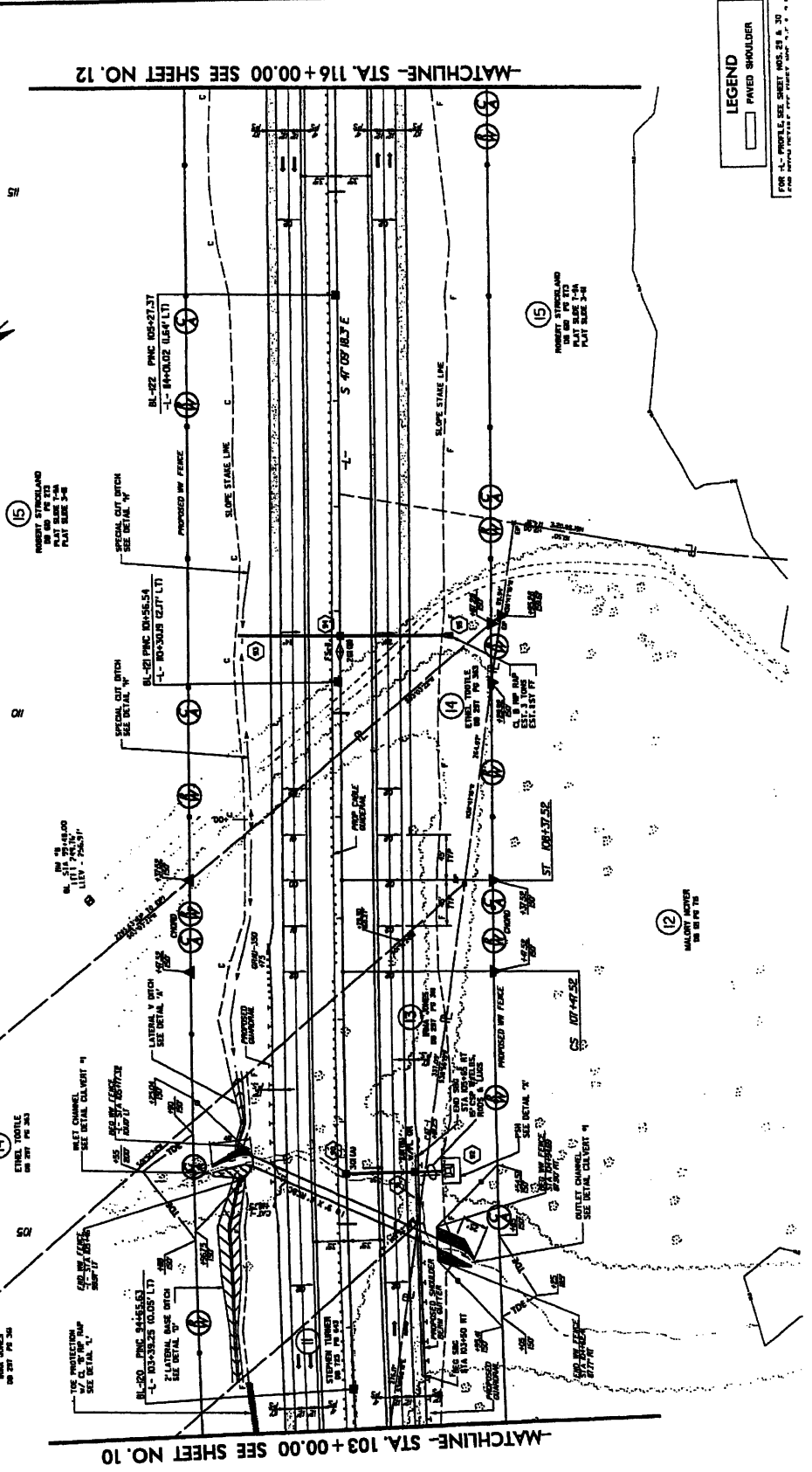
LEGEND
 [Symbol] PAVED SHOULDER
 [Symbol] HWY - L- PROFILE SEE SHEET NO. 49

PROJECT REFERENCE NO. R-2477A
 SHEET NO. 17
 PRELIMINARY PLANS
 FOR THE STATE OF NORTH CAROLINA

KO & ASSOCIATES, P.C.
 Consulting Engineers
 A Division of The Carolina Company, P.C.
 1111 W. Hargett Street, Suite 1000
 Raleigh, NC 27601
 (919) 781-2000

NC GRID NAD 83

- 1. ALL DIMENSIONS UNLESS OTHERWISE NOTED
- 2. ALL DIMENSIONS TO CENTERLINE UNLESS OTHERWISE NOTED
- 3. ALL DIMENSIONS TO FACE UNLESS OTHERWISE NOTED
- 4. ALL DIMENSIONS TO EDGE UNLESS OTHERWISE NOTED
- 5. ALL DIMENSIONS TO SURFACE UNLESS OTHERWISE NOTED
- 6. ALL DIMENSIONS TO CENTERLINE OF ROAD UNLESS OTHERWISE NOTED
- 7. ALL DIMENSIONS TO CENTERLINE OF RAILROAD UNLESS OTHERWISE NOTED
- 8. ALL DIMENSIONS TO CENTERLINE OF CANAL UNLESS OTHERWISE NOTED
- 9. ALL DIMENSIONS TO CENTERLINE OF DITCH UNLESS OTHERWISE NOTED
- 10. ALL DIMENSIONS TO CENTERLINE OF UTILITY UNLESS OTHERWISE NOTED
- 11. ALL DIMENSIONS TO CENTERLINE OF STRUCTURE UNLESS OTHERWISE NOTED
- 12. ALL DIMENSIONS TO CENTERLINE OF PIPE UNLESS OTHERWISE NOTED
- 13. ALL DIMENSIONS TO CENTERLINE OF WALL UNLESS OTHERWISE NOTED
- 14. ALL DIMENSIONS TO CENTERLINE OF CURB UNLESS OTHERWISE NOTED
- 15. ALL DIMENSIONS TO CENTERLINE OF DRIVE UNLESS OTHERWISE NOTED
- 16. ALL DIMENSIONS TO CENTERLINE OF SIDEWALK UNLESS OTHERWISE NOTED
- 17. ALL DIMENSIONS TO CENTERLINE OF PLANT UNLESS OTHERWISE NOTED
- 18. ALL DIMENSIONS TO CENTERLINE OF FENCE UNLESS OTHERWISE NOTED
- 19. ALL DIMENSIONS TO CENTERLINE OF BOUNDARY UNLESS OTHERWISE NOTED
- 20. ALL DIMENSIONS TO CENTERLINE OF PROPERTY UNLESS OTHERWISE NOTED

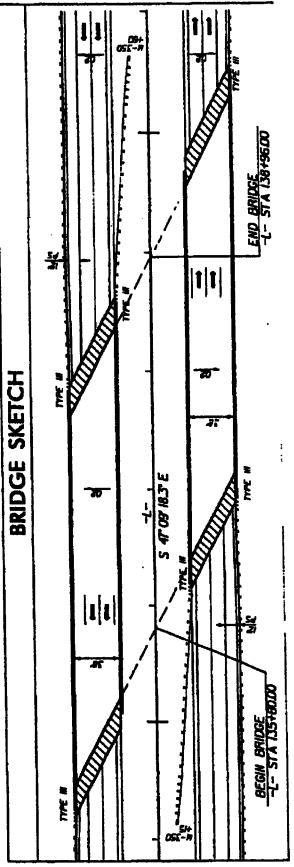
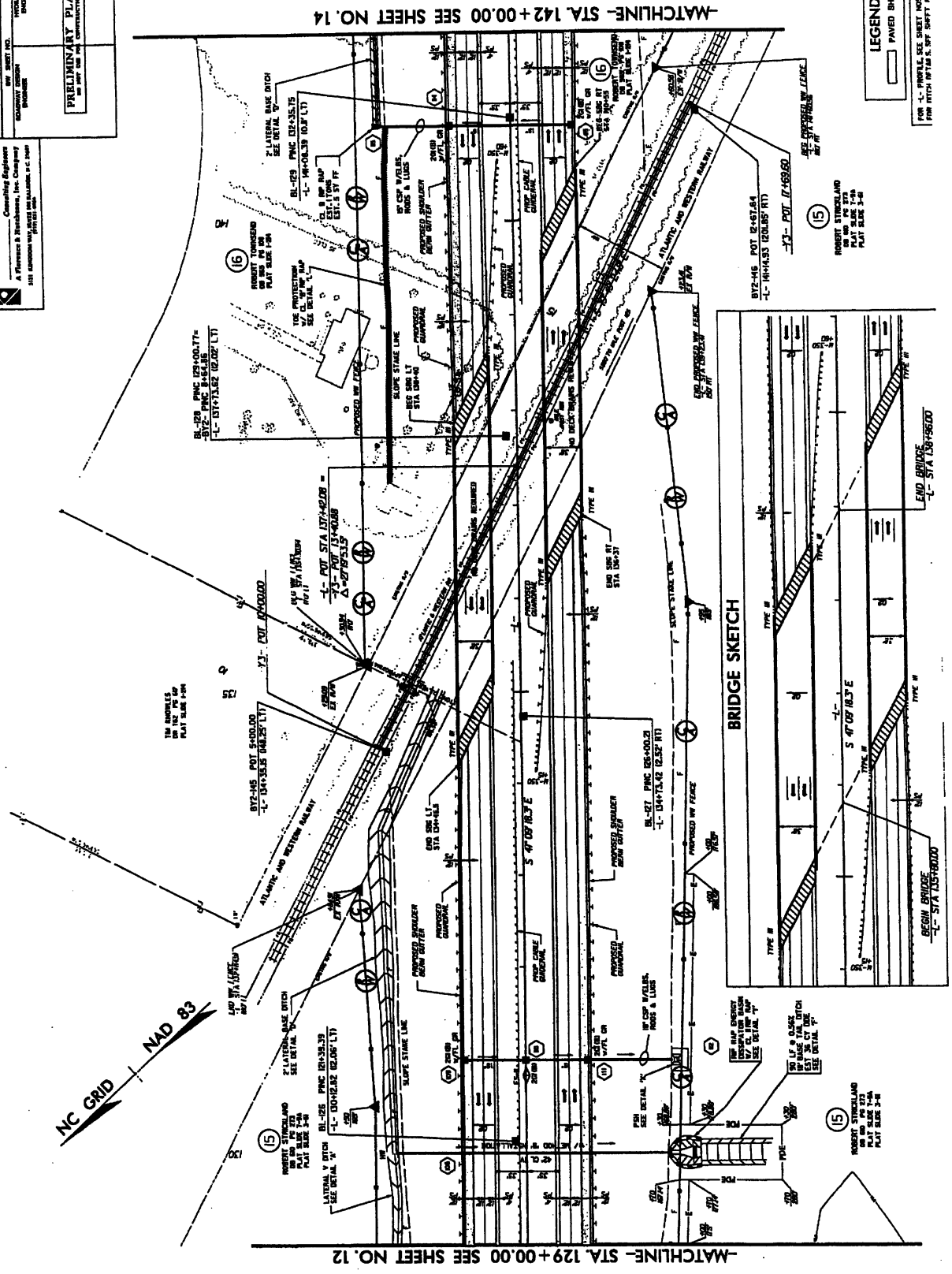


LEGEND
 PAVED SHOULDER

PROJECT SHEET NO.	R-247/A
SHEET NO.	13
DATE	10/1/88
DESIGNED BY	W. J. HARRIS
CHECKED BY	W. J. HARRIS
IN CHARGE	W. J. HARRIS

KO & ASSOCIATES, P.C.
 Consulting Engineers
 A Flannery & Harbison, Inc. Company
 1111 UNIVERSITY BLVD., SUITE 200
 RALEIGH, N.C. 27601
 PHONE: 773-444-4444

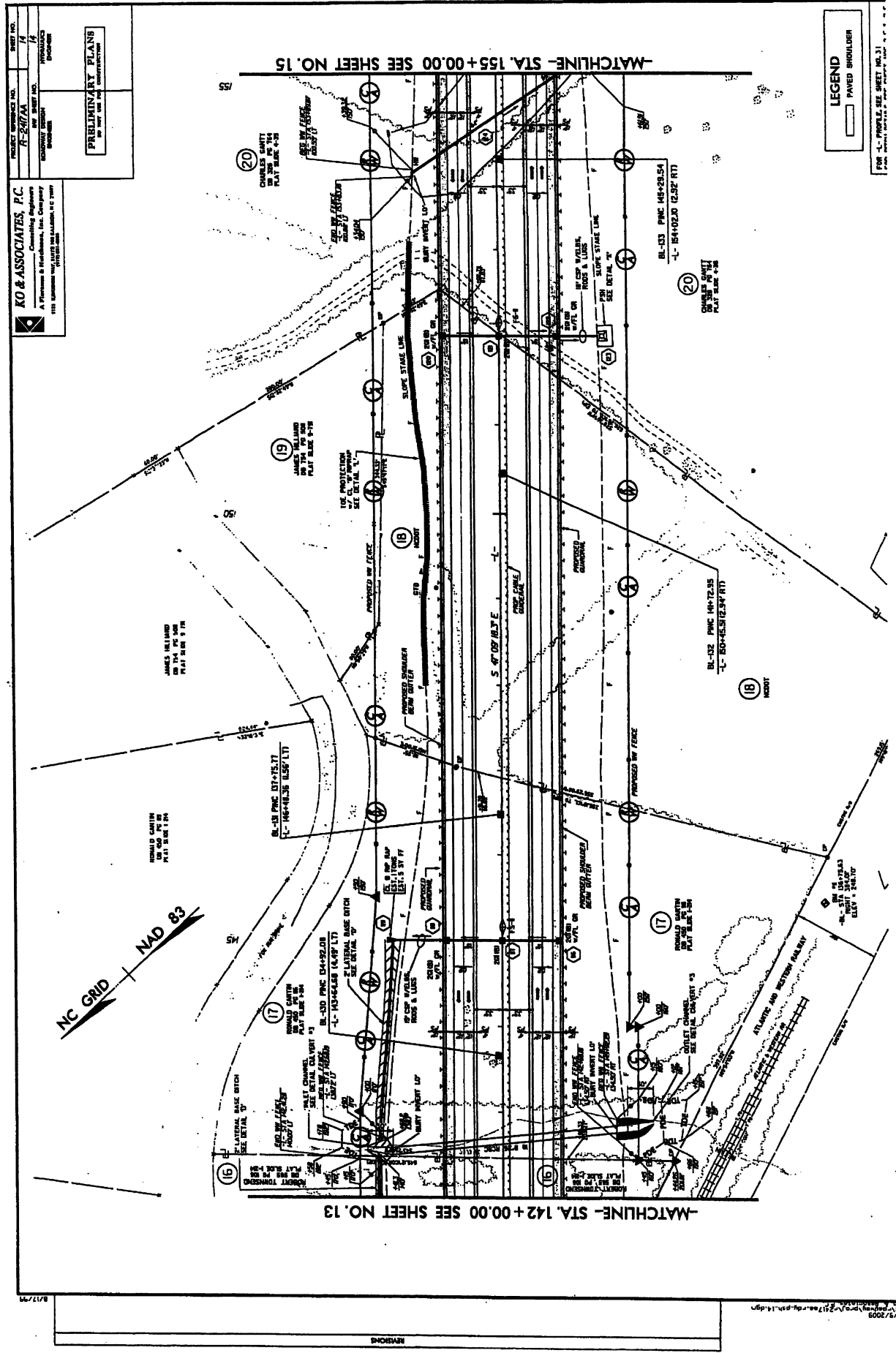
PRELIMINARY PLANS
 FOR THE PROPOSED
 CONSTRUCTION



LEGEND

[Symbol]	PAVED SHOULDER
----------	----------------

FOR 4" FINISH SEE SHEET NOS. 20 & 31
 FOR 12" FINISH SEE SHEET NOS. 24 & 25



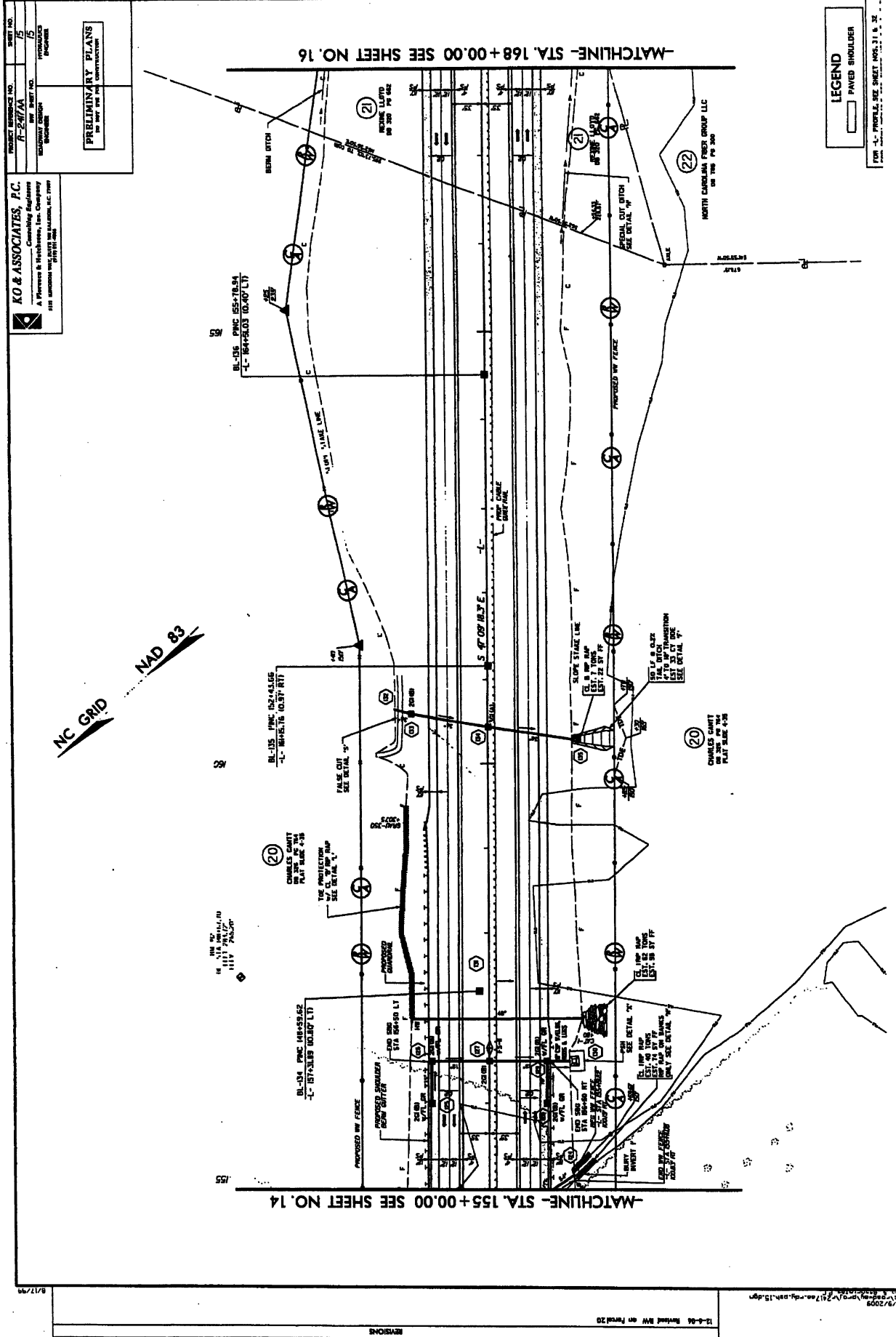
PROJECT NUMBER NO.	17
DATE	1/14
BY	1/14
CHECKED BY	1/14
DESIGNED BY	1/14
APPROVED BY	1/14

KO & ASSOCIATES, P.C.
 A Professional Corporation
 1111 EAST WILSON ROAD, SUITE 100
 RALEIGH, N.C. 27601
 (919) 876-1111

PRELIMINARY PLANS
 FOR ROAD AND UTILITIES

LEGEND	PAVED SHOULDER
--------	----------------

FOR "L" SYMBOLS SEE SHEET NO. 31
 FOR "C" SYMBOLS SEE SHEET NO. 32



PROJECT REFERENCE NO. R-2077AA
 SHEET NO. 16
 PRELIMINARY PLANS
 FOR THE NEW AND
 CONSTRUCTION

KO & ASSOCIATES, P.C.
 Consulting Engineers
 A Division of Hatchells, Inc. Company
 401 Eastmoreland Avenue, N.C. 27601
 (919) 487-3000

NC GRID NAD 83

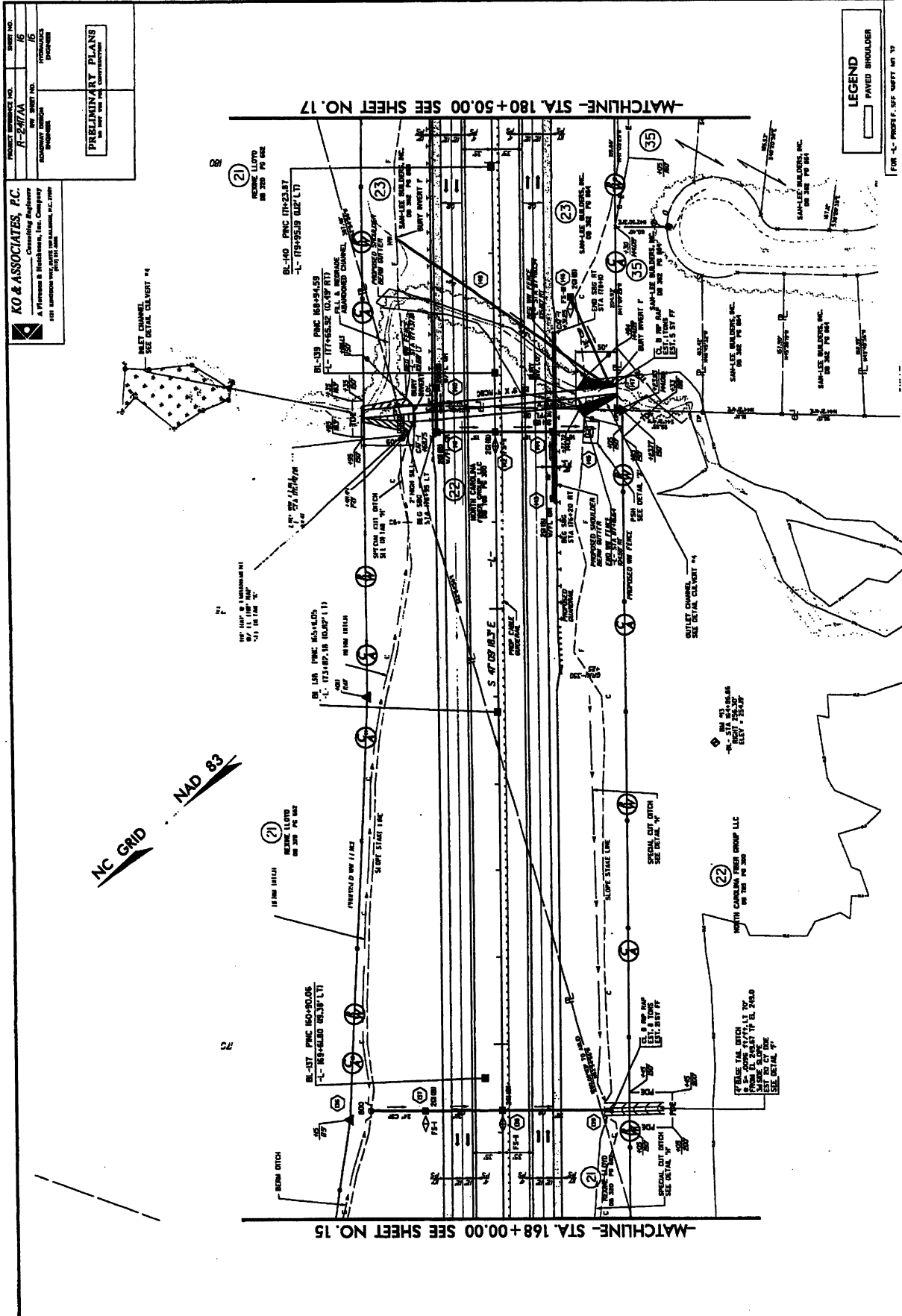


FIG. 1-1 PROFILE SHEET NO. 17

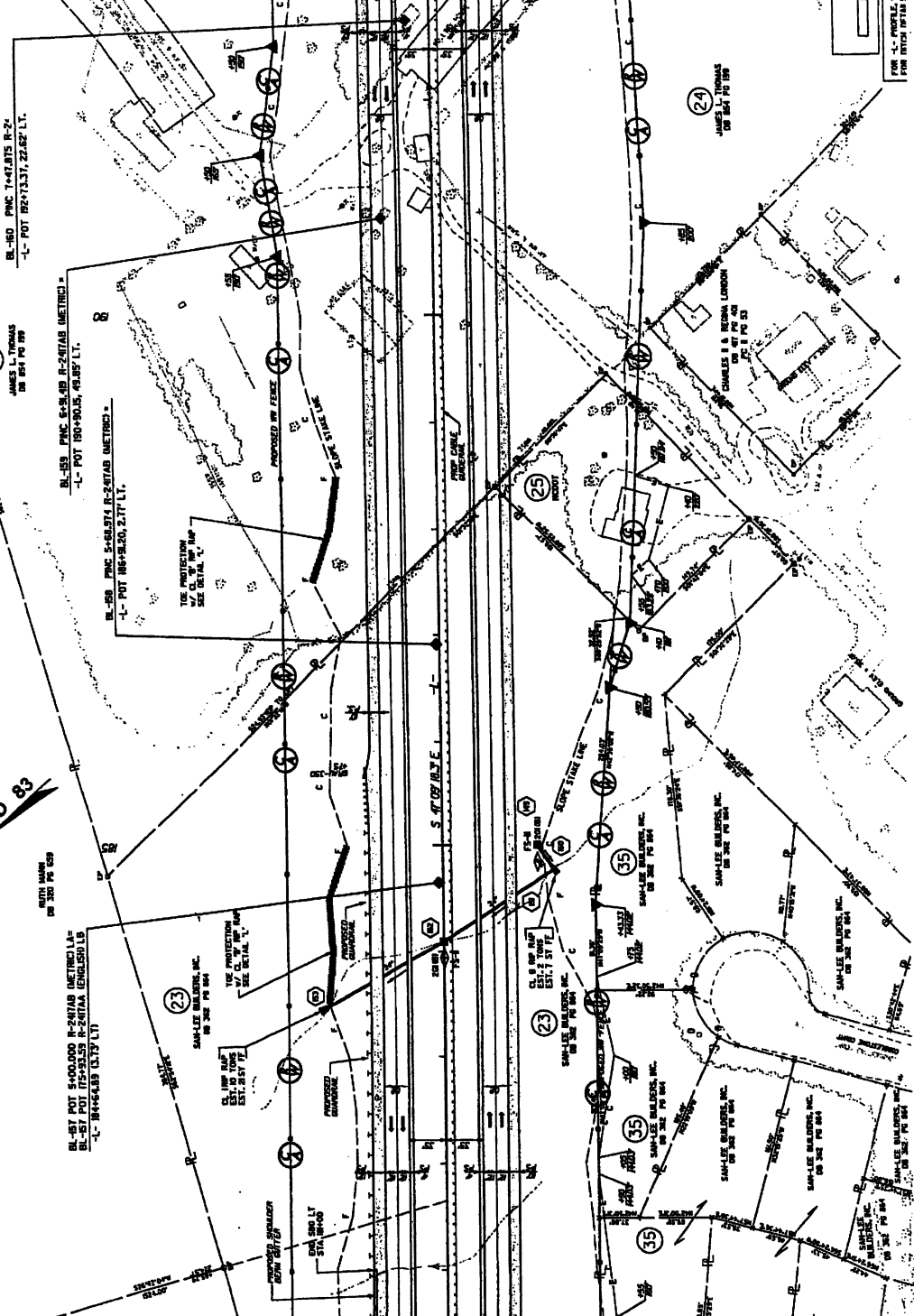
KO & ASSOCIATES, P.C.
 Consulting Engineers
 & Planners & Architects, Inc. Company
 1000 HUNTERS LANE, SUITE 200
 WASHINGTON, D.C. 20002

PROJECT SURVEY NO. R-267AA
 SHEET NO. 7
 PRELIMINARY PLANS
 FOR THE
 CONSTRUCTION

NC GRID NAD 83

-MATCHLINE- STA. 193+00.00 SEE SHEET NO. 18

-MATCHLINE- STA. 180+50.00 SEE SHEET NO. 16



LEGEND

PAVED SHOULDER

FOR A-1, REFER TO SHEET NO. 33
 FOR A-2, REFER TO SHEET NO. 34

15-4-06 Revised Section of Parcel 23 to Parcel 25 - Included RW & TCE on Parcel 23
 REVISIONS

1/9/2009
 C:\Projects\10-0-217\10-0-217.dwg
 P:\Projects\10-0-217\10-0-217.dwg

PROJECT REFERENCE NO. R-217AA	SHEET NO. 23
DATE 10/20/09	PROJECT ROADWAY IMPROVEMENTS
PRELIMINARY PLANS FOR ROAD AND SIDEWALK CONSTRUCTION	

KO & ASSOCIATES, P.C.
 Consulting Engineers
 A Division of K&A Associates, Inc.
 1011 Landonwood Drive, Suite 100
 Raleigh, NC 27605
 Tel: 919.877.1234

NOTE:
 1. ALL DIMENSIONS ARE IN FEET AND INCHES.
 2. ALL DIMENSIONS ARE TO FACE UNLESS NOTED OTHERWISE.
 3. ALL DIMENSIONS ARE TO CENTERLINE UNLESS NOTED OTHERWISE.
 4. ALL DIMENSIONS ARE TO THE CENTERLINE OF THE ROADWAY UNLESS NOTED OTHERWISE.
 5. ALL DIMENSIONS ARE TO THE CENTERLINE OF THE SIDEWALK UNLESS NOTED OTHERWISE.

NC GRID + NAD 83

MATCHLINE - STA. 26+00.00
 SEE THIS SHEET

MATCHLINE - STA. 13+00.00
 SEE SHEET 21

NC GRID + NAD 83

END CONSTRUCTION
 -YRPPC- ST 28+87.75
 TIE TO EXIST. PAVEMENT

-YRPPC- ST 29+36.69

-YRPPC- CS 27+42.53

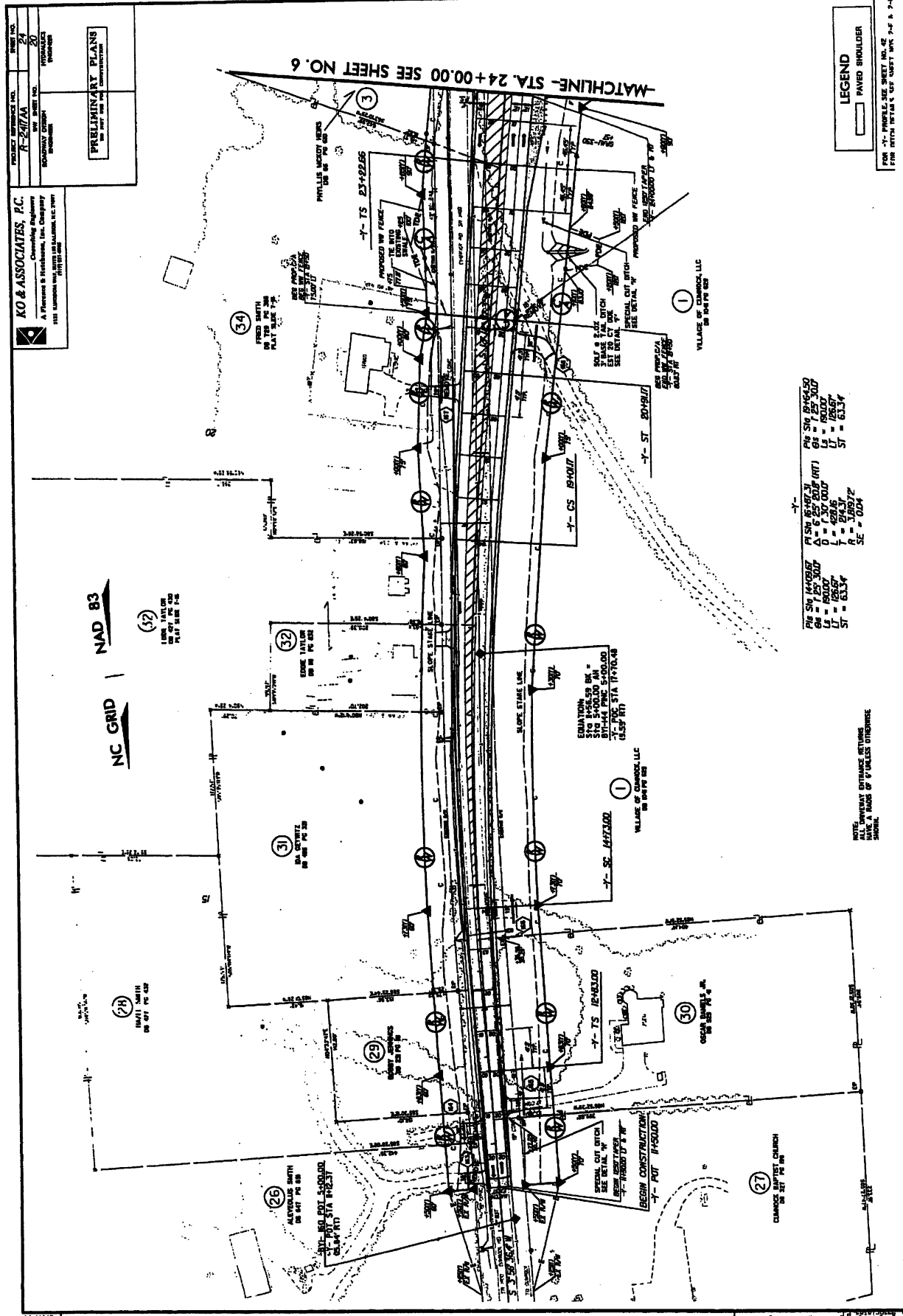
MATCHLINE - STA. 26+00.00
 SEE THIS SHEET

R-217AA WAS DESIGNED AND CONSTRUCTED FOR THE STATE OF NORTH CAROLINA. THE R-217AA SECTION HAS BEEN CONVERTED TO THE ENGLISH EQUIVALENT.

-YRPPC-
 P/Sig. 17+42.70 P/Sig. 27+42.04
 D = 27.18' (8.28m) G.S. = 2.125' (0.646m)
 L = 27.18' (8.28m) L.T. = 142.20'
 I = 1.385% R = 1/352.5'

LEGEND
 [Symbol] PAVED SHOULDER

FOR YRPPC, PLEASE SEE SHEET 105 & 106 FOR YRPPC DETAILS & SEE SHEET 100 & 101 FOR



PI = 510.00	PI ST = 510.00	PI ST = 510.00
D = 100.00	D = 100.00	D = 100.00
L = 420.00	L = 420.00	L = 420.00
E = 100.00	E = 100.00	E = 100.00
SE = 0.004	SE = 0.004	SE = 0.004

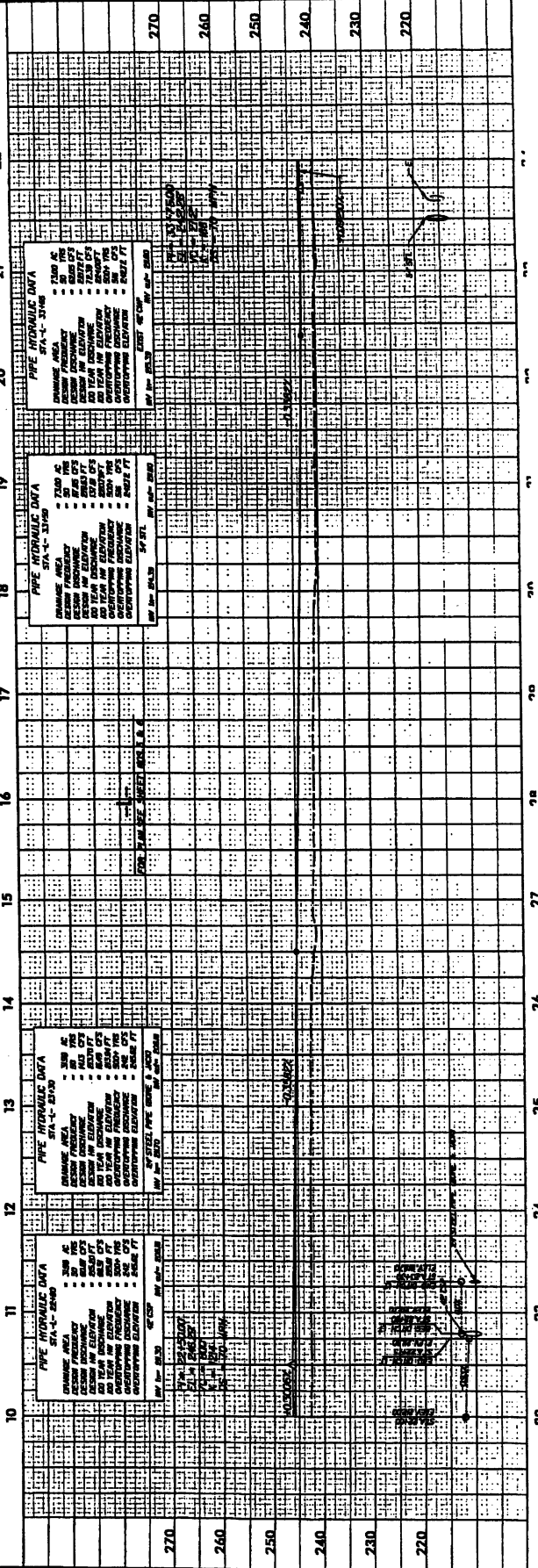
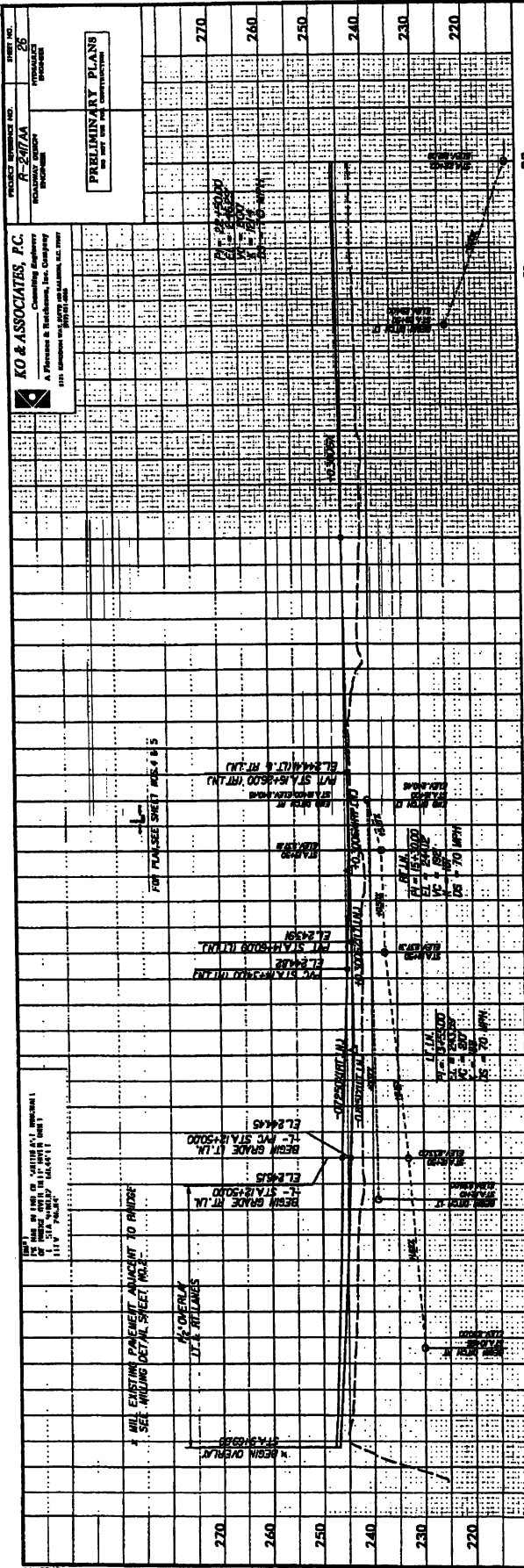
LEGEND
 PAVED SHOULDER

NOTE: DIMENSIONS DISTANCE RETURNING
 HAVE A RANGE OF 0 UNLESS OTHERWISE
 SHOWN.

PRELIMINARY PLANS
 FOR THE PROPOSED
 ROADWAY DESIGN
 PROJECT

KO & ASSOCIATES, P.C.
 Consulting Engineers
 A. Phares & Associates, Inc. Company
 1111 N. ROSS ST. SUITE 100
 RALEIGH, N.C. 27601

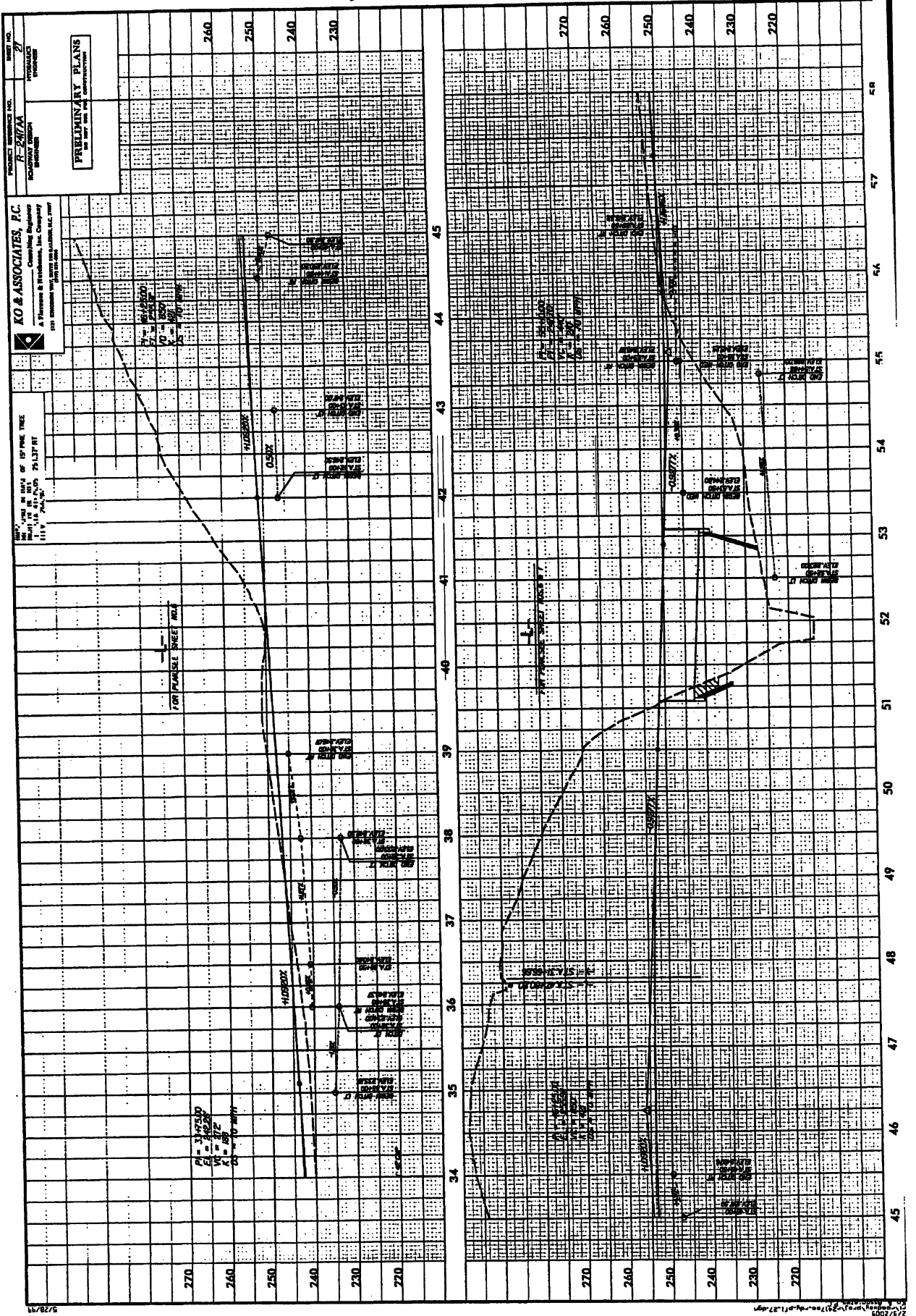
PROJECT REFERENCE NO. R-2017AA
 SHEET NO. 24
 TOTAL SHEETS 20
 DRAWN BY: [Name]
 CHECKED BY: [Name]



KO & ASSOCIATES, P.C.
A Professional Consulting Engineer
A Professional & Technical, Inc. Company
1175 GARDNER ROAD, SUITE 100, JENKINSVILLE, NC 27150
PH: 704/281-1000
FAX: 704/281-1001
WWW.KO-ASSOCIATES.COM

DATE: 11/20/07
BY: M.H. WILSON, P.E.
SCALE: AS SHOWN
PROJECT: 1117 PALM ST.

11/20/07
M.H. WILSON, P.E.
11/20/07



PROJECT NUMBER: 100-2017A
 SHEET NO. 27
 HYDRAULIC
 PRELIMINARY

KO & ASSOCIATES, P.C.
 Consulting Engineers
 A Division of Kohn, Hovnanian & Associates, Inc. Company
 1225 CHESAPEAKE BLVD., SUITE 100, FARMERSVILLE, N.C. 27834
 (704) 775-1111

PRELIMINARY PLANS
 NOT TO BE USED FOR CONSTRUCTION

DATE: 11/14/2017
 TIME: 11:14 AM
 DRAWN BY: JLM
 CHECKED BY: JLM

P1 = 317500
 Q1 = 160200
 R1 = 1000
 CS = 10.0000

FOR PLANSHEET SEE NO. 1

FOR PLANSHEET SEE NO. 2

FOR PLANSHEET SEE NO. 3

FOR PLANSHEET SEE NO. 4

FOR PLANSHEET SEE NO. 5

FOR PLANSHEET SEE NO. 6

FOR PLANSHEET SEE NO. 7

FOR PLANSHEET SEE NO. 8

FOR PLANSHEET SEE NO. 9

FOR PLANSHEET SEE NO. 10

FOR PLANSHEET SEE NO. 11

FOR PLANSHEET SEE NO. 12

FOR PLANSHEET SEE NO. 13

FOR PLANSHEET SEE NO. 14

FOR PLANSHEET SEE NO. 15

FOR PLANSHEET SEE NO. 16

FOR PLANSHEET SEE NO. 17

FOR PLANSHEET SEE NO. 18

FOR PLANSHEET SEE NO. 19

FOR PLANSHEET SEE NO. 20

FOR PLANSHEET SEE NO. 21

FOR PLANSHEET SEE NO. 22

FOR PLANSHEET SEE NO. 23

FOR PLANSHEET SEE NO. 24

FOR PLANSHEET SEE NO. 25

FOR PLANSHEET SEE NO. 26

FOR PLANSHEET SEE NO. 27

FOR PLANSHEET SEE NO. 28

FOR PLANSHEET SEE NO. 29

FOR PLANSHEET SEE NO. 30

FOR PLANSHEET SEE NO. 31

FOR PLANSHEET SEE NO. 32

FOR PLANSHEET SEE NO. 33

FOR PLANSHEET SEE NO. 34

FOR PLANSHEET SEE NO. 35

FOR PLANSHEET SEE NO. 36

FOR PLANSHEET SEE NO. 37

FOR PLANSHEET SEE NO. 38

FOR PLANSHEET SEE NO. 39

FOR PLANSHEET SEE NO. 40

FOR PLANSHEET SEE NO. 41

FOR PLANSHEET SEE NO. 42

FOR PLANSHEET SEE NO. 43

FOR PLANSHEET SEE NO. 44

FOR PLANSHEET SEE NO. 45

FOR PLANSHEET SEE NO. 46

FOR PLANSHEET SEE NO. 47

FOR PLANSHEET SEE NO. 48

FOR PLANSHEET SEE NO. 49

FOR PLANSHEET SEE NO. 50

FOR PLANSHEET SEE NO. 51

FOR PLANSHEET SEE NO. 52

FOR PLANSHEET SEE NO. 53

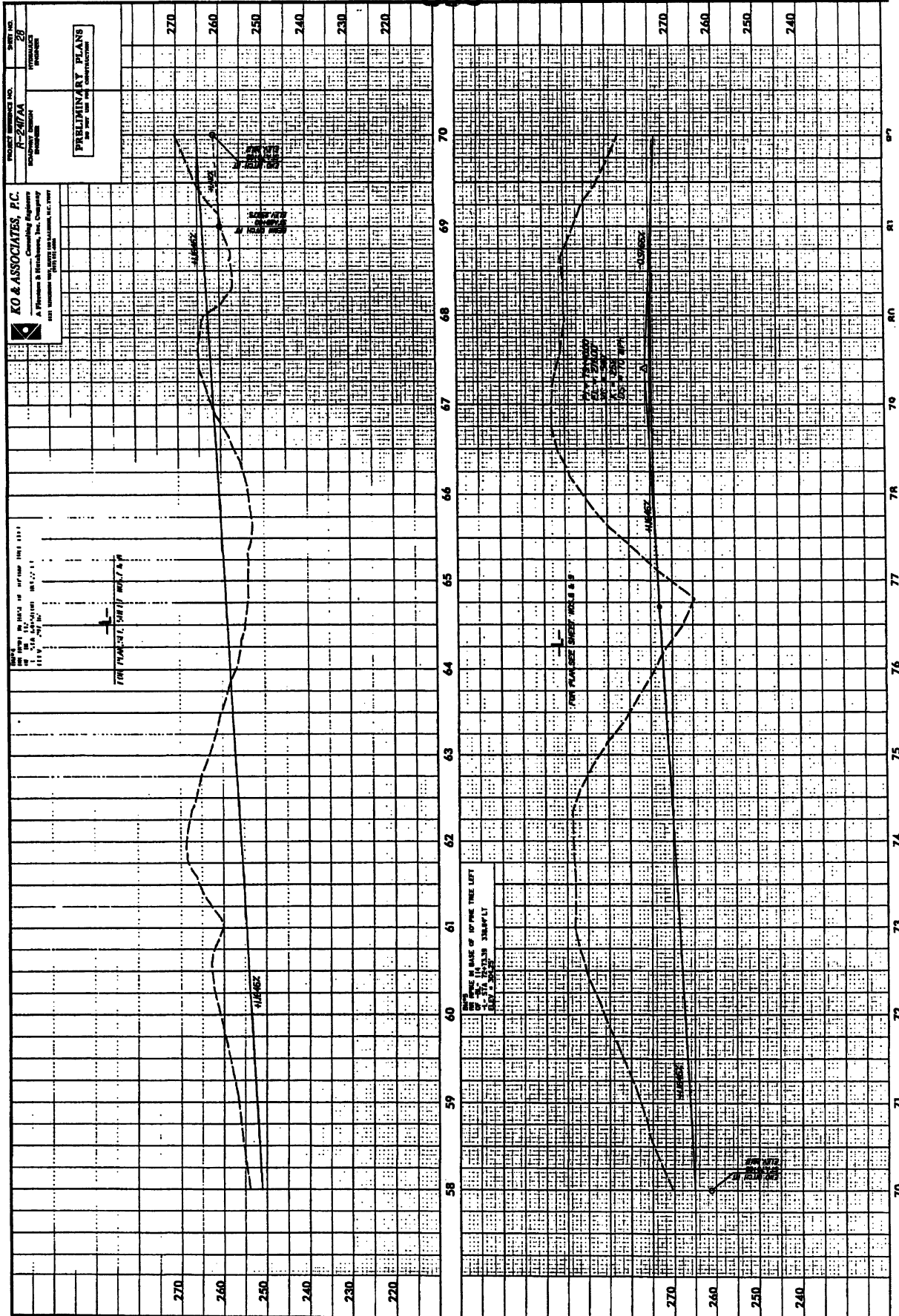
FOR PLANSHEET SEE NO. 54

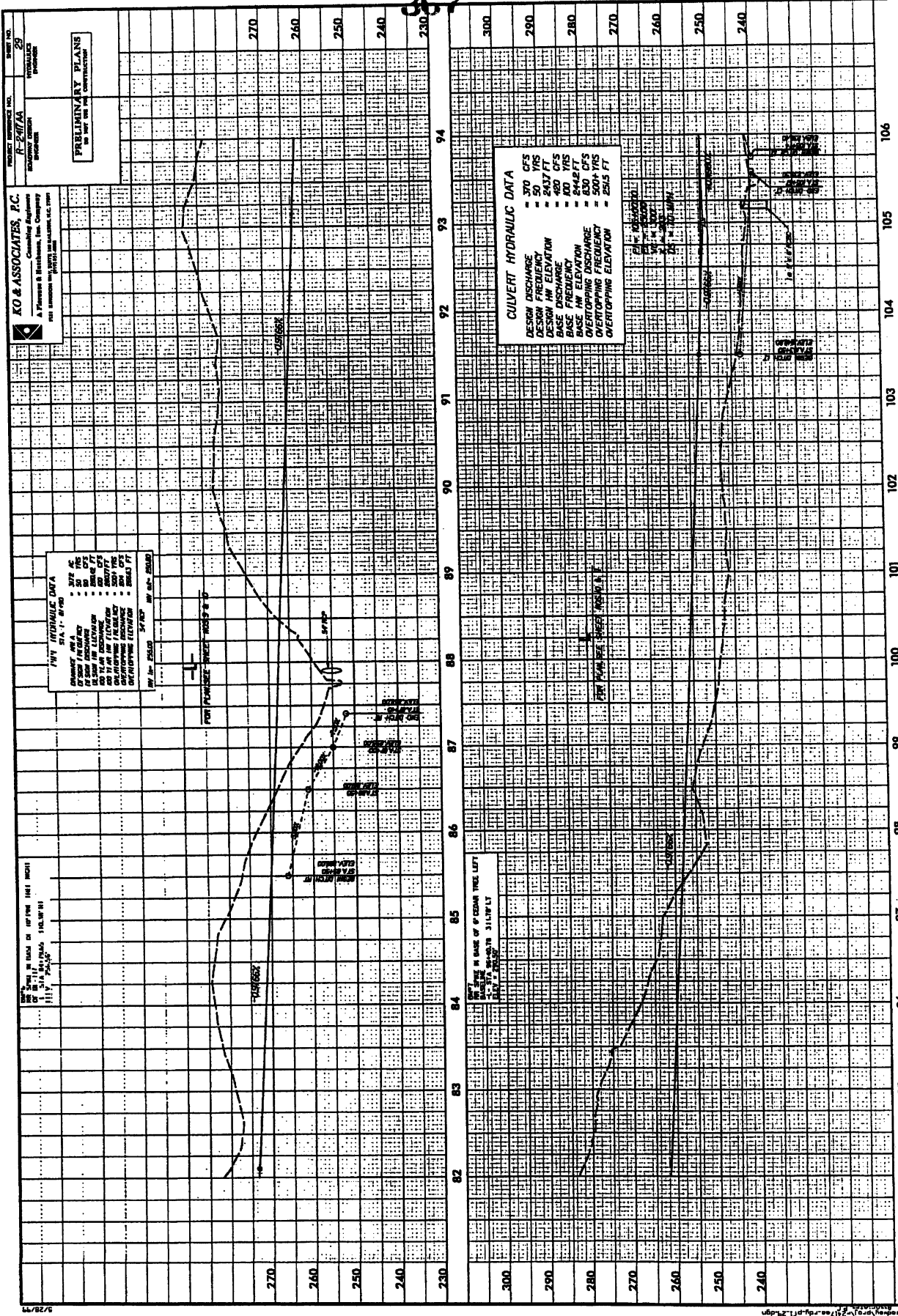
FOR PLANSHEET SEE NO. 55

FOR PLANSHEET SEE NO. 56

FOR PLANSHEET SEE NO. 57

FOR PLANSHEET SEE NO. 58





PROJECT REFERENCE NO.
R-247/AA
 PRELIMINARY
 RAILROAD CROSSING
 DRAWING

KO & ASSOCIATES, P.C.
 Consulting Engineers
 A Planners & Architects, Inc. Company
 1011 UNIVERSITY AVENUE
 SUITE 1000
 ANN ARBOR, MI 48106-1000

PRELIMINARY PLANS
 FOR THE
 CONSTRUCTION

PVT HYDRAULIC DATA
 10% SLOPE

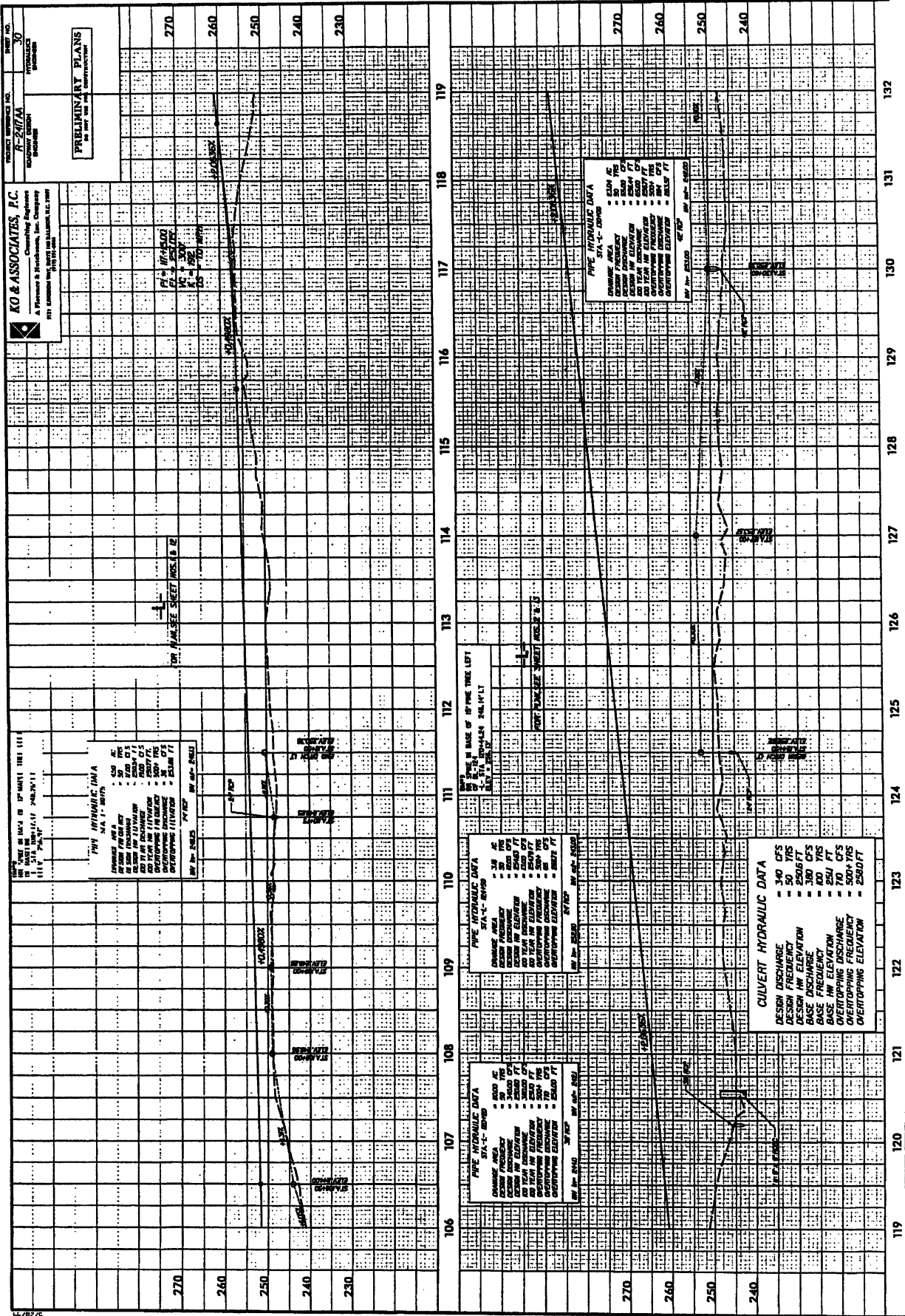
DESIGN FREQ	50 YRS
DESIGN DISCH	370 CFS
DESIGN HW ELEV	243.7 FT
BASE DISCH	480 CFS
BASE FREQ	100 YRS
BASE HW ELEV	244.8 FT
OVERTOPPING DISCH	630 CFS
OVERTOPPING FREQ	500+ YRS
OVERTOPPING ELEV	250.5 FT

CULVERT HYDRAULIC DATA

DESIGN DISCHARGE	370 CFS
DESIGN FREQ	50 YRS
DESIGN HW ELEVATION	243.7 FT
BASE DISCHARGE	480 CFS
BASE FREQ	100 YRS
BASE HW ELEVATION	244.8 FT
OVERTOPPING DISCHARGE	630 CFS
OVERTOPPING FREQ	500+ YRS
OVERTOPPING ELEVATION	250.5 FT

ELEVATIONS IN FEET UNLESS OTHERWISE INDICATED

ELEVATIONS IN FEET UNLESS OTHERWISE INDICATED



PROJECT NUMBER: 10
 DRAWING NO. 30
 HYDRAULICS

KO & ASSOCIATES, P.C.
 Consulting Engineers
 A Partner of Kitchell, Inc. Company
 1111 W. 15th Street, Suite 100
 Denver, Colorado 80202

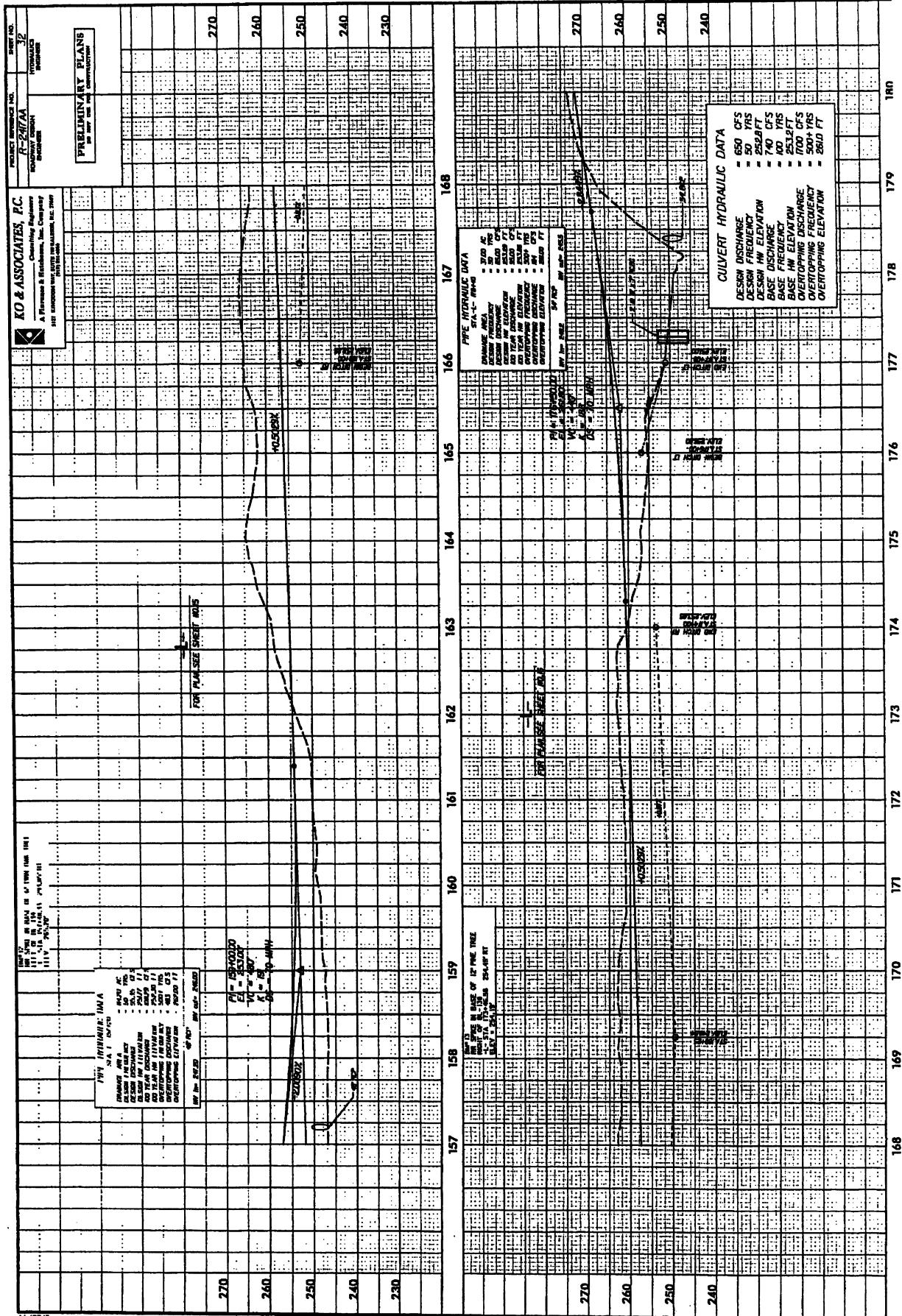
PRELIMINARY PLANS
 FOR THE PROJECT

PIPE HYDRAULIC DATA
 DESIGN AND CONSTRUCTION
 DESIGN DISCHARGE: 50 CFS
 DESIGN FREQ: 100 YRS
 DESIGN ELEVATION: 250.00 FT
 DESIGN YEAR: 2000
 DESIGN OVERTOPPING FREQ: 100 YRS
 DESIGN OVERTOPPING ELEVATION: 250.00 FT

PIPE HYDRAULIC DATA
 DESIGN AND CONSTRUCTION
 DESIGN DISCHARGE: 50 CFS
 DESIGN FREQ: 100 YRS
 DESIGN ELEVATION: 250.00 FT
 DESIGN YEAR: 2000
 DESIGN OVERTOPPING FREQ: 100 YRS
 DESIGN OVERTOPPING ELEVATION: 250.00 FT

PIPE HYDRAULIC DATA
 DESIGN AND CONSTRUCTION
 DESIGN DISCHARGE: 50 CFS
 DESIGN FREQ: 100 YRS
 DESIGN ELEVATION: 250.00 FT
 DESIGN YEAR: 2000
 DESIGN OVERTOPPING FREQ: 100 YRS
 DESIGN OVERTOPPING ELEVATION: 250.00 FT

CULVERT HYDRAULIC DATA
 DESIGN DISCHARGE: 340 CFS
 DESIGN FREQ: 100 YRS
 DESIGN ELEVATION: 250.00 FT
 DESIGN YEAR: 2000
 DESIGN OVERTOPPING FREQ: 100 YRS
 DESIGN OVERTOPPING ELEVATION: 250.00 FT



PROJECT REFERENCE NO. **F-2217AA**
SHEET NO. **370**
DATE **11/20/87**
DRAWN BY **[Name]**
CHECKED BY **[Name]**

KO & ASSOCIATES, P.C.
A Professional Engineering Firm
1501 EASTWOOD BLVD., SUITE 100, RALEIGH, NC 27607
(919) 877-1234

PRELIMINARY PLANS
FOR HYDRAULIC DATA

THE WORK ON THIS SHEET IS BASED ON THE DATA SUPPLIED BY THE CLIENT. THE ENGINEER HAS CONDUCTED VISUAL INSPECTIONS OF THE DATA AND HAS FOUND IT TO BE REASONABLY ACCURATE. THE ENGINEER HAS NOT CONDUCTED FIELD SURVEYS OR TESTS TO VERIFY THE DATA. THE ENGINEER HAS NOT CONDUCTED HYDRAULIC TESTS OR ANALYSES TO VERIFY THE DATA. THE ENGINEER HAS NOT CONDUCTED FIELD SURVEYS OR TESTS TO VERIFY THE DATA.

174 HYDRAULIC DATA
STA 158+00 TO 158+07
DESIGN DISCHARGE = 800 CFS
DESIGN FREQUENCY = 50 YRS
DESIGN HW ELEVATION = 252.8 FT
DESIGN SW ELEVATION = 248.8 FT
DESIGN V.C. = 4.0 FT
DESIGN W.C. = 1.0 FT
DESIGN SLOPE = 0.025
DESIGN OVERLAPPING FREQUENCY = 100 YRS
DESIGN OVERLAPPING ELEVATION = 260.0 FT

175 HYDRAULIC DATA
STA 159+00 TO 159+07
DESIGN DISCHARGE = 800 CFS
DESIGN FREQUENCY = 50 YRS
DESIGN HW ELEVATION = 252.8 FT
DESIGN SW ELEVATION = 248.8 FT
DESIGN V.C. = 4.0 FT
DESIGN W.C. = 1.0 FT
DESIGN SLOPE = 0.025
DESIGN OVERLAPPING FREQUENCY = 100 YRS
DESIGN OVERLAPPING ELEVATION = 260.0 FT

176 HYDRAULIC DATA
STA 160+00 TO 160+07
DESIGN DISCHARGE = 800 CFS
DESIGN FREQUENCY = 50 YRS
DESIGN HW ELEVATION = 252.8 FT
DESIGN SW ELEVATION = 248.8 FT
DESIGN V.C. = 4.0 FT
DESIGN W.C. = 1.0 FT
DESIGN SLOPE = 0.025
DESIGN OVERLAPPING FREQUENCY = 100 YRS
DESIGN OVERLAPPING ELEVATION = 260.0 FT

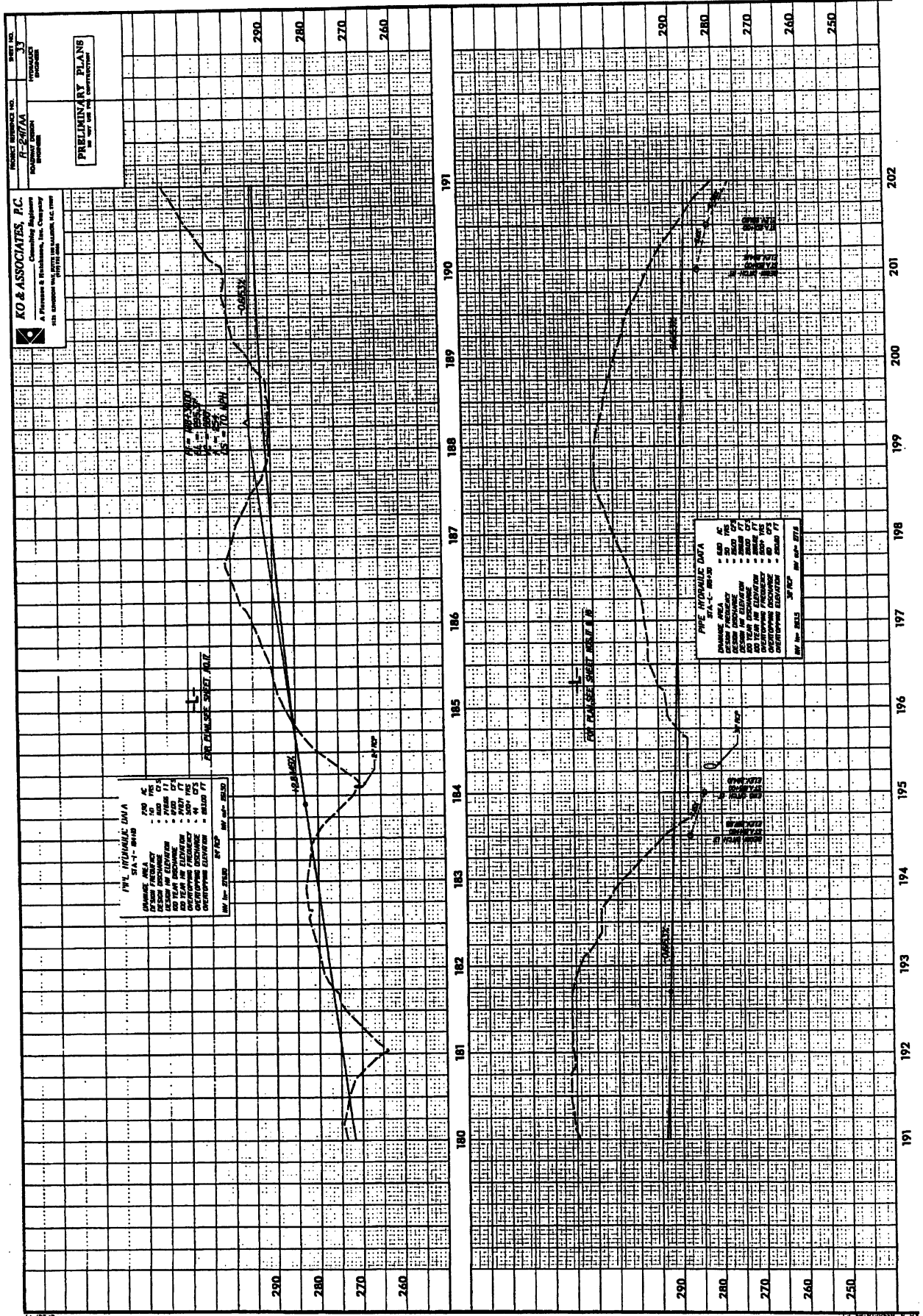
177 PIPE HYDRAULIC DATA
STA 161+00 TO 161+07
DESIGN DISCHARGE = 800 CFS
DESIGN FREQUENCY = 50 YRS
DESIGN HW ELEVATION = 252.8 FT
DESIGN SW ELEVATION = 248.8 FT
DESIGN V.C. = 4.0 FT
DESIGN W.C. = 1.0 FT
DESIGN SLOPE = 0.025
DESIGN OVERLAPPING FREQUENCY = 100 YRS
DESIGN OVERLAPPING ELEVATION = 260.0 FT

178 PIPE HYDRAULIC DATA
STA 162+00 TO 162+07
DESIGN DISCHARGE = 800 CFS
DESIGN FREQUENCY = 50 YRS
DESIGN HW ELEVATION = 252.8 FT
DESIGN SW ELEVATION = 248.8 FT
DESIGN V.C. = 4.0 FT
DESIGN W.C. = 1.0 FT
DESIGN SLOPE = 0.025
DESIGN OVERLAPPING FREQUENCY = 100 YRS
DESIGN OVERLAPPING ELEVATION = 260.0 FT

179 PIPE HYDRAULIC DATA
STA 163+00 TO 163+07
DESIGN DISCHARGE = 800 CFS
DESIGN FREQUENCY = 50 YRS
DESIGN HW ELEVATION = 252.8 FT
DESIGN SW ELEVATION = 248.8 FT
DESIGN V.C. = 4.0 FT
DESIGN W.C. = 1.0 FT
DESIGN SLOPE = 0.025
DESIGN OVERLAPPING FREQUENCY = 100 YRS
DESIGN OVERLAPPING ELEVATION = 260.0 FT

180 PIPE HYDRAULIC DATA
STA 164+00 TO 164+07
DESIGN DISCHARGE = 800 CFS
DESIGN FREQUENCY = 50 YRS
DESIGN HW ELEVATION = 252.8 FT
DESIGN SW ELEVATION = 248.8 FT
DESIGN V.C. = 4.0 FT
DESIGN W.C. = 1.0 FT
DESIGN SLOPE = 0.025
DESIGN OVERLAPPING FREQUENCY = 100 YRS
DESIGN OVERLAPPING ELEVATION = 260.0 FT

CULVERT HYDRAULIC DATA
DESIGN DISCHARGE = 800 CFS
DESIGN FREQUENCY = 50 YRS
DESIGN HW ELEVATION = 252.8 FT
DESIGN SW ELEVATION = 248.8 FT
DESIGN V.C. = 4.0 FT
DESIGN W.C. = 1.0 FT
DESIGN SLOPE = 0.025
DESIGN OVERLAPPING FREQUENCY = 100 YRS
DESIGN OVERLAPPING ELEVATION = 260.0 FT



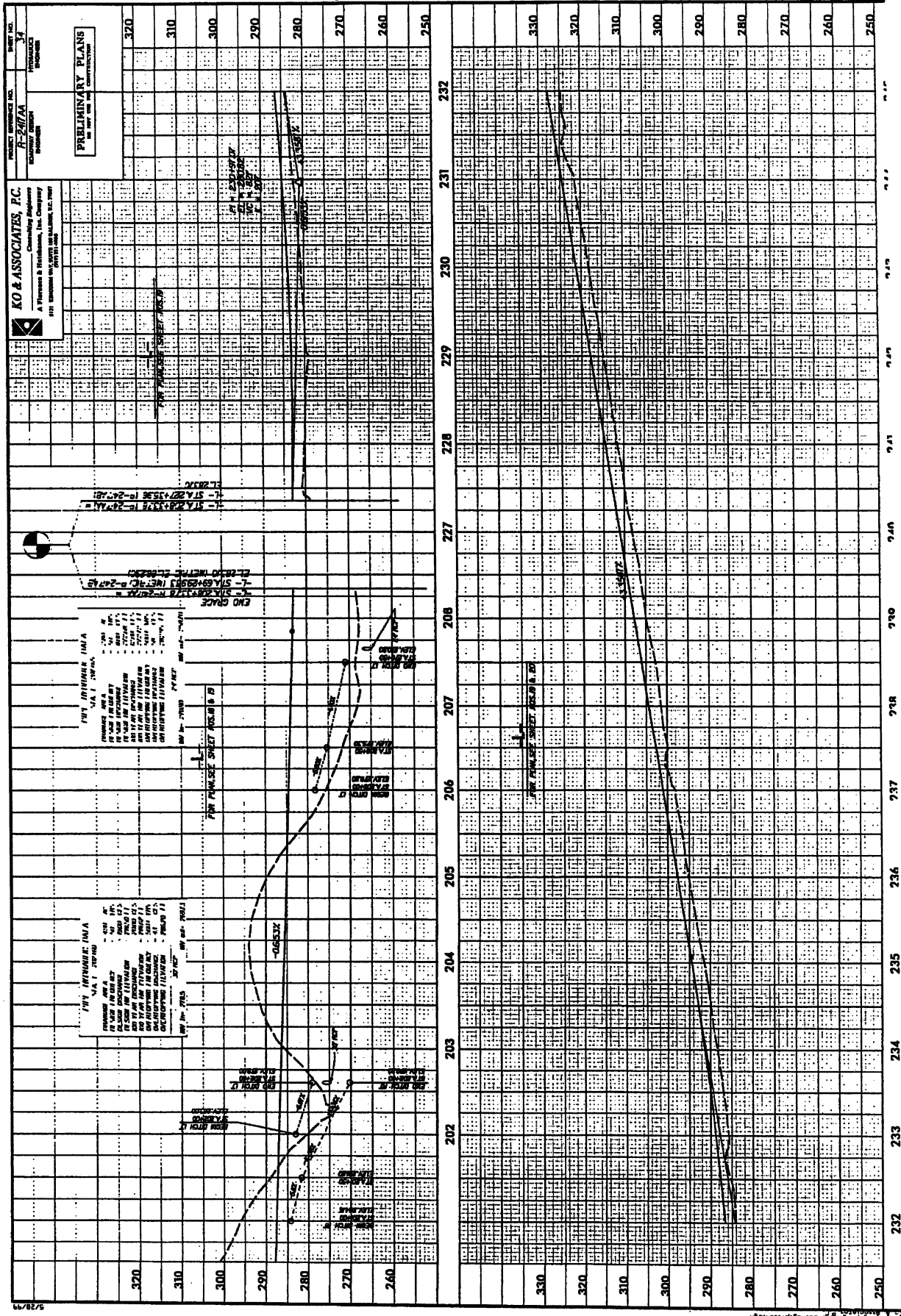
PROJECT REFERENCE NO. **F-207/A**
 SHEET NO. **37**
 PRELIMINARY PLANS
 FOR THE PROPOSED CONSTRUCTION

KO & ASSOCIATES, P.C.
 A Planning & Engineering Firm
 4100 University Avenue, Suite 200
 Berkeley, CA 94704
 TEL: (415) 841-1133
 FAX: (415) 841-1134

PRELIMINARY PLANS
 FOR THE PROPOSED CONSTRUCTION

PROPOSED ROAD DATA
 ROAD NAME: FRANKLIN STREET
 ROAD TYPE: LOCAL STREET
 ROAD WIDTH: 20 FT
 ROAD ALIGNMENT: CENTERLINE
 ROAD ELEVATION: 270 FT
 ROAD GRADE: 0%
 ROAD CURVE: NONE
 ROAD RIGHT-OF-WAY: 10 FT
 ROAD DRAINAGE: NONE
 ROAD UTILITIES: NONE
 ROAD NOTES: SEE SHEET F-207/B

EXISTING ROAD DATA
 ROAD NAME: FRANKLIN STREET
 ROAD TYPE: LOCAL STREET
 ROAD WIDTH: 20 FT
 ROAD ALIGNMENT: CENTERLINE
 ROAD ELEVATION: 270 FT
 ROAD GRADE: 0%
 ROAD CURVE: NONE
 ROAD RIGHT-OF-WAY: 10 FT
 ROAD DRAINAGE: NONE
 ROAD UTILITIES: NONE
 ROAD NOTES: SEE SHEET F-207/B



2/9/2009

2/9/2009 11:00 AM

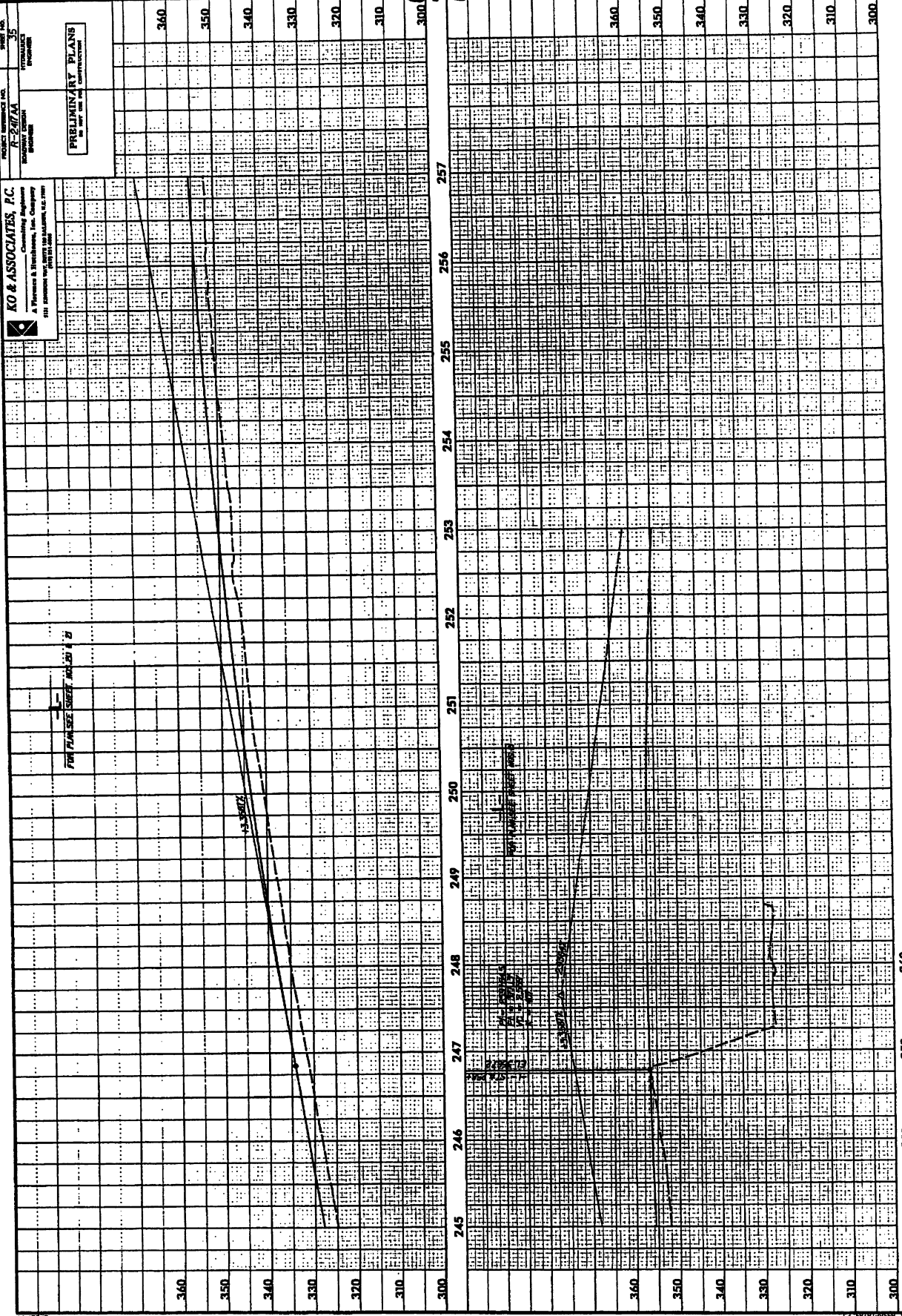
373

PROJECT NUMBER: R-207AA
SHEET NO. 35
PROPOSED
ROADWAY DESIGN
STATIONING

PRELIMINARY PLANS
FOR THE
CONSTRUCTION OF

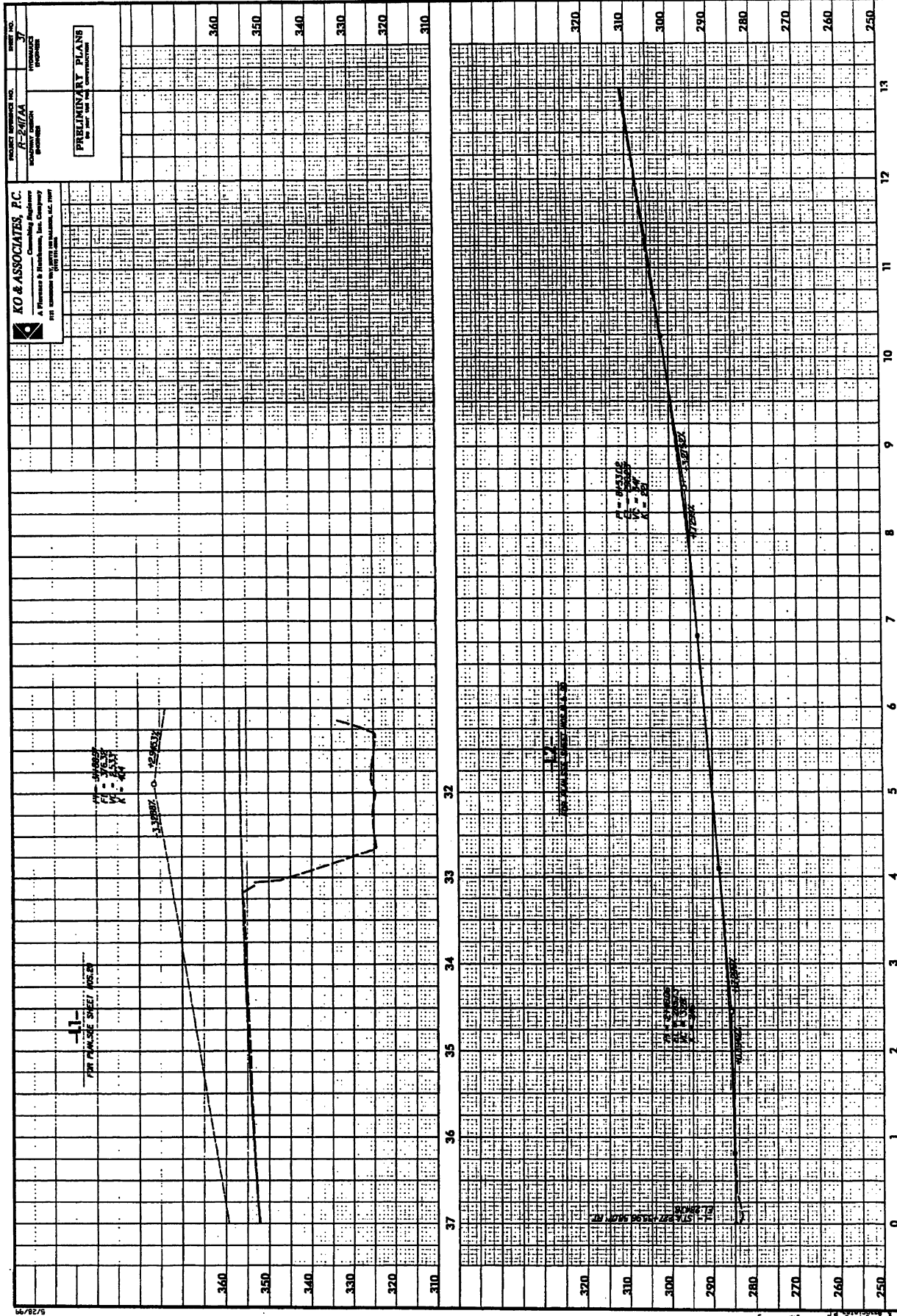
KO & ASSOCIATES, P.C.
Consulting Engineers
A Whittier & Birchbaker, Inc. Company
1111 Eastman Avenue, Suite 100
Burlington, Vermont 05401

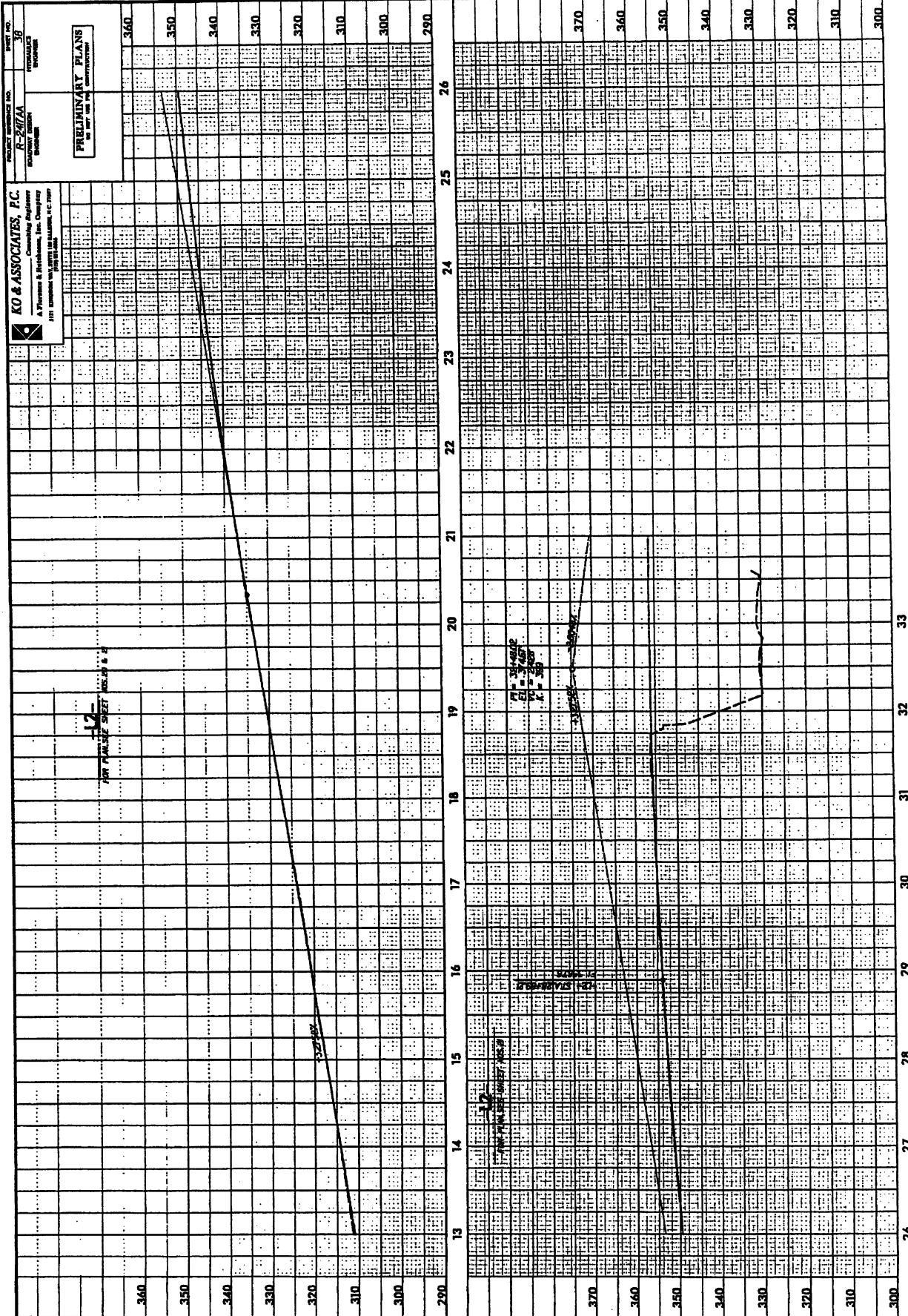
PLAN SHEET NO. 207A-1



5/28/13

1/3/2009 10:27:12 AM 11:25:59 AM





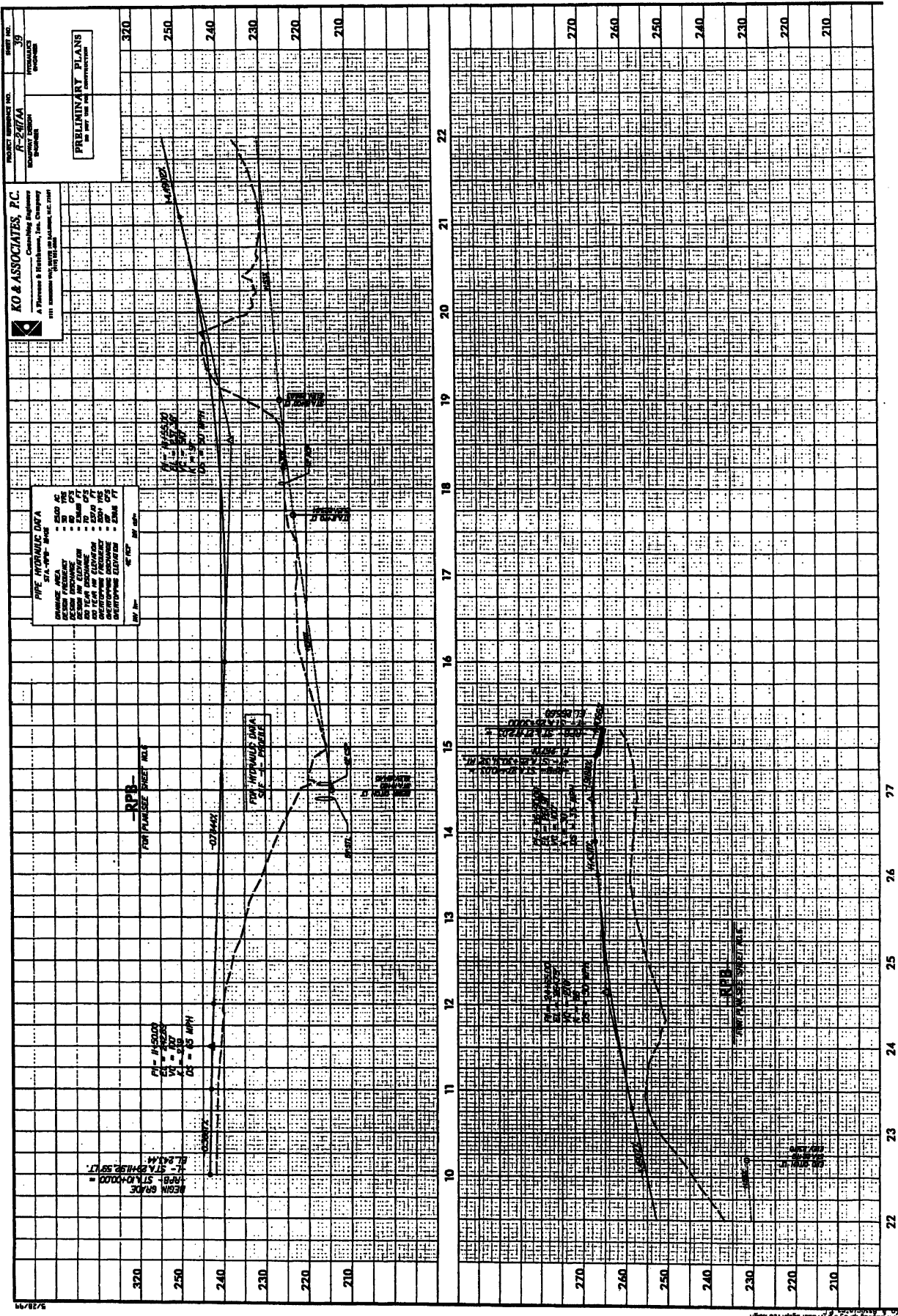
PROJECT NUMBER NO. **18**
R-211A
 PROJECT NAME
 LOCATION

KO & ASSOCIATES, P.C.
 Consulting Engineers
 A Phoenix & Breckman, Inc. Company
 111 East Washington Blvd., Suite 100
 Phoenix, AZ 85001

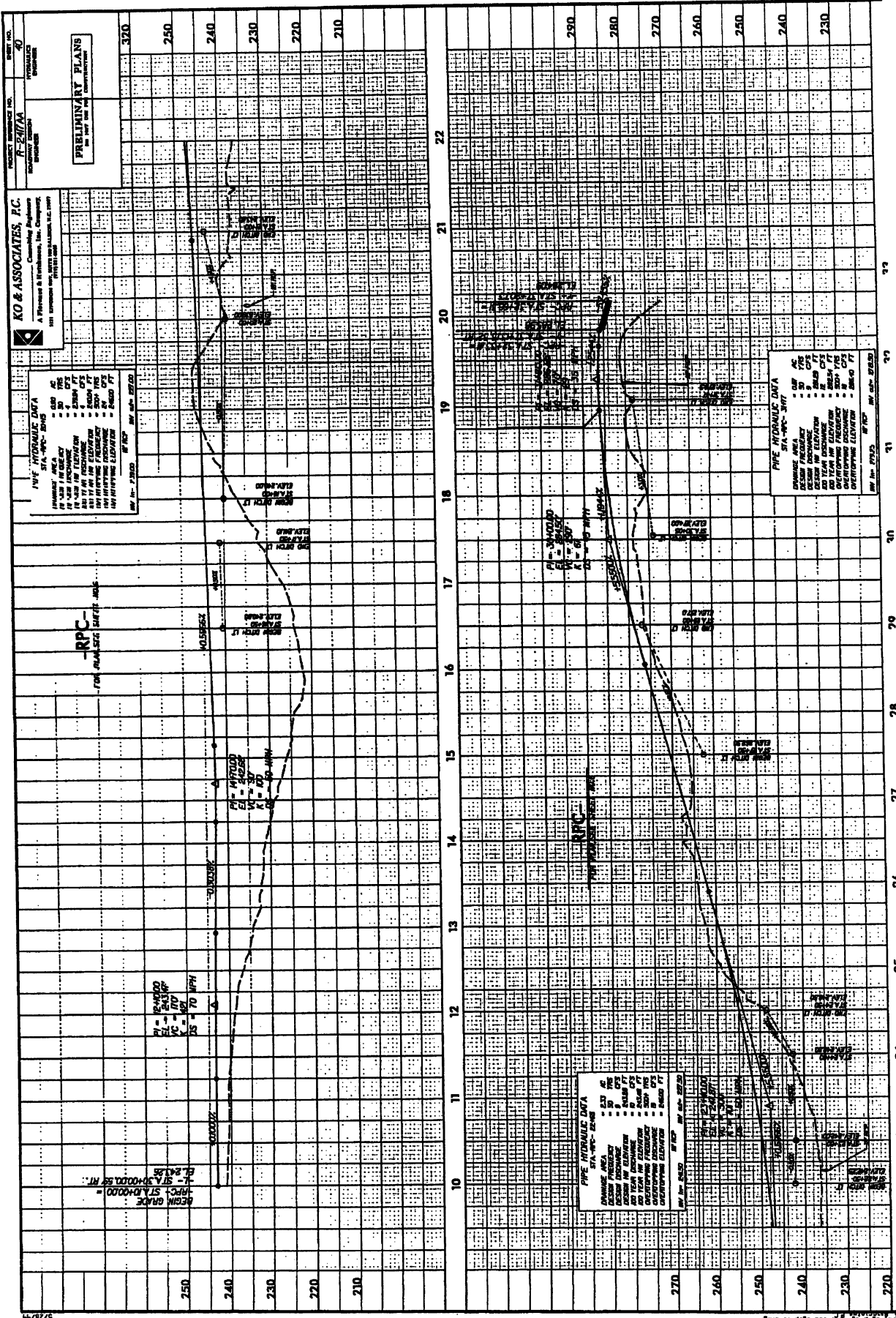
PRELIMINARY PLANS
 AS SHOWN ON SHEET NO. 18

12
 FOR PLANS SEE SHEET NO. 12 & 2

3
 FOR PLANS SEE SHEET NO. 3



5/28/94



PROJECT REFERENCE NO. R-2171A
 DATE 9/13/79
 PRELIMINARY PLANS
 NOT TO BE USED FOR CONSTRUCTION

KO & ASSOCIATES, P.C.
 Consulting Engineers
 A Division of K. H. Johnson, Inc., Company
 1001 Wisconsin Avenue, N.W.
 Washington, D.C. 20007

PIPE HYDRAULIC DATA
 STA. 10+00 - 22+00

DESIGN AREA	- 1.00 AC
DESIGN FREQUENCY	- 10 YRS
DESIGN STORM	- 3.54 IN
DESIGN VELOCITY	- 70 MPH
DESIGN DISCHARGE	- 10.24 CFS
DESIGN ELEVATION	- 230 FT
DESIGN SLOPE	- 0.005
DESIGN FRICTION	- 0.020
DESIGN LOSS	- 0.010
DESIGN EFFICIENCY	- 0.950
DESIGN HEAD	- 1.00 FT
DESIGN LENGTH	- 12.00 FT
DESIGN TIME	- 0.100 HRS
DESIGN LOSS	- 0.010
DESIGN EFFICIENCY	- 0.950
DESIGN HEAD	- 1.00 FT
DESIGN LENGTH	- 12.00 FT

PIPE HYDRAULIC DATA
 STA. 10+00 - 22+00

DESIGN AREA	- 1.00 AC
DESIGN FREQUENCY	- 10 YRS
DESIGN STORM	- 3.54 IN
DESIGN VELOCITY	- 70 MPH
DESIGN DISCHARGE	- 10.24 CFS
DESIGN ELEVATION	- 230 FT
DESIGN SLOPE	- 0.005
DESIGN FRICTION	- 0.020
DESIGN LOSS	- 0.010
DESIGN EFFICIENCY	- 0.950
DESIGN HEAD	- 1.00 FT
DESIGN LENGTH	- 12.00 FT

PIPE HYDRAULIC DATA
 STA. 10+00 - 22+00

DESIGN AREA	- 1.00 AC
DESIGN FREQUENCY	- 10 YRS
DESIGN STORM	- 3.54 IN
DESIGN VELOCITY	- 70 MPH
DESIGN DISCHARGE	- 10.24 CFS
DESIGN ELEVATION	- 230 FT
DESIGN SLOPE	- 0.005
DESIGN FRICTION	- 0.020
DESIGN LOSS	- 0.010
DESIGN EFFICIENCY	- 0.950
DESIGN HEAD	- 1.00 FT
DESIGN LENGTH	- 12.00 FT

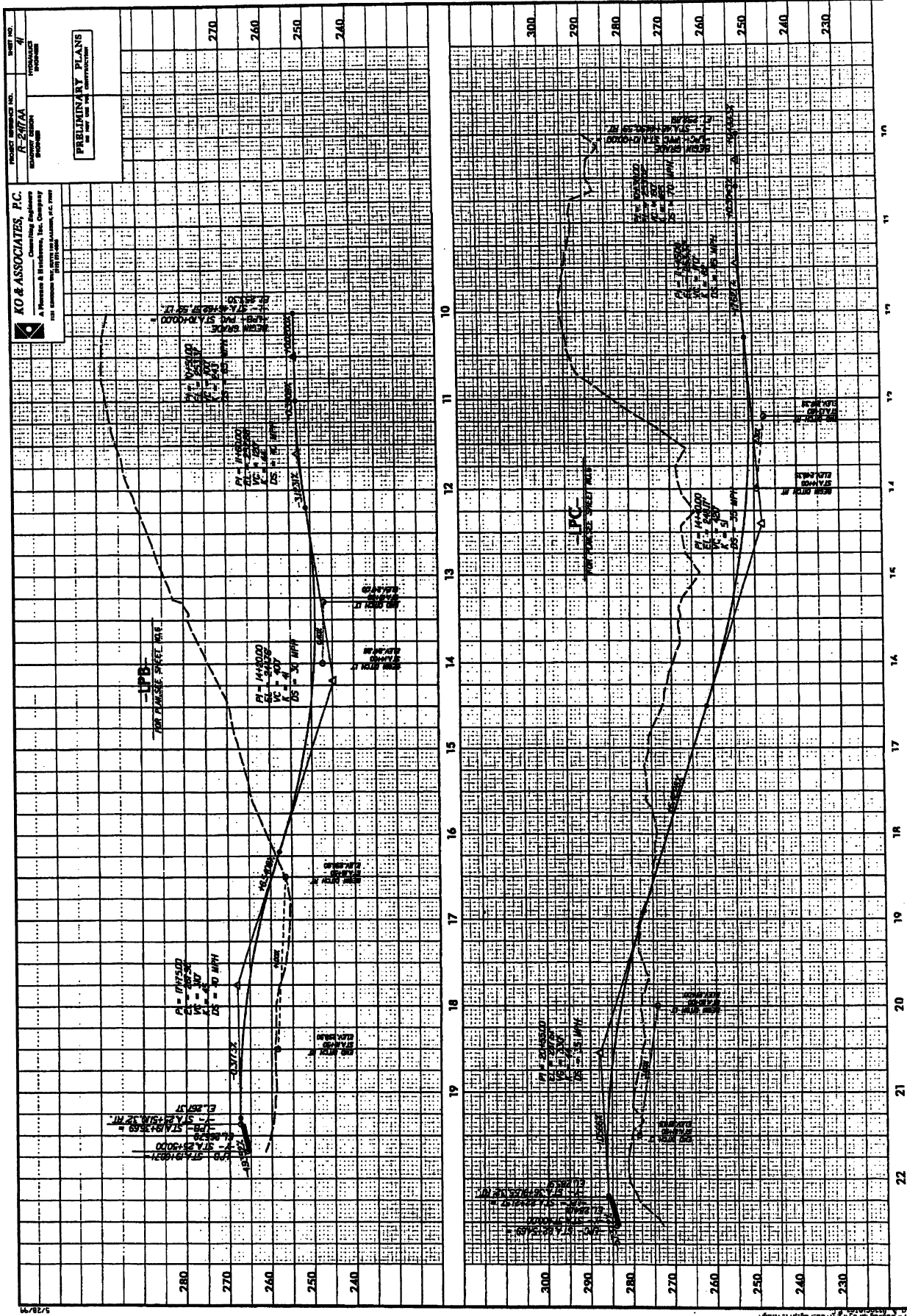
RPC-1
 70 MPH DESIGN VELOCITY

RPC-2
 70 MPH DESIGN VELOCITY

BEGIN GRADE
 - STA. 10+000.00
 - ELEVATION 230 FT

9/13/79

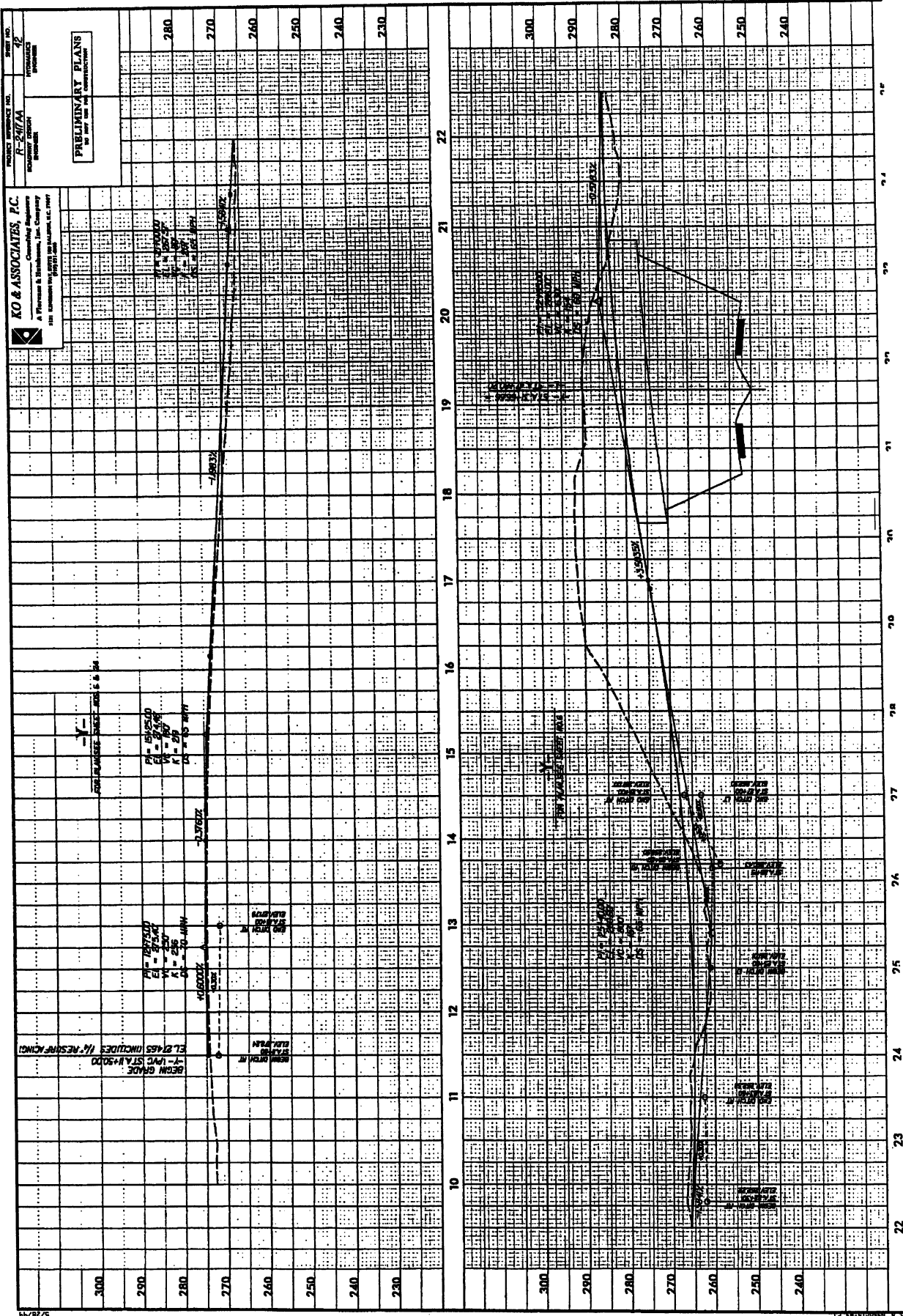
9/13/79

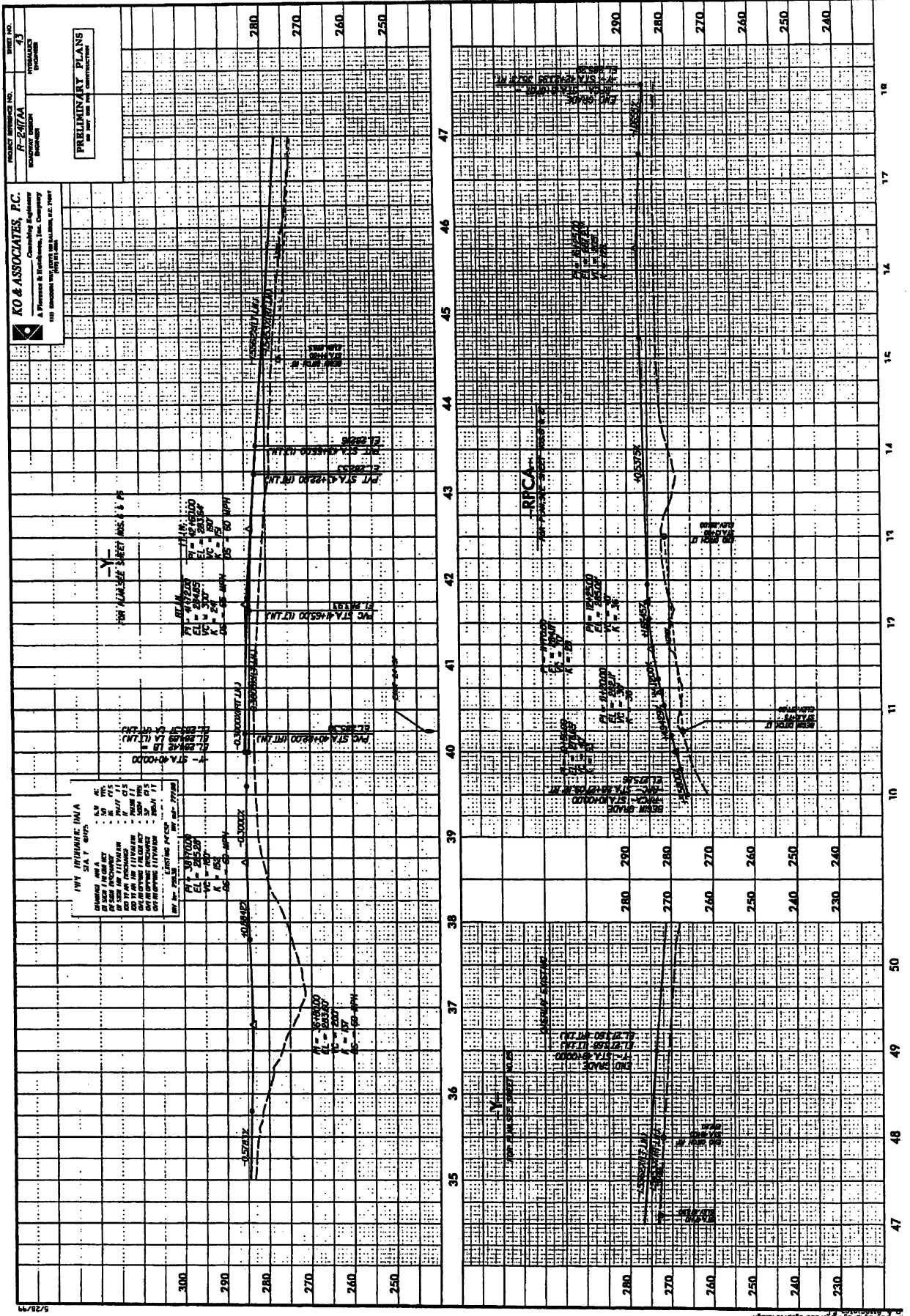


PROJECT: BRIDGE NO. 41
 DRAWING: PRELIMINARY PLANS
 DATE: 11/13/2001

PRELIMINARY PLANS
 NO. 1111 - 1111
 1111 - 1111

KO & ASSOCIATES, P.C.
 Consulting Engineers
 A Minnesota & Wisconsin, Inc. Company
 1111 Louisiana Ave. West, Ste. 100, Eden Prairie, MN 55324





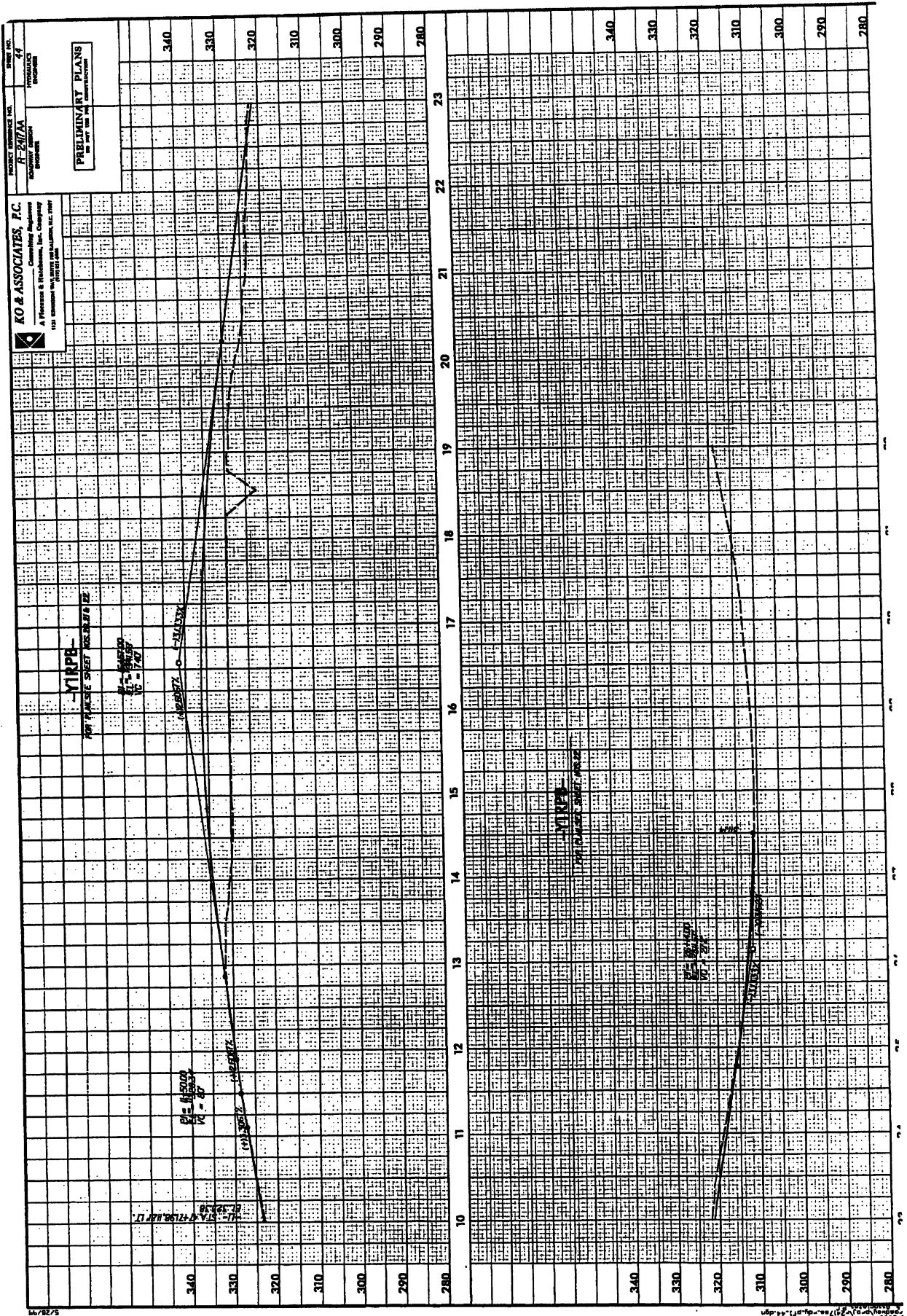
PROJECT NO. 73
 R-217A
 CONTRACT NO. 1000000000000000

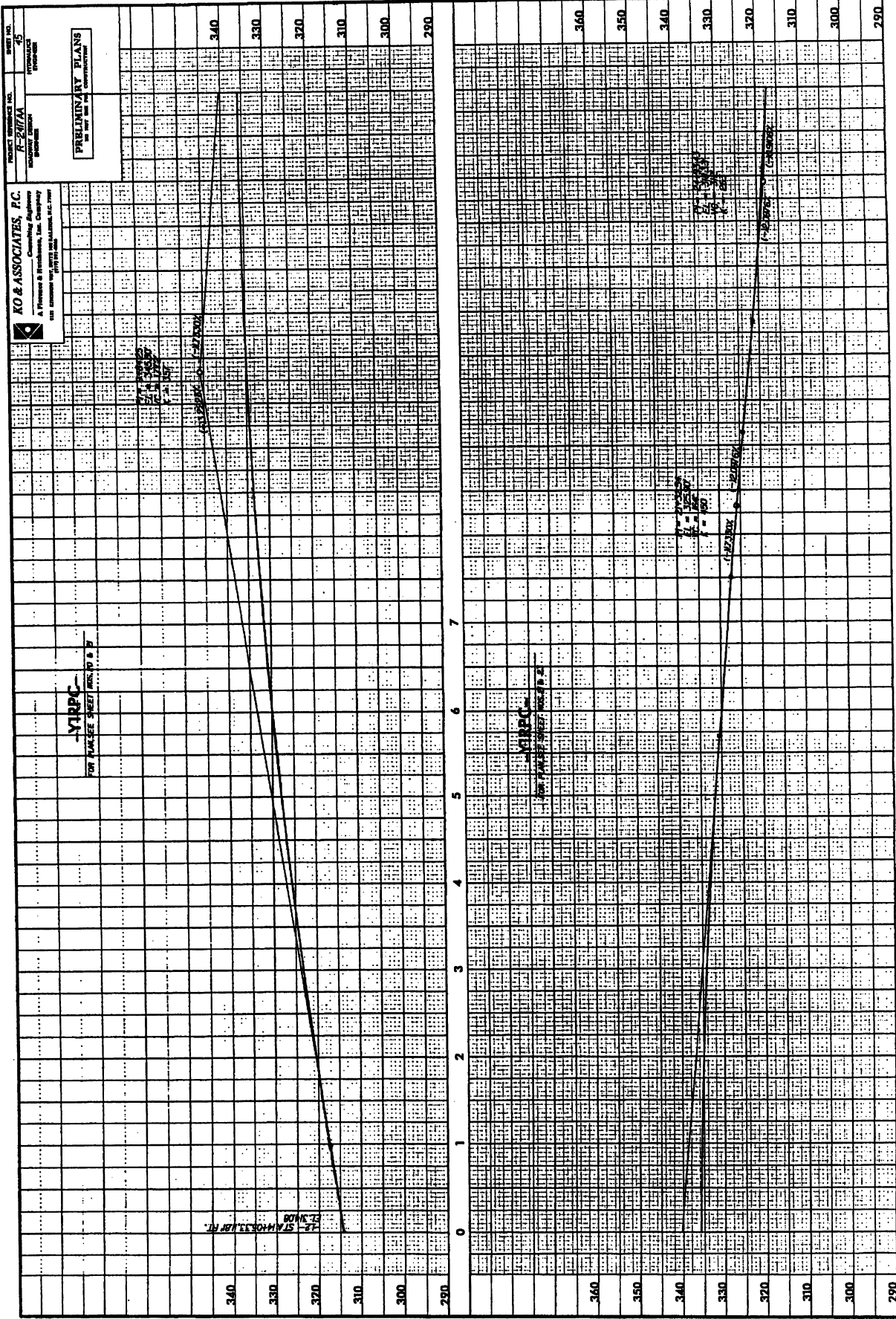
KO & ASSOCIATES, P.C.
 A Florence & Harborside, Inc. Company
 1111 Broadway, Suite 1000, New York, N.Y. 10018
 PHONE: (212) 512-2000

PRELIMINARY PLANS
 SHEET NO. 1000000000000000

5/28/79

5/28/79





PROJECT NUMBER: 101-10101
DATE: 11/14/01
DRAWING NO.: 382.0

KO & ASSOCIATES, P.C.
A Division of Kohn Pedersen Fox Associates, Inc.
100 Greenwich Street, New York, N.Y. 10006
Tel: 212-904-6000

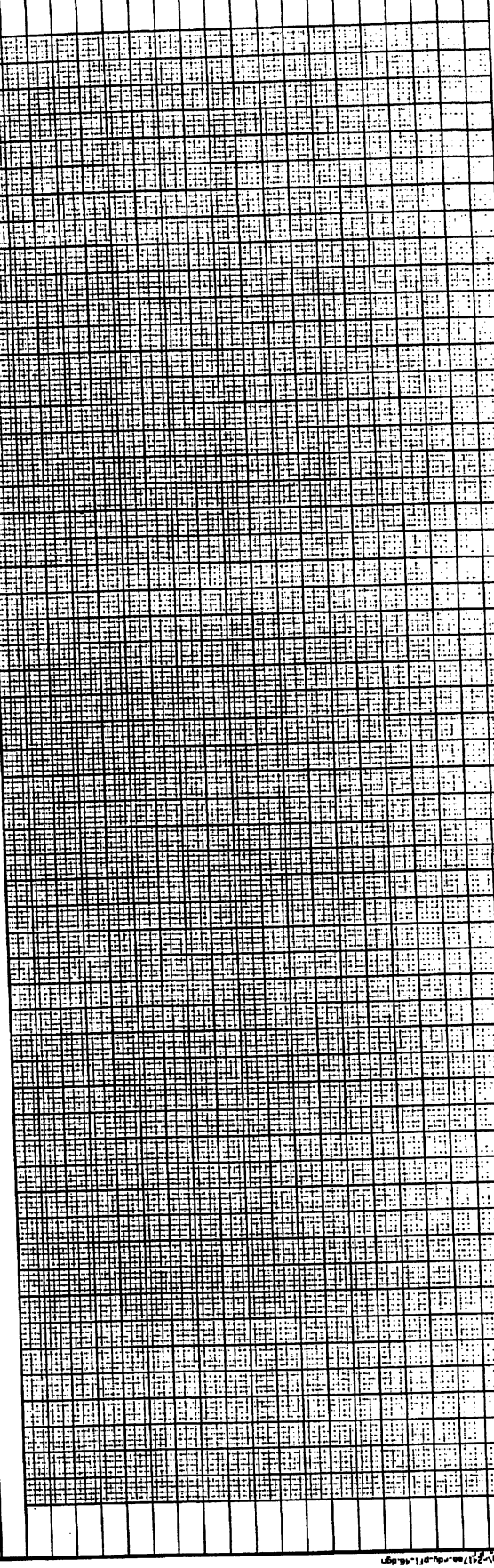
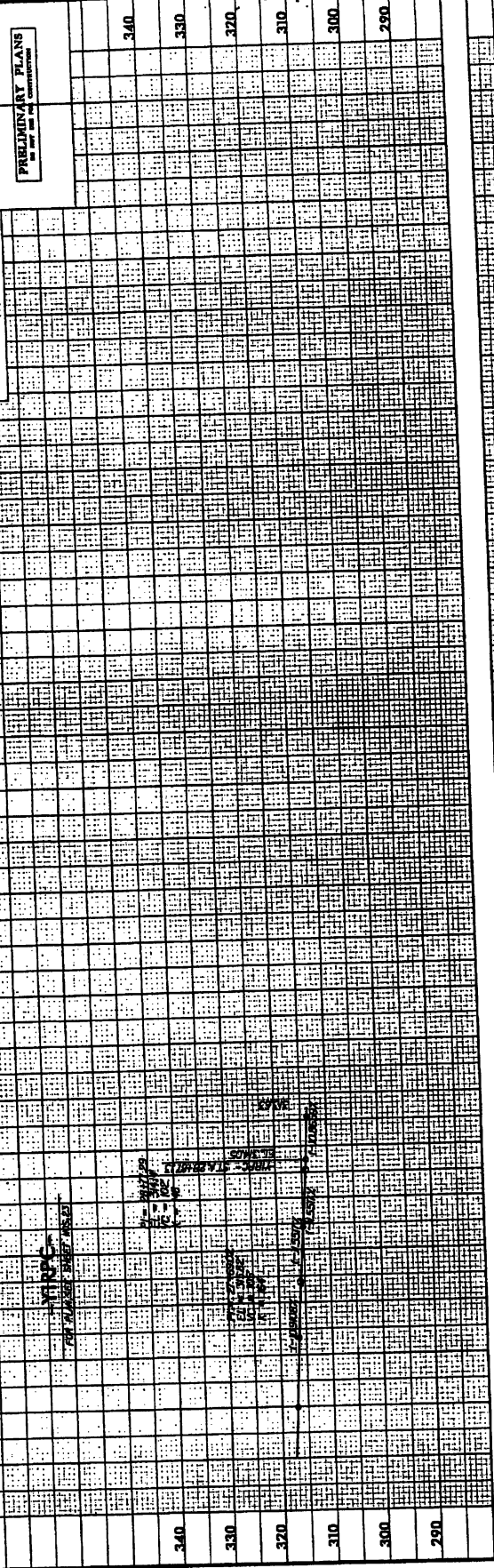
PRELIMINARY PLANS
NO. 101-10101-01

18 STAINLESS STEEL
PLEASE SEE SHEET 382.0 & 7

18 STAINLESS STEEL
PLEASE SEE SHEET 382.0 & 7

PROJECT REFERENCE NO.
R-2711AA
SHEET NO. 45
PRELIMINARY PLANS
NOT TO BE USED FOR CONSTRUCTION

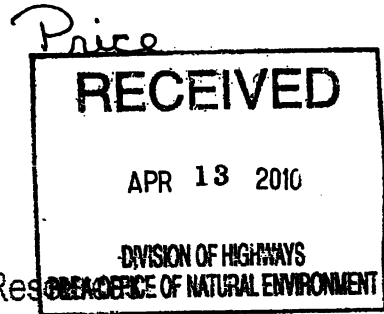
KO & ASSOCIATES, P.C.
Consulting Engineers
A Phoenix & Harkness, Inc. Company
111 EAST WASHINGTON STREET, SUITE 1200
PHOENIX, ARIZONA 85001



340
330
320
310
300
290



North Carolina Department of Environment and Natural Resources



Beverly Eaves Perdue, Governor

Dee Freeman, Secretary

April 1, 2010

Dr. Greg Thorpe, PhD., Manager
Project Development and Environmental Analysis Branch
North Carolina Department of Transportation
1548 Mail Service Center
Raleigh, North Carolina, 27699-1548

Subject: Seventh Modification to the 401 Water Quality Certification Pursuant to Section 401 of the Federal Clean Water Act with **ADDITIONAL CONDITIONS** for the US 421/NC 87 (Sanford Bypass) from East of NC 42 to NC 87 near SR 1138 in Lee County, Federal Aid Project No. STPNHF-421(2), State Project No. 8.T540402, TIP R-2417AA, DWQ Project No. 00-1432

Dear Dr. Thorpe:

Attached hereto is a modification of Certification No. 3378 issued to The North Carolina Department of Transportation (NCDOT) and dated April 10, 2002. This modification is being issued to correct the TIP project number from R-2417C to R-2471AA. No other modifications are being made to this certification.

All authorized activities and conditions of the original Water Quality Certification *modification* (dated September 15, 2009), and all other previous and subsequent modifications still apply except where superseded by this certification.

If we can be of further assistance, please do not hesitate to contact Polly Lespinasse at (704) 663-1699.

Sincerely,

for Coleen H. Sullins
Director

Attachments

cc: Kimberly Garvey, US Army Corps of Engineers, Wilmington Office
David Wainwright, NCDWQ Transportation Permitting Unit
Greg Price, NCDOT PDEA
Sonia Gregory, NCDWQ Transportation Permitting Unit
File Copy

Modification to the 401 Water Quality Certification Pursuant to Section 401 of the Federal Clean Water Act with ADDITIONAL CONDITIONS

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 .0500. This certification authorizes the NCDOT to **additionally** impact 3,248 linear feet of jurisdictional streams, 1.59 acres of jurisdictional wetlands, and 0.66 acres of surface waters in Lee County as listed below. The project shall be constructed pursuant to the modification received August 7, 2009. The authorized impacts are as described below:

Stream Impacts in the Cape Fear River Basin

Permit Site No. and Station No. /Stream Name	Permanent Fill in Intermittent Stream (linear ft)	Temporary Fill in Intermittent Stream (linear ft)	Permanent Fill in Perennial Stream (linear ft)	Temporary Fill in Perennial Stream (linear ft)	Total Stream Impact (linear feet)	Stream Impacts Requiring Mitigation (linear ft)
Site #1, Station No. 23+32(RT)/Patterson Creek			10	20	30	0
Site #2a, Station No. 33+00/33+65(LT)/UT to Patterson Creek	816	14			830	0
Site #2b, Station No. 33+00/33+65(RT)/UT to Patterson Creek			274	15	289	274
Site #4, Station No. 52+08(LT/RT) and 63+00(RT)/Big Buffalo Creek			44	57	101	0
Site #5, Station No. 87+90 (LT/RT)/UT to Big Buffalo Creek			295	47	342	295
Site #6, Station No. 120+20(LT)/UT to Buffalo Creek	140	55			195	0
Site #6, Station No. 120+57(LT/RT)/UT to Buffalo Creek			320	83	403	320
Site #7, Station No. 142+67(LT/RT)/UT to Big Buffalo Creek	351	66			417	0
Site #9, Station No. 177+29(LT/RT)/UT to Big Buffalo Creek			425	60	485	425
Site #9, Station No. 178+82(LT)/UT to Big Buffalo Creek	80	30			110	0
Site #10, Station No. 195+65(RT)/UT to Big Buffalo Creek	16	30			46	0

UT = Unnamed Tributary

Total Stream Impacts for Project: 3,248 linear feet
Total Stream Impacts Requiring Mitigation: 1,314 linear feet

Riverine and Non-Riverine Wetland Impacts in the Cape Fear River Basin

Permit Site No./Station No.	Wetland Type (Riverine or Non-Riverine)	Permanent Fill (acres)	Excavation (acres)	Mechanized Clearing (acres)	Hand Clearing (acres)	Total Acres
Site #1, Station No. 22+30/26+80(LT)	Riverine	0.02	0.01	0.02		0.05
Site #2, Station No. 33+00/33+65(LT)	Riverine	0.16	0.21	0.05		0.42
Site #3, Station No. 35+20/36+30(RT)	Riverine	0.11		0.01		0.12
Site #8, Station No. 153+50/160+00(RT)	Riverine	0.73	0.01	0.08		0.82
Site #9, Station No. 177+29(LT/RT)	Riverine	0.12	0.03	0.03		0.18

Total Riverine Wetland Impacts for Project: 1.59 acres
 Total Riverine Wetland Impacts Requiring Mitigation: 1.59 acres

Open Water (Ponds) Impacts in the Cape Fear River Basin

Permit Site No./ Station No.	Permanent Fill in Open Waters (ac)	Temporary Fill in Open Waters (ac)	Total Fill in Open Waters (ac)
Site #10, Station No. 194+60/196+10(LT/RT)	0.66		0.66

Total Open Water Impacts for Project: 0.66 acres

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

This approval is only valid for the purpose and design that you submitted in your modification application dated received August 7, 2009. Should your project change, you are required to notify the DWQ and 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 any additional wetland or stream impacts, for this project (now or in the future) exceed one acre or 150 linear feet, respectively, 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, Coastal Storm Water, Non-discharge and Water Supply watershed regulations. This Certification shall expire on the same day as the expiration date of the corresponding Corps of Engineers Permit.

Conditions of Certification:

1. At Permit Site #1, a 24" culvert discharges to Patterson Creek at an approximate 90 degree angle. NCDOT is advised that if stream bank destabilization occurs as a result of this alignment, corrective actions to stabilize the stream will be required.
2. At Permit Site #2b, a ditch ties into Patterson Creek such that storm flows will be directed upstream once they exit the ditchline. NCDOT is advised that if the stream destabilizes in this area due to backwater or other conditions caused by the ditchline alignment, corrective actions to stabilize the stream will be required.
3. At Permit Sites #4 and #7, ditches tie into the streams at an approximate 90 degree angle. NCDOT is advised that if stream bank destabilization occurs as a result of this alignment, corrective actions to stabilize the stream will be required.
- ✱ 4. **Compensatory mitigation for impacts to 1.59 acres of riverine wetlands and 1,314 linear feet of stream are required. We understand that you have chosen to perform compensatory mitigation for impacts to wetlands and streams through the North Carolina Ecosystem Enhancement Program (EEP). EEP has agreed to implement the mitigation for 1.58 acres of riverine wetlands and 1,130 linear feet of stream as per a letter, dated May 4, 2009. DWQ is requiring mitigation for all riverine wetland impacts and all perennial stream impacts (exceeding 150 linear feet of impact per stream, including riprap bank stabilization). Therefore, prior to wetland and stream impacts, NCDOT must provide documentation demonstrating EEP's ability to provide the remaining mitigation which is required for this project (0.01 acres of wetland impact and 184 linear feet of stream impact).**

5. All portions of the proposed project draining to 303(d) listed watersheds that are impaired due to biological criteria exceedances, specifically Big Buffalo Creek, shall not discharge stormwater directly to surface waters. Stormwater shall be treated using appropriate best management practices (e.g., vegetated conveyances, constructed wetlands, detention ponds, etc.) prior to discharging to surface waters.
6. Bridge deck drains should not discharge directly into the stream. Stormwater shall be directed across the bridge and pre-treated through site-appropriate means (grassed swales, pre-formed scour holes, vegetated buffers, etc.) before entering the stream. Please refer to the most current version of Stormwater Best Management Practices.
7. All bridge construction shall be performed from the existing bridge, temporary work bridges, temporary causeways, or floating or sunken barges. If work conditions require barges, they shall be floated into position and then sunk. The barges shall not be sunk and then dragged into position. Under no circumstances should barges be dragged along the bottom of the surface water.
8. The post-construction removal of any temporary bridge structures must return the project site to its preconstruction contours and elevations. The impacted areas shall be revegetated with appropriate native species.
9. If multiple pipes or barrels are required, they shall be designed to mimic natural stream cross section as closely as possible including pipes or barrels at flood plain elevation and/or sills where appropriate. Widening the stream channel should be avoided. Stream channel widening at the inlet or outlet end of structures typically decreases water velocity causing sediment deposition that requires increased maintenance and disrupts aquatic life passage.
10. At locations where ponds will be drained, proper measures will be taken to drain the pond with limited impact to upstream and downstream channel stability as well as to native aquatic species. Proper measures will be taken to avoid sediment release and/or sediment accumulation downstream as a result of pond draining. If typical pond draining techniques will create significant disturbance to native aquatic species, additional measures such as collection and relocation may be necessary to prevent a significant fish kill. NCDOT shall consult with the NC Wildlife Resources Commission Staff to determine if there are any sensitive species, and the most appropriate measures to limit impacts to these species.
11. Riprap shall not be placed in the active thalweg channel or placed in the streambed in a manner that precludes aquatic life passage. Bioengineering boulders or structures should be properly designed, sized and installed. In addition, riprap shall be of sufficient size such that it is not carried downstream by normal stream flow.
12. Placement of culverts and other structures in waters, streams and wetlands shall be below the elevation of the streambed by one (1) foot for all culverts with a diameter greater than 48 inches and 20 percent of the culvert diameter for culverts having a diameter of less than 48 inches, to allow for low flow passage of water and aquatic life. Design and placement of culverts and other structures, including temporary erosion control measures, shall not be conducted in a manner that may result in disequilibrium of wetlands or streambeds or banks, adjacent to or upstream and downstream of the above structures. The applicant is required to provide evidence that the equilibrium is being maintained if requested in writing by DWQ. If this condition is unable to be met due to bedrock or other limiting features encountered during construction, please contact the NCDWQ for guidance on how to proceed and to determine whether or not a modification to this certification will be required.
13. The outside buffer, wetland or water boundary located within the construction corridor approved by this authorization shall be clearly marked by highly visible fencing prior to any land disturbing activities. Impacts to areas within the fencing are prohibited unless otherwise authorized by this Certification.

14. During construction of the project, no staging of equipment, of any kind, is permitted in waters of the U.S. or protected riparian buffers.
- *15. The Permittee shall ensure that the final design drawings adhere to the certification and to the drawings submitted for approval.
16. If concrete is used during construction, a dry work area shall be maintained to prevent direct contact between curing concrete and surface waters. Water that inadvertently contacts uncured concrete shall not be discharged to surface waters due to the potential for elevated pH and possible aquatic life and fish kills.
17. The dimension, pattern and profile of the stream above and below the crossing shall not be modified. Disturbed floodplains and streams should be restored to natural geomorphic conditions.
18. All work in or adjacent to stream waters shall be conducted in a dry work area. Approved BMP measures from the most current version of the NCDOT Construction and Maintenance Activities Manual such as sandbags, rock berms, cofferdams and other diversion structures shall be used to prevent excavation in flowing water.
19. Heavy equipment shall be operated from the banks rather than in the stream channel in order to minimize sedimentation and reduce the introduction of other pollutants into the stream.
20. All mechanized equipment operated near surface waters must be regularly inspected and maintained to prevent contamination of stream waters from fuels, lubricants, hydraulic fluids, or other toxic materials.
21. No rock, sand or other materials shall be dredged from the stream channel except where authorized by this Certification.
22. Discharging hydroseed mixtures and washing out hydroseeders and other equipment in or adjacent to surface waters is prohibited.
23. Native riparian vegetation must be re-established within the construction limits of the project by the end of the growing season following completion of construction.
24. There shall be no excavation from, or waste disposal into, jurisdictional wetlands or waters associated this permit without appropriate modification. Should waste or borrow sites be located in wetlands or streams, compensatory mitigation will be required since that is a direct impact from road construction activities.
25. Erosion and sediment control practices must be in full compliance with all specifications governing the proper design, installation and operation and maintenance of such Best Management Practices in order to protect surface water standards:
 - a. The erosion and sediment control measures for the project must be designed, installed, operated and maintained in accordance with the most recent version of the *North Carolina Sediment and Erosion Control Planning and Design Manual*.
 - b. The design, installation, operation, and maintenance of the sediment and erosion control measures must be such that they equal, or exceed, the requirements specified in the most recent version of the *North Carolina Sediment and Erosion Control Manual*. The devices shall be maintained on all construction sites, borrow sites, and waste pile (spoil) projects, including contractor-owned or leased borrow pits associated with the project.
 - c. For borrow pit sites, the erosion and sediment control measures must be designed, installed, operated and maintained in accordance with the most recent version of the *North Carolina Surface Mining Manual*.
 - d. The reclamation measures and implementation must comply with the reclamation in accordance with the requirements of the Sedimentation Pollution Control Act.

26. Sediment and erosion control measures shall not be placed in wetlands or waters unless otherwise approved by this Certification.
27. The issuance of this certification does not exempt the Permittee from complying with any and all statutes, rules, regulations or ordinances that may be imposed by other governmental agencies (i.e., local, state, and federal) having jurisdiction, including but not limited to, applicable buffer rules, stormwater management rules, soil erosion and sedimentation control requirements, etc.
28. The Permittee shall report any violations of this certification to the Division of Water Quality within 24 hours of discovery.
29. A copy of this Water Quality Certification shall be posted on the construction site at all times. In addition, the Water Quality Certification and all subsequent modifications, if any, shall be maintained with the Division Engineer and the on-site project manager.
- * 30. Upon completion of the project, the NCDOT Division Engineer shall complete and return the enclosed "Certification of Completion Form" to notify DWQ when all work included in the 401 Certification has been completed.
31. The permittee and its authorized agents shall conduct its activities in a manner consistent with State Water Quality Standards [including any requirements resulting from compliance with 303(d) of the Clean Water Act] and any other appropriate requirements of State and Federal law. If DWQ determines that such standards or laws are not being met (including the failure to sustain a designated or achieved use), that State or Federal law is being violated, or that further conditions are necessary to assure compliance, DWQ may re-evaluate and modify this certification.

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

If this Certification is unacceptable to you have the right to an adjudicatory hearing upon written request within sixty (60) days following receipt of this Certification. This request must be in the form of a written petition conforming to Chapter 150B of the North Carolina General Statutes and filed with the Office of Administrative Hearings, 6714 Mail Service Center, Raleigh, N.C. 27699-6714. If modifications are made to an original Certification, you have the right to an adjudicatory hearing on the modifications upon written request within sixty (60) days following receipt of the Certification. Unless such demands are made, this Certification shall be final and binding.

This the 1st day of April 2010

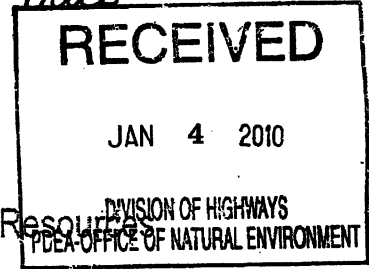
DIVISION OF WATER QUALITY



Coleen H. Sullins
Director



North Carolina Department of Environment and Natural Resources



Beverly Eaves Perdue, Governor

Dee Freeman, Secretary

December 9, 2009

Dr. Greg Thorpe, Ph.D., Manager
Project Development and Environmental Analysis Branch
North Carolina Department of Transportation
1598 Mail Service Center
Raleigh, North Carolina, 27699-1548

Subject: Eighth Modification to the 401 Water Quality Certification Pursuant to Section 401 of the Federal Clean Water Act with ADDITIONAL CONDITIONS for the US 421/NC 87 (Sanford Bypass) from East of NC 42 to NC 87 near SR 1138 in Lee County, Federal Aid Project No. STPNHF-421(2), State Project No. 8.T540402, TIP R-2417C, DWQ Project No. 00-1432

Dear Dr. Thorpe:

Attached hereto is a modification of Certification No. 3378 issued to The North Carolina Department of Transportation (NCDOT) and dated April 10, 2002. This modification is applicable only to the additional proposed activities. **All authorized activities and conditions of the original certification associated with the original Water Quality Certification, dated April 10, 2002, and all subsequent modifications still apply except where superseded by this certification.**

If we can be of further assistance, please do not hesitate to contact Polly Lespinasse at (704) 663-1699.

Sincerely,

for Coleen H. Sullins
Director

Attachments

cc: Kimberly Garvey, US Army Corps of Engineers, Wilmington Office
Polly Lespinasse, DWQ Mooresville Regional Office
Ken Averitte, DWQ Fayetteville Regional Office
Greg Price, PDEA, NCDOT
File Copy

610 East Center Avenue, Suite 301, Mooresville, North Carolina 28115
Phone: 704-663-1699 \ FAX: 704-663-6040 \ Internet: www.enr.state.nc.us.

Modification to the 401 Water Quality Certification Pursuant to Section 401 of the Federal Clean Water Act with ADDITIONAL CONDITIONS

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 .0500. This certification authorizes the NCDOT to **additionally impact 0.04 acres of jurisdictional wetlands** in Lee County as listed below. The project shall be constructed pursuant to the modification received November 18, 2009. The authorized impacts are as described below:

Stream Impacts in the Cape Fear River Basin

Permit Site No. and Station No. (Stream Name)	Permanent Fill in Intermittent Stream (linear ft)	Temporary Fill in Intermittent Stream (linear ft)	Permanent Fill in Perennial Stream (linear ft)	Temporary Fill in Perennial Stream (linear ft)	Total Stream Impact (linear feet)	Stream Impacts Requiring Mitigation (linear ft)
Site #2, Station No. 13+00 +/- -YRPC-/ Carrs Creek			312		312	312
Site #2, Station No. 613+28 +/- LREV/ Carrs Creek			540		540	540
Site #2, Station No. 12+28, 151' RT, YRPC (utility impact)/ Carrs Creek			10		10	10
Site #3, Station No. 18+67, 171' RT, YRPB (utility impact)/ Carrs Creek			10		10	10
Site #4, Station No. 18+20 -YRPB-LT/ UT to Carrs Creek				80	80	0
Site #4, Station No. 19+84 -YRPB-LT/ UT to Carrs Creek				42	42	0
Site #4, Station No. 11+63, 128.3' RT, YRPD (utility impact)/ UT Carrs Creek			10		10	10
Site #4, Station No. 11+63, 141' RT, YRPD (utility impact)/ UT Carrs Creek			10		10	10
Site #5, Station No. 19+18 +/- -YRPB-/ UT to Carrs Creek			252		252	252
Site #5, Station No. 19+58 - YRPB-/ UT to Carrs Creek	143				143	0
Site #5, Station No. 19+94 +/- -Y-LT/ UT to Carrs Creek			175	117	292	175
Site #5, Station No. 7+69, 142' RT, YRPD (utility impact)/ UT Carrs Creek			20		20	20
Site #6, Station No. 10+50 -YRPD-/ UT to Carrs Creek			393	33	426	393
Site #6, Station No. 6+25 - YRPA-/ UT to Carrs Creek			305		305	305
Site #7, Station No. 13+62 -Front-/ UT to Carrs Creek			121	117	238	121
Site #8, Station No. 643+75 -LREV-RT/ UT to Carrs Creek	442	32			474	0

Site #10, Station No. 26+50-19FLY-/ UT to Carrs Creek			120	105	225	120
Site #11, Station No. 19+68 -19DFLY-/ UT to Carrs Creek			700		700	700
Site #11, Station No. 678+00 -LREV-LT/ UT to Carrs Creek			690	15	705	690
Site #13, Station No. 690+00 -LREV-LT/ UT to Carrs Creek	266				266	0
Site #14, Station No. 45+25 -Y-RT/ UT to Carrs Creek	107	43			150	0
Site #16, Station No. 589+17 to 593+67 LREV RT/ UT to Carrs Creek			566	11	577	566

Total Stream Impacts for Project: 5,192 linear feet
 Total Stream Impacts Requiring Mitigation: 4,234 linear feet

Riverine and Non-Riverine Wetland Impacts in the Cape Fear River Basin

Permit Site No./Station No.	Wetland Type (Riverine or Non-Riverine)	Permanent Fill (acres)	Temporary Fill (acres)	Mechanized Clearing (acres)	Hand Clearing (acres)	Total Acres
Site #1/YRPC - 10+97LT to 12+71RT	Riverine	0.41		0.02		0.43
Site #1/YRPC 11+75, 171'RT (utility impact)	Riverine	0.006				0.006
Site #3/613+00 +/- - LREV-	Riverine	0.06				0.06
Site #3/26+64 +/- - Y- to 22+35 +/- -Y- LT	Riverine	0.43				0.43
Site #5/20+20 +/- - Y-RT	Riverine	0.03	0.01	0.01		0.05
Site #8/643+75 - LREV-RT	Riverine	0.09		<0.01		0.10
Site #9/649+80 - LREV-	Riverine	0.15	0.02	<0.01		0.15
Site #10/26+50 - 19FLY-	Riverine	0.23				0.23
Site #10/20+00 - 19FLY-	Riverine	0.02				0.02
Site #15/LREV RT 574+76 to 583+84	Riverine	2.18		0.23		2.41
Site #16/LREV RT 589+17 to 593+67	Riverine	0.11		0.01		0.12

Total Riverine Wetland Impacts for Project: 4.01 acres
 Total Riverine Wetland Impacts Requiring Mitigation: 4.01 acres

Open Water (Ponds) Impacts in the Cape Fear River Basin

Permit Site No./Station No.	Permanent Fill in Open Waters (ac)	Temporary Fill in Open Waters (ac)	Total Fill in Open Waters (ac)
Site #10/665+00 -LREV-	2.83		2.83
Site #12/680+00 -LREV-LT	0.03		0.03
Total	2.86		2.86

Total Open Water Impacts for Project: 2.86 acres

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

This approval is only valid for the purpose and design that you submitted in your modification application dated received November 18, 2009. Should your project change, you are required to notify the DWQ and 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 any additional wetland or stream impacts, for this project (now or in the future) exceed one acre or 150 linear feet, respectively, 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, Coastal Storm Water, Non-discharge and Water Supply watershed regulations. This Certification shall expire on the same day as the expiration date of the corresponding Corps of Engineers Permit.

Conditions of Certification:

1. Placement of culverts and other structures in waters, streams and wetlands shall be below the elevation of the streambed by one (1) foot for all culverts with a diameter greater than 48 inches and 20 percent of the culvert diameter for culverts having a diameter of less than 48 inches, to allow for low flow passage of water and aquatic life. Design and placement of culverts and other structures, including temporary erosion control measures, shall not be conducted in a manner that may result in disequilibrium of wetlands or streambeds or banks, adjacent to or upstream and downstream of the above structures. The applicant is required to provide evidence that the equilibrium is being maintained if requested in writing by DWQ. If this condition is unable to be met due to bedrock or other limiting features encountered during construction, please contact the NCDWQ for guidance on how to proceed and to determine whether or not a modification to this certification will be required.
- * 2. Compensatory mitigation for 4,234 linear feet of streams and 4.01 acres of impacts to riverine wetlands is required. We understand that you have chosen to perform compensatory mitigation for impacts to wetlands through the North Carolina Ecosystem Enhancement Program (EEP) and that the EEP has agreed to implement the mitigation for the project. EEP has indicated in letters dated October 22, 2008, and November 3, 2009, that they will assume responsibility for satisfying the federal Clean Water Act compensatory mitigation requirements for the above referenced project, in accordance with the Tri-Party MOA signed on July 22, 2003, and the Dual-Party MOA signed on April 12, 2004.
3. Due to the possibility that compaction and/or other site alterations might prevent the temporary wetland impact areas from re-attaining jurisdictional wetland status, the permittee shall schedule an agency field meeting with the NC Division of Water Quality to determine if the wetland areas temporarily impacted by this project have re-attained jurisdictional wetland status. If the temporarily impacted wetland areas have not re-attained jurisdictional wetland status, NC Division of Water Quality shall determine if compensatory wetland mitigation will be required.
4. The outside buffer, wetland or water boundary located within the construction corridor approved by this authorization shall be clearly marked by highly visible fencing prior to any land disturbing activities. Impacts to areas within the fencing are prohibited unless otherwise authorized by this Certification.
5. During construction of the project, no staging of equipment, of any kind, is permitted in waters of the U.S. or protected riparian buffers.

- *6. The Permittee shall ensure that the final design drawings adhere to the certification and to the drawings submitted for approval.
7. If concrete is used during construction, a dry work area shall be maintained to prevent direct contact between curing concrete and surface waters. Water that inadvertently contacts uncured concrete shall not be discharged to surface waters due to the potential for elevated pH and possible aquatic life and fish kills.
8. The dimension, pattern and profile of the stream above and below the crossing shall not be modified. Disturbed floodplains and streams should be restored to natural geomorphic conditions.
9. All work in or adjacent to stream waters shall be conducted in a dry work area. Approved BMP measures from the most current version of the NCDOT Construction and Maintenance Activities Manual such as sandbags, rock berms, cofferdams and other diversion structures shall be used to prevent excavation in flowing water.
10. Heavy equipment shall be operated from the banks rather than in the stream channel in order to minimize sedimentation and reduce the introduction of other pollutants into the stream.
11. All mechanized equipment operated near surface waters must be regularly inspected and maintained to prevent contamination of stream waters from fuels, lubricants, hydraulic fluids, or other toxic materials.
12. No rock, sand or other materials shall be dredged from the stream channel except where authorized by this Certification.
13. Discharging hydroseed mixtures and washing out hydroseeders and other equipment in or adjacent to surface waters is prohibited.
14. Native riparian vegetation must be re-established within the construction limits of the project by the end of the growing season following completion of construction.
15. There shall be no excavation from, or waste disposal into, jurisdictional wetlands or waters associated this permit without appropriate modification. Should waste or borrow sites be located in wetlands or streams, compensatory mitigation will be required since that is a direct impact from road construction activities.
16. Erosion and sediment control practices must be in full compliance with all specifications governing the proper design, installation and operation and maintenance of such Best Management Practices in order to protect surface water standards:
 - a. The erosion and sediment control measures for the project must be designed, installed, operated and maintained in accordance with the most recent version of the *North Carolina Sediment and Erosion Control Planning and Design Manual*.
 - b. The design, installation, operation, and maintenance of the sediment and erosion control measures must be such that they equal, or exceed, the requirements specified in the most recent version of the *North Carolina Sediment and Erosion Control Manual*. The devices shall be maintained on all construction sites, borrow sites, and waste pile (spoil) projects, including contractor-owned or leased borrow pits associated with the project.
 - c. For borrow pit sites, the erosion and sediment control measures must be designed, installed, operated and maintained in accordance with the most recent version of the *North Carolina Surface Mining Manual*.
 - d. The reclamation measures and implementation must comply with the reclamation in accordance with the requirements of the Sedimentation Pollution Control Act.
17. Sediment and erosion control measures shall not be placed in wetlands or waters unless otherwise approved by this Certification.

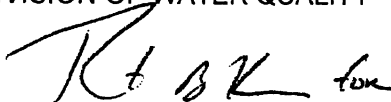
18. The issuance of this certification does not exempt the Permittee from complying with any and all statutes, rules, regulations or ordinances that may be imposed by other governmental agencies (i.e., local, state, and federal) having jurisdiction, including but not limited to, applicable buffer rules, stormwater management rules, soil erosion and sedimentation control requirements, etc.
19. The Permittee shall report any violations of this certification to the Division of Water Quality within 24 hours of discovery.
20. A copy of this Water Quality Certification shall be posted on the construction site at all times. In addition, the Water Quality Certification and all subsequent modifications, if any, shall be maintained with the Division Engineer and the on-site project manager.
- * 21. Upon completion of the project, the NCDOT Division Engineer shall complete and return the enclosed "Certification of Completion Form" to notify DWQ when all work included in the 401 Certification has been completed.
22. The permittee and its authorized agents shall conduct its activities in a manner consistent with State Water Quality Standards [including any requirements resulting from compliance with 303(d) of the Clean Water Act] and any other appropriate requirements of State and Federal law. If DWQ determines that such standards or laws are not being met (including the failure to sustain a designated or achieved use), that State or Federal law is being violated, or that further conditions are necessary to assure compliance, DWQ may re-evaluate and modify this certification.

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

If this Certification is unacceptable to you have the right to an adjudicatory hearing upon written request within sixty (60) days following receipt of this Certification. This request must be in the form of a written petition conforming to Chapter 150B of the North Carolina General Statutes and filed with the Office of Administrative Hearings, 6714 Mail Service Center, Raleigh, N.C. 27699-6714. If modifications are made to an original Certification, you have the right to an adjudicatory hearing on the modifications upon written request within sixty (60) days following receipt of the Certification. Unless such demands are made, this Certification shall be final and binding.

This, the 9th day of December 2009

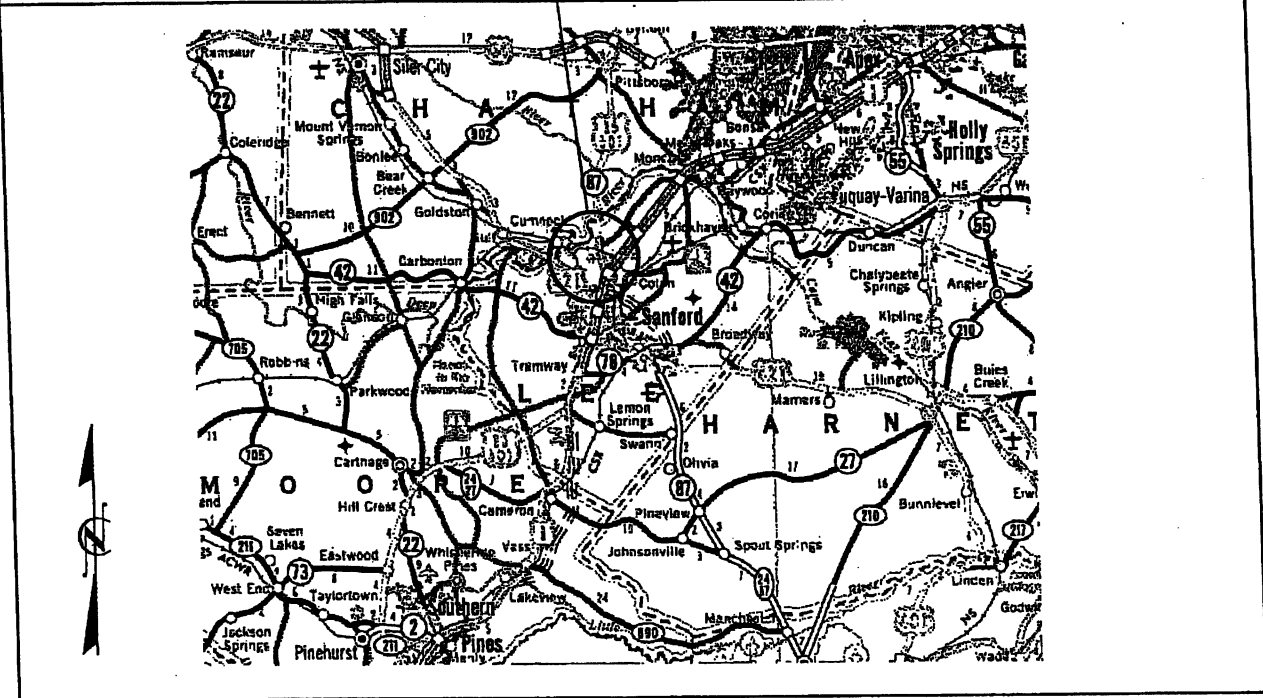
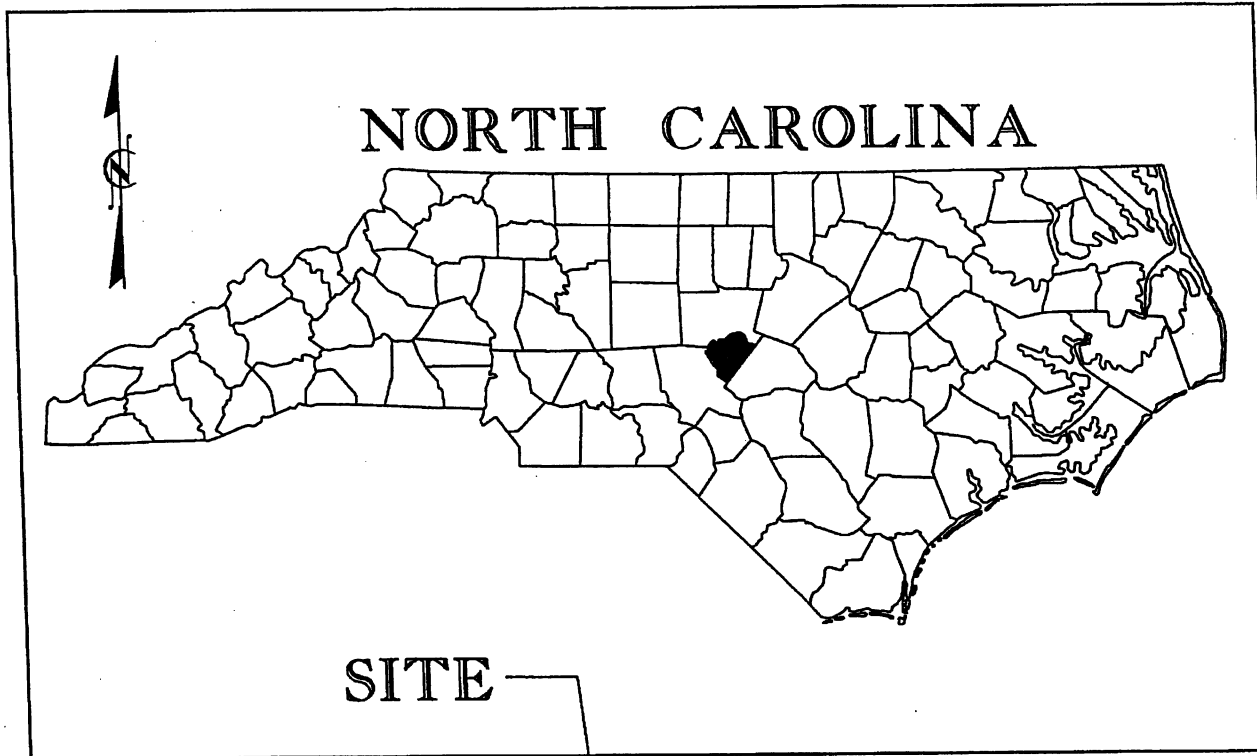
DIVISION OF WATER QUALITY



Coleen H. Sullins
Director

WQC No. 3378

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MAP

NCDOT
DIVISION OF HIGHWAYS
LEE COUNTY
PROJECT: 3443L12 (R-2417AA)
US 421-NC 87 SANFORD
BYPASS FROM WEST
OF SR 1400 TO WEST
OF US 1-15-501
SHEET 1 OF 41

SUMMARY OF AFFECTED PROPERTY OWNERS

TRACT NO.	PROPERTY OWNER	ADDRESS	SITE NO.
1	ERNEST MILLER	PO BOX 20561 GREENSBORO NC 27330	1 & 2
2	ERNEST MILLER	PO BOX 20561 GREENSBORO NC 27330	3
3	PHYLLIS McKOY HEIRS	3707 CRAIGHOLM CT CHARLOTTE NC 28262	4
5	JOSEPHINE WOMACK D.C. HOLLER JR & INEZ J. HOLLER	710 ERWIN RD SANFORD NC 27330 PO BOX 399 SANFORD NC 27331	4
8	HELENA EDWARDS	115 180TH ST JAMAICA NY 11434	5
15	ROBERT STRICKLAND	2394 COTTON RD SANFORD NC 27330	6
17	RONALD GARTIN	4240 FOX RUN DR SANFORD NC 27330	7
20	CHARLES GANTT	1606 LORD ASHLEY DR SANFORD NC 27330	8
21	REXINE LLOYD	511 MAPLEWOOD DR SANFORD NC 27330	9
23	SAN-LEE BUILDERS	PO BOX 3367 SANFORD NC 27331	9
24	ROGER & LILLIAN THOMAS	3212 GREEN VALLEY DR SANFORD NC 27330	10

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NCDOT
 DIVISION OF HIGHWAYS
 LEE COUNTY
 PROJECT: 34431.12 (R-2417AA)
 US 421-NC 87 SANFORD
 BYPASS FROM WEST
 OF SR 1400 TO WEST
 OF US 1-15-501
 SHEET 2 OF 41

WETLAND PERMIT IMPACT SUMMARY

Site No.	Station (From/To)	Structure Size / Type	WETLAND IMPACTS						SURFACE WATER IMPACTS										
			Permanent Fill in Wetlands (ac)	Temp. Fill in Wetlands (ac)	Excavation in Wetlands (ac)	Mechanized Clearing in Wetlands (ac)	Hand Clearing in Wetlands (ac)	Permanent SW Impacts (ac)	Temp. SW Impacts (ac)	Existing Channel Impacts Permanent (ft)	Existing Channel Impacts Temp. (ft)	Natural Stream Design (ft)							
1	-L- 22+30/26+80 (L-T)	Roadway Embankment	0.02	---	<0.01	0.02	---	---	<0.01	---	---	---	---	---	---	---	---	---	---
	-L- 23+32 (RT)	Bank Stabilization	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
2	-L- 33+00/33+65 (L-T)	Roadway Embankment	0.16	---	0.21	0.05	---	---	---	---	---	---	---	---	---	---	---	---	---
2a**	-L- 33+00/33+65 (L-T)	42" CMP w/ 54" STL Suppl	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
2b	-L- 33+00/33+65 (RT)	42" CMP w/ 54" STL Suppl	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
3	-L- 35+20/36+30 (RT)	Roadway Embankment	0.11	---	---	0.01	---	---	---	---	---	---	---	---	---	---	---	---	---
4	-L- 52+08 (L-T/RT) & L- 63+00 (RT)	Bank Stabilization	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
5	-L- 87+90 (L-T/RT)	54" RCP	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
		Bank Stabilization	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
6	-L- 120+20 (L-T)	36" RCP	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
		8' x 6' RCBC	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
6	-L- 120+57 (L-T/RT)	Bank Stabilization	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
7**	-L- 142+67 (L-T/RT)	8' x 6' RCBC	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
8	-L- 153+50/160+00 (RT)	54" RCP	0.73	---	0.01	0.08	---	---	---	---	---	---	---	---	---	---	---	---	---
		(2) 9' x 7' RCBC	0.12	---	0.03	0.03	---	---	---	---	---	---	---	---	---	---	---	---	---
9	-L- 177+29 (L-T/RT)	Bank Stabilization	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
9**	-L- 178+82 (L-T)	54" RCP	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
10	-L- 194+60/196+10 (L-T/RT)	36" RCP	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
10**	-L- 195+65 (RT)		---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
TOTALS:			1.14		0.25	0.19			0.91	0.04	2771	477							

** Intermittent Stream - No Mitigation Required

Perennial & Intermittent Total - Mitigation Req'd: 1130 ft
 Perennial & Intermittent Total - Bank Stabilization: 238 ft
 ** Intermittent Total - Not Requiring Mitigation: 1403 ft

NOTES:

- SITE 2 - ADDITIONAL IMPACT DUE TO DRAWDOWN = 0.10 AC.
- SITE 4 - ADDITIONAL IMPACT DUE TO TEMPORARY CONSTRUCTION BENTS [2 @ 55' x 5'] = 0.01 AC (550 SF).
- SITE 8 - ADDITIONAL IMPACT DUE TO TOTAL TAKE AT -L- STA 154+00 LT = 0.02 AC.

NC DEPARTMENT OF TRANSPORTATION
 DIVISION OF HIGHWAYS

LEE COUNTY
 WBS - 34431.1.2 (R-3417AA)

SHEET 3 OF 41 4/2/2009

WETLAND PERMIT IMPACT SUMMARY

Site No.	ORIGINAL PERMIT IMPACTS					PERMIT MODIFICATION IMPACTS						
	Fill In Wetlands (ac)	Mechanized Clearing (Method III) (ac)	Fill In SW (Natural) (ac)	Fill In SW (Pond) (ac)	Existing Channel Impacted (ft)	Permanent Fill In Wetlands (ac)	Excavation In Wetlands (ac)	Mechanized Clearing in Wetlands (ac)	Fill In SW (Pond) (ac)	Temp. SW Impacts (ac)	Existing Channel Impacts Permanent (ft)	Existing Channel Impacts Temp. (ft)
1	0.05					0.02	<0.01	0.02			10*	20
2	0.05				561**	0.16	0.21	0.05			816**	14
3	0.13					0.11		0.01				
4											44*	57
5					377						265	47
6					322						216	83
7					330						104*	55
8	0.36				331						35	56
9	0.19				345**						80**	30
10				0.54	59**				0.66		16**	30
TOTALS:	1.38			0.54	2602	1.14	0.25	0.19	0.66	0.00	2771	477

NOTES:

- * Bank stabilization requiring no mitigation
- ** Intermittent stream requiring no mitigation

Mitigatable stream impacts for original permit = 1116 linear feet
 Mitigatable stream impacts for permit modification = 1130 linear feet
 Mitigatable wetland impacts for original permit = 1.38 acres
 Mitigatable wetland impacts for permit modification = 1.58 acres

NC DEPARTMENT OF TRANSPORTATION
 DIVISION OF HIGHWAYS

LEE COUNTY
 WBS - 34431.1.1 (R-2417AA)

SHEET 4 of 41

4/14/2009

STATE	PROJECT NUMBER	SHEET NO.	TOTAL SHEETS
N.C.	R-2417AA	I	1
PROJECT NAME	DATE	DESIGNED BY	CHECKED BY
34431.1.2	STP-NHF-421(2)	P.E.	RW
34431.2.2	STP-NHF-421(2)		

Permit Drawing
Sheet 5 of 41

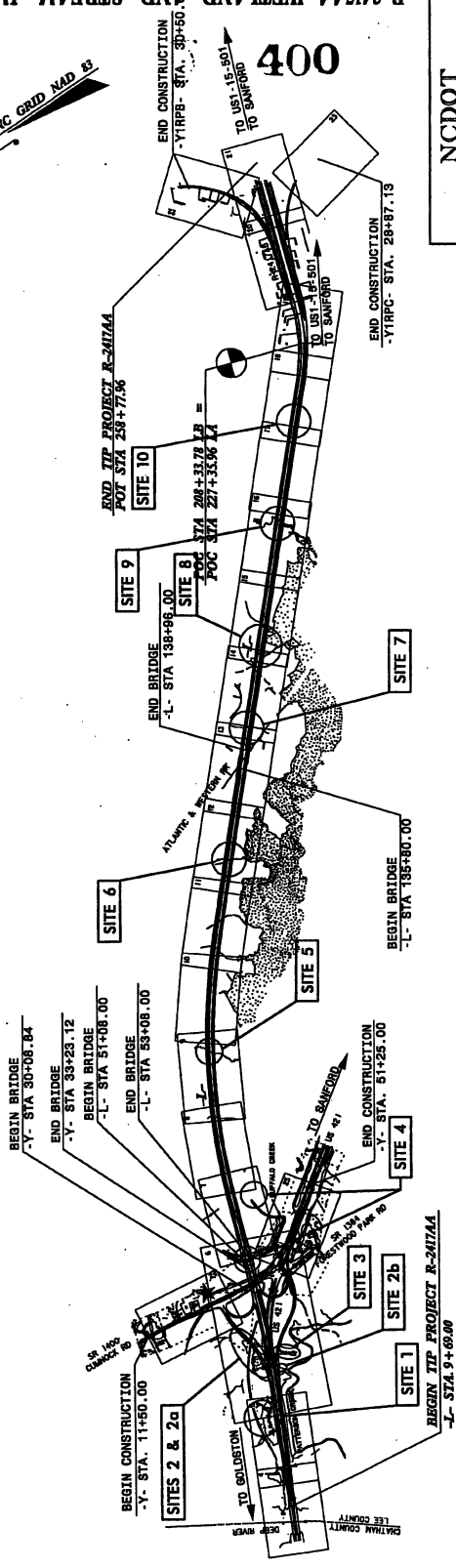
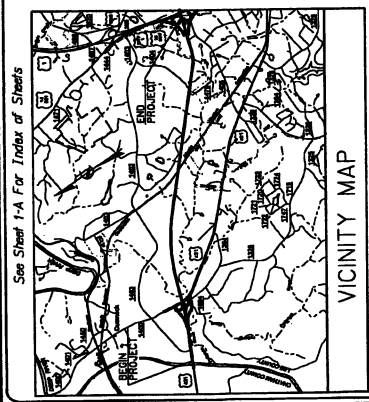
LEEDS:
★ REQUIRED SOCIAL

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS
LEE COUNTY

LOCATION: US 421 - NC 87 SANFORD BYPASS FROM WEST
OF SR 1400 TO WEST OF US 1-15-501

TYPE OF WORK: GRADING, DRAINAGE, PAVING, STRUCTURES
AND SIGNAL.

R-2417AA: WETLAND AND STREAM IMPACTS PLAN



NC DOT
DIVISION OF HIGHWAYS
LEE COUNTY
PROJECT: 34431.1.2 (R-2417AA)
US 421-NC 87 SANFORD
BYPASS FROM WEST
OF SR 1400 TO WEST
OF US 1-15-501

SECTION OF HIGHWAYS
STATE OF NORTH CAROLINA

STATE HIGHWAY DESIGN ENGINEER

HYDRAULICS ENGINEER
ROADWAY DESIGN ENGINEER

Prepared by the Office of
KO & ASSOCIATES, P.C.
Civil Engineering
11111 University Blvd., Suite 200
Charlotte, NC 28213
TEL: 704.366.1111 FAX: 704.366.1112

RIGHT OF WAY DATE: February 17, 2006
PROJECT ENGINEER: David C. Waller, P.E.

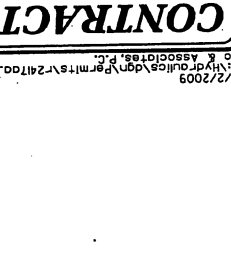
LETTING DATE: February 16, 2010
PROJECT DESIGN ENGINEER: Michael A. Young, P.E.

THIS IS A CONTROLLED - ACCESS PROJECT WITH ACCESS BEING LIMITED TO INTERCHANGES. CLEARING ON THIS PROJECT SHALL BE PERFORMED TO THE LIMITS ESTABLISHED BY METEOD III

PROJECT LENGTH	LENGTH ROADWAY TIP PROJECT R-2417AA	LENGTH STRUCTURES TIP PROJECT R-2417AA	TOTAL LENGTH OF TIP PROJECT R-2417AA
	4.29 MI	0.98 MI	4.37 MI

DESIGN DATA

ADT 2008	= 13,300
ADT 2028	= 20,800
DHV	= 10 %
D	= 60 %
T	= 9 %
V	= 70 MPH
* TTST 5% DUAL 4%	



TIP PROJECT: R-2417AA

CONTRACT:

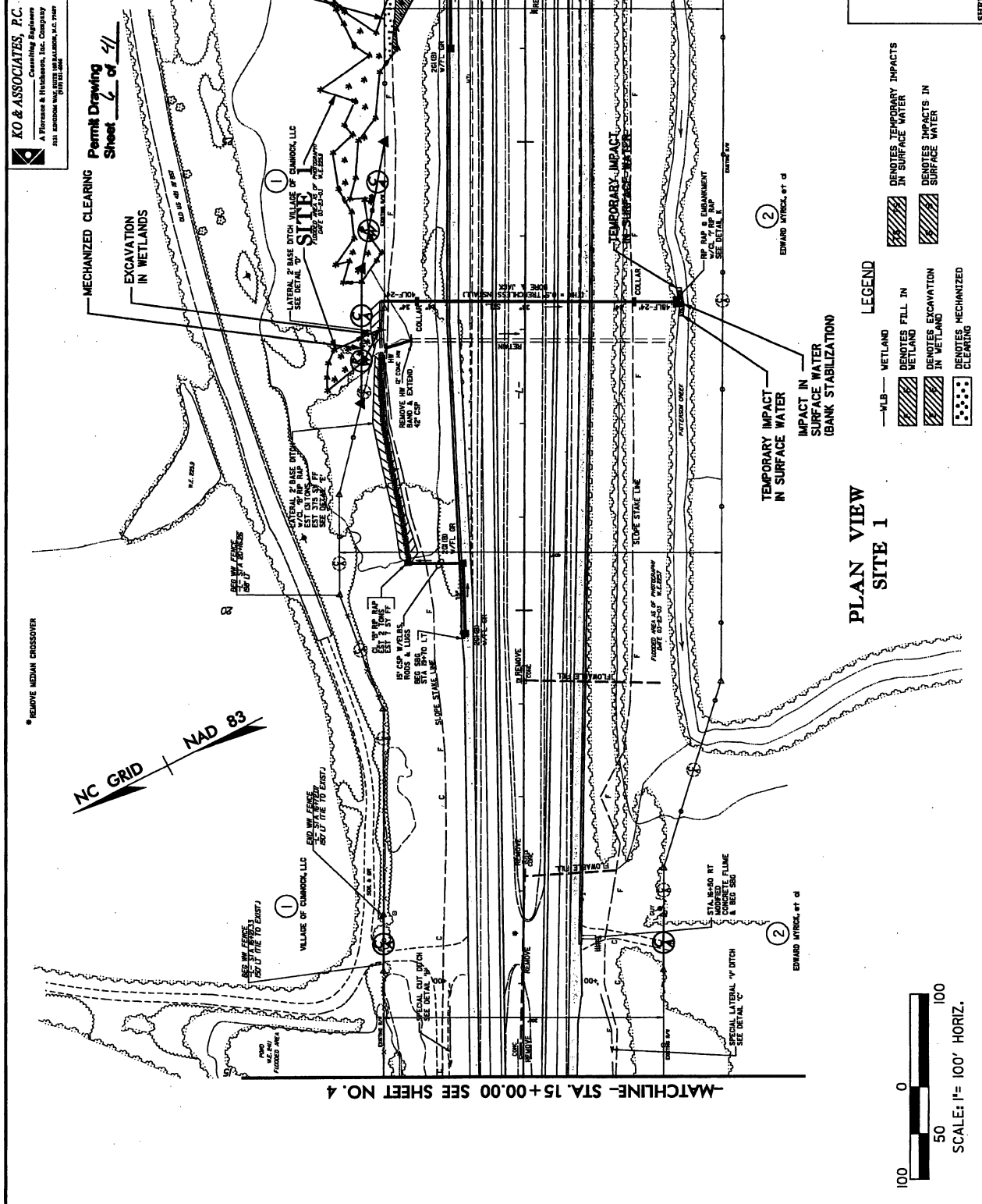
PROJECT REFERENCE NO. **R-2477A**
 SHEET NO. **6**
 ROADWAY DESIGN ENGINEER
PRELIMINARY PLANS
 FOR WEST SIDE AND INTERSECTION

KO & ASSOCIATES, P.C.
 Consulting Engineers
 A Florence & Hildebrand, Inc. Company
 211 KENNEDY HIGHWAY, WELLSVILLE, N.C. 27986
 (704) 755-1000

Permit Drawing
 Sheet **6** of **41**



401



LEGEND

- WETLAND
- TEMPORARY IMPACTS IN SURFACE WATER
- IMPACTS IN SURFACE WATER
- EXCAVATION IN WETLAND
- MECHANIZED CLEARING
- FILL IN WETLANDS
- TEMPORARY IMPACTS IN SURFACE WATER
- IMPACTS IN SURFACE WATER

SCALE: 1" = 100' HORIZ.
 0 50 100

PLAN VIEW SITE 1

NC DOT
 DIVISION OF HIGHWAYS
 LEE COUNTY
 PROJECT: 846113 (I-95-402AA)
 US 421-NC BY SAINFORD
 BYPASS FROM WEST
 OF SR 1400 TO WEST
 OF US 1-31-901
 SHEET **6** OF **41**

PROJECT INTEREST NO. R-247AA
 SHEET NO. 3
 PREPARED BY: [Name]
 CHECKED BY: [Name]
 DATE: [Date]

PRELIMINARY PLANS
 IN PART FOR CONSTRUCTION
 Permit Drawing
 Sheet 7 of 44

MECHANIZED CLEARING
 EXCAVATION IN WETLANDS
 FILL IN WETLANDS

MECHANIZED CLEARING
 EXCAVATION IN WETLANDS
 FILL IN WETLANDS

MECHANIZED CLEARING
 EXCAVATION IN WETLANDS
 FILL IN WETLANDS

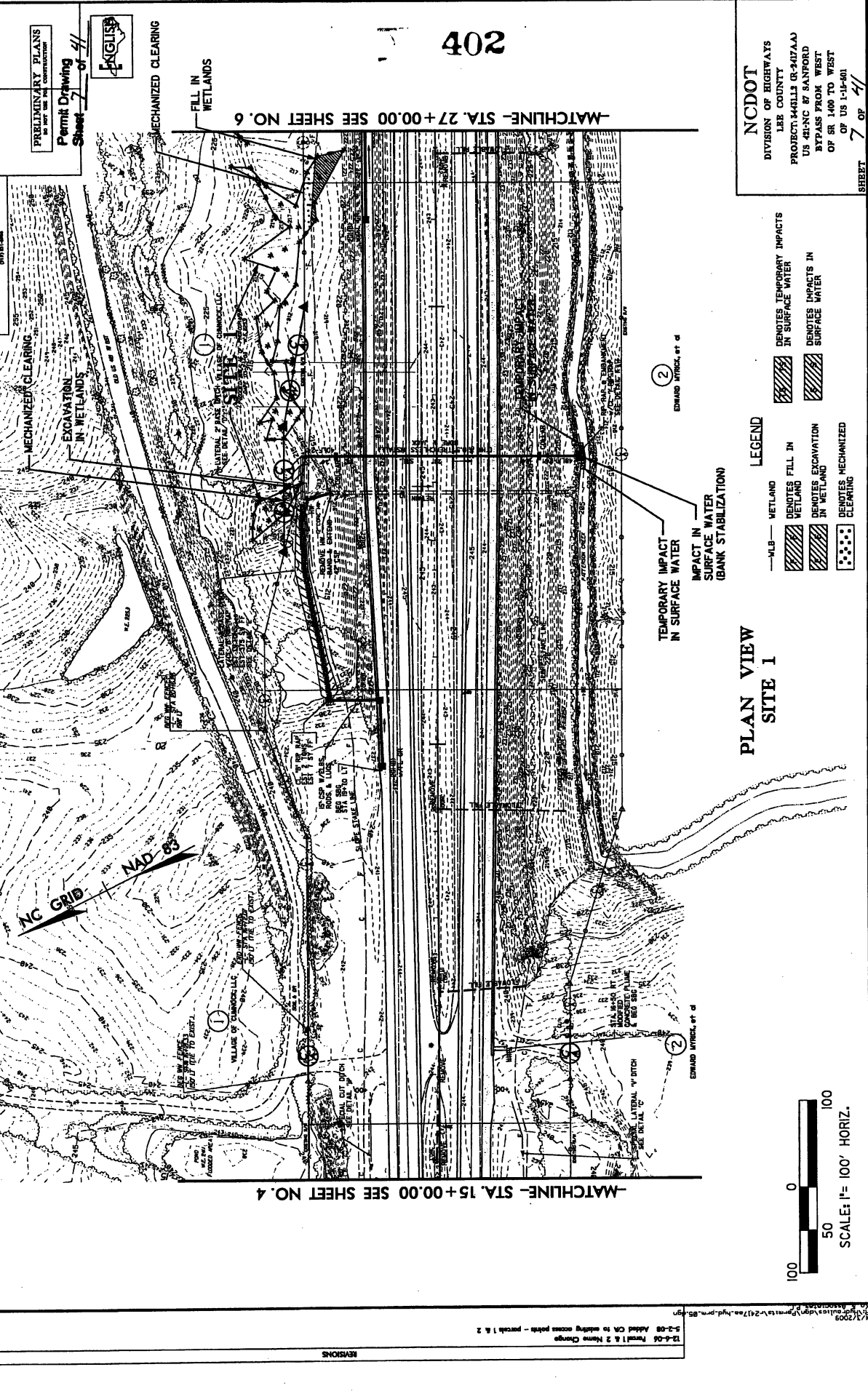
MECHANIZED CLEARING
 EXCAVATION IN WETLANDS
 FILL IN WETLANDS

MECHANIZED CLEARING
 EXCAVATION IN WETLANDS
 FILL IN WETLANDS

MECHANIZED CLEARING
 EXCAVATION IN WETLANDS
 FILL IN WETLANDS

MECHANIZED CLEARING
 EXCAVATION IN WETLANDS
 FILL IN WETLANDS

MECHANIZED CLEARING
 EXCAVATION IN WETLANDS
 FILL IN WETLANDS



REVISIONS
 5-2-08 Revised 1 & 2 Name Change
 8/17/99

402

NCDOT
 DIVISION OF HIGHWAYS
 LEE COUNTY
 PROJECT: HILLS (R-247AA)
 US 41-NC BY SANFORD
 BYPASS FROM WEST
 OF SR 1400 TO WEST
 OF US 1-15-01
 SHEET 7 OF 44

LEGEND
 -MLB- WETLAND
 DENOTES FILL IN WETLAND
 DENOTES EXCAVATION IN WETLAND
 DENOTES MECHANIZED CLEARING
 DENOTES TEMPORARY IMPACTS IN SURFACE WATER
 DENOTES IMPACTS IN SURFACE WATER

TEMPORARY IMPACT IN SURFACE WATER (BANK STABILIZATION)
 IMPACT IN SURFACE WATER

PLAN VIEW
 SITE 1

EDWARD WITCK, et al

EDWARD WITCK, et al

EDWARD WITCK, et al

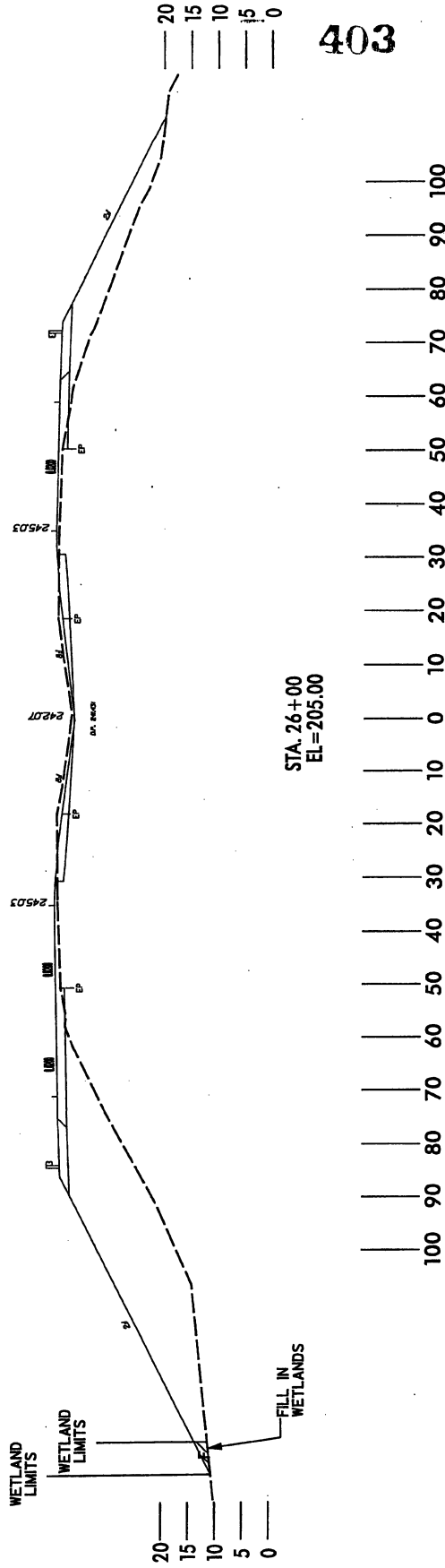
EDWARD WITCK, et al

EDWARD WITCK, et al

PROJECT NUMBER: 441	SHEET NO: 41
DATE: 2/17/09	SCALE: 1"=20'
DESIGNER: J. W. HARRIS	CHECKER: J. W. HARRIS
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	



Permit Drawing
Sheet 8 of 41



403

NCDOT

DIVISION OF HIGHWAYS
LEE COUNTY
PROJECT: 3443112 (R-2417AA)
US 421-NC 87 SANFORD
BYPASS FROM WEST
OF SR 1400 TO WEST
OF US 1-15-501

SHEET 8 OF 41

TYPICAL X-SECTIONS
SITE 1

LEGEND

- WLB — WETLAND
- ▨ DENOTES FILL IN WETLAND

PROJECT NUMBER: 91-2071A
 ROADWAY: BYPASS
 DRAWN BY: [Signature]
 CHECKED BY: [Signature]

KO & ASSOCIATES, P.C.
 Consulting Engineers
 A Division of Kitchell, Inc. Company
 111 CANTON ROAD, SUITE 100, WILMINGTON, N.C. 28403
 (704) 762-1111

PRELIMINARY PLANS
 DO NOT USE FOR CONSTRUCTION

BY MAIL IN END OF SOUTHEAST QUADRANT
 OF STATE ROAD 140, 40' WIDE
 ELEV. 245.87

* MILL EXISTING PAVEMENT ADJACENT TO BRIDGE
 SEE MILLING DETAIL SHEET, NO. 2

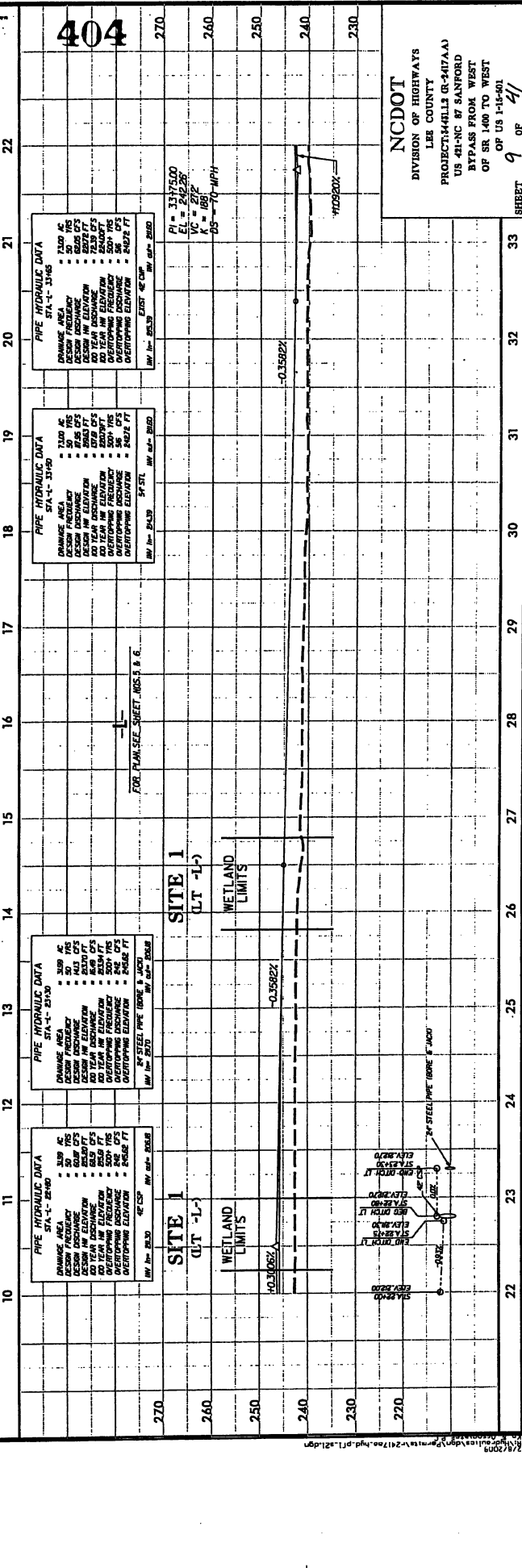
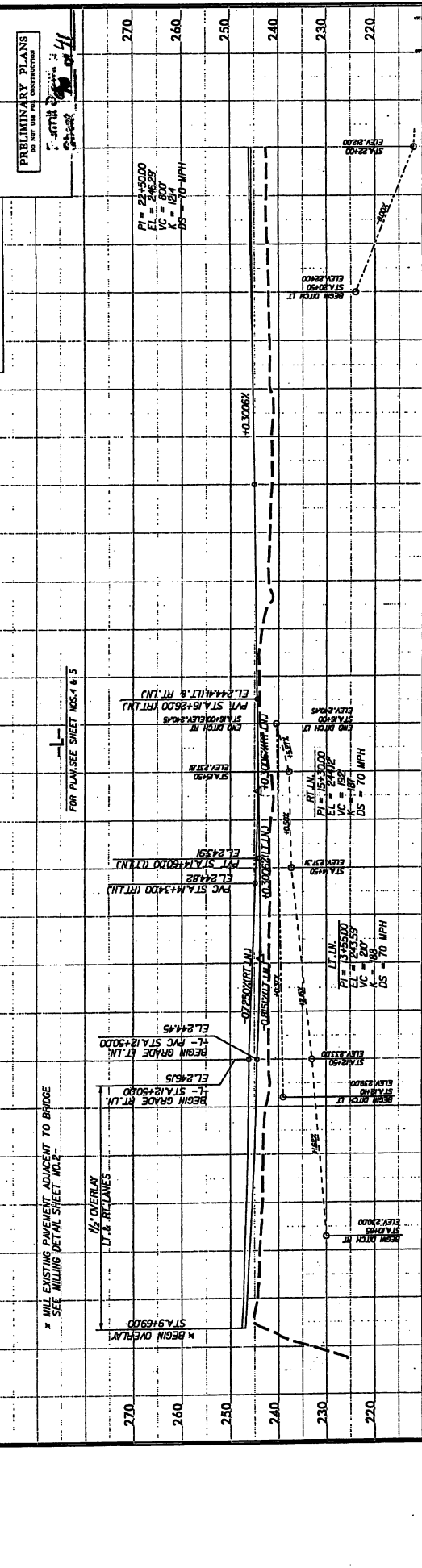
FOR PLAN, SEE SHEET NOS. 4 & 5

FOR PLAN, SEE SHEET NOS. 5 & 6

FOR PLAN, SEE SHEET NOS. 6 & 7

FOR PLAN, SEE SHEET NOS. 7 & 8

FOR PLAN, SEE SHEET NOS. 8 & 9



PIPE HYDRAULIC DATA
 STA. 11-3180

DESIGN FREQ.	100 YRS
DESIGN FREQ.	50 YRS
DESIGN FREQ.	25 YRS
DESIGN FREQ.	10 YRS
DESIGN FREQ.	5 YRS
DESIGN FREQ.	2 YRS
DESIGN FREQ.	1 YRS
DESIGN FREQ.	0.5 YRS
DESIGN FREQ.	0.2 YRS
DESIGN FREQ.	0.1 YRS
DESIGN FREQ.	0.05 YRS
DESIGN FREQ.	0.02 YRS
DESIGN FREQ.	0.01 YRS
DESIGN FREQ.	0.005 YRS
DESIGN FREQ.	0.002 YRS
DESIGN FREQ.	0.001 YRS
DESIGN FREQ.	0.0005 YRS
DESIGN FREQ.	0.0002 YRS
DESIGN FREQ.	0.0001 YRS

PIPE HYDRAULIC DATA
 STA. 11-3190

DESIGN FREQ.	100 YRS
DESIGN FREQ.	50 YRS
DESIGN FREQ.	25 YRS
DESIGN FREQ.	10 YRS
DESIGN FREQ.	5 YRS
DESIGN FREQ.	2 YRS
DESIGN FREQ.	1 YRS
DESIGN FREQ.	0.5 YRS
DESIGN FREQ.	0.2 YRS
DESIGN FREQ.	0.1 YRS
DESIGN FREQ.	0.05 YRS
DESIGN FREQ.	0.02 YRS
DESIGN FREQ.	0.01 YRS
DESIGN FREQ.	0.005 YRS
DESIGN FREQ.	0.002 YRS
DESIGN FREQ.	0.001 YRS
DESIGN FREQ.	0.0005 YRS
DESIGN FREQ.	0.0002 YRS
DESIGN FREQ.	0.0001 YRS

PIPE HYDRAULIC DATA
 STA. 11-3200

DESIGN FREQ.	100 YRS
DESIGN FREQ.	50 YRS
DESIGN FREQ.	25 YRS
DESIGN FREQ.	10 YRS
DESIGN FREQ.	5 YRS
DESIGN FREQ.	2 YRS
DESIGN FREQ.	1 YRS
DESIGN FREQ.	0.5 YRS
DESIGN FREQ.	0.2 YRS
DESIGN FREQ.	0.1 YRS
DESIGN FREQ.	0.05 YRS
DESIGN FREQ.	0.02 YRS
DESIGN FREQ.	0.01 YRS
DESIGN FREQ.	0.005 YRS
DESIGN FREQ.	0.002 YRS
DESIGN FREQ.	0.001 YRS
DESIGN FREQ.	0.0005 YRS
DESIGN FREQ.	0.0002 YRS
DESIGN FREQ.	0.0001 YRS

PIPE HYDRAULIC DATA
 STA. 11-3210

DESIGN FREQ.	100 YRS
DESIGN FREQ.	50 YRS
DESIGN FREQ.	25 YRS
DESIGN FREQ.	10 YRS
DESIGN FREQ.	5 YRS
DESIGN FREQ.	2 YRS
DESIGN FREQ.	1 YRS
DESIGN FREQ.	0.5 YRS
DESIGN FREQ.	0.2 YRS
DESIGN FREQ.	0.1 YRS
DESIGN FREQ.	0.05 YRS
DESIGN FREQ.	0.02 YRS
DESIGN FREQ.	0.01 YRS
DESIGN FREQ.	0.005 YRS
DESIGN FREQ.	0.002 YRS
DESIGN FREQ.	0.001 YRS
DESIGN FREQ.	0.0005 YRS
DESIGN FREQ.	0.0002 YRS
DESIGN FREQ.	0.0001 YRS

NCDOT
 DIVISION OF HIGHWAYS
 LEE COUNTY
 PROJECT: I-405 (BYPASS)
 US 401-NC BY SANFORD
 BYPASS FROM WEST
 OF SR 140 TO WEST
 OF SR 140

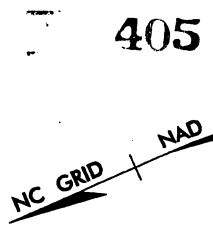
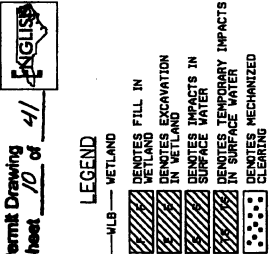
SHEET 9 OF 41

PROJECT REFERENCE NO. **R-2477A**
 SHEET NO. **6A**
 PERMIT NO. **10**
 DATE **10/11/04**

KO & ASSOCIATES, P.C.
 CONSULTING ENGINEERS
 A PRINCE & BRIDGES, INC. COMPANY
 101 WOODROW WILSON BLVD., SUITE 100, RALEIGH, N.C. 27603
 (919) 781-4444

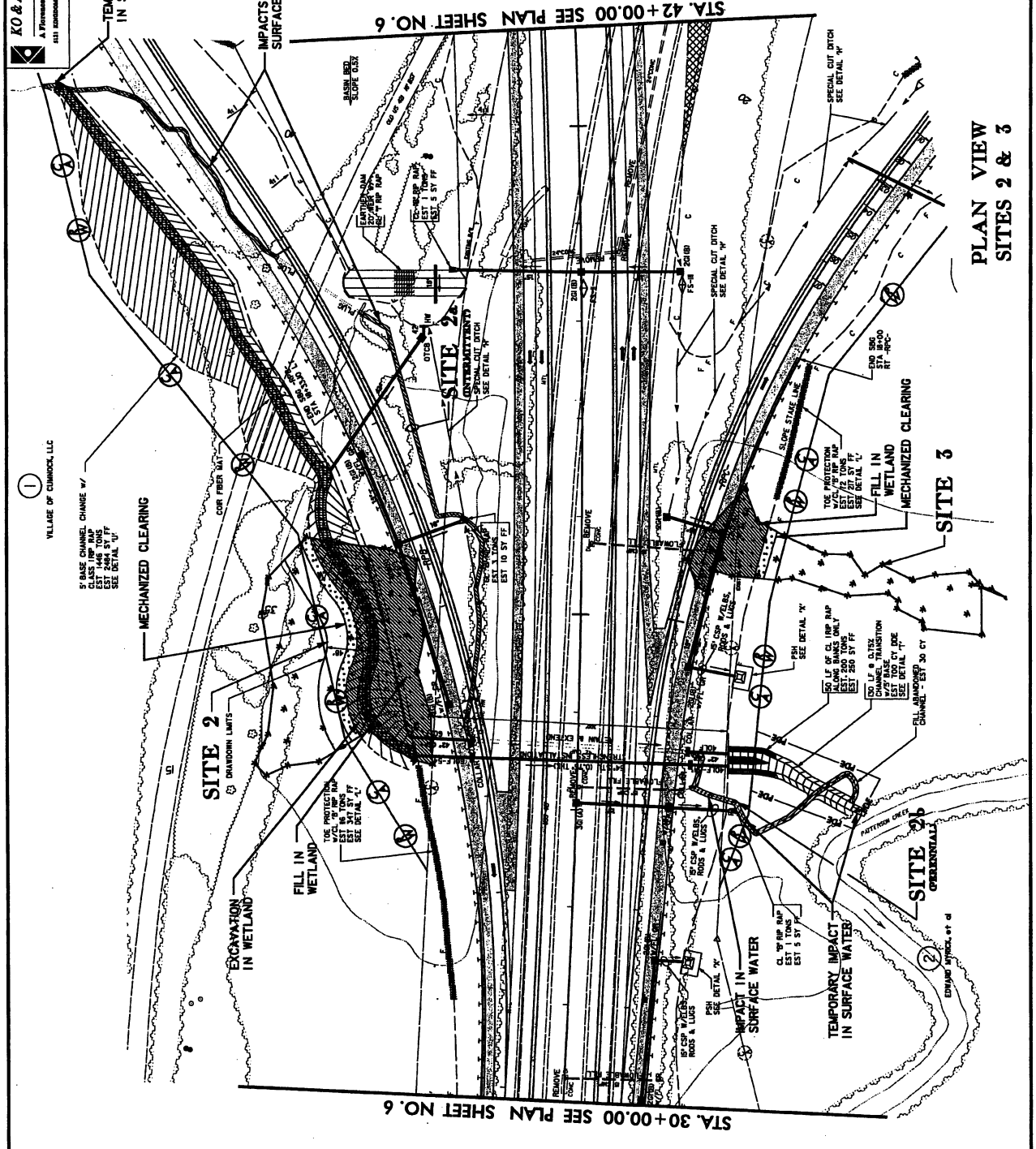
PERMIT DRAWING
 SHEET **10** OF **41**

PRELIMINARY PLANS
 FOR THE PROPOSED
 CONSTRUCTION



NCDOT
 DIVISION OF HIGHWAYS
 LEE COUNTY
 PROJECT: 344RL3 (R-2477A)
 US 421-NC 87 SANFORD
 BYPASS FROM WEST
 OF SR 1400 TO WEST
 OF US 1-14-00

SHEET **10** OF **41**



8/17/99

1/2/2005

PROJECT NUMBER NO. **R-2477AA**
 SHEET NO. **6**
 DATE **11/11/08**
 DRAWN BY **W. J. BROWN**
 CHECKED BY **W. J. BROWN**

PRELIMINARY PLANS
 FOR THE STATE HIGHWAY
 CONSTRUCTION

Permit Drawing
 Sheet **11** of **41**

- LEGEND**
- MLB - WETLAND
 - DENOTES FILL IN WETLAND EXCAVATION
 - DENOTES IMPACTS IN SURFACE WATER
 - DENOTES TEMPORARY IMPACTS IN SURFACE WATER
 - DENOTES MECHANIZED CLEARING

406

NC GRID / NAD 83

100 0 100
 50
 SCALE: 1" = 100' HORIZ.

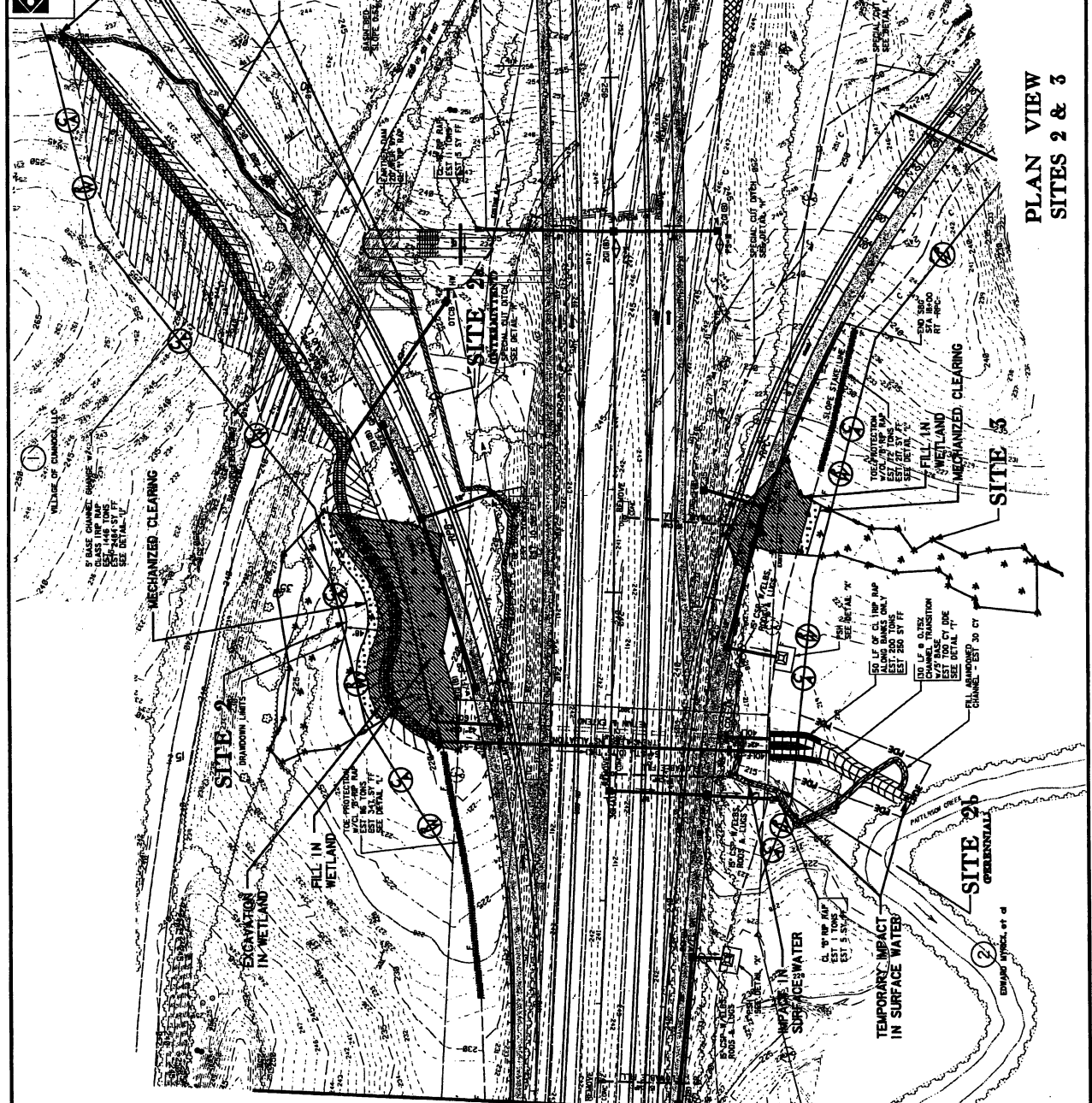
NCDOT
 DIVISION OF HIGHWAYS
 LEE COUNTY
 PROJECT: 446LL3 (R-2477AA)
 US 41-NC BY SANFORD
 BYPASS FROM WEST
 OF SR 1400 TO WEST
 OF US 1-15-50
 SHEET **11** OF **41**

KO & ASSOCIATES, P.C.
 Consulting Engineers
 A Division of Kiewit Construction Company
 1011 BROADWAY, SUITE 100, RALEIGH, NC 27601
 (919) 873-1000

TEMPORARY IMPACT
 IN SURFACE WATER

IMPACTS IN
 SURFACE WATER

STA. 42+00.00 SEE PLAN SHEET NO. 6

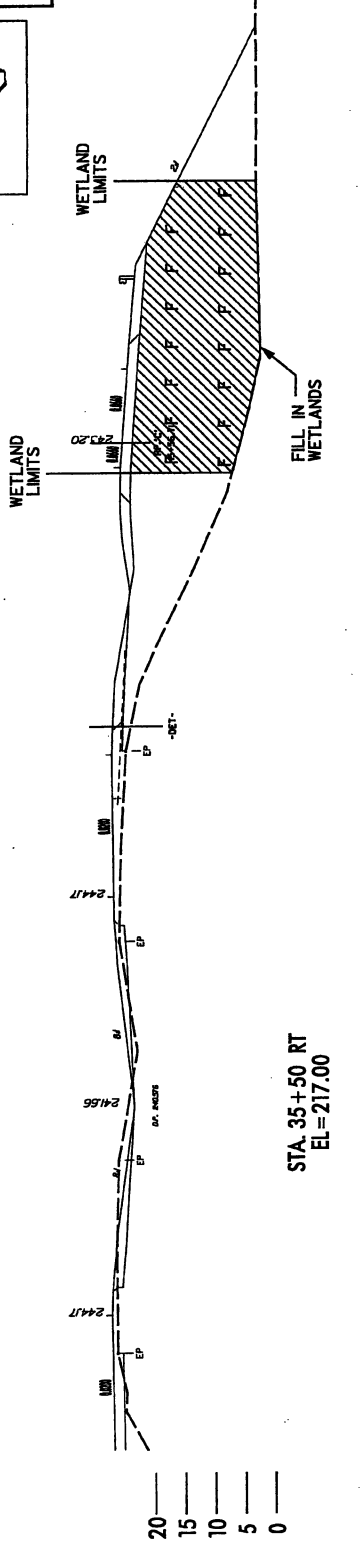


STA. 30+00.00 SEE PLAN SHEET NO. 6

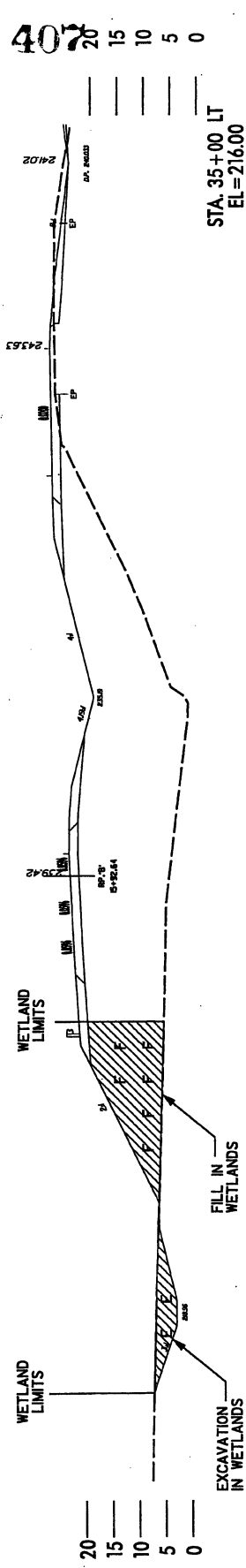
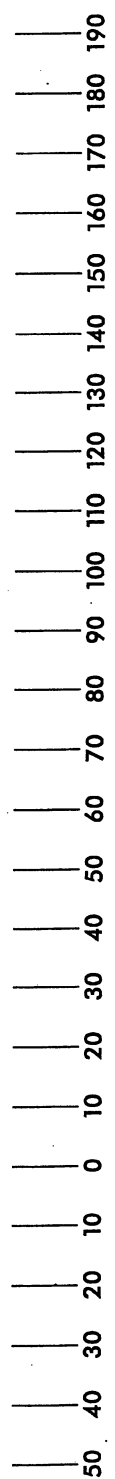
PLAN VIEW
 SITES 2 & 3



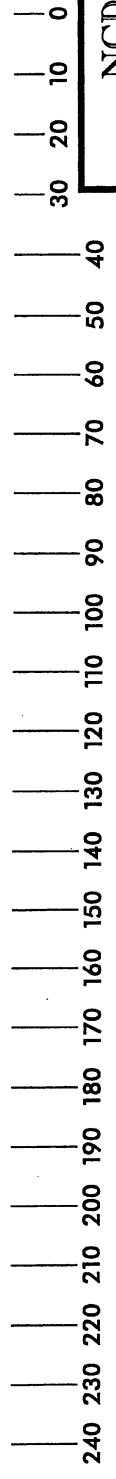
Permit Drawing
 Sheet **12** of **41**



STA. 35+50 RT
 EL=217.00



STA. 35+00 LT
 EL=216.00



- LEGEND**
- WLB — WETLAND LIMITS
 - WL — WETLAND LIMITS
 - ▨ DENOTES FILL IN WETLANDS
 - ▨ DENOTES EXCAVATION IN WETLANDS

TYPICAL X-SECTIONS
 SITES 2 & 3

NC DOT
 DIVISION OF HIGHWAYS
 LEE COUNTY
 PROJECT: 3448L12 (R-2417AA)
 US 421-NC 87 SANFORD
 BYPASS FROM WEST
 OF SR 1400 TO WEST
 OF US 1-15-501

PROJECT REFERENCE NO. R-2477AA
ROADWAY DESIGN ROUTE 41

KO & ASSOCIATES, P.C.
A Firmness & Inc. Consulting Engineers
411 HENDERSON WAY, WESTFORD, N.C. 27150
(919) 791-9944

PRELIMINARY PLANS
Permit Drawing 41
Sheet 13 of 41

PIPE HYDRAULIC DATA
STA. - RPB - 8005
DRAINAGE AREA
DESIGN DISCHARGE
DESIGN FLOW
DESIGN VELOCITY
DESIGN FRICTION
DESIGN CHANNEL
DESIGN SLOPE
DESIGN FRICTION
DESIGN CHANNEL
DESIGN VELOCITY
DESIGN FRICTION
DESIGN CHANNEL
DESIGN VELOCITY
DESIGN FRICTION

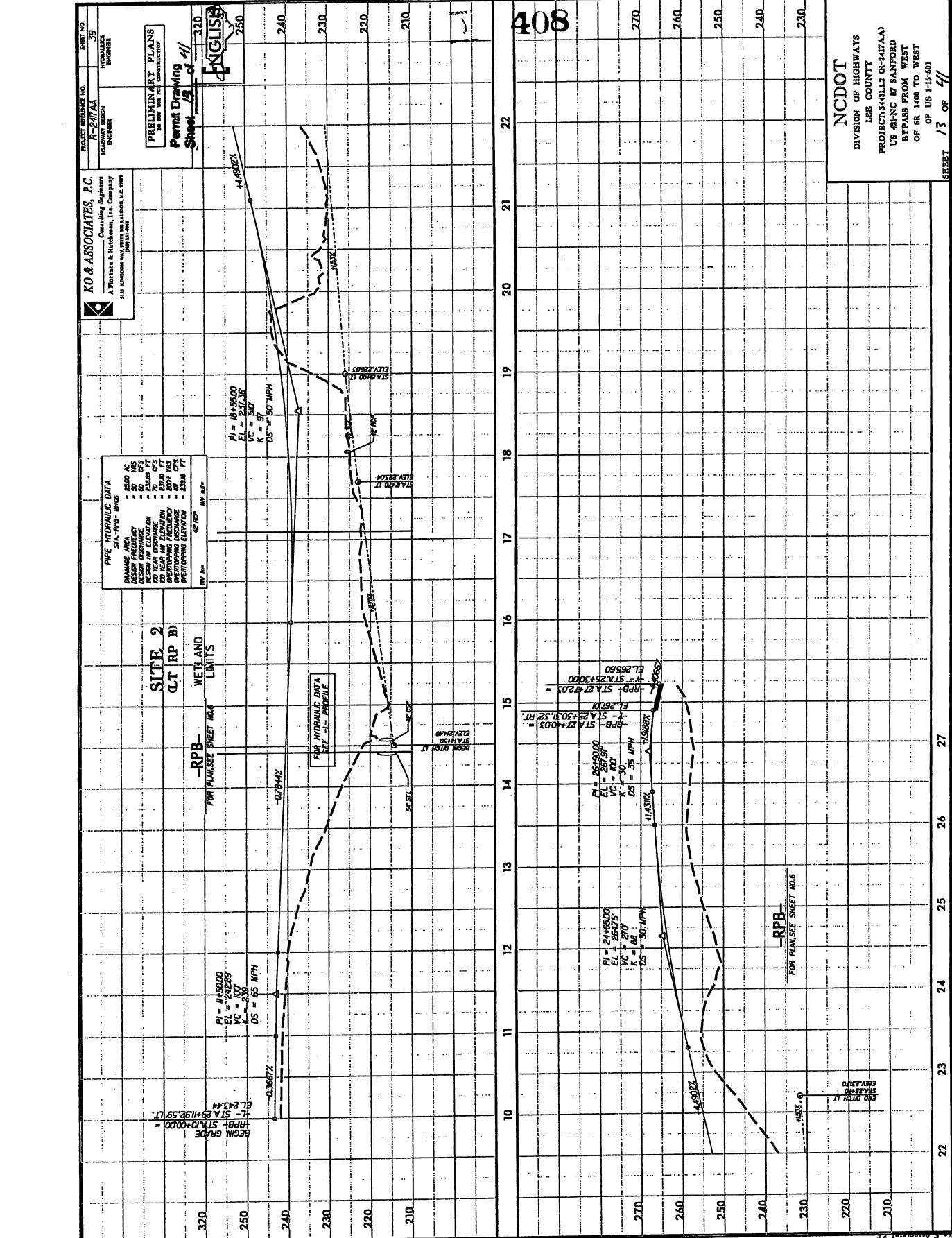
SITE 2
(LT RP B)

WETLAND LIMITS
RPB -
FOR PLAN/SHEET 706

FOR HYDRAULIC DATA
SEE J - PROFILE

NCDOT
DIVISION OF HIGHWAYS
LEE COUNTY
PROJECT: 3446L3 (R-347AA)
US 41-NC BY SANFORD
BYPASS FROM WEST
OF SR 1400 TO WEST
OF US 1-15-401

SHEET 13 OF 41



PROJECT NUMBER: 100-204-SEE-SHEET-M06
 SHEET NO. 409
 DATE: 11/20/11
 ENGINEER: HYDRAULICS

KO & ASSOCIATES, P.C.
 Consulting Engineers
 A Harsco & Bickelmeier, Inc. Company
 301 LINDSEY WAY SUITE 200 WILSON, NC 27157
 (704) 241-1100

PRELIMINARY PLANS
 Permit Drawing
 Sheet 14 of 41

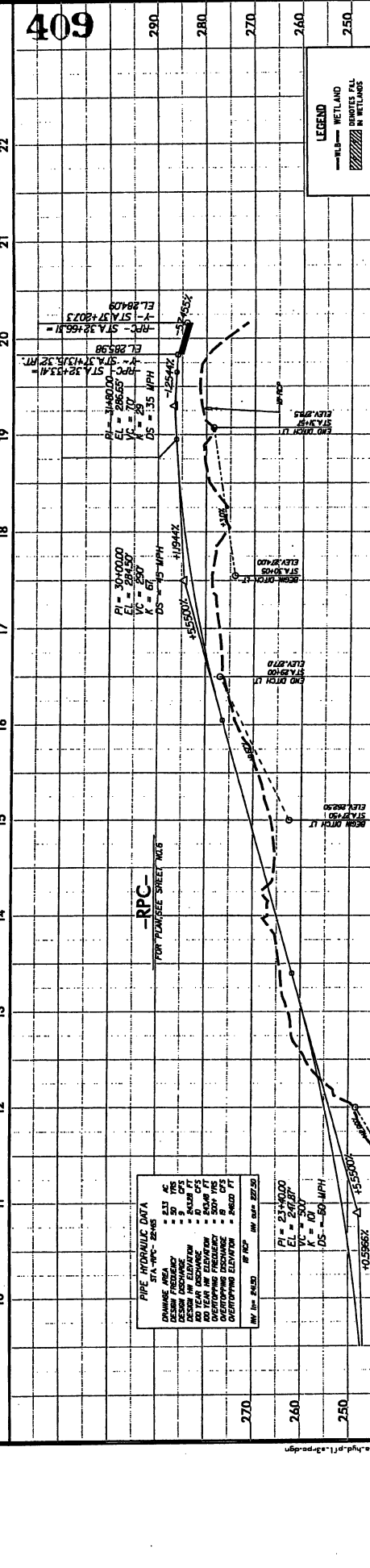
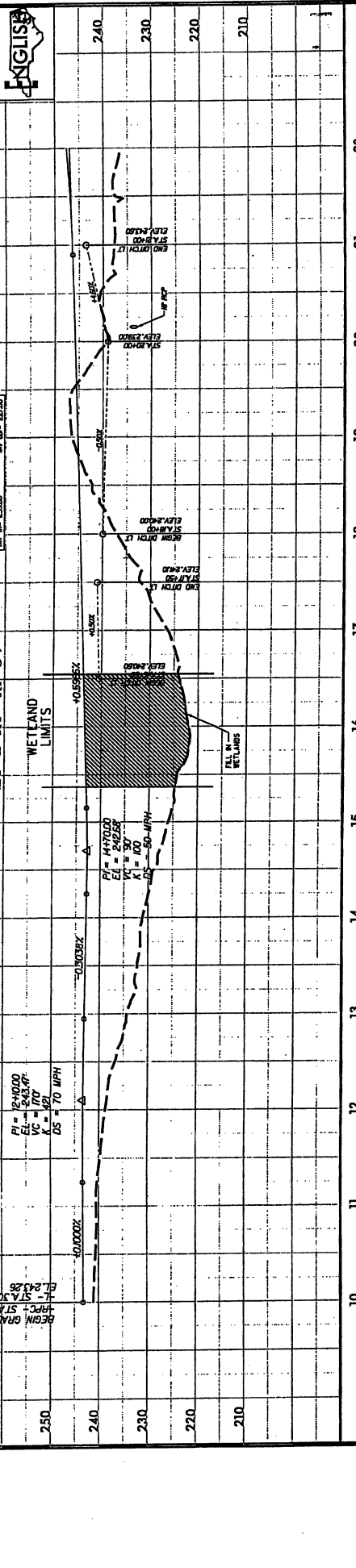
PIPE HYDRAULIC DATA
 STA. -RPC- 80+5
 DRAINAGE AREA: 2.13 AC
 DESIGN FREQUENCY: 0.50
 DESIGN INLET ELEVATION: 243.47 FT
 DESIGN PIPE ELEVATION: 242.55 FT
 10 YEAR DESIGN FLOW: 1.07 CFS
 10 YEAR DESIGN VELOCITY: 1.50 MPH
 DESIGNING FREQUENCY: 0.50
 DESIGNING ELEVATION: 242.00 FT

PIPE HYDRAULIC DATA
 STA. -RPC- 80+5
 DRAINAGE AREA: 2.13 AC
 DESIGN FREQUENCY: 0.50
 DESIGN INLET ELEVATION: 243.47 FT
 DESIGN PIPE ELEVATION: 242.55 FT
 10 YEAR DESIGN FLOW: 1.07 CFS
 10 YEAR DESIGN VELOCITY: 1.50 MPH
 DESIGNING FREQUENCY: 0.50
 DESIGNING ELEVATION: 242.00 FT

PIPE HYDRAULIC DATA
 STA. -RPC- 80+5
 DRAINAGE AREA: 2.13 AC
 DESIGN FREQUENCY: 0.50
 DESIGN INLET ELEVATION: 243.47 FT
 DESIGN PIPE ELEVATION: 242.55 FT
 10 YEAR DESIGN FLOW: 1.07 CFS
 10 YEAR DESIGN VELOCITY: 1.50 MPH
 DESIGNING FREQUENCY: 0.50
 DESIGNING ELEVATION: 242.00 FT

PIPE HYDRAULIC DATA
 STA. -RPC- 80+5
 DRAINAGE AREA: 2.13 AC
 DESIGN FREQUENCY: 0.50
 DESIGN INLET ELEVATION: 243.47 FT
 DESIGN PIPE ELEVATION: 242.55 FT
 10 YEAR DESIGN FLOW: 1.07 CFS
 10 YEAR DESIGN VELOCITY: 1.50 MPH
 DESIGNING FREQUENCY: 0.50
 DESIGNING ELEVATION: 242.00 FT

PIPE HYDRAULIC DATA
 STA. -RPC- 80+5
 DRAINAGE AREA: 2.13 AC
 DESIGN FREQUENCY: 0.50
 DESIGN INLET ELEVATION: 243.47 FT
 DESIGN PIPE ELEVATION: 242.55 FT
 10 YEAR DESIGN FLOW: 1.07 CFS
 10 YEAR DESIGN VELOCITY: 1.50 MPH
 DESIGNING FREQUENCY: 0.50
 DESIGNING ELEVATION: 242.00 FT



LEGEND
 --- WETLAND
 --- WETLAND

NC DOT
 DIVISION OF HIGHWAYS
 LEE COUNTY
 PROJECT: WALLS (R-247A-A)
 US 421 NC 47 Bypass
 BYPASS FROM WEST
 OF SR 1400 TO WEST
 OF US 1-45-90L

PIPE HYDRAULIC DATA
 STA. -RPC- 80+5
 DRAINAGE AREA: 2.13 AC
 DESIGN FREQUENCY: 0.50
 DESIGN INLET ELEVATION: 243.47 FT
 DESIGN PIPE ELEVATION: 242.55 FT
 10 YEAR DESIGN FLOW: 1.07 CFS
 10 YEAR DESIGN VELOCITY: 1.50 MPH
 DESIGNING FREQUENCY: 0.50
 DESIGNING ELEVATION: 242.00 FT

PIPE HYDRAULIC DATA
 STA. -RPC- 80+5
 DRAINAGE AREA: 2.13 AC
 DESIGN FREQUENCY: 0.50
 DESIGN INLET ELEVATION: 243.47 FT
 DESIGN PIPE ELEVATION: 242.55 FT
 10 YEAR DESIGN FLOW: 1.07 CFS
 10 YEAR DESIGN VELOCITY: 1.50 MPH
 DESIGNING FREQUENCY: 0.50
 DESIGNING ELEVATION: 242.00 FT

PIPE HYDRAULIC DATA
 STA. -RPC- 80+5
 DRAINAGE AREA: 2.13 AC
 DESIGN FREQUENCY: 0.50
 DESIGN INLET ELEVATION: 243.47 FT
 DESIGN PIPE ELEVATION: 242.55 FT
 10 YEAR DESIGN FLOW: 1.07 CFS
 10 YEAR DESIGN VELOCITY: 1.50 MPH
 DESIGNING FREQUENCY: 0.50
 DESIGNING ELEVATION: 242.00 FT

PIPE HYDRAULIC DATA
 STA. -RPC- 80+5
 DRAINAGE AREA: 2.13 AC
 DESIGN FREQUENCY: 0.50
 DESIGN INLET ELEVATION: 243.47 FT
 DESIGN PIPE ELEVATION: 242.55 FT
 10 YEAR DESIGN FLOW: 1.07 CFS
 10 YEAR DESIGN VELOCITY: 1.50 MPH
 DESIGNING FREQUENCY: 0.50
 DESIGNING ELEVATION: 242.00 FT

PIPE HYDRAULIC DATA
 STA. -RPC- 80+5
 DRAINAGE AREA: 2.13 AC
 DESIGN FREQUENCY: 0.50
 DESIGN INLET ELEVATION: 243.47 FT
 DESIGN PIPE ELEVATION: 242.55 FT
 10 YEAR DESIGN FLOW: 1.07 CFS
 10 YEAR DESIGN VELOCITY: 1.50 MPH
 DESIGNING FREQUENCY: 0.50
 DESIGNING ELEVATION: 242.00 FT

PIPE HYDRAULIC DATA
 STA. -RPC- 80+5
 DRAINAGE AREA: 2.13 AC
 DESIGN FREQUENCY: 0.50
 DESIGN INLET ELEVATION: 243.47 FT
 DESIGN PIPE ELEVATION: 242.55 FT
 10 YEAR DESIGN FLOW: 1.07 CFS
 10 YEAR DESIGN VELOCITY: 1.50 MPH
 DESIGNING FREQUENCY: 0.50
 DESIGNING ELEVATION: 242.00 FT

PROJECT REFERENCE NO. **R-217AA**
 SHEET NO. **6B**
 CONTRACTOR: **WYOMING ENGINEERS**
 ENGINEER: **BOB WYOMING**

PRELIMINARY PLANS
 BY INT. USE FOR CONSTRUCTION

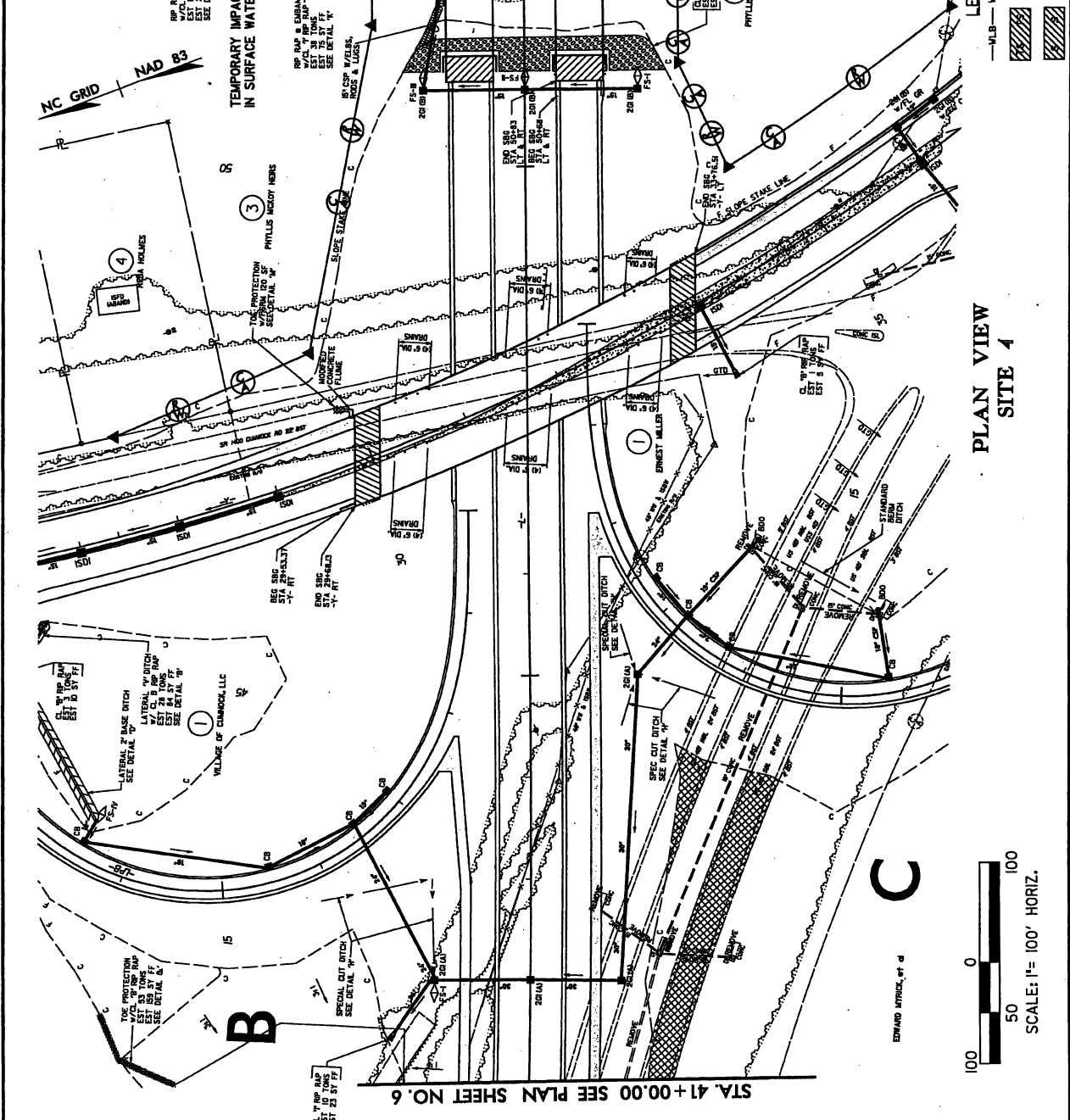
Permit Drawing
 Sheet **15** of **41**

KO & ASSOCIATES, P.C.
 Consulting Engineers
 A Florence & Stephens, Inc. Company
 111 Florence & Stephens, Inc. Building, N.C. 27601
 (919) 733-5555

410
 STA. 55+00.00 SEE PLAN SHEET NO. 7

NCDOT
 DIVISION OF HIGHWAYS
 LEE COUNTY
 PROJECT: 946L3 (R-217AA)
 US 41-NC BY SANFORD
 BYPASS FROM WBST
 OF SR 1400 TO WBST
 OF US 1-15-01

SHEET **15** OF **41**



PLAN VIEW
SITE 4

0 50 100
 SCALES: 1" = 100' HORIZ.

PROJECT REFERENCE NO. **R-217A**
 SHEET NO. **411**
 HYDRAULICS ENGINEER

PRELIMINARY PLANS
 DO NOT USE FOR CONSTRUCTION

KO & ASSOCIATES, P.C.
 Consulting Engineers
 A Fluorine & Bruchman, Inc. Company
 331 S. DODD ST. SUITE 100 RALPHAHAM, N.C. 27681
 (919) 311-0000

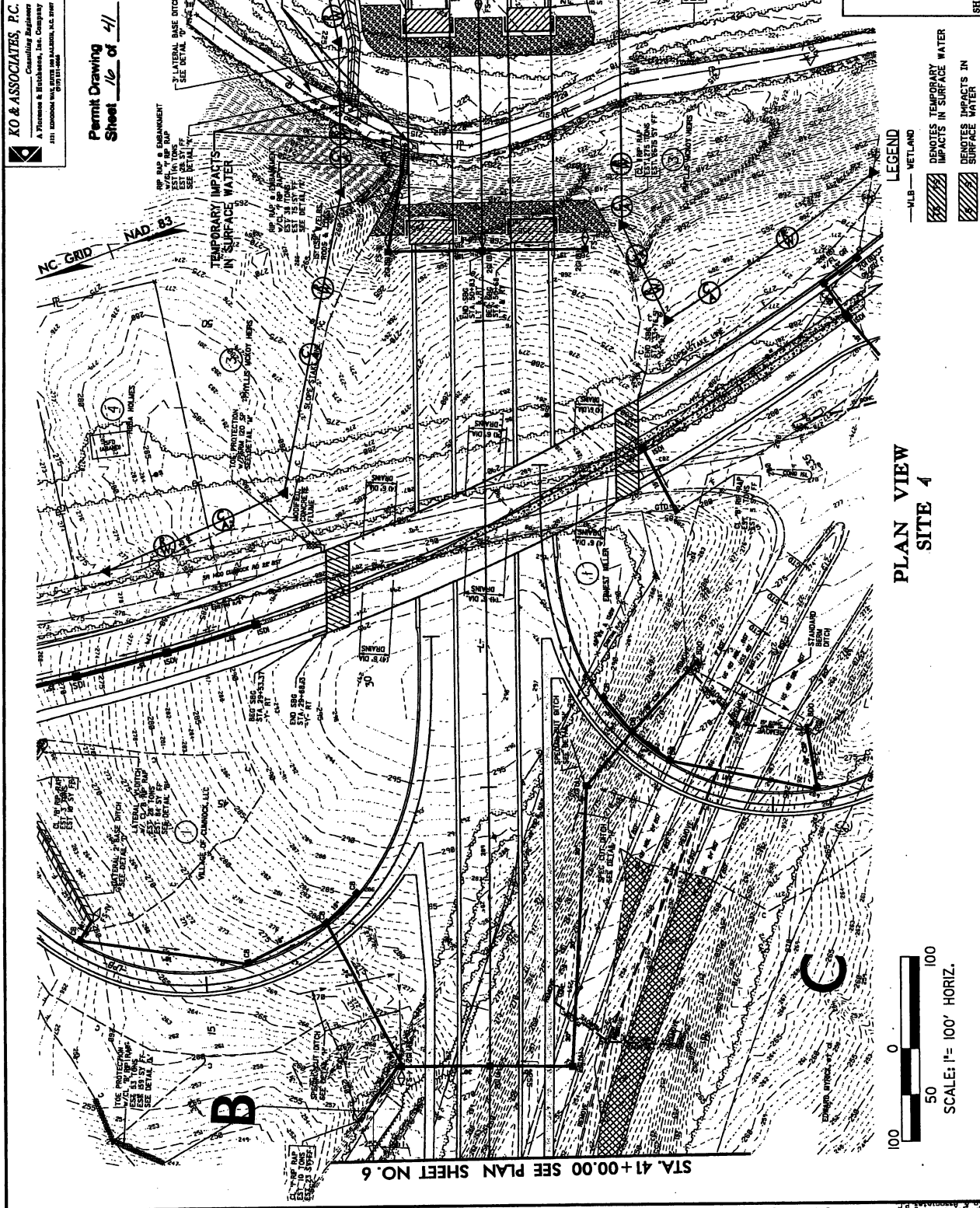
Permit Drawing
 Sheet **16** of **41**



411 STA. 55+00.00 SEE PLAN SHEET NO. 7

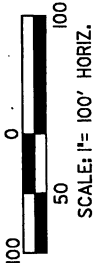
NCDOT
 DIVISION OF HIGHWAYS
 LEE COUNTY
 PROJECT: 44613 (R-217A)
 BYPASS FROM WEST
 OF SR 1400 TO WEST
 OF US 1-15-601

SHEET **16** OF **41**



LEGEND
 -MLB - WETLAND
 DENOTES TEMPORARY IMPACTS IN SURFACE WATER
 DENOTES IMPACTS IN SURFACE WATER

PLAN VIEW
SITE 4



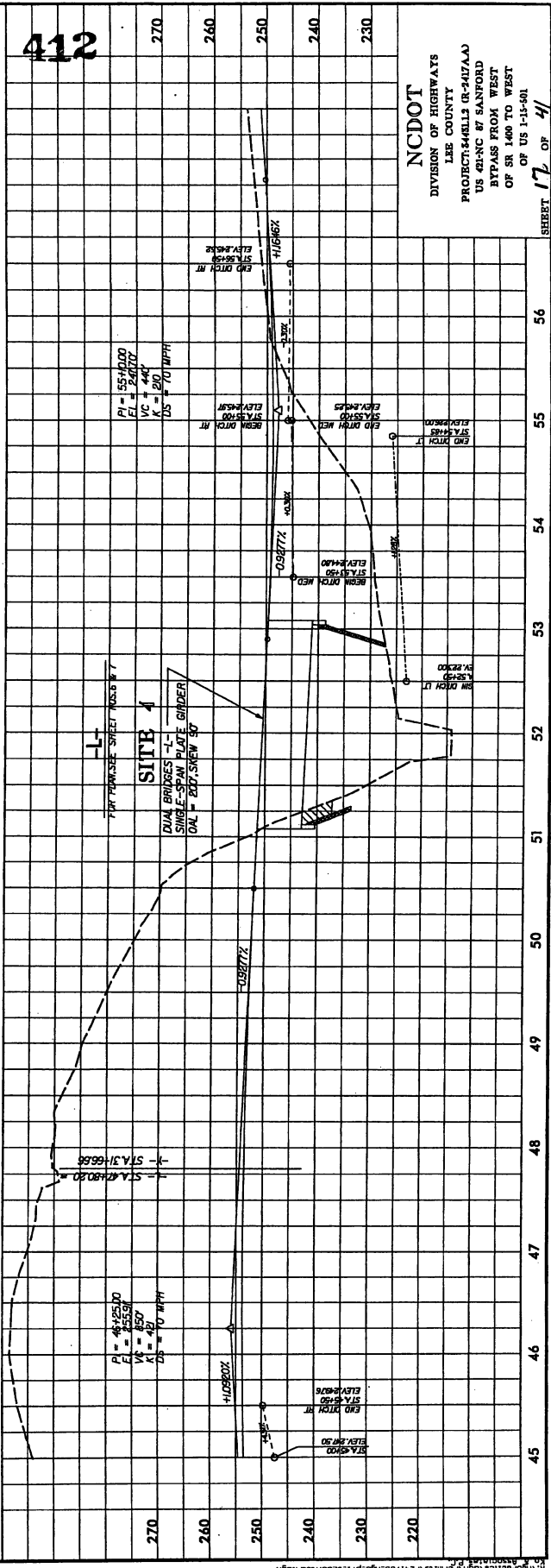
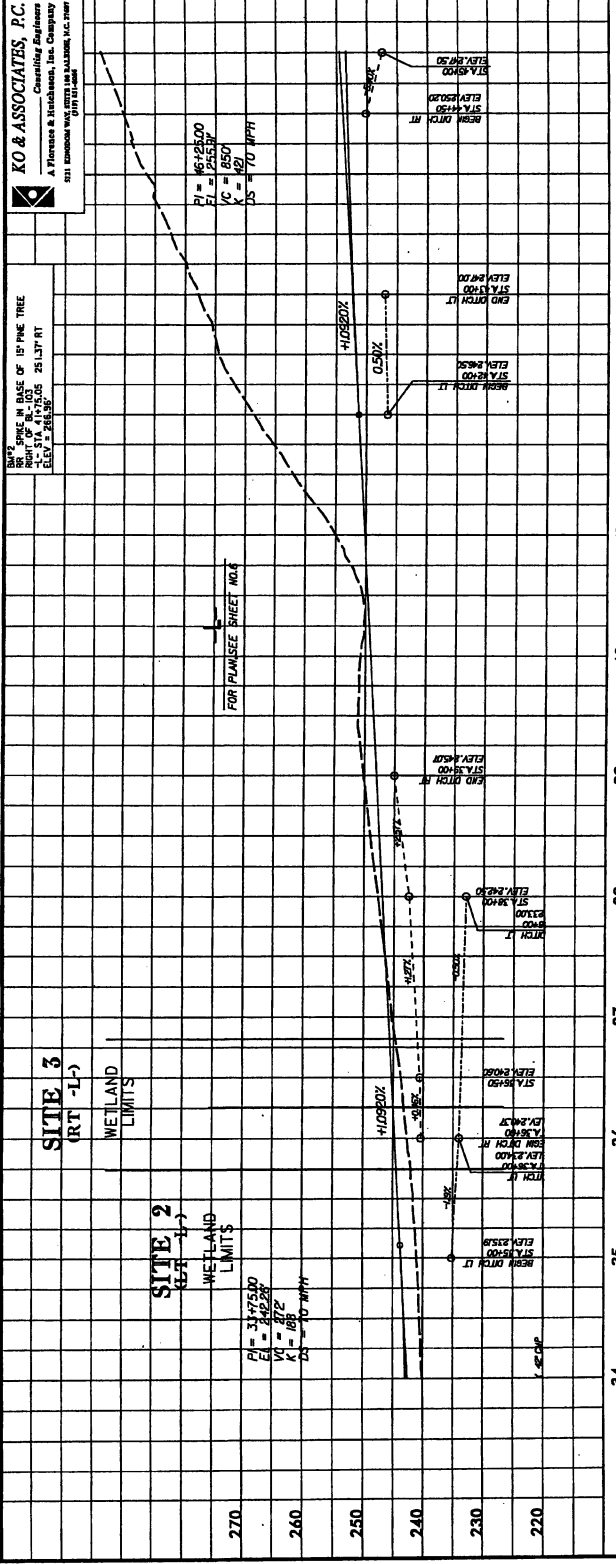
STA. 41+00.00 SEE PLAN SHEET NO. 6

PROJECT REFERENCE NO. **R-217/AA**
 ROADWAY DESIGN
 SHEET NO. **27**
 HYDRAULICS
 STRUCTURES

KO & ASSOCIATES, P.C.
 Consulting Engineers
 A. Fritzsche & Associates, Inc. Company
 511 W. HARRIS ST. SUITE 100
 WILMINGTON, NC 28401

BASE GRADE TO BE USED OF 15" PINE TREE
 BRIDGE OF 10' CLEARANCE
 STA. 41+00 TO STA. 45+00
 25' LANE WIDTH
 ELEV. = 235.00

PRELIMINARY PLANS
 AS NOTED FOR THE
 CONSTRUCTION
Permit Drawing
 Sheet **17** of **41**



NC DOT
 DIVISION OF HIGHWAYS
 IBER COUNTY
 PROJECT: 4468L3 (R-217/AA)
 US 421-NC 87 SANFORD
 BYPASS FROM WEST
 OF SR 1400 TO WEST
 OF US 1-15-01

SHEET **17** OF **41**

412

NCDOT
 DIVISION OF HIGHWAYS
 LEE COUNTY
 PROJECT: 844613 (R-242AA)
 US 41-NC BY SANFORD
 BYPASS FROM WEST
 OF SR 1400 TO WEST
 OF US 1-15-01
SHEET 18 OF 41

413

Permit Drawing
 Sheet 18 of 41

KO & ASSOCIATES, P.C.
 Consulting Engineers
 A Florence & Stillman, Inc. Company
 201 FLORENCE STREET, SUITE 200
 FLORENCE, SC 29502
 (803) 663-1000

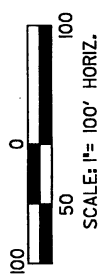
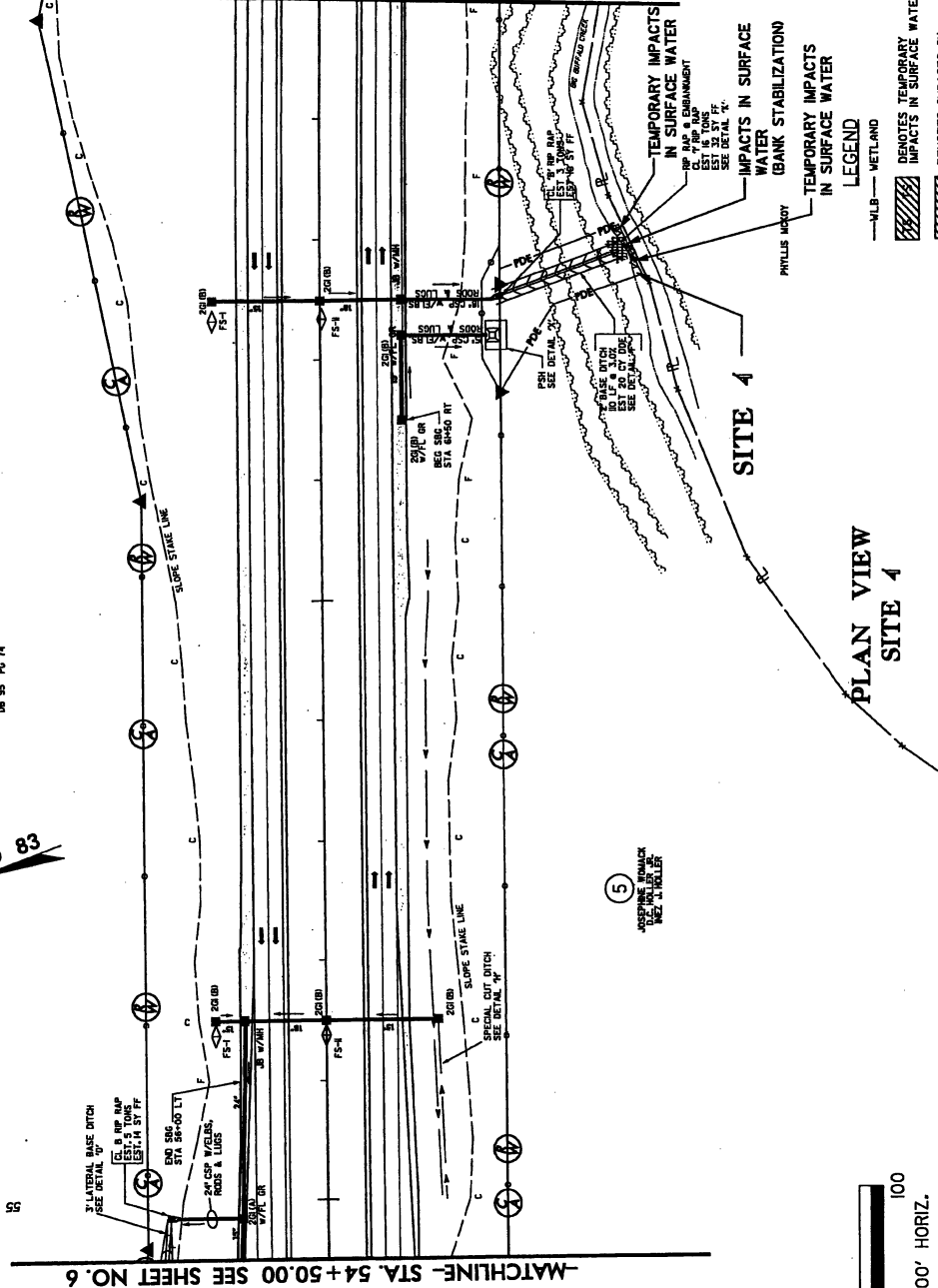
PROJECT REFERENCE NO. R-242AA	SHEET NO. 7
DATE 11/15/07	BY HYDRAULIC ENGINEER
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	



NC GRID
NAD 83

(5) JOSEPHINE WINDACK
 LEE COUNTY, NC
 DP 95-110-74

(5) JOSEPHINE WINDACK
 LEE COUNTY, NC
 DP 95-110-74



PLAN VIEW
SITE 4

LEGEND
 DENOTES TEMPORARY IMPACTS IN SURFACE WATER
 DENOTES IMPACTS IN SURFACE WATER

PROJECT REFERENCE NO. R-2477A
 SHEET NO. 7
 HYDRAULICS ENGINEER

KO & ASSOCIATES, P.C.
 Consulting Engineers
 A Florence & Irwin, Inc. Company
 1111 IRWIN ROAD, SUITE 100, WYOMING, N.C. 28176
 (704) 762-1000

PRELIMINARY PLANS
 NOT FOR CONSTRUCTION

Permit Drawing
 Sheet 19 of 41

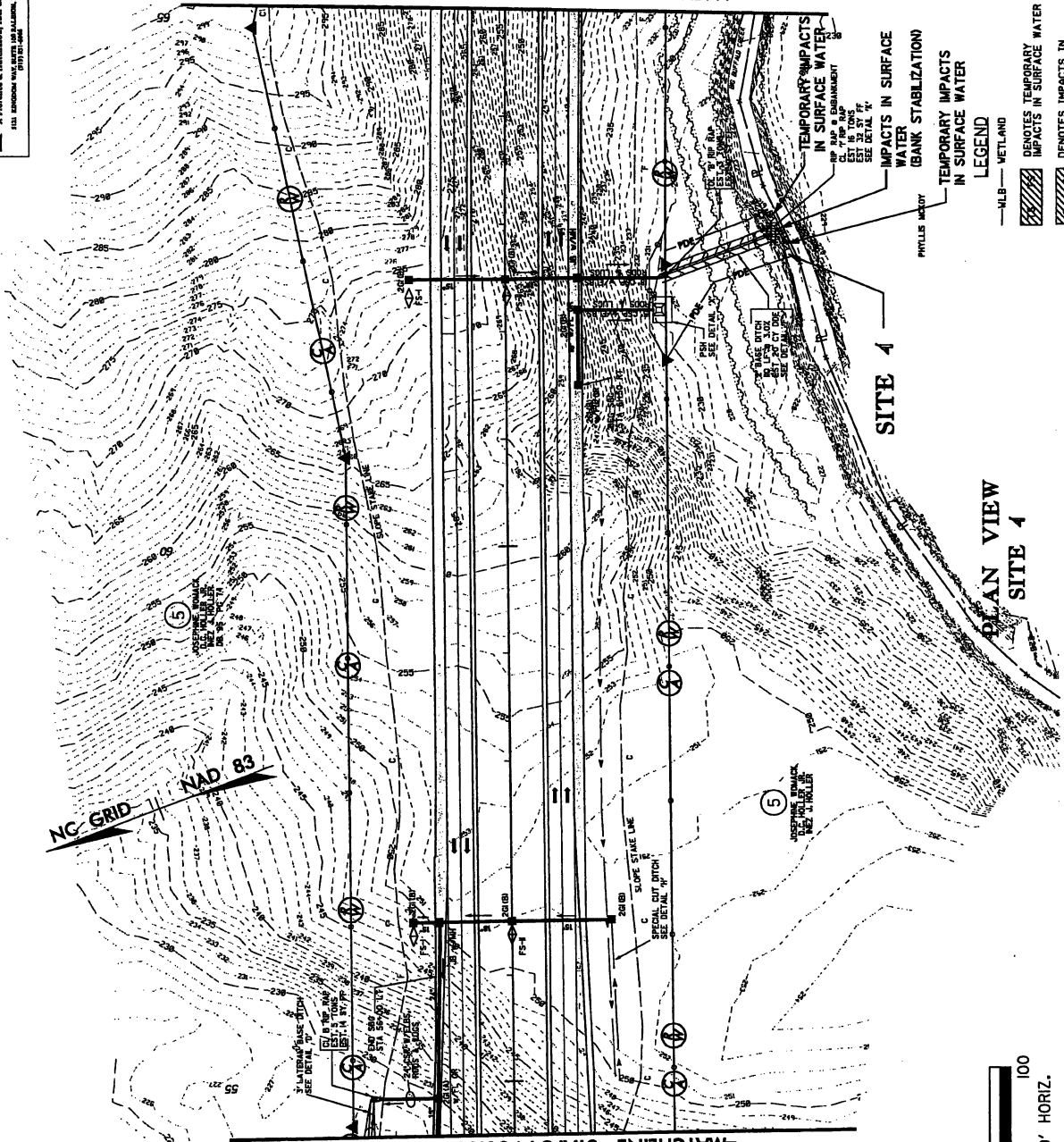


414

NC DOT
 DIVISION OF HIGHWAYS
 LEE COUNTY
 PROJECT: 44613 (R-2477A)
 US 401-NC BY SANFORD
 BYPASS FROM WEST
 OF SR 1400 TO WEST
 OF US 1-13-90L

SHEET 19 OF 41

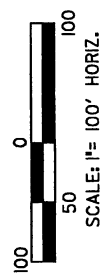
-MATCHLINE- STA. 65+00.00 SEE SHEET NO. 8



-MATCHLINE- STA. 54+50.00 SEE SHEET NO. 6

SITE 4

PLAN VIEW
 SITE 4

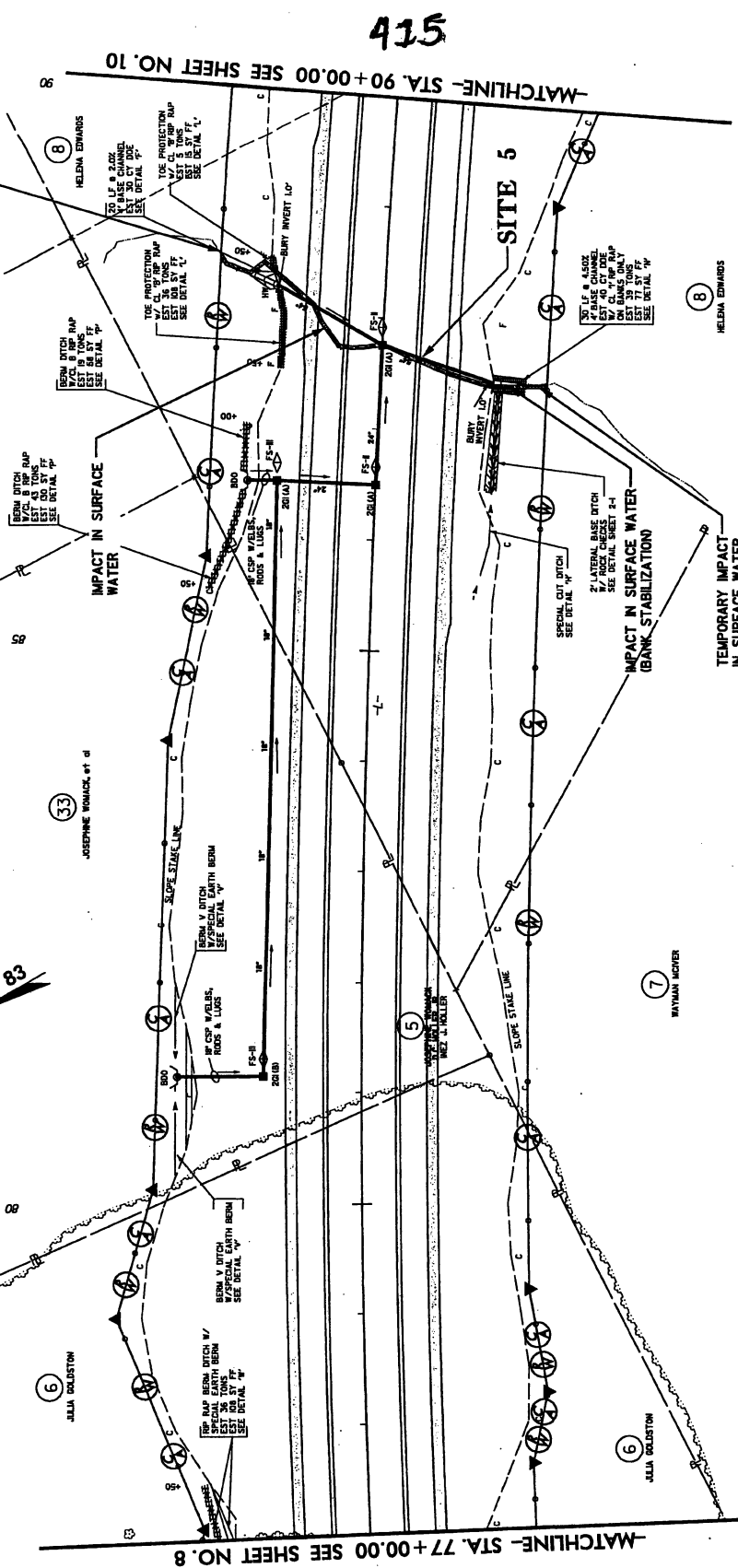


PROJECT REFERENCE NO. **P-2477A**
 SHEET NO. **9**
 DRAWN BY **W. J. WILSON**
 CHECKED BY **W. J. WILSON**
 DATE **10/20/09**

PRELIMINARY PLANS
 DO NOT USE FOR CONSTRUCTION

Permit Drawing
 Sheet **20** of **41**

KO & ASSOCIATES, P.C.
 Consulting Engineers
 A Florence & Brantcomb, Inc. Company
 2111 LENOX ROAD, SUITE 300, FLORENCE, S.C. 29507
 803/661-8888



415

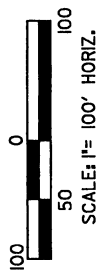
NC GRID NAD 83

NCDOT
 DIVISION OF HIGHWAYS
 LEE COUNTY
 PROJECT 846LLS (R-2477A)
 US 41-NC BY SANFORD
 BYPASS FROM WEST
 OF SR 1400 TO WEST
 OF US 1-16-01

SHEET **20** OF **41**

LEGEND
 -ULB- WETLAND
 DENOTES IMPACTS IN SURFACE WATER
 DENOTES TEMPORARY IMPACTS IN SURFACE WATER

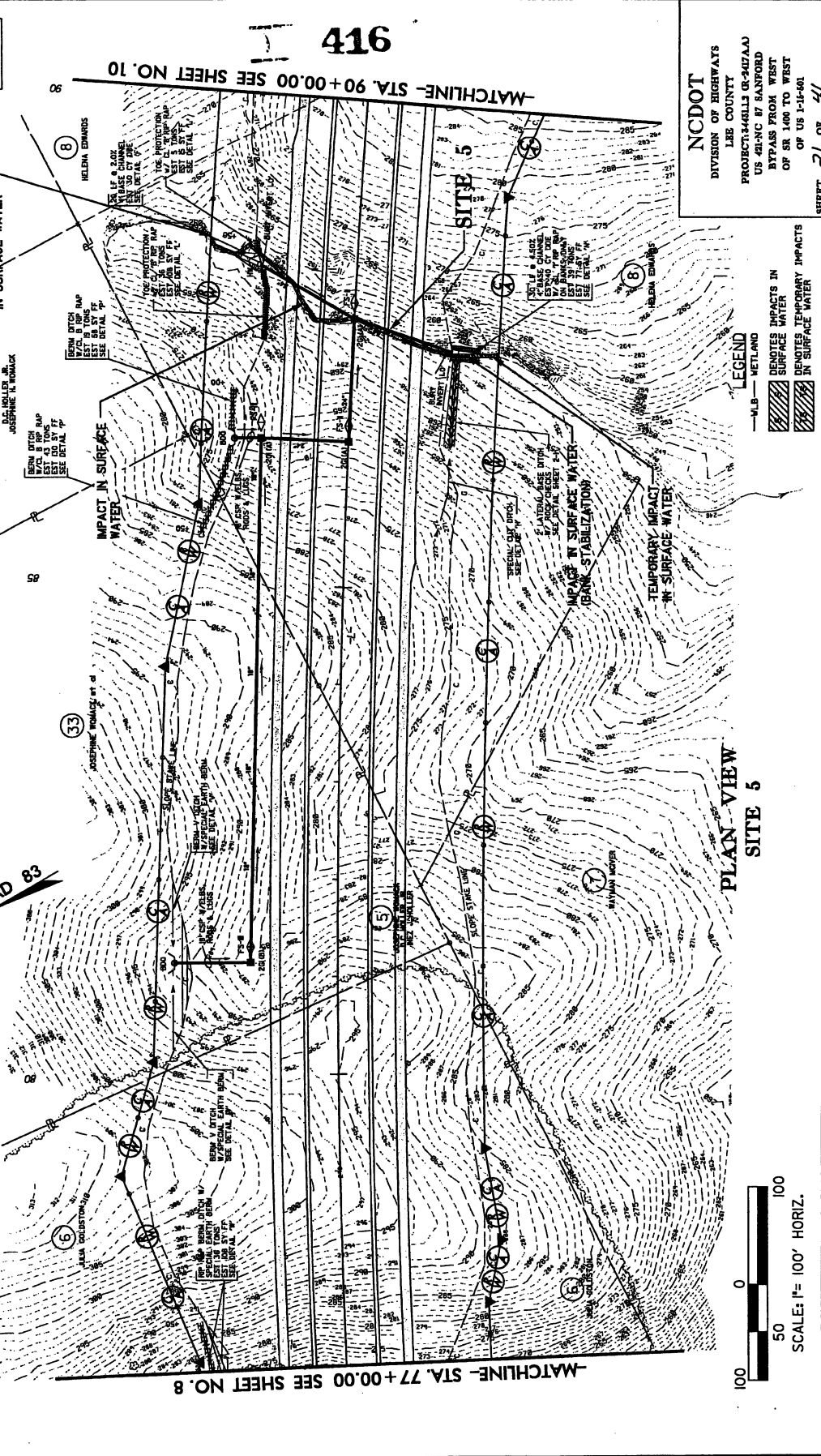
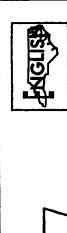
PLAN VIEW
SITE 5



PROJECT INFORMATION
 SHEET NO. 9
 DRAWING NO. F-2477A
 DATE 10/21/88
 ENGINEER: HYDRAULICS
 CHECKER: CIVIL ENGINEER

KO & ASSOCIATES, P.C.
 Consulting Engineers
 A Parsons & Brinckerhoff, Inc. Company
 131 LINDSEY WALKER RD., SUITE 200, RALEIGH, N.C. 27615
 919/771-1234

PERMIT DRAWING
 SHEET 21 of 41



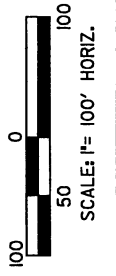
NC DOT
 DIVISION OF HIGHWAYS
 LEE COUNTY
 PROJECT 144813 (R-2477A)
 US 41-NC BY SANFORD
 BYPASS FROM WEST
 OF SR 1400 TO WEST
 OF US 1-14-801

SHEET 21 of 41

LEGEND

- ULB- WETLAND
- ▨ DENOTES IMPACTS IN SURFACE WATER
- ▨ DENOTES TEMPORARY IMPACTS IN SURFACE WATER

**PLAN-VIEW
 SITE 5**



NC GRID
 NAD 83

PROJECT REFERENCE NO.
R-2017A
 ROADWAY DESIGN
 ENGINEER

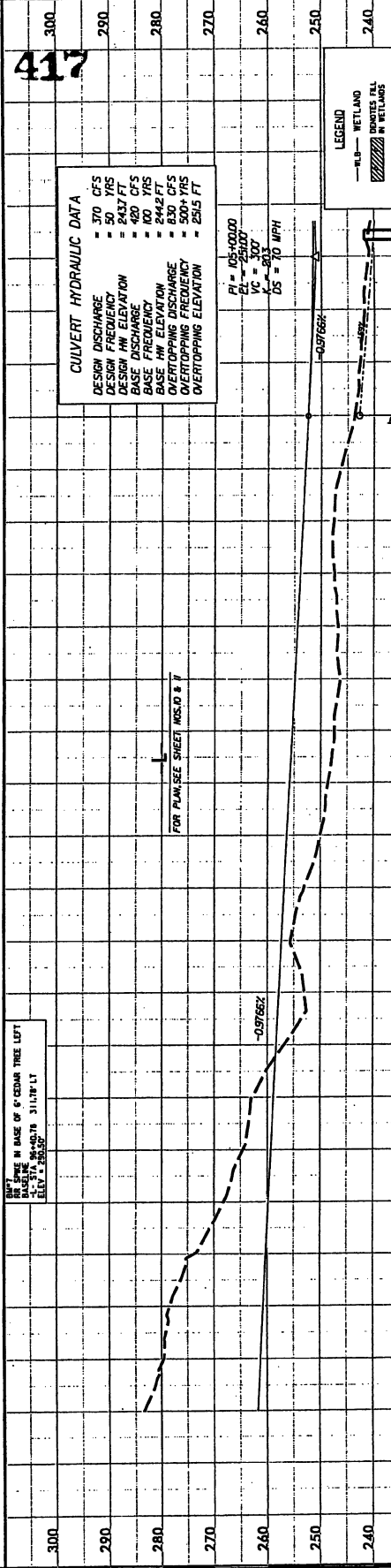
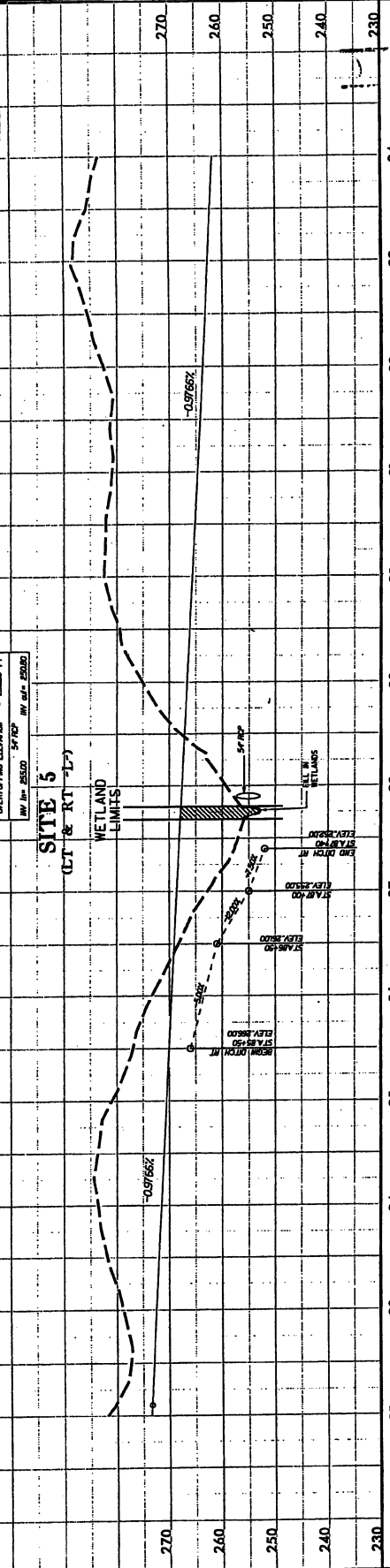
KO & ASSOCIATES, P.C.
 Consulting Engineers
 A Pharras & Bruckman, Inc. Company
 1111 JOHNSON WAY, SUITE 100, LITTLE ROCK, AR 72207
 (501) 331-2200

SHEET NO.
29
 OF 30

PRELIMINARY PLANS
 FOR THE PROPOSED
Permit Drawing
 Sheet **22** of **41**

PIPE HYDRAULIC DATA
 STA. 4+80.00 - 4+90.00
 DRAINAGE AREA
 • 572 AC
 • 50 YRS
 DESIGN DISCHARGE
 • 400 CFS
 • 100 YRS
 DESIGN DISCHARGE
 • 400 CFS
 100 YEAR ASSURANCE
 DESIGN DISCHARGE
 • 400 CFS
 100 YEAR AN ELEVATION
 • 260.0 FT
 OVERTOPPING FREQUENCY
 • 100+ YRS
 OVERTOPPING ELEVATION
 • 265.0 FT

10' PINE TREE IN BASE OF
 OF 10' PINE TREE 310.31 FT
 ELEV. 265.0 FT



CULVERT HYDRAULIC DATA

DESIGN DISCHARGE	370 CFS
DESIGN FREQUENCY	50 YRS
DESIGN HW ELEVATION	243.7 FT
BASE DISCHARGE	400 CFS
BASE FREQUENCY	100 YRS
BASE HW ELEVATION	244.2 FT
OVERTOPPING FREQUENCY	500+ YRS
OVERTOPPING ELEVATION	254.5 FT

PI = 05+00.00
 CL = 300.00
 R = 30.00
 OS = 70 MPH

LEGEND
 - - - - - WETLAND
 --- --- --- DITCHES ALL
 --- --- --- IN PERMANENT

NC DOT
 DIVISION OF HIGHWAYS
 LEE COUNTY
 PROJECT: 44611 (R-2017A)
 US 41-NC 87 SANFORD
 BYPASS FROM WEST
 OF US 140 TO WEST

SHEET **22** OF **41**

5/28/23

2/8/2009

PROJECT REFERENCE NO. **R-2477AA**
 SHEET NO. **12**
 ROADWAY DESIGN
 HYDRAULICS
 STRUCTURES

KO & ASSOCIATES, P.C.
 Consulting Engineers
 A Florence & Beaufort, Inc. Company
 201 Landon Way, Durham, NC 27708
 919.286.1200

PRELIMINARY PLANS
 DO NOT USE FOR CONSTRUCTION

Permit Drawing
 Sheet **23** of **41**

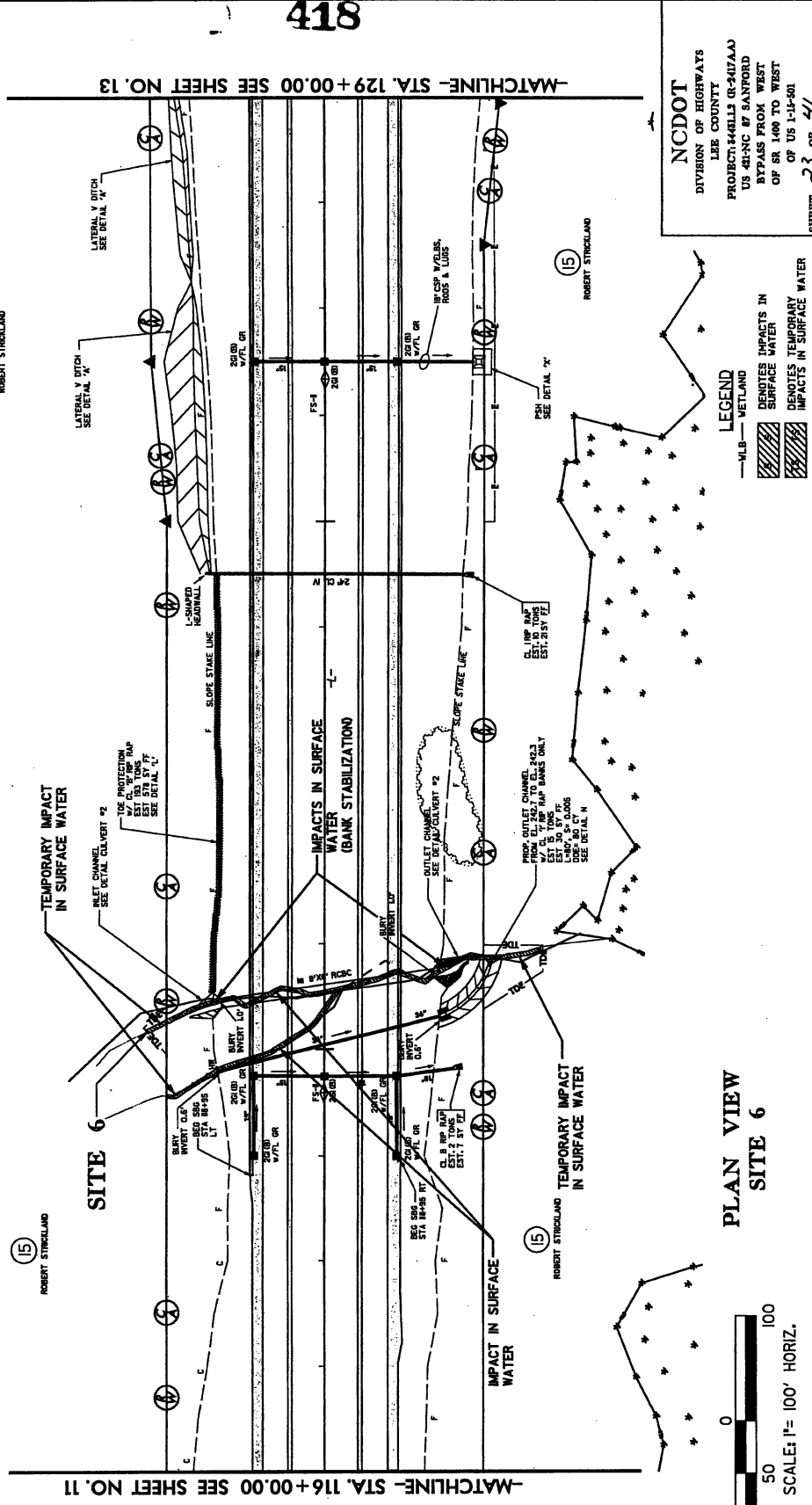


418

NC DOT
 DIVISION OF HIGHWAYS
 LEE COUNTY
 PROJECT: 146113 (R-2477AA)
 US 41-NC AT SANFORD
 BYPASS FROM WEST
 OF SR 1400 TO WEST
 OF US 1-15-001

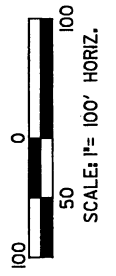
SHEET **23** OF **41**

NC GRID / NAD 83



LEGEND
 ---MLB--- WETLAND
 [Hatched Box] DENOTES IMPACTS IN SURFACE WATER
 [Cross-hatched Box] DENOTES TEMPORARY IMPACTS IN SURFACE WATER

PLAN VIEW
SITE 6



PROJECT REFERENCE NO. R-2177AA	SHEET NO. 12
CONTRACT NO. 100-100-0000	DATE 10/20/00
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	

KO & ASSOCIATES, P.C.
 Consulting Engineers
 A Wisconsin & North Carolina Limited Liability Company
 1421 WILSON ROAD, SUITE 100, RALEIGH, NC 27607
 919-877-0200

Permit Drawing
 Sheet 24 of 44

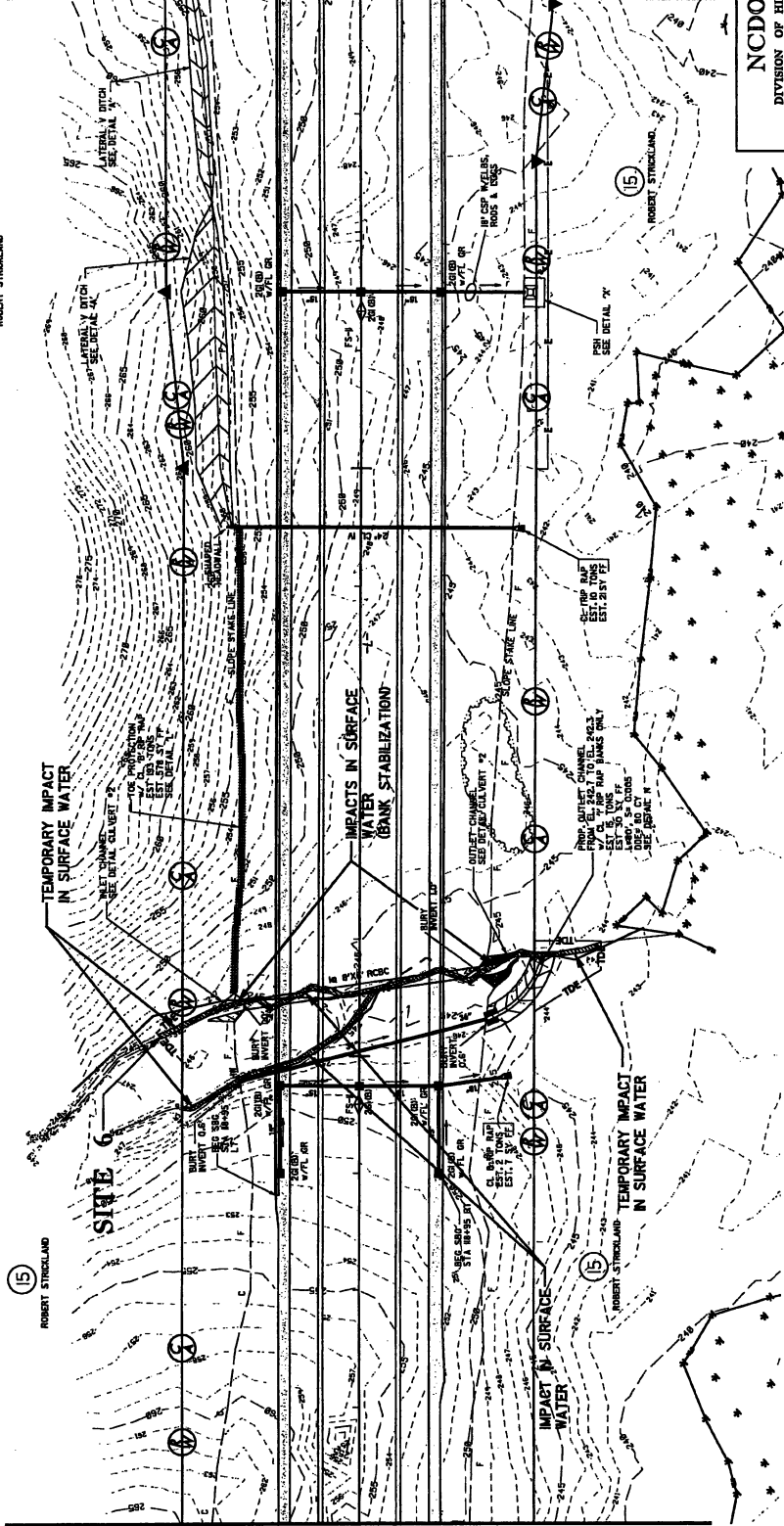


NC GRID NAD 83

419

-MATCHLINE- STA. 129+00.00 SEE SHEET NO. 13

-MATCHLINE- STA. 116+00.00 SEE SHEET NO. 11

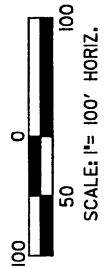


NC DOT
 DIVISION OF HIGHWAYS
 LEE COUNTY
 PROJECT: 446LL3 (R-2177AA)
 US 421-NC 87 SANFORD
 BYPASS FROM WEST
 OF SR 1400 TO WEST
 OF US 1-15-00L

SHEET 24 OF 44

- LEGEND**
- WLB— WETLAND
 - DENOTES IMPACTS IN SURFACE WATER
 - DENOTES TEMPORARY IMPACTS IN SURFACE WATER

PLAN VIEW
 SITE 6



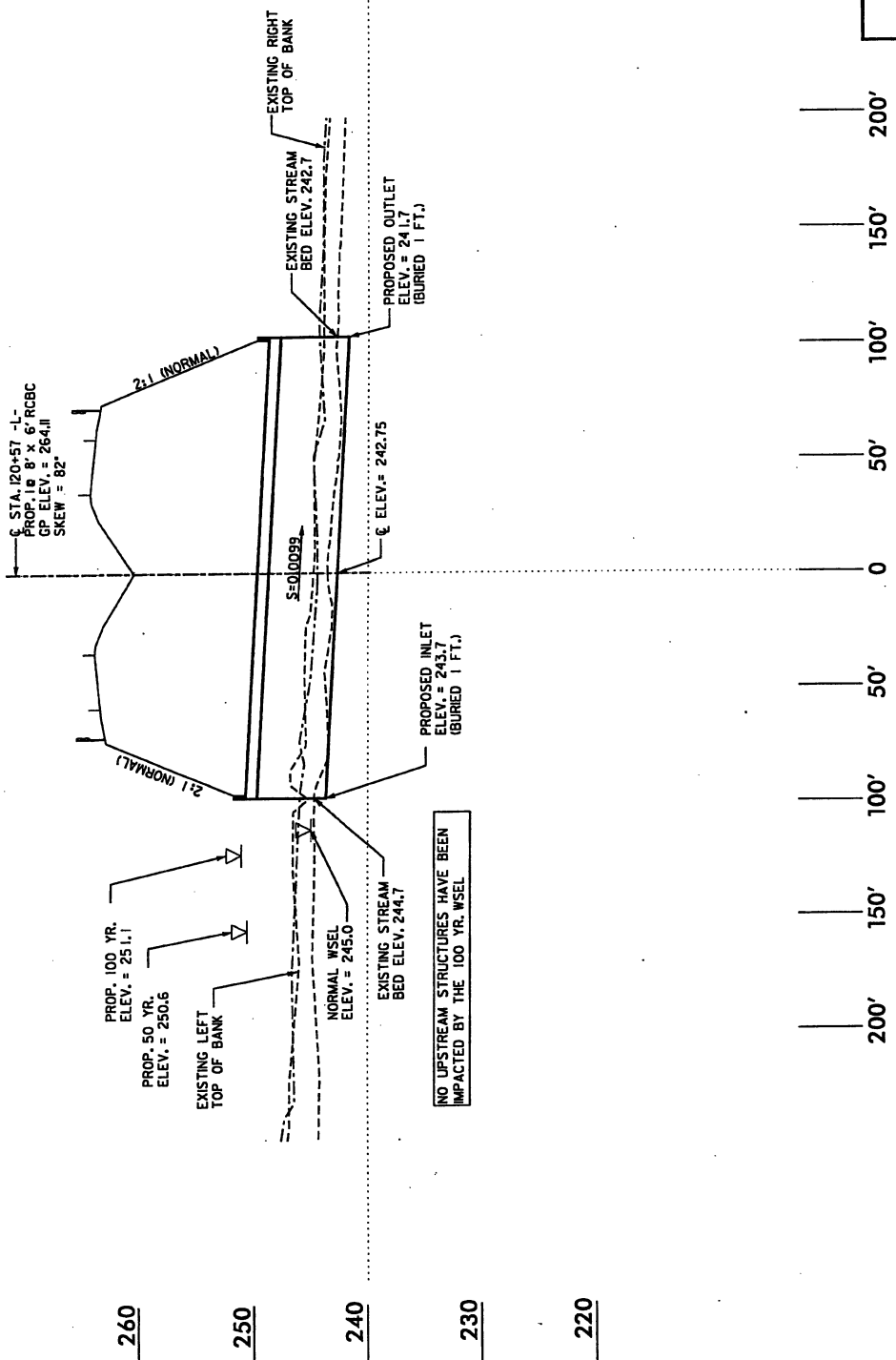
PROJECT REFERENCE NO. **F-247AA** SHEET NO. **56-PAS**
 HYDRAULICS
 EXISTING DESIGN
 SOURCE
 PRELIMINARY PLANS
 FOR THE WEST
 CONSTRUCTION

Permit Drawing
 Sheet 25 of 41

420



NCDOT
 DIVISION OF HIGHWAYS
 LEE COUNTY
 PROJECT: 3448112 (R-247AA)
 US 421-NC 87 SANFORD
 BYPASS FROM WEST
 OF SR 1400 TO WEST
 OF US 1-15-501
 SHEET 25 OF 41
 5/15/06



**PROFILE ALONG STRUCTURE
 SITE 6**

SCALE:
 1" = 50' HORIZONTAL
 1" = 10' VERTICAL

PROJECT REFERENCE NO. R-247/AL
 SHEET NO. 41
 DATE 10/15/03
 PREPARED BY
 CHECKED BY
 APPROVED BY

KO & ASSOCIATES, P.C.
 Consulting Engineers
 A Firmness & Stinchcomb, Inc. Company
 111 S. LENOX ROAD, SUITE 100, RALEIGH, N.C. 27601
 (919) 871-0000

PRELIMINARY PLANS
 FOR THE
 CONSTRUCTION

Permit Drawing
 Sheet 27 of 41



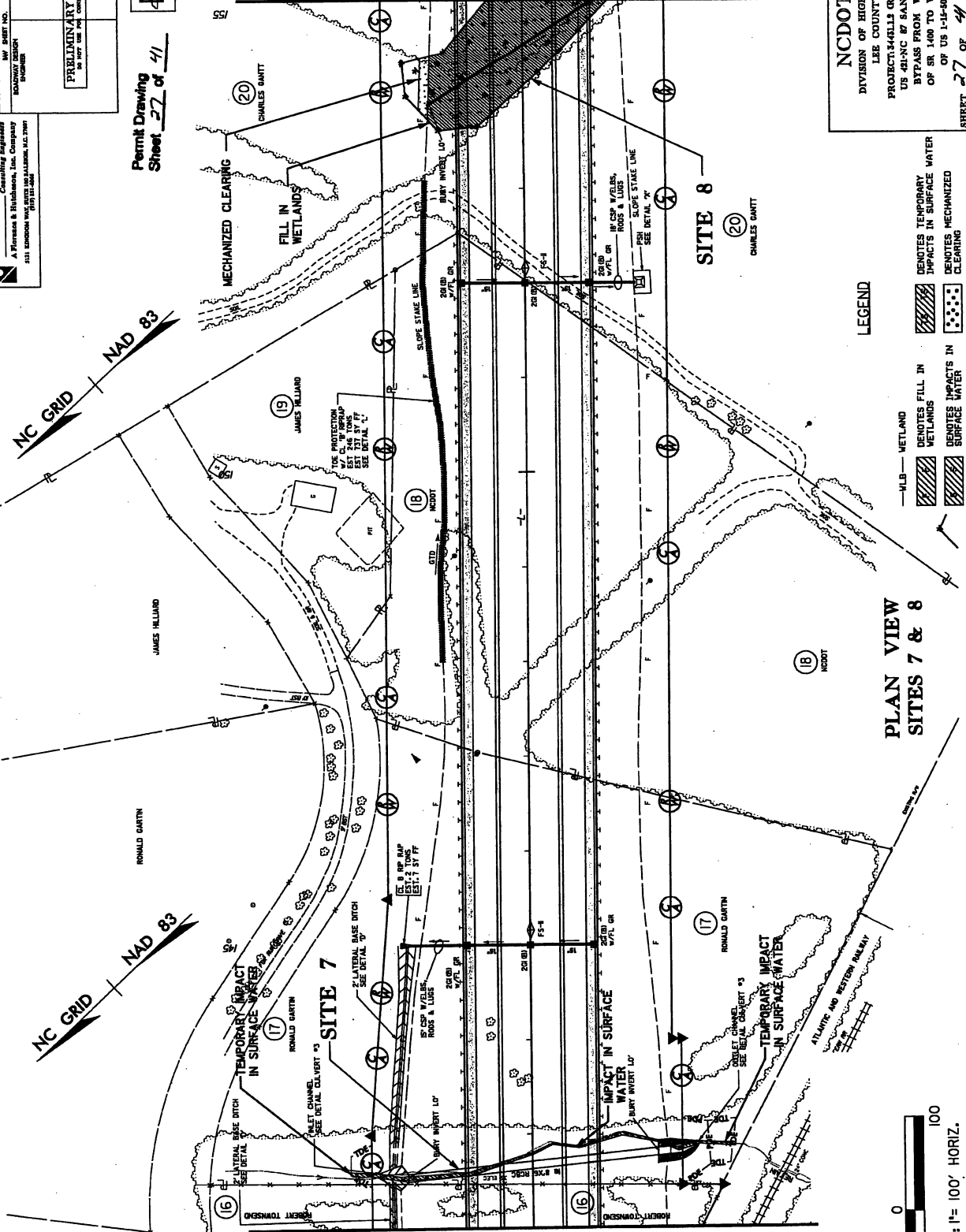
422

MATCHLINE- STA. 155+00.00 SEE SHEET NO. 15

MATCHLINE- STA. 142+00.00 SEE SHEET NO. 13

NC GRID NAD 83

NC GRID NAD 83

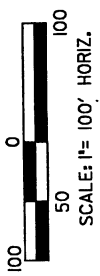


NC DOT
 DIVISION OF HIGHWAYS
 LEE COUNTY
 PROJECT: 34613 GR-347AA
 US 41-NC BY SANFORD
 BYPASS FROM WEST
 OF SR 1400 TO WEST
 OF US 1-15-401
 SHEET 27 OF 41

LEGEND

- WETLAND
- WETLANDS
- IMPACTS IN SURFACE WATER
- MECHANIZED CLEARING
- FILL IN WETLANDS
- IMPACTS IN SURFACE WATER
- TEMPORARY IMPACTS IN SURFACE WATER

**PLAN VIEW
 SITES 7 & 8**



PROJECT REFERENCE NO. **423**
 SHEET NO. **14**
 DATE **1/14**
 DRAWN BY **W. J. HARRIS**
 CHECKED BY **W. J. HARRIS**
 APPROVED BY **W. J. HARRIS**

KO & ASSOCIATES, P.C.
 Consulting Engineers
 A Parsons & Brinckerhoff, Inc. Company
 5111 BRIDGEMAN WAY, SUITE 100, RALEIGH, N.C. 27607
 (919) 871-3000

PRELIMINARY PLANS
 AS SHOWN ON THESE DRAWINGS

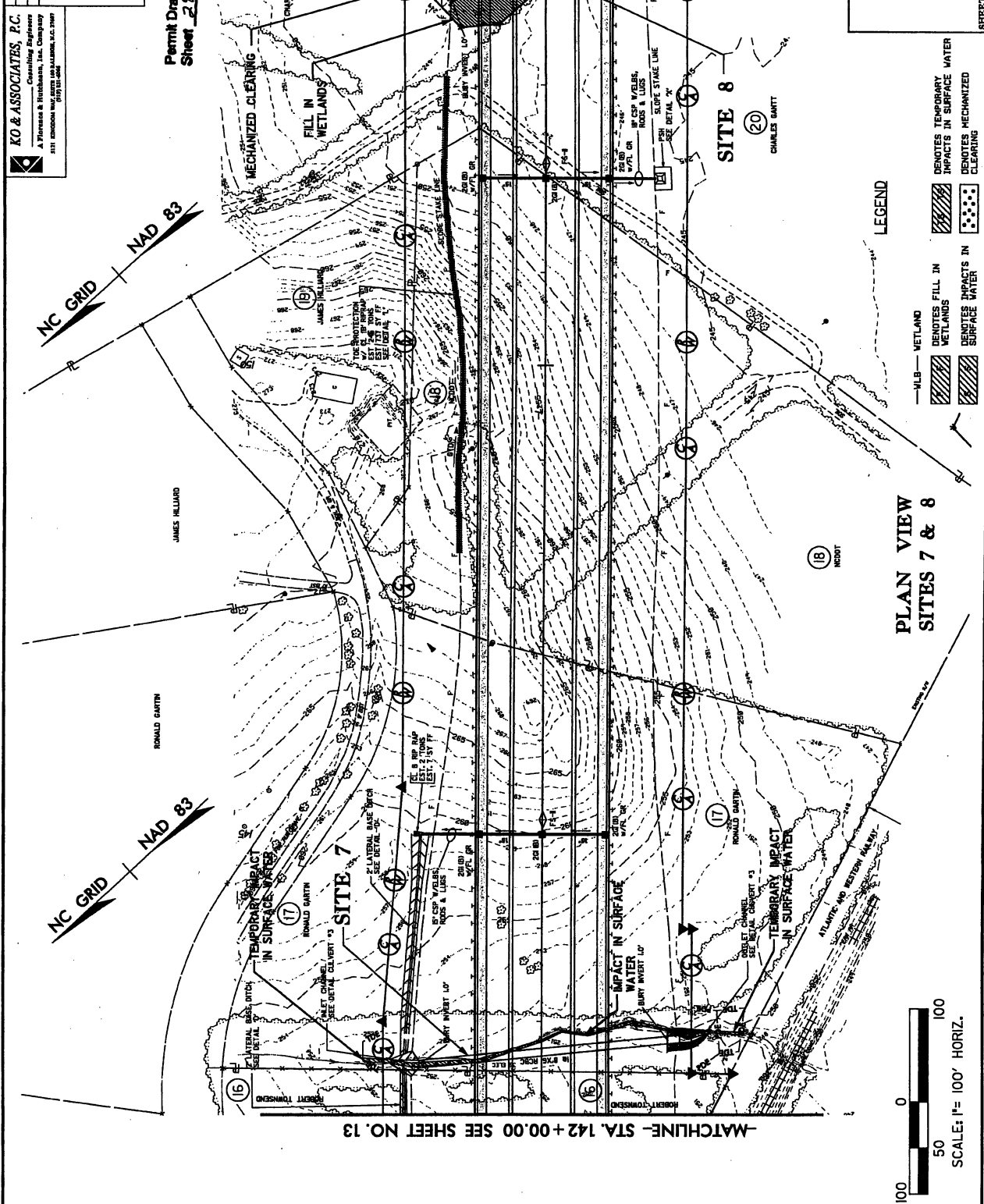


Permit Drawing
 Sheet **23** of **41**

MATCHLINE- STA. 155+00.00 SEE SHEET NO. 15

423

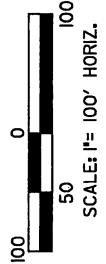
NCDOT
 DIVISION OF HIGHWAYS
 LEE COUNTY
 PROJECT: 44613 (R-247AA)
 US 41-NC BY SANFORD
 BYPASS FROM WEST
 OF SR 1400 TO WEST
 OF US 1-15-01
 SHEET **23** OF **41**



LEGEND

- HLB— WETLAND
- Denotes FILL IN WETLANDS
- Denotes IMPACTS IN SURFACE WATER
- Denotes TEMPORARY IMPACTS IN SURFACE WATER
- Denotes MECHANIZED CLEARING

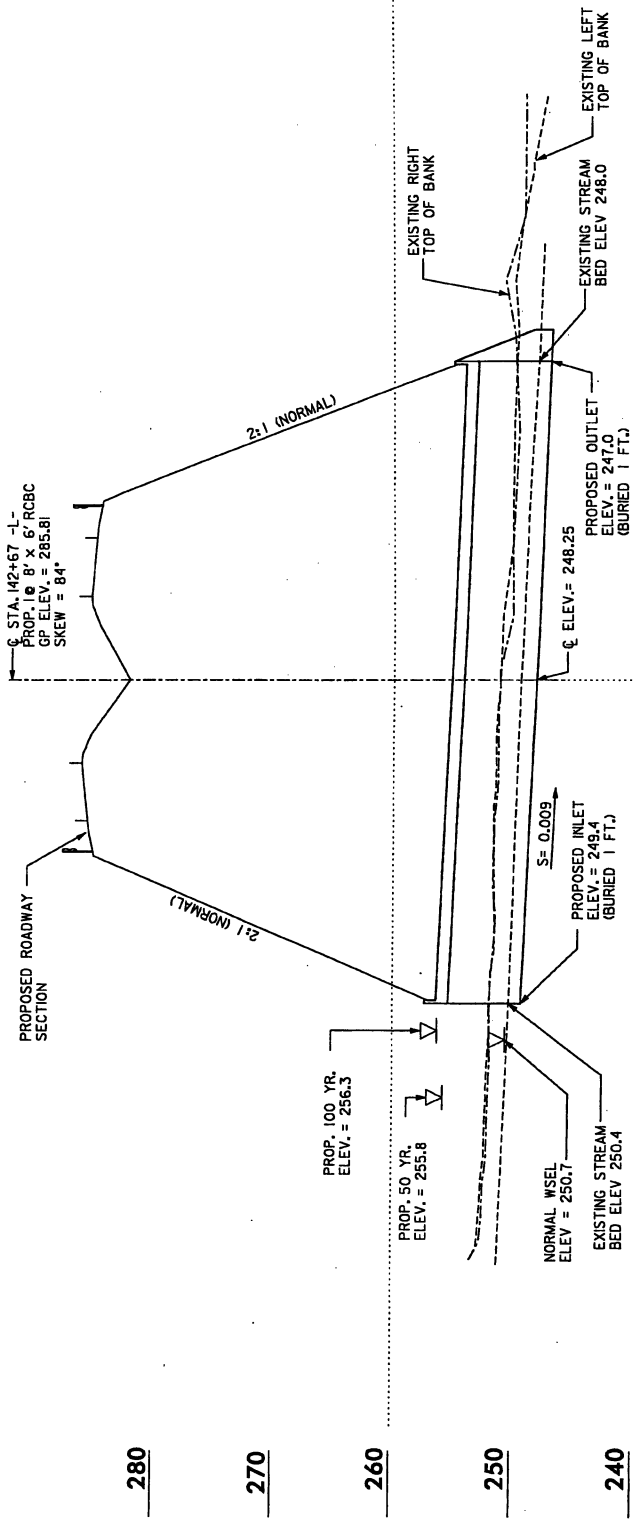
**PLAN VIEW
 SITES 7 & 8**



MATCHLINE- STA. 142+00.00 SEE SHEET NO. 13

PROJECT REFERENCE NO. **R-2417AA**
 SHEET NO. **ST-PAS**
 DIVISION OF HIGHWAYS
 LEES COUNTY
 PRELIMINARY PLANS
 NOT FOR CONSTRUCTION

Permit Drawing
 Sheet **29** of **41**
280



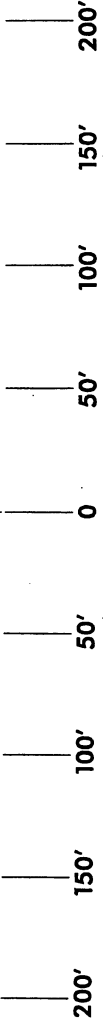
280

270

260

250

240



SCALE:
 1" = 50' HORIZONTAL
 1" = 10' VERTICAL

**PROFILE ALONG STRUCTURE
 SITE 7**

NC DOT
 DIVISION OF HIGHWAYS
 LEE COUNTY
 PROJECT: 3445L12 (R-2417AA)
 US 421-NC BY SANFORD
 BYPASS FROM WEST
 OF SR 1400 TO WEST
 OF US 1-15-501
 SHEET **29** OF **41**
 5/5/06

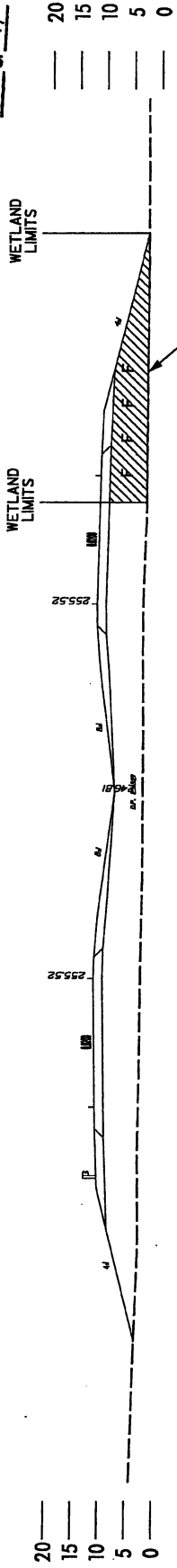


424

PROJECT REFERENCE NO. R-2417AA
 SHEET NO. B-7PL
 PRELIMINARY PLANS
 FOR THE USE OF CONSTRUCTION

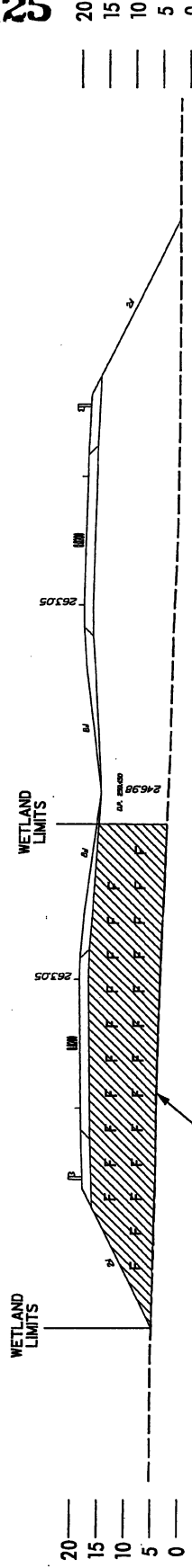


Permit Drawing
 Sheet 30 of 41

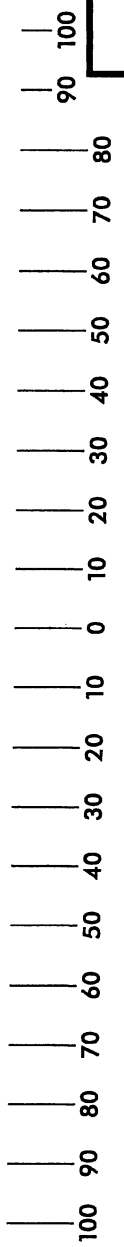


STA. 158+00 RT
 EL=244.00

425



STA. 154+00
 EL=244.00



LEGEND
 — WLB — WETLAND
 DENOTES FILL
 IN WETLAND

**TYPICAL X-SECTIONS
 SITE 8**

NCDOT
 DIVISION OF HIGHWAYS
 LEE COUNTY
 PROJECT: 3446119 (R-2417AA)
 US 421-NC 87 SANFORD
 BYPASS FROM WEST
 OF SR 1400 TO WEST
 OF US 1-15-601

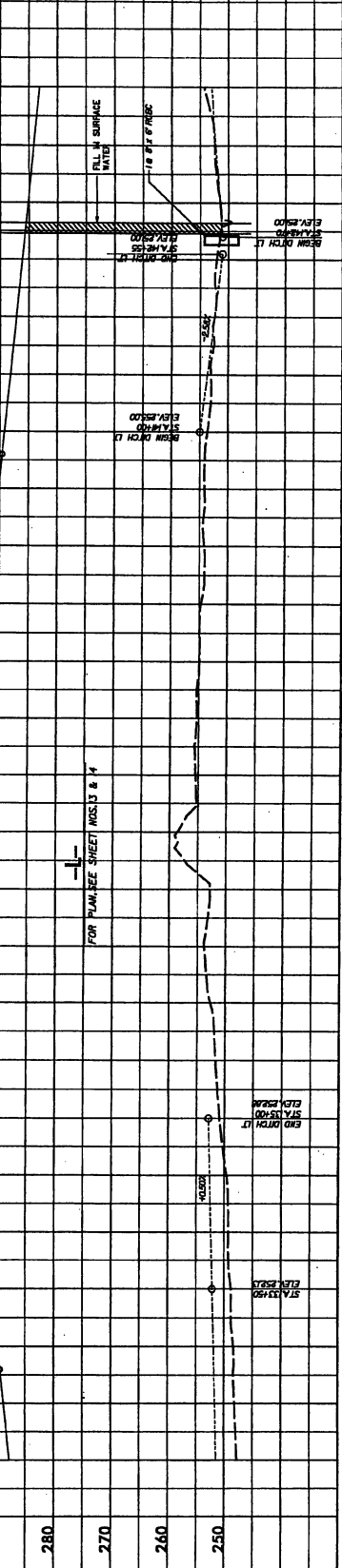
SHEET 30 OF 41

KO & ASSOCIATES, P.C.
 Consulting Engineers
 A Florence & Fitzhugh, Inc. Company
 111 Florence Station, Raleigh, N.C. 27601
 TEL. (919) 835-4400

SITE 7
 (LT & RT -1-)

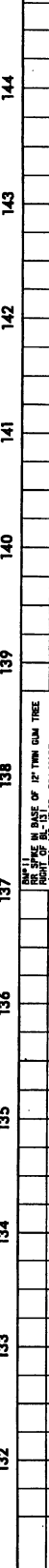
CULVERT HYDRAULIC DATA

DESIGN DISCHARGE	= 300 CFS
DESIGN FREQUENCY	= 50 YRS
DESIGN HW ELEVATION	= 255.8 FT
BASE ELEVATION	= 254.0 FT
BASE FREQUENCY	= 100 YRS
DESIGN DISCHARGE	= 256.3 FT
DESIGN HW ELEVATION	= 550 CFS
OVERTOPPING FREQUENCY	= 500 YRS
OVERTOPPING ELEVATION	= 260.0 FT



FOR PLANS SEE SHEETS NOS. 1 & 4

FOR PLAN SEE SHEETS NOS. 1 & 4



FOR PROFILE SEE SHEETS NOS. 1 & 4

SITE 8
 (LT & RT -1-)

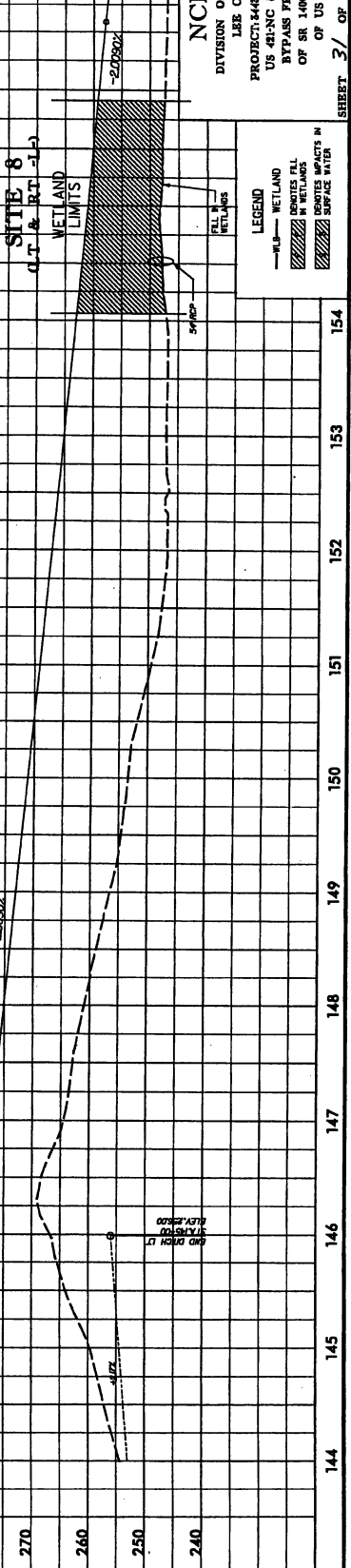
WETLAND LIMITS

PIPE HYDRAULIC DATA

DRAINAGE AREA	= 600 AC
DESIGN DISCHARGE	= 745 CFS
DESIGN FREQUENCY	= 50 YRS
DESIGN HW ELEVATION	= 257.7 CFS
10 YEAR FLOOD	= 255.3 FT
50 YEAR FLOOD	= 258.9 FT
100 YEAR FLOOD	= 260.0 FT
OVERTOPPING DISCHARGE	= 400 CFS
OVERTOPPING ELEVATION	= 260.0 FT

LEGEND

- W-L - WETLAND
- ELL - ELIPSE SURFACE WATER



FOR PLANS SEE SHEETS NOS. 1 & 4

FOR PROFILE SEE SHEETS NOS. 1 & 4

PROJECT REFERENCE NO. **A-2477A**
 SHEET NO. **15**
 CONTRACTOR: **WYMAN BROS. ENGINEERS**
PRELIMINARY PLANS
 FOR **NOT FOR CONSTRUCTION**

KO & ASSOCIATES, P.C.
 Consulting Engineers
 A Pittman & Brantcomb, Inc. Company
 3111 SANDHOG ROAD, SUITE 200, RALEIGH, N.C. 27617
 (919) 211-4000

Permit Drawing
 Sheet **32** of **41**



427

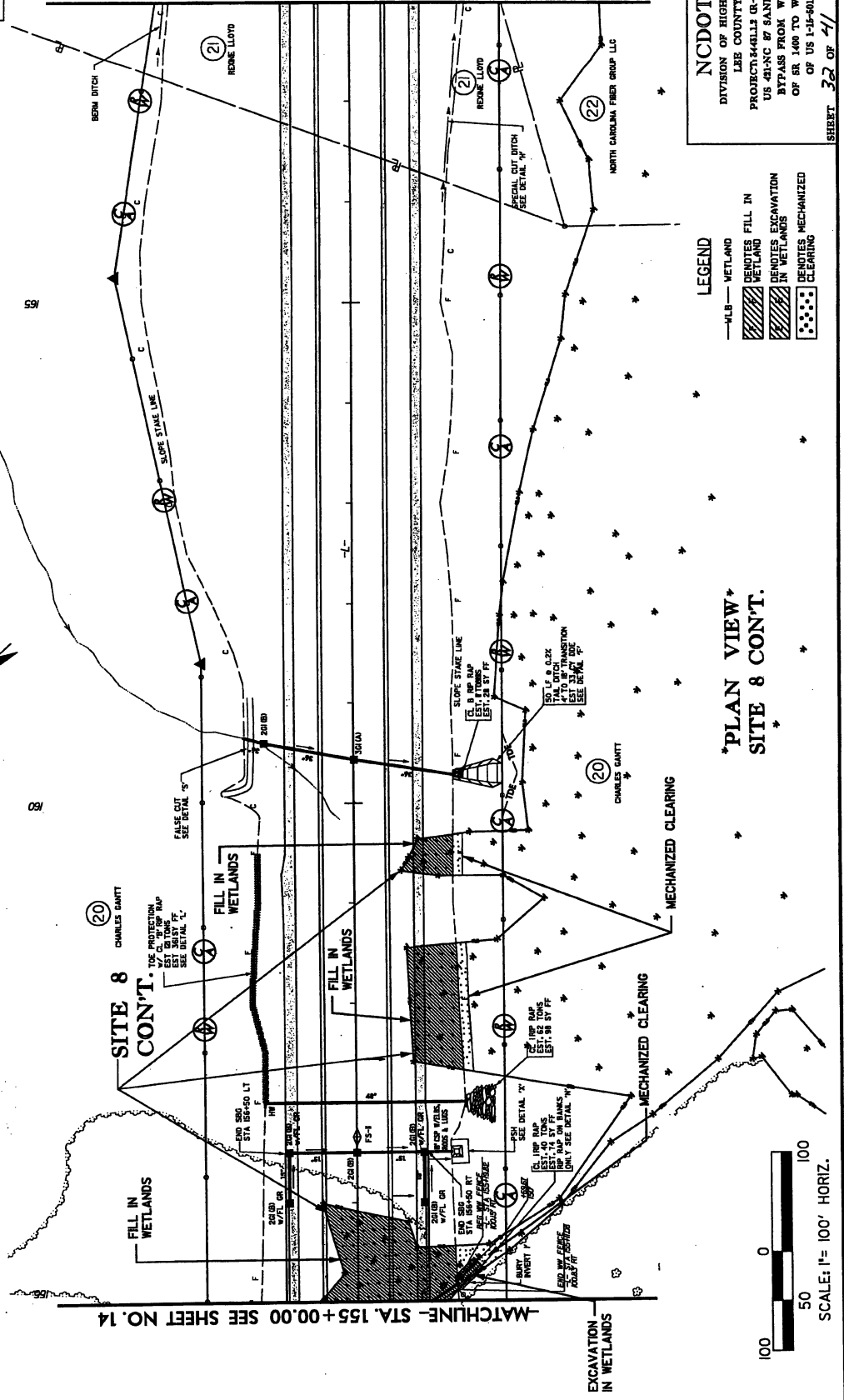
-MATCHLINE- STA. 168+00.00 SEE SHEET NO. 16

NCDOT
 DIVISION OF HIGHWAYS
 LEE COUNTY
 PROJECT 344116 G-3477A-A
 US 41-NC BY SANFORD
 BYPASS FROM WEST
 OF SR 1400 TO WEST
 OF US 1-15-801
 SHEET **32** OF **41**

LEGEND

- ULB— WETLAND
- ▨ DENOTES FILL IN WETLAND
- ▨ DENOTES EXCAVATION IN WETLAND
- DENOTES MECHANIZED CLEARING

NC GRID NAD 83



PLAN VIEW
 SITE 8 CONT.

100 0 50 100
 SCALE: 1" = 100' HORIZ.

PROJECT REFERENCE NO. R-2474A
 SHEET NO. 15
 PRELIMINARY PLANS
 FOR THE
 CONSTRUCTION OF
 THE
 I-85
 BRIDGE
 OVER
 THE
 CATAWBA
 RIVER

KO & ASSOCIATES, P.C.
 Consulting Engineers
 A Florence & Hitchcock, Inc. Company
 211 Easton Way
 Charlotte, N.C. 28202

PERMIT DRAWING
 SHEET 33 OF 41

428

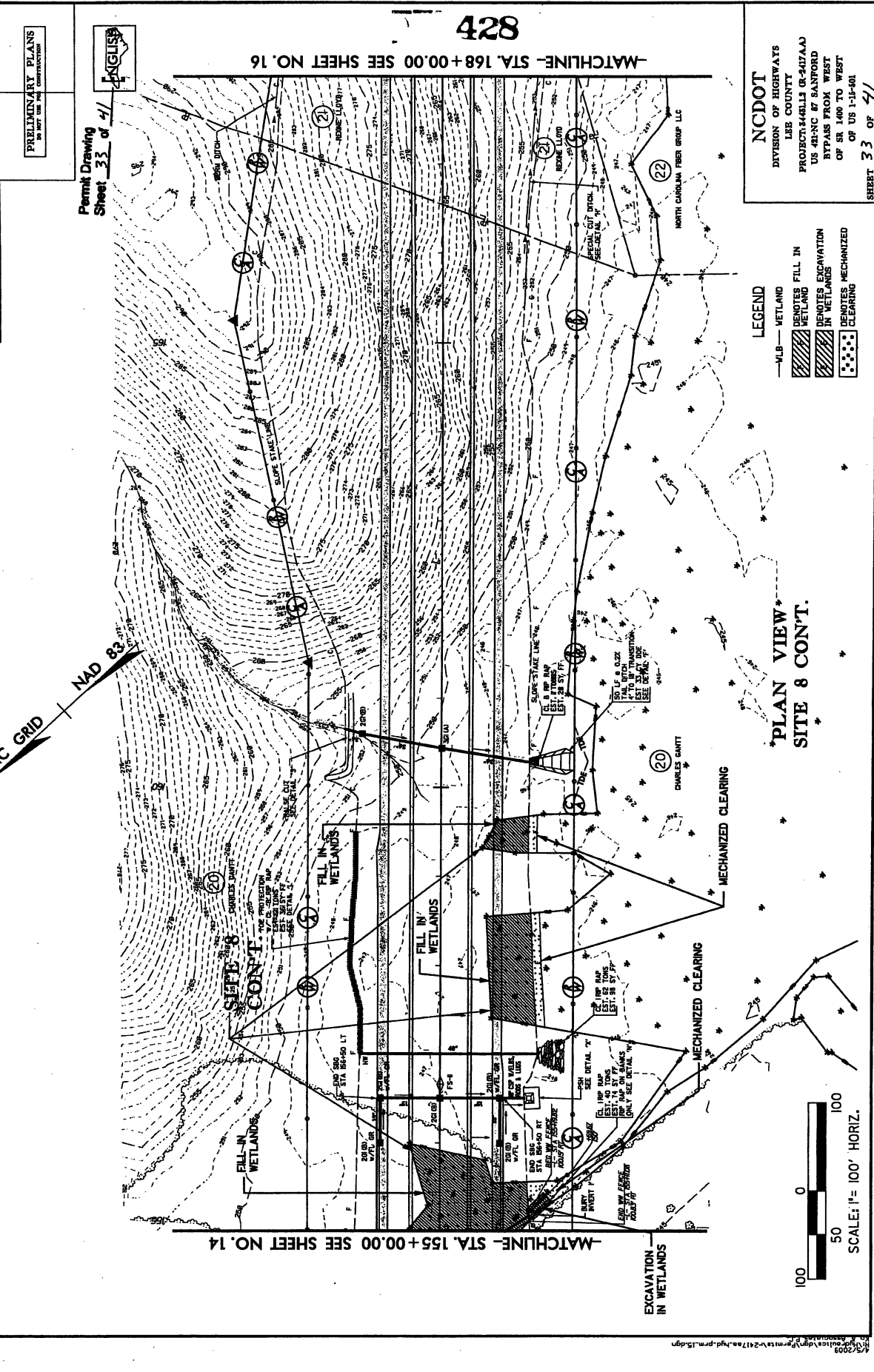
MATCHLINE - STA. 168+00.00 SEE SHEET NO. 16

MATCHLINE - STA. 155+00.00 SEE SHEET NO. 14

NC GRID NAD 83

LEGEND
 -MLB- WETLAND
 DENOTES FILL IN WETLANDS
 DENOTES EXCAVATION IN WETLANDS
 DENOTES MECHANIZED CLEARING

SCALE: 1" = 100' HORIZ.
 0 50 100



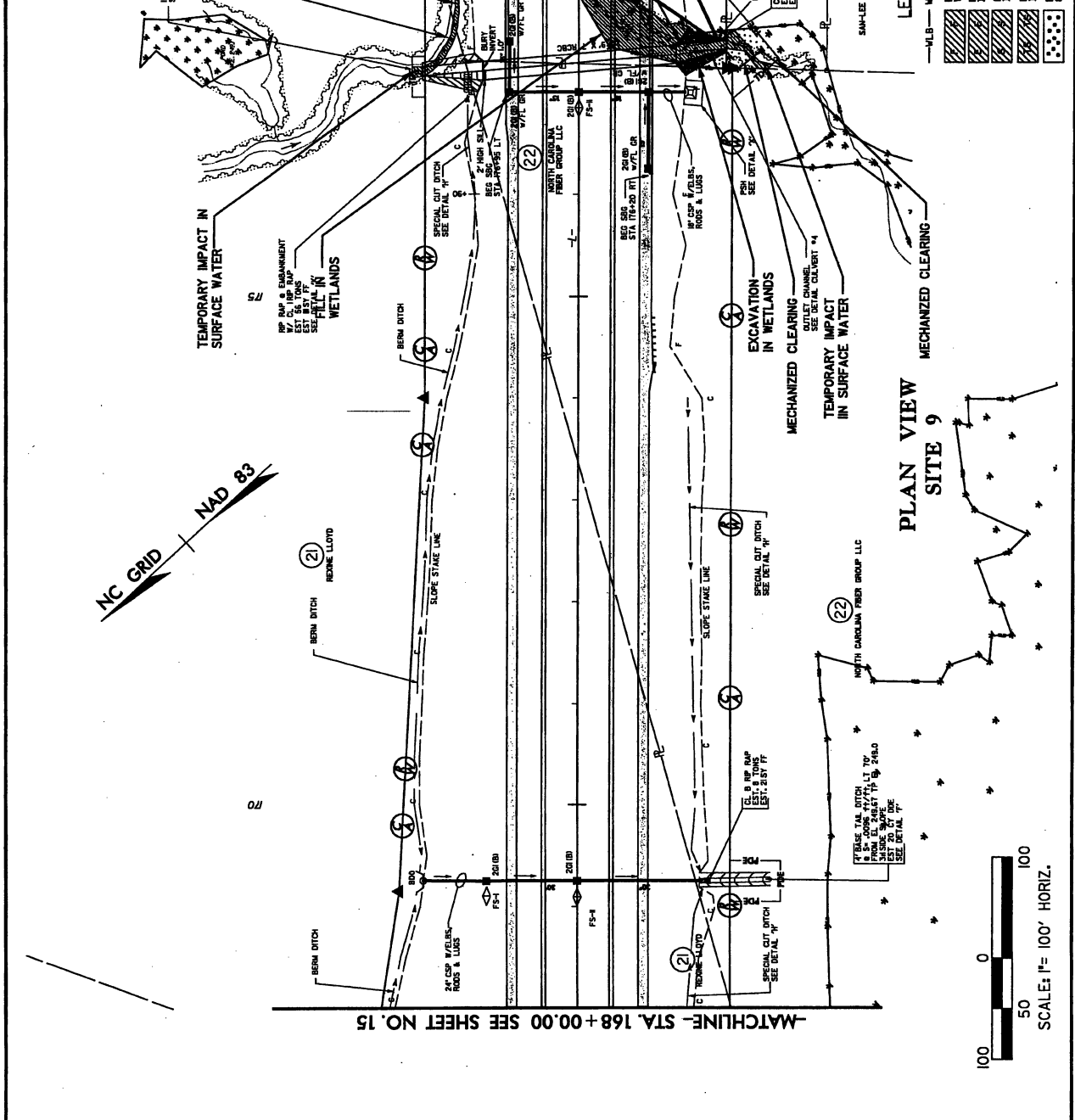
PROJECT REFERENCE NO. R-247AA
 SHEET NO. 16
 HYDRAULIC ENGINEER
 PRELIMINARY PLANS
 BY NCE FOR THE CONTRACTOR

KO & ASSOCIATES, P.C.
 Consulting Engineers
 A. Pittman & Hutchison, Inc. Company
 151 ANSONSON WING DRIVE, SUITE 100, WILMINGTON, NC 28403
 (910) 762-1100

Permit Drawing
 Sheet 34 of 41
 ENGLISH

429

NC DOT
 DIVISION OF HIGHWAYS
 LEE COUNTY
 PROJECT: 44-113 (0-247AA)
 US 421-NC AT SAINFORD
 BYPASS FROM WBST
 OF SR 1400 TO WEST
 OF US 1-31-401
 SHEET 34 OF 41



LEGEND

- WETLAND
- WETLAND EXCAVATION
- EXCAVATION IN WETLAND
- IMPACTS IN SURFACE WATER
- TEMPORARY IMPACTS IN SURFACE WATER
- MECHANIZED CLEARING

SCALE: 1" = 100' HORIZ.
 0 50 100

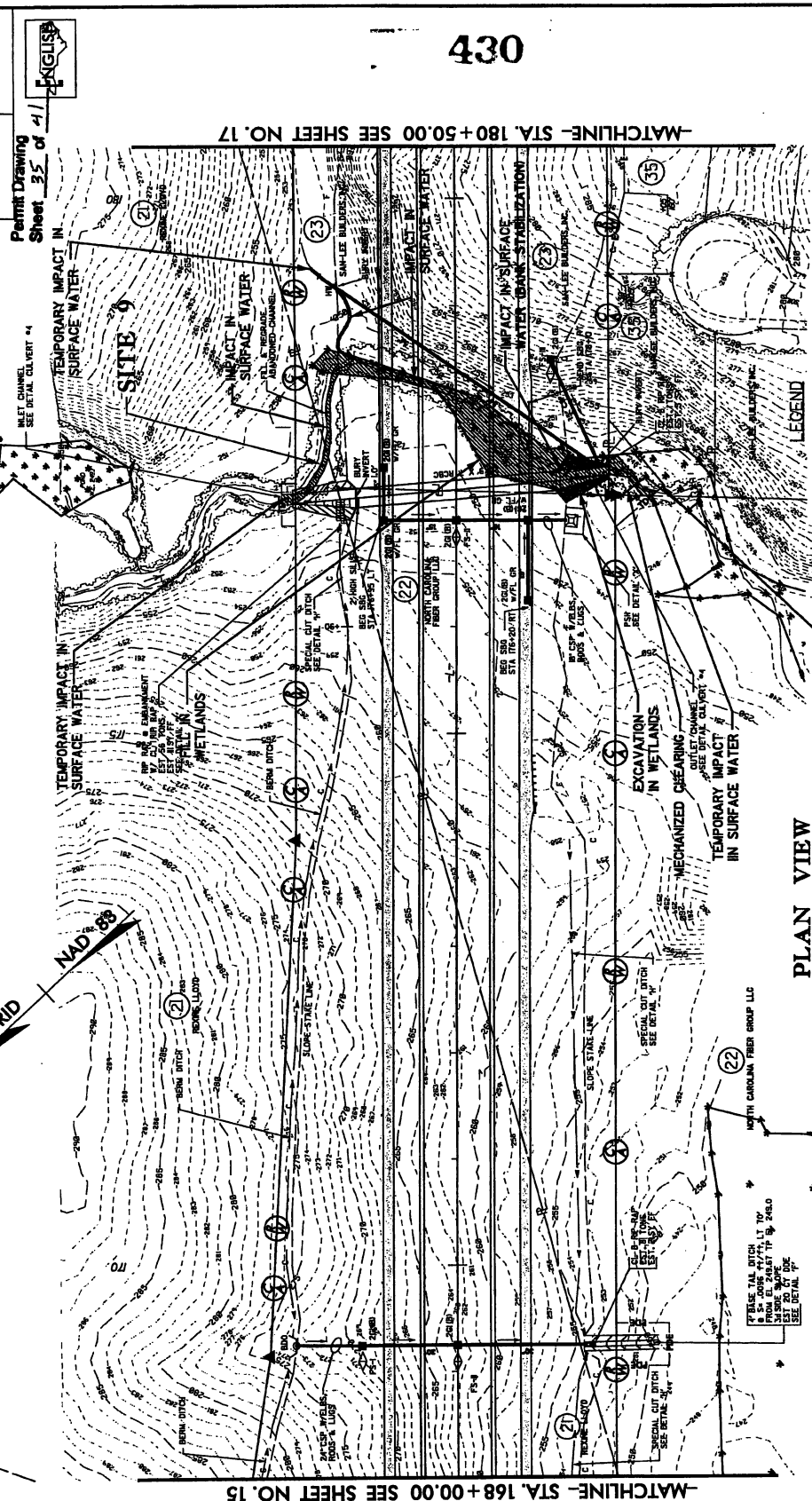
12-6-05 Changed portion of Parcel 23 to Parcel 35 - Revised RW & TCE on Parcel 35
 12/2/2005
 8/17/99

KO & ASSOCIATES, P.C.
 Consulting Engineers
 A Plimosa & Brachmann, Inc. Company
 111 WOODROW WILSON BLVD. WILMINGTON, N.C. 28401
 910-331-4400

PROJECT NUMBER NO. **F-2173A**
 SHEET NO. **35**
 DRAWN BY **HYDRAULICS ENGINEER**

PERMIT DRAWING
 SHEET **35** OF **41**

PRELIMINARY PLANS
 FOR THE STATE OF NORTH CAROLINA



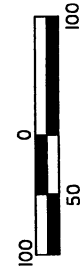
NCDOT
 DIVISION OF HIGHWAYS
 LEE COUNTY
 PROJECT: 446LL3 GR-447AAJ
 US 421 NC BY SANFORD
 BYPASS FROM WEST
 OF SR 1409 TO WEST
 OF US 1-41-801

SHEET **35** OF **41**

LEGEND

- WETLANDS FILL IN
- DEMOTES EXCAVATION IN WETLAND
- DEMOTES IMPACTS IN SURFACE WATER
- DEMOTES TEMPORARY IMPACTS IN SURFACE WATER
- DEMOTES MECHANIZED CLEARING

**PLAN VIEW
 SITE 9**



SCALE: 1" = 100' HORIZ.

12-4-06 Changed Portion of Parcel 23 to Parcel 25 - Revised MW & TCE on Parcel 25
 8/17/99

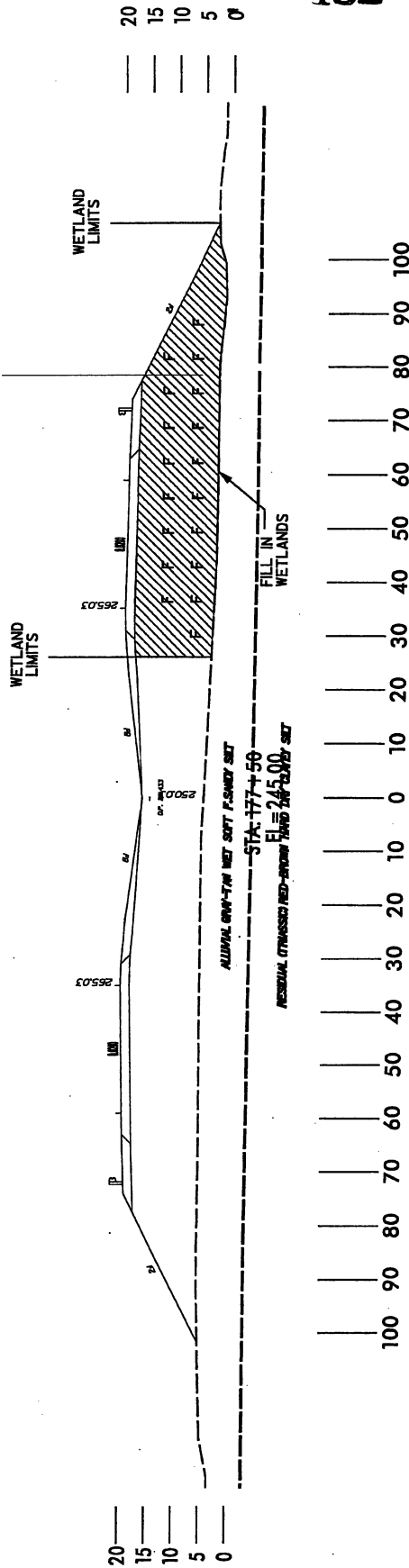


PROJECT NUMBER NO. 8-2471A
 ENGINEER ROADWAY DESIGN
 DATE 9-27-11
 TOPOGRAPHIC ENGINEER

PRELIMINARY PLANS
 FOR PERMIT AND FOR CONSTRUCTION

Permit Drawing
 Sheet 36 of 41

431



NCDOT
 DIVISION OF HIGHWAYS
 LEE COUNTY
 PROJECT: 3448LL2 (R-2417AA)
 US 421-NC 87 SANFORD
 BYPASS FROM WEST
 OF SR 1400 TO WEST
 OF US 1-15-501
 SHEET 36 OF 41

**TYPICAL X-SECTIONS
 SITE 9**

LEGEND
 — WLB — WETLAND
 DENOTES FILL
 IN WETLAND

PROJECT REFERENCE NO. **H-2477AA**
 ROADWAY DESIGN ENGINEER
 HYDRAULICS ENGINEER
PRELIMINARY PLANS
 NOT FOR CONSTRUCTION

SHEET NO. **59-PAS**
 DIVISION OF HIGHWAYS

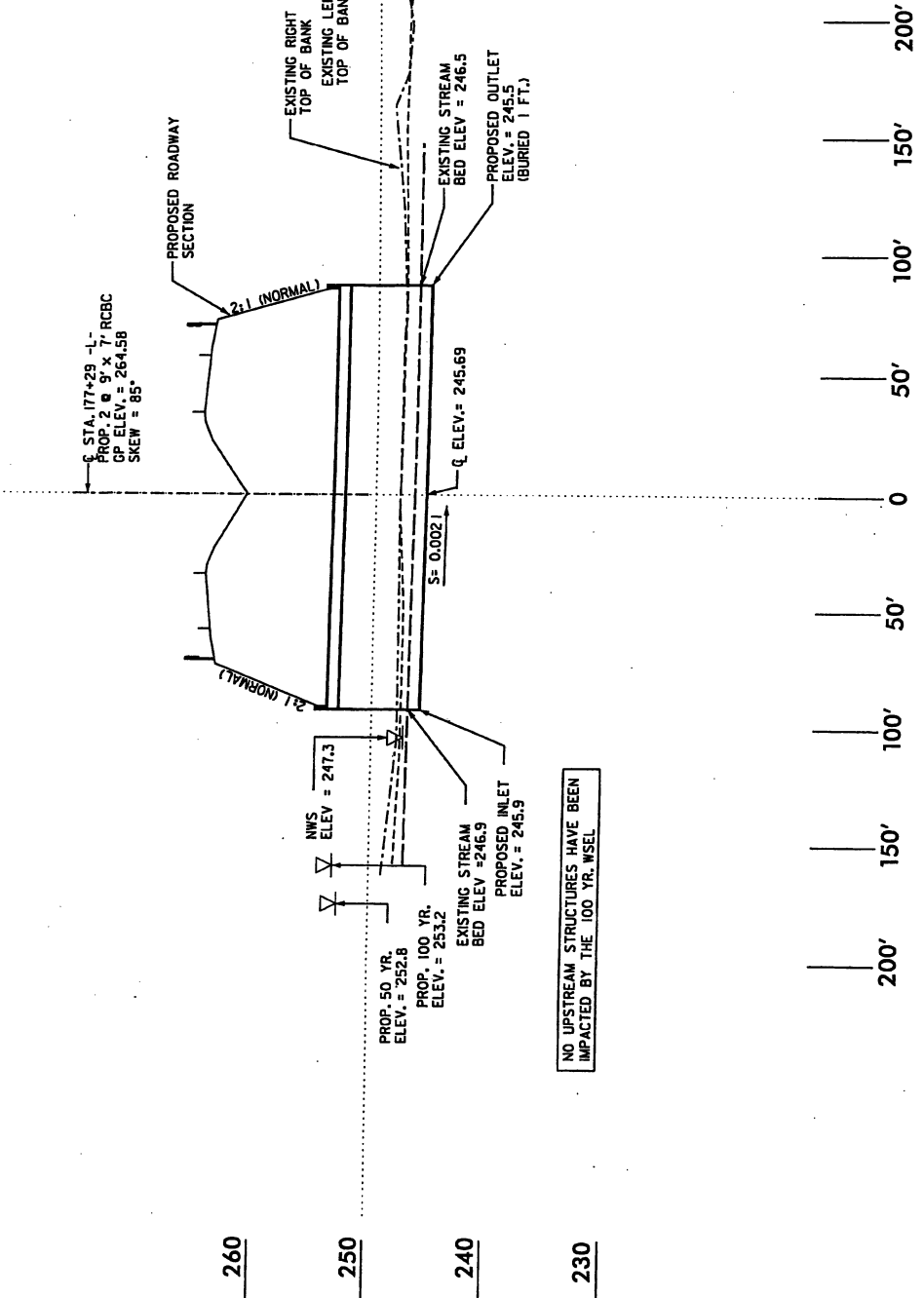
Permit Drawing
 Sheet **37** of **41**

432



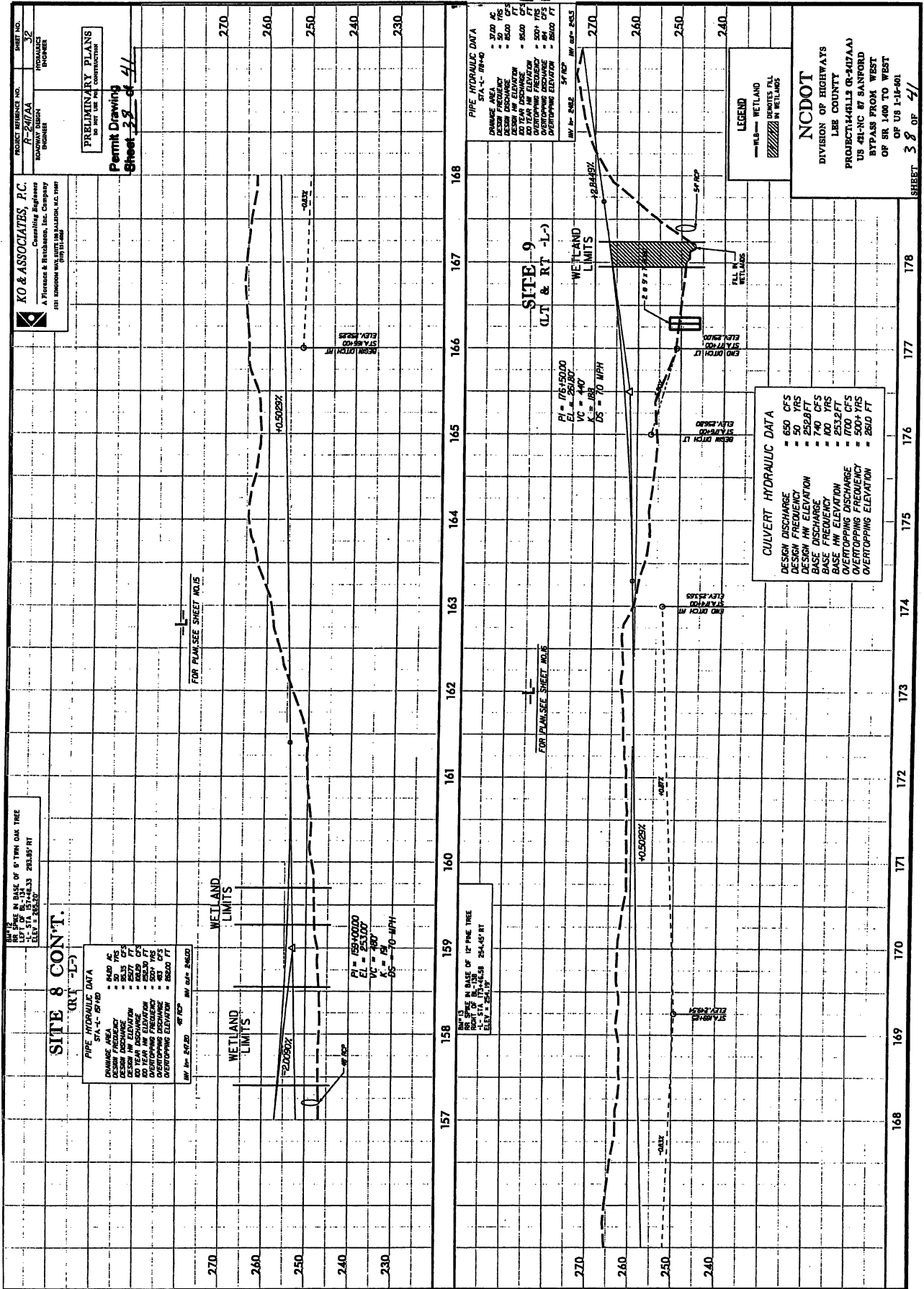
NCDOT
 DIVISION OF HIGHWAYS
 LEE COUNTY
 PROJECT: 3443112 (R-3417AA)
 US 421-NC 87 SANFORD
 BYPASS FROM WEST
 OF SR 1400 TO WEST
 OF US 1-15-501

SHEET **37** OF **41**
 5/5/06



**PROFILE ALONG STRUCTURE
 SITE 9**

SCALE:
 1" = 50' HORIZONTAL
 1" = 10' VERTICAL



DATE: 10/15/03
 IN BASE OF 8" TYP. OAK TREE
 STA. 168+00.00 TO 168+45.00
 ELEV. 230.00'

SITE 8 CONT.
 (RT -L-3)

PIPE HYDRAULIC DATA
 STA. 168+00.00 TO 168+45.00

DESIGN DISCHARGE	650 CFS
DESIGN FREQ.	50 YRS
DESIGN HW ELEVATION	252.0 FT
DESIGN AN ELEVATION	250.0 FT
DESIGN AN ELEVATION	250.0 FT
DESIGN AN ELEVATION	250.0 FT
DESIGN AN ELEVATION	250.0 FT
DESIGN AN ELEVATION	250.0 FT
DESIGN AN ELEVATION	250.0 FT
DESIGN AN ELEVATION	250.0 FT
DESIGN AN ELEVATION	250.0 FT

FOR PLAN SEE SHEET NO. 41

PI = 168+00.00
 EL = 253.00
 VC = 400'
 K = 10
 DS = 70 MPH

DATE: 10/15/03
 IN BASE OF 12" PINE TREE
 STA. 168+45.00 TO 169+00.00
 ELEV. 254.00'

SITE 9
 (LT & RT -L-)

PIPE HYDRAULIC DATA
 STA. 168+45.00 TO 169+00.00

DESIGN DISCHARGE	650 CFS
DESIGN FREQ.	50 YRS
DESIGN HW ELEVATION	252.0 FT
DESIGN AN ELEVATION	250.0 FT
DESIGN AN ELEVATION	250.0 FT
DESIGN AN ELEVATION	250.0 FT
DESIGN AN ELEVATION	250.0 FT
DESIGN AN ELEVATION	250.0 FT
DESIGN AN ELEVATION	250.0 FT
DESIGN AN ELEVATION	250.0 FT
DESIGN AN ELEVATION	250.0 FT

PI = 168+45.00
 EL = 253.00
 VC = 400'
 K = 10
 DS = 70 MPH

FOR PLAN SEE SHEET NO. 41

NCDOT
 DIVISION OF HIGHWAYS
 LEE COUNTY
 PROJECT 14-0113 (R-2407AA)
 US 41-NC RT BYPASS
 BYPASS FROM WEST
 OF SR 1400 TO WEST
 OF US 1-14-01

CULVERT HYDRAULIC DATA

DESIGN DISCHARGE	650 CFS
DESIGN FREQ.	50 YRS
DESIGN HW ELEVATION	252.0 FT
DESIGN AN ELEVATION	250.0 FT
DESIGN AN ELEVATION	250.0 FT
DESIGN AN ELEVATION	250.0 FT
DESIGN AN ELEVATION	250.0 FT
DESIGN AN ELEVATION	250.0 FT
DESIGN AN ELEVATION	250.0 FT
DESIGN AN ELEVATION	250.0 FT
DESIGN AN ELEVATION	250.0 FT

LEGEND
 -W-L- WETLAND
 WETLANDS FULL
 WETLANDS

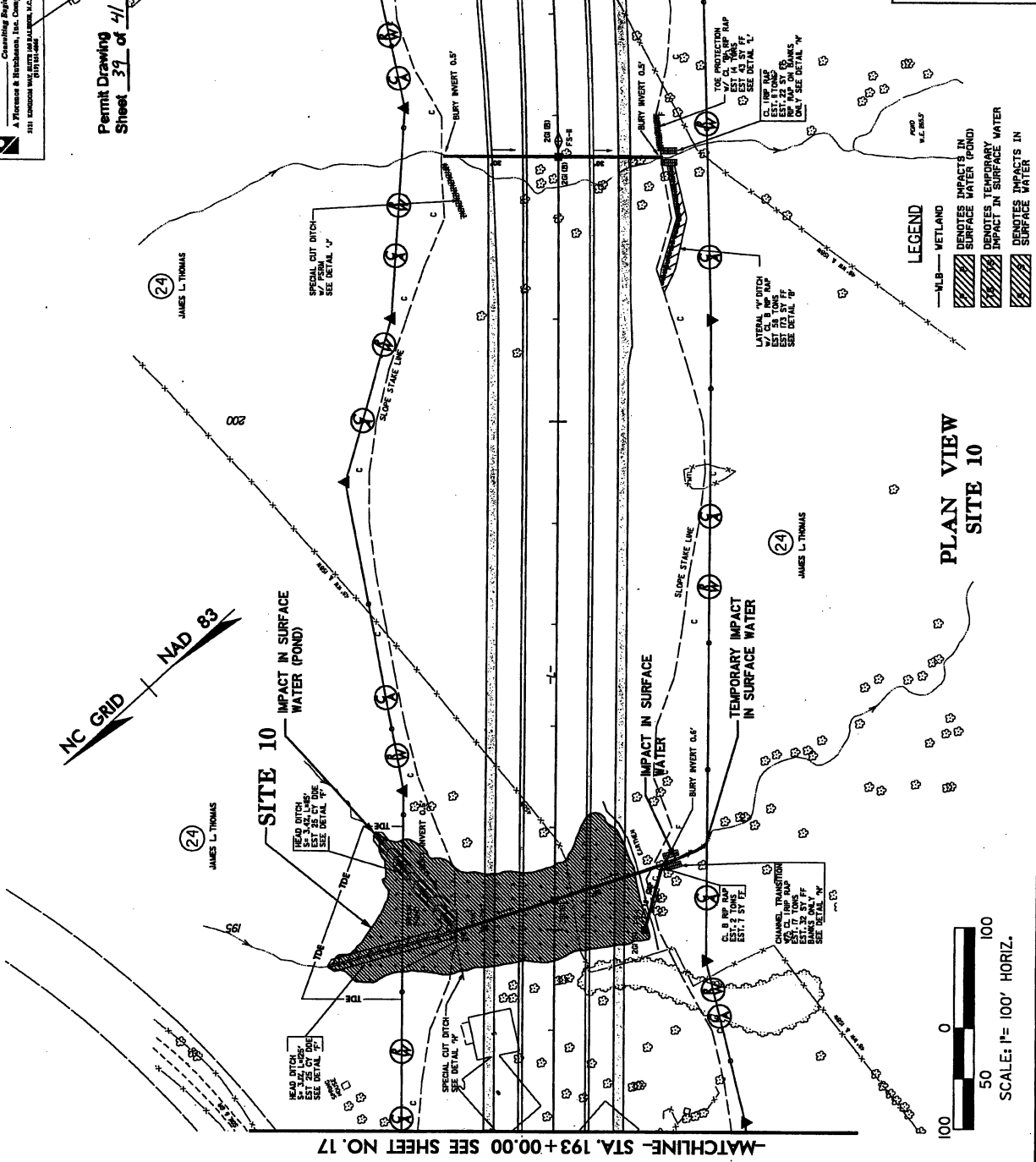
PROJECT REFERENCE NO. R-2477A-A
 SHEET NO. 18
 PRELIMINARY PLANS
 FOR THE USE AND CONSTRUCTION

KO & ASSOCIATES, P.C.
 Consulting Engineers
 & Architects
 1111 WILSON ROAD, SUITE 100, WILSON, N.C. 27157
 PERMIT DRAWING
 SHEET 39 OF 41



434

NC DOT
 DIVISION OF HIGHWAYS
 LEE COUNTY
 PROJECT 3441L3 (R-2477A-A)
 US 421-NC AT SANFORD
 BYPASS FROM WEST
 OF SR 1400 TO WEST
 OF US 1-141-001



**PLAN VIEW
 SITE 10**

0 50 100
 SCALE: 1" = 100' HORIZ.

SHEET 39 OF 41

8/17/99

12-4-06 Final 24 News Change
 12/2/05
 KO & ASSOCIATES, P.C. 1111 WILSON ROAD, SUITE 100, WILSON, N.C. 27157

PROJECT NUMBER NO. 17-00
 PROJECT NAME 17-00/AA
 PROJECT LOCATION ROADWAY DESIGN
 ENGINEER

KO & ASSOCIATES, P.C.
 Consulting Engineers
 A Florence & Harbison, Inc. Company
 1517 MIDWOOD ROAD, SUITE 100, LENOIR, NC 27540
 (919) 755-1100

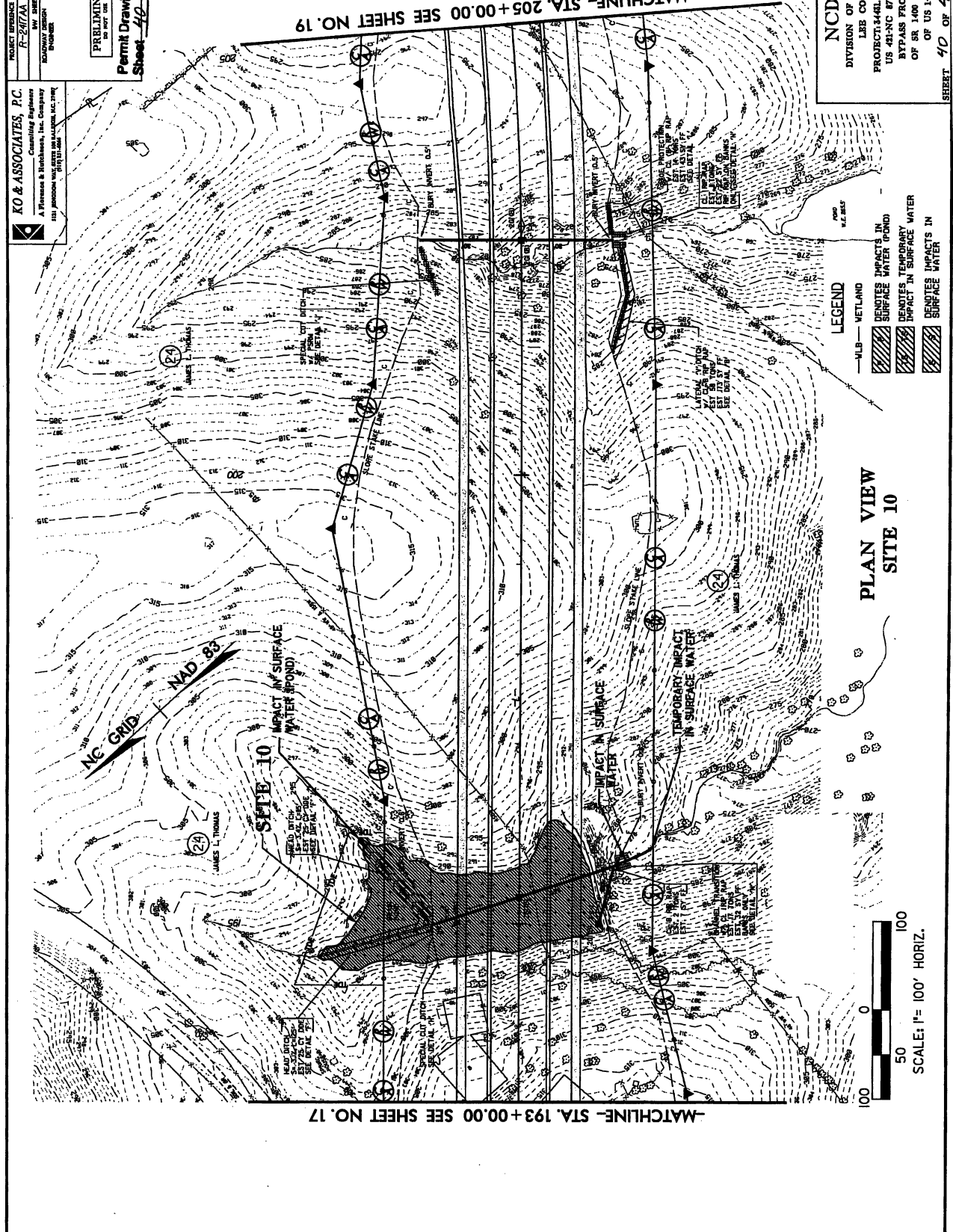
PRELIMINARY PLANS
 Permit Drawing
 Sheet 40 of 41



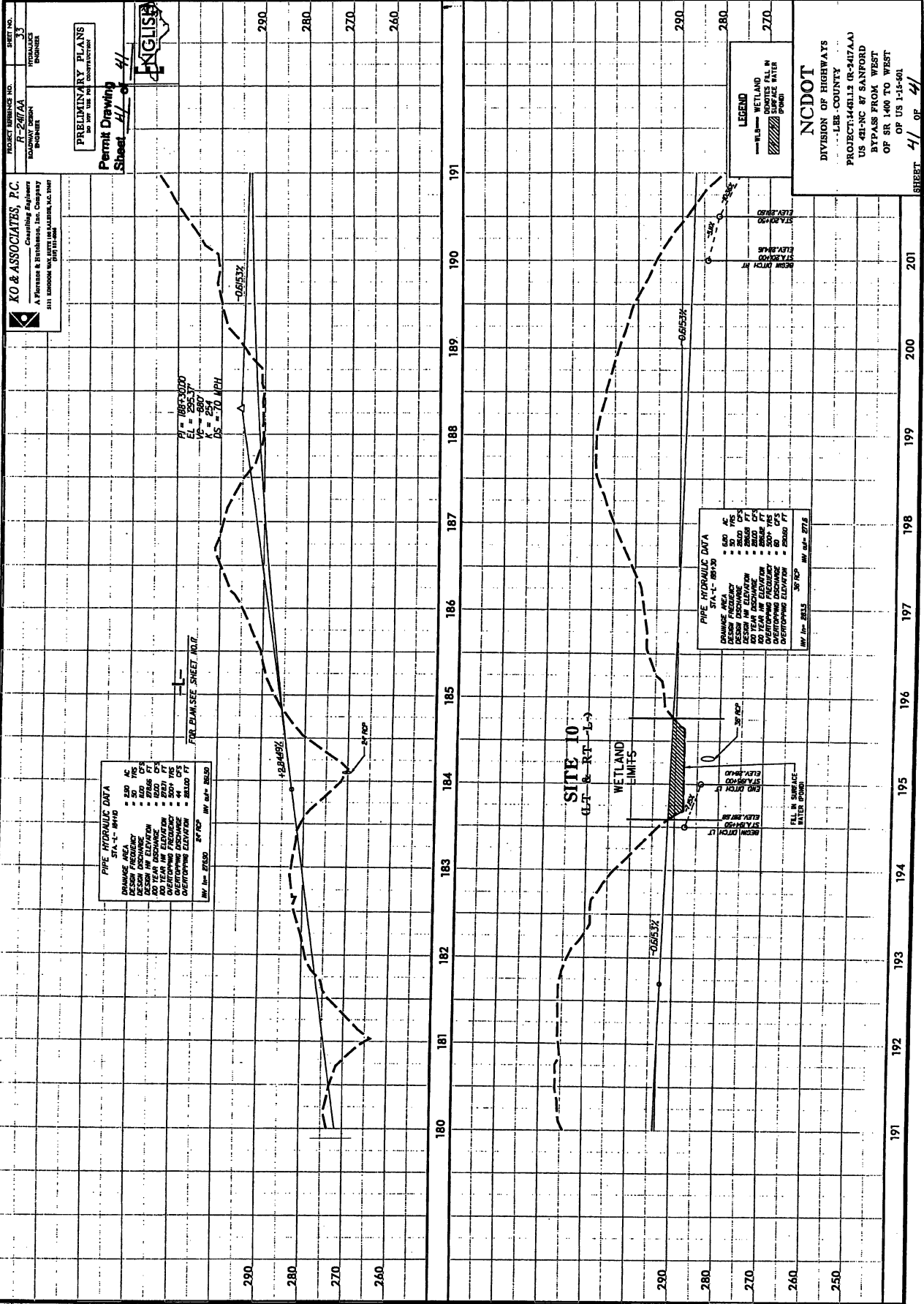
435

NC DOT
 DIVISION OF HIGHWAYS
 LEEB COUNTY
 PROJECT 17-00/AA
 US 421-NC BY SANFORD
 BYPASS FROM WEST
 OF SR 1400 TO WEST
 OF US 1-11-01

SHEET 40 OF 41



17-00 Road 24 Name Change
 6/3/2009
 8/17/99



PROJECT NUMBER: 11-2417AA
 SHEET NO. 41
 DATE: 11/15/00
 ENGINEER: [Signature]

KO & ASSOCIATES, P.C.
 Consulting Engineers
 A. P. K. & B. P. Inc. Company
 5111 KENNEDY WILKINS ROAD, WILKINS, N.C. 28690
 (704) 771-1122

PRELIMINARY PLANS
 Permit Drawing
 Sheet H-1 of 41



NC DOT
 DIVISION OF HIGHWAYS
 LEE COUNTY
 PROJECT: 11-2417AA
 US 421 NC 87 SANFORD
 BYPASS FROM WEST
 OF SR 1400 TO WEST
 OF SR 1-1-5-00
 SHEET 41 OF 41

PIPE HYDRAULIC DATA
 STA. 1- 1810

DESIGN FREQUENCY	50	CF
DESIGN DISCHARGE	140	CF
10 YEAR DISCHARGE	120	CF
20 YEAR DISCHARGE	100	CF
10 YEAR W.S. ELEVATION	287.1	FT
20 YEAR W.S. ELEVATION	285.0	FT
10 YEAR DISCHARGE	4	CF
20 YEAR DISCHARGE	4	CF
10 YEAR W.S. ELEVATION	280.0	FT
20 YEAR W.S. ELEVATION	278.0	FT

IN. 36" 24" 30" 36" 42" 48" 54" 60" 66" 72" 78" 84" 90" 96" 102" 108" 114" 120" 126" 132" 138" 144" 150" 156" 162" 168" 174" 180" 186" 192" 198" 204" 210" 216" 222" 228" 234" 240" 246" 252" 258" 264" 270" 276" 282" 288" 294

PIPE HYDRAULIC DATA
 STA. 1- 1813

DESIGN FREQUENCY	50	CF
DESIGN DISCHARGE	140	CF
10 YEAR DISCHARGE	120	CF
20 YEAR DISCHARGE	100	CF
10 YEAR W.S. ELEVATION	287.1	FT
20 YEAR W.S. ELEVATION	285.0	FT
10 YEAR DISCHARGE	4	CF
20 YEAR DISCHARGE	4	CF
10 YEAR W.S. ELEVATION	280.0	FT
20 YEAR W.S. ELEVATION	278.0	FT

IN. 36" 24" 30" 36" 42" 48" 54" 60" 66" 72" 78" 84" 90" 96" 102" 108" 114" 120" 126" 132" 138" 144" 150" 156" 162" 168" 174" 180" 186" 192" 198" 204" 210" 216" 222" 228" 234" 240" 246" 252" 258" 264" 270" 276" 282" 288" 294



437
DEPARTMENT OF THE ARMY
WILMINGTON DISTRICT, CORPS OF ENGINEERS
P.O. BOX 1890
WILMINGTON, NORTH CAROLINA 28402-1890

IN REPLY REFER TO

May 28, 2002

Regulatory Division

SUBJECT: Action ID 2002-2-0899, TIP No. R-2417

Mr. William D. Gilmore, P.E., Manager
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. Gilmore:

In accordance with your written request of June 11, 2001, subsequently modified on June 22, 2001, and September 28, 2001, and the resulting administrative record, enclosed are two copies of a Department of the Army permit to authorize the discharge of dredged and fill material into waters of the United States, for construction of the US 421-NC 87 Sanford Bypass (T.I.P. No. R-2417), in the Cape Fear River Basin, in Lee County, North Carolina.

You should acknowledge that you accept the terms and conditions of the enclosed permit by signing and dating each copy in the spaces provided ("Permittee" on page 3). Your signature, as permittee, shows that, as consideration for the issuance of this permit, you voluntarily accept and agree to comply with all of the terms and conditions of this permit. All pages of both copies of the signed permit with drawings should then be returned to this office for final authorization. A self-addressed envelope is enclosed for your convenience.

After the permit is authorized in this office, the original copy will be returned to you; the duplicate copy will be permanently retained in this office. Should you have questions, contact Mr. Eric Alsmeyer of my Raleigh Field Office regulatory staff at telephone (919) 876-8441, extension 23.

Sincerely,

E. David Franklin
Chief, NCDOT Team

Enclosures

Blind Copies Furnished:

CESAW-RG-R/Alsmeyer

CESAW-RG-R/Manuele

CESAW-RG-R/COMPLIANCE FILE (with Permit and Conditions)

SUSPENSE

**NOTIFICATION OF ADMINISTRATIVE APPEAL OPTIONS AND PROCESS AND
REQUEST FOR APPEAL**

Applicant: NCDOT/TIP R-2417 (Sanford Bypass)	File Number: 2002-2-0899	Date: May 28, 2002
Attached is:		See Section below
X	INITIAL PROFFERED PERMIT (Standard Permit or Letter of permission)	A
	PROFFERED PERMIT (Standard Permit or Letter of permission)	B
	PERMIT DENIAL	C
	APPROVED JURISDICTIONAL DETERMINATION	D
	PRELIMINARY JURISDICTIONAL DETERMINATION	E

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

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

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

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

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

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

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

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

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

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

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

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

POINT OF CONTACT FOR QUESTIONS OR INFORMATION

If you have questions regarding this decision and/or the appeal process you may contact:

Mr. Eric C. Alsmeyer, Regulatory Project Manager
U.S. Army Corps of Engineers, Wilmington District
Raleigh Regulatory Field Office
6508 Falls of Neuse Road, Suite 120
Raleigh, North Carolina 27615-6814

If you only have questions regarding the appeal process you may also contact:

Mr. Arthur Middleton, Administrative Appeal Review Officer
CESAD-ET-CO-R
U.S. Army Corps of Engineers, South Atlantic Division
60 Forsyth Street, Room 9M15
Atlanta, Georgia 30303-8801

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

Signature of appellant or agent.

Date:

Telephone number:

DIVISION ENGINEER:

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

DEPARTMENT OF THE ARMY PERMIT

Permittee NC Department of TransportationPermit No. 200220899Issuing Office CESAW-RG-R

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

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

Project Description:

Place fill material impacting a total of 11.06 acres of wetlands, 23,640 linear feet of stream, and 6.32 acres of ponds, for construction of the US 421-NC 87 Sanford bypass (T.I.P. No. R-2417).

In the upper and middle Cape Fear River basins, from existing US 421 northwest of Sanford to existing NC 87, southeast of Sanford, in Lee County, North Carolina.

Project Location:

Permit Conditions:

General Conditions:

1. The time limit for completing the work authorized ends on December 31, 2009. 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.

4. If you sell the property associated with this permit, you must obtain the signature of the new owner in the space provided and forward a copy of the permit to this office to validate the transfer of this authorization.
5. If a conditioned water quality certification has been issued for your project, you must comply with the conditions specified in the certification as special conditions to this permit. For your convenience, a copy of the certification is attached if it contains such conditions.
6. You must allow representatives from this office to inspect the authorized activity at any time deemed necessary to ensure that it is being or has been accomplished in accordance with the terms and conditions of your permit.

Special Conditions:

See enclosed sheet.

Further Information:

1. **Congressional Authorities:** You have been authorized to undertake the activity described above pursuant to:
 - () Section 10 of the Rivers and Harbors Act of 1899 (33 U.S.C. 403).
 - (X) Section 404 of the Clean Water Act (33 U.S.C. 1344).
 - () Section 103 of the Marine Protection, Research and Sanctuaries Act of 1972 (33 U.S.C. 1413).
2. **Limits of this authorization.**
 - a. This permit does not obviate the need to obtain other Federal, state, or local authorizations required by law.
 - b. This permit does not grant any property rights or exclusive privileges.
 - c. This permit does not authorize any injury to the property or rights of others.
 - d. This permit does not authorize interference with any existing or proposed Federal project.
3. **Limits of Federal Liability.** In issuing this permit, the Federal Government does not assume any liability for the following:
 - 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 activities undertaken by or on behalf of the United States in the public interest.
 - c. Damages to persons, property, or to other permitted or unpermitted activities or structures caused by the activity authorized by this permit.
 - d. Design or construction deficiencies associated with the permitted work.

- 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.

William D. Stence
 (PERMITTEE)
 NC DEPARTMENT OF TRANSPORTATION

28 May 2007
 (DATE)

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

 (DISTRICT ENGINEER)
 JAMES W. DELONY, COLONEL

 (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)



444
DEPARTMENT OF THE ARMY
WILMINGTON DISTRICT, CORPS OF ENGINEERS
P.O. BOX 1890
WILMINGTON, NORTH CAROLINA 28402-1890

IN REPLY REFER TO

May 28, 2002

Regulatory Division

SUBJECT: Action ID 2002-2-0899, TIP No. R-2417

Mr. William D. Gilmore, P.E., Manager
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. Gilmore:

In accordance with your written request of June 11, 2001, subsequently modified on June 22, 2001, and September 28, 2001, and the resulting administrative record, enclosed are two copies of a Department of the Army permit to authorize the discharge of dredged and fill material into waters of the United States, for construction of the US 421-NC 87 Sanford Bypass (T.I.P. No. R-2417), in the Cape Fear River Basin, in Lee County, North Carolina.

You should acknowledge that you accept the terms and conditions of the enclosed permit by signing and dating each copy in the spaces provided ("Permittee" on page 3). Your signature, as permittee, shows that, as consideration for the issuance of this permit, you voluntarily accept and agree to comply with all of the terms and conditions of this permit. All pages of both copies of the signed permit with drawings should then be returned to this office for final authorization. A self-addressed envelope is enclosed for your convenience.

After the permit is authorized in this office, the original copy will be returned to you; the duplicate copy will be permanently retained in this office. Should you have questions, contact Mr. Eric Alsmeyer of my Raleigh Field Office regulatory staff at telephone (919) 876-8441, extension 23.

Sincerely,

E. David Franklin
Chief, NCDOT Team

Enclosures

Blind Copies Furnished:

CESAW-RG-R/Alsmeyer

CESAW-RG-R/Manuele

CESAW-RG-R/COMPLIANCE FILE (with Permit and Conditions)

SUSPENSE

SPECIAL CONDITIONS (Action ID. 2002-2-0899; NCDOT/TIP R-2417)

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

b. The permittee shall mitigate for 11.06 acres of unavoidable impacts to wetlands, and for 19,222 linear feet of impact to important streams, for the project, as described below (2.21 acres of wetland restoration at the Sandy Creek mitigation site, 11.05 acres of wetlands preservation, along with upland buffer and stream preservation, at the Blue Tract mitigation site, 2,084 linear feet of onsite stream relocation, 4,545 linear feet of stream restoration/enhancement at the Deaton mitigation site, and 25,186 linear feet of stream mitigation and 17.7 acres of wetland mitigation through the North Carolina Wetlands Restoration Program (NCWRP), in the Middle Cape Fear basin (Cataloging Unit 03030004)).

SANDY CREEK WETLANDS RESTORATION

c. The permittee shall provide the restoration described in condition d. below through implementation of the compensatory wetland mitigation plan "Wetland Mitigation Plan – Sandy Creek Site", dated April, 1999.

d. The permittee shall mitigate for 1.105 acres of unavoidable impacts to wetlands associated with this project with 2.21 acres of wetland restoration at the Sandy Creek Mitigation Site.

e. NCDOT will do a boundary survey of the 2.21 acres of wetland restoration at the Sandy Creek Mitigation Site, and submit a copy of the survey to the District Engineer within 90 days after the permit is issued.

f. The permittee will monitor the site vegetation between June 1 and November 30, inclusively, of each year, and document plant mortality and stress. A minimum of three 0.05 acre sample plots will be used (placed randomly within representative positions in the restoration area). The permittee will continue monitoring of the planting areas annually until the respective performance criteria are met, as described below.

SANDY CREEK MITIGATION MONITORING

g. Performance criteria for tree planting areas will be met if sample plots demonstrate that for each of the first three complete years of monitoring, at least 320 target-species trees per acre have survived, such that at the end of three years, at least 320 three-year old target-species trees per acre have survived on the site, and, in years four and five, at least 288 and 260 trees per acre, respectively, have survived on the site, such that at the end of year five, at least 260 five-year old target-species trees per acre have survived on the site.

h. If for any monitoring year, vegetation survival is not favorable, as determined by the Corps of Engineers, any remedial action required by the Corps of Engineers will be performed, the required restoration areas will be replanted, and the five-year monitoring period will begin again with year one.

i. Hydrology in the restoration areas will be monitored through the use of monitoring gauges during each growing season for the first five years of the vegetative monitoring, or until performance criteria have been met, whichever occurs later. A minimum of six groundwater gauges will be used within the total wetland restoration area at Sandy Creek.

j. To meet the hydrology success criteria, the monitoring data must show that for each normal precipitation year within the monitoring period, the site has been inundated or saturated within the upper 12 inches of the soil for a minimum of 12.5% of the growing season (29 consecutive days for Randolph County). WETS tables for Randolph County will be utilized as appropriate to determine normal precipitation years.

k. 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.

l. In the alternative, and at the Corps' discretion, a site may be found to meet the hydrology performance criteria on the basis of comparison of monitoring data taken from the site with monitoring data taken from an established jurisdictional mitigation reference site approved by the Corps. The Corps retains the discretion to find that the hydrology criteria are met if such monitoring data from the mitigation site and the reference site are substantially the same. This finding by the Corps may be made during years with or without normal rainfall.

m. In the event there are years of normal precipitation during the monitoring period, and the data for those years do not show that the site has been inundated or saturated within the upper 12 inches of the soil for a minimum of 12.5 % of the growing season (29 consecutive days) during a normal precipitation year, the Corps may require remedial action. The permittee shall perform such required remedial action, and continue to monitor hydrology on the site until it displays that the site has been inundated or saturated as described above, during a normal precipitation year. If the Corps determines that further remediation is not appropriate, other options will be considered, including use of a different site to mitigate for project impacts.

n. The permittee will submit yearly mitigation monitoring reports by the first day of February after each assessment period, for five years following final site manipulation. These reports will include, at a minimum, sample plot, well and rainfall data; number of individuals of each tree species within each sample plot; photographs, including a location key; and problems/resolution, and will be provided to both the Corps and the North Carolina Division of Water Quality.

BLUE TRACT WETLANDS PRESERVATION

o. The permittee shall implement the compensatory wetland mitigation plan entitled "Blue Tract Mitigation Planning Document", dated June 11, 2001, to provide the preservation described in condition p. below.

p. The permittee shall mitigate for 1.105 acres of unavoidable impacts to wetlands associated with this project with 11.05 acres of wetland preservation, and additional upland buffer and stream preservation, at the Blue Tract Mitigation Site.

q. NCDOT will submit a copy of a boundary survey of the 11.05 acres of wetland preservation at the Blue Tract Mitigation Site, to the District Engineer within 90 days after this permit is issued.

ONSITE STREAM RELOCATION

r. The permittee shall mitigate for 2,084 linear feet of unavoidable impacts to important stream channel associated with this project by completing 2,084 linear feet of onsite stream relocation, as described in the permit application. 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.

s. The permittee shall construct all channel relocations in a dry work area. The permittee shall stabilize the relocated channel before stream flows are turned into the new channel. Whenever possible, channel relocations shall be allowed to stabilize for an entire growing season. Vegetation used to stabilize banks shall be limited to native woody species, and should include establishment of a 30 foot wide wooded buffer and an adjacent 20 foot wide vegetated buffer on both sides of the relocated channel to the maximum extent practical.

t. The permittee shall visually monitor the vegetative plantings on all mitigation stream banks to assess and insure complete stabilization of the mitigation stream segments. This monitoring shall include adequate visual monitoring of planted vegetation quarterly for a minimum of two years after final planting, and appropriate remedial actions (e.g., replanting, streambank grading, etc.). If within any monitoring year, bank stabilization is not acceptable as determined by the Corps of Engineers, and remedial action required by the Corps of Engineers is performed, the two year monitoring of the affected portions of the stream will begin again. The permittee will coordinate

stream mitigation activities with the Corps of Engineers, Raleigh Regulatory Field Office Project Manager, and will report verbally on the status of the stream mitigation within thirty days of the quarterly monitoring. The permittee will submit a brief written report with representative photographs within 90 days after the monitoring year is completed.

DEATON SITE STREAM MITIGATION

u. The permittee shall mitigate for 4,545 linear feet of unavoidable impacts to stream channel associated with this project with 4,545 linear feet of stream restoration at the Deaton Mitigation Site, as described in the Deaton Site stream mitigation plan.

v. The permittee shall visually monitor the vegetative plantings on the mitigation stream banks to assess and insure complete stabilization of the mitigation stream segments. This monitoring shall include adequate visual monitoring of planted vegetation quarterly for a minimum of two years after final planting, and appropriate remedial actions (e.g., replanting, streambank grading, etc.). The permittee will coordinate with the Corps of Engineers, Raleigh Regulatory Field Office NCDOT Regulatory Project Manager, and will report verbally on the status of the stream mitigation, within thirty days of the quarterly monitoring. The permittee will submit a brief report with representative photographs within 90 days after the monitoring year is completed.

w. All site preparation activities at the Deaton Mitigation Site shall be completed before October 1, 2003. An "as built" plan, which describes the completed mitigation project, including variations from the original plan, final structure locations, and photographs, including a location key, shall be submitted to the District Engineer within 60 days of completion of the mitigation. NCDOT shall submit the first monitoring report to both the Corps and the North Carolina Division of Water Quality before February 1, 2003.

GENERAL MITIGATION

x. The permittee and/or current and subsequent property owners shall maintain the Sandy Creek, Blue Tract, and Deaton Mitigation Sites in their natural condition, as altered by work in the mitigation plans, in perpetuity. Prohibited activities within the mitigation sites 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 properties, which will adversely impact the wetlands or streams on the mitigation properties, except as specifically authorized by this permit, or subsequent modifications that are approved by the Corps of Engineers.

y. The permittee shall make every effort to convey the Sandy Creek, and Blue Tract Mitigation Site properties to a nonprofit conservation organization or a natural resource agency, which is willing to hold the areas in perpetuity for conservation purposes, and which is acceptable to the Corps of Engineers. The annual monitoring reports, as required, will include the status of the conveyance efforts.

z. The permittee shall not sell or otherwise convey any interest in the wetland mitigation properties used to satisfy mitigation requirements for this permit, to any third party, without written approval from the Wilmington Corps of Engineers.

aa. Any sale, lease, or other conveyance of the wetland mitigation site properties shall include restrictions on the use of the properties as described in condition y. above, which conditions shall be enforced by the North Carolina Department of Transportation. Such restrictions shall include language providing for third party enforcement rights in favor of the Corps of Engineers. Such restrictions must be approved by the Corps of Engineers prior to conveyance.

NCWRP WETLANDS MITIGATION

bb. The permittee shall mitigate for 8.85 acres of unavoidable impacts to wetlands associated with this project by payment to the North Carolina Wetlands Restoration Program (NCWRP) in an amount determined by the NCWRP sufficient to perform 17.7 acres of riparian, palustrine forested wetland mitigation in the middle Cape Fear River basin (Cataloging Unit 03030004). Construction within wetlands 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.

NCWRP STREAM MITIGATION

cc. The permittee shall mitigate for 12,593 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 25,186 linear feet of warm water stream mitigation, or the equivalent water quality improvement projects, as approved by the Corps of Engineers, in the middle 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.

GENERAL MITIGATION

dd. The permittee shall contact the Corps of Engineers, Raleigh Regulatory Field Office NCDOT Regulatory Project Manager for this project, to provide that individual with the opportunity to attend the yearly mitigation monitoring efforts.

ee. Failure to institute and carry out the details of special conditions a. - dd, above, will result in a directive to cease all ongoing and permitted work within waters and/or wetlands associated with the permitted project, or such other remedy as the District Engineer or his authorized representatives may seek.

OTHER CONDITIONS

ff. When final design plans are completed for Sections AA and C of TIP R-2417, any necessary permit modifications shall be submitted to the District Engineer and the North Carolina Division of Water Quality (NCDWQ). If necessary, a public notice will be circulated for review. Final designs shall reflect all appropriate avoidance, minimization, and a compensatory mitigation plan for additional impacts within streams and wetlands. Construction within streams and wetlands on TIP R-2417 shall begin only after approval by the District Engineer of the modified impacts.

gg. NCDOT shall use "High Quality Waters" sedimentation and erosion control measures for all portions of the project west of SR 1415.

hh. Prior to commencing construction within jurisdictional waters of the United States for any section, the permittee shall forward the latest version of project construction drawings for that section to the Corps of Engineers, Raleigh Regulatory Field Office NCDOT Regulatory Project Manager. Half-size drawings are acceptable.

ii. The permittee shall schedule a meeting between its representatives, the contractor's representatives, and the Corps of Engineers, Raleigh Regulatory Field Office NCDOT Regulatory Project Manager, prior to any work within jurisdictional waters and wetlands in each section, 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.

jj. The permittee and its contractors and/or agents shall not excavate, fill, or perform mechanized landclearing at any time in the construction or maintenance of this project within waters and/or wetlands, 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.

kk. 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 to borrow material, or to dispose of dredged, fill, or waste material. The permittee shall ensure that all such areas comply with the preceding condition (jj.) 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 (jj.). All information will be available to the Corps of Engineers upon request.

ll. The permittee shall comply with the conditions specified in the water quality certification, No. 3378, issued by the North Carolina Division of Water Quality on April 10, 2002.

mm. The permittee shall place culverts and other structures in waters, streams, and wetlands below the elevation of the streambed to allow low flow passage of water and aquatic life, unless 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 streambeds or banks, adjacent to, or upstream and downstream of the structures.

nn. 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).

oo. 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.

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

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

rr. No excavated or fill material will be placed at any time in waters or wetlands outside the permitted construction areas, 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.

ss. The permittee will maintain the authorized work in good condition and in conformance with the terms and conditions of this permit. The permittee is not relieved of this requirement if he abandons the permitted activity without transferring it to a third party.

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

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

vv. This permit does not grant any property rights or exclusive privileges.

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

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

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

3. Damages to other permitted or unpermitted activities or structures caused by the authorized activity.

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

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

State of North Carolina
Department of Environment
and Natural Resources
Division of Water Quality

Michael F. Easley, Governor
William G. Ross, Jr., Secretary
Gregory J. Thorpe, Ph.D., Acting Director



Attachments

cc: Wilmington District Corps of Engineers
Corps of Engineers Raleigh Field Office
DWQ Raleigh Regional Office
Ron Ferrell, Wetlands Restoration Program
Central Files
File Copy

Wetlands/401 Unit

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APPROVAL OF 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 15A NCAC 2H. Section .0500, and 15A NCAC 2B .0233. You have our approval, in accordance with the attached conditions and those listed below, to place fill material in 11.06 acres of jurisdictional wetlands, 23,640 linear feet of streams, and 6.32 acres of other surface waters (ponds). In addition, 0.1 acres of temporary impacts to jurisdictional wetlands at Section BB Site 2 are authorized. The project shall be constructed in accordance with your application dated June 11, 2001, and the subsequent addendums dated June 22, 2001, August 31, 2001, and September 28, 2001. Any proposed site plans submitted in the June 11, 2001 application that have a subsequent revised site plan submitted in the June 22, 2001, August 31, 2001, or September 28, 2001 addendums are not authorized by this certification. Instead, for all impacts where a proposed site design as provided in the original June 11, 2001 application was revised and submitted in the the June 22, 2001, August 31, 2001, or September 28, 2001 addendums, the drawings with the latest date of revision are authorized. The purpose of the authorized impacts is the construction of the US 421-NC 87 Sanford Bypass from existing US 421 northwest of Sanford to existing NC 87 southeast of Sanford in Lee County (TIP R-2417).

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

This approval is only valid for the purpose and design that you submitted in your application, as described in the Public Notice. Should your project change, you are required to notify the DWQ and 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. Any additional impacts to wetlands, streams, or buffers, for this project (now or in the future) will require additional compensatory mitigation may be required as described in 15A NCAC 2H .0506 (h) (6) and (7), and 15A NCAC 2B .0233. For this approval to remain valid, you are required to comply with all the conditions listed below. In addition, you should obtain all other federal, state or local permits before proceeding with your project including (but not limited to) Sediment and Erosion control, Coastal Stormwater, Non-discharge and Water Supply watershed regulations. This Certification shall expire three years from the date of the cover letter from DWQ or on the same day as the expiration date of the corresponding Corps of Engineers Permit, whichever is sooner.

Condition(s) of Certification:

1. 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) 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

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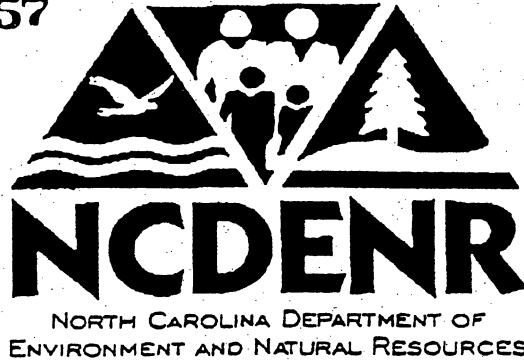
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the appropriate turbidity water quality standard (50 NTUs in all fresh water streams and rivers not designated as trout waters; 25 NTUs in all lakes and reservoirs, and all saltwater classes; and 10 NTUs in trout waters);

2. Sediment and erosion control measures shall not be placed in wetlands or waters to the maximum extent practicable. If placement of sediment and erosion control devices in wetlands and waters is unavoidable, they shall be removed and the natural grade restored after the Division of Land Resources has released the project;
3. If an environmental document is required, this Certification is not valid until a FONSI or ROD is issued by the State Clearinghouse. All water quality-related conditions of the FONSI or ROD shall become conditions of this Certification;
4. Measures shall be taken to prevent live or fresh concrete from coming into contact with waters of the state until the concrete has hardened;
5. There shall be no excavation from or waste disposal into jurisdictional wetlands or waters associated with this permit without appropriate modification of this permit. Should waste or borrow sites be located in wetlands or stream, compensatory mitigation will be required since it is a direct impact from road construction activities.
6. All channel relocations will be constructed in a dry work area, and stabilized before stream flows are diverted. Channel relocations will be completed and stabilized prior to diverting water into the new channel. Whenever possible, channel relocations shall be allowed to stabilize for an entire growing season. Vegetation used for bank stabilization shall be limited to native woody species, and should include establishment of a 30 foot wide wooded and an adjacent 20 foot wide vegetated buffer on both sides of the relocated channel to the maximum extent practical. A transitional phase incorporating coir fiber and seedling establishment is allowable. Also, rip-rap may be allowed if it is necessary to maintain the physical integrity of the stream, but the applicant must provide written justification and any calculations used to determine the extent of rip-rap coverage requested.
7. Compensatory mitigation for impacts to streams shall be done for 17,138 linear feet of stream impact (4545 linear feet in Hydrologic Unit 03030003 and 12,593 linear feet in Hydrologic Unit 03030004) at a replacement ratio of 1:1. Compensatory mitigation for impacts to jurisdictional streams shall be provided by onsite stream relocations of 144 linear feet of streams on site (in Hydrologic Unit 03030004) as described in the June 11, 2001 application for Sites 14 and 22 in segment BA. In addition, compensatory mitigation for impacts to jurisdictional streams shall be provided by onsite stream relocations of 1930 linear feet of streams on site (in Hydrologic Unit 03030004) as described in the September 28, 2001 addendum for Site 6 in segment BB. All stream relocations shall have 50-foot wooded buffers planted on both sides of the stream. As-Builts for the completed streams shall be submitted to the North Carolina Division of Water Quality 401 Wetlands Unit within 30 days of the completion of the construction of the relocations. If the parameters of this condition are not met, then the NCDOT shall supply additional stream mitigation for the 2074 linear feet of impacts. In addition to the 2,074 linear

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feet of on-site mitigation. compensatory mitigation for an additional 15,064 linear feet of streams is required as described below:

Mitigation Site	Linear Feet Debited from Site	Type of Mitigation	Replacement Ratio	Linear Feet of Mitigation Credited
Hydrologic Unit 03030003				
Deaton Mitigation Site	4,545	Restoration	1:1	4,545
Hydrologic Unit 03030004				
On-site	2,074	Restoration	1:1	2,074
WRP	10,519	Restoration	1:1	10,519
Total				17,138

We understand that you have chosen to perform compensatory mitigation for some of your impacts to streams through an in lieu payment to the North Carolina Wetland Restoration Program (NCWRP), and that the WRP has agreed to implement the mitigation for the project. Mitigation for unavoidable impacts to 10,519 linear feet of streams shall be provided through an in-lieu payment to the North Carolina Wetlands Restoration Program (NCWRP) at a rate of \$125 per linear foot. Therefore, a total payment of \$ 1,314,875 shall be submitted to the NCWRP to offset the impacts. No construction activities in jurisdictional streams shall begin until payment for stream mitigation is made and the Wetland Restoration Program receives and clears your check (made payable to DENR - Wetland Restoration Program). The payment to NCWRP shall be sent within two months of issuance of the 404 permit. If you have any questions concerning the Wetland Restoration Program please contact them at 919-733-5208.

8. Compensatory mitigation for impacts to wetlands shall be done for 11.06 acres of impacts (2.21 in Hydrologic Unit 03030003 and 8.85 in Hydrologic Unit 03030004). Applying a replacement ration of 2:1 total mitigation for 22.12 acres of riparian wetlands (4.42 in Hydrologic Unit 03030003 and 17.70 acres in Hydrologic Unit 03030004) shall be provided as described below.

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Mitigation Site	Acres of WL Debited from Site	Type of Mitigation	Replacement Ratio	Acres of Mitigation Credited
Hydrologic Unit 03030003				
Sandy Creek Mitigation Site	2.21	Restoration	1:1	2.21
Blue Mitigation Site	11.04	Preservation	5:1	2.21
Hydrologic Unit 03030004				
WRP	17.70	Restoration	1:1	17.70
Total				22.12

9. 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.
10. Placement of culverts and other structures in waters, streams, and wetlands must 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.
11. When final design plans are completed for Sections R-2417 AA, and R-2417 C, a modification to the 401 Water Quality Certification shall be submitted with seven copies and fees to the NC Division of Water Quality. Final designs shall reflect all appropriate avoidance, minimization, and mitigation for impacts to wetlands, streams, and other surface waters. Construction activities that impact any wetlands, streams, and other surface waters located in Sections R-2417 AA or Sections R-2417 C shall begin only after NCDOT applies for and receives a modified 401 Water Quality Certification from the NC Division of Water Quality.
12. No construction activities are authorized in Section R-2417 AA or Section R-2417 AB until a final design is approved in writing by the NC Division of Water Quality 401 Wetlands Unit for the Deaton Mitigation Site.

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13. Given the multiple set of addendums to the original application, NCDOT shall provide to the NCDWQ a final of site drawings within 2 months of the date of issuance of the 401 Water Quality Certification that reflects the authorized impacts in 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 404 and/or Coastal Area Management Act Permit. This Certification shall expire upon the expiration of the 404 or CAMA permit.

If this Certification is unacceptable to you have the right to an adjudicatory hearing upon written request within sixty (60) days following receipt of this Certification. This request must be in the form of a written petition conforming to Chapter 150B of the North Carolina General Statutes and filed with the Office of Administrative Hearings, P.O. Box 27447, Raleigh, N.C. 27611-7447. If modifications are made to an original Certification, you have the right to an adjudicatory hearing on the modifications upon written request within sixty (60) days following receipt of the Certification. Unless such demands are made, this Certification shall be final and binding.

This the 10th day of April 2002

DIVISION OF WATER QUALITY

Gregory J. Thorpe, Ph.D.
Acting Director

WQC No. 3377

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NORTH CAROLINA - DIVISION OF WATER QUALITY
401 WATER QUALITY CERTIFICATION
SUMMARY OF PERMITTED IMPACTS AND MITIGATION REQUIREMENTS

In accordance with 15A NCAC 2H.0500, the North Carolina Department of Transportation is authorized to impact the waters of the State of North Carolina as indicated below for the purpose of constructing the Proposed US 421-NC 87 Sanford Bypass from existing US 421 northwest of Sanford to existing NC 87 southeast of Sanford in Lee County (TIP R-2417, WQC Project No. 001432). All activities associated with these authorized impacts must be conducted in accordance with the conditions listed in the attached certification transmittal letter. **THIS CERTIFICATION IS NOT VALID WITHOUT THE ATTACHMENTS.**

COMPENSATORY MITIGATION REQUIREMENTS FOR WETLAND RESTORATION:

LOCATION: US 421 Bypass of Sanford
COUNTY: Lee
BASIN/SUBBASIN: Cape Fear, Cataloging Unit 03030003 and 03030004
DWQ No.: 001432

As required by 15A NCAC 2H.0506, and the conditions of this certification, you are required to compensate for the above impacts through the restoration, creation, enhancement or preservation of wetlands and surface waters as outlined below prior to conducting any activities that impact or degrade waters of the state. Note: Acreage requirements proposed to be mitigated through the Wetland Restoration Program must be rounded to one-quarter increments according to 15A 2R.0503(b).

17.70 acres of Class WL wetlands
17.70 acres of riparian wetlands

10,519 linear feet of stream channel

One of the options you have available to satisfy the compensatory mitigation requirements is through payment of a fee to the Wetland Restoration Fund per 15A NCAC 2R.0503. If you choose this option, please sign this form and mail it to the Wetlands Restoration Fund at the address listed below. An invoice for the appropriate amount of payment will be sent to you upon receipt of this form. **PLEASE NOTE, THE ABOVE IMPACTS ARE NOT AUTHORIZED UNTIL YOU RECEIVE NOTIFICATION THAT YOUR PAYMENT HAS BEEN PROCESSED BY THE WETLANDS RESTORATION PROGRAM.**

Signature

Date

WETLANDS RESTORATION PROGRAM
DIVISION OF WATER QUALITY
P.O. BOX 29535
RALEIGH, NC, 27626-0535
(919) 733-5208

Wetlands/401 Unit

1650 Mail Service Center

Raleigh, North Carolina 27699-1621

Telephone 919-733-1786

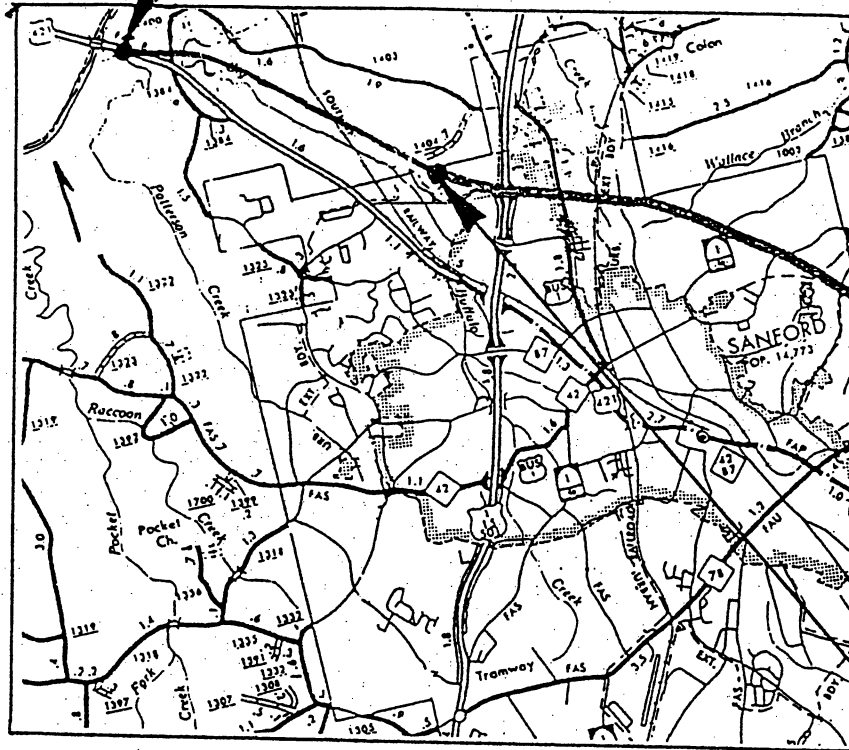
FAX 733-6893

An Equal Opportunity Affirmative Action Employer

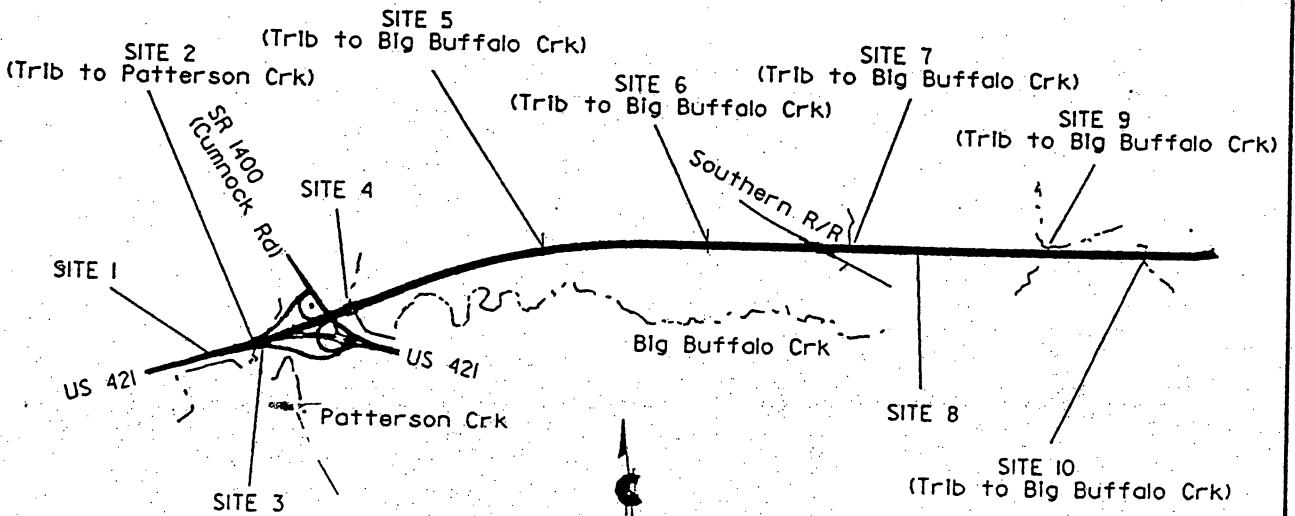
50% recycled/10% post consumer paper

BEGIN PROJECT

462



END PROJECT



VICINITY MAP

Sanford Bypass from US 421 to East of US 15/501

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

PROJECT: 8.T540402 (R-2417.A.A)

SANFORD BYPASS

SHEET 1 OF 14

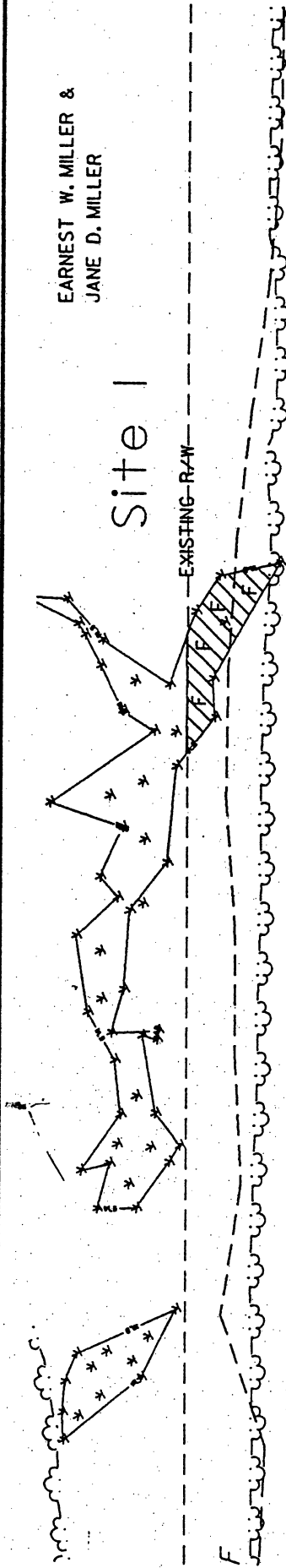
LEGEND

	LINE WT		LINE WT
— WLB —	4-6		6
	4-6		6
	2		15
	2	(DASHED LINES DENOTE EXISTING STRUCTURES)	6
	2		2
	2		2
	2		2
	2		2
	2		2
	2		2
	2	— BZ 1 —	2
— TB —	2-4	— BZ 2 —	2
— WE —	2		
— C —	2		
— E —	2		
	2		
— NG —	2		
— PL —	2		
— TDE —	2		
— PDE —	2		
— EAB —	2		
— EPB —	2		
— ∇ —	2		
X X X X	2		
	6		
— — —			

N. C. DEPT. OF TRANSPORTATION
 DIVISION OF HIGHWAYS
 LEE COUNTY
 PROJECT: 8.T540402 (R-2417AA)
 SANFORD BYPASS

EARNEST W. MILLER &
JANE D. MILLER

Site 1



EXISTING R/W

F

US 421

-L-

74700

13+00

SANFORD

US 421

464



EXISTING R/W

PATTERSON CREEK

PROPERTY OWNER
UNKNOWN

N. C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
LEE COUNTY
PROJECT: 8.T540402 (R-2417AA)

SANFORD BYPASS
October 2000 - EST

SHEET 3 OF 14

PLAN VIEW



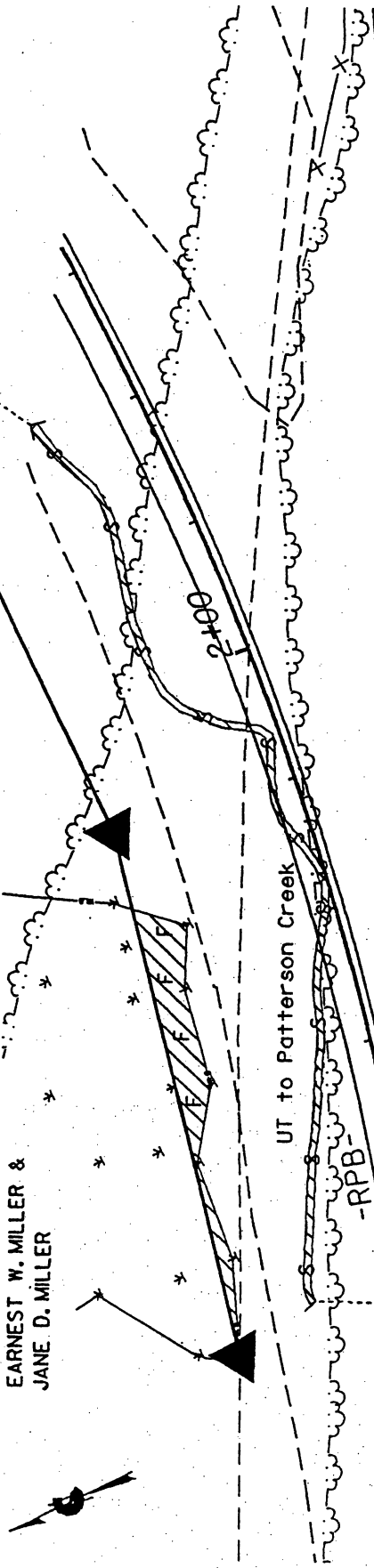
SCALE

DENOTES FILL
IN WETLANDS



Site 2

EARNEST W. MILLER &
JANE D. MILLER



465

US 421

US 421

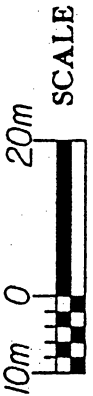
Site 3

PROPERTY OWNER
UNKNOWN

8
DENOTES FILL IN
SURFACE WATERS

8
DENOTES FILL
IN WETLANDS

PLAN VIEW



SCALE

N. C. DEPT. OF TRANSPORTATION
 DIVISION OF HIGHWAYS
 LEE COUNTY
 PROJECT: 8.T540402 (R-2417AA)

SANFORD BYPASS
 0000-62

SHEET 4 OF 14

PHYLLIS MCKOY (HEIRS) &
DONNIE TAYLOR

JOSEPHINE H. WOMACK

466

22+00

21+00

-L-

Site 4

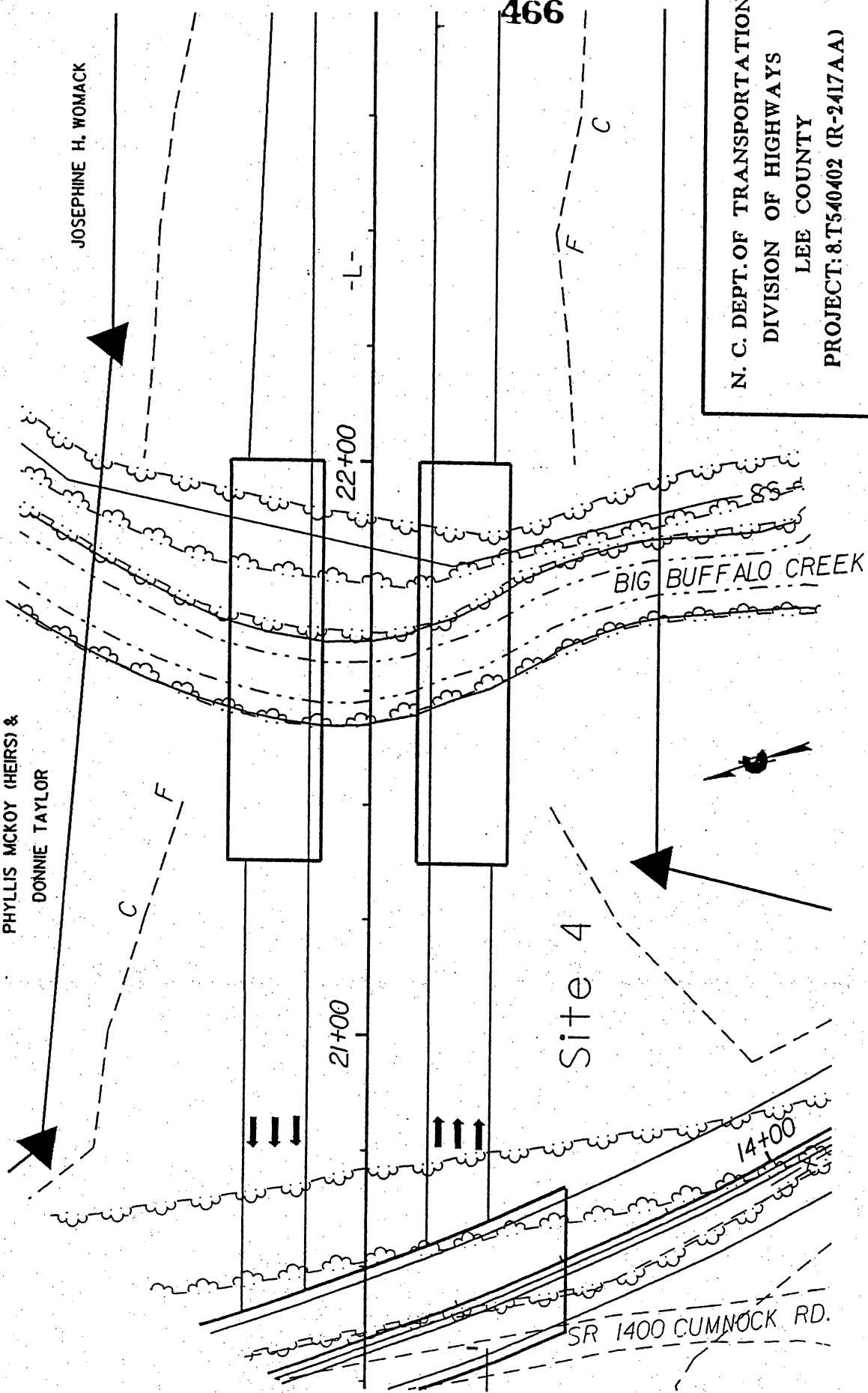
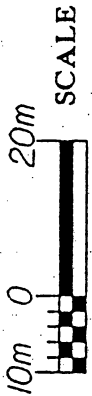
BIG BUFFALO CREEK

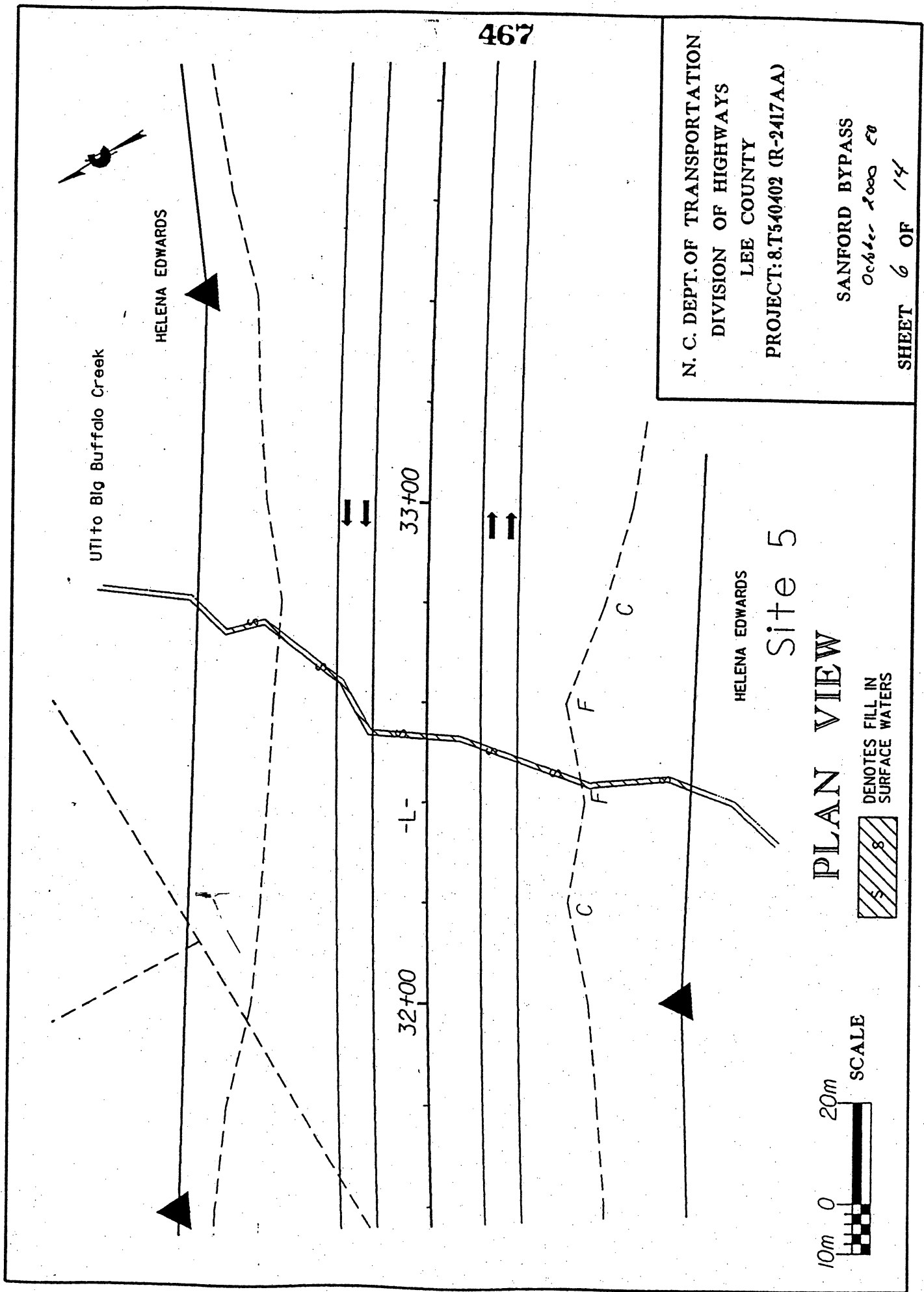
SR 1400 CUMNOCK RD.

N. C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
LEE COUNTY
PROJECT: 8.T540402 (R-2417AA)

SANFORD BYPASS
October 2000 - 02
SHEET 5 OF 14

PLAN VIEW



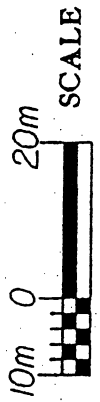


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 DIVISION OF HIGHWAYS
 LEE COUNTY
 PROJECT: 8.T540402 (R-2417AA)

SANFORD BYPASS
 October 2000 CB
 SHEET 6 OF 14

HELENA EDWARDS
 Site 5

PLAN VIEW



DENOTES FILL IN SURFACE WATERS



ELIZABETH M. WICKER

F

UT2 to Big Buffalo Creek

UT3 to Big Buffalo Creek

42+00

43+00

-L-

468

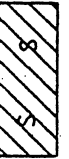
Site 6

ELIZABETH M. WICKER



SCALE

PLAN VIEW

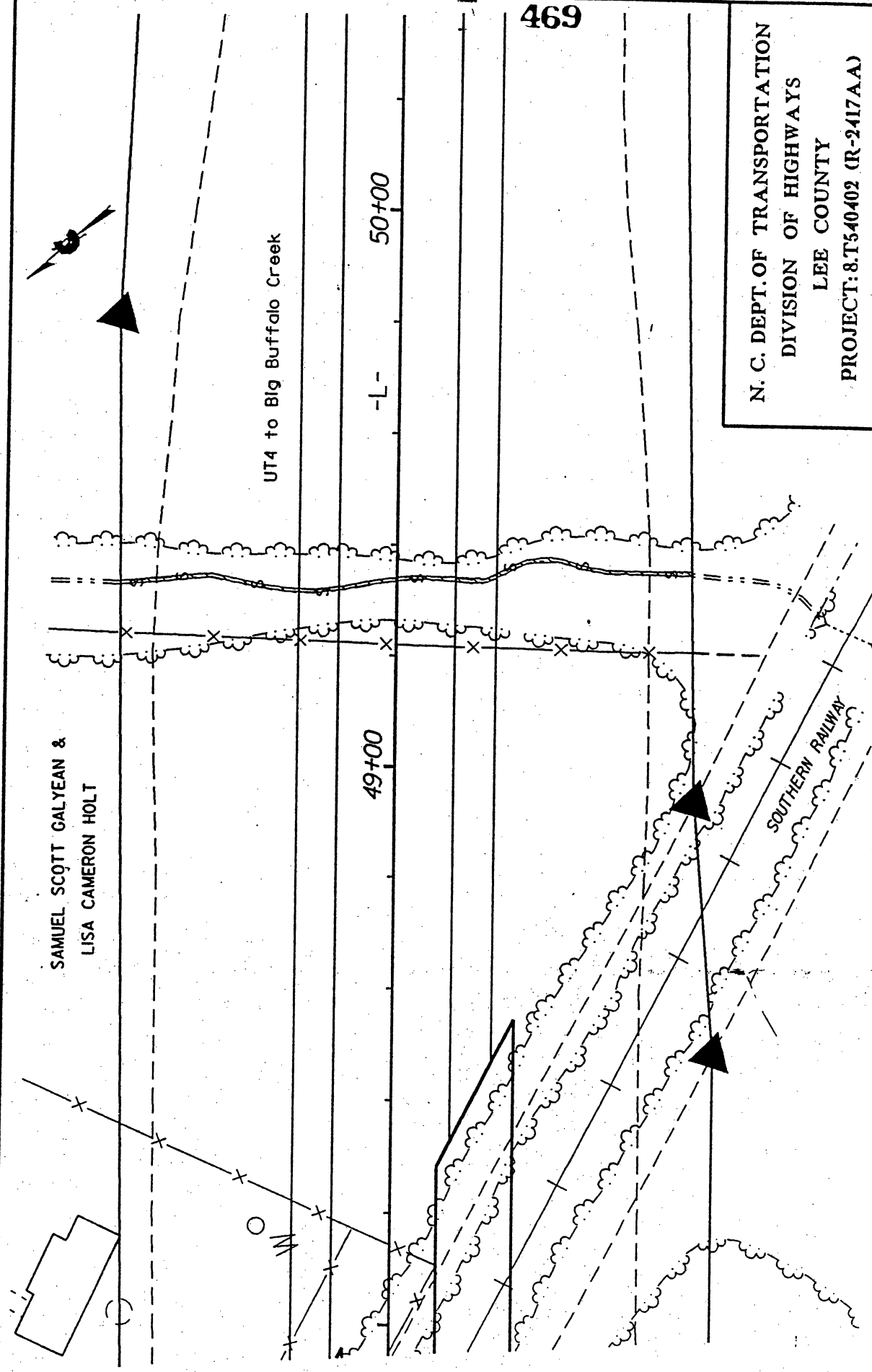


DENOTES FILL IN SURFACE WATERS

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DIVISION OF HIGHWAYS
LEE COUNTY
PROJECT: 8.T540402 (R-2417AA)

SANFORD BYPASS
October 2000 CWB
SHEET 7 OF 14

SAMUEL SCOTT GALYEAN &
LISA CAMERON HOLT



469

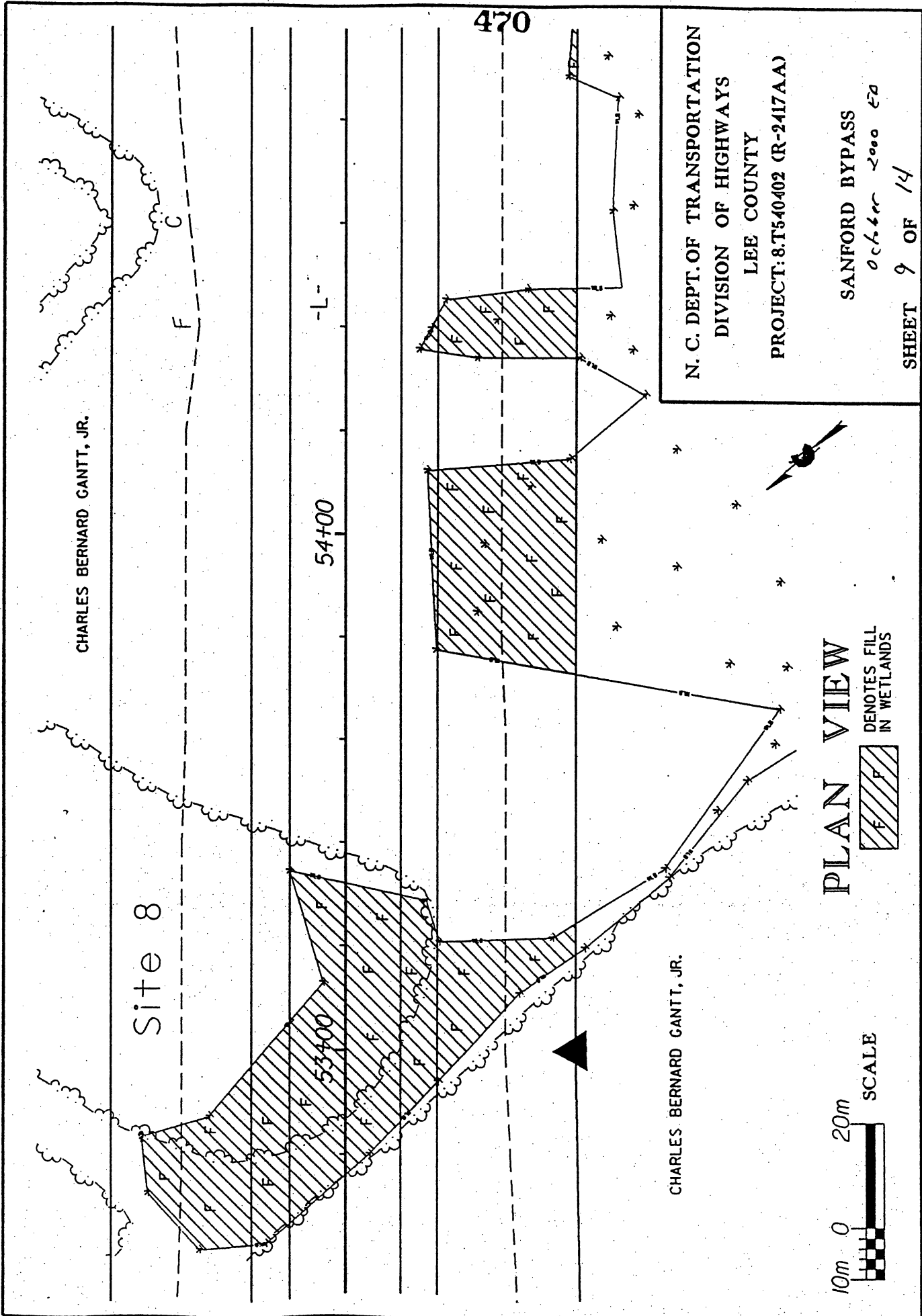
N. C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
LEE COUNTY
PROJECT: 8.T540402 (R-2417AA)

SANFORD BYPASS

October 2000 ED

SHEET 8 OF 14

PLAN VIEW Site 7



CHARLES BERNARD GANTT, JR.

Site 8

54100

-L-

53400

470

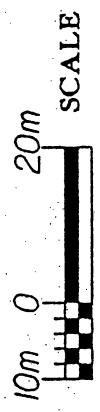
CHARLES BERNARD GANTT, JR.

N. C. DEPT. OF TRANSPORTATION
 DIVISION OF HIGHWAYS
 LEE COUNTY
 PROJECT: 8.T540402 (R-2417AA)

SANFORD BYPASS
 October 2000 ETD
 SHEET 9 OF 14

PLAN VIEW

Hatched area
 DENOTES FILL
 IN WETLANDS



REXINE KELLY LLOYD

UT5 to Big Buffalo Creek

SAN LEE BUILDERS, INC.

UT6 to Big Buffalo Creek

C F

60+00

61+00

-L-

Site 9

471

PAUL K. CRAIG

SAN LEE BUILDERS, INC.

N. C. DEPT. OF TRANSPORTATION
 DIVISION OF HIGHWAYS
 LEE COUNTY
 PROJECT: 8.T540402 (R-2417AA)

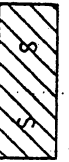
SANFORD BYPASS

SHEET 10 OF 14

PLAN VIEW



SCALE



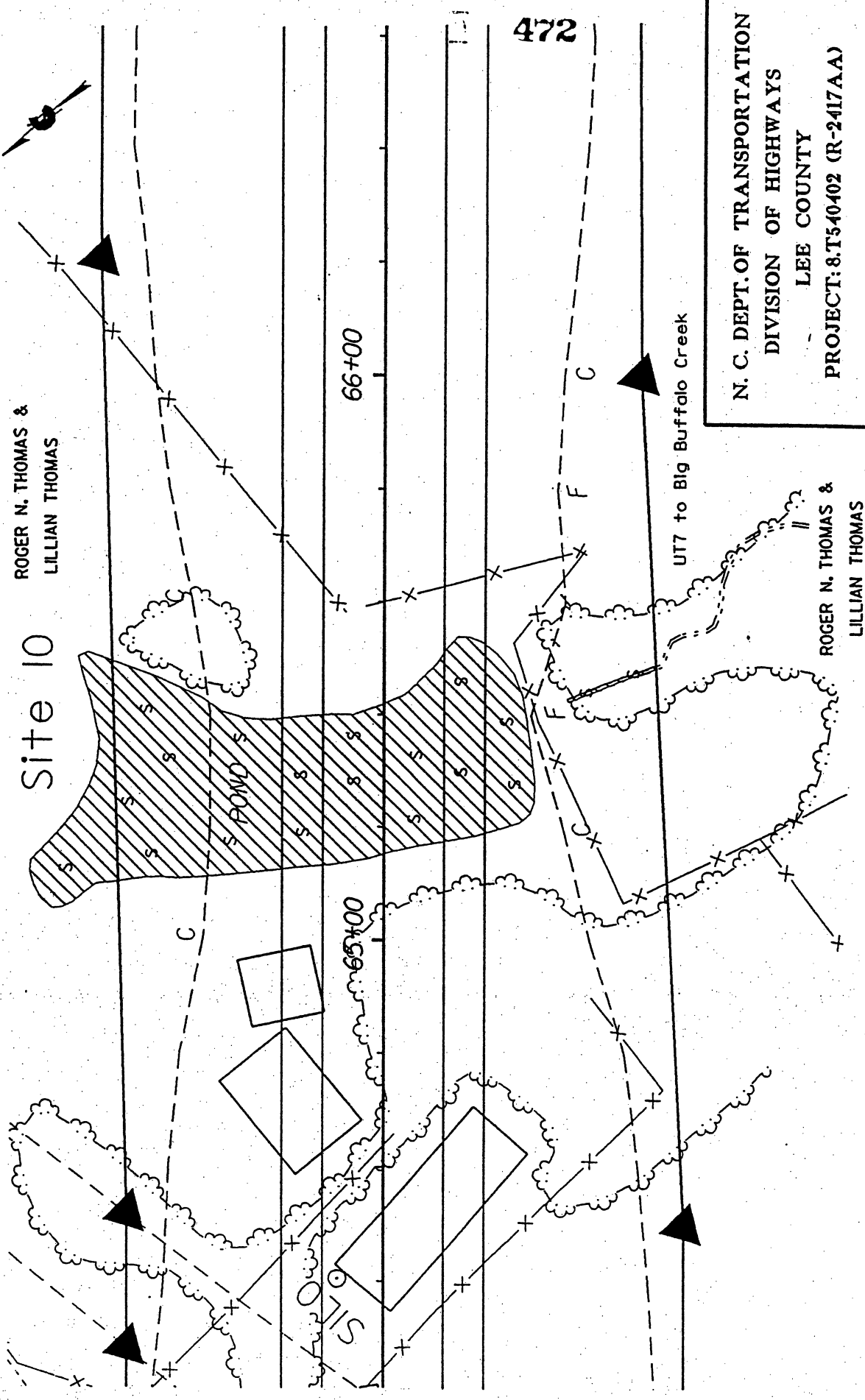
DENOTES FILL IN SURFACE WATERS



DENOTES FILL IN WETLANDS

ROGER N. THOMAS &
LILLIAN THOMAS

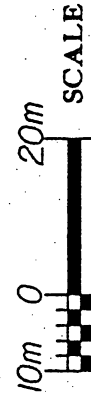
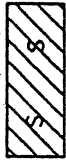
Site 10



ROGER N. THOMAS &
LILLIAN THOMAS

PLAN VIEW

DENOTES FILL IN
SURFACE WATERS



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DIVISION OF HIGHWAYS
LEE COUNTY
PROJECT: 8.T540402 (R-2417AA)

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October 2000 Ed

SHEET 11 OF 14

SUMMARY

Site No.	Station (From/To)	Structure Size	WETLAND IMPACTS				SURFACE WATER IMPACTS				BUFFER IMPACTS					
			Fill In Wetlands (ha)	Temp. Fill In Wetland (ha)	Excavation In Wetland (ha)	Interchange/Isolated Wetland (ha)	Mechanized Clearing (Method -) (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)	ZONE 1 (ha)	ZONE 2 (ha)	Mech Clear (ha)
1	14+00 -L- (LT)		0.020													
2**	16+00/16+05 -L- (LT&RT)		0.020													
3	16+60 -L- (RT)		0.053													
4	21+60 -L-	Bridges														
5	32+50 -L-															
6	42+50 -L-															
6**	42+40 -L-															
7**	49+35 -L-															
8	53+00/54+10 -L- (LT&RT)		0.390													
9	60+10 -L- (LT&RT)		0.076													
9**	60+12 -L- (LT)															
10**	65+10 -L-															
TOTALS:			0.559							0.042	0.220		793			

** Intermittent Stream

Perennial Total: 340 m
Intermittent Total: 453 m

N.C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
LEE COUNTY
PROJECT: 0 c/f/b/y/r d o u o e t
8.1540402 (R-2417AA)
SHEET 12 OF 14

PROPERTY OWNERS

NAMES AND ADDRESSES

PARCEL NO.	NAMES	ADDRESSES
1, 2, 3	EARNEST W. JANE D. MILLER	108 Sunset Drive Greensboro, NC 27408
4	PHYLLIS MCKOY (HIERS) & DONNIE TAYLOR	5218 Cumnock Rd Sanford, NC 28262
4	JOSEPHINE WOMACK	710 Erwin Rd Sanford, NC 27330
5	HELENA EDWARDS	115-23 180th Jamaica, NY 11434
6	ELIZABETH WICKER	1239 Cherry Tree Lane Annapolis, MD 21403
7	SAMUEL S. GALYEAN & LISA C. HOLT	4305 Foxrun Drive Sanford, NC 27330
8	CHARLES B. GANTT, JR.	1606 Lord Ashley Drive Sanford, NC 27330
9	REXINE KELLY LLOYD	511 Maplewood Drive Sanford, NC 27330
9	PAUL K. CRAIG	3301 Greenvally Drive Sanford, NC 27330

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DIVISION OF HIGHWAYS
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PROJECT: 8.T540402 (R-2417AA)

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SHEET 13 OF 14

PROPERTY OWNERS

NAMES AND ADDRESSES

PARCEL NO.	NAMES	ADDRESSES
9	SAN LEE BUILDERS	P.O. Box 3367 Sanford, NC 27330
10	ROGER N. & LILLIAN THOMAS	3212 Greenvally Drive Sanford, NC 27330

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