STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

BEVERLY EAVES PERDUE
GOVERNOR

EUGENE A. CONTI, JR.
SECRETARY

March 29, 2011

U. S. Army Corps of Engineers
Asheville Regulatory Field Office
151 Patton Avenue, Room 208
Asheville, NC 28801-5006

Attention: Ms. Sarah Hair
NCDOT Coordinator

Subject: **Application for Section 404 Individual Permit and Section 401 Water Quality Certification** for the reconstruction and widening of I-85, from south of Concord Mills/Bruton Smith Boulevard (SR 2894) to north of NC 73 in Cabarrus County. Federal Aid Project No. NHIMF-85-2(62)48. State Project No. 34187.3.GV3. Division 10. TIP No. I-3803B.

Debit $570.00 from WBS Element 34187.3.GV3

Dear Madam:

The North Carolina Department of Transportation (NCDOT) proposes to reconstruct and widen I-85 to an eight–lane facility from south of Concord Mills/Bruton Smith Boulevard to NC 73 in Cabarrus County. From east of NC 73, the roadway will gradually merge lanes and tie into the existing four-lane facility. This project is approximately 7.0 miles and contains four interchanges including SR 2894 (Concord Mills/Bruton Smith Boulevard) Exit 49, SR 1394 (Poplar Tent Road) Exit 52, SR 1430 (Kannapolis Parkway) Exit 54, and NC 73 (Davidson Highway) Exit 55. I-3803B was let as a design-build project in July 2010. Included in this application package are the following: (1) this cover letter, (2) ENG Form 4345, (3) State Historic Preservation Office concurrence forms, (4) USFWS concurrence letter (5) Hydraulic Design and Permit Drawing Review Meetings (Concurrence Point 4B and 4C) minutes, (6) Ecosystem Enhancement Program (EEP) confirmation letter, (7) Stormwater Management Plan, (8) permit drawings, (9) and half-size roadway plans.

Purpose and Need

The purpose of this project is to provide relief from present and future congestion and provide a higher level of efficiency on I-85. Future traffic projections indicate that without the proposed improvements to this section of I-85, traffic delays would continue. Traffic volumes on I-85 at I-485 are expected to increase from 100,400 vehicles per day (vpd) to 186,200 vpd by the year 2030. By

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

TELEPHONE: 919-717-6100
FAX: 919-212-5785
WEBSITE: WWW.NCDOT.ORG

LOCATION:
1020 BIRCH RIDGE DR.
CENTURY CENTER BUILDING B
RALEIGH NC 27610

the same year, traffic volumes on I-85 at NC 73 are expected to increase from 82,400 vpd to 168,400 vpd. Analysis also indicates 92 percent of the mainline road segments and ramp junctions and 67 percent of the intersections currently operate at unacceptable levels of service (LOS E and F) during peak morning and afternoon traffic periods.

Summary of Impacts

Waters of the U.S.: Construction of I-3803B will necessitate impacts to Jurisdictional Waters of the U.S. The project lies in the Yadkin River Basin in HUC 03040105. The construction of I-3803B will result in permanent impacts to 0.05 acre of wetlands and 1427 linear feet of stream. There are < 0.01 acre of temporary impacts to streams associated with a culvert extension and replacement of culvert wingwalls. There will be no temporary impacts to wetlands or streams due to the placement of temporary erosion control devices or temporary stream crossings.

Table 1. Summary of Jurisdictional Impacts

Section	Riparian Wetlands (ac)*	Non-riparian Wetlands (ac)*	Streams (ft)	Surface Waters (ac)
I-3803B	0.05	0	1427	0.14

Summary of Utility Impacts

Utility relocations will be located outside of jurisdictional resources and thus will have no permanent or temporary impacts to streams or wetlands.

Summary of Mitigation

Project impacts will require mitigation for 0.05 acre of riparian jurisdictional wetlands and 1169 linear feet of stream within the Yadkin River Basin. NCDOT will utilize the North Carolina Department of Environment and Natural Resources Ecosystem Enhancement Program (EEP) for satisfying the federal Clean Water Act compensatory mitigation requirements for the unavoidable impacts for I-3803B (see attached EEP letter).

PROJECT SCHEDULE

I-3803B is being built by a Design Build Team and is scheduled to begin construction upon receipt of all necessary permits and approvals (anticipated July 2011) and completed by December 2013. I-3803A has been constructed.

NEPA DOCUMENT STATUS

The Final Environmental Assessment (FEA) and the Finding on No Significant Impact (FONSI) for the FEA were approved by the Federal Highway Administration (FHWA) in June 2009 and April 2010, respectively, for I-3803B and circulated to the appropriate agencies. The Concurrence Point 4B meeting was held on December 16, 2010 and the Concurrence 4C meeting was held on March 9, 2011.

INDEPENDENT UTILITY

The subject project complies with 23 CFR Part 771.111(f), which lists the Federal Highway Administration (FHWA) characteristics of independent utility of a project:

1) The project connects logical termini and is of sufficient length to address environmental matters on a broad scope;
2) The project is usable and a reasonable expenditure, even if no additional transportation improvements are made in the area;
3) The project does not restrict consideration of alternatives for other reasonably foreseeable transportation improvements.

RESOURCE STATUS

NCDOT received a final Jurisdictional Determination (JD) from the USACE on August 19, 2008 which will expire on August 19, 2013. Wetlands were delineated using the methodology outlined in the 1987 US Army Corps of Engineers Wetland Delineation Manual. The North Carolina Division of Water Quality's (DWQ) Identification Methods for the Origins of Intermittent and Perennial Streams was used to make stream determinations.

The Rocky River, Coddle Creek and Irish Buffalo Creek are listed in the Final 2010 303(d) report. Coddle Creek from a point 0.2 mile upstream of N.C. Hwy. 73 to the Rocky River is listed for ecological/biological integrity and turbidity. The Rocky River from its source to the mouth of Reedy Creek is listed for ecological/biological integrity, fecal coliform, and turbidity. Irish Buffalo Creek from the Kannapolis Water Supply Dam to the Rocky River is listed for copper, turbidity, and ecological//biological integrity. This project does not directly impact Irish Buffalo Creek; however, tributaries to this stream are located within the project area.

No other streams within the project area are listed as 303(d). No streams within one mile of the project are classified as ORW, HQW, WS-I or WS-II. All streams within the project area are Class C waters.

IMPACTS TO WATERS OF THE UNITED STATES

<u>Wetlands</u>

Permanent riparian wetland impacts total 0.05 acres and there are no non-riparian impacts for I-3803B. Table 2 lists permanent impacts (fill, excavation, and mechanized clearing), temporary impacts and hand clearing. Impacts are based upon final design for I-3803B presented in the March 2011 Concurrence Point 4C meeting.

Borrow/Waste Sites: Borrow and waste activities will occur on high ground, except as authorized by permit. The NCDOT requires its contractors to identify all areas to be used for borrow material, or for disposal of dredged, fill or waste material. There will be additional waste for this project from the median being removed; however, the contractor anticipates utilizing this material on the nearby interchange project (R-2123CE).

Table 2. I-3803B Wetland Impacts

Permit Site No.	Wetland ID in EA/JD Package	Riparian or Non-riparian	Impact Type	Permanent Impacts (ac)	Temporary Impacts (ac)	Mitigation Ratio
3	B	Riparian	Clearing	0.02	0	2:1
12	D	Riparian	Fill & Clearing	0.01	0	2:1
16	E	Riparian	Clearing	<0.01	0	2:1
19	K	Riparian	Fill	0.01	0	2:1
20	L	Riparian	Excavation & Clearing	0.01	0	2:1
Total				**0.05**	**0**	-

Surface Waters

Permanent stream impacts for I-3803B are 1427 linear feet. Tables 3 and 4 list the site number, reference ID, stream name, amount of permanent impacts, amount of mitigation required, and DWQ index number.

Table 3. I-3803B Streams Impacted and Their Descriptions

Permit Site No.	Stream ID in EA / JD Package	Stream Name	Intermittent/ Perennial/	DWQ Index No.
1	UT 10	UT to Rocky River	Perennial	13-17
2	RR	Rocky River	Perennial	13-17
4	UT 8C	UT to Rocky River	Perennial	13-17
5	UT 8B	UT to Rocky River	Perennial	13-17
6	UT 8	UT to Rocky River	Perennial	13-17
7	UT 8A	UT to Rocky River	Perennial	13-17
8	UT 8A1	UT to Rocky River	Perennial	13-17
9	UT 7A	UT to Coddle Creek	Intermittent/Perennial	13-17-6-(5.5)
10	CC	Coddle Creek	Perennial	13-17-6-(5.5)
11	UT 4	UT to Afton Run	Perennial	13-17-6-6
13	UT 4B	UT to Afton Run	Perennial	13-17-6-6
14	UT 4A	UT to Afton Run	Perennial	13-17-6-6
15	UT 4	UT to Afton Run	Perennial	13-17-6-6
16	UT 1	UT to Irish Buffalo Creek	Perennial	13-17-9-(2)
17	UT 1B	UT to Irish Buffalo Creek	Perennial	13-17-9-(2)
18	UT 1	UT to Irish Buffalo Creek	Perennial	13-17-9-(2)
19	UT 14A	UT to Rocky River	Perennial	13-17
20	UT 15	UT to Irish Buffalo Creek	Perennial	13-17-9-(2)

Table 4. I-3803B Surface Water Impacts

Permit Site No.	Type of Impact	Permanent Stream Impacts (ft)	Temporary Stream Impacts (ft)	Impacts Requiring Mitigation (ft)	Mitigation Ratio	Total Amount of Mitigation Needed
1	Bank Stabilization	16	0	0	-	0
2	Bridge	0	0	0	-	0
4	42" RCP	24	0	24	2:1	48
	Bank Stabilization	14	0	0	-	0
5	42" RCP	52	0	52	2:1	104
	Bank Stabilization	14	0	0	-	0
6	7x7 RCBC	0	7	0	-	0
	Lateral Ditch	11	0	11	2:1	22
7	Bank Stabilization	24	0	0	-	0
8	Roadway Fill	699	0	699	2:1	1398
	Bank Stabilization	43	0	43	1.1	43
9	Bank Stabilization	11	0	0	-	0
10	Bridge	0	0	0	-	0
11	7x6 RCBC	47	27	47	2:1	94
13	36" RCP	18	0	18	2:1	36
	Bank Stabilization	49	0	0	-	0
14	36" RCP	43	0	43	2:1	86
	Bank Stabilization	26	0	0	-	0
15	30"RCP	12	0	12	2:1	24
	Bank Stabilization	14	0	0	-	0
16	30"RCP	65	0	65	2:1	130
17	30" RCP	18	0	18	2:1	36
	Bank Stabilization	23	0	0	-	0
18	66" RCP	8	0	8	2:1	16
	Bank Stabilization	27	0	0	-	0
19	Roadway Fill	34	0	34	2:1	68
	Bank Stabilization	40	0	0	-	0
20	(2) 18" RCP	95	0	95	2:1	190
Total		1427	34	1169	-	2295

PROTECTED SPECIES

The United States Fish and Wildlife Service (USFWS) list two federally protected species for Cabarrus County as of September 22, 2010 (Table 5).

Table 5. Federally Protected Species in Cabarrus County

Scientific Name	Common Name	Federal Status	Habitat Present	Biological Conclusion
Lasmigona decorata	Carolina heelsplitter	E	Yes	No Effect
Helianthus schweinitzii	Schweinitz's sunflower	E	Yes	MANLAA*

*May affect, not likely to adversely affect.

A letter from the USFWS dated January 30, 2008 and additional correspondence on March 3, 2009 (appended in the EA) concurred on the Biological Conclusions for these species. Mussel surveys conducted in August and December 2007 and April, July, and October 2008 in the Rocky River, Coddle Creek, and Afton Run resulted in no occurrences of Carolina heelsplitter observed during the surveys in any of these stream reaches.

Schweinitz's sunflower has a "May Affect, Not Likely to Adversely Affect" biological conclusion based on suitable habitat present within the project area. A survey of suitable habitat was conducted by NCDOT biologists on October 18, 24, and 25, 2006, resulting in no populations of the species observed within the study area. A review of the NHP database of rare species and unique habitats on January 3, 2008 revealed two known populations of Schweinitz's sunflower within one mile of the project study area. The project study area was expanded in November 2007 and NCDOT biologists performed additional surveys within potential habitat of the expanded study area on August 28 and September 17, 2008. During the expanded survey, no individuals of Schweinitz's sunflower were observed. The project area was resurveyed on October 5, 2009 with no occurrences of the species found; however, due to a nearby population, the Biological Conclusion remains as "May Affect, Not Likely to Adversely Affect."

CULTURAL RESOURCES

The State Historic Preservation Office (HPO) and NCDOT concurred that the project will have no direct effect on any known historic architectural or archaeological resources; however, architectural sites fall within close proximity to the project right of way.

Archaeology

There will be no effect on any archaeological resources. The HPO concurred with these findings in their February 26, 2008 response (see attached letter of concurrence).

Historic Architecture

Poplar Tent Presbyterian Church, which is listed in the National Register of Historic Places, is located on the south side of Poplar Tent Road east of Shelton Road (see Roadway Plan Sheet 39). The Blake House, which is eligible for listing in the Register, is located on the east side of Trinity Church Road northwest of the I-85 interchange with NC 73 (see Roadway Plan Sheet 26). The project was designed to avoid the taking of right of way or easements from either property. The FHWA, NCDOT and HPO determined (Concurrence Form dated February 16, 2010, enclosed) that the project, as currently designed, will have No Adverse Effect on either property with the provisions noted on the Concurrence Form.

FEMA COMPLIANCE

The project will be coordinated with appropriate state and local officials and the Federal Emergency Management Agency (FEMA) to assure compliance with FEMA, state, and local floodway regulations.

INDIRECT AND CULMULATIVE EFFECTS

The widening of I-85 in the project area is unlikely to cause significant indirect and cumulative growth along the I-85 corridor. Future development in the project area will continue to be centered on residential and employment growth in Cabarrus County. Traffic services will be maintained throughout the project's construction with no anticipated adverse effects on emergency services coverage in the area. Likewise, no impacts to public services, such as public transportation, are anticipated. The project will not disrupt community stability or neighborhood cohesion, impact community facilities, negatively impact property values, alter emergency response, or have any visual-aesthetic implications as the project is primarily within existing NCDOT right of way. The widening of I-85 is not likely to spur development along the corridor, but may contribute to development, particularly commercial uses at interchange locations.

It is unlikely that the widening of I-85 will be the primary variable responsible for secondary growth. Increased development in the project area is already expected based on the high growth projections for the region. The roadway network is already experiencing an increase in traffic and modifications to existing interchanges in this area could improve traffic conditions and provide better access to businesses and residences. These modifications could facilitate faster development of currently vacant/undeveloped parcels as they become more attractive for large commercial, business, or residential development. Increased traffic, noise, air pollution, and run-off from impervious surfaces could follow this development.

Existing regulations and ordinances governing ongoing and future development in the project area will serve to manage impacts that could result from the proposed I-85 improvements. Indirect and cumulative effects were discussed in greater detail in the EA signed in June 2009.

MITIGATION OPTIONS

The NCDOT is committed to incorporating all reasonable and practicable design features to avoid and minimize jurisdictional impacts, and to provide either on-site or compensatory mitigation of all remaining, unavoidable jurisdictional impacts. Avoidance measures were taken during the planning and NEPA compliance stages; minimization measures were incorporated as part of the project design.

Avoidance and Minimization

All jurisdictional features were delineated, field verified and surveyed within the right of way for I-3803B. Using these surveyed features, preliminary designs were adjusted to avoid and/or minimize impacts to jurisdictional areas. NCDOT employs many strategies to avoid and minimize impacts to jurisdictional areas in all of its designs. Many of these strategies have been incorporated into BMP documents that have been reviewed and approved by the resource agencies and will be followed throughout construction. All wetland areas not affected by the project will be protected from unnecessary encroachment. Individual avoidance and minimization items are as follows:

- NCDOT will minimize long-term water quality impacts using the most recent Best Management Practices for Protection of Surface Waters, as identified in the Federal Aid Highway Program (FHPM) and North Carolina Administrative Code, Chapter 4.
- Sediment and erosion control measures will accommodate a 25-year storm event.
- NCDOT will avoid placing erosion control devices in wetlands.
- The use of preformed scour holes where applicable.
- Grass swales are utilized where feasible to provide stormwater treatment. These are summarized in the Stormwater Management Plan.
- Special sediment control fence will be used at wetlands and low areas along the standard silt fence.
- The use of 3:1 fill slopes and rock plating in jurisdictional areas where practicable.
- No riprap will be placed in the bed of the channels during stabilization of outlet structures.
- Bridges will be constructed at Rocky River and Coddle Creek to reduce impacts to streams.
- Temporary work bridges will be used to construct the permanent bridges at Rocky River and Coddle Creek. These temporary work bridges will not impact any jurisdictional features as the bridge will span the tops of banks.
- The design reconfigured the NC 73 interchange to avoid impacts to wetlands and minimized impacts to streams.
- Utilized guardrail and greater slopes in the final design to avoid pipe extensions at several locations across the project.
- Avoided impacts to Afton Run and previously constructed mitigation project. Provided two PSHs in the Afton Run vicinity to assist with additional roadway drainage.
- Utilized guardrail, steeper slopes (1.5:1) and additional rock at the Rocky River crossing to avoid parallel stream impacts.
- A current stream blockage will be removed at Site 1 by removing rip rap placed in the channel during previous pipe installation.
- Provided an alternative solution to a perched pipe at Site 17 by utilizing a rock ladder at the request of the agencies.
- Provided larger rock (typically Class I) at ditch tie-ins with jurisdictional features to provide increased stability at locations with greater volumes and high velocities.
- At several locations with perched pipes, a junction box was used to dissipate energy flows in those systems.

On-Site Mitigation

There are no on-site mitigation opportunities within the existing NCDOT right of way. At the request of the agencies, on-site stream preservation sites adjacent to NCDOT right of way were fully evaluated with the project. These sites were deemed unfeasible as a result of mitigation ratios vs. land acquisition costs.

Compensation

The NCDOT has avoided and minimized impacts to jurisdictional resources to the greatest extent possible as described above. Total riparian wetland impacts requiring mitigation are 0.05 acre. Total stream impacts requiring mitigation are 1169 linear feet. These impacts will be offset by the EEP at a 2:1 ratio with the exception of the 43 linear feet of bank stabilization impact at Site 8, which will be mitigated at a 1.1 ratio. A copy of the EEP Acceptance Letter is included with this application.

Table 9. Summary of Mitigation Required

I-3803B	Riparian Wetlands (ac)*	Non-riparian Wetlands (ac)*	Streams (ft)
Total	0.10	0	2295

REGULATORY APPROVALS

Section 404
Application is hereby made for a USACE Individual Section 404 Permit as required for the above-described activities.

Section 401
Application is hereby made for a Section 401 Water Quality Certification from the N. C. Division of Water Quality.

A copy of this permit application and its distribution list will be posted on the NCDOT website at: http://www.ncdot.org/doh/preconstruct/pe/neu/permit.html. If you have any questions or need additional information, please contact Jason Dilday at jldilday@ncdot.gov or (919) 707-6111.

Sincerely,

E. L. Lusk

for Gregory J. Thorpe, Ph.D., Manager
Project Development and Environmental Analysis Branch

CC:
NCDOT Permit Application Standard Distribution List

APPLICATION FOR DEPARTMENT OF THE ARMY PERMIT *(33 CFR 325)*	OMB APPROVAL NO. 0710-0003 EXPIRES: 31 August 2012

Public reporting burden for this collection of information is estimated to average 11 hours per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Department of Defense, Washington Headquarters, Executive Services and Communications Directorate, Information Management Division and to the Office of Management and Budget, Paperwork Reduction Project (0710-0003). Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to any penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number. Please DO NOT RETURN your form to either of those addresses. Completed applications must be submitted to the District Engineer having jurisdiction over the location of the proposed activity.

PRIVACY ACT STATEMENT

Authorities: Rivers and Harbors Act, Section 10, 33 USC 403; Clean Water Act, Section 404, 33 USC 1344; Marine Protection, Research, and Sanctuaries Act, Section 103, 33 USC 1413; Regulatory Programs of the Corps of Engineers; Final Rule 33 CFR 320-332. Principal Purpose: Information provided on this form will be used in evaluating the application for a permit. Routine Uses: This Information may be shared with the Department of Justice and other federal, state, and local government agencies, and the public and may be made available as part of a public notice as required by Federal law. Submission of requested information is voluntary, however, if information is not provided the permit application cannot be evaluated nor can a permit be issued. One set of original drawings or good reproducible copies which show the location and character of the proposed activity must be attached to this application (see sample drawings and instructions) and be submitted to the District Engineer having jurisdiction over the location of the proposed activity. An application that is not completed in full will be returned.

(ITEMS 1 THRU 4 TO BE FILLED BY THE CORPS)

1. APPLICATION NO.	2. FIELD OFFICE CODE	3. DATE RECEIVED	4. DATE APPLICATION COMPLETE

(ITEMS BELOW TO BE FILLED BY APPLICANT)

5. APPLICANT'S NAME:	8. AUTHORIZED AGENT'S NAME AND TITLE (an agent is not required)
First - Middle - Last –	First - Middle - Last –
Company – North Carolina Department of Transportation	Company –
E-mail Address – Project Development and Environmental Analysis	E-mail Address –
6. APPLICANT'S ADDRESS. Address - 1598 Mail Service Center City – Raleigh State – NC Zip – 27699-1598 Country –	9. AGENT'S ADDRESS Address - City – State – Zip – Country –
7. APPLICANT'S PHONE NOs. W/AREA CODE a. Residence b. Business 919-707-6111 c. Fax	10. AGENT'S PHONE NOs. W/AREA CODE a. Residence b. Business c. Fax

STATEMENT OF AUTHORIZATION

11. I hereby authorize, ____________________ to act in my behalf as my agent in the processing of this application and to furnish, upon request, supplemental information in support of this permit application.

APPLICANT'S SIGNATURE DATE

NAME, LOCATION, AND DESCRIPTION OF PROJECT OR ACTIVITY

12. PROJECT NAME OR TITLE (see instructions)
I-3803B - I-85 Widening from South of Concord Mills Blvd/Bruton Smith Blvd to north of NC 73.

13. NAME OF WATERBODY, IF KNOWN (if applicable) Rocky River, UTs to Rocky River, Coddle Creek, UTs to Coddle Creek and UTs to Irish Buffalo Creek	14. PROJECT STREET ADDRESS (if applicable) Address
15. LOCATION OF PROJECT Latitude: °N Longitude: °W	City - State – Zip -

16. OTHER LOCATION DESCRIPTIONS, IF KNOWN (see instructions) Brunswick and New Hanover Counties
State Tax Parcel ID Municipality
Section – Township – Range –

17. DIRECTIONS TO THE SITE
Please see attached vicinity map and cover letter.

18. **Nature of Activity** (Description of project, include all features)

I-3803B - Proposed I-85 Widening from South of Concord Mills Blvd/Bruton Smith Blvd to north of NC 73. Approximately 7 mile fully controlled access interstate with widening to the median.

19. **Project Purpose** (Describe the reason or purpose of the project, see instructions)

The purpose of this project is to provide relief from present and future congestion and provide a higher level of efficiency on I-85.

USE BLOCKS 20-23 IF DREDGED AND/OR FILL MATERIAL IS TO BE DISCHARGED

20. **Reason(s) for Discharge**

Construction of roadway.

21. **Type(s) of Material Being Discharged and the Amount of Each Type in Cubic Yards:**

Type Amount in Cubic Yards	Type Amount in Cubic Yards	Type Amount in Cubic Yards

Please see attached permit drawings.

22. **Surface Area in Acres of Wetlands or Other Waters Filled** (see instructions)

Acres 0.05 acre of riparian wetland will be permanently impacted.

Or

Liner Feet 1427 linear feet of stream channel will be impacted.

23. **Description of Avoidance, Minimization, and Compensation** (see instructions)

Please see cover letter.

24. **Is Any Portion of the Work Already Complete?** Yes ☐ No ☑ IF YES, DESCRIBE THE COMPLETED WORK

25. **Addresses of Adjoining Property Owners, Lessees, Etc., Whose Property Adjoins the Waterbody** (If more than can be entered here, please attach a supplemental list).

Address – Please see the attached list in the permit drawing package.

City – State – Zip –

26. **List of Other Certifications or Approvals/Denials Received from other Federal, State, or Local Agencies for Work Described in This Application.**

AGENCY	TYPE APPROVAL*	IDENTIFICATION NUMBER	DATE APPLIED	DATE APPROVED	DATE DENIED

* Would include but is not restricted to zoning, building, and flood plain permits

27. Application is hereby made for a permit or permits to authorize the work described in this application. I certify that the information in this application is complete and accurate. I further certify that I possess the authority to undertake the work described herein or am acting as the duly authorized agent of the applicant.

E. L. Lusk for Gregory J. Thorpe Mar 29 2011

SIGNATURE OF APPLICANT DATE SIGNATURE OF AGENT DATE

The application must be signed by the person who desires to undertake the proposed activity (applicant) or it may be signed by a duly authorized agent if the statement in block 11 has been filled out and signed.

18 U.S.C. Section 1001 provides that: Whoever, in any manner within the jurisdiction of any department or agency of the United States knowingly and willfully falsifies, conceals, or covers up any trick, scheme, or disguises a material fact or makes any false, fictitious or fraudulent statements or representations or makes or uses any false writing or document knowing same to contain any false, fictitious or fraudulent statements or entry, shall be fined not more than $10,000 or imprisoned not more than five years or both.

Federal Aid #: **NHIMF-85-2(51)47** *TIP#:* **I-3803B** *County:* **Mecklenburg/Cabarrus**

CONCURRENCE FORM FOR ASSESSMENT OF EFFECTS

Project Description: **Add additional lanes from I-85, from I-485 in Mecklenburg County to NC 73 in Cabarrus County**

On 16 February 2010, representatives of the

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

Reviewed the subject project and agreed on the effects findings listed within the table on the reverse of this signature page.

Signed:

Courtney Foley — 23 FEBRUARY 2010
Representative, NCDOT — Date

[signature] — 2-23-10
FHWA, for the Division Administrator, or other Federal Agency — Date

Representative, HPO — Date

Renee Gledhill-Earley — 2·24·10
State Historic Preservation Officer — Date

Federal Aid #· **NHIMF-85-2(51)47** *TIP#*· **I-3803B** *County*: **Mecklenburg/Cabarrus**

Property and Status	Alternative	Effect Finding	Reasons
Poplar Tent Presbyterian Church (DE)	Alt. 1 Alt 2	No Adverse Effect	• No ROW or permanent easements are being acquired from boundary • Poplar Tent Road will be shifted northward away from the historic property. • Access to the church will be maintained by two driveways. • No heavy equipment will be allowed under the tree canopies immediately in front of the church. • Temporary fencing will be placed around the trees during construction • No channelization curbing will be placed within the historic boundary No heavy construction equipment will be permitted within the historic boundary during construction • A special note will be place on the project plans stating "Do Not Disturb trees, including overhanging branches" for the trees directly in front of the church. If trees need to be trimmed, NCDOT Historic Architecture will need to be contacted first
Blake House (DE)		No Adverse Effect	Off ramp near property will be relocated

Initialed: NCDOT CH FHWA DB HPO RSE

North Carolina Department of Cultural Resources

State Historic Preservation Office
Peter B. Sandbeck, Administrator

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

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

February 26, 2008

MEMORANDUM

TO: Matt Wilkerson
Office of Human Environment
North Carolina Department of Transportation

FROM: Peter Sandbeck RGE for PBS

SUBJECT: Preliminary Reconnaissance of the Revised Environmental Study Area for the I-85/NC 73 Interchange Vicinity, I-3803B, Mecklenburg and Cabarrus Counties, ER 05-212~~3~~4

Thank you for your letter of February 14, 2008, concerning the above project.

The report authors state that no archaeological sites were discovered during the archaeological reconnaissance investigations and the proposed project will not affect any archaeological resources and that no further cultural resources investigations are necessary and/or warranted. For purposes of compliance with Section 106 of the National Historic Preservation Act, we concur with their recommendations.

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

Thank you for your cooperation and considerations. If you have any questions concerning the above comment, please contact Renee Gledhill-Earley, environmental review coordinator, at 919.807.6579. In all future communication concerning this project, please cite the above referenced tracking number.

Location: 109 East Jones Street, Raleigh NC [illegible] Mailing Address: 4617 Mail Service Center, Raleigh NC [illegible] Telephone/Fax: [illegible]-6599

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Asheville Field Office
160 Zillicoa Street
Asheville, North Carolina 28801

January 30, 2008

Dr. Gregory J. Thorpe, 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: Endangered Species Concurrence for TIP Project No. I-3803B, Proposed Widening of I-85 from I-485 to NC 73, Mecklenburg and Cabarrus Counties, North Carolina

As requested by the North Carolina Department of Transportation (NCDOT), we have reviewed the natural resources information and biological conclusions for federally protected species for the subject project. The following comments are provided in accordance with the provisions of section 7 of the Endangered Species Act of 1973, as amended (16 U.S.C. 1531-1543) (Act).

The NCDOT proposes to widen I-85 from I-485 (Charlotte Outer Loop) in Mecklenburg County to NC 73 in Cabarrus County. Currently, I-85 varies from four to eight lanes along the project length; the proposal is to widen it to eight to ten lanes. Lanes will be added primarily within the existing maintained right-of-way of the current facility.

According to the information provided, the entire project length was surveyed for the federally endangered Schweinitz's sunflower (*Helianthus schweinitzii*). Although there are occurrences of the Schweinitz's sunflower within a mile of the project area on Mallard Creek Road, no individuals were located along the project length. Given the negative survey information, we agree that there will be no impact to listed species from implementation of this project. Therefore, we believe the requirements under section 7(c) of the Act are fulfilled for this species. However, obligations under section 7 of the Act must be reconsidered if: (1) new information reveals impacts of this identified action that may affect listed species or critical habitat in a manner not previously considered, (2) this action is subsequently modified in a manner that was not considered in this review, or (3) a new species is listed or critical habitat is determined that may be affected by the identified action.

If you have questions about these comments please contact Ms. Marella Buncick of our staff at 828/258-3939, Ext. 237 In any future correspondence concerning this project, please reference our Log Number 4-2-08-092.

Sincerely,

Brian P. Cole
Field Supervisor

cc:
Ms. Marla J. Chambers, Western NCDOT Permit Coordinator, North Carolina Wildlife Resources Commission, 12275 Swift Road, Oakboro, NC 28129
Mr. Steve Lund, Asheville Regulatory Field Office, U.S. Army Corps of Engineers, 151 Patton Avenue, Room 208, Asheville, NC 28801-5006
Ms. Polly Lespinasse, Mooresville Regional Office, North Carolina Division of Water Quality, 610 East Center Avenue, Suite 301, Mooresville, NC 28115

From: Dilday, Jason L
Sent: Monday, March 09, 2009 2:50 PM
To: Stroud, Wilson
Subject: FW: TIP I-3803B
Wilson,
This is the response Marella had to the updated mussel survey for I-3803B. This makes the Biological Conclusion a "No Effect" for Carolina heelsplitter. Let me know if you have any questions.

Jason

Jason Dilday
Environmental Specialist
North Carolina Department of Transportation
Natural Environment Unit
(W) 919-431-6693
(F) 919-431-2002
jldilday@ncdot.gov
www.ncdot.org/

From: Marella_Buncick@fws.gov [mailto:Marella_Buncick@fws.gov]
Sent: Monday, March 09, 2009 2:44 PM
To: Dilday, Jason L
Subject: TIP I-3803B

Jason,

I have reviewed the file for I-3803B, the widening of I-85 from I-485 to NC 73 in Mecklenburg and Cabarrus Counties, including our concurrence letter from January of 2008. In your concurrence request you determined there would be no effect to federally listed species for Mecklenburg and Cabarrus counties with the exception of Schweinitz's sunflower and we concurred with your "not likely to adversely affect" determination for that species.

An additional survey for Carolina heelsplitter in October, 2008, found no native freshwater mussels in streams affected by the project. These findings supported previous surveys that also found no native freshwater mussels. Based on the updated survey data, the conclusions in our January 30, 2008 letter remain the same.

If you have further questions please call or e-mail.

Marella

marella buncick
USFWS
160 Zillicoa St.
Asheville, NC 28801
828-258-3939 ext 237

People don't resist change, they resist being changed.

Subject: Minutes from the **Interagency 4B Concurrence Meeting** for Hydraulic Design on December 16, 2010 for **I-3803B in Cabarrus County**

Team Members:

Liz Hair – USACE (absent)
Marella Buncick – USFWS
Marla Chambers – NCWRC
Polly Lespinasse – NCDWQ (absent)
Chris Militscher – EPA (absent)
Renee Gledhill-Early – SHPO
Bill Zerman – NCDOT (Hydraulics)
Jason Dilday – NCDOT (NEU)
Teresa Bruton – NCDOT (TPMU) (absent)
Rodger Rochelle – NCDOT (TPMU) (absent)
Jackie Armstrong – NCDOT (TPMU)
Rick Baucom – NCDOT (Div-10) (absent)
Larry Thompson – NCDOT (Div-10)

Other Participants:

Khaled Al-Akhdar – NCDOT (TPMU)
James Dunlop – NCDOT
Wilson Stroud – PDEA
Zahid Baloch – PDEA
Katina Lucas – NCDOT
Donnie Brew – FHWA
Amy Simes – NCDENR
Jonathan Henderson – HDR
James Rice – HDR
Vickie Miller – HDR
Wyatt Yelverton – HDR
Josh Massrock – HDR
John Jamison – HDR
Jim Seybert – Lane
Chip Hawke – Carolina Land

A general introduction of the project was initiated by James Rice, hydraulic design engineer for the Lane/HDR Design-Build (DB) Team. Introductions were made by all in attendance. James Rice initiated the review by describing the overall project as follows. This project consists of widening approximately 7 miles of existing I-85 to the inside median. The median will be paved and there will be barrier between traffic. There are 2 major Y-Lines (Poplar Tent and NC73) both of which will be transferred from an open shoulder section to a curb and gutter section and the interchanges for both of these Y-Lines will be a diverging diamond interchange (DDI). James noted that there are no specific stormwater requirements for this area; however, Coddle Creek and Rocky River are both 303(d) listed streams. The current design utilizes existing outfalls to the greatest extent possible although the RFP requires replacement of any CSP within 8 feet of the existing ground. Where feasible, the design has shifted outlets that were directly discharging into jurisdictional streams to provide as much treatment as possible before entering a jurisdictional stream. The wetland and stream identifications used in the discussions were taken from the Natural Resources Technical Report (dated May 2008).

Plan sets with the current drainage design were available to use for the review and a meeting agenda was provided to those in attendance.

The typical section and each plan sheet was then reviewed.

Polly Lespinasse of NCDWQ was unable to attend the meeting; however, she provided comments prior to the meeting. Those comments were discussed as the plan sheets were reviewed and are included below.

Polly Lespinasse provided a comment for all sheets: Not clear what is being proposed (i.e., extension, new culvert).
James Rice: The set that was provided did not include drainage features. A set with updated drainage will be provided to Polly for review and should clear up many of the questions with what structures are proposed as well as which ones are being retained.

Marella Buncick asked about the interchange and project limits.
James Rice stated that the project does not tie to the 485 interchange and it actually begins in Cabarrus County

PSH 4

- Pond – 48" RCP with Riser pipe – Not disturbing.
- UT10 – 2 @ 10(W)x9(H) RCBC – Not disturbing.
- Outlet of 48" RCP – Not disturbing.

No Comments on this sheet.

PSH 5

- Interchange with Speedway Blvd / Concord Mills Blvd.
- UT10 – Outletting at structure 0502. We are replacing the existing CSP.

Polly Lespinasse: Two 24" cross pipes (running from Section B-C and A-D) – jurisdictional streams?
Jason Dilday answered that they are not jurisdictional.

Marla Chambers asked what the impacts are to UT 10 where the pipe ties to the channel.
James Rice answered that the impacts would be from rip rap only.

PSH 6

- Wetland A – Combining 2 existing discharge points to outlet into a PSH.

No comments on this sheet.

PSH 7

- Wetland A – Not disturbing.
- UT9 – 1.5:1 and rock plating to stay off the stream. Also taking existing outlet across to other side of the road and discharging into a PSH.
- Rocky River – 303(d), Class C.
- UT8 – 1.5.1 and rock plating to stay off the stream. Discharging on opposite side of road from existing conditions to reduce direct discharge.
- Wetland B – In order to reduce the direct discharge into UT8, there will need to be a ditch to convey the water through the area adjacent to this wetland.
- Mitigation sites start here. Mitigation to be discussed at the end.

Polly Lespinasse: Any impacts to Rocky River or tributaries on the north side?
James Rice: There are no impacts to the Rocky River or the tributaries on the north side as currently planned.

Polly Lespinasse: Bottom of the sheet depicts a wetland and what appears to be a stream, with portions of the stream being impacted by fill. No structures or ditches depicted. Clarify.
James Rice: There is not a jurisdictional stream adjacent to the wetland on the bottom of the sheet. There is an existing ditch at that location.

Polly Lespinasse: Top of sheet depicts a stream running parallel to the road and then tying into Rocky River. The toe of the proposed fill appears to be close to this stream in some sections. What is the proposed fill slope and how high is the slope?
James Rice: The fill height is high and it will be close to the existing channel. We have proposed the use of rock plating in the area of the bridge to stabilize the fill adjacent to the stream. The rock plating is not velocity control.

Marla Chambers asked if the channel/ditch that runs adjacent to the wetland at the bottom of the sheet was jurisdictional.
James Rice: It is not a jurisdictional feature.

PSH 8

- UT8 - Discharging on opposite side of road from existing conditions to reduce direct discharge.
- Maintaining existing discharge points.

Polly Lespinasse: The bottom of the sheet depicts a dashed line beginning at the outlet of the 15" RCP. Is this a jurisdictional stream? It appears that the cut slope will impact this feature. Will it be relocated?
James Rice: This is not a jurisdictional stream. This is the existing berm ditch.

Polly Lespinasse: There is a 24" RCP just past Station 226. Is this jurisdictional?
James Rice: This is not a jurisdictional feature.

Marla Chambers asked where the pipe at Station 221+50 is draining.
James Rice: It is draining toward the top of the page which is westerly

PSH 9

- UT8 – Not disturbing.
- UT8C – Extending 42" RCP on inlet end, adding rip rap on outlet end.

Polly Lespinasse: The bottom of the sheet depicts a dashed line (continuation from Sheet 8). Is this a jurisdictional stream? It appears that the cut slope will impact this feature. Will it be relocated?
James Rice: This is not a jurisdictional stream. This is the existing berm ditch.

Polly Lespinasse: Is the culvert being extended on the 42" RCP at Station 234?
James Rice: It is being extended on the inlet end.

Polly Lespinasse: Is this feature just before Station 238 jurisdictional at the inlet? Culvert extension?
James Rice: It is not a jurisdictional feature. The culvert will be extended.

PSH 10

- UT8 – Extending 7X7 RCBC. Channel realignments on the upstream end. The existing culvert is not buried, is there any advantage to burying the 15' extension? Removing existing direct discharge and relocating outlet to discharge into a PSH.
- UT8B – Extending 42" RCP. Flattened out lateral ditches to try to achieve grass swale credit.

Marla Chambers and Marella Buncick both felt that burying the 15' extension would not do anything for passage and felt that it could create a barrier for the 15'.

Polly Lespinasse: There is a feature located near the 24" RCP near Station 245 (bottom of the sheet) that runs to just past Station 250. Is this jurisdictional? The cut slope impacts this feature.
James Rice: This is not a jurisdictional feature. It is the existing berm ditch.

Polly Lespinasse: Is the 48" RCP being extended?
James Rice: Yes, the pipe is being extended.

Polly Lespinasse: There is a feature located near Station 250 (bottom of the sheet) that runs almost to Station 255. The fill slope is very close to this feature.
James Rice: This is an existing ditch and not a jurisdictional feature.

Polly Lespinasse: A jurisdictional stream will be impacted by the fill slope at Station 255 at the inlet of the 7 x 7 culvert. What will happen to this stream? Additionally, a cross section was provided for the "ditch" at the inlet of the 7 x 7 culvert. Isn't this a stream?
James Rice: We are currently working on this area and trying to determine if the inlet of the pipe will need to be extended or if it can be avoided. The note on all of the streams state "Cross Section for Ditch" and will update this. This is a jurisdictional channel.

Marella Buncick asked about the outlet of the 42" pipe and suggested that this one may benefit in the use of a junction box and rip rap at the outlet on the opposite side to stabilize the banks. The concern was about energy dissipation at the outlet.
Comment noted.

PSH 11

- UT8 – Adding a PSH at existing outlet (1104).
- UT8A - Not disturbing.

Polly Lespinasse: Is the feature at Station 260 jurisdictional?

James Rice: This is not a jurisdictional feature.

Polly Lespinasse: Is there a jurisdictional feature at Station 265?
James Rice: This is not a jurisdictional feature.

Polly Lespinasse: Where is the origin of the jurisdictional stream at Station 270?
James Rice: This stream continues beyond the limits that location and surveys picked up. The stream continues toward the bottom of the sheet.

PSH 12

- UT8A – 1.5:1 and rock plating to stay off stream. Adding a drop structure at 1227 to stabilize eroding channel. UT8A has been relocated and the main flow is now channelized just beyond the existing right-of-way. There is a ditch block upstream (north) of the existing 30" RCP which restricts the flow from UT8A reaching the remnant channel from Sta. 274+00 to Sta. 277+00.

Polly Lespinasse: Does a jurisdictional stream begin at the outlet of the 30" RCP at Station 277?
James Rice: A stream does not start at the outlet of the 30" RCP. This area has been impacted and the flow of the channel has been redirected (channelized) to the east of the old channel.

Polly Lespinasse: Provide the flow direction of the stream on the bottom of the sheet.
James Rice: Comment noted and will be included on future plan sets.

Marella Buncick asked if the ditch is flat.
James Rice: The slope on the ditch is not flat.

Marla Chambers asked if the current design is emptying into the old channel and if it is basically being used as detention.
James Rice: Yes, the drainage is being directed to the old channel and it is acting as a detention area. The old channel has a large scour hole in this area and currently holds water at the outlet.

Marella Buncick and Marla Chambers both asked if this area is jurisdictional and stated that this is a question for the permitting agencies.
Comment noted.

PSH 13

- UT8A – The head waters of this stream are under the proposed fill slope and will need to be relocated to outside the slope stake line. The jurisdictional designation ends at the outlet of the existing 30" pipe.

Polly Lespinasse: Is the 30" RCP at Station 289 conveying a jurisdictional stream?
James Rice: This is not a jurisdictional feature.

Polly Lespinasse: What is happening to the jurisdictional stream at the bottom of the sheet? Looks like it will be impacted by the fill slope. Also, where is the origin of this stream?
James Rice: The origin of the stream is at the existing 30" RCP near Station 298. We will be moving and relocating this section of stream into a ditch section.

Marella Buncick asked if there is a need for additional armoring at the ditch transition or to try to step it down and protect the outlet. Marella also asked what the slope on the ditch is entering the stream and noted that it would be gaining a lot of water (roadway and industry) and may need additional protection if possible.
James Rice: We will look into the need for additional armoring. The slope of the ditch entering the stream is 2.1% and at the beginning of the ditch it is 4.27 %. We have flattened it as much as possible but will evaluate the need for additional armoring at the tie in with the stream.

PSH 14

- Poplar Tent Interchange – DDI.
- Pond at 303+00 RT – Not disturbing.

Polly Lespinasse: Will the pond in the "C" Section be impacted?
James Rice: There will not be any impacts to the pond.
The DDI at this location reduces the footprint of the interchange but also minimizes the opportunities for additional stormwater treatment.

PSH 15

- UT7A – Extending 42" CSP on upstream side.

Polly Lespinasse: There is what appears to be a stream in the CA area near Station 325 (bottom of the page). Will this feature be impacted? Also, are there any impacts proposed at the existing outlet of the 42" RCP?
James Rice: The feature at the bottom of the page is an existing ditch and not a jurisdictional feature. It will not be impacted. There are no impacts proposed at the 42" RCP outlet; however, the inlet will be collared and extended.

Marella Buncick asked about the slope of the ditch at Station 325 at the top of the page which outlets into UT7A.
James Rice: It is a steep slope and we will review placing armor on the opposite bank for stability

PSH 16

- UT7A – Not disturbing.

Polly Lespinasse: Culvert being extended on the 66" RCP?
James Rice: The current design does not require extending the 66" RCP

PSH 17

- UT7A – Not disturbing.

- UT7 – Able to remove 1 direct discharge at 353+50 lt, but outlet at 1721 is opposite of a deep cut, so no choice but to retain existing outlet.

Polly Lespinasse: Is the 30" RCP near Station 355 conveying a jurisdictional stream?
James Rice: This is not a jurisdictional feature.

Marla Chambers asked how much of the stream would be impacted.
James Rice: Impacts to the stream will be rip rap placed on the banks for stability.

PSH 18

- UT7 – Extended SBG to outlet into a PSH. At outlet 1801, outlet is opposite from a deep cut, so no choice but to maintain existing outlet.
- Coddle Creek – Not disturbing.

Polly Lespinasse: Is there a jurisdictional feature at the top of the page at Station 375 (near the 15" RCP and where the fill slope juts out?
James Rice: This is not a jurisdictional feature.

PSH 19

- Coddle Creek – 303(d), Class C.
- Detention or grass swale for roadway drainage discharging at Coddle Creek.
- PSH for deck drainage.

Polly Lespinasse: Any impacts to Coddle Creek (i.e., riprap)?
James Rice: Only temporary impacts associated with removing the existing structure are anticipated.

Marla Chambers noted that they would request a 10' stable, level bench under the bridge.
James Rice: This will be possible and was also included in the project commitments for both Coddle Creek and the Rocky River.

PSH 20

- Afton Run – Not disturbing. Noise wall occurs in this area.

Polly Lespinasse: Is the 36" RCP at Station 398 conveying a jurisdictional stream?
James Rice: This is not a jurisdictional feature.

PSH 21

- Afton Run – Not disturbing.
- Maintaining existing outfalls to minimize impact to natural channel design associated with Mitigation for the U-2009A Project.
- UT6 - Not disturbing.

Polly Lespinasse: Is the 42" CMP conveying a jurisdictional stream (Station 413)? If so, what is happening to it?
James Rice: This is not a jurisdictional feature.

Polly Lespinasse: Are there any impacts to Afton Run?
James Rice: The current design will not impact Afton Run. Due to the existing mitigation site located within the interchange and the minimal changes to this interchange, efforts were made to avoid Afton Run and the current structures conveying it.

Polly Lespinasse: Is the 30" CMP near Station 418 conveying a jurisdictional stream?
James Rice: This is not a jurisdictional feature.

Marella Buncick asked that the velocities at the pipes outlets discharging into Afton Run Stream Mitigation Area be included in the plans.
Comment noted.

Marella Buncick asked if there is anything that can be done at the inlet before the water reaches Afton Run to reduce velocity, etc. She also asked how much extra water will be entering the system and the concern was the stability of the stream (Afton Run) banks with the additional inputs.
There were no answers to these questions at this time and everyone agreed to consider the issue of these pipes discharging into Afton Run.

PSH 22

- Afton Run – Not disturbing. Maintaining existing outfalls.
- UT5 - Not disturbing 72" RCP.
- UT4 - Not disturbing. Maintaining existing outfalls.

Polly Lespinasse: Are there any impacts to Afton Run?
James Rice: The current design will not impact Afton Run.

Polly Lespinasse: What is happening to the stream at Station 422 at the outlet of the multi barrel culvert and the 72" RCP (jurisdictional stream)?
James Rice: There are no impacts and current design is to retain existing structures. Efforts were made to avoid impacts to Afton Run.

Polly Lespinasse: Where is the origin of the stream (top of page) at Station 433? Will it be impacted by the fill slope?
James Rice: The jurisdictional stream begins at Station 431. This stream will not be impacted by the fill slope.

Marla Chambers noted that she will be visiting the 4 barrel structure conveying Afton Run at Station 422 to review it functionality.
Comment noted.

PSH 23

- UT4 – extend 7X6 RCBC approx 20 ft. Scour hole at outlet
- Reducing direct discharges through use of PSH.
- UT4C – Not disturbing.
- Wetland C – Not disturbing.
- Wetland D – Small impact.

Polly Lespinasse: What impacts are proposed to the jurisdictional stream at Station 438?
James Rice: The current design includes extending the outlet end of the culvert and attempting to tie the stream back in taking into account the existing scour hole at the outlet.

Polly Lespinasse: There is a wetland at Station 445 (bottom of page) that is right next to the fill slope. What is the height of the fill and the proposed slope?
James Rice: We are currently showing a small area of impact to this wetland; however, we are reviewing the slopes at these areas to try to avoid or minimize these locations.

General discussion about the 6x6 RCBC commenced due to the culvert being perched and a scour hole occurring at the outlet.
Marla Chambers asked about placing armor at the 6x6 RCBC.
Marella Buncick asked the slope on the existing 6x6 RCBC and if a drop box could be used at this location.
James Rice: The slope is 0.8%.
Jason Dilday noted that the stream and wetlands were full of sediment due to an upstream development.
Marella Buncick also asked if there was a possibility of pulling out the 6x6 RCBC and replacing.
James Rice: This project is widening to the median and it will not be replaced.

PSH 24

- UT4 – Not disturbing.
- UT4B – Extending 36" RCP

Polly Lespinasse: Where is the origin of the stream located between Station 449 and 450 (bottom of page)?
James Rice: This is not a jurisdictional feature.

Polly Lespinasse: Is the 30" RCP between Stations 452 and 453 conveying a jurisdictional stream?
James Rice: This is not a jurisdictional feature.

Polly Lespinasse: What are the proposed impacts to the jurisdictional stream at Station 460?
James Rice: This pipe will be extended at the inlet and rip rap will be used at the outlet to stabilize the existing scour hole.

PSH 25

- UT4A – Extend 36" RCP with a JB

- UT4 – Not disturbing.
- Wetland G – Not disturbing. DDI interchange allows us to stay off of this wetland.

Polly Lespinasse: Is there a jurisdictional stream at the outlet of the 18" RCP between Stations 467 and 468?
James Rice: This is not a jurisdictional feature.

Polly Lespinasse: What are the impacts to stream located between Stations 471 and 472?
James Rice: The pipe will be extended at the outlet and rip rap placed on the banks for stability.

Marella Buncick asked about moving the PSH between Stations 472 and 473 away from the wetland and stream and noted concern of constructing this due to the slope.
James Rice: It was not possible to move it further from the wetland due to the slope of the existing ground.

PSH 26

- NC73 Interchange – DDI.
- UT4 – Extending pipes. Stream starts at the existing 30" RCP.
- UT1 – Extending pipe.
- Wetland E – Small impact.
- Pond – Not disturbing.

Polly Lespinasse: It appears that there are multiple jurisdictional features near the Ramp B section (where the 30" RCP crosses Station 480). Clarify any impacts.
James Rice: The survey at this location is incorrect. The jurisdictional stream begins at the outlet of the 30" RCP. The 15" RCP does not convey a jurisdictional stream. There should only be one JS line at this location originating from the 30" RCP This will be corrected in the next plan set.

Polly Lespinasse: Will the wetland located at the top of the page near Station 499 be a total take?
James Rice: The current design shows a small impact to the wetland at this location due to the fill slope. We are reviewing this location to determine if this impact is necessary and try to avoid or minimize if feasible.

Polly Lespinasse: What are the impacts at the outlet of the 30" RCP at Station 500 (bottom of the page)?
James Rice: We will be extending this pipe and have a ditch that will tie into the channel on Sheets 26 and 27.

PSH 27

- UT1 – Not disturbing.

Polly Lespinasse: Any impacts to the stream in the Ramp D section (near matchline sheet No. 46) with the 42" RCP?
James Rice: A ditch will be tying into the channel at this location.

PSH 28

- Wetland F – Not disturbing.
- UT1B – Extending 30" RCP on upstream side. Adding rip rap at outlet end.
- UT1 – Extending 66" RCP. Utilizing PSH.

Polly Lespinasse: At the top of the page, between Stations 513 and 515, there is a jurisdictional stream that doesn't appear to start or end anywhere. Please clarify.
James Rice: The jurisdictional stream begins at the base of the current slope. The stream should tie to the existing 30" RCP

Polly Lespinasse: What are the impacts associated with the 30" RCP at Station 515?
James Rice: There will be rip rap placed on the banks at the outlet of the pipe for stability.

Polly Lespinasse: What are the impacts associated with the 66" RCP at Station 523?
James Rice: This pipe will be extended at the outlet and rip rap used at the banks for stability.

PSH 29

- UT1 – Not disturbing.
- UT1A - Not disturbing.
- Irish Buffalo Creek – Not disturbing.

Polly Lespinasse: What are the impacts associated with the 30" RCP at Station 535?
James Rice: There are no impacts associated with the 30" RCP at this location. This is beyond the limits of the project.

PSH 30-32

- No jurisdictional features

Polly Lespinasse: Any impacts associated with the 2-9 x 8 culverts? *(On Sheet 30)*
James Rice: There are no impacts to this structure.

PSH 33 (Poplar Tent Road –Y6-)

- Wetland J – Not disturbing.
- UT14 – Not disturbing.

No Comments on this sheet.

PSH 34

- UT14 – Tying to headwaters with a ditch.
- UT14A and UT14B – Under fill slope.

- Wetland K – Under fill slope. Total take.
- Detention.

Polly Lespinasse: Where is the origin(s) of the features (and associated wetland) just before Station 31 (bottom of the page)? Looks like the wetland and origins of two streams will be impacted by the fill slope.
James Rice: The streams (UT14A and UT14B) originate at the base of the slope in the small wetland. These areas will be impacted by the project.

PSH 35-47

- No jurisdictional features.

Polly Lespinasse: Will there be any impacts to the stream with the 42" RCP (top of the sheet) near Station 20? *(Sheet 46)*
James Rice: A portion of this area was noted previously on Plan Sheets 26 and 27 Impacts are associated with the pipe extension and tying in of the ditches. There will be no impacts associated with the pipe conveying the stream beneath the grave (soil) road east of Ramp D.

PSH 48

- Wetland L – Impact.

No comments on this sheet.

Stream Preservation

Stream preservation opportunities were briefly mentioned. The four sites were noted in the agenda with their approximate stream footage and preliminary cost estimates (see below). Due to the number of team members who were unable to attend the meeting because of the weather, the discussion about feasibility of the sites and ratios for stream preservation was postponed. The Design-Build Team will work with NCDOT and the Team's ROW consultant, Carolina Land Acquisitions, to determine more accurate cost estimates for the property acquisition.

Site 7

- Approximately 1200 linear feet.
- Preliminary estimated property acquisition cost: 225K.

Site 7A

- Approximately 2100 linear feet.
- Preliminary estimated property acquisition cost: 880K.

Site 8

- Approximately 4925 linear feet.
- Preliminary estimated property acquisition cost: 957K.

Site 8A

- Approximately 4230 linear feet.

Preliminary estimated property acquisition cost: 759K.

General Discussion

Jason Dilday noted that any pipe 48" or greater may require the use of Class II rock.

Meeting Adjourned

Subject: Minutes from the **Interagency 4C Concurrence Meeting** for Hydraulic Design on March 9, 2011 for **I-3803B in Cabarrus County**

Team Members:

Liz Hair – USACE
Marella Buncick – USFWS
Marla Chambers – NCWRC
Polly Lespinasse – NCDWQ
Chris Militscher – EPA
Renee Gledhill-Early – SHPO (absent)
Bill Zerman – NCDOT (Hydraulics)
Jason Dilday – NCDOT (NEU)
Teresa Bruton – NCDOT (TPMU) (absent)
Rodger Rochelle – NCDOT (TPMU) (absent)
Jackie Armstrong – NCDOT (TPMU)
Rick Baucom – NCDOT (Div-10) (absent)
Larry Thompson – NCDOT (Div-10) (absent)

Other Participants:

Khaled Al-Akhdar – NCDOT (TPMU)
Mark Staley – NCDOT (REU)
Byron Moore – NCDOT (NEU)
LeiLani Paugh – NCDOT (NEU)
Phil Harris – NCDOT (NEU)
Carla Dagnino – NCDOT (NEU)
Jamal Atkins – NCDOT (TPMU)
Jacquelyn Bowles – NCDOT (TPMU)
Eric Hunter – NCDOT (Construction)
Wilson Stroud – NCDOT (PDEA)
Donnie Brew – FHWA
Jonathan Henderson – HDR
James Rice – HDR
Vickie Miller – HDR
Wyatt Yelverton – HDR
Josh Massrock – HDR
Jim Seybert – Lane

A general introduction of the project was initiated by James Rice, hydraulic design engineer for the Lane/HDR Design-Build (DB) Team. Introductions were made by all in attendance. James Rice initiated the review by describing the overall project as follows. This project consists of widening approximately 7 miles of existing I-85 to the inside median. The median will be paved and there will be barrier between traffic. There are 2 major Y-Lines (Poplar Tent and NC73) both of which will be transferred from an open shoulder section to a curb and gutter section and the interchanges for both of these Y-Lines will be a diverging diamond interchange (DDI). James noted that there are no specific stormwater requirements for this area; however, Coddle Creek and Rocky River are both 303(d) listed streams. Because of these crossings, the sediment and erosion control was designed for the entire project to accommodate the 25 year storm event. The current design utilizes existing outfalls to the greatest extent possible although the RFP requires replacement of any CSP within 8 feet of the existing ground. Where feasible, the design has shifted outlets that were directly discharging into jurisdictional streams to provide as much treatment as possible before entering a jurisdictional stream. A bank stabilization detail and rip rap at embankment detail has been added to the plan sheets where applicable also noting that no rock is to be placed in the bed of jurisdictional streams.

Several additional items were passed out to those in attendance including a meeting agenda, photos of each site, and stream preservation site information.

Each permit site was then reviewed.

Marla Chambers asked about what storm the drainage design would accommodate.
James Rice answered that drainage design was for the 10 year storm.

<u>SITE 1 (Sheet 5)</u>

- Replacing the existing 24" CMP with a new 24" CSP in same location due to the requirements of the RFP.
- Impact to the JS is due to the 24" outlet rip rap pad.

Marla Chambers asked if the rip rap will be placed in the existing channel.
James Rice answered that the current stream contains rip rap in the channel.

Marla Chambers and Polly Lespinasse noted that this looks like an opportunity to remove a stream blockage from previous construction activities. They requested a note included on the plan sheet to remove rip rap from the channel. The impacts as shown in the permit impact summary table are fine. They stated rip rap on the banks are fine, just selectively remove rock to provide a channel at this location.

LeiLani Paugh asked the agencies if NCDOT would not be responsible for a headcut at this location if one occurs noting that this blockage may currently be providing grade control.

Polly Lespinasse stated to selectively remove rock at this location and during construction she would be available to review the location and determine the best solution.
A note will be added to the plan set stating "Clean out existing rip rap in stream bed and plan on banks by hand."

<u>SITE 2 (Sheet 7)</u>

- Bridge replacement over Rocky River.
- No permanent surface water impacts, the proposed piles will be outside the top of bank of Rocky River.
- A temporary work bridge will be utilized for construction of the bridge at Rocky River.

Marla Chambers asked if the stream preservation currently exists at this location.
James Rice stated that it is proposed mitigation and that we would discuss those areas at the end of the meeting.

<u>SITE 3 (Sheet 7)</u>

- Mechanized clearing impacts on wetland due to lateral ditch.

Polly Lespinasse and Liz Hair asked if we could avoid the wetland and do without the mechanized clearing.
Jim Seybert stated that they would need the area during construction and most likely an excavator track would go through this location.

Polly Lespinasse and Liz Hair asked the size of the entire wetland should the area be considered a total take.

James Rice answered 0.15 acre.
The agencies determine that the site would not be a total take.

SITE 4 (Sheet 9)

- Extending the existing 42" RCP.
- Surface water impacts are due to the roadway fill on the inlet end of the existing 42" RCP.
- Bank stabilization impacts at the outlet end of the existing 42" RCP.

Polly Lespinasse asked if there is an extension on the outlet end of the pipe and if pipe burial is an issue.
James Rice noted there isn't an extension at the outlet and pipe burial is not an issue.

Chris Militscher asked if we will be removing the broken sections of pipe.
James Rice answered yes.

SITE 5 (Sheet 10)

- Extending the existing 42" RCP.
- Surface water impacts are due to roadway fill and lateral ditches on the inlet end of the existing 42" RCP and also the outlet end where we propose installing a junction box and section of 42" RCP. A junction box is being utilized at the outlet end because the last three sections of the existing pipe have fallen off due to the steep slope of the pipe (3.17% slope on existing pipe). The junction box will allow the extension on the outlet end to be installed at a flatter slope as well as dissipate energy before the water enters the JS.
- Bank stabilization impacts at the outlet of the 42" RCP.

Polly Lespinasse asked about velocity of the ditch and slope and noted that on higher slopes and velocities, they would prefer larger rock to be used and if smaller rock made it to the stream, then they would request it to be removed.
James Rice stated the slope was 3% and that we would include Class I rock at this location.

Polly Lespinasse asked where Details C and D are located.
James Rice stated they are in the roadway set but will be included with the permit sheets.

Marla Chambers asked if there was anything that could be done to fix the perched pipe.
James Rice stated that we are utilizing a junction box at this location to help dissipate energy and the pipe is in good condition.

SITE 6 (Sheet 10)

- Extending the 7' x 7' RCBC has been avoided by providing 1.5.1 side slopes and class 'I' rock plating around the culvert fill slope.

- Temporary surface water impacts are anticipated due to removing and replacing the wing walls on the 7' x 7' RCBC.
- Surface water impacts are due to tying in the lateral ditch to the JS. Embankment rip rap has been provided at the end of the lateral ditch to reduce velocities at the tie in point. The lateral ditch has been designed to provide grass swale treatment.

Polly Lespinasse asked if this location is a grass swale.
James Rice noted that the ditch was flattened out to get grass swale credit.

Polly Lespinasse noted they would like to see larger rock at the ditch outlets of larger systems.
James Rice stated that we would utilize larger rock (Class I) in this situation across the project.

Polly Lespinasse and Marella Buncick discussed a portion of the drainage near Site 6 is being directed to a Pre Formed Scour Hole near Site 5 to avoid additional inputs at Site 6.

<u>SITE 7 (Sheet 12)</u>

- Additional surface water impacts were avoided by increasing the side slopes to 1.5:1 and armoring with class 'I' rip rap.
- A junction box is being proposed at the outlet end in order to dissipate energy and allow the proposed 30" RCP extension to be installed at a flatter slope.
- Bank stabilization impacts are the only impacts at this site.

Polly Lespinasse noted that the current summary impact table is missing bank stabilization impacts.
James Rice responded this will be corrected.

Polly Lespinasse stated her concern with the 9.5% slope of the ditch and why we added bank stabilization.

Chris Militscher asked about the use of a PSH at the 18" pipe and his concern about the velocity and stability of the ditch.
James Rice responded that the topo was too steep for a PSH.

Polly Lespinasse asked if it would be better to add additional rock at the non-jurisdictional area and have the rip rap lined ditch.

Marla Chambers noted her concern about the angle the ditch is tying in and stability.

Marella Buncick stated that the ditch is outletting in a non-jurisdictional area and there are additional constraints at this location.

James Rice stated that we could look at the angle of the ditch outlet, utilize larger rock at the ditch tie-in and that we would change the grass swale title on the computation boxes.

SITE 8 (Sheet 13)

- Surface water impacts are due to the roadway fill.
- Bank stabilization impacts occur where the lateral ditch ties to the JS.

Polly Lespinasse noted concern about the ditch alignment and tie-in. She also requested the use of larger rock due to the slope on the ditch.
James Rice stated that they would reevaluate the alignment of the ditch and that larger rock would be placed at the ditch outlets for stability

SITE 9 (Sheet 15)

- Impacts to the JS on the inlet end of the existing 42" CMP have been avoided by increasing slopes to 2:1 and providing guardrail in this area.
- Bank stabilization impacts occur where the lateral ditch ties to the JS.

Polly Lespinasse noted the high slope on the ditch and if there was any way to tie the ditch in at a better angle.
James Rice stated they followed the existing contours but will look at the area and try to align the ditch outlet at a better angle.

SITE 10 (Sheet 19)

- Bridge replacement over Coddle Creek.
- No permanent surface water impacts, the proposed piles will be outside the top of bank of Coddle Creek.
- A temporary work bridge will be utilized for construction of the bridge at Coddle Creek.

Polly Lespinasse asked if any stormwater treatment is being obtained in this area.
James Rice stated that a PSH is being used and on the right side they are utilizing a natural draw and creating a berm to act as a detention area for storage that is designed to handle a 100 year storm event.

Chris Militscher asked if the box is acting as a riser.
James Rice confirmed that it is.

Polly Lespinasse asked the drainage area coming to the detention area.
James Rice indicated it was approximately 6.5 acres.

Chris Militscher asked about the concrete ditch on the north side.
Polly Lespinasse stated they typically ask for the concrete ditches to be taken out and replaced with rip rap or that it be busted up and left in place.
Jim Seybert stated that he would be willing to bust it up and leave in place.

AFTON RUN (Sheet 21)

- Preformed scour holes have been proposed as an alternative for handling the additional water runoff from the increased pavement.

- The four barrel box culvert is in good condition on both the upstream and downstream ends. Sediment is blocking three of the four overflow barrels; this is expected for a stream of this size. The overall vegetation for this site is good and no visible signs of erosion or instability were noticed during field visits.

Polly Lespinasse stated that the area appear to be getting more treatment than it currently gets with the PSHs. She asked about the distance the PSHs are from the stream and how much vegetation would be removed.
James Rice stated that they are 50' and 90' from the stream.
Jim Seybert stated that about a 16' wide path would be needed to get in to the area to place the PSH and back out.

SITE 11 (Sheet 23)

- Surface water impacts were minimized by using 2:1 side slopes and guardrail along the roadway.
- Surface water impacts at outlet are due to extending the existing culvert as well as filling in a large scour hole with rip rap.
- Temporary surface water impacts occur at the inlet end due to the removal and replacement of the existing culvert wing walls.

Polly Lespinasse asked if contractors will be doing any work to the channel during construction to fix the wing walls.
James Rice stated that they should not be in the channel working other than to put in the diversion.

Chris Militscher asked the age of the culverts that are in need of work.
Bill Zerman stated they are less than 50 years old as they typically ask 50 year old culverts to be replaced and these are being retained.
Khaled Al-Akhdar stated that he will email the CSR information on the culverts to Chris.

Marla Chambers asked if the culvert is perched and if there is a way to slope it rather than dropping.
James Rice stated that the outlet is perched and the inlet is not, it currently has tree debris which is to be removed. We are going to lower the culvert extension to help. We are also proposing to fill in the scour hole with rock.

SITE 12 (Sheet 23)

- Wetland impacts are due to the roadway fill.
- A preformed scour hole is proposed to avoid erosive velocities from the pipe outlet (Str# 2323) entering the wetland.

Polly Lespinasse asked how far the PSH is from the wetland and stream.
Jonathan Henderson stated it is 60-70' from the stream.

SITE 13 (Sheet 24)

- Surface water impacts were minimized by using 2:1 side slopes and guardrail along the roadway at the outlet end. The existing 36" RCP is perched approximately 3' so a junction box is proposed at the outlet end in order to dissipate energy and allow the installation of the new 36" RCP at a flatter slope.
- Surface water impacts occur due to the roadway fill on inlet end of the existing 36" RCP.
- Bank stabilization impacts occur where the lateral ditch ties in to the JS upstream of the inlet and where the 36" RCP outlets into the JS.

Polly Lespinasse noted the bank stabilization is missing from the permit impact summary table and voiced concern with the angle of the pipe and use of Class B rip rap on the opposite bank.
James Rice stated that we will update the summary table and also use Class I rip rap for armoring. The angle of the ditch can not be altered.

SITE 14 (Sheet 25)

- Avoiding surface water and wetland impacts by using a DDI interchange design as well as 1.5:1 side slopes and rock plating at the inlet end of the 30" RCP. A junction box is proposed at outlet end of the existing 30" RCP to dissipate energy and allow the new 30" RCP to be installed at a flatter slope.
- Surface water impacts occur at the outlet end of the 30" RCP due to roadway fill.
- Bank stabilization impacts occur at outlet end of the 30" RCP.

Marella Buncick voiced concern about the distance and discharge at the PSH. She noted the possibility that another channel will be cut at this location due to proximity and grade. She asked if planting could be included in this area to avoid a channel forming.
James Rice stated that we followed guidelines on PSH design as far as Q10 discharge and downstream slope of ground. We will monitor these areas during construction to determine if additional measures are warranted.

Carla Dagnino asked if we will include the bank stabilization detail.
James Rice responded that it will be included.

SITE 15 (Sheet 26)

- Impacts to the JS were minimized using the DDI interchange design. A junction box is proposed at the outlet end of the existing 30" RCP to dissipate energy and allow the new 30" RCP to be installed at a flatter slope.
- Surface water impacts are due to roadway fill.
- Bank stabilization impacts occur at the 30" RCP outlet.

No Comments.

SITE 16 (Sheet 26 & 27)

- Wetland and surface water impacts were minimized due to the DDI interchange design as well as the use of 1.5:1 side slopes and rock plating on the inlet end of the 30" RCP.
- Surface water impacts are due to the roadway fill and lateral ditch tying into the JS on the outlet end.

Polly Lespinasse asked how high the slope is with the rock plating.
Jonathan Henderson stated it is 14'.

Polly Lespinasse asked for the summary impact table to include a 30" RCP at this location rather than roadway fill.
James Rice indicated that we will correct the summary impact table.

Polly Lespinasse voiced concern about the ditches tying in to the channel at 9% slopes.
James Rice stated that they utilized a junction box in this area. The ditches also have rock to help dissipate energy and use Class I at the tie-in to help with stability.

SITE 17 (Sheet 28)

- Surface water impacts were minimized on the outlet end by using 2:1 side slopes.
- Surface water impacts are on the inlet end due to roadway fill.
- Bank stabilization impacts occur at the 30" RCP outlet.

Polly Lespinasse and Marla Chambers discussed the potential use of a rock ladder at the outlet of the pipe noting that this has been very successful in Division 10. Polly Lespinasse will contact James Rice to provide additional information on rock ladders.

Chris Militscher asked if using the rock ladder would be a non-mitigable impact because it is essentially making the conditions better.
Polly Lespinasse stated that it would not require mitigation.

Marella Buncick noted her concern with the distance and discharge of the 18" pipe to the JS. She noted that if we are going to the trouble of installing a rock ladder at the 30" RCP, it would make sense to ensure that another channel will not form from the 18" pipe to the JS.
James Rice stated we will add rip rap from the 18" pipe outlet to the scoured area. We will also protect the scour hole at the 30" pipe with bank stabilization to prevent further damage.

SITE 18 (Sheet 28)

- Surface water impacts are on the outlet end due to roadway fill.
- Bank stabilization impacts occur at outlet of the 66" RCP.

Polly Lespinasse asked if there was any work on the inlet.
James Rice responded that they are extending the pipe and adding to the existing bank stabilization at the outlet and no work will occur at the inlet of the pipe.

SITE 19 (Sheet 34)

- Wetland and surface water impacts are due to roadway fill.
- The detention basin proposed at this site is for water volume reduction.
- Bank stabilization impacts occur where the lateral ditch ties to the JS.

Polly Lespinasse asked if the ditch is for overflow.
James Rice confirmed the ditch is for overflow of the detention basin.

SITE 20 (Sheet 48)

- Wetland and surface water impacts are due to roadway cut.

Several people questioned the jurisdiction of the stream at this location.
Jason Dilday noted that the project has an approved Jurisdictional Determination and Polly Lespinasse stated several streams similar to this are considered jurisdictional.

James Rice asked if the area would be considered a total take.
The agencies agreed the site would not be considered a total take.

Potential Stream Preservation (Sites 7, 7A, 8 and 8A)

Vickie Miller led a discussion about the onsite stream preservation opportunities which have been carried over from the earlier planning process. A handout was provided with stream length, additional acreage to be purchased to provide a 100' buffer, photos, and mapping. Each site was then reviewed and updates on acquisition were provided. Stream preservation ratios were discussed to determine if the sites would be feasible and cost effective. LeiLani Paugh noted that for these sites to be inline with current mitigation costs per foot that a 2:1 ratio would be required to move forward. The agencies in attendance could not agree to that ratio during the meeting but stated they would provide LeiLani a confirmation of the ratio they could agree to within one week of the meeting.

Site 7

- Approximately 1200 linear feet.
- Preliminary estimated property acquisition cost: 225K.

A meeting is set up with the land owner to discuss the possibilities of purchase next week.

Site 7A

- Approximately 2100 linear feet.
- Preliminary estimated property acquisition cost: 880K.

One of the three landowners was very open to discussing purchase of the property for preservation.

Site 8

- Approximately 4925 linear feet.
- Preliminary estimated property acquisition cost: 957K.

The City of Concord is the owner of this property and very open to discussing selling the area for stream preservation. They noted that the process would be a little more involved as they would have to include the Airport Board in the discussions and negotiations.

<u>Site 8A</u>

- Approximately 4230 linear feet.
- Preliminary estimated property acquisition cost: 759K.

This site has a family which is divided on their interest in selling the property for preservation. It is unlikely this site will move forward for stream preservation at this time.

Meeting Adjourned

Ecosystem Enhancement PROGRAM

April 12, 2010

Ms. Liz Hair
U. S. Army Corps of Engineers
Asheville Regulatory Field Office
151 Patton Avenue, Room 208
Asheville, North Carolina 28801-5006

Dear Ms. Hair:

Subject: EEP Mitigation Acceptance Letter:

I-3803B, I-85 Widening from I-485 to NC 73, Cabarrus County

The purpose of this letter is to notify you that the Ecosystem Enhancement Program (EEP) will provide the compensatory stream and riparian wetland mitigation for the unavoidable impact associated with the above referenced project. Based on the information supplied by the NCDOT on April 7, 2010, the impacts are located in CU 03040105 of the Yadkin River Basin in the Southern Piedmont (SP) Eco-Region, and the anticipated mitigation credits needed to offset the impacts are as follows:

Yadkin 03040105 SP	Stream			Wetlands			Buffer (Sq. Ft.)	
	Cold	Cool	Warm	Riparian	Non-Riparian	Coastal Marsh	Zone 1	Zone 2
Impacts (feet/acres)	0	0	5,510	0.15	0	0	0	0
Mitigation Units (Credits-up to 2:1)	0	0	11,020	0.30	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 compensatory 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,

James B. Stanfill for

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: I-3803B

Ecosystem Enhancement PROGRAM

April 12, 2010

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:

I-3803B, I-85 Widening from I-485 to NC 73, Cabarrus County

The purpose of this letter is to notify you that the Ecosystem Enhancement Program (EEP) will provide the compensatory stream and riparian wetland mitigation for the subject project. Based on the information supplied by you on April 7, 2010, the impacts are located in CU 03040105 of the Yadkin River Basin in the Southern Piedmont (SP) Eco-Region, and are as follows:

Yadkin 03040105 SP	Stream			Wetlands			Buffer (Sq. Ft.)	
	Cold	Cool	Warm	Riparian	Non-Riparian	Coastal Marsh	Zone 1	Zone 2
Impacts (feet/acres)	0	0	5,510	0.15	0	0	0	0
Mitigation Units (Credits-up to 2:1)	0	0	11,020	0.30	0	0	0	0

EEP commits to implementing sufficient compensatory 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,

James B. Stanfill for

William D. Gilmore, P.E.
EEP Director

cc: Ms. Liz Hair, USACE – Asheville Regulatory Field Office
Mr. Brian Wrenn, Division of Water Quality, Wetlands/401 Unit
File: I-3803B

Restoring... Enhancing... Protecting Our State

NCDENR

STORMWATER MANAGEMENT PLAN

Project: 34187.3.GV3
TIP No. I-3803B
Cabarrus County 03/29/2011
Hydraulics Project Manager: James Rice, P.E. / Wyatt Yelverton, P.E. (HDR Engineering), Marshall Clawson, P.E. (NCDOT Hydraulics Unit)

ROADWAY DESCRIPTION

The I-3803B project consists of reconstruction and widening of I-85 to an eight-lane facility from south of Concord Mills/Bruton Smith Boulevard to NC 73 in Cabarrus County. The total project length is 7.012 miles. The project creates impacts to unnamed tributaries (UTs) to the Rocky River, UTs to Coddle Creek, UTs to Afton Run and UTs to Irish Buffalo Creek. The project drainage systems consist of grated inlets with associated pipe systems, and rip rap dissipaters at the pipe outlets. Jurisdictional Streams: Rocky River, Coddle Creek, Afton Run and UTs to each of those streams as well as UTs to Irish Buffalo Creek.

ENVIRONMENTAL DESCRIPTION

The project is located within the Yadkin River Basin in Cabarrus County, which is not a CAMA county. There are five wetlands located within the project limits. None of these wetlands were considered "total takes." The Yadkin River Basin is not subject to buffer rules; however, efforts have been taken to minimize wetlands, streams and buffer impacts where practicable. Rocky River and Coddle Creek are both 303(d) listed streams. Rip rap dissipaters at pipe outlets have been specified and fill slopes were tightened to 1.5:1 (horizontal to vertical) with rock plating to reduce or avoid stream impacts.

BEST MANAGEMENT PRACTICES AND MAJOR STRUCTURES

The primary goal of Best Management Practices (BMPs) is to prevent degradation of the states surface waters by the location, construction and operation of the highway system. The BMPs are activities, practices and procedures taken to prevent or reduce stormwater pollution. The BMP measures used on this project to reduce stormwater impacts are:

- Rip rap dissipaters at pipe outlets.
- Pre-formed scour holes.
- Grass swales.

NCDOT Highway Stormwater Program

Released: July 2010 (DRAFT)

North Carolina Department of Transportation

Highway Stormwater Program

STORMWATER MANAGEMENT PLAN

Version 1.1

General Project Information

Project No.:	I-3803B		**Date:**	2/22/2011		
City/Town:	Concord / Kannapolis		**Designer:**	J. Rice / W. Yelverton		
County(ies):	Cabarrus County		**Project Manager:**	J. Henderson		
River Basin(s):	**Yadkin-Pee Dee**		**CAMA County?**	no	**TVA County?**	no
Primary Receiving Water:	Rocky River [Coddle Ck, Afton Run, Irish Buffalo Ck]		**NCDWQ Stream Index:**	13-17 [13-17-6-(5.5), 13-17-6-6, 13-17-9-(2)]		
NCDWQ Surface Water Classification for Primary Receiving Water		**Primary:**	Class C			
		Supplemental:				
Other Stream Classification:						
303(d) Stream?	yes	**Type(s) of Impairment:**	Turbidity	Ecological/Bio.Integrity	Fecal coliform	
State Stormwater Permit Required?	yes	**If yes, why?**	To meet the requirements of NCDOTs NPDES Permit			
Could the Project Impact Threatened or Endangered Species?			no			
Description:						
Anadromous Fish Present?	**no**					
Description:						
Buffer Rules in Effect?	no		**Buffer Rules:**			

Existing Site

Description of Existing Project Area:	The project lies in an area which is prodominately zoned as commercial and industrial The Concord Regional Airport, Concord Mills Shopping Center, and numerous other commercial and industrial businesses occur along this portion of I-85.		
Average Daily Traffic (existing):	118,275		
Existing Cross Section:	4-lane divided highway with 60' grass median.		
Surrounding Land Use:	Predominately commercial and industrial uses. Minimal residential areas occur along the Y lines.		
General Comments:			

Project Description

Description of Proposed Project:		The project will provide relief from present/future congestion and provide greater efficiency on I-85 from south of Bruton Smith Blvd /Concord Mills Blvd. to NC 73. The project consists of reconstructing and widening approximately 7 miles of I-85, including interchange modifications.		
Average Daily Traffic (proposed):		189,775 in 2031		
Proposed Cross-Section:		8-lane divided highway with paved median and barrier.		
Interchange Modification:		yes	**Median Type:**	paved
North	**Terminus:**	Approximately 3000 feet beyond the NC 73 interchange		
South	**Terminus:**	Approximately 500 feet before the Concord Mills interchange		
Project Length (lin. miles/feet):		7.0 miles	**Added Impervious Area (ac.):**	51 acres
General Comments:				

North Carolina Department of Transportation

Highway Stormwater Program

STORMWATER MANAGEMENT PLAN

Environmental Summary

Riparian Buffer and Jurisdictional Stream Impacts and Associated SCMs

Station	Stream Name	Stream Type	Jurisdict Stream	Buffer?	Classific-ation?	Proposed Structure	SCM Type	Checklist Complete?	DA (ac.)	Q_2 (ft^3/s)	Q_{10} (ft^3/s)	WQv^c (ft^3)
173+05 -L- RT	UT to Rocky River	Perennial	RPW	No	Class C	24" CSP	no					
202+57 / 205+00 -L-	Rocky River	Perennial	TNW	No	Class C	Bridge	preformed scour hole	yes	0.70	n/a	3.5	n/a
233+94-L-LT	UT to Rocky River	Perennial	RPW	No	Class C	Bank Stabilization	no					
234+20-L-RT	UT to Rocky River	Perennial	RPW	No	Class C	42"RCP	no					
250+57-L-LT	UT to Rocky River	Perennial	RPW	No	Class C	42"RCP & Bank stabilization	no					
254+58-L-RT	UT to Rocky River	Perennial	RPW	No	Class C	7'x7' RCBC; Lateral Ditch	no					
277+05-L-RT	UT to Rocky River	Perennial	RPW	No	Class C	30" RCP	no					
325+25-L-LT	UT to Coddle Creek	Perennial	RPW	No	Class C	Bank Stabilization	no					
380+00-L-	Coddle Creek	Perennial	RPW	No	Class C	Bridge	preformed scour hole	yes	1.03	n/a	5.3	n/a
437+25-L-LT	UT to Afton Run	Perennial	RPW	No	Class C	7'x6' RCBC	no					
437+25-L-RT	UT to Afton Run	Perennial	RPW	No	Class C	7'x6' RCBC	no					
460+20-L-	UT to Afton Run	Perennial	RPW	No	Class C	36" RCP	preformed scour hole	yes	0.48	n/a	2.3	n/a
471+15-L-RT	UT to Afton Run	Perennial	RPW	No	Class C	36" RCP; Bank stabilization	preformed scour hole	yes	0.78	n/a	1.8	n/a
478+25-L-RT	UT to Afton Run	Perennial	RPW	No	Class C	30" RCP; Bank stabilization	no					
499+15-L-	UT to Irish Buffalo Creek	Perennial	RPW	No	Class C	Roadway Fill	no					
514+68-L-LT	UT to Irish Buffalo Creek	Perennial	RPW	No	Class C	30" RCP	no					
515+51-L-RT	UT to Irish Buffalo Creek	Perennial	TNW	No	Class C	Bank Stabilization	no					

General Comments: See attached grass swale comps and PSH summary

NCDOT Highway Stormwater Program

Released: July 2010 (DRAFT)

North Carolina Department of Transportation

Highway Stormwater Program

STORMWATER MANAGEMENT PLAN

Version 1.1

Page of

Environmental Summary

Riparian Buffer and Jurisdictional Stream Impacts and Associated SCMs

Station	Stream Name	Jurisdictional Stream	Buffer?	Classific-ation?	Proposed Structure	SCM Type	Checklist Complete?	DA (ac.)	Q_2 (ft^3/s)	Q_{10} (ft^3/s)	WQv (ft^3)
524+30-L-LT	UT to Irish Buffalo Creek	Perennial	No	Class C	66" RCP	no					
31+00-Y6-RT	UT to Rocky River	Perennial	No	Class C	Roadway Fill	no					
17+90-Y16-LT	UT to Irish Buffalo Creek	Perennial	No	Class C	Double 18" RCP	no					

General Comments:

NCDOT Highway Stormwater Program

Released: July 2010 (DRAFT)

North Carolina Department of Transportation

Highway Stormwater Program

STORMWATER MANAGEMENT PLAN

Version 1.1

Stream Relocation

Station	Stream Name	Stream Length (ft)	Additional Information
286+39 / 293+43 -L-RT	UT to Rocky River	670	Due to steep terrain, impact could not be avoided.

General Comments:

NCDOT Highway Stormwater Program

Released: July 2010 (DRAFT)

North Carolina Department of Transportation

Highway Stormwater Program

STORMWATER MANAGEMENT PLAN

Version 1.1

Jurisdictional Wetlands

Station	Type of Impact	Minimization of Impact
209+82 / 211+64-L-RT	Mechanized Clearing	Tightened up fill slope and ditch slopes as much as possible.
445+06 / 445+67-L-RT	Fill and Mechanized Clearing	Tightened up fill slope as much as possible.
499+15-L-	Mechanized Clearing	Tightened up fill slope as much as possible.
31+00-Y6-RT	Fill	Impact was unavoidable due to widening on this side.
17+90-Y16-LT	Excavation and Mechanized Clearing	Impact was unavoidable due to location of Y-Line.

General Comments:

North Carolina Department of Transportation

Highway Stormwater Program

STORMWATER MANAGEMENT PLAN

Version 1.1

Additional Comments

References

North Carolina Department of Transportation
Highway Stormwater Program

PREFORMED SCOUR HOLE CHECKLIST	Page 1 of 1

GENERAL PROJECT INFORMATION

Project: I-85 Widening **TIP No:** I-3803 B

Prepared by: SRR **Date:** 3/22/11 **Checked by:** SRK **Date:** 3/22/11

NCDOT Division: 10 **River Basin:** Yadkin/Pee-Dee

City: Concord/Kannapolis **NCDWQ Stream Classification** Class C

County: Cabarrus **Primary:** Class C

CAMA County: Yes (No) **Supplemental:**

TVA County: Yes (No) **303(d) Stream:** (Yes) No

Buffer Required: Yes (No)

PROJECT DESCRIPTION

	Check the correct response.	Yes	No	Not Applicable	Comments/Design Assumptions
1	Was a field visit made for the proposed preformed scour hole site/location?	☑	☐	☐	
2	Was the preformed scour hole positioned outside the roadway clear recovery zone?	☑	☐	☐	
3	Were permit requirements addressed?	☑	☐	☐	
4	Were off-site drainage areas verified and accommodated?	☑	☐	☐	
5	Were adequate ingress and egress for maintenance provided within right-of-way?	☑	☐	☐	
6	Were different preformed scour hole locations and orientations considered to optimize water quality benefits? Explain.	☑	☐	☐	Located PSH in flattest location possible
7	Was topography downgrade of the preformed scour hole reviewed for ability to diffuse flow?	☑	☐	☐	
8	Is the PSRM apron shown on the plans to be flush with the natural ground?	☑	☐	☐	
9	Is the discharge pipe an allowable size for use with a preformed scour hole (15 in. or 18 in.)?	☑	☐	☐	
10	Have maximum allowable discharges based on the Q_{10} discharge been verified?	☑	☐	☐	
11	Were all design assumptions documented?	☑	☐	☐	

NCDOT Highway Stormwater Program

North Carolina Department of Transportation
Highway Stormwater Program

SWALE CHECKLIST	Page 1 of 1

GENERAL PROJECT INFORMATION

Project: [illegible] TIP No: [illegible]

Prepared by: [illegible] Date: 2/22/11 Checked by: [illegible] Date: [illegible]

NCDOT Division: 10 River Basin: YADKIN/PEE DEE

City: [illegible] NCDWQ Stream Classification

County: [illegible] Primary: [illegible]

CAMA County: Yes No Supplemental:

TVA County: Yes No 303(d) Stream: Yes No

Buffer Required: Yes No

PROJECT DESCRIPTION

	Check the correct response.	Yes	No	Not Applicable	Comments/Design Assumptions
1	Was a field visit made to the proposed swale site?	☑	☐	☐	
2	Were off-site drainage areas verified and accommodated?	☑	☐	☐	
3	Were different swale locations and orientations considered to optimize water quality benefits? Explain.	☑	☐	☐	UE FLATTENED DITCHES [illegible] WHERE POSSIBLE
4	Was NCDENR (2006) Erosion and Sediment Control Planning and Design Manual reviewed for proper vegetative cover selection?	☑	☐	☐	
5	Is selected vegetation specified?	☑	☐	☐	
6	Were adequate ingress and egress for maintenance provided within the right-of-way?	☑	☐	☐	
7	Were water quality rock checks used in the swale design?	☐	☑	☐	
8	Was temporary erosion-resistant lining specified?	☑	☐	☐	
9	Were all design assumptions documented?	☑	☐	☐	

I-3803B Pre Formed Scour Holes

Station	DA (ac.)	Q10 (cfs)
197+53 -L-	0.64	3.3
198+05 -L-	1.66	8.5
201+20 -L-	0.70	3.5
205+50 -L-	0.81	4.2
250+70 -L-	1.54	6.9
259+08 -L-	1.22	6.2
369+25 -L-	1.94	6.2
370+50 -L-	1.31	6.2
372+65 -L-	0.89	4.5
378+25 -L-	1.03	5.3
399+16 -L-	1.20	6.2
401+16 -L-	1.21	5.2
434+75 -L-	2.66	9.3
436+52 -L-	1.97	5.6
444+15 -L-	1.84	7.6
458+62 -L-	0.48	2.3
469+86 -L-	0.67	3.3
471+44 -L-	1.53	7.6
472+77 -L-	0.78	1.8
520+50 -L-	1.33	6.9
521+62 -L-	0.27	1.3

HDR

Engineering, Inc of The Carolinas

DITCH COMPUTATION SHEET

I D NO: I-3803B
PROJ NO: 34187.3.GV2
COUNTY: CABARRUS
PLAN SHEET: 5 Sheet 1 of 2

I_{10} = 5 9 in/hr I_5 = 5 3 in/hr

DESIGNED BY: JJM
CHECKED BY: JRR

DITCH LOCATION FROM	DITCH LOCATION TO	DRAINAGE AREA in Acres	C_5	Q_5	PERCENT SLOPE	BASE WIDTH	SIDE SLOPE	APPENDIX FACTOR	ADJUSTED Q	DEPTH	VELOCITY	REMARKS
172+83 -L- LT 618.50	176+50 -L- LT 614.37	1.79	0.50	4.74	1.13%	0.00	6.00	-	-	0 59	2.30	Roadway Ditch - GOOD
176+50 -L- LT 614.37	177+50 -L- LT 614.07	1 79	0.50	4.74	0.30%	0.00	6.00	-	-	0.75	1 40	SDG - GOOD
183+00 -L- LT 610.84	183+60 -L- LT 609.70	0.84	0.45	1.99	1.90%	0.00	6.00	-	-	0.38	2 25	SDG - GOOD
183+60 -L- LT 609.70	184+00 -L- LT 608.50	0.69	0 50	1.83	3.00%	0.00	6 00	-	-	0.34	2 62	SDG - GOOD
184+00 -L- LT 608.50	185+57 -L- LT 607.95	0.69	0 55	2 00	0.35%	0 00	6 00	-	-	0 53	1 20	SDG - GOOD
185+57 -L- LT 607.95	186+00 -L- LT 607.52	1 52	0 55	4.44	1.00%	0 00	6 00	-	-	0.58	2.16	SDG - GOOD
186+00 -L- LT 607.52	189+55 -L- LT 606.46	1 52	0 55	4.44	0.30%	0.00	6.00	-	-	0.73	1.38	Roadway Ditch - GOOD
176+00 -L- RT 609.44	178+39 -L- RT 603.93	2.47	0.45	5 89	2.31%	0.00	6.00	-	-	0.56	3 17	SDG - GOOD
178+39 -L- RT 603.93	179+00 -L- RT 610.15	0.70	0 43	1 60	10.20%	0 00	6.00	-	-	0.26	4 00	SDG - GOOD
180+50 -L- RT 613.43	181+00 -L- RT 610.68	0.97	0 50	2.58	5 50%	0.00	6 00	-	-	0 35	3 58	SDG - GOOD
181+00 -L- RT 610.68	181+69 -L- RT 610.33	0 97	0.50	2 58	0 51%	0.00	6 00	-	-	0 54	1 46	SDG - GOOD
181+69 -L- RT 610.33	185+57 -L- RT 612.54	1 01	0.50	2.67	0.57%	0 00	6.00	-	-	0.54	1 54	SDG - GOOD
186+00 -L- RT 612.79	187+00 -L- RT 613.16	0.19	0.50	0.51	0.37%	0 00	6.00	-	-	0 31	0 87	Roadway Ditch - GOOD
172+79 -L- LT 628.50	176+50 -L- LT 635.50	0 57	0.40	1.34	1.89%	0.00	2 00	-	-	0.51	2 55	Berm Ditch - GOOD
176+50 -L- LT 635.50	178+76 -L- LT 634.30	1.72	0.40	4.05	0.53%	0.00	2 00	-	-	0 98	2 09	Berm Ditch - GOOD

Grass Swale Comps

Discharge is considered to be treated if it meets the following criteria:
100 ft of grass swale for every 1 acre of drainage area AND
2 yr velocity is less than or equal to 2 ft./sec.

Date: 2/22/2011
Dsn By: JJM
Check: JRR

SHT	Station Range	Site	Type	D.A (ac)	Required length for treatment	Actual Length	Slope	Base Width	Side Slope	Treated Discharge	Q2 (cfs)	Q2 vel (fps)	Q10 (cfs)	Q10 vel (fps)	Treatment Provided
5	17283 - 17650	--	2GI	1 79	178 80	367	0 01	0 00	6.00	**NO**	4 03	2 21	5.27	2 36	NONE
5	17650 - 17750	--	2GI	1.79	178.80	467	0.00	0 00	6 00	**YES**	4 03	1 34	5 27	1 44	GS
5	18300 - 18360	--	2GI	0.84	83 60	60	0 02	0 00	6.00	**NO**	1 70	2 16	2 22	2 31	NONE
5	18360 - 18400	--	2GI	0 69	69 00	40	0 03	0 00	6 00	**NO**	1 56	2.51	2.04	2 69	NONE
5	18400 - 18557	--	2GI	0 69	68 50	197	0 00	0 00	6.00	**YES**	1.70	1.15	2.22	1 23	GS
5	18557 - 18600	--	2GI	1.52	152 20	43	0.01	0 00	6 00	**NO**	3 78	2.08	4.94	2 22	NONE
5	18600 - 18955	--	2GI	1 52	152 20	398	0 00	0 00	6 00	**YES**	3 78	1 32	4.94	1 41	GS
5	17600 - 17839	--	2GI	2 47	247 00	789	0 02	0 00	6 00	**NO**	5 01	3.05	6 56	3 26	NONE
5	17839 - 17900	--	2GI	0 70	70 00	61	0 10	0 00	6.00	**NO**	1 36	3 84	1 78	4 11	NONE
5	18050 - 18100	--	2GI	0 97	97 40	50	0.06	0 00	6 00	**NO**	2 20	3 44	2 87	3 68	NONE
5	18100 - 18169	--	2GI	0 97	97.40	119	0 01	0 00	6 00	**YES**	2.20	1 41	2 87	1.50	GS
5	18169 - 18557	--	2GI	1 01	100 70	388	0 01	0 00	6 00	**YES**	2.27	1 48	2 97	1 58	GS
5	18600 - 18700	--	2GI	0 19	19 10	100	0 00	0 00	6 00	**YES**	0.43	0.83	0 56	0.89	GS
5	17279 - 17650	1	2GI	0 57	56 60	371	0 02	0 00	2 00	**NO**	1 02	2 38	1 34	2 55	NONE
5	17650 - 17876	--	2GI	1.72	171 60	226	0 01	0 00	2 00	**YES**	3 10	1.95	4 05	2 09	GS

2GI = 2 GRATED INLET
SBG = SHOULDER BERM GUTTER
CB = CATCH BASIN
DDB = DRY DETENTION BASIN
B = BASIN
GS = GRASS SWALE

BDOS = BERM DRAINAGE OUTLET STRUCTURE
OTCB = OPEN THROAT CATCH BASIN
OPEN = OPEN END PIPE
PSH = PRE FORMED SCOUR HOLE
LS = LEVEL SPREADER

HDR

Engineering, Inc of The Carolinas

DITCH COMPUTATION SHEET

I D NO: I-3803B
PROJ NO: 34187.3.GV2
COUNTY: CABARRUS
PLAN SHEET: 5   Sheet 2 of 2

I_{10} = 5 9 in/hr I_5 = 5 3 in/hr

DESIGNED BY: JJM
CHECKED BY: WDY

DITCH LOCATION TO	FROM	DRAINAGE AREA in Acres	C5	Q5	PERCENT SLOPE	BASE WIDTH	SIDE SLOPE	APPENDIX FACTOR	ADJUSTED Q	DEPTH	VELOCITY	REMARKS
177+50 -L- LT 614.07	178+67 -L- LT 613.71	0.32	0 50	0 85	0 31%	0.00	6.00	-	-	0.39	0 92	SDG - GOOD
185+57 -L- RT 612.54	186+00 -L- RT 612.79	1.01	0 50	2 68	0.58%	0 00	6.00	-	-	0.54	1.55	SDG - GOOD
16+24 -Y5RPD LT 612.60	18+24 -Y5RPD LT 620.37	2.64	0.48	6 72	3 88%	0 00	6.00	-	-	0.53	3.99	Roadway Ditch - GOOD

Grass Swale Comps

Discharge is considered to be treated if it meets the following criteria:

100 ft. of grass swale for every 1 acre of drainage area AND

2 yr. velocity is less than or equal to 2 ft /sec

Date 2/22/2011
Dsn By: JJM
Check· JRR

SHT.	Station Range	Site	Type	D A (ac)	Required length for treatment	Actual Length	Slope	Base Width	Side Slope	Treated Discharge	Q2 (cfs)	Q2 vel. (fps)	Q10 (cfs)	Q10 vel (fps)	Treatment Provided
5	17750 - 17867	--	2GI	0 32	32.00	117	0 00	0 00	6.00	**YES**	0 72	0 88	0 94	0 94	GS
5	18557 - 18600	--	2GI	1 01	101 00	100	0.01	0.00	6 00	**NO**	2 28	1 49	2 98	1 60	NONE
5	1624 - 1824	--	2GI	2 64	264 00	200	0.04	0.00	6 00	**NO**	5 72	3 83	7 48	4.10	NONE

2GI = 2 GRATED INLET
SBG = SHOULDER BERM GUTTER
CB = CATCH BASIN
DDB = DRY DETENTION BASIN
B = BASIN
GS = GRASS SWALE

BDOS = BERM DRAINAGE OUTLET STRUCTURE
OTCB = OPEN THROAT CATCH BASIN
OPEN = OPEN END PIPE
PSH = PRE FORMED SCOUR HOLE
LS = LEVEL SPREADER

HDR

Engineering, Inc of The Carolinas

DITCH COMPUTATION SHEET

I D NO: I-3803B
PROJ NO: 34187.3.GV2
COUNTY: CABARRUS
PLAN SHEET: 7 Sheet 1 of 1

I_{10} = 5 9 in/hr I_5 = 5 3 in/hr

DESIGNED BY: WDY
CHECKED BY: JRR

DITCH LOCATION FROM	TO	DRAINAGE AREA in Acres	C5	Q5	PERCENT SLOPE	BASE WIDTH	SIDE SLOPE	APPENDIX FACTOR	ADJUSTED Q	DEPTH	VELOCITY	REMARKS
207+26 -L- RT 583.56	208+00 -L- RT 583.84	29 60	0 64	22 00 HWY	0.38%	2.00	2.00	-	-	1 54	2 80	2' Base Ditch - GOOD
208+00 -L- RT 583.84	209+50 -L- RT 584.23	29.60	0.64	22.00 HWY	0.26%	2 00	2.00	-	-	1 68	2.44	2' Base Ditch - GOOD
209+50 -L- RT 584.23	211+50 -L- RT 585.50	29.60	0 64	22.00 HWY	0.63%	2.00	2.00	-	-	1.37	3.40	2' Base Ditch - GOOD
211+50 -L- RT 585.50	213+50 -L- RT 588.00	29.60	0 64	22.00 HWY	1.25%	2.00	2.00	-	-	1.20	4 16	2' Base Ditch w/ Class 'B' Rip Rap - GOOD
213+50 -L- RT 588.00	214+50 -L- RT 590.64	26 75	0 72	20.30 HWY	2.64%	2 00	2 00	-	-	0 96	5 37	2' Base Ditch w/ Class 'B' Rip Rap - GOOD
214+50 -L- RT 590.64	215+00 -L- RT 592.80	26.75	0 72	20.30 HWY	4.32%	2.00	2.00	-	-	0.85	6 43	2' Base Ditch w/ Class 'B' Rip Rap - GOOD

Grass Swale Comps

Discharge is considered to be treated if it meets the following criteria:

100 ft of grass swale for every 1 acre of drainage area AND

2 yr. velocity is less than or equal to 2 ft /sec.

Date: 2/22/2011

Dsn By: JJM

Check: JRR

SHT	Station Range	Site	Type	D A. (ac)	Required length for treatment	Actual Length	Slope	Base Width	Side Slope	Treated Discharge	Q2 (cfs)	Q2 vel (fps)	Q10 (cfs)	Q10 vel (fps)	Treatment Provided
7	20726 - 20800	--	Ditch	29 60	2960 00	424	0 00	2 00	2 00	**NO**	27 50	2 97	43 00	3 32	NONE
7	20800 - 20950	--	Ditch	29.60	2960 00	350	0.00	2.00	2.00	**NO**	27 50	2 58	43 00	2 89	NONE
7	20950 - 21150	--	Ditch	29 60	2960 00	200	0 01	2 00	2 00	**NO**	27 50	3 60	43 00	4.03	NONE
7	21150 - 21350	--	Ditch	29 60	2960.00	200	0 01	2.00	2 00	**NO**	27 50	4 41	43.00	4 95	NONE
7	21350 - 21450	--	Ditch	26.75	2675.00	100	0 03	2 00	2.00	**NO**	25 00	5 67	39 00	6 37	NONE
7	21450 - 21500	--	Ditch	26.75	2675.00	50	0 04	2.00	2 00	**NO**	25 00	6.79	39 00	7 64	NONE

2GI = 2 GRATED INLET

SBG = SHOULDER BERM GUTTER

CB = CATCH BASIN

DDB = DRY DETENTION BASIN

B = BASIN

GS = GRASS SWALE

BDOS = BERM DRAINAGE OUTLET STRUCTURE

OTCB = OPEN THROAT CATCH BASIN

OPEN = OPEN END PIPE

PSH = PRE FORMED SCOUR HOLE

LS = LEVEL SPREADER

HDR

Engineering, Inc. of The Carolinas

DITCH COMPUTATION SHEET

I D NO I-3803B

PROJ NO 34187.3.GV2

COUNTY CABARRUS

PLAN SHEET 9 Sheet 1 of 2

I_{10} = 5 9 in/hr I_5 = 5 3 in/hr

DESIGNED BY: JJM

CHECKED BY: WDY

DITCH LOCATION FROM	TO	DRAINAGE AREA in Acres	C_5	Q_5	PERCENT SLOPE	BASE WIDTH	SIDE SLOPE	APPENDIX FACTOR	ADJUSTED Q	DEPTH	VELOCITY	REMARKS
227+83 -L- LT 601.82	229+00 -L- LT 608.34	0 98	0.55	2.86	5 57%	0.00	6.00	-	-	0 36	3 69	SDG - GOOD
229+00 -L- LT 608.34	233+50 -L- LT 612.85	0.78	0 55	2.27	1.00%	0.00	6.00	-	-	0.45	1.83	Roadway Ditch - GOOD
238+50 -L- LT 616.78	239+50 -L- LT 618.80	1.23	0 60	3.91	2 02%	0 00	6.00	-	-	0 49	2.73	SDG - GOOD
239+50 -L- LT 618.80	245+50 -L- LT 626.00	1.23	0 60	3 91	1.20%	0.00	6.00	-	-	0.54	2.24	Roadway Ditch - GOOD
235+00 -L-RRT 619.22	235+80 -L-RRT 617.40	0.80	0.40	1 89	2 28%	0.00	2 00	-	-	0.56	2.98	Berm Ditch - GOOD
228+34 -L- RT 607.40	234+00 -L- RT 613.07	1.23	0.60	3 91	1 00%	0.00	6.00	-	-	0 56	2.10	Roadway Ditch - GOOD
235+00 -L- RT 615.46	235+80 -L- RT 615.22	0.41	0.60	1.32	0.30%	0 00	6.00	-	-	0 46	1.02	SDG - GOOD
236+50 -L- RT 615.79	237+50 -L- RT 616.89	0.41	0.60	1.32	1 10%	0 00	6 00	-	-	0 36	1.65	Roadway Ditch - GOOD
237+55 -L- RT 615.23	238+00 -L- RT 617.44	0 97	0 60	3.07	4 91%	0 00	6 00	-	-	0.38	3 58	SDG - GOOD
238+00 -L- RT 617.44	240+50 -L- RT 620.20	0 97	0 60	3.07	1 10%	0 00	6 00	-	-	0 50	2 05	Roadway Ditch - GOOD
240+50 -L- RT 620.20	240+87 -L- RT 621.33	0 97	0.60	3.07	3.05%	0 00	6 00	-	-	0 41	3 00	SDG - GOOD
240+87 -L- RT 621.33	242+00 -L- RT 621.85	1.44	0 60	4 58	0.46%	0 00	6 00	-	-	0.68	1 63	SDG - GOOD
235+80 -L-RRT 617.40	237+14 -L-RRT 621.00	1.11	0.40	2 62	2.69%	0.00	2.00	-	-	0 62	3.44	Berm Ditch - GOOD
228+34 -L- RT 620.10	229+50 -L- RT 625.00	6 70	0 35	13 83	4.22%	2.00	2 00	-	-	0.71	5.74	Berm Ditch w/ Class 'B' Rip Rap - GOOD
239+00 -L- RT 645.59	242+62 -L- RT 660.80	2.22	0.50	6 55	4 20%	2 00	2.00	-	-	0.48	4 65	Berm Ditch w/ Class 'B' Rip Rap - GOOD

Grass Swale Comps

Discharge is considered to be treated if it meets the following criteria·
100 ft of grass swale for every 1 acre of drainage area AND
2 yr. velocity is less than or equal to 2 ft /sec.

Date 2/22/2011
Dsn By JJM
Check: JRR

SHT	Station Range	Site	Type	D A. (ac)	Required length for treatment	Actual Length	Slope	Base Width	Side Slope	Treated Discharge	Q2 (cfs)	Q2 vel. (fps)	Q10 (cfs)	Q10 vel (fps)	Treatment Provided
9	22783 - 22900	--	DITCH	0 98	98.00	117	0 06	0.00	6 00	**NO**	2 43	3 54	3 18	3 79	NONE
9	22900 - 23350	--	DITCH	0 78	78 00	450	0 01	0 00	6.00	**YES**	1 93	1.76	2.53	1 88	GS
9	23850 - 23950	--	DITCH	1 23	123.10	700	0 02	0.00	6.00	**NO**	3.33	2.62	4.36	2.80	NONE
9	23950 - 24550	--	DITCH	1 23	123 00	600	0 01	0 00	6 00	**NO**	3 33	2.15	4 35	2 30	NONE
9	23500 - 23580	--	BDOS	0 80	80 00	80	0 02	0 00	2 00	**NO**	1 44	2.79	1 89	2 98	NONE
9	22834 - 23400	--	2GI	1 23	123 00	566	0 01	0.00	6 00	**NO**	3 33	2 01	4 35	2.15	NONE
9	23500 - 23580	--	2GI	0 41	41.40	80	0 00	0.00	6 00	**YES**	1 12	0 98	1 47	1 04	GS
9	23650 - 23750	--	2GI	0.41	41 40	100	0 01	0 00	6 00	**YES**	1 12	1 59	1 47	1 70	GS
9	23755 - 23800	--	OPEN	0 97	96 50	332	0 05	0 00	6 00	**NO**	2 61	3 44	3 42	3 68	NONE
9	23800 - 24050	--	OPEN	0 97	96 50	287	0 01	0 00	6 00	**YES**	2 61	1 97	3.42	2 10	GS
9	24050 - 24087	--	OPEN	0 97	96.50	37	0 03	0 00	6 00	**NO**	2 61	2 88	3 42	3.08	NONE
9	24087 - 24200	--	2GI	1 44	144 00	150	0.00	0 00	6.00	**YES**	3.90	1.56	5.10	1 67	GS
9	23580 - 23714	--	BDOS	1 11	111 00	134	0 03	0 00	2.00	**NO**	2 00	3 22	2 62	3.44	NONE
9	22834 - 22950	--	BDOS	6 70	669.90	116	0 04	2.00	2.00	**NO**	10 57	5.33	13 83	5 74	NONE
9	23900 - 24262	--	BDOS	2 22	222 00	362	0 04	2 00	2 00	**NO**	5 01	4 30	6 55	4 65	NONE

2GI = 2 GRATED INLET
SBG = SHOULDER BERM GUTTER
CB = CATCH BASIN
DDB = DRY DETENTION BASIN
B = BASIN
GS = GRASS SWALE

BDOS = BERM DRAINAGE OUTLET STRUCTURE
OTCB = OPEN THROAT CATCH BASIN
OPEN = OPEN END PIPE
PSH = PRE FORMED SCOUR HOLE
LS = LEVEL SPREADER

HDR

Engineering, Inc of The Carolinas

DITCH COMPUTATION SHEET

I D NO: I-3803B
PROJ NO: 34187.3.GV2
COUNTY: CABARRUS
PLAN SHEET: 9 Sheet 2 of 2

I_{10} = 5 9 in/hr I_5 = 5.3 in/hr

DESIGNED BY: JJM
CHECKED BY: WDY

DITCH LOCATION FROM	TO	DRAINAGE AREA in Acres	C_5	Q_5	PERCENT SLOPE	BASE WIDTH	SIDE SLOPE	APPENDIX FACTOR	ADJUSTED Q	DEPTH	VELOCITY	REMARKS
235+80 -L- RT 615.22	236+50 -L- RT 615.79	0.41	0.60	1 32	0.81%	0 00	6 00	-	-	0.39	1 48	SDG - GOOD

Grass Swale Comps

Discharge is considered to be treated if it meets the following criteria:

100 ft of grass swale for every 1 acre of drainage area AND

2 yr velocity is less than or equal to 2 ft /sec.

Date 2/22/2011
Dsn By JJM
Check: JRR

SHT	Station Range	Site	Type	D A (ac)	Required length for treatment	Actual Length	Slope	Base Width	Side Slope	Treated Discharge	Q2 (cfs)	Q2 vel (fps)	Q10 (cfs)	Q10 vel (fps)	Treatment Provided
9	23580 - 23650	--	2GI	0.41	41 40	70	0.01	0.00	6 00	**YES**	1.12	1 42	1 47	1 52	GS

2GI = 2 GRATED INLET
SBG = SHOULDER BERM GUTTER
CB = CATCH BASIN
DDB = DRY DETENTION BASIN
B = BASIN
GS = GRASS SWALE

BDOS = BERM DRAINAGE OUTLET STRUCTURE
OTCB = OPEN THROAT CATCH BASIN
OPEN = OPEN END PIPE
PSH = PRE FORMED SCOUR HOLE
LS = LEVEL SPREADER

HDR

Engineering, Inc of The Carolinas

DITCH COMPUTATION SHEET

I D NO: I-3803B
PROJ NO: 34187.3.GV2
COUNTY: CABARRUS
PLAN SHEET: 10 Sheet 1 of 1

I_{10} = 5 9 in/hr I_5 = 5 3 in/hr

DESIGNED BY: JJM
CHECKED BY: WDY

DITCH LOCATION FROM	TO	DRAINAGE AREA in Acres	C5	Q5	PERCENT SLOPE	BASE WIDTH	SIDE SLOPE	APPENDIX FACTOR	ADJUSTED Q	DEPTH	VELOCITY	REMARKS
253+50 -L- LT 626.60	256+50 -L- LT 638.57	4.39	0.45	11 67	3.99%	2.00	2.00	-	-	0.66	5.37	2' Base Ditch w/ Class 'B' Rip Rap - GOOD
256+50 -L- LT 638.57	257+50 -L- LT 641.89	0.41	0.60	1 29	3.32%	0 00	4.00	-	-	0.34	2.73	SDG - GOOD
245+22 -L- RT 625.39	249+00 -L- RT 629.55	0 94	0 55	2.75	1.10%	0.00	6.00	-	-	0 48	1.99	Roadway Ditch - GOOD
249+50 -L- RT 622.30	250+13 -L- RT 620.34	1.89	0 60	6.69	3 11%	2 00	2 00	-	-	0 52	4 20	2' Base Ditch w/ Class 'B' Rip Rap - GOOD
250+13 -L- RT 620.34	252+50 -L- RT 621.29	1.41	0 65	5.42	0 40%	2.00	2 00	-	-	0.77	1 98	2' Base Ditch - GOOD
252+50 -L- RT 621.29	254+50 -L- RT 619.70	1.13	0 65	4.34	0.79%	4 00	2 00	-	-	0.42	2 16	4' Base Ditch - GOOD
245+60 -L- LT 621.00	245+60 -L- LT 620.27	2.71	0.80	12.80	1 44%	2.00	2.00	-	-	0 86	3 99	Tail Ditch - GOOD
242+00 -L- RT 621.85	245+22 -L- RT 625.39	1.44	0 60	4 58	1.10%	0.00	6.00	-	-	0 58	2 26	Roadway Ditch - GOOD
242+62 -L- RT 660.80	245+08 -L- RT 647.60	1 06	0 40	2 50	5.37%	2.00	2 00	-	-	0.25	3.95	Berm Ditch - GOOD
245+08 -L- RT 647.60	248+50 -L- RT 640.06	1.29	0.40	3.04	2.20%	2 00	2 00	-	-	0.36	3 09	Berm Ditch - GOOD

Grass Swale Comps

Discharge is considered to be treated if it meets the following criteria:

100 ft. of grass swale for every 1 acre of drainage area AND

2 yr velocity is less than or equal to 2 ft./sec.

Date 2/22/2011

Dsn By JJM

Check: JRR

SHT	Station Range	Site	Type	D A. (ac)	Required length for treatment	Actual Length	Slope	Base Width	Side Slope	Treated Discharge	Q2 (cfs)	Q2 vel (fps)	Q10 (cfs)	Q10 vel (fps)	Treatment Provided
10	25350 - 25650	--	DITCH	4 39	439 40	300	0.04	2 00	2 00	**NO**	8 92	4 98	11 67	5 37	NONE
10	25650 - 25750	--	DITCH	0 41	40 60	100	0.03	0 00	4 00	**NO**	1 10	2 63	1 44	2 81	NONE
10	24522 - 24900	--	2GI	0.94	94 40	378	0.01	0.00	6 00	**YES**	2 34	1 91	3 06	2 04	GS
10	24950 - 25013	5	DITCH	1.89	189.00	63	0 03	2.00	2 00	**NO**	5 11	3 89	6.69	4 20	NONE
10	25013 - 25250	5	DITCH	1 41	141 30	237	0.00	2.00	2.00	**YES**	4 14	1 84	5.42	1 98	GS
10	25250 - 25450	6	DITCH	1 13	113 10	200	0.01	4.00	2 00	**YES**	3.32	1.98	4.34	2.16	GS
10	24560 - 24560	--	DITCH	2 71	271 10	51	0 01	2 00	2 00	**NO**	9.78	3.71	12.80	3 99	NONE
10	24200 - 24522	--	2GI	1 44	144 00	322	0 01	0 00	6 00	**NO**	3 90	2 17	5 10	2.32	NONE
10	24262 - 24508	--	BDOS	1 06	106 00	246	0 05	2 00	2,00	**NO**	1 91	3 63	2.50	3 95	NONE
10	24508 - 24850	5	BDOS	1 29	129 00	342	0 02	2 00	2.00	**NO**	2 33	2 85	3.04	3 09	NONE

2GI = 2 GRATED INLET

SBG = SHOULDER BERM GUTTER

CB = CATCH BASIN

DDB = DRY DETENTION BASIN

B = BASIN

GS = GRASS SWALE

BDOS = BERM DRAINAGE OUTLET STRUCTURE

OTCB = OPEN THROAT CATCH BASIN

OPEN = OPEN END PIPE

PSH = PRE FORMED SCOUR HOLE

LS = LEVEL SPREADER

HDR

Engineering, Inc of The Carolinas

DITCH COMPUTATION SHEET

ID NO: I-3803B
PROJ NO: 34187.3.GV2
COUNTY: CABARRUS
PLAN SHEET: 12 Sheet 1 of 1

I_{10} = 5 9 in/hr I_5 = 5.3 in/hr

DESIGNED BY: JJM
CHECKED BY: WDY

DITCH LOCATION FROM	TO	DRAINAGE AREA in Acres	C_5	Q_5	PERCENT SLOPE	BASE WIDTH	SIDE SLOPE	APPENDIX FACTOR	ADJUSTED Q	DEPTH	VELOCITY	REMARKS
272+06 -L- LT 666.93	277+00 -L- LT 673.16	1 24	0 50	3 28	1.26%	0 00	6.00	-	-	0.50	2 19	Roadway Ditch - GOOD
277+30 -L- LT 671.70	277+50 -L- LT 671.90	1.28	0.60	4.08	1 00%	0.00	5.00	-	-	0 61	2 21	SDG - GOOD
277+50 -L- LT 671.90	279+00 -L- LT 675.32	1 28	0.60	4 08	2.28%	0.00	6.00	-	-	0 49	2.88	SDG - GOOD
279+00 -L- LT 675.32	284+08 -L- LT 680.63	0 98	0.60	3.10	1.05%	0 00	6 00	-	-	0 51	2.01	Roadway Ditch - GOOD
272+00 -L-LLT 710.39	275+50 -L-LLT 686.07	1.57	0.40	3.70	6.95%	2.00	2.00	-	-	0.30	4 67	Berm Ditch w/ Class 'B' Rip Rap - GOOD
276+50 -L-LLT 676.11	277+30 -L-LLT 672.93	2 97	0 40	7.00	3 98%	2 00	2 00	-	-	0 50	4 64	Berm Ditch w/ Class 'B' Rip Rap - GOOD
277+30 -L-LLT 672.93	279+00 -L-LLT 678.73	4.25	0 45	11.28	3 41%	2 00	2.00	-	-	0.67	5 03	Berm Ditch w/ Class 'B' Rip Rap - GOOD
279+00 -L-LLT 678.73	282+62 -L-LLT 690.96	4 25	0 45	11.28	3 38%	2.00	2 00	-	-	0 67	5 01	Berm Ditch w/ Class 'B' Rip Rap - GOOD
282+62 -L-LLT 690.96	284+08 -L-LLT 685.79	0.37	0.60	1.30	3.54%	0.00	2 00	-	-	0.45	3.20	Berm Ditch - GOOD
277+08 -L- RT 648.15	278+00 -L- RT 657.00	1.14	0 85	5 72	9.62%	2 00	2.00	-	-	0 35	5 98	2' Base Ditch w/ Class 'B' Rip Rap - GOOD
272+13 -L- RT 645.00	273+00 -L- RT 646.82	3 04	0.58	10.40	2 55%	2.00	2.00	-	-	0.69	4.42	Tail Ditch w/ Class 'B' Rip Rap - GOOD

Grass Swale Comps

Discharge is considered to be treated if it meets the following criteria:

100 ft of grass swale for every 1 acre of drainage area AND

2 yr. velocity is less than or equal to 2 ft /sec.

Date: 2/22/2011

Dsn By: JJM

Check: JRR

SHT	Station Range	Site	Type	D A (ac)	Required length for treatment	Actual Length	Slope	Base Width	Side Slope	Treated Discharge	Q2 (cfs)	Q2 vel (fps)	Q10 (cfs)	Q10 vel. (fps)	Treatment Provided
12	27206 - 27700	--	2GI	1 24	123.60	494	0 01	0 00	6 00	**NO**	2 79	2 10	3 65	2 25	EDB
12	27730 - 27750	7	2GI	1.28	128 30	678	0 01	0 00	5 00	**NO**	3 47	2 12	4 54	2 27	NONE
12	27750 - 27900	7	2GI	1 28	128 30	658	0.02	0 00	6 00	**NO**	3.47	2 77	4 54	2 96	NONE
12	27900 - 28408	7	2GI	0 98	97 60	508	0 01	0 00	6 00	**YES**	2.64	1 93	3.46	2 07	GS
12	27200 - 27550	7	BDOS	1 57	156 60	350	0 07	2.00	2 00	**NO**	2.83	4.29	3 70	4 67	NONE
12	27650 - 27730	7	BDOS	2 97	296 60	80	0 04	2 00	2 00	**NO**	5 35	4.30	7 00	4 64	NONE
12	27730 - 27900	7	BDOS	4 25	425 00	532	0 03	2.00	2 00	**NO**	8 63	4 67	11 28	5 03	NONE
12	27900 - 28262	7	BDOS	4 25	425 00	362	0 03	2 00	2.00	**NO**	8 63	4 65	11 28	5 01	NONE
12	28262 - 28408	--	BDOS	0.37	36 80	146	0 04	0 00	2 00	**NO**	1 00	3 00	1 30	3 20	NONE
12	27708 - 27800	7	DITCH	1.14	114 00	92	0 10	2 00	2 00	**NO**	4 37	5 50	5 72	5 98	NONE
12	27213 - 27300	--	DITCH	3 04	304 00	72	0 03	2 00	2 00	**NO**	7 95	4 10	10 40	4.42	NONE

2GI = 2 GRATED INLET

SBG = SHOULDER BERM GUTTER

CB = CATCH BASIN

DDB = DRY DETENTION BASIN

B = BASIN

GS = GRASS SWALE

BDOS = BERM DRAINAGE OUTLET STRUCTURE

OTCB = OPEN THROAT CATCH BASIN

OPEN = OPEN END PIPE

PSH = PRE FORMED SCOUR HOLE

LS = LEVEL SPREADER

EDB=ENERGY DISSIPATOR BASIN

HDR

Engineering, Inc. of The Carolinas

DITCH COMPUTATION SHEET

I D NO: I-3803B
PROJ NO: 34187.3.GV2
COUNTY: CABARRUS
PLAN SHEET: 13 Sheet 1 of 2

I_{10} = 5 9 in/hr I_5 = 5 3 in/hr

DESIGNED BY: JJM
CHECKED BY: WDY

DITCH LOCATION FROM	TO	DRAINAGE AREA in Acres	C5	Q5	PERCENT SLOPE	BASE WIDTH	SIDE SLOPE	APPENDIX FACTOR	ADJUSTED Q	DEPTH	VELOCITY	REMARKS
284+08 -L- LT 680.63	289+00 -L- LT 687.52	0.98	0.60	3.10	1.40%	0.00	6.00	-	-	0.48	2.24	Roadway Ditch - GOOD
289+00 -L- LT 687.52	289+75 -L- LT 686.30	0 11	0.60	0.35	1.63%	0 00	4 00	-	-	0.24	1 51	SDG - GOOD
284+08 -L- LT 685.68	286+50 -L- LT 691.16	1 92	0.50	5.66	2 26%	0 00	2.00	-	-	0 85	3.91	Berm Ditch - GOOD
286+50 -L- LT 691.16	289+75 -L- LT 686.30	1.90	0 50	5.61	1 50%	0.00	2 00	-	-	0.92	3.34	Berm Ditch - GOOD
289+75 -L- LT 686.30	291+00 -L- LT 690.77	0 73	0.64	2 48	3.58%	0.00	4.00	-	-	0.43	3.31	SDG - GOOD
291+00 -L- LT 690.77	293+86 -L- LT 695.50	0 73	0 64	2 48	1.65%	0.00	6 00	-	-	0.43	2.26	Roadway Ditch - GOOD
295+00 -L- RT 695.40	296+20 -L- RT 699.17	0 48	0 65	1 65	3 14%	0 00	6.00	-	-	0.33	2.60	SDG - GOOD
296+20 -L- RT 699.17	300+24 -L- RT 702.90	1.20	0.65	4.13	0.92%	0.00	6 00	-	-	0 58	2.06	Roadway Ditch - GOOD
293+86 -L- LT 695.50	298+00 -L- LT 702.64	0 98	0.54	2 80	1.72%	0.00	6.00	-	-	0.44	2 37	Roadway Ditch - GOOD
290+50 -L- LT 688.83	291+00 -L- LT 693.00	0.35	0.40	0 83	8.34%	0 00	2 00	-	-	0.33	3 76	Berm Ditch w/ Class 'B' Rip Rap - GOOD
291+00 -L- LT 693.00	293+86 -L- LT 705.39	0.35	0.40	0 83	4.33%	0.00	2.00	-	-	0 37	3.08	Berm Ditch - GOOD
293+86 -L- LT 705.39	298+54 -L- LT 709.35	10 60	0 40	10 55 HWY	0.85%	2 00	2.00	-	-	0 89	3.11	Berm Ditch - GOOD
296+20 -L- RT 710.00	299+00 -L- RT 718.74	1.03	0.38	2.31	3.12%	0.00	2 00	-	-	0 57	3.53	Berm Ditch - GOOD

Grass Swale Comps

Discharge is considered to be treated if it meets the following criteria
100 ft of grass swale for every 1 acre of drainage area AND
2 yr velocity is less than or equal to 2 ft /sec

Date 2/22/2011
Dsn By: JJM
Check: JRR

SHT	Station Range	Site	Type	D A (ac)	Required length for treatment	Actual Length	Slope	Base Width	Side Slope	Treated Discharge	Q2 (cfs)	Q2 vel (fps)	Q10 (cfs)	Q10 vel (fps)	Treatment Provided
13	28408 - 28900	--	2GI	0 98	97 60	492	0.01	0 00	6 00	**NO**	2 64	2 15	3 46	2 30	NONE
13	28900 - 28975	8	OPEN	0 11	11 00	75	0 02	0 00	4 00	**YES**	0 30	1 45	0 39	1 55	GS
13	28408 - 28650	--	BDOS	1.92	192 00	242	0.02	0 00	2.00	**NO**	4.33	3 66	5 66	3 91	NONE
13	28650 - 28975	8	OPEN	1 90	190 00	325	0 01	0 00	2 00	**NO**	4.28	3.12	5 61	3 34	NONE
13	28975 - 29100	8	OPEN	0 73	73 00	125	0.04	0.00	4.00	**NO**	2.11	3.18	2.76	3.40	NONE
13	29100 - 29386	8	OPEN	0 73	73 00	286	0.02	0 00	6 00	**NO**	2 11	2 17	2 76	2 32	NONE
13	29500 - 29620	8	DITCH	0 48	48 00	120	0 03	0 00	6 00	**NO**	1.41	2 49	1 84	2 67	NONE
13	29620 - 30024	8	2GI	1 20	120 00	404	0.01	0.00	6 00	**YES**	3.52	1 98	4.60	2 12	GS
13	29386 - 29800	8	2GI	0 98	98 00	414	0 02	0 00	6 00	**NO**	2 39	2 27	3 12	2 43	NONE
13	29050 - 29100	8	OPEN	0 35	35 00	50	0 08	0 00	2 00	**NO**	0 63	3 51	0 83	3 76	NONE
13	29100 - 29386	8	OPEN	0 35	35 00	286	0 04	0.00	2.00	**NO**	0.63	2 88	0 83	3 08	NONE
13	29386 - 29854	8	BDOS	10 60	1060.00	468	0 01	2 00	2.00	**NO**	9 60	3.04	15 00	3.42	NONE
13	29620 - 29900	8	BDOS	1.03	103.00	280	0 03	0 00	2 00	**NO**	1 77	3.30	2 31	3 53	NONE

2GI = 2 GRATED INLET
SBG = SHOULDER BERM GUTTER
CB = CATCH BASIN
DDB = DRY DETENTION BASIN
B = BASIN
GS = GRASS SWALE

BDOS = BERM DRAINAGE OUTLET STRUCTURE
OTCB = OPEN THROAT CATCH BASIN
OPEN = OPEN END PIPE
PSH = PRE FORMED SCOUR HOLE
LS = LEVEL SPREADER

HDR

Engineering, Inc of The Carolinas

DITCH COMPUTATION SHEET

ID NO I-3803B
PROJ NO 34187.3.GV2
COUNTY CABARRUS
PLAN SHEET 13 Sheet 2 of 2

I_{10} = 5 9 in/hr I_5 = 5.3 in/hr

DESIGNED BY: JJM
CHECKED BY WDY

DITCH LOCATION FROM	TO	DRAINAGE AREA in Acres	C	Q5	PERCENT SLOPE	BASE WIDTH	SIDE SLOPE	APPENDIX FACTOR	ADJUSTED Q	DEPTH	VELOCITY	REMARKS
286+70 -L- RT 672.00	288+00 -L- RT 678.05	68.00	0.45	44 73 HWY	4.65%	4 00	2.00	-	-	1.00	7.48	4' Base Ditch w/ Class 'I' Rip Rap - GOOD
288+00 -L- RT 678.05	288+93 -L- RT 681.37	68.00	0.45	44 73 HWY	3.57%	4.00	2.00	-	-	1.07	6.81	4' Base Ditch w/ Class 'I' Rip Rap - GOOD
288+93 -L- RT 681.37	293+27 -L- RT 687.00	39.98	0 45	28.20 HWY	1 30%	4 00	2.00	-	-	1.06	4.34	4' Base Ditch w/ Class 'B' Rip Rap - GOOD
293+27 -L- RT 687.00	295+00 -L- RT 695.40	8 01	0 45	21 27	4.86%	4 00	2 00	-	-	0 64	6.35	4' Base Ditch w/ Class 'B' Rip Rap - GOOD
298+00 -L- LT 702.64	299+00 -L- LT 704.32	0 98	0.54	2 80	1.68%	0.00	5.00	-	-	0.48	2.44	SDG - GOOD

Grass Swale Comps

Discharge is considered to be treated if it meets the following criteria
100 ft of grass swale for every 1 acre of drainage area AND
2 yr velocity is less than or equal to 2 ft /sec

Date: 2/22/2011
Dsn By: JJM
Check: JRR

SHT	Station Range	Site	Type	D A (ac)	Required length for treatment	Actual Length	Slope	Base Width	Side Slope	Treated Discharge	Q2 (cfs)	Q2 vel. (fps)	Q10 (cfs)	Q10 vel (fps)	Treatment Provided
13	28670 - 28800	8	DITCH	68 00	6800 00	223	0 05	4 00	2.00	**NO**	38 00	7 14	59 00	8 09	NONE
13	28800 - 28893	8	DITCH	68 00	6800 00	93	0 04	4 00	2 00	**NO**	38 00	6 49	59 00	7 36	NONE
13	28893 - 29327	8	DITCH	39 98	3998 00	434	0 01	4 00	2 00	**NO**	34 00	4 57	53 00	5 17	NONE
13	29327 - 29500	8	DITCH	8 01	801 00	173	0 05	4 00	2 00	**NO**	16 26	5 84	21 27	6 35	NONE
14	29800 - 29900	8	2GI	0.98	98 00	100	0 02	0 00	5 00	**NO**	2 39	2.35	3 12	2 51	NONE

2GI = 2 GRATED INLET
SBG = SHOULDER BERM GUTTER
CB = CATCH BASIN
DDB = DRY DETENTION BASIN
B = BASIN
GS = GRASS SWALE

BDOS = BERM DRAINAGE OUTLET STRUCTURE
OTCB = OPEN THROAT CATCH BASIN
OPEN = OPEN END PIPE
PSH = PRE FORMED SCOUR HOLE
LS = LEVEL SPREADER

HDR

Engineering, Inc of The Carolinas

DITCH COMPUTATION SHEET

I D NO: I-3803B
PROJ NO: 34187.3.GV2
COUNTY: CABARRUS
PLAN SHEET: 15 Sheet 1 of 1

I_{10} = 5 9 in/hr I_5 = 5 3 in/hr

DESIGNED BY: JJM
CHECKED BY: WDY

DITCH LOCATION FROM	TO	DRAINAGE AREA in Acres	C_5	Q_5	PERCENT SLOPE	BASE WIDTH	SIDE SLOPE	APPENDIX FACTOR	ADJUSTED Q	DEPTH	VELOCITY	REMARKS
321+00 -L- LT 705.69	324+50 -L- LT 681.79	2.28	0.44	5.92	6 83%	2.00	2 00	-	-	0 40	5 35	2' Base Ditch w/ Class 'B' Rip Rap - GOOD
324+50 -L- LT 681.79	325+15 -L- LT 677.00	2 28	0 44	5.92	7 37%	2 00	2.00	-	-	0 39	5.50	2' Base Ditch w/ Class 'B' Rip Rap - GOOD
327+00 -L- LT 694.40	331+12 -L- LT 686.29	0 76	0.50	2.01	1 97%	0 00	6.00	-	-	0 38	2.29	Roadway Ditch - GOOD
331+12 -L- LT 686.29	336+09 -L- LT 676.57	1 07	0.50	2 84	1.96%	0.00	6.00	-	-	0.44	2.49	Roadway Ditch - GOOD
327+50 -L- RT 690.38	331+08 -L- RT 683.41	1.06	0 60	3.38	1 95%	0 00	6 00	-	-	0 47	2.59	Roadway Ditch - GOOD
331+08 -L- RT 683.41	336+06 -L- RT 675.66	1.37	0 65	4.70	1.56%	0.00	6 00	-	-	0 55	2.59	Roadway Ditch - GOOD
330+00 -L- LT 710.70	331+13 -L- LT 709.26	0 85	0 38	1.91	1 27%	0 00	2 00	-	-	0 63	2 40	Berm Ditch - GOOD
331+13 -L- LT 709.26	331+50 -L- LT 711.09	0 85	0 38	1 91	4.95%	0.00	2 00	-	-	0.49	4.00	Berm Ditch - GOOD

Grass Swale Comps

Discharge is considered to be treated if it meets the following criteria·

100 ft. of grass swale for every 1 acre of drainage area AND

2 yr. velocity is less than or equal to 2 ft /sec.

Date 2/22/2011

Dsn By: JJM

Check: JRR

SHT	Station Range	Site	Type	D A (ac)	Required length for treatment	Actual Length	Slope	Base Width	Side Slope	Treated Discharge	Q2 (cfs)	Q2 vel. (fps)	Q10 (cfs)	Q10 vel (fps)	Treatment Provided
15	32100 - 32450	9	DITCH	2 28	228.00	350	0.07	2 00	2 00	**NO**	4 52	4 94	5 92	5 35	NONE
15	32450 - 32515	9	DITCH	2.28	228 00	415	0 07	2.00	2 00	**NO**	4.52	5.07	5.92	5.50	NONE
15	32700 - 33112	--	2GI	0.76	76 00	412	0.02	0.00	6 00	**NO**	1 71	2 20	2.24	2 35	NONE
15	33112 - 33609	--	2GI	1 07	107 00	497	0 02	0 00	6.00	**NO**	2 41	2.39	3 16	2 55	NONE
15	32750 - 33108	--	2GI	1 06	106 30	358	0 02	0.00	6.00	**NO**	2 88	2 49	3 76	2 66	NONE
15	33108 - 33606	--	2GI	1 37	136 50	498	0 02	0 00	6 00	**NO**	4 00	2 49	5 23	2 66	NONE
15	33000 - 33113	--	BDOS	0 85	85 00	113	0 01	0 00	2 00	**NO**	1 46	2 25	1 91	2 40	NONE
15	33113 - 33150	--	BDOS	0 85	85 00	37	0 05	0 00	2 00	**NO**	1 46	3.74	1.91	4 00	NONE

2GI = 2 GRATED INLET

SBG = SHOULDER BERM GUTTER

CB = CATCH BASIN

DDB = DRY DETENTION BASIN

B = BASIN

GS = GRASS SWALE

BDOS = BERM DRAINAGE OUTLET STRUCTURE

OTCB = OPEN THROAT CATCH BASIN

OPEN = OPEN END PIPE

PSH = PRE FORMED SCOUR HOLE

LS = LEVEL SPREADER

HDR

Engineering, Inc of The Carolinas

DITCH COMPUTATION SHEET

I D. NO I-3803B

PROJ NO 34187.3.GV2

COUNTY CABARRUS

PLAN SHEET 19 Sheet 1 of 1

I_{10} = 5 9 in/hr I_5 = 5.3 in/hr

DESIGNED BY: JJM

CHECKED BY: WDY

DITCH LOCATION FROM	TO	DRAINAGE AREA in Acres	C_5	Q_5	PERCENT SLOPE	BASE WIDTH	SIDE SLOPE	APPENDIX FACTOR	ADJUSTED Q	DEPTH	VELOCITY	REMARKS
381+50 -L- LT 601.11	382+50 -L- LT 616.60	2.66	0 48	7.53	15 49%	2 00	2.00	-	-	0.37	7.35	2' Base Ditch w/ Class 'I' Rip Rap - GOOD
382+50 -L- LT 616.60	383+50 -L- LT 620.71	1.74	0.54	4 98	4.11%	0.00	6.00	-	-	0.47	3.78	SDG - GOOD
383+50 -L- LT 620.71	385+00 -L- LT 622.00	1.49	0.54	4.26	0.86%	0.00	6.00	-	-	0.59	2.02	SDG - GOOD
385+00 -L- LT 622.00	388+59 -L- LT 627.54	1.49	0.54	4.26	1.54%	0.00	6.00	-	-	0 53	2 52	Roadway Ditch - GOOD
388+59 -L- LT 627.54	391+36 -L- LT 630.28	0 63	0 40	1.34	0.99%	0.00	6.00	-	-	0 37	1 60	Roadway Ditch - GOOD
391+36 -L- LT 630.28	392+88 -L- LT 631.03	0 24	0.40	0 51	0.49%	0.00	4.00	-	-	0.35	1.06	SDG - GOOD
382+50 -L- LT 616.60	387+00 -L- LT 660.00	0.92	0.40	2 17	9 64%	2.00	2.00	-	-	0.20	4.41	Berm Ditch w/ Class 'B' Rip Rap - GOOD
381+00 -L- RT 601.00	381+50 -L- RT 606.89	6.50	0 50	19.18	11.78%	4 00	2 00	-	-	0.48	8.00	4' Base Ditch w/ Class 'I' Rip Rap - GOOD
381+50 -L- RT 606.89	382+50 -L- RT 614.79	5 24	0.50	15.46	7.90%	4.00	2.00	-	-	0 46	6.79	4' Base Ditch w/ Class 'B' Rip Rap - GOOD
382+50 -L- RT 614.79	384+00 -L- RT 617.36	5 24	0.50	15.46	1.71%	4.00	2 00	-	-	0.71	4.01	4' Base Ditch w/ Class 'B' Rip Rap - GOOD
384+65 -L- RT 626.86	388+63 -L- RT 632.96	0 53	0.50	1.40	1 53%	0.00	6 00	-	-	0.35	1.90	Roadway Ditch - GOOD
388+63 -L- RT 632.96	392+59 -L- RT 636.19	0.57	0.45	1 36	0.82%	0.00	6.00	-	-	0.39	1.49	Roadway Ditch - GOOD

Grass Swale Comps

Discharge is considered to be treated if it meets the following criteria:

100 ft of grass swale for every 1 acre of drainage area AND

2 yr. velocity is less than or equal to 2 ft /sec

Date 2/22/2011
Dsn By: JJM
Check: JRR

SHT.	Station Range	Site	Type	D.A (ac)	Required length for treatment	Actual Length	Slope	Base Width	Side Slope	Treated Discharge	Q2 (cfs)	Q2 vel (fps)	Q10 (cfs)	Q10 vel. (fps)	Treatment Provided
19	38150 - 38250	10	DITCH	2 66	266 00	100	0 15	2 00	2 00	**NO**	5.76	6 78	7 53	7 35	NONE
19	38250 - 38350	10	DITCH	1 74	174 00	609	0.04	0 00	6 00	**NO**	4.24	3.63	5 54	3 88	NONE
19	38350 - 38500	10	DITCH	1 49	149 00	509	0 01	0 00	6 00	**YES**	3 63	1.94	4 75	2 08	GS
19	38500 - 38859	10	DITCH	1 49	149 00	359	0 02	0 00	6 00	**NO**	3 63	2 42	4 75	2 59	NONE
19	38859 - 39136	--	2GI	0 63	63 00	277	0.01	0 00	6 00	**YES**	1 14	1 53	1 49	1 64	GS
19	39136 - 39288	--	2GI	0 24	24.00	152	0 00	0 00	4 00	**YES**	0.43	1 02	0.57	1 09	GS
19	38250 - 38700	10	DITCH	0 92	92 00	450	0 10	2 00	2 00	**NO**	1 66	4 03	2 17	4 41	NONE
19	38100 - 38150	10	DITCH	6 50	650 00	50	0 12	4 00	2 00	**NO**	14 66	7.33	19 18	8 00	NONE
19	38150 - 38250	10	DITCH	5.24	524 00	250	0 08	4 00	2.00	**NO**	11 82	6 22	15 46	6 79	NONE
19	38250 - 38400	10	DITCH	5 24	524 00	150	0 02	4 00	2 00	**NO**	11 82	3 70	15 46	4 01	NONE
19	38465 - 38863	10	2GI	0 53	53 00	398	0 02	0.00	6.00	**YES**	1.20	1.83	1 56	1 96	GS
19	38863 - 39259	10	2GI	0 57	57 00	396	0 01	0 00	6 00	**YES**	1.16	1 43	1 51	1.53	GS

2GI = 2 GRATED INLET
SBG = SHOULDER BERM GUTTER
CB = CATCH BASIN
DDB = DRY DETENTION BASIN
B = BASIN
GS = GRASS SWALE

BDOS = BERM DRAINAGE OUTLET STRUCTURE
OTCB = OPEN THROAT CATCH BASIN
OPEN = OPEN END PIPE
PSH = PRE FORMED SCOUR HOLE
LS = LEVEL SPREADER

HDR

Engineering, Inc of The Carolinas

DITCH COMPUTATION SHEET

I D NO. I-3803B
PROJ NO. 34187.3.GV2
COUNTY CABARRUS
PLAN SHEET 23 Sheet 1 of 1 I_{10} = 5 9 in/hr I_5 = 5 3 in/hr

DESIGNED BY: JJM
CHECKED BY: WDY

DITCH LOCATION FROM	TO	DRAINAGE AREA in Acres	C_5	Q_5	PERCENT SLOPE	BASE WIDTH	SIDE SLOPE	APPENDIX FACTOR	ADJUSTED Q	DEPTH	VELOCITY	REMARKS
435+00 -L- RT 627.08	438+50 -L- RT 630.34	0.86	0 54	2 46	0.93%	0 00	6 00	-	-	0.48	1.82	Roadway Ditch - GOOD
433+50 -L- RT 658.22	435+06 -L- RT 649.44	0 67	0 36	1.42	5 63%	0 00	2 00	-	-	0.43	3.90	Berm Ditch - GOOD
435+06 -L- RT 649.44	435+80 -L- RT 651.50	0 37	0 36	0.79	2.78%	0 00	2 00	-	-	0 39	2 59	Berm Ditch - GOOD
435+80 -L- RT 651.50	437+50 -L- RT 634.60	1 20	0 36	2.55	9 94%	2.00	2 00	-	-	0 22	4 69	Berm Ditch w/ Class 'B' Rip Rap - GOOD
437+50 -L- RT 634.60	438+50 -L- RT 636.70	0 49	0.36	1.04	2.10%	0.00	2.00	-	-	0.46	2.49	Berm Ditch - GOOD
439+00 -L- LT 621.84	440+50 -L- LT 625.70	3.65	0.43	9 26	2.57%	2 00	2.00	-	-	0 65	4 30	2' Base Ditch w/ Class 'B' Rip Rap - GOOD
440+50 -L- LT 625.70	441+50 -L- LT 634.99	3.46	0 43	8 78	9.29%	2 00	2.00	-	-	0.45	6.70	2' Base Ditch w/ Class 'B' Rip Rap - GOOD
441+50 -L- LT 634.99	444+40 -L- LT 640.69	0 44	0 40	0.94	1.97%	0 00	6 00	-	-	0.29	1 89	Roadway Ditch - GOOD
444+40 -L- LT 640.69	449+00 -L- LT 645.56	0 70	0.40	1.48	1 06%	0 00	6 00	-	-	0.38	1 68	Roadway Ditch - GOOD
442+50 -L- LT 647.00	444+40 -L- LT 650.00	3.82	0.38	8.56	1.58%	2.00	2.00	-	-	0 69	3 69	Berm Ditch - GOOD
444+40 -L- LT 650.00	447+00 -L- LT 660.46	0.80	0.38	1 79	4.02%	2.00	2 00	-	-	0.23	3 22	Berm Ditch - GOOD

Grass Swale Comps

Discharge is considered to be treated if it meets the following criteria

100 ft of grass swale for every 1 acre of drainage area. AND

2 yr velocity is less than or equal to 2 ft /sec.

Date 2/22/2011

Dsn By: JJM

Check: JRR

SHT	Station Range	Site	Type	D A (ac)	Required length for treatment	Actual Length	Slope	Base Width	Side Slope	Treated Discharge	Q2 (cfs)	Q2 vel (fps)	Q10 (cfs)	Q10 vel (fps)	Treatment Provided
23	43500 - 43850	--	2GI	0 86	86 00	350	0 01	0 00	6.00	**YES**	2.09	1.75	2 74	1.87	GS
23	43350 - 43506	--	BDOS	0 67	67 00	156	0 06	0 00	2 00	**NO**	1 09	3 65	1 42	3.90	PSH
23	43506 - 43580	--	BDOS	0 37	37.40	74	0 03	0 00	2 00	**NO**	0 61	2 42	0 79	2 59	PSH
23	43580 - 43750	--	BDOS	1 20	120 00	170	0 10	2.00	2 00	**NO**	1 95	4 30	2 55	4 69	PSH
23	43750 - 43850	--	BDOS	0 49	49 00	100	0 02	0.00	2 00	**NO**	0 80	2 33	1 04	2 49	NONE
23	43900 - 44050	11	DITCH	3 65	365 00	250	0.03	2 00	2 00	**NO**	7.08	3 99	9.26	4 30	NONE
23	44050 - 44150	11	DITCH	3 46	346 00	100	0 09	2 00	2 00	**NO**	6 71	6.19	8.78	6.70	NONE
23	44150 - 44440	11	DITCH	0.44	44 20	290	0 02	0 00	6 00	**YES**	0 80	1 81	1 04	1 94	GS
23	44440 - 44900	--	2GI	0 70	70 00	460	0 01	0 00	6.00	**YES**	1 26	1 61	1 65	1 73	GS
23	44250 - 44440	11	BDOS	3 82	382 00	190	0 02	2 00	2 00	**NO**	6 55	3 43	8 56	3 69	NONE
23	44440 - 44700	--	BDOS	0 80	80.00	260	0.04	2.00	2 00	**NO**	1 37	2.95	1.79	3 22	NONE

2GI = 2 GRATED INLET

SBG = SHOULDER BERM GUTTER

CB = CATCH BASIN

DDB = DRY DETENTION BASIN

B = BASIN

GS = GRASS SWALE

BDOS = BERM DRAINAGE OUTLET STRUCTURE

OTCB = OPEN THROAT CATCH BASIN

OPEN = OPEN END PIPE

PSH = PRE FORMED SCOUR HOLE

LS = LEVEL SPREADER

HDR

Engineering, Inc. of The Carolinas

DITCH COMPUTATION SHEET

I D NO: I-3803B
PROJ NO: 34187.3.GV2
COUNTY: CABARRUS
PLAN SHEET: 24 Sheet 1 of 1

I_{10} = 5 9 in/hr I_5 = 5 3 in/hr

DESIGNED BY: JJM
CHECKED BY: WDY

DITCH LOCATION FROM	TO	DRAINAGE AREA in Acres	C_5	Q_5	PERCENT SLOPE	BASE WIDTH	SIDE SLOPE	APPENDIX FACTOR	ADJUSTED Q	DEPTH	VELOCITY	REMARKS
447+00 -L- LT 660.46	448+50 L- LT 655.00	1 02	0 40	2.41	3.64%	0 00	2 00	-	-	0.56	3.78	Berm Ditch - GOOD
450+00 -L- LT 639.49	452+60 -L- LT 647.32	4.38	0.40	10.34	3 01%	2.00	2.00	-	-	0.66	4.69	2' Base Ditch w/ Class 'B' Rip Rap - GOOD
454+50 -L- LT 652.70	455+50 -L- LT 659.38	0.46	0.40	0 98	6.68%	0.00	6.00	-	-	0.23	3.02	SDG - GOOD
455+50 -L- LT 659.38	458+00 -L- LT 665.13	0.35	0 40	0 75	2 30%	0 00	6 00	-	-	0 26	1.89	Roadway Ditch - GOOD
455+00 -L- LT 662.73	456+50 -L- LT 669.29	0.36	0.36	0 77	4 37%	0.00	2.00	-	-	0 36	3.04	Berm Ditch - GOOD
456+50 -L- LT 669.29	458+00 -L- LT 667.00	0 63	0 36	1.35	1 53%	0.00	2.00	-	-	0 53	2 36	Berm Ditch - GOOD
449+50 -L- LT 642.31	450+00 -L- LT 639.49	1 61	0.40	3.80	5.64%	2 00	2.00	-	-	0.33	4.38	2' Base Ditch w/ Class 'B' Rip Rap - GOOD
454+45 -L- RT 647.80	455+50 -L- RT 654.28	0 65	0.78	2 69	6.17%	0 00	6.00	-	-	0.34	3.77	SDG - GOOD
455+50 -L- RT 654.28	457+00 -L- RT 656.71	0.65	0.78	2 69	1 62%	0 00	6 00	-	-	0.44	2.29	SDG - GOOD
452+98 -L- LT 642.32	454+50 -L- LT 652.70	5 46	0.38	12.24	6.83%	2 00	2 00	-	-	0 58	6 61	2' Base Ditch w/ Class 'B' Rip Rap - GOOD
458+50 -L- LT 663.49	460+00 -L- LT 657.10	2 62	0 38	5.88	4 26%	2 00	2 00	-	-	0.45	4.52	2' Base Ditch w/ Class 'B' Rip Rap - GOOD
460+00 -L- LT 657.10	461+20 -L- LT 653.25	2.62	0.38	5 87	3.21%	2.00	2.00	-	-	0.48	4.09	2' Base Ditch w/ Class 'B' Rip Rap - GOOD

Grass Swale Comps

Discharge is considered to be treated if it meets the following criteria:

100 ft of grass swale for every 1 acre of drainage area AND

2 yr velocity is less than or equal to 2 ft /sec

Date 2/22/2011
Dsn By JJM
Check: JRR

SHT	Station Range	Site	Type	D A (ac)	Required length for treatment	Actual Length	Slope	Base Width	Side Slope	Treated Discharge	Q2 (cfs)	Q2 vel. (fps)	Q10 (cfs)	Q10 vel (fps)	Treatment Provided
24	44700 - 44850	--	BDOS	1 02	102.00	150	0.04	0 00	2.00	**NO**	1 84	3 53	2 41	3 78	NONE
24	45000 - 45260	--	OPEN	4.38	438 00	260	0.03	2.00	2.00	**NO**	7 90	4.35	10.34	4 69	NONE
24	45450 - 45550	--	OPEN	0 46	46 20	100	0.07	0 00	6 00	**NO**	0 83	2 90	1.09	3.10	NONE
24	45550 - 45800	--	OPEN	0 35	35 30	250	0 02	0 00	6 00	**YES**	0 64	1.82	0 83	1 95	GS
24	45500 - 45650	--	BDOS	0.36	36 20	150	0 04	0.00	2.00	**NO**	0.59	2.84	0 77	3 04	NONE
24	45650 - 45800	--	BDOS	0 63	63 40	150	0 02	0.00	2 00	**NO**	1.03	2.20	1.35	2 36	NONE
24	44950 - 45000	--	OPEN	1 61	161 00	50	0 06	2 00	2 00	**NO**	2 90	4 03	3 80	4 38	NONE
24	45445 - 45550	--	DITCH	0 65	65.00	105	0 06	0 00	6.00	**NO**	2.29	3 63	2 99	3 88	NONE
24	45550 - 45700	--	DITCH	0 65	65 00	150	0 02	0 00	6 00	**NO**	2 29	2 20	2 99	2 35	NONE
24	45298 - 45450	--	OPEN	5.46	546 00	152	0 07	2 00	2 00	**NO**	9 36	6.12	12 24	6 61	NONE
24	45850 - 46000	13	OPEN	2.62	262.20	150	0 04	2.00	2 00	**NO**	4 49	4 18	5 88	4 52	NONE
24	46000 - 46120	13	OPEN	2.62	262.00	270	0 03	2 00	2 00	**NO**	4.49	3 78	5.87	4.09	NONE

2GI = 2 GRATED INLET
SBG = SHOULDER BERM GUTTER
CB = CATCH BASIN
DDB = DRY DETENTION BASIN
B = BASIN
GS = GRASS SWALE

BDOS = BERM DRAINAGE OUTLET STRUCTURE
OTCB = OPEN THROAT CATCH BASIN
OPEN = OPEN END PIPE
PSH = PRE FORMED SCOUR HOLE
LS = LEVEL SPREADER

HDR

Engineering, Inc. of The Carolinas

DITCH COMPUTATION SHEET

I D. NO I-3803B

PROJ NO 34187.3.GV2

COUNTY CABARRUS

PLAN SHEET 25 Sheet 1 of 1

I_{10} = 5 9 in/hr I_5 = 5 3 in/hr

DESIGNED BY: JJM

CHECKED BY: WDY

DITCH LOCATION FROM	TO	DRAINAGE AREA in Acres	C_5	Q_5	PERCENT SLOPE	BASE WIDTH	SIDE SLOPE	APPENDIX FACTOR	ADJUSTED Q	DEPTH	VELOCITY	REMARKS
462+50 -L- LT 674.76	467+75 -L- LT 686.83	0.83	0 40	1.75	2.30%	0 00	6 00	-	-	0 35	2.34	Roadway Ditch - GOOD
467+75 -L- LT 686.83	471+00 -L- LT 694.31	0 86	0.42	1.91	2 30%	0.00	6.00	-	-	0 36	2 40	Roadway Ditch - GOOD
474+00 -L- LT 700.71	477+74 -L- LT 707.97	0 60	0.40	1.27	1.94%	0.00	6.00	-	-	0.32	2.03	Roadway Ditch - GOOD
466+50 -L- LT 695.00	467+77 -L- LT 687.40	0.13	0 40	0 31	5.98%	0 00	2 00	-	-	0.24	2.72	Berm Ditch - GOOD
467+77 -L- LT 687.40	469+50 -L- LT 700.00	0 17	0.40	0 40	7 28%	0 00	2 00	-	-	0.25	3 13	Berm Ditch - GOOD
464+75 -L- RT 673.00	466+50 -L- RT 680.36	0.45	0.70	1.68	4 21%	0 00	6 00	-	-	0 31	2 91	Roadway Ditch - GOOD

Grass Swale Comps

Date 2/22/2011
Dsn By: JJM
Check: JRR

Discharge is considered to be treated if it meets the following criteria
100 ft of grass swale for every 1 acre of drainage area AND
2 yr velocity is less than or equal to 2 ft /sec.

SHT	Station Range	Site	Type	D A (ac)	Required length for treatment	Actual Length	Slope	Base Width	Side Slope	Treated Discharge	Q2 (cfs)	Q2 vel (fps)	Q10 (cfs)	Q10 vel (fps)	Treatment Provided
25	46250 - 46775	13	2GI	0 83	82 50	525	0 02	0.00	6.00	**NO**	1.49	2 25	1 95	2.40	NONE
25	46775 - 47100	--	2GI	0.86	86 00	325	0 02	0 00	6.00	**NO**	1 63	2 30	2 13	2.46	NONE
25	47400 - 47774	--	2GI	0 60	60.00	374	0 02	0 00	6 00	**YES**	1.08	1 95	1 42	2.08	GS
25	46650 - 46777	--	BDOS	0.13	13.00	127	0.06	0 00	2 00	**NO**	0 23	2 54	0 31	2 72	NONE
25	46777 - 46950	-	BDOS	0.17	17 00	173	0 07	0.00	2.00	**NO**	0 31	2 93	0.40	3 13	NONE
25	46475 - 46650	--	DITCH	0 45	45.40	175	0.04	0 00	6.00	**NO**	1.43	2.79	1.88	2 99	NONE

2GI = 2 GRATED INLET
SBG = SHOULDER BERM GUTTER
CB = CATCH BASIN
DDB = DRY DETENTION BASIN
B = BASIN
GS = GRASS SWALE

BDOS = BERM DRAINAGE OUTLET STRUCTURE
OTCB = OPEN THROAT CATCH BASIN
OPEN = OPEN END PIPE
PSH = PRE FORMED SCOUR HOLE
LS = LEVEL SPREADER

HDR

Engineering, Inc. of The Carolinas

DITCH COMPUTATION SHEET

I D NO: I-3803B
PROJ NO: 34187.3.GV2
COUNTY: CABARRUS
PLAN SHEET: 26 Sheet 1 of 2

I_{10} = 5 9 in/hr I_5 = 5 3 in/hr

DESIGNED BY: JJM
CHECKED BY: WDY

DITCH LOCATION TO	FROM	DRAINAGE AREA in Acres	C	Q_5	PERCENT SLOPE	BASE WIDTH	SIDE SLOPE	APPENDIX FACTOR	ADJUSTED Q	DEPTH	VELOCITY	REMARKS
16+55 -Y12RPD- LT 678.76	17+04 -Y12RPD- LT 683.27	14 63	0.68	17.25 HWY	9 20%	4 00	2.00	-	-	0.49	7.11	4' Base Ditch w/ Class 'I' Rip Rap - GOOD
17+04 -Y12RPD- LT 683.27	17+54 -Y12RPD- LT 685.45	14.63	0.68	17.25 HWY	4 36%	4 00	2.00	-	-	0.60	5 50	4' Base Ditch w/ Class 'I' Rip Rap - GOOD
17+54 -Y12RPD- LT 685.45	22+00 -Y12RPD- LT 728.89	14 63	0 68	17.25 HWY	9 74%	4.00	2.00	-	-	0.48	7.25	4' Base Ditch w/ Class 'I' Rip Rap - GOOD
22+63 -Y12SPURC RT 732.91	24+00 Y12SPUR(RT 738.85	2.26	0.48	5.75	4.34%	0.00	6 00	-	-	0.49	4.00	Roadway Ditch - GOOD
17+88 -Y12RPB- LT 707.97	22+50 -Y12RPB- LT 731.32	0 71	0 48	1 81	5.05%	0.00	6 00	-	-	0 31	3.17	Roadway Ditch - GOOD
477+00 -L- LT 710.36	477+76 -L- LT 710.14	0 10	0.75	0 40	0 30%	0.00	4 00	-	-	0.35	0.83	SDG - GOOD
477+76 -L- LT 710.14	479+50 -L- LT 712.07	0 49	0 60	1 56	1 11%	0 00	4 00	-	-	0.45	1 90	SDG - GOOD
480+31 -L- RT 712.62	482+40 -L- RT 712.00	0.50	0.64	1.70	0.30%	0.00	4 00	-	-	0.60	1.18	SDG - GOOD
482+40 -L- RT 712.00	483+00 -L- RT 713.40	3 45	0.54	9.87	2.33%	0.00	4 00	-	-	0 79	3 98	SDG - GOOD
483+00 -L- RT 713.40	487+00 -L- RT 715.93	3 45	0 54	9 87	0.63%	0.00	6.00	-	-	0.86	2 22	Roadway Ditch - GOOD
18+62 -Y12RPC- RT 712.43	22+63 -Y12RPC- RT 732.91	5.86	0.48	14 91	5.11%	2 00	4.00	-	-	0.61	5.54	SDG w/ Class 'B' Rip Rap - GOOD
488+50 -L- LT 719.68	491+00 -L- LT 718.80	1.30	0.40	2.76	0.35%	0.00	4.00	-	-	0 70	1.42	SDG - GOOD
491+00 -L- LT 718.80	492+50 -L- LT 719.25	0 23	0.40	0 49	0.30%	0.00	4 00	-	-	0.37	0 87	SDG - GOOD

Grass Swale Comps

Discharge is considered to be treated if it meets the following criteria·

100 ft of grass swale for every 1 acre of drainage area AND

2 yr. velocity is less than or equal to 2 ft./sec.

Date 2/22/2011

Dsn By JJM

Check JRR

SHT	Station Range	Site	Type	D A (ac)	Required length for treatment	Actual Length	Slope	Base Width	Side Slope	Treated Discharge	Q2 (cfs)	Q2 vel (fps)	Q10 (cfs)	Q10 vel (fps)	Treatment Provided
26	1655 - 1704	16	DITCH	14 63	1463.00	49	0.09	4.00	2 00	**NO**	14.70	6.75	23 00	7.79	NONE
26	1704 - 1754	16	DITCH	14.63	1463.00	50	0.04	4.00	2.00	**NO**	14 70	5.24	23 00	6.01	NONE
26	1754 - 2200	16	DITCH	14.63	1463 00	446	0.10	4 00	2 00	**NO**	14.70	6 88	23 00	7 94	NONE
26	2263 - 2400	16	DITCH	2.26	226.00	137	0.04	0 00	6.00	**NO**	4.89	3.84	6 40	4 11	NONE
26	1788 - 2250	15	2GI	0 71	71 10	462	0.05	0.00	6 00	**NO**	1.54	3 05	2.01	3 26	NONE
26	47700 - 47776	15	2GI	0 10	10 00	76	0 00	0.00	4.00	**YES**	0 34	0 79	0 44	0 85	GS
26	47776 - 47950	15	2GI	0 49	49 20	174	0 01	0 00	4 00	**YES**	1.33	1 83	1 74	1 95	GS
26	48031 - 48240	--	2GI	0 50	50 00	209	0.00	0.00	4 00	**YES**	1 44	1 14	1 89	1 22	GS
26	48240 - 48300	--	2GI	3 45	345 00	460	0 02	0 00	4.00	**NO**	8.40	3 83	10.99	4 09	NONE
26	48300 - 48700	--	2GI	3 45	345 00	400	0 01	0.00	6 00	**NO**	8 40	2 14	10 99	2 28	NONE
26	1862 - 2263	--	DITCH	5.86	586 00	401	0 05	2 00	4 00	**NO**	12 69	5 31	16 60	5.70	NONE
26	48850 - 49100	16	2GI	1.30	130.00	250	0.00	0.00	4 00	**YES**	2 35	1.37	3 07	1 46	GS
26	49100 - 49250	16	2GI	0 23	23.00	150	0.00	0.00	4 00	**YES**	0 41	0 84	0 54	0 89	GS

2GI = 2 GRATED INLET

SBG = SHOULDER BERM GUTTER

CB = CATCH BASIN

DDB = DRY DETENTION BASIN

B = BASIN

GS = GRASS SWALE

BDOS = BERM DRAINAGE OUTLET STRUCTURE

OTCB = OPEN THROAT CATCH BASIN

OPEN = OPEN END PIPE

PSH = PRE FORMED SCOUR HOLE

LS = LEVEL SPREADER

HDR

Engineering, Inc of The Carolinas

DITCH COMPUTATION SHEET

I D NO: I-3803B
PROJ NO: 34187.3.GV2
COUNTY: CABARRUS
PLAN SHEET: 26 Sheet 2 of 2

I_{10} = 5 9 in/hr I_5 = 5 3 in/hr

DESIGNED BY: JJM
CHECKED BY: WDY

DITCH LOCATION FROM	TO	DRAINAGE AREA in Acres	C_5	Q_5	PERCENT SLOPE	BASE WIDTH	SIDE SLOPE	APPENDIX FACTOR	ADJUSTED Q	DEPTH	VELOCITY	REMARKS
484+00 -L- LT 715.64	484+63 -L- LT 717.38	0 23	0 75	0.91	2.76%	0 00	4.00	-	-	0.31	2.34	SDG - GOOD
490+50 -L- RT 715.78	491+58 -L- RT 715.45	0 88	0.64	2.98	0.31%	0.00	6.00	-	-	0.63	1.26	SDG - GOOD
491+58 -L- RT 715.45	492+00 -L- RT 714.29	1.02	0.64	3 46	2.76%	0.00	6.00	-	-	0.44	2 97	SDG - GOOD
492+00 -L- RT 714.29	495+00 -L- RT 711.00	2.15	0.64	7.29	1.10%	0 00	6.00	-	-	0.69	2.53	Roadway Ditch - GOOD
25+75 Y12SPURA1 RT 737.12	27+00 Y12SPURA1 RT 740.80	1.18	0.49	3.06	2 94%	0.00	4.00	-	-	0.49	3.24	Roadway Ditch - GOOD
27+00 Y12SPURA1 RT 740.80	27+55 Y12SPURA1 RT 739.80	0.35	0 49	0.91	1 82%	0.00	4.00	-	-	0.34	2.00	SDG - GOOD
27+55 Y12SPURA1 RT 739.80	28+17 Y12SPURA1 RT 737.49	0.98	0.49	2 83	3.73%	0.00	2 00	-	-	0 60	3 97	Lat V Ditch - GOOD
45+50 -Y12- LT 741.94	48+08 -Y12- LT 737.49	1.69	0.72	7.18	1.72%	0.00	2.00	-	-	0.98	3.75	Lat V Ditch - GOOD
19+00 -Y15- LT 749.39	22+00 -Y15- LT 746.08	0.20	0.40	0.43	1.10%	0.00	6.00	-	-	0.24	1.25	Roadway Ditch - GOOD
16+00 -Y15- LT 746.62	17+00 -Y15- LT 748.39	0.10	0.40	0.21	1.77%	0.00	4.00	-	-	0.20	1.37	SDG - GOOD
19+50 -Y12RPA- RT 716.51	21+00 -Y12RPA- RT 716.06	0.25	0.45	0 60	0.30%	0.00	4 00	-	-	0.40	0 92	SDG - GOOD
21+00 -Y12RPA- RT 716.06	22+00 -Y12RPA- RT 720.00	1 97	0 49	5 12	3 94%	0 00	6 00	-	-	0 48	3 75	SDG - GOOD
22+00 -Y12RPA- RT 720.00	24+50 -Y12RPA- RT 733.10	1.80	0.45	4.29	5.24%	0.00	6 00	-	-	0 42	3 99	Roadway Ditch - GOOD
24+50 -Y12RPA- RT 733.10	25+50 -Y12RPA- RT 737.12	1 80	0.45	4.29	4.02%	0.00	6 00	-	-	0 44	3 61	SDG PSRM - GOOD
22+70 -Y12SPURB- LT 717.74	23+27 -Y12SPURB- LT 727.71	0 77	0 70	3 18	24 93%	2.00	2 00	-	-	0.19	6 87	2' Base Ditch w/ Class 'B' Rip Rap - GOOD

Grass Swale Comps

Discharge is considered to be treated if it meets the following criteria:

100 ft of grass swale for every 1 acre of drainage area AND

2 yr. velocity is less than or equal to 2 ft./sec.

Date: 2/22/2011
Dsn. By: JJM
Check: JRR

SHT	Station Range	Site	Type	D A (ac)	Required length for treatment	Actual Length	Slope	Base Width	Side Slope	Treated Discharge	Q2 (cfs)	Q2 vel (fps)	Q10 (cfs)	Q10 vel (fps)	Treatment Provided
26	48400 - 48463	--	DITCH	0 23	23 00	63	0.03	0.00	4 00	**NO**	0.78	2 25	1 02	2.40	NONE
26	49050 - 49158	16	2GI	0 88	88 00	108	0 00	0 00	6 00	**YES**	2 54	1 21	3 32	1 29	GS
26	49158 - 49200	16	2GI	1 02	102 10	42	0 03	0 00	6 00	**NO**	2 95	2 86	3 86	3 06	NONE
26	49200 - 49500	16	2GI	2 15	215 00	300	0.01	0.00	6 00	**NO**	6 21	2 43	8 12	2 60	NONE
26	2575 - 2700	16	2GI	1.18	118.00	125	0.03	0 00	4.00	**NO**	2.61	3.12	3 41	3 33	NONE
26	2700 - 2755	--	OPEN	0 35	35 00	55	0 02	0 00	4 00	**YES**	0 77	1 92	1 01	2 05	GS
26	2755 - 2817	--	OPEN	0 98	98 00	62	0 04	0 00	2 00	**NO**	2.17	3 71	2 83	3 97	NONE
26	4550 - 4808	--	OPEN	1 69	169 00	258	0 02	0.00	2.00	**NO**	5.49	3 51	7 18	3 75	NONE
26	1900 - 2200	--	2GI	0 20	20 30	300	0 01	0.00	6.00	**YES**	0.37	1.20	0.48	1.29	GS
26	1600 - 1700	--	DITCH	0.10	10 00	100	0 02	0 00	4.00	**YES**	0.18	1.32	0.24	1.41	GS
26	1950 - 2100	16	2GI	0 25	25 10	150	0 00	0 00	4 00	**YES**	0 51	0 88	0 67	0.94	GS
26	2100 - 2200	16	2GI	1 97	197 00	100	0 04	0 00	6 00	**NO**	4 35	3 60	5 70	3 85	NONE
26	2200 - 2450	16	2GI	1.80	180 00	250	0 05	0.00	6.00	**NO**	3 65	3.83	4.78	4.10	NONE
26	2450 - 2550	16	2GI	1 80	180.00	100	0 04	0.00	6.00	**NO**	3.65	3 47	4 78	3 71	NONE
26	2270 - 2327	--	DITCH	0 77	77 00	57	0 25	2 00	2.00	**NO**	2 43	6 28	3 18	6 87	NONE

2GI = 2 GRATED INLET
SBG = SHOULDER BERM GUTTER
CB = CATCH BASIN
DDB = DRY DETENTION BASIN
B = BASIN
GS = GRASS SWALE

BDOS = BERM DRAINAGE OUTLET STRUCTURE
OTCB = OPEN THROAT CATCH BASIN
OPEN = OPEN END PIPE
PSH = PRE FORMED SCOUR HOLE
LS = LEVEL SPREADER

HDR

Engineering, Inc of The Carolinas

DITCH COMPUTATION SHEET

I D NO: I-3803B
PROJ NO: 34187.3.GV2
COUNTY: CABARRUS
PLAN SHEET: 27 Sheet 1 of 1

I_{10} = 5.9 in/hr I_5 = 5 3 in/hr

DESIGNED BY: JJM
CHECKED BY: WDY

DITCH LOCATION TO	FROM	DRAINAGE AREA in Acres	C_5	Q_5	PERCENT SLOPE	BASE WIDTH	SIDE SLOPE	APPENDIX FACTOR	ADJUSTED Q	DEPTH	VELOCITY	REMARKS
500+00 -L- RT 676.00	500+50 -L- RT 680.75	1 41	0.70	5.82	9.50%	2.00	2.00	-	-	0 36	5 98	2' Base Ditch w/ Class 'B' Rip Rap - GOOD
500+50 -L- RT 680.75	501+25 -L- RT 682.60	1.41	0 70	5 82	2.46%	2 00	2 00	-	-	0.50	3.89	2' Base Ditch - GOOD
500+50 -L- LT 703.75	504+65 -L- LT 694.19	1.14	0 40	2 42	2.30%	0.00	6 00	-	-	0.40	2 54	Roadway Ditch - GOOD
504+65 -L- LT 694.19	509+36 -L- LT 684.02	0.75	0 40	1.59	2.16%	0 00	6 00	-	-	0.34	2 23	Roadway Ditch - GOOD
509+36 -L- LT 684.02	511+50 -L- LT 679.21	0 24	0.40	0.52	2 25%	0.00	6 00	-	-	0 22	1.71	Roadway Ditch - GOOD
505+50 -L- RT 688.50	511+50 -L- RT 674.68	1 76	0.66	6.16	2.30%	0.00	6.00	-	-	0.57	3 21	Roadway Ditch - GOOD
511+50 -L- RT 674.68	513+50 -L- RT 670.39	1 49	0.66	5 21	2.14%	0 00	6 00	-	-	0 54	3 00	Roadway Ditch - GOOD
502+00 -L- LT 717.00	504+64 -L- LT 693.92	0.45	0 35	0 93	8.74%	2 00	2 00	-	-	0.12	3 34	Berm Ditch - GOOD
504+64 -L- LT 693.92	506+50 -L- LT 711.00	0 91	0 35	1.88	9 18%	2 00	2 00	-	-	0 19	4.13	Berm Ditch w/ Class 'B' Rip Rap - GOOD

Grass Swale Comps

Discharge is considered to be treated if it meets the following criteria

100 ft of grass swale for every 1 acre of drainage area AND

2 yr velocity is less than or equal to 2 ft /sec

Date 2/22/2011
Dsn By: JJM
Check: JRR

SHT	Station Range	Site	Type	D A (ac)	Required length for treatment	Actual Length	Slope	Base Width	Side Slope	Treated Discharge	Q2 (cfs)	Q2 vel (fps)	Q10 (cfs)	Q10 vel (fps)	Treatment Provided
27	50000 - 50050	16	DITCH	1 41	141.00	50	0 10	2 00	2 00	**NO**	4 45	5.51	5.82	5.98	NONE
27	50050 - 50125	16	DITCH	1 41	141.00	75	0 02	2.00	2.00	**NO**	4 45	3 60	5.82	3 89	NONE
27	50050 - 50465	--	2GI	1 14	114 00	415	0 02	0 00	6 00	**NO**	2 06	2 44	2.69	2 61	NONE
27	50465 - 50936	--	2GI	0 75	75 00	471	0.02	0.00	6 00	**NO**	1.35	2.14	1.77	2.29	NONE
27	50936 - 51150	--	2GI	0.24	24.30	214	0.02	0.00	6 00	**YES**	0.44	1.64	0.57	1 76	GS
27	50550 - 51150	--	2GI	1.76	176.00	600	0 02	0 00	6.00	**NO**	5.24	3 08	6 85	3.30	NONE
27	51150 - 51350	--	2GI	1 49	149.00	200	0.02	0 00	6 00	**NO**	4 44	2.88	5 80	3 08	NONE
27	50200 - 50464	--	BDOS	0 45	45.00	264	0.09	2.00	2 00	**NO**	0.71	3 04	0 93	3.34	NONE
27	50464 - 50650	--	BDOS	0.91	91.00	186	0.09	2.00	2.00	**NO**	1 44	3.78	1 88	4 13	NONE

2GI = 2 GRATED INLET
SBG = SHOULDER BERM GUTTER
CB = CATCH BASIN
DDB = DRY DETENTION BASIN
B = BASIN
GS = GRASS SWALE

BDOS = BERM DRAINAGE OUTLET STRUCTURE
OTCB = OPEN THROAT CATCH BASIN
OPEN = OPEN END PIPE
PSH = PRE FORMED SCOUR HOLE
LS = LEVEL SPREADER

HDR

Engineering, Inc of The Carolinas

DITCH COMPUTATION SHEET

I D NO: I-3803B
PROJ NO: 34187.3.GV2
COUNTY: CABARRUS
PLAN SHEET: 28 Sheet 1 of 1

I_{10} = 5 9 in/hr I_5 = 5 3 in/hr

DESIGNED BY: JJM
CHECKED BY: WDY

DITCH LOCATION TO	FROM	DRAINAGE AREA in Acres	C_5	Q_5	PERCENT SLOPE	BASE WIDTH	SIDE SLOPE	APPENDIX FACTOR	ADJUSTED Q	DEPTH	VELOCITY	REMARKS
512+00 -L- LT 674.14	512+50 -L- LT 667.00	1.05	0 73	4.52	14 28%	2 00	2 00	-	-	0.28	6 37	2' Base Ditch w/ Class 'B' Rip Rap - GOOD
512+50 -L- LT 667.00	513+12 -L- LT 664.00	1.05	0.73	4 52	4.84%	2 00	2.00	-	-	0.38	4.38	2' Base Ditch w/ Class 'B' Rip Rap - GOOD
514+66 -L- LT 658.80	517+50 -L- LT 665.83	1 55	0 38	3.48	2 48%	0 00	2 00	-	-	0.70	3 58	Lat V Ditch - GOOD
517+50 -L- LT 665.83	519+50 -L- LT 661.99	0.32	0 38	0 65	1 92%	0.00	6 00	-	-	0 25	1.71	Roadway Ditch - GOOD
517+50 -L- LT 668.00	520+00 -L- LT 659.56	2.12	0 35	4.38	3.38%	2.00	2 00	-	-	0.39	4.00	Berm Ditch - GOOD
519+50 -L- LT 661.99	521+50 -L- LT 652.50	5 38	0.40	12.70	4.75%	2.00	2.00	-	-	0.66	5.85	2' Base Ditch w/ Class 'B' Rip Rap - GOOD
521+50 -L- LT 652.50	522+50 -L- LT 643.08	5 38	0.40	12 70	9 42%	2 00	2 00	-	-	0 57	7 17	2' Base Ditch w/ Class 'I' Rip Rap - GOOD
522+60 -L- RT 644.00	524+00 -L- RT 651.19	0.52	0 50	1.54	5.14%	2 00	2.00	-	-	0.19	3.33	2' Base Ditch - GOOD
524+00 -L- RT 651.19	525+00 -L- RT 650.89	0 93	0 55	2.72	0 30%	0 00	4.00	-	-	0 71	1 34	SDG - GOOD
525+00 -L- RT 650.89	526+91 -L- RT 648.40	0.93	0.55	2 71	1.30%	0.00	4.00	-	-	0 54	2 32	SDG - GOOD

Grass Swale Comps

Discharge is considered to be treated if it meets the following criteria

100 ft of grass swale for every 1 acre of drainage area AND

2 yr velocity is less than or equal to 2 ft /sec.

Date: 2/22/2011

Dsn. By: JJM

Check: JRR

SHT	Station Range	Site	Type	D.A (ac)	Required length for treatment	Actual Length	Slope	Base Width	Side Slope	Treated Discharge	Q2 (cfs)	Q2 vel (fps)	Q10 (cfs)	Q10 vel (fps)	Treatment Provided
28	51200 - 51250	17	DITCH	1 05	105 00	50	0.14	2 00	2.00	**NO**	3.46	5.85	4 52	6 37	NONE
28	51250 - 51312	17	DITCH	1.05	105 00	62	0.05	2 00	2.00	**NO**	3.46	4 04	4 52	4 38	NONE
28	51466 - 51750	17	DITCH	1 55	155 00	284	0 02	0 00	2 00	**NO**	2 66	3.35	3 48	3.58	NONE
28	51750 - 51950	17	DITCH	0 32	32.40	200	0 02	0 00	6 00	**YES**	0 56	1.64	0 73	1 76	GS
28	51750 - 52000	18	DITCH	2.12	212 00	250	0 03	2 00	2 00	**NO**	3 35	3 69	4 38	4 00	NONE
28	51950 - 52150	18	DITCH	5 38	538 00	200	0 05	2 00	2 00	**NO**	9 71	5 43	12 70	5 85	NONE
28	52150 - 52250	18	DITCH	5.38	538 00	300	0 09	2 00	2 00	**NO**	9 71	6 64	12 70	7 17	NONE
28	52260 - 52400	--	DITCH	0 52	52 20	140	0 05	2 00	2 00	**NO**	1.18	3 04	1 54	3 33	NONE
28	52400 - 52500	--	2GI	0 93	93.40	100	0.00	0 00	4 00	**YES**	2.32	1.28	3 03	1.37	GS
28	52500 - 52691	--	2GI	0 93	93 00	191	0 01	0 00	4.00	**NO**	2.31	2 23	3 02	2 38	NONE

2GI = 2 GRATED INLET

SBG = SHOULDER BERM GUTTER

CB = CATCH BASIN

DDB = DRY DETENTION BASIN

B = BASIN

GS = GRASS SWALE

BDOS = BERM DRAINAGE OUTLET STRUCTURE

OTCB = OPEN THROAT CATCH BASIN

OPEN = OPEN END PIPE

PSH = PRE FORMED SCOUR HOLE

LS = LEVEL SPREADER

HDR

Engineering, Inc. of The Carolinas

DITCH COMPUTATION SHEET

I D NO I-3803B
PROJ NO 34187.3.GV2
COUNTY CABARRUS
PLAN SHEET 34 Sheet 1 of 1

I_{10} = 5 9 in/hr I_5 = 5 3 in/hr

DESIGNED BY: JJM
CHECKED BY: WDY

DITCH LOCATION FROM	TO	DRAINAGE AREA in Acres	C_5	Q_5	PERCENT SLOPE	BASE WIDTH	SIDE SLOPE	APPENDIX FACTOR	ADJUSTED Q	DEPTH	VELOCITY	REMARKS
26+56 -Y6- LT 704.55	28+00 -Y6 LT 718.20	0.10	0 38	0 23	9.48%	0 00	2 00	-	-	0.20	3.02	Berm Ditch - GOOD
28+00 -Y6- LT 718.20	28+75 -Y6 LT 715.45	0 39	0 45	1.02	3 67%	0 00	2.00	-	-	0.41	3 06	Berm Ditch - GOOD
29+00 -Y6- LT 716.57	29+50 -Y6 LT 716.00	0 24	0 58	0 82	1.14%	0 00	2 00	-	-	0 47	1 87	Berm Ditch - GOOD
29+50 -Y6- LT 716.00	29+90 -Y6 LT 721.37	0 05	0.70	0 21	13 43%	0 00	2 00	-	-	0.18	3.33	Berm Ditch - GOOD
30+50 -Y6- LT 716.26	31+10 -Y6- LT 712.93	3.05	0.38	6.84	5.55%	2 00	2 00	-	-	0.45	5 19	Berm Ditch w/ Class 'B' Rip Rap - GOOD
31+10 -Y6- LT 712.93	33+50 -Y6 LT 716.73	3 05	0.38	6 84	1 58%	2 00	2.00	-	-	0 61	3 47	Berm Ditch - GOOD
33+75 -Y6- LT 717.17	34+50 -Y6 LT 717.88	3.72	0.38	8.34	0.95%	2 00	2 00	-	-	0.77	3 04	Berm Ditch - GOOD
34+50 -Y6- LT 717.88	36+00 -Y6 LT 722.81	3,72	0.38	8.34	3 29%	2.00	2.00	-	-	0 58	4 56	Berm Ditch w/ Class 'B' Rip Rap - GOOD
39+15 -Y6- LT 730.50	41+00 -Y6 LT 723.48	1 85	0.55	6.00	3.79%	2.00	2 00	-	-	0.47	4.37	Berm Ditch w/ Class 'B' Rip Rap - GOOD
31+00 -Y6- RT 697.00	31+75 -Y6 RT 704.00	16 36	0.44	14.05 HWY	9 33%	4 00	2 00	-	-	0.42	6.96	4' Base Ditch w/ Class 'B' Rip Rap - GOOD

Grass Swale Comps

Discharge is considered to be treated if it meets the following criteria·
100 ft of grass swale for every 1 acre of drainage area AND
2 yr velocity is less than or equal to 2 ft./sec

Date. 2/22/2011
Dsn By: JJM
Check: JRR

SHT.	Station Range	Site	Type	D A (ac)	Required length for treatment	Actual Length	Slope	Base Width	Side Slope	Treated Discharge	Q2 (cfs)	Q2 vel (fps)	Q10 (cfs)	Q10 vel (fps)	Treatment Provided
34	2656 - 2800	--	2GI	0 10	10 40	144	0.09	0 00	2.00	**NO**	0.18	2 82	0.23	3.02	NONE
34	2800 - 2875	--	BDOS	0 39	38 60	75	0 04	0 00	2.00	**NO**	0.78	2.86	1.02	3 06	NONE
34	2900 - 2950	19	BDOS	0 24	24 00	50	0 01	0 00	2 00	**YES**	0 63	1 75	0.82	1 87	GS
34	2950 - 2990	19	BDOS	0.05	5 00	40	0.13	0 00	2 00	**NO**	0 16	3.12	0.21	3.33	DDB
34	3050 - 3110	19	BDOS	3 05	305 00	60	0 06	2 00	2 00	**NO**	5 23	4 80	6 84	5.19	DDB
34	3110 - 3350	19	BDOS	3 05	305 00	240	0 02	2 00	2 00	**NO**	5 23	3 22	6 84	3 47	DDB
34	3375 - 3450	19	BDOS	3 72	372.00	75	0 01	2 00	2 00	**NO**	6 38	2 83	8 34	3 04	NONE
34	3450 - 3600	19	BDOS	3 72	372 00	150	0 03	2.00	2 00	**NO**	6 38	4 22	8 34	4 56	NONE
34	3915 - 4100	--	2GI	1 85	185 00	185	0.04	2.00	2 00	**NO**	10.00	5 05	15 70	5.72	NONE
34	3100 - 3175	19	DITCH	16 36	1636 00	75	0 09	4 00	2 00	**NO**	11 95	6 60	18 74	7 64	NONE

2GI = 2 GRATED INLET
SBG = SHOULDER BERM GUTTER
CB = CATCH BASIN
DDB = DRY DETENTION BASIN
B = BASIN
GS = GRASS SWALE

BDOS = BERM DRAINAGE OUTLET STRUCTURE
OTCB = OPEN THROAT CATCH BASIN
OPEN = OPEN END PIPE
PSH = PRE FORMED SCOUR HOLE
LS = LEVEL SPREADER

HDR

Engineering, Inc of The Carolinas

DITCH COMPUTATION SHEET

I D NO I-3803B
PROJ NO 34187.3.GV2
COUNTY CABARRUS
PLAN SHEET 48 Sheet 1 of 1

I_{10} = 5 9 in/hr I_5 = 5 3 in/hr

DESIGNED BY: JJM
CHECKED BY: WDY

DITCH LOCATION FROM	TO	DRAINAGE AREA in Acres	C5	Q5	PERCENT SLOPE	BASE WIDTH	SIDE SLOPE	APPENDIX FACTOR	ADJUSTED Q	DEPTH	VELOCITY	REMARKS	
10+63 -Y14- LT 738.22	11+00 -Y14- LT 740.25	0 22	0.50	0.58	5.50%	0.00	6.00	-	-	0.20	2.47	Roadway Ditch	- GOOD
11+00 -Y14- LT 740.25	11+50 -Y14- LT 741.74	0 22	0.50	0.58	2 98%	0.00	6 00	-	-	0.22	1.96	Roadway Ditch	- GOOD
13+04 -Y14- LT 737.50	13+04 -Y14- LT 737.00	0 22	0 90	1.17	1 20%	0 00	2.00	-	-	0 53	2 08	Tail Ditch	- GOOD
11+00 -Y14- RT 740.98	12+00 -Y14- RT 741.51	0.46	0.48	1.17	0.53%	0 00	6 00	-	-	0.40	1.22	Roadway Ditch	- GOOD
12+00 -Y14- RT 741.51	14+00 -Y14- RT 738.84	2.24	0.48	5 70	1.33%	0.00	6.00	-	-	0.61	2.57	Roadway Ditch	- GOOD
14+00 -Y14- RT 738.84	17+77 -Y14- RT 737.40	2.24	0 48	5.70	0.38%	0.00	4 00	-	-	0 90	1 76	SDG	- GOOD
10+50 -Y16- LT 731.38	14+00 -Y16- LT 705.36	0.41	0.53	1.14	7.43%	0.00	3.50	-	-	0.30	3.69	Roadway Ditch	- GOOD
14+00 -Y16- LT 705.36	14+50 -Y16- LT 698.50	0 57	0.52	1 57	13.72%	0 00	3 00	-	-	0 33	4.73	SDG PSRM	- GOOD
14+50 -Y16- LT 698.50	15+00 -Y16- LT 694.50	0.78	0 53	2 19	8 00%	0.00	3 00	-	-	0 42	4 20	SDG PSRM	- GOOD
15+00 -Y16- LT 694.50	17+95 -Y16- LT 678.95	0.78	0.53	2.19	5 27%	0.00	4 00	-	-	0 38	3 71	Roadway Ditch	- GOOD
10+50 -Y16- RT 730.99	14+00 -Y16- RT 705.36	0.43	0.53	1 21	7.32%	0.00	3.00	-	-	0 32	3.84	Roadway Ditch	- GOOD
14+00 -Y16- RT 705.36	14+50 -Y16- RT 699.00	0 61	0.53	1 71	12.72%	0 00	3.00	-	-	0.35	4 70	SDG PSRM	- GOOD
14+50 -Y16- RT 699.00	15+00 -Y16- RT 694.50	0 94	0 53	2.64	9 00%	0 00	3.00	-	-	0.44	4 60	SDG PSRM	- GOOD
15+00 -Y16- RT 694.50	18+05 -Y16- RT 678.00	0.94	0 53	2.64	5.41%	0 00	4.00	-	-	0 41	3.93	Roadway Ditch	- GOOD

Grass Swale Comps

Discharge is considered to be treated if it meets the following criteria·

100 ft of grass swale for every 1 acre of drainage area AND

2 yr. velocity is less than or equal to 2 ft /sec.

Date 2/22/2011

Dsn. By: JJM

Check: JRR

SHT	Station Range	Site	Type	D A (ac)	Required length for treatment	Actual Length	Slope	Base Width	Side Slope	Treated Discharge	Q2 (cfs)	Q2 vel (fps)	Q10 (cfs)	Q10 vel (fps)	Treatment Provided
48	1063 - 1100	--	2GI	0.22	22 00	37	0 05	0 00	6 00	**NO**	0 50	2.37	0 65	2.53	NONE
48	1100 - 1150	--	2GI	0 22	22 00	50	0 03	0 00	6.00	**YES**	0.50	1 88	0 65	2 01	GS
48	1304 - 1304	--	DITCH	0 22	22.00	42	0.01	0.00	2.00	**YES**	0 89	1 95	1 17	2 08	GS
48	1100 - 1200	--	DITCH	0 46	46 00	100	0 01	0 00	6 00	**YES**	1 00	1 17	1.30	1 25	GS
48	1200 - 1400	--	DITCH	2 24	224 00	200	0 01	0 00	6 00	**NO**	4.85	2.46	6 34	2 64	NONE
48	1400 - 1777	--	DITCH	2 24	224.00	377	0.00	0 00	4 00	**YES**	4.85	1 69	6 34	1 81	GS
48	1050 - 1400	20	OPEN	0 41	40.50	350	0.07	0 00	3.50	**NO**	0 97	3 54	1.27	3 79	NONE
48	1400 - 1450	20	OPEN	0 57	57 00	400	0.14	0 00	3 00	**NO**	1 34	4.54	1 75	4 86	NONE
48	1450 - 1500	20	OPEN	0 78	78 00	450	0.08	0 00	3.00	**NO**	1 86	4 03	2 44	4 31	NONE
48	1500 - 1795	20	OPEN	0.78	78 00	745	0 05	0 00	4.00	**NO**	1.86	3.56	2 44	3 81	NONE
48	1050 - 1400	--	DITCH	0 43	43 00	350	0 07	0 00	3 00	**NO**	1 03	3 69	1 34	3 95	NONE
48	1400 - 1450	--	DITCH	0 61	61 00	400	0 13	0 00	3 00	**NO**	1 46	4 51	1 91	4 82	NONE
48	1450 - 1500	--	DITCH	0.94	94 00	450	0 09	0.00	3 00	**NO**	2 25	4 41	2 94	4 72	NONE
48	1500 - 1805	--	DITCH	0 94	94 00	755	0 05	0 00	4 00	**NO**	2 25	3 77	2 94	4 03	NONE

2GI = 2 GRATED INLET

SBG = SHOULDER BERM GUTTER

CB = CATCH BASIN

DDB = DRY DETENTION BASIN

B = BASIN

GS = GRASS SWALE

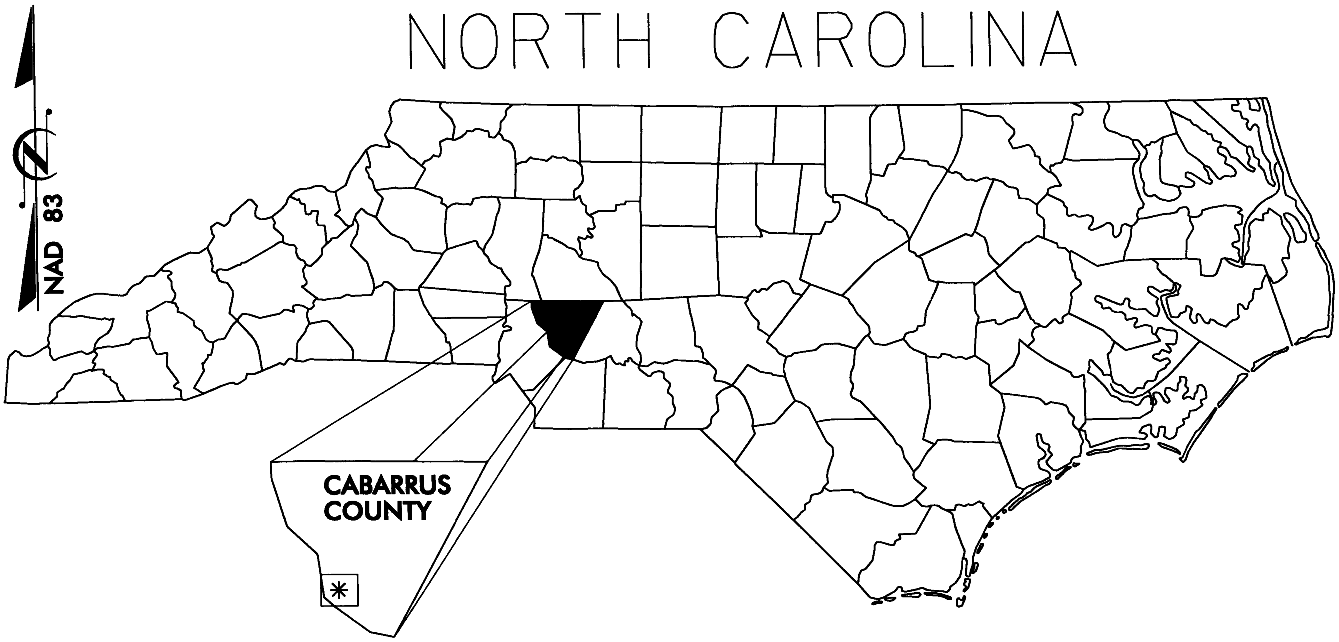
BDOS = BERM DRAINAGE OUTLET STRUCTURE

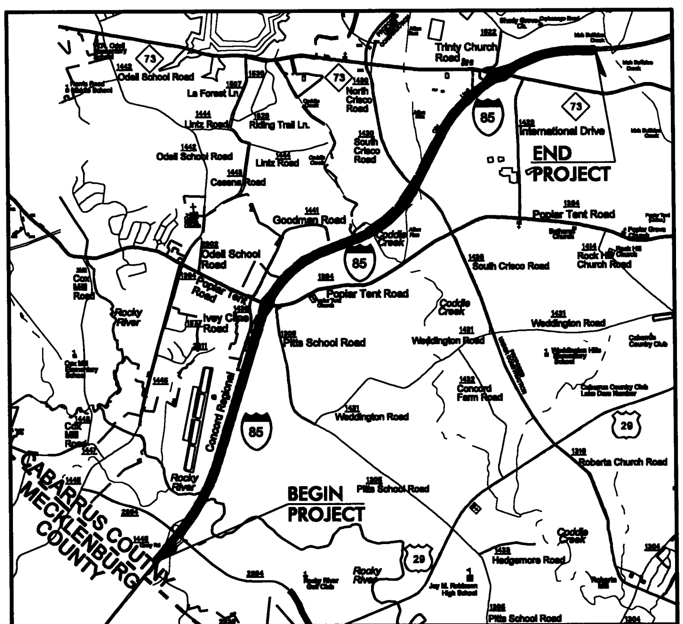
OTCB = OPEN THROAT CATCH BASIN

OPEN = OPEN END PIPE

PSH = PRE FORMED SCOUR HOLE

LS = LEVEL SPREADER





VICINITY MAP
(NOT TO SCALE)

VICINITY MAPS

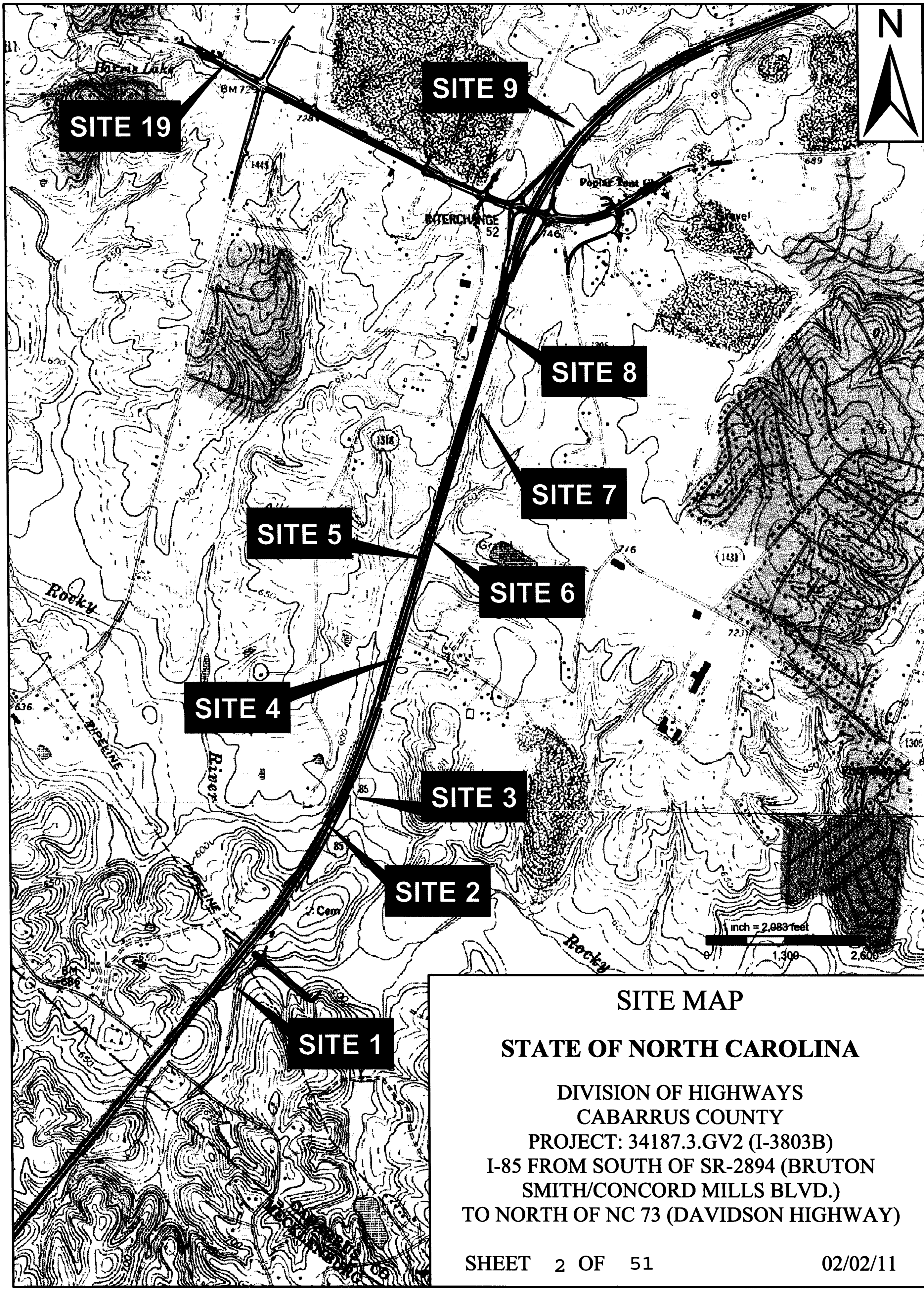
NORTH CAROLINA

DIVISION OF HIGHWAYS
CABARRUS COUNTY

PROJECT: 34187.3.GV2
(I-3803B)

I-85 FROM SOUTH OF SR-2894
(BRUTON SMITH/ CONCORD MILLS BLVD.)
TO NORTH OF NC 73 (DAVIDSON HIGHWAY)

SHEET 1 **OF** 51 **02/02/11**

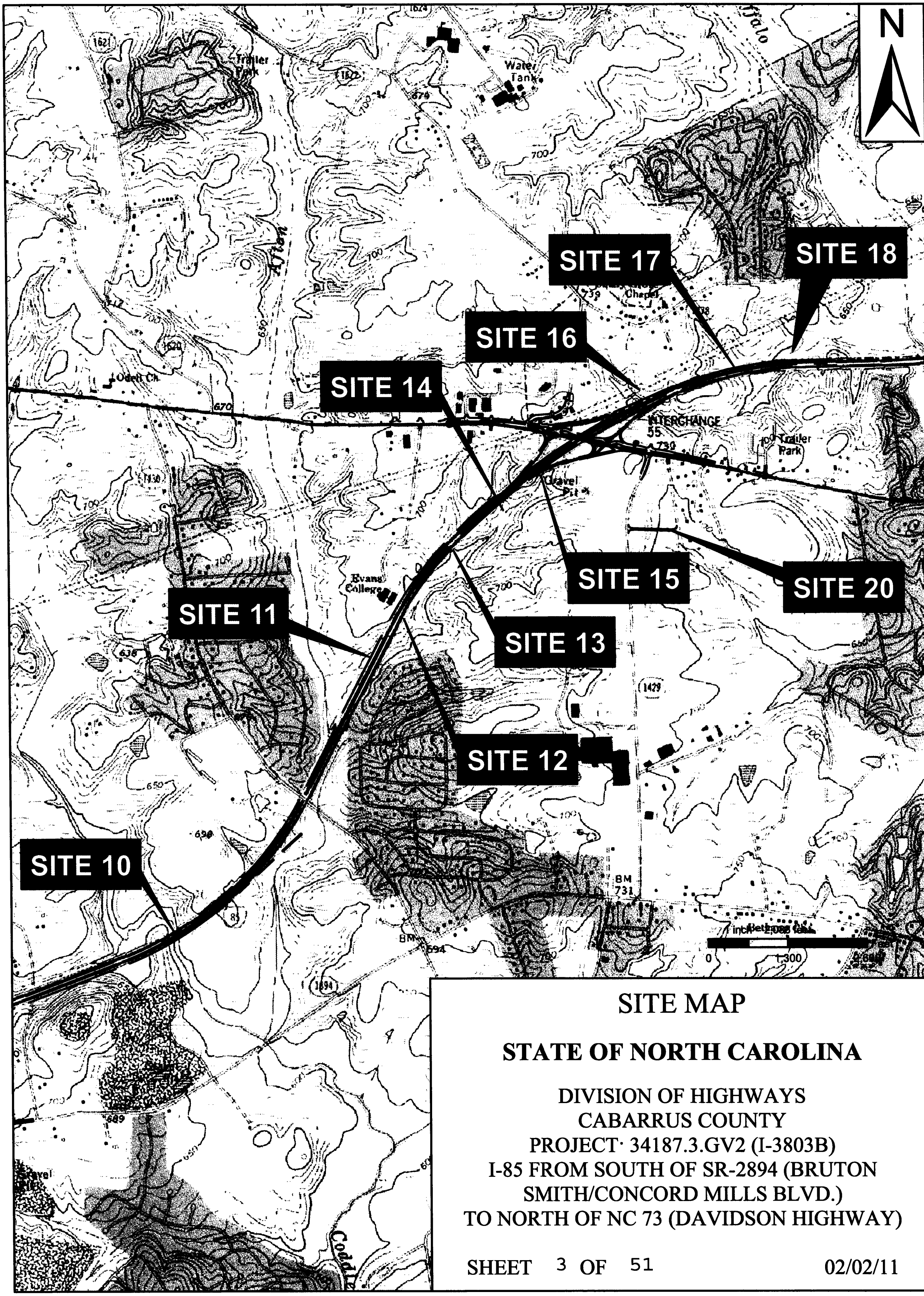


SITE MAP

STATE OF NORTH CAROLINA

DIVISION OF HIGHWAYS
CABARRUS COUNTY
PROJECT: 34187.3.GV2 (I-3803B)
I-85 FROM SOUTH OF SR-2894 (BRUTON SMITH/CONCORD MILLS BLVD.)
TO NORTH OF NC 73 (DAVIDSON HIGHWAY)

SHEET 2 OF 51 02/02/11



SITE MAP

STATE OF NORTH CAROLINA

DIVISION OF HIGHWAYS
CABARRUS COUNTY
PROJECT· 34187.3.GV2 (I-3803B)
I-85 FROM SOUTH OF SR-2894 (BRUTON SMITH/CONCORD MILLS BLVD.)
TO NORTH OF NC 73 (DAVIDSON HIGHWAY)

SHEET 3 OF 51 02/02/11

PROPERTY OWNERS

NAMES AND ADDRESSES

PARCEL NO.	NAMES	ADDRESSES	SITE NO.
1	BASSETT DIRECT NC, LLC	3525 FAIRYSTONE PK HWY BASSETT, VA 24055	1
2	JMH, LLC	2838 MAJOR RIDGE TRAIL DULUTH,GA 30097	9
3	NOLIM GROUP, S.A, INC.	1499 W PALMETTO PK RD BOCA RATON, FL 33486	13
4	SHOFFNER DEVELOPMENT, LLC	P.O. BOX 10 MORRIS, OK 74445	16
5	CAROLINA TRACTOR AND EQUIPMENT COMPANY	P.O. BOX 1095 CHARLOTTE, NC 28201	19
6	JAMES FRANK HEGLER	36225 FINGER RD. MY. PLEASANT,NC	20

NORTH CAROLINA
DIVISION OF HIGHWAYS
CABARRUS COUNTY

PROJECT: 34187.3.GV2
(I-3803B)

I-85 FROM SOUTH OF SR-2894
(BRUTON SMITH/ CONCORD MILLS BLVD.)
TO NORTH OF NC 73 (DAVIDSON HIGHWAY)

SHEET 4 OF 51 02/02/11

WETLAND PERMIT IMPACT SUMMARY

			WETLAND IMPACTS					SURFACE WATER IMPACTS				
Site No	Station (From/To)	Structure Size / Type	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	173+05 -L- RT	Bank Stabilization						<0.01		16		
2	202+57 / 205+00 -L-	Bridge										
3	209+82 / 211+64 -L- RT	Lateral Ditch				0.02						
4	233+94 -L- LT	Bank Stabilization						<0.01		14		
4	234+20 -L- RT	42" RCP						<0.01		24		
5	250+57 -L- LT	42" RCP						0.01		52		
5	250+57 -L- LT	Bank Stabilization						<0.01		14		
*6	254+58 -L- RT	7' X 7' RCBC							<0.01		7	
6	254+58 -L- RT	Lateral Ditch						<0.01		11		
7	277+05 -L- RT	Bank Stabilization						<0.01		24		
8	286+39 / 293+43 -L- RT	Roadway Fill						0.06		699		
8	286+55 -L- RT	Bank Stabilization						<0.01		43		
9	325+25 -L- LT	Bank Stabilization						<0.01		11		
10	380+00 -L-	Bridge										
11	437+25 -L- LT	7' X 6" RCBC						0.02		47		
*11	437+25 -L- RT	7' X 6" RCBC							<0.01		27	
12	445+06 / 445+67 -L- RT	Roadway Fill	<0.01			0.01						
13	460+20 -L-	36" RCP						<0.01		18		
13	460+20 -L-	Bank Stabilization						0.01		49		
14	471+15 -L- RT	36" RCP						<0.01		43		
14	471+15 -L- RT	Bank Stabilization						<0.01		26		
15	478+25 -L- RT	30" RCP						<0.01		12		
15	478+25 -L- RT	Bank Stabilization						<0.01		14		
16	499+15 -L-	30" RCP				<0.01		0.02		65		
17	514+68 -L- LT	30" RCP						<0.01		18		
17	515+51 -L- RT	Bank Stabilization						<0.01		23		
18	524+30 -L- LT	66" RCP						<0.01		8		
18	524+30 -L- LT	Bank Stabilization						<0.01		27		
TOTALS.			<0.01	0.00	0.00	0.03	0.00	0.12	<0.01	1258	34	0

*Temporary impacts due to the replacing of culvert wing walls

NC DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

CABARRUS COUNTY
34187 3 GV2 (I-3803B)

SHEET 5 OF 51 3/11/2011

ATN Revised 3/31/05

WETLAND PERMIT IMPACT SUMMARY

			WETLAND IMPACTS					SURFACE WATER IMPACTS				
Site No	Station (From/To)	Structure Size / Type	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)
19	31+00 -Y6- RT	Roadway Fill	0.01					<0.01		34		
19	31+00 -Y6- RT	Bank Stabilization						0.01		40		
20	17+90 -Y16- LT	Double 18" RCP			0.01	<0.01		0.01		95		
TOTALS.			0.01	0.00	0.01	<0.01	0.00	0.02	0.00	169	0	0
Totals Sheet 1 and 2			0.01	0.00	0.01	0.03	0.00	0.14	<0.01	1427	34	0

NC DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

CABARRUS COUNTY
34187 3 GV2 (I-3803B)

SHEET 6 OF 51 3/11/2011

ATN Revised 3/31/05

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

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

CABARRUS COUNTY

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	I-3803B	1	
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
34187.3.GV2	NHIMF-85-2(62)48	CONSTRUCTION	

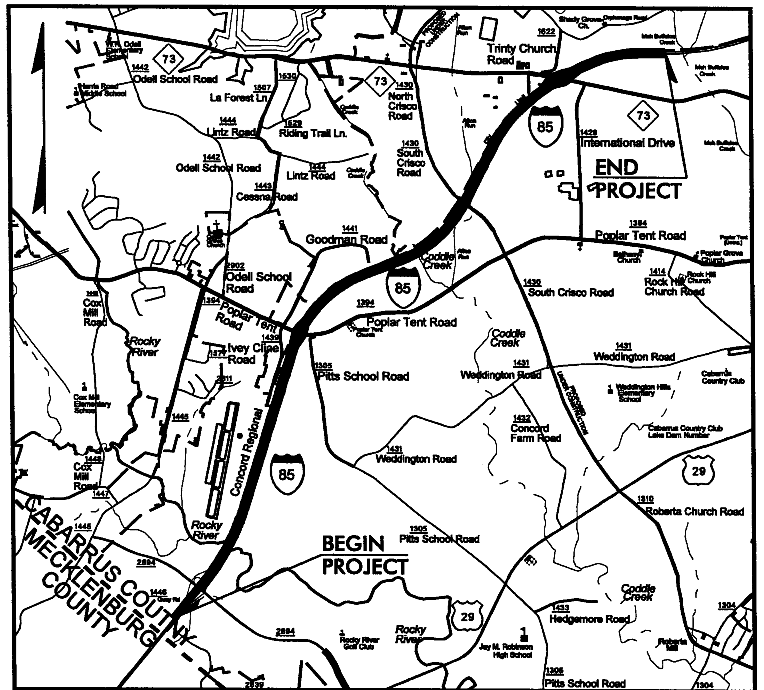
LOCATION: I-85 FROM SOUTH OF SR-2894 (BRUTON SMITH/CONCORD MILLS BLVD.) TO NORTH OF NC 73 (DAVIDSON HIGHWAY)

TYPE OF WORK: DESIGN-BUILD AS SPECIFIED IN THE SCOPE OF WORK CONTAINED IN THE REQUEST FOR PROPOSALS

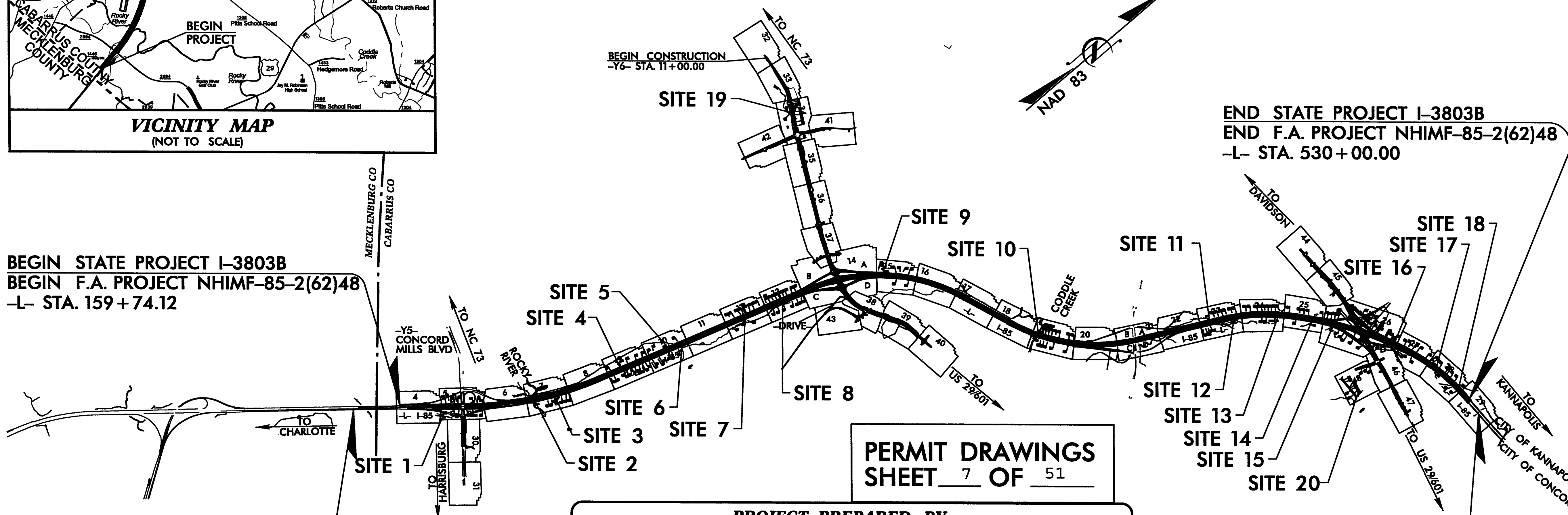
WETLAND SITE MAP

SUBMITTED: 03-29-2011

SUBMITTAL # C-020R



VICINITY MAP
(NOT TO SCALE)



PERMIT DRAWINGS
SHEET 7 OF 51

PROJECT PREPARED BY:

HDR Engineering, Inc. of the Carolinas
3733 National Drive, Suite 207 Raleigh, N.C. 27612
N.C.B.E.L.S. License Number: F-0116

THE LANE CONSTRUCTION CORPORATION

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

THIS PROJECT IS A CONTROLLED ACCESS PROJECT WITH ACCESS BEING LIMITED TO INTERCHANGES.
THIS PROJECT IS WITHIN THE MUNICIPAL BOUNDARIES OF CONCORD AND KANNAPOLIS.
CLEARING ON THIS PROJECT SHALL BE PERFORMED TO THE LIMITS ESTABLISHED BY METHOD III.

GRAPHIC SCALES

50 25 0 50 100
PLANS

50 25 0 50 100
PROFILE (HORIZONTAL)

10 5 0 10 20
PROFILE (VERTICAL)

DESIGN DATA

ADT 2011 = 118,275
ADT 2031 = 189,775
DHV = 10 %
D = 60 %
T = 14 % *
V = 70 MPH
FUNCTIONAL CLASSIFICATION: INTERSTATE
* TTST = 9% DUAL = 5%

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT I-3803B = 6.930 MILES
LENGTH STRUCTURE TIP PROJECT I-3803B = 0.082 MILES
TOTAL LENGTH TIP PROJECT I-3803B = 7.012 MILES

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

2006 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
JULY 23, 2010

LETTING DATE:
JULY 23, 2010

GREGORY KEMPF, P.E.
PROJECT ENGINEER

JONATHAN HENDERSON, P.E.
PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER

SIGNATURE: P.E.

ROADWAY DESIGN ENGINEER

SIGNATURE: P.E.

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

STATE HIGHWAY DESIGN ENGINEER P.E.

TIP PROJECT: I-3803B

CONTRACT: C202522

09/08/99

PENTABLE: NCDOT_permits.tbl
TIME: 12:18:32 PM SCALE: 1:3600
PLOT DRIVER: NCDOT_pdf_color_eng.100.plt
USER: jmassroc DATE: 3/28/2011
FILE: Mktg_Charlotte\Charlotte_Trans_Design_Build\Lane_I-3803B_I-85_Widening\I-3803B\Hydraulics\PERMITS_Enviromental\Drawings\I3803B_HYD_PRM_TSH.dgn

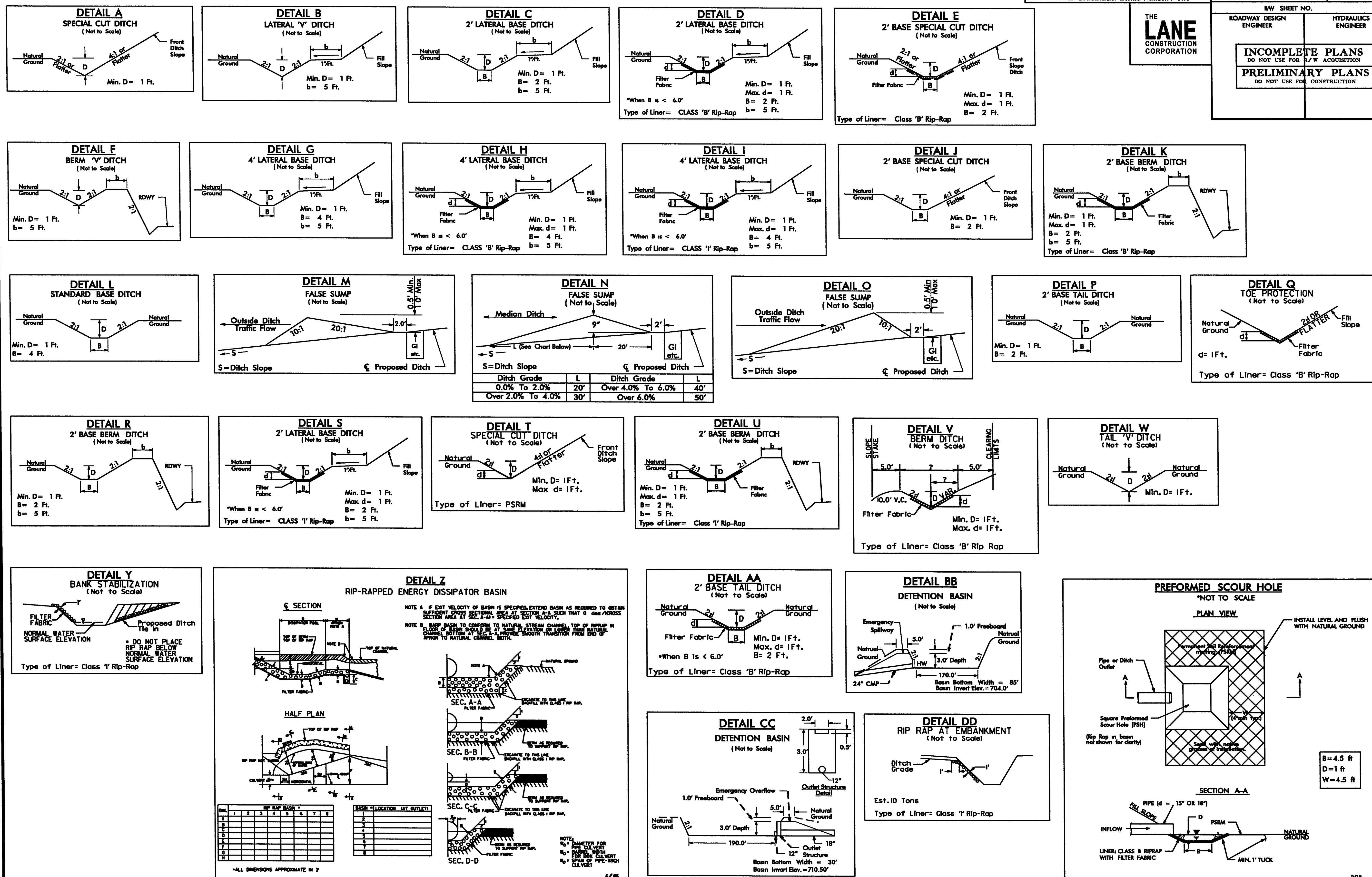
HDR Engineering, Inc. of the Carolinas
3733 National Drive, Suite 207 Raleigh, N.C. 27612
N.C.B.E.L.S. License Number: F-0116

PROJECT REFERENCE NO.	SHEET NO.
I-3803B	2
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

THE LANE CONSTRUCTION CORPORATION

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

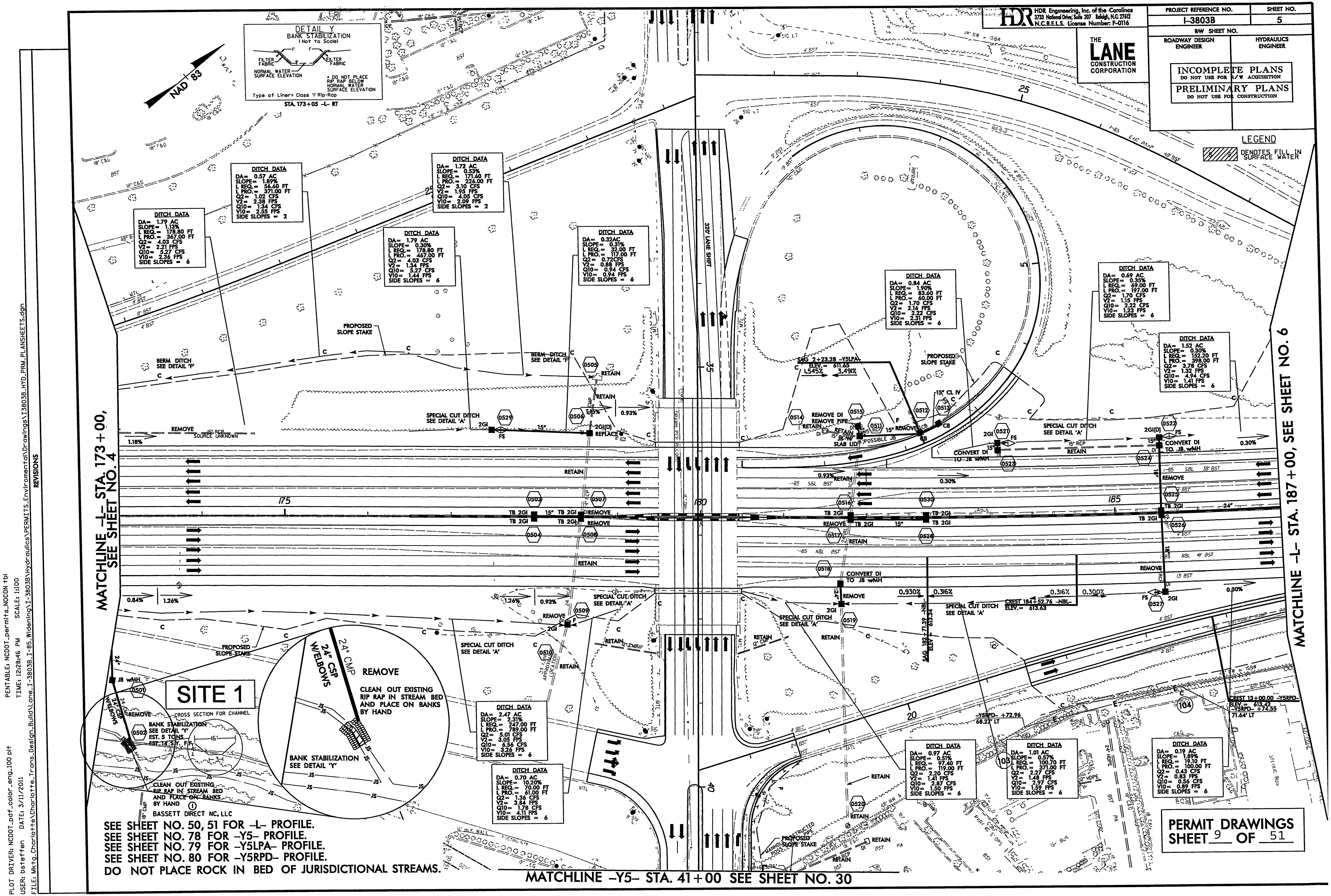


Ditch Grade	L	Ditch Grade	L
0.0% To 2.0%	20'	Over 4.0% To 6.0%	40'
Over 2.0% To 4.0%	30'	Over 6.0%	50'

PERMIT DRAWINGS
SHEET 8 OF 51

REVISIONS

PLOT DRIVER: NCDOT_pdf_color_eng_100.plt PENTABLE: NCDOT_EC.tbl
USER: jmassroc DATE: 3/29/2011 TIME: 11:36:34 AM SCALE: 1:100
FILE: Mktg_Charlotte\Charlotte_Trans_Design_Build\Lane_I-3803B_I-85_Widening\I-3803B\Hydraulics\PERMITS_Environmental\Drawings\I3803B_HYD_PRM_PLANSHEETS.dgn



HDR Engineering, Inc. of the Carolinas
3733 National Drive, Suite 207 Raleigh, N.C. 27612
N.C.B.E.L.S. License Number: F-0116
THE LANE CONSTRUCTION CORPORATION
PROJECT REFERENCE NO. I-3803B
SHEET NO. 5
R/W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
LEGEND
DENOTES FILL IN SURFACE WATER
DETAIL Y
BANK STABILIZATION
(Not to Scale)
FILTER FABRIC
NORMAL WATER SURFACE ELEVATION
* DO NOT PLACE RIP RAP BELOW NORMAL WATER SURFACE ELEVATION
Type of Liner= Class 'I' Rip-Rap
STA. 173+05 -L- RT
NAD 83
DITCH DATA
DA= 1.79 AC
SLOPE= 1.13%
L REQ.= 178.80 FT
L PRO.= 367.00 FT
Q2= 4.03 CFS
V2= 2.21 FPS
Q10= 5.27 CFS
V10= 2.36 FPS
SIDE SLOPES = 6
DITCH DATA
DA= 0.57 AC
SLOPE= 1.89%
L REQ.= 56.60 FT
L PRO.= 371.00 FT
Q2= 1.02 CFS
V2= 2.38 FPS
Q10= 1.34 CFS
V10= 2.55 FPS
SIDE SLOPES = 2
DITCH DATA
DA= 1.72 AC
SLOPE= 0.53%
L REQ.= 171.60 FT
L PRO.= 226.00 FT
Q2= 3.10 CFS
V2= 1.95 FPS
Q10= 4.05 CFS
V10= 2.09 FPS
SIDE SLOPES = 2
DITCH DATA
DA= 1.79 AC
SLOPE= 0.30%
L REQ.= 178.80 FT
L PRO.= 467.00 FT
Q2= 4.03 CFS
V2= 1.34 FPS
Q10= 5.27 CFS
V10= 1.44 FPS
SIDE SLOPES = 6
DITCH DATA
DA= 0.32AC
SLOPE= 0.31%
L REQ.= 32.00 FT
L PRO.= 117.00 FT
Q2= 0.72CFS
V2= 0.88 FPS
Q10= 0.94 CFS
V10= 0.94 FPS
SIDE SLOPES = 6
DITCH DATA
DA= 0.84 AC
SLOPE= 1.90%
L REQ.= 83.60 FT
L PRO.= 60.00 FT
Q2= 1.70 CFS
V2= 2.16 FPS
Q10= 2.22 CFS
V10= 2.31 FPS
SIDE SLOPES = 6
DITCH DATA
DA= 0.69 AC
SLOPE= 0.35%
L REQ.= 69.00 FT
L PRO.= 197.00 FT
Q2= 1.70 CFS
V2= 1.15 FPS
Q10= 2.22 CFS
V10= 1.23 FPS
SIDE SLOPES = 6
DITCH DATA
DA= 1.52 AC
SLOPE= 0.30%
L REQ.= 152.20 FT
L PRO.= 398.00 FT
Q2= 3.78 CFS
V2= 1.32 FPS
Q10= 4.94 CFS
V10= 1.41 FPS
SIDE SLOPES = 6
DITCH DATA
DA= 2.47 AC
SLOPE= 2.31%
L REQ.= 247.00 FT
L PRO.= 789.00 FT
Q2= 5.01 CFS
V2= 3.05 FPS
Q10= 6.56 CFS
V10= 3.26 FPS
SIDE SLOPES = 6
DITCH DATA
DA= 0.70 AC
SLOPE= 10.20%
L REQ.= 70.00 FT
L PRO.= 61.00 FT
Q2= 1.36 CFS
V2= 3.84 FPS
Q10= 1.78 CFS
V10= 4.11 FPS
SIDE SLOPES = 6
DITCH DATA
DA= 0.97 AC
SLOPE= 0.51%
L REQ.= 97.40 FT
L PRO.= 119.00 FT
Q2= 2.20 CFS
V2= 1.41 FPS
Q10= 2.87 CFS
V10= 1.50 FPS
SIDE SLOPES = 6
DITCH DATA
DA= 1.01 AC
SLOPE= 0.57%
L REQ.= 100.70 FT
L PRO.= 371.00 FT
Q2= 2.27 CFS
V2= 1.48 FPS
Q10= 2.97 CFS
V10= 1.59 FPS
SIDE SLOPES = 6
DITCH DATA
DA= 0.19 AC
SLOPE= 1.89%
L REQ.= 19.10 FT
L PRO.= 100.00 FT
Q2= 0.43 CFS
V2= 0.83 FPS
Q10= 0.56 CFS
V10= 0.89 FPS
SIDE SLOPES = 6
PROPOSED SLOPE STAKE
BERM DITCH SEE DETAIL 'F'
SPECIAL CUT DITCH SEE DETAIL 'A'
SAG 2+23.28 -Y5LPA- ELEV.= 611.65
CREST 184+52.76 -NBL- ELEV.= 613.63
SAG 182+71.39 -NBL- ELEV.= 613.34
CREST 13+00.00 -Y5RPD- ELEV.= 613.42
-Y5RPD- +74.55 71.64' LT
-Y5RPD- +72.96 68.22' LT
CONVERT DI TO JB wMH
REMOVE
RETAIN
320' LANE SHIFT
MATCHLINE -L- STA. 173+00, SEE SHEET NO. 4
MATCHLINE -L- STA. 187+00, SEE SHEET NO. 6
MATCHLINE -Y5- STA. 41+00 SEE SHEET NO. 30
SITE 1
24" CSP W/ELBOWS
24" CMP
REMOVE
CLEAN OUT EXISTING RIP RAP IN STREAM BED AND PLACE ON BANKS BY HAND
BANK STABILIZATION SEE DETAIL 'Y'
BANK STABILIZATION SEE DETAIL 'Y' EST. 5 TONS EST. 14 S.Y. F.F.
CROSS SECTION FOR CHANNEL
BASSETT DIRECT NC, LLC
SEE SHEET NO. 50, 51 FOR -L- PROFILE.
SEE SHEET NO. 78 FOR -Y5- PROFILE.
SEE SHEET NO. 79 FOR -Y5LPA- PROFILE.
SEE SHEET NO. 80 FOR -Y5RPD- PROFILE.
DO NOT PLACE ROCK IN BED OF JURISDICTIONAL STREAMS.
PERMIT DRAWINGS SHEET 9 OF 51
REVISIONS
PLOT DRIVER: NCDOT_pdf_color_eng_100.plt
PENTABLE: NCDOT_permits_NOCON.tbl
USER: bsteffen DATE: 3/11/2011 TIME: 12:28:46 PM SCALE: 1:100
FILE: Mktg_Charlotte\Trans_Design_Build\Lane_I-3803B_I-85_Widening\I-3803B\Hydraulics\PERMITS_Enviromental\Drawings\I3803B_HYD_PRM_PLANSHEETS.dgn

PLOT DRIVER: NCDOT_pdf_color_eng_100.plt PENTABLE: NCDOT_permits.tbl
USER: bsteffen DATE: 3/11/2011 TIME: 12:17:39 PM SCALE: 1:100
FILE: Mktg_Charlotte\Charlotte_Trans_Design_Build\Lane_I-3803B_I-85_Widening\I-3803B\Hydraulics\PERMITS_Enviromental\Drawings\I3803B_HYD_PRM_PLANSHEETS.dgn

REVISIONS

PROJECT REFERENCE NO.	SHEET NO.
I-3803B	5

R/W SHEET NO.

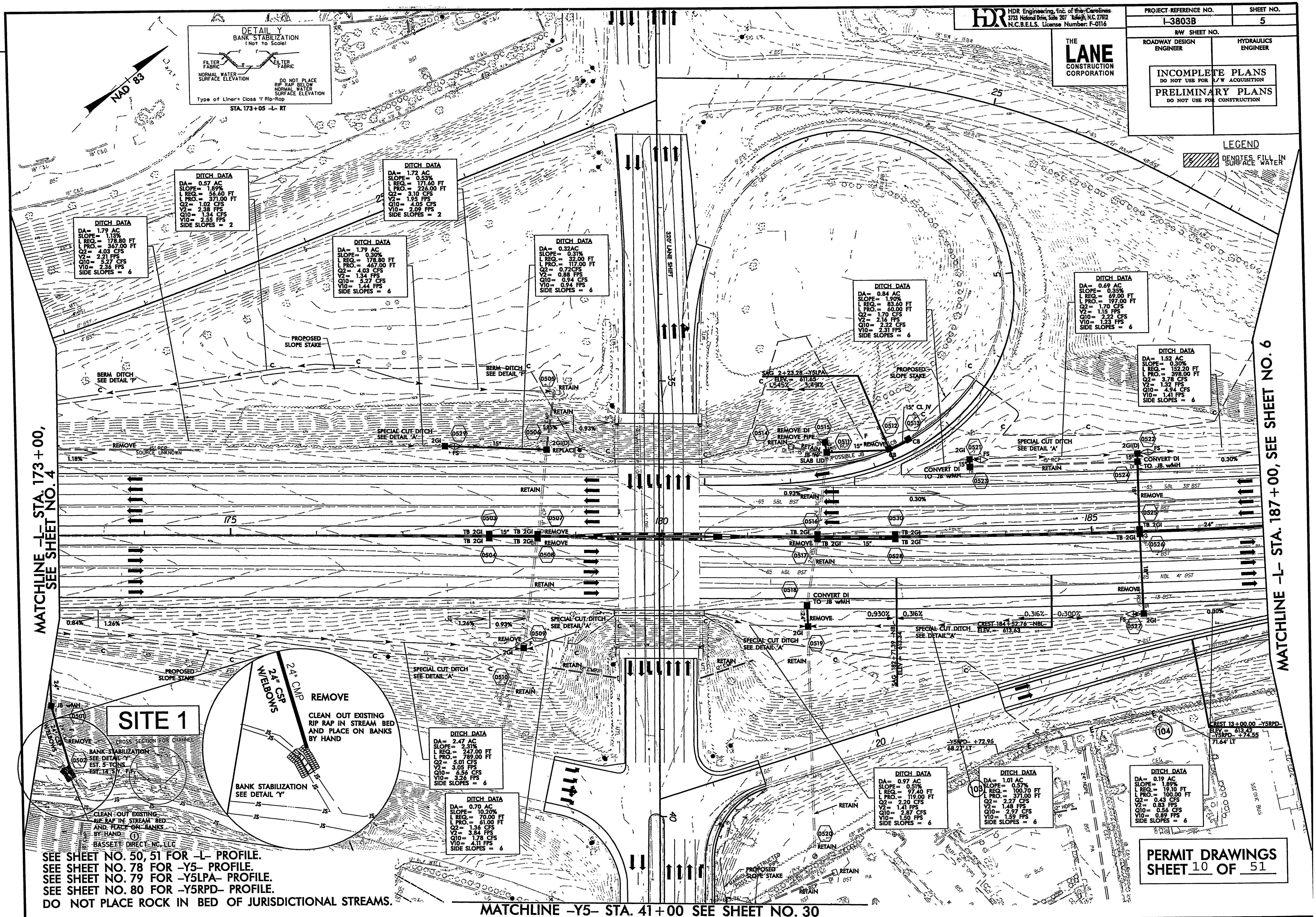
ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER

HDR Engineering, Inc. of the Carolinas
3733 National Drive, Suite 207 Raleigh, N.C. 27612
N.C.B.E.L.S. License Number: F-0116

THE LANE CONSTRUCTION CORPORATION

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



DA	SLOPE	L REQ.	L PRO.	Q2	V2	Q10	V10	SIDE SLOPES
1.79 AC	1.13%	178.80 FT	367.00 FT	4.03 CFS	2.21 FPS	5.27 CFS	2.36 FPS	6
0.57 AC	1.87%	56.60 FT	371.00 FT	1.02 CFS	2.38 FPS	1.34 CFS	2.55 FPS	2
1.72 AC	0.53%	171.60 FT	226.00 FT	3.10 CFS	1.95 FPS	4.05 CFS	2.09 FPS	2
1.79 AC	0.30%	178.80 FT	467.00 FT	4.03 CFS	1.34 FPS	5.27 CFS	1.44 FPS	6
0.32AC	0.31%	32.00 FT	117.00 FT	0.72CFS	0.88 FPS	0.94 CFS	0.94 FPS	6
0.84 AC	1.90%	83.60 FT	60.00 FT	1.70 CFS	2.16 FPS	2.22 CFS	2.31 FPS	6
0.69 AC	0.35%	69.00 FT	197.00 FT	1.70 CFS	1.15 FPS	2.22 CFS	1.23 FPS	6
1.52 AC	0.30%	152.20 FT	398.00 FT	3.78 CFS	1.32 FPS	4.94 CFS	1.41 FPS	6
2.47 AC	2.31%	247.00 FT	789.00 FT	5.01 CFS	3.05 FPS	6.56 CFS	3.26 FPS	6
0.70 AC	10.20%	70.00 FT	61.00 FT	1.36 CFS	3.84 FPS	1.78 CFS	4.11 FPS	6
0.97 AC	0.51%	97.40 FT	119.00 FT	2.20 CFS	1.41 FPS	2.87 CFS	1.50 FPS	6
1.01 AC	0.57%	100.70 FT	371.00 FT	2.27 CFS	1.48 FPS	2.97 CFS	1.59 FPS	6
0.19 AC	1.89%	19.10 FT	100.00 FT	0.43 CFS	0.83 FPS	0.56 CFS	0.89 FPS	6

SEE SHEET NO. 50, 51 FOR -L- PROFILE.
SEE SHEET NO. 78 FOR -Y5- PROFILE.
SEE SHEET NO. 79 FOR -Y5LPA- PROFILE.
SEE SHEET NO. 80 FOR -Y5RPD- PROFILE.
DO NOT PLACE ROCK IN BED OF JURISDICTIONAL STREAMS.

PERMIT DRAWINGS
SHEET 10 OF 51

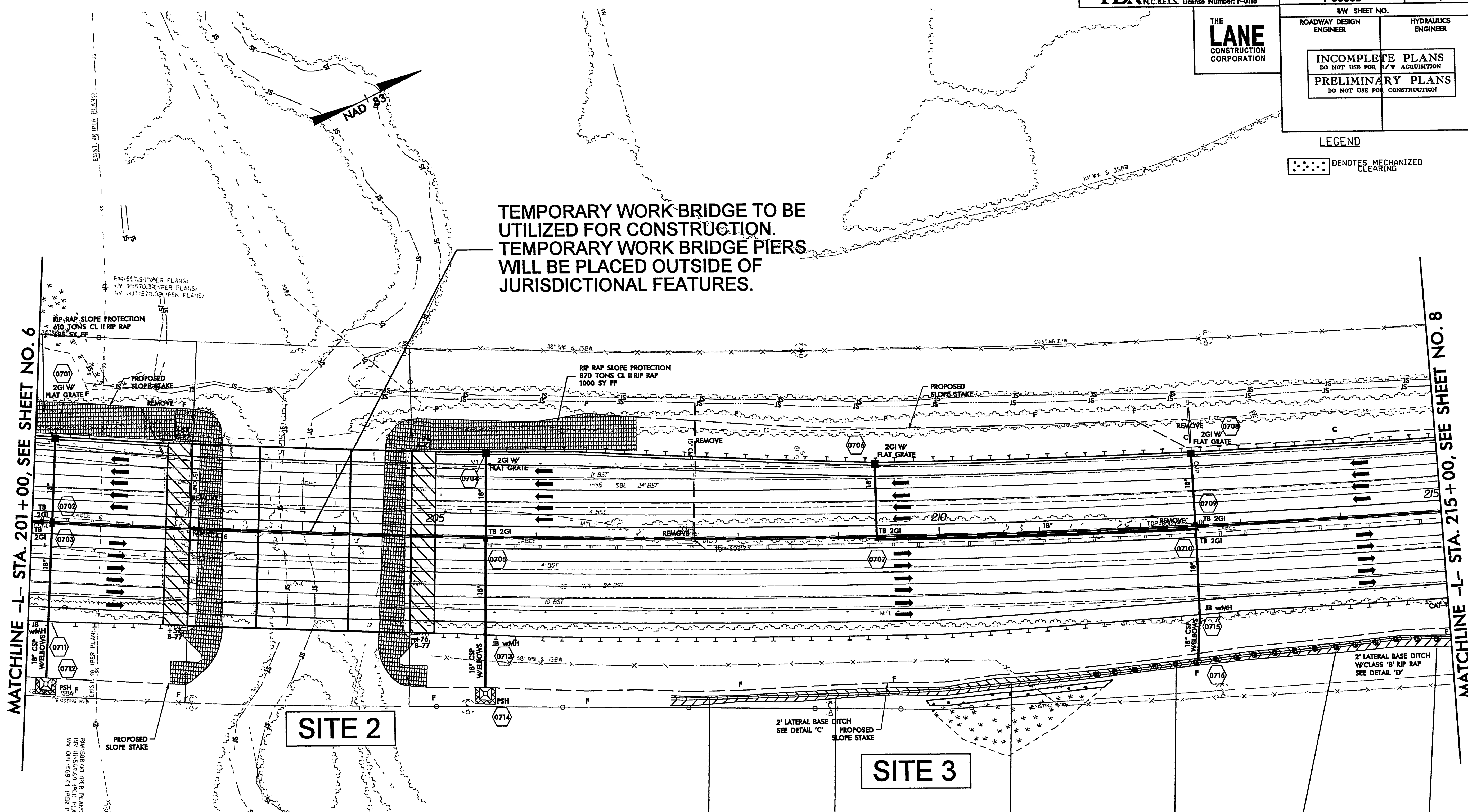
HDR Engineering, Inc. of the Carolinas 3733 National Drive, Suite 207 Raleigh, N.C. 27612 N.C.B.E.L.S. License Number: F-0116	PROJECT REFERENCE NO.	SHEET NO.
	I-3803B	7
THE LANE CONSTRUCTION CORPORATION	R/W SHEET NO.	
	ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

LEGEND

DENOTES MECHANIZED CLEARING



DITCH DATA
DA= 29.60 AC
SLOPE= 0.38%
L REQ.= 2960.00 FT
L PRO.= 424.00 FT
Q2= 27.50 CFS
V2= 2.97 FPS
Q10= 43.00 CFS
V10= 3.32 FPS
SIDE SLOPES = 2

DITCH DATA
DA= 29.60 AC
SLOPE= 0.26%
L REQ.= 2960.00 FT
L PRO.= 350.00 FT
Q2= 27.50 CFS
V2= 2.58 FPS
Q10= 43.00 CFS
V10= 2.89 FPS
SIDE SLOPES = 2

DITCH DATA
DA= 29.60 AC
SLOPE= 0.63%
L REQ.= 2960.00 FT
L PRO.= 200.00 FT
Q2= 27.50 CFS
V2= 3.60 FPS
Q10= 43.00 CFS
V10= 4.03 FPS
SIDE SLOPES = 2

DITCH DATA
DA= 29.60 AC
SLOPE= 1.25%
L REQ.= 2960.00 FT
L PRO.= 200.00 FT
Q2= 27.50 CFS
V2= 4.41 FPS
Q10= 43.00 CFS
V10= 4.95 FPS
SIDE SLOPES = 2

DITCH DATA
DA= 26.75 AC
SLOPE= 2.64%
L REQ.= 2675.00 FT
L PRO.= 100.00 FT
Q2= 25.00 CFS
V2= 5.67 FPS
Q10= 39.00 CFS
V10= 6.37 FPS
SIDE SLOPES = 2

DITCH DATA
DA= 26.75 AC
SLOPE= 4.32%
L REQ.= 2675.00 FT
L PRO.= 50.00 FT
Q2= 25.00 CFS
V2= 6.79 FPS
Q10= 39.00 CFS
V10= 7.64 FPS
SIDE SLOPES = 2

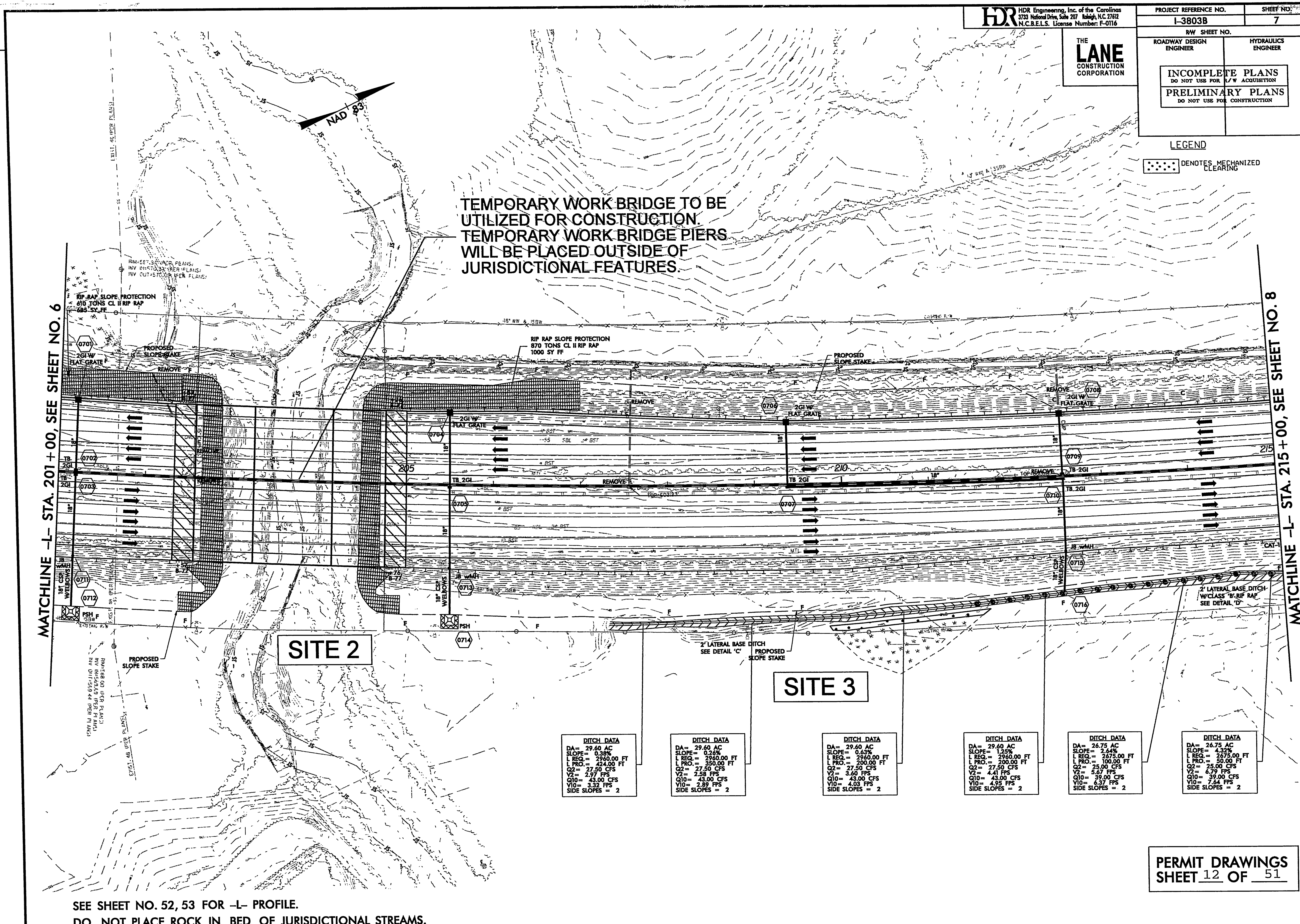
SEE SHEET NO. 52, 53 FOR -L- PROFILE.

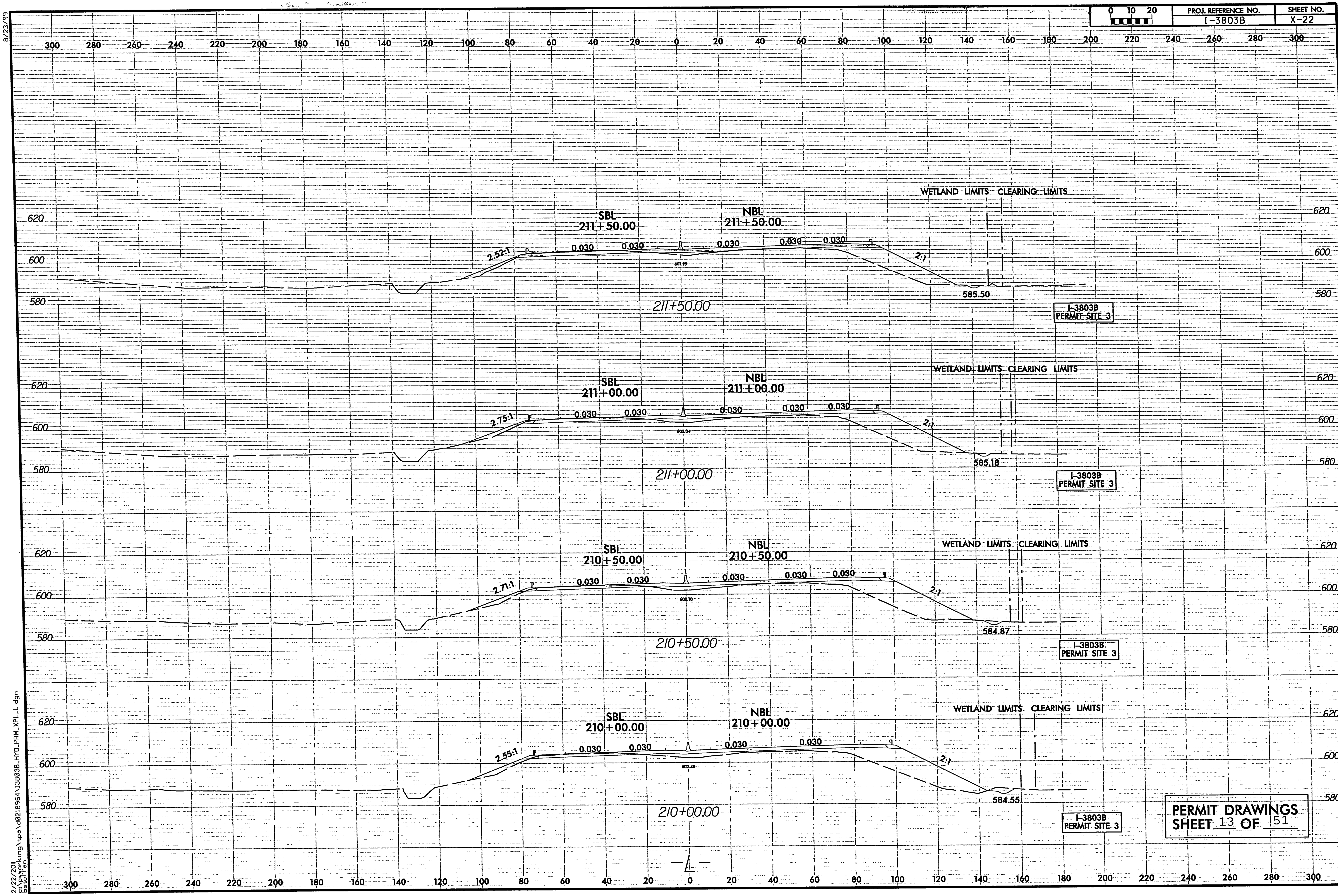
DO NOT PLACE ROCK IN BED OF JURISDICTIONAL STREAMS.

PERMIT DRAWINGS
SHEET 11 OF 51

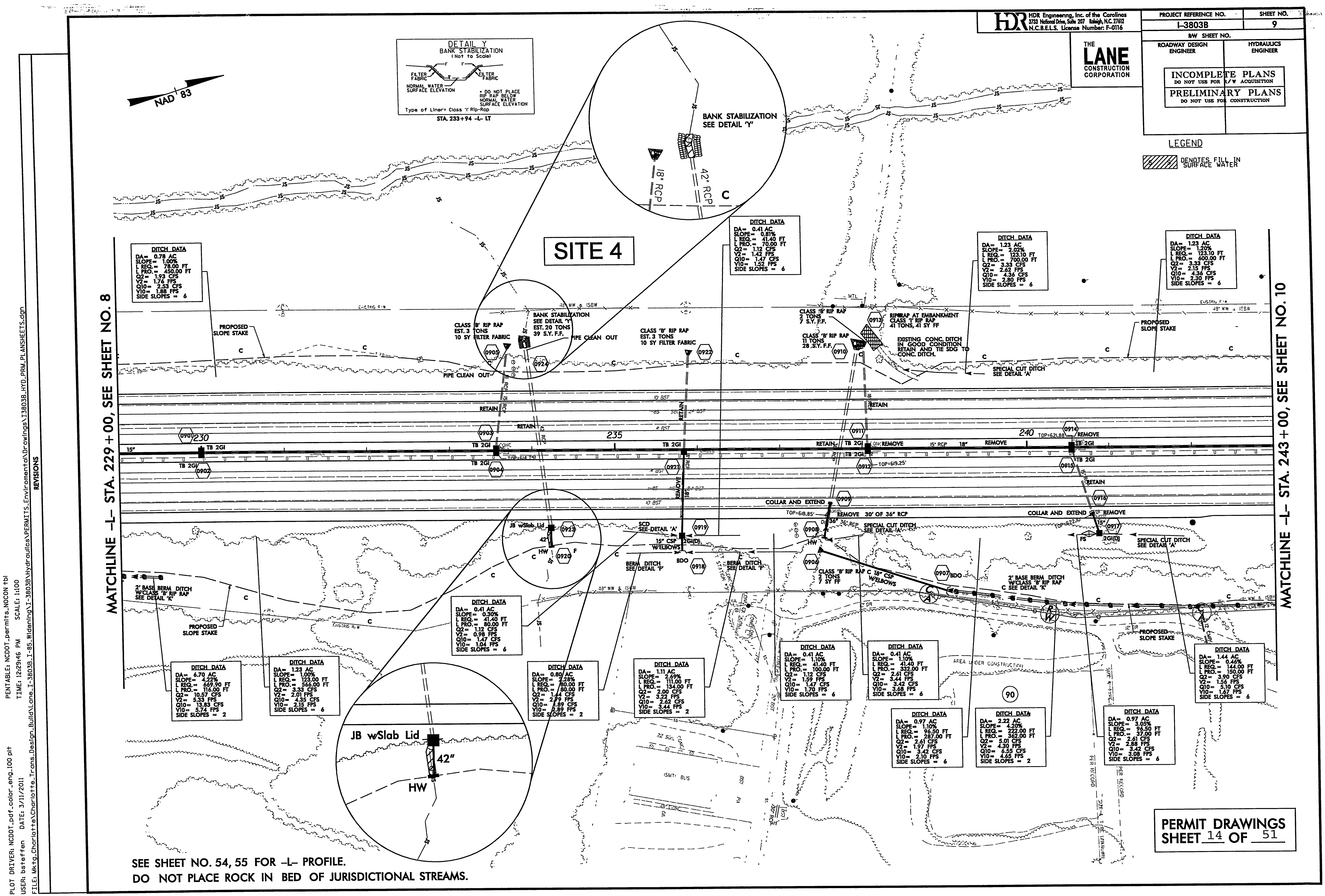
REVISIONS

PENTABLE: NCDOT_permits_NOCON.tbl
PLOT DRIVER: NCDOT_pdf_color_eng_100.plt
USER: bsteffen DATE: 3/11/2011 TIME: 12:29:15 PM SCALE: 1:100
FILE: Mktg_Charlotte\Charlotte_Trans_Design_Build\Lane_I-3803B_I-85_Widening\I-3803B\Hydraulics\PERMITS_Environmental\Drawings\I3803B_HYD_PRM_PLANSHEETS.dgn


HDR Engineering, Inc. of the Carolinas
3733 National Drive, Suite 207 Raleigh, N.C. 27612
N.C.B.E.L.S. License Number: F-0116
PROJECT REFERENCE NO. I-3803B
SHEET NO. 7
R/W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
THE LANE CONSTRUCTION CORPORATION
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
LEGEND
DENOTES MECHANIZED CLEARING
NAD 83
TEMPORARY WORK BRIDGE TO BE UTILIZED FOR CONSTRUCTION. TEMPORARY WORK BRIDGE PIERS WILL BE PLACED OUTSIDE OF JURISDICTIONAL FEATURES.
RIP RAP SLOPE PROTECTION
610 TONS CL II RIP RAP
685 SY FF
RIP RAP SLOPE PROTECTION
870 TONS CL II RIP RAP
1000 SY FF
PROPOSED SLOPE STAKE
REMOVE
2GI W/ FLAT GRATE
2' LATERAL BASE DITCH SEE DETAIL 'C'
2' LATERAL BASE DITCH W/CLASS 'B' RIP RAP SEE DETAIL 'D'
MATCHLINE -L- STA. 201+00, SEE SHEET NO. 6
MATCHLINE -L- STA. 215+00, SEE SHEET NO. 8
SITE 2
SITE 3
DITCH DATA
DA= 29.60 AC
SLOPE= 0.38%
L REQ.= 2960.00 FT
L PRO.= 424.00 FT
Q2= 27.50 CFS
V2= 2.97 FPS
Q10= 43.00 CFS
V10= 3.32 FPS
SIDE SLOPES = 2
DITCH DATA
DA= 29.60 AC
SLOPE= 0.26%
L REQ.= 2960.00 FT
L PRO.= 350.00 FT
Q2= 27.50 CFS
V2= 2.58 FPS
Q10= 43.00 CFS
V10= 2.89 FPS
SIDE SLOPES = 2
DITCH DATA
DA= 29.60 AC
SLOPE= 0.63%
L REQ.= 2960.00 FT
L PRO.= 200.00 FT
Q2= 27.50 CFS
V2= 3.60 FPS
Q10= 43.00 CFS
V10= 4.03 FPS
SIDE SLOPES = 2
DITCH DATA
DA= 29.60 AC
SLOPE= 1.25%
L REQ.= 2960.00 FT
L PRO.= 200.00 FT
Q2= 27.50 CFS
V2= 4.41 FPS
Q10= 43.00 CFS
V10= 4.95 FPS
SIDE SLOPES = 2
DITCH DATA
DA= 26.75 AC
SLOPE= 2.64%
L REQ.= 2675.00 FT
L PRO.= 100.00 FT
Q2= 25.00 CFS
V2= 5.67 FPS
Q10= 39.00 CFS
V10= 6.37 FPS
SIDE SLOPES = 2
DITCH DATA
DA= 26.75 AC
SLOPE= 4.32%
L REQ.= 2675.00 FT
L PRO.= 50.00 FT
Q2= 25.00 CFS
V2= 6.79 FPS
Q10= 39.00 CFS
V10= 7.64 FPS
SIDE SLOPES = 2
PERMIT DRAWINGS
SHEET 12 OF 51
SEE SHEET NO. 52, 53 FOR -L- PROFILE.
DO NOT PLACE ROCK IN BED OF JURISDICTIONAL STREAMS.

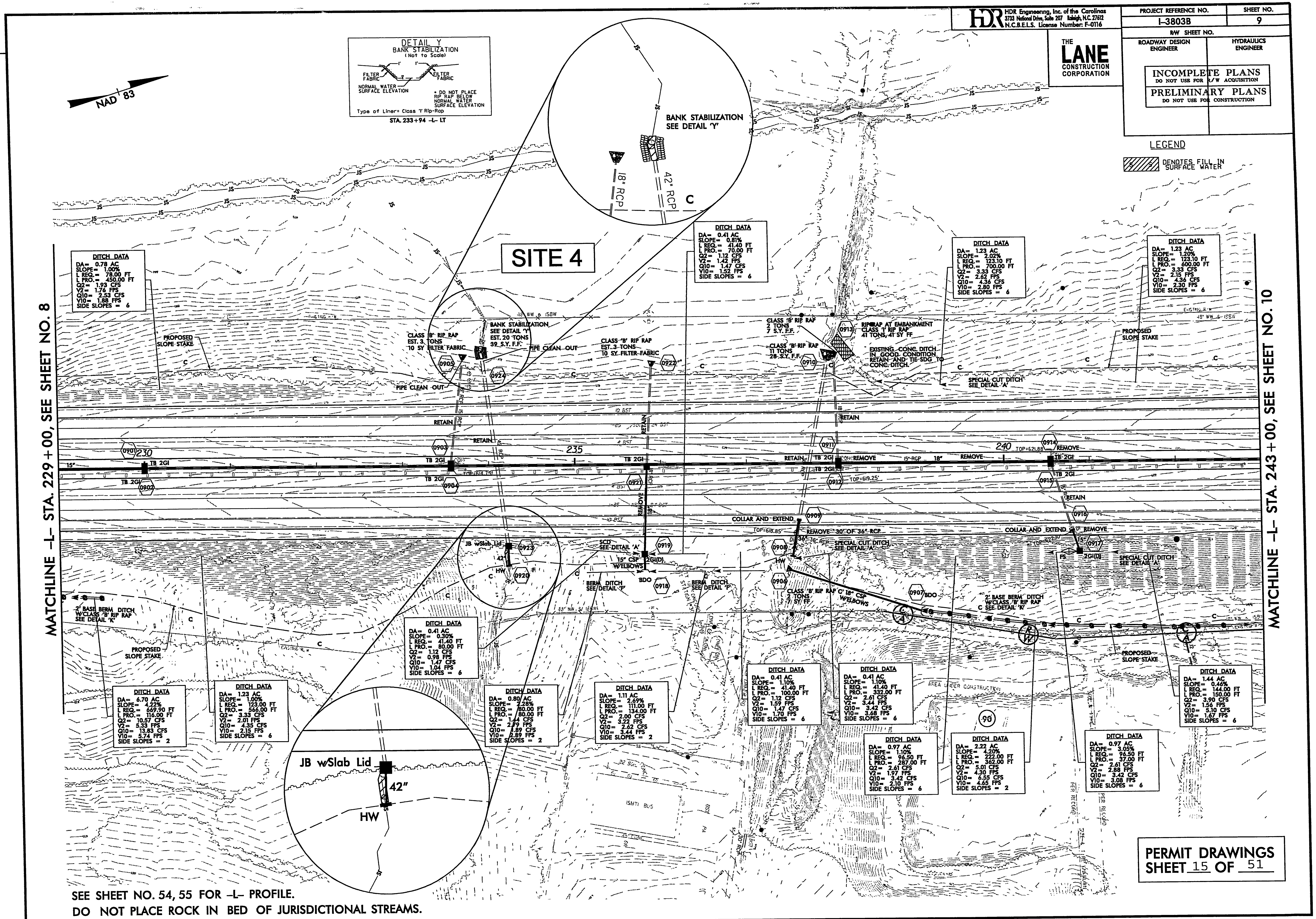


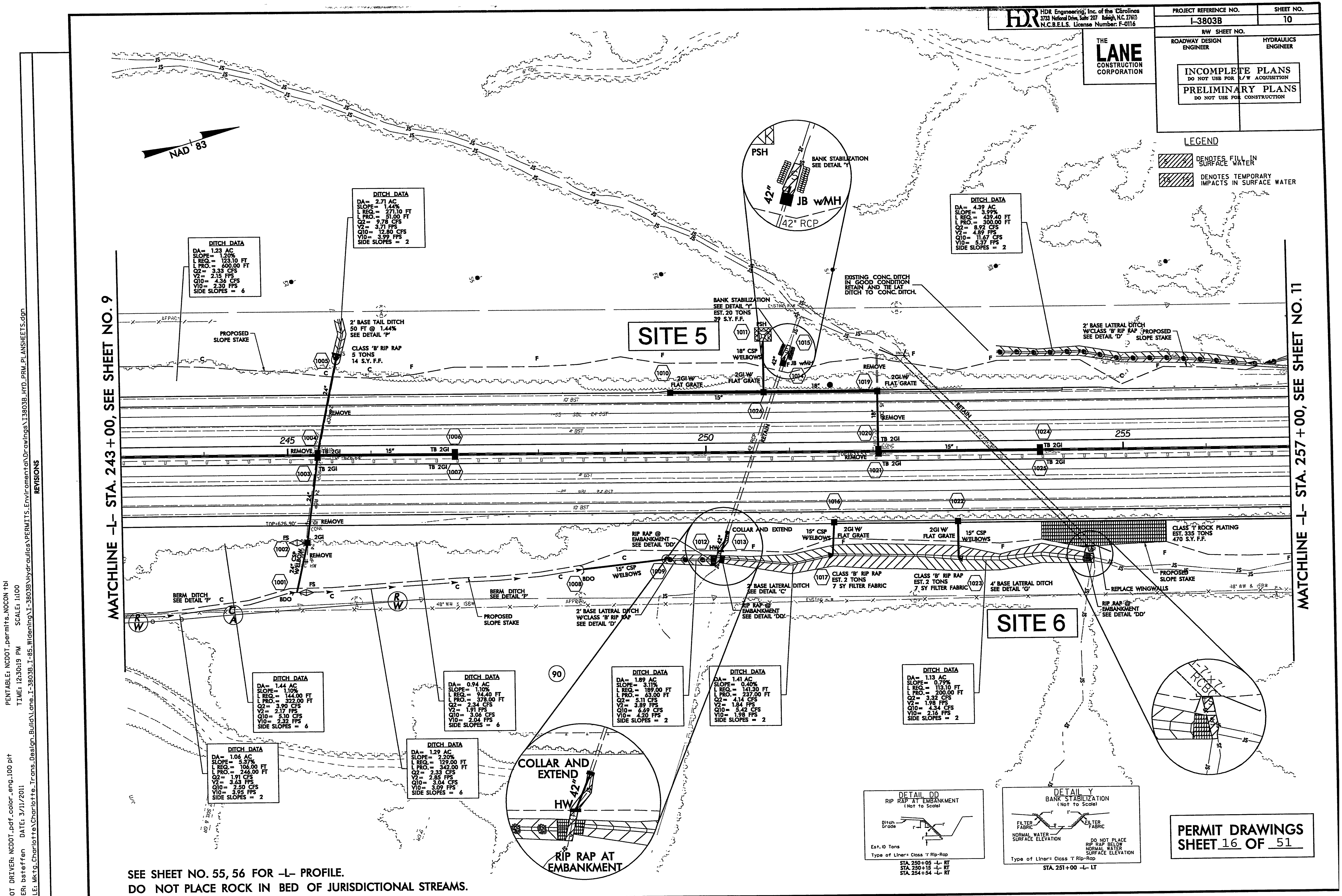
PERMIT DRAWINGS
SHEET 13 OF 51

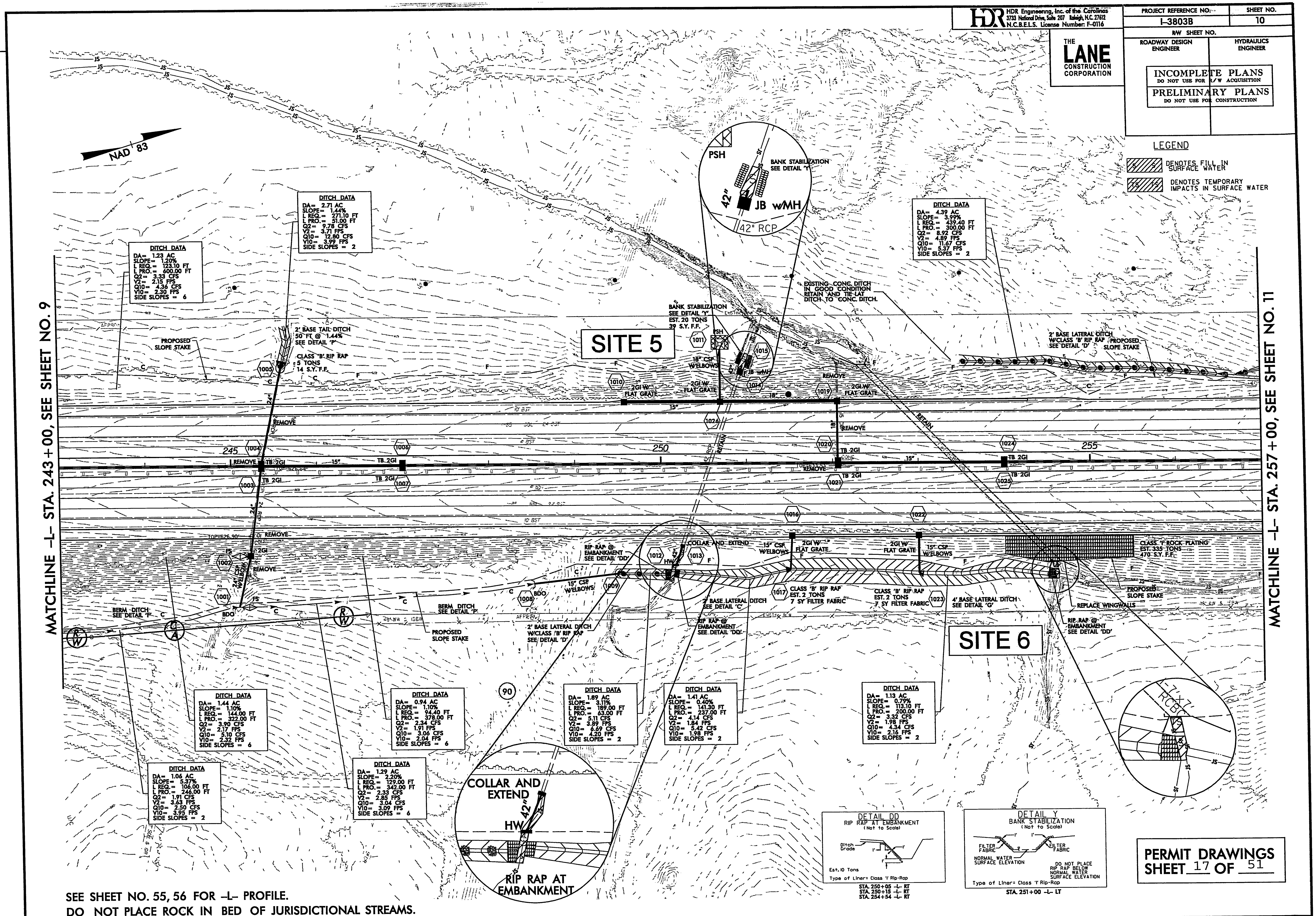

HDR Engineering, Inc. of the Carolinas
3733 National Drive, Suite 207 Raleigh, N.C. 27612
N.C.B.E.L.S. License Number: F-0116
PROJECT REFERENCE NO. I-3803B
SHEET NO. 9
R/W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
THE LANE CONSTRUCTION CORPORATION
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION
LEGEND
DENOTES FILL IN SURFACE WATER
DETAIL Y
BANK STABILIZATION
(Not to Scale)
FILTER FABRIC
NORMAL WATER SURFACE ELEVATION
* DO NOT PLACE RIP RAP BELOW NORMAL WATER SURFACE ELEVATION
Type of Liner= Class 'I' Rip-Rap
STA. 233+94 -L- LT
NAD 83
SITE 4
BANK STABILIZATION SEE DETAIL 'Y'
18" RCP
42" RCP
MATCHLINE -L- STA. 229+00, SEE SHEET NO. 8
MATCHLINE -L- STA. 243+00, SEE SHEET NO. 10
DITCH DATA
DA= 0.78 AC
SLOPE= 1.00%
L REQ.= 78.00 FT
L PRO.= 450.00 FT
Q2= 1.93 CFS
V2= 1.76 FPS
Q10= 2.53 CFS
V10= 1.88 FPS
SIDE SLOPES = 6
DITCH DATA
DA= 0.41 AC
SLOPE= 0.81%
L REQ.= 41.40 FT
L PRO.= 70.00 FT
Q2= 1.12 CFS
V2= 1.42 FPS
Q10= 1.47 CFS
V10= 1.52 FPS
SIDE SLOPES = 6
DITCH DATA
DA= 1.23 AC
SLOPE= 2.02%
L REQ.= 123.10 FT
L PRO.= 700.00 FT
Q2= 3.33 CFS
V2= 2.62 FPS
Q10= 4.36 CFS
V10= 2.80 FPS
SIDE SLOPES = 6
DITCH DATA
DA= 1.23 AC
SLOPE= 1.20%
L REQ.= 123.10 FT
L PRO.= 600.00 FT
Q2= 3.33 CFS
V2= 2.15 FPS
Q10= 4.36 CFS
V10= 2.30 FPS
SIDE SLOPES = 6
PROPOSED SLOPE STAKE
CLASS 'B' RIP RAP EST. 3 TONS 10 SY FILTER FABRIC
BANK STABILIZATION SEE DETAIL 'Y' EST. 20 TONS 39 S.Y. F.F.
PIPE CLEAN OUT
CLASS 'B' RIP RAP EST. 3 TONS 10 SY FILTER FABRIC
CLASS 'B' RIP RAP 2 TONS 7 S.Y. F.F.
CLASS 'B' RIP RAP 11 TONS 28 S.Y. F.F.
RIPRAP AT EMBANKMENT CLASS 'I' RIP RAP 41 TONS, 41 SY FF
EXISTING CONC. DITCH IN GOOD CONDITION RETAIN AND TIE SDG TO CONC. DITCH.
SPECIAL CUT DITCH SEE DETAIL 'A'
RETAIN
REMOVE
TB 2GI
TB 2G
COLLAR AND EXTEND
REMOVE 30' OF 36" RCP
JB w/Slab Lid
42"
HW
SCD SEE DETAIL 'A'
15" CSP W/ELBOWS
2GI(D)
BDO
BERM DITCH SEE DETAIL 'F'
CLASS 'B' RIP RAP 2 TONS 7 SY FF
18" CSP W/ELBOWS
2' BASE BERM DITCH W/CLASS 'B' RIP RAP SEE DETAIL 'K'
DITCH DATA
DA= 0.41 AC
SLOPE= 0.30%
L REQ.= 41.40 FT
L PRO.= 80.00 FT
Q2= 1.12 CFS
V2= 0.98 FPS
Q10= 1.47 CFS
V10= 1.04 FPS
SIDE SLOPES = 6
DITCH DATA
DA= 6.70 AC
SLOPE= 4.22%
L REQ.= 669.90 FT
L PRO.= 116.00 FT
Q2= 10.57 CFS
V2= 5.33 FPS
Q10= 13.83 CFS
V10= 5.74 FPS
SIDE SLOPES = 2
DITCH DATA
DA= 1.23 AC
SLOPE= 1.00%
L REQ.= 123.00 FT
L PRO.= 566.00 FT
Q2= 3.33 CFS
V2= 2.01 FPS
Q10= 4.35 CFS
V10= 2.15 FPS
SIDE SLOPES = 6
DITCH DATA
DA= 0.80 AC
SLOPE= 2.28%
L REQ.= 80.00 FT
L PRO.= 80.00 FT
Q2= 1.44 CFS
V2= 2.79 FPS
Q10= 1.89 CFS
V10= 2.89 FPS
SIDE SLOPES = 2
DITCH DATA
DA= 1.11 AC
SLOPE= 2.69%
L REQ.= 111.00 FT
L PRO.= 134.00 FT
Q2= 2.00 CFS
V2= 3.22 FPS
Q10= 2.62 CFS
V10= 3.44 FPS
SIDE SLOPES = 2
DITCH DATA
DA= 0.41 AC
SLOPE= 1.10%
L REQ.= 41.40 FT
L PRO.= 100.00 FT
Q2= 1.12 CFS
V2= 1.59 FPS
Q10= 1.47 CFS
V10= 1.70 FPS
SIDE SLOPES = 6
DITCH DATA
DA= 0.41 AC
SLOPE= 1.10%
L REQ.= 41.40 FT
L PRO.= 332.00 FT
Q2= 2.61 CFS
V2= 3.44 FPS
Q10= 3.42 CFS
V10= 3.68 FPS
SIDE SLOPES = 6
DITCH DATA
DA= 0.97 AC
SLOPE= 1.10%
L REQ.= 96.50 FT
L PRO.= 287.00 FT
Q2= 2.61 CFS
V2= 1.97 FPS
Q10= 3.42 CFS
V10= 2.10 FPS
SIDE SLOPES = 6
DITCH DATA
DA= 2.22 AC
SLOPE= 4.20%
L REQ.= 222.00 FT
L PRO.= 362.00 FT
Q2= 5.01 CFS
V2= 4.30 FPS
Q10= 6.55 CFS
V10= 4.65 FPS
SIDE SLOPES = 2
DITCH DATA
DA= 0.97 AC
SLOPE= 3.05%
L REQ.= 96.50 FT
L PRO.= 37.00 FT
Q2= 2.61 CFS
V2= 2.88 FPS
Q10= 3.42 CFS
V10= 3.08 FPS
SIDE SLOPES = 6
DITCH DATA
DA= 1.44 AC
SLOPE= 0.46%
L REQ.= 144.00 FT
L PRO.= 150.00 FT
Q2= 3.90 CFS
V2= 1.56 FPS
Q10= 5.10 CFS
V10= 1.67 FPS
SIDE SLOPES = 6
AREA UNDER CONSTRUCTION
90
SEE SHEET NO. 54, 55 FOR -L- PROFILE.
DO NOT PLACE ROCK IN BED OF JURISDICTIONAL STREAMS.
PERMIT DRAWINGS SHEET 14 OF 51
REVISIONS
PLOT DRIVER: NCDOT_pdf_color_eng_100.plt PENTABLE: NCDOT_permits_NOCON.tbl
USER: bsteffen DATE: 3/11/2011 TIME: 12:29:46 PM SCALE: 1:100
FILE: Mktg_Charlotte\Charlotte_Trans_Design_Build\Lane_I-3803B_I-85_Widening\I-3803B\Hydraulics\PERMITS_Enviromental\Drawings\I3803B_HYD_PRM_PLANSHEETS.dgn

PLOT DRIVER: NCDOT_pdf_color_eng_100.plt PENTABLE: NCDOT_permits.tbl
USER: bsteffen DATE: 3/11/2011 TIME: 12:19:22 PM SCALE: 1:100
FILE: Mktg_Charlotte\Charlotte_Trans_Design_Build\Lane_I-3803B_I-85_Widening\I-3803B\Hydraulics\PERMITS_Enviromental\Drawings\I3803B_HYD_PRM_PLANSHEETS.dgn

REVISIONS

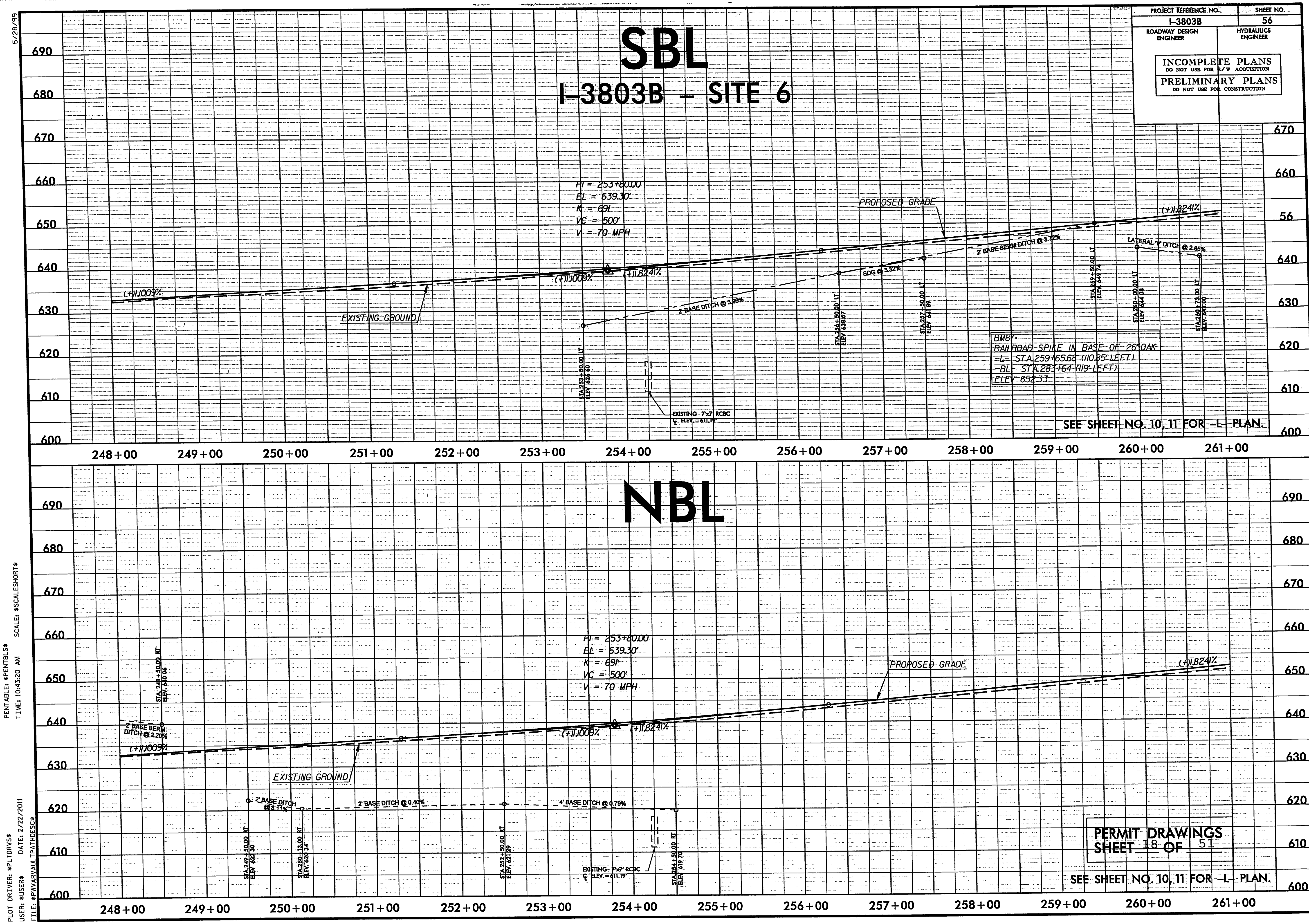



HDR Engineering, Inc. of the Carolinas
3733 National Drive, Suite 207 Raleigh, N.C. 27612
N.C.B.E.L.S. License Number: F-0116
PROJECT REFERENCE NO.
I-3803B
SHEET NO.
10
R/W SHEET NO.
THE LANE CONSTRUCTION CORPORATION
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
LEGEND
DENOTES FILL IN SURFACE WATER
DENOTES TEMPORARY IMPACTS IN SURFACE WATER
NAD 83
DITCH DATA
DA= 1.23 AC
SLOPE= 1.20%
L REQ.= 123.10 FT
L PRO.= 600.00 FT
Q2= 3.33 CFS
V2= 2.15 FPS
Q10= 4.36 CFS
V10= 2.30 FPS
SIDE SLOPES = 6
DITCH DATA
DA= 2.71 AC
SLOPE= 1.44%
L REQ.= 271.10 FT
L PRO.= 51.00 FT
Q2= 9.78 CFS
V2= 3.71 FPS
Q10= 12.80 CFS
V10= 3.99 FPS
SIDE SLOPES = 2
DITCH DATA
DA= 4.39 AC
SLOPE= 3.99%
L REQ.= 439.40 FT
L PRO.= 300.00 FT
Q2= 8.92 CFS
V2= 4.89 FPS
Q10= 11.67 CFS
V10= 5.37 FPS
SIDE SLOPES = 2
PSH
BANK STABILIZATION SEE DETAIL 'Y'
42"
JB wMH
42" RCP
EXISTING CONC. DITCH IN GOOD CONDITION RETAIN AND TIE LAT DITCH TO CONC. DITCH.
MATCHLINE -L- STA. 243+00, SEE SHEET NO. 9
MATCHLINE -L- STA. 257+00, SEE SHEET NO. 11
2' BASE TAIL DITCH
50 FT @ 1.44%
SEE DETAIL 'P'
CLASS 'B' RIP RAP
5 TONS
14 S.Y. F.F.
PROPOSED SLOPE STAKE
BANK STABILIZATION
SEE DETAIL 'Y'
EST. 20 TONS
39 S.Y. F.F.
SITE 5
18" CSP W/ELBOWS
2GI W/ FLAT GRATE
REMOVE
2' BASE LATERAL DITCH W/CLASS 'B' RIP RAP SEE DETAIL 'D'
RETAIN
245
250
255
TB 2GI
TOP=626.90'
REMOVE
2GI
RIP RAP @ EMBANKMENT SEE DETAIL 'DD'
COLLAR AND EXTEND
15" CSP W/ELBOWS
CLASS 'I' ROCK PLATING
EST. 335 TONS
470 S.Y. F.F.
BERM DITCH SEE DETAIL 'P'
2' BASE LATERAL DITCH SEE DETAIL 'C'
CLASS 'B' RIP RAP
EST. 2 TONS
7 SY FILTER FABRIC
4' BASE LATERAL DITCH SEE DETAIL 'G'
REPLACE WINGWALLS
SITE 6
DITCH DATA
DA= 1.44 AC
SLOPE= 1.10%
L REQ.= 144.00 FT
L PRO.= 322.00 FT
Q2= 3.90 CFS
V2= 2.17 FPS
Q10= 5.10 CFS
V10= 2.32 FPS
SIDE SLOPES = 6
DITCH DATA
DA= 0.94 AC
SLOPE= 1.10%
L REQ.= 94.40 FT
L PRO.= 378.00 FT
Q2= 2.34 CFS
V2= 1.91 FPS
Q10= 3.06 CFS
V10= 2.04 FPS
SIDE SLOPES = 6
DITCH DATA
DA= 1.89 AC
SLOPE= 3.11%
L REQ.= 189.00 FT
L PRO.= 63.00 FT
Q2= 5.11 CFS
V2= 3.89 FPS
Q10= 6.69 CFS
V10= 4.20 FPS
SIDE SLOPES = 2
DITCH DATA
DA= 1.41 AC
SLOPE= 0.40%
L REQ.= 141.30 FT
L PRO.= 237.00 FT
Q2= 4.14 CFS
V2= 1.84 FPS
Q10= 5.42 CFS
V10= 1.98 FPS
SIDE SLOPES = 2
DITCH DATA
DA= 1.13 AC
SLOPE= 0.79%
L REQ.= 113.10 FT
L PRO.= 200.00 FT
Q2= 3.32 CFS
V2= 1.98 FPS
Q10= 4.34 CFS
V10= 2.16 FPS
SIDE SLOPES = 2
DITCH DATA
DA= 1.06 AC
SLOPE= 5.37%
L REQ.= 106.00 FT
L PRO.= 246.00 FT
Q2= 1.91 CFS
V2= 3.63 FPS
Q10= 2.50 CFS
V10= 3.95 FPS
SIDE SLOPES = 2
DITCH DATA
DA= 1.29 AC
SLOPE= 2.20%
L REQ.= 129.00 FT
L PRO.= 342.00 FT
Q2= 2.33 CFS
V2= 2.85 FPS
Q10= 3.04 CFS
V10= 3.09 FPS
SIDE SLOPES = 6
COLLAR AND EXTEND
HW
42"
RIP RAP AT EMBANKMENT
DETAIL DD
RIP RAP AT EMBANKMENT
(Not to Scale)
Est. 10 Tons
Type of Liner= Class 'I' Rip-Rap
STA. 250+05 -L- RT
STA. 250+15 -L- RT
STA. 254+54 -L- RT
DETAIL Y
BANK STABILIZATION
(Not to Scale)
FILTER FABRIC
NORMAL WATER SURFACE ELEVATION
DO NOT PLACE RIP RAP BELOW NORMAL WATER SURFACE ELEVATION
Type of Liner= Class 'I' Rip-Rap
STA. 251+00 -L- LT
7'x7' RCBC
PERMIT DRAWINGS
SHEET 16 OF 51
SEE SHEET NO. 55, 56 FOR -L- PROFILE.
DO NOT PLACE ROCK IN BED OF JURISDICTIONAL STREAMS.
REVISIONS
PENTABLE: NCDOT_permits_NOCON.tbl
PLOT DRIVER: NCDOT_pdf_color_eng.100.plt
USER: bsteffen DATE: 3/11/2011 TIME: 12:30:19 PM SCALE: 1:100
FILE: Mktg_Charlotte\Trans_Design_Build\Lane_I-3803B_I-85_Widening\I-3803B\Hydraulics\PERMITS_Environmental\Drawings\I3803B_HYD_PRM_PLANSHEETS.dgn



REVISIONS

PLOT DRIVER: NCDOT_pdf_color_eng_100.plt PENTABLE: NCDOT_permits.tbl
USER: bsteffen DATE: 3/11/2011 TIME: 12:20:02 PM SCALE: 1:100
FILE: Mktg_Charlotte\Charlotte_Trans_Design_Build\Lane_I-3803B_I-85_Widening\I-3803B\Hydraulics\PERMITS_Enviromental\Drawings\I3803B_HYD_PRM_PLANSHEETS.dgn



PROJECT REFERENCE NO.
I-3803B
SHEET NO.
56
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
SBL
I-3803B - SITE 6
PI = 253+80.00
EL = 639.30'
K = 691
VC = 500'
V = 70 MPH
PROPOSED GRADE
(+)1.8241%
(+)1.1009%
EXISTING GROUND
2' BASE DITCH @ 3.99%
SDG @ 3.32%
2' BASE BERM DITCH @ 3.72%
LATERAL "V" DITCH @ 2.65%
STA.253+50.00 LT ELEV. 626.60
STA.256+50.00 LT ELEV. 638.57
STA.257+50.00 LT ELEV. 641.89
STA.259+50.00 LT ELEV. 649.74
STA.260+00.00 LT ELEV. 644.08
STA.260+73.00 LT ELEV. 642.00
EXISTING 7'x7' RCBC
℄ ELEV.=611.19'
BM87:
RAILROAD SPIKE IN BASE OF 26" OAK
-L- STA.259+65.68 (110.85' LEFT)
-BL- STA.283+64 (119' LEFT)
ELEV. 652.33
SEE SHEET NO. 10, 11 FOR -L- PLAN.
248+00
249+00
250+00
251+00
252+00
253+00
254+00
255+00
256+00
257+00
258+00
259+00
260+00
261+00
NBL
PI = 253+80.00
EL = 639.30'
K = 691
VC = 500'
V = 70 MPH
PROPOSED GRADE
(+)1.8241%
(+)1.1009%
EXISTING GROUND
2' BASE BERM DITCH @ 2.20%
STA.248+50.00 RT ELEV. 640.06
2' BASE DITCH @ 3.11%
2' BASE DITCH @ 0.40%
4' BASE DITCH @ 0.79%
STA.249+50.00 RT ELEV. 622.30
STA.250+13.00 RT ELEV. 620.34
STA.252+50.00 RT ELEV. 621.29
STA.254+50.00 RT ELEV. 619.70
EXISTING 7'x7' RCBC
℄ ELEV.=611.19'
PERMIT DRAWINGS
SHEET 18 OF 51
SEE SHEET NO. 10, 11 FOR -L- PLAN.
5/28/99
PLOT DRIVER: $PLTDRVS$
USER: $USER$
FILE: $PWVARVAULTPATHDESC$
DATE: 2/22/2011
TIME: 10:43:20 AM
PENTABLE: $PENTBLS$
SCALE: $SCALESHORT$

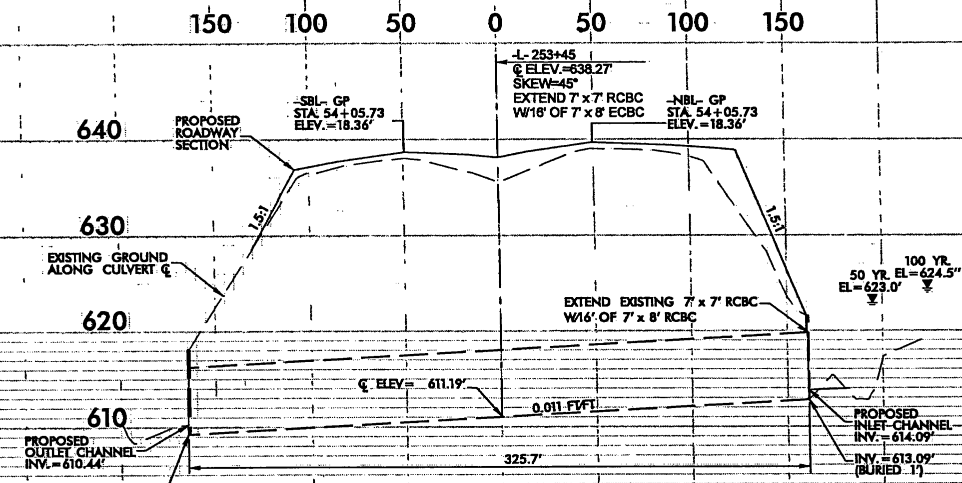
PROJECT REFERENCE NO.	SHEET NO.
I-3803B	

ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

I-3803B SITE 6



PROFILE ALONG ℄ OF CULVERT

PERMIT DRAWINGS
SHEET 19 OF 51

PLOT DRIVER: $PLTDRVS$ DATE: 2/22/2011
USER: $USER$
FILE: $PWVARVAULTPATHDESC$
PENTABLE: $PENTBLS$
TIME: 9:37:07 AM SCALE: $SCALESHORT$

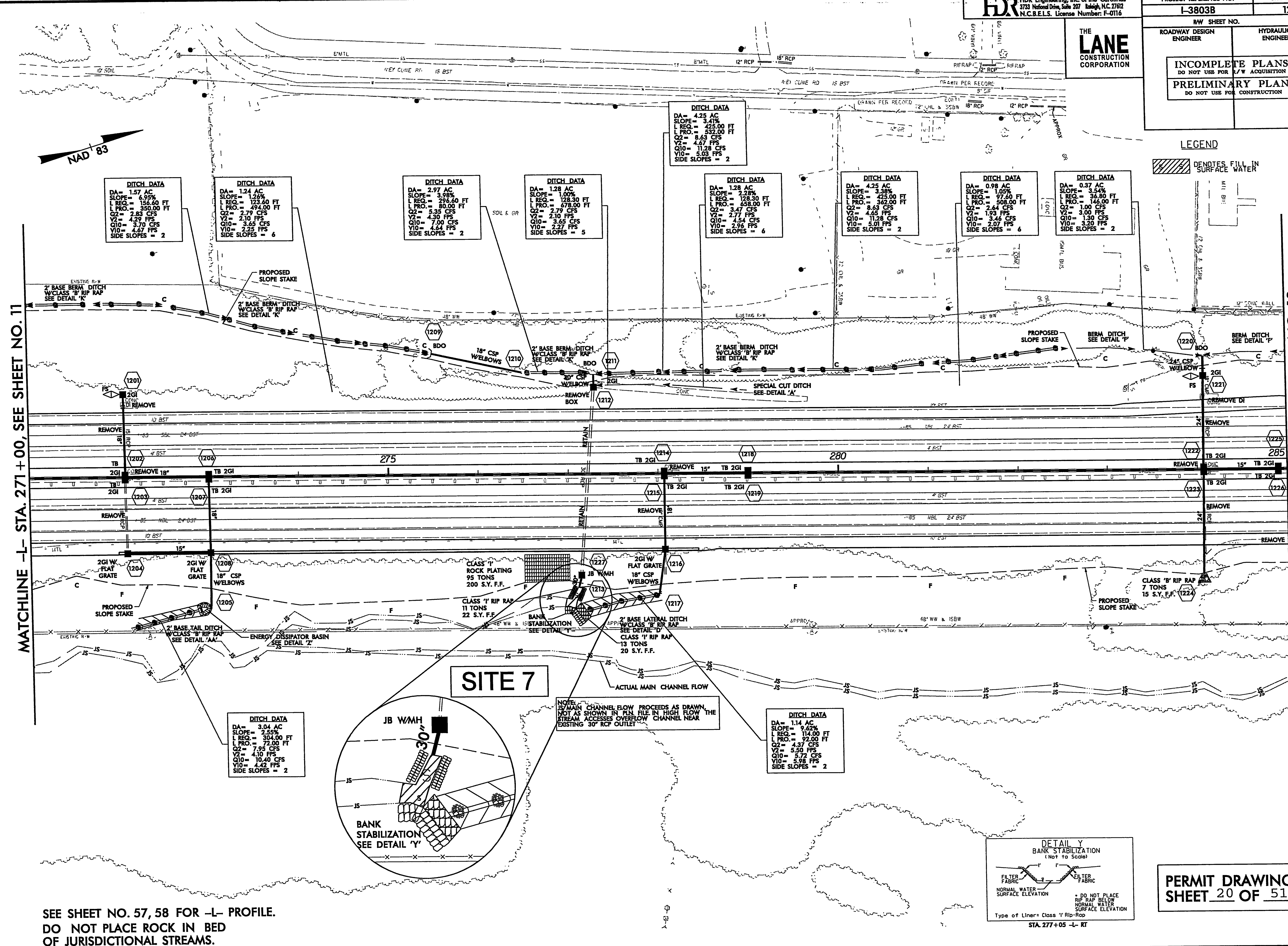
HDR Engineering, Inc. of the Carolinas
3733 National Drive, Suite 207 Raleigh, N.C. 27612
N.C.B.E.L.S. License Number: F-0116

THE LANE CONSTRUCTION CORPORATION

PROJECT REFERENCE NO.	SHEET NO.
I-3803B	12
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



SEE SHEET NO. 57, 58 FOR -L- PROFILE.
DO NOT PLACE ROCK IN BED OF JURISDICTIONAL STREAMS.

PERMIT DRAWINGS SHEET 20 OF 51

REVISIONS

PLOT DRIVER: NCDOT_pdf_color_eng_100 plt
PENTABLE: NCDOT_permits_NOCON tbl
USER: bsteffen DATE: 3/11/2011 TIME: 12:30:48 PM SCALE: 1:100
FILE: Mktg_Charlotte\Charlotte_Trans_Design_Build\Lane_I-3803B_I-85_Widening\I-3803B\Hydraulics\PERMITS_Enviromental\Drawings\I3803B_HYD_PRM_PLANSHEETS.dgn

PROJECT REFERENCE NO.	SHEET NO.
I-3803B	12
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

HDR Engineering, Inc. of the Carolinas
3733 National Drive, Suite 207 Raleigh, N.C. 27612
N.C.B.E.L.S. License Number: F-0116

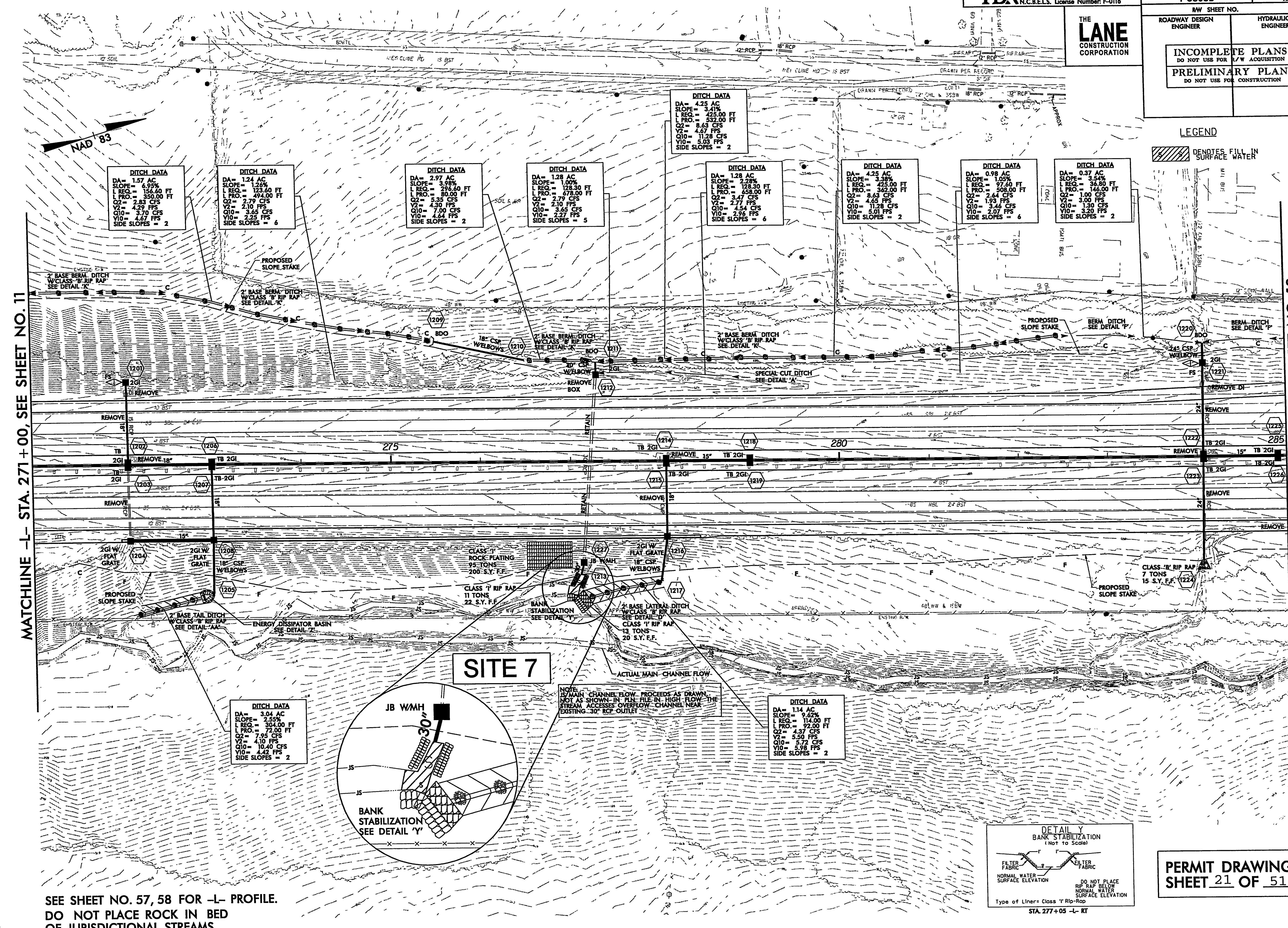
THE LANE CONSTRUCTION CORPORATION

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

LEGEND

DENOTES FILL IN SURFACE WATER



SEE SHEET NO. 57, 58 FOR -L- PROFILE.
DO NOT PLACE ROCK IN BED OF JURISDICTIONAL STREAMS.

PERMIT DRAWINGS
SHEET 21 OF 51

REVISIONS

PLOT DRIVER: NCDOT_pdf_color_eng.100 plt
PENTABLE: NCDOT_permits.tbl
USER: bsteffen DATE: 3/11/2011 TIME: 12:20:36 PM SCALE: 1:100
FILE: Mktg_Charlotte\Charlotte_Trans_Design_Build\Lane_I-3803B_I-85_Widening\I-3803B\Hydraulics\PERMITS_Environmental\Drawings\I3803B_HYD_PRM_PLANSHEETS.dgn

HDR Engineering, Inc. of the Carolinas
3733 National Drive, Suite 207 Raleigh, N.C. 27612
N.C.B.E.L.S. License Number: F-0116

THE LANE CONSTRUCTION CORPORATION

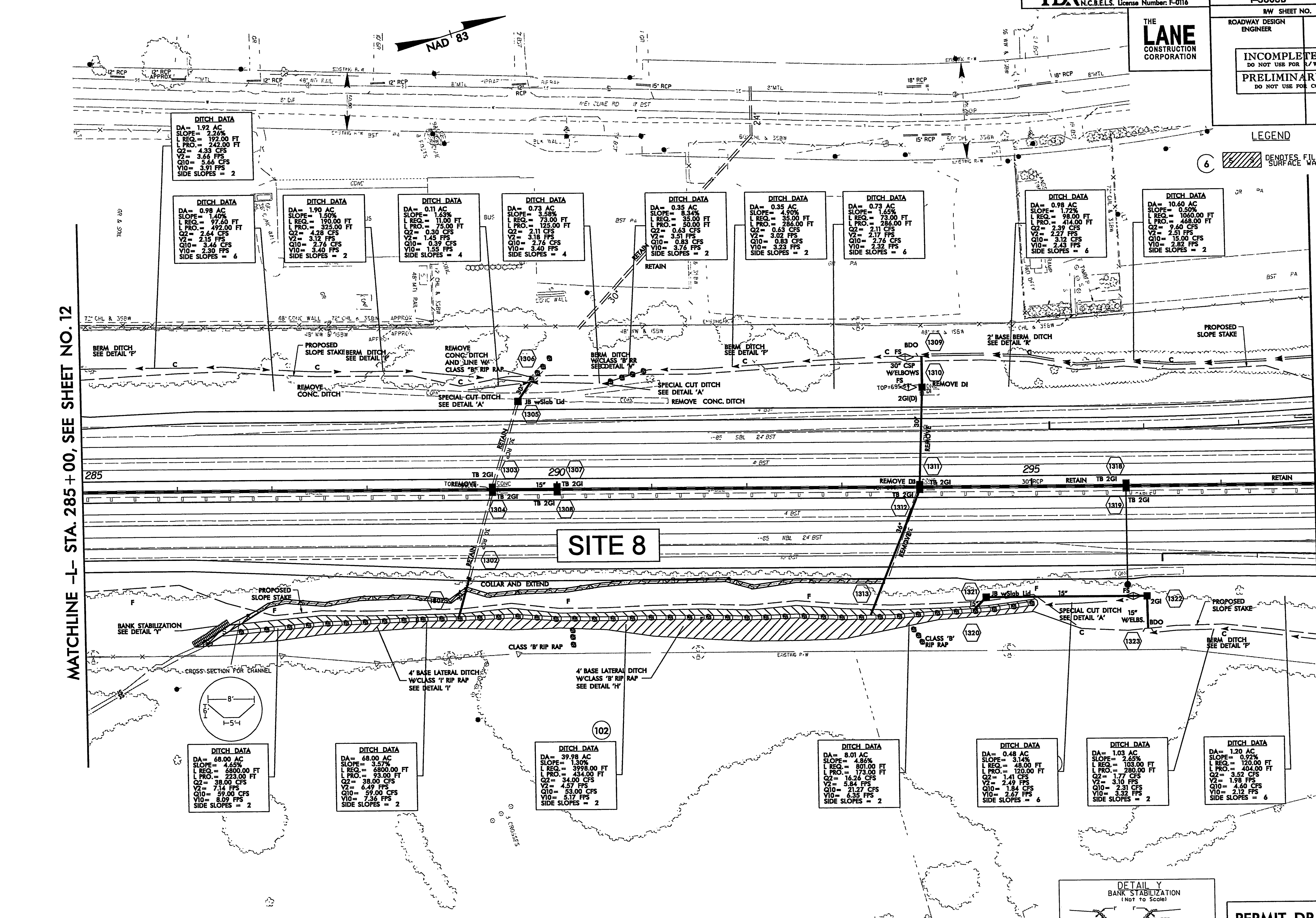
PROJECT REFERENCE NO.	SHEET NO.
I-3803B	13
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

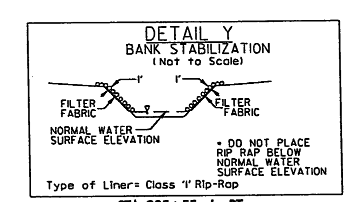
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

LEGEND

6 DENOTES FILL IN SURFACE WATER



SEE SHEET NO. 58, 59 FOR -L- PROFILE.
SEE SHEET NO. 87 FOR -Y6RPB- PROFILE.
SEE SHEET NO. 89 FOR -Y6RPC- PROFILE.
DO NOT PLACE ROCK IN BED OF JURISDICTIONAL STREAMS.



PERMIT DRAWINGS
SHEET 22 OF 51

REVISIONS

PLOT DRIVER: NCDOT_pdf_color_eng.100 plt PENTABLE: NCDOT_permits_NOCON.tbl
USER: bsteffen DATE: 3/11/2011 TIME: 12:31:17 PM SCALE: 1:100
FILE: Mktg_Charlotte\Charlotte_Trans_Design_Build\Lane_I-3803B_I-85_Widening\I-3803B\Hydraulics\PERMITS_Environmental\Drawings\I3803B_HYD_PRM_PLANSHEETS.dgn

HDR Engineering, Inc. of the Carolinas
3733 National Drive, Suite 207 Raleigh, N.C. 27612
N.C.B.E.L.S. License Number: F-0116

PROJECT REFERENCE NO.	SHEET NO.
I-3803B	13
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

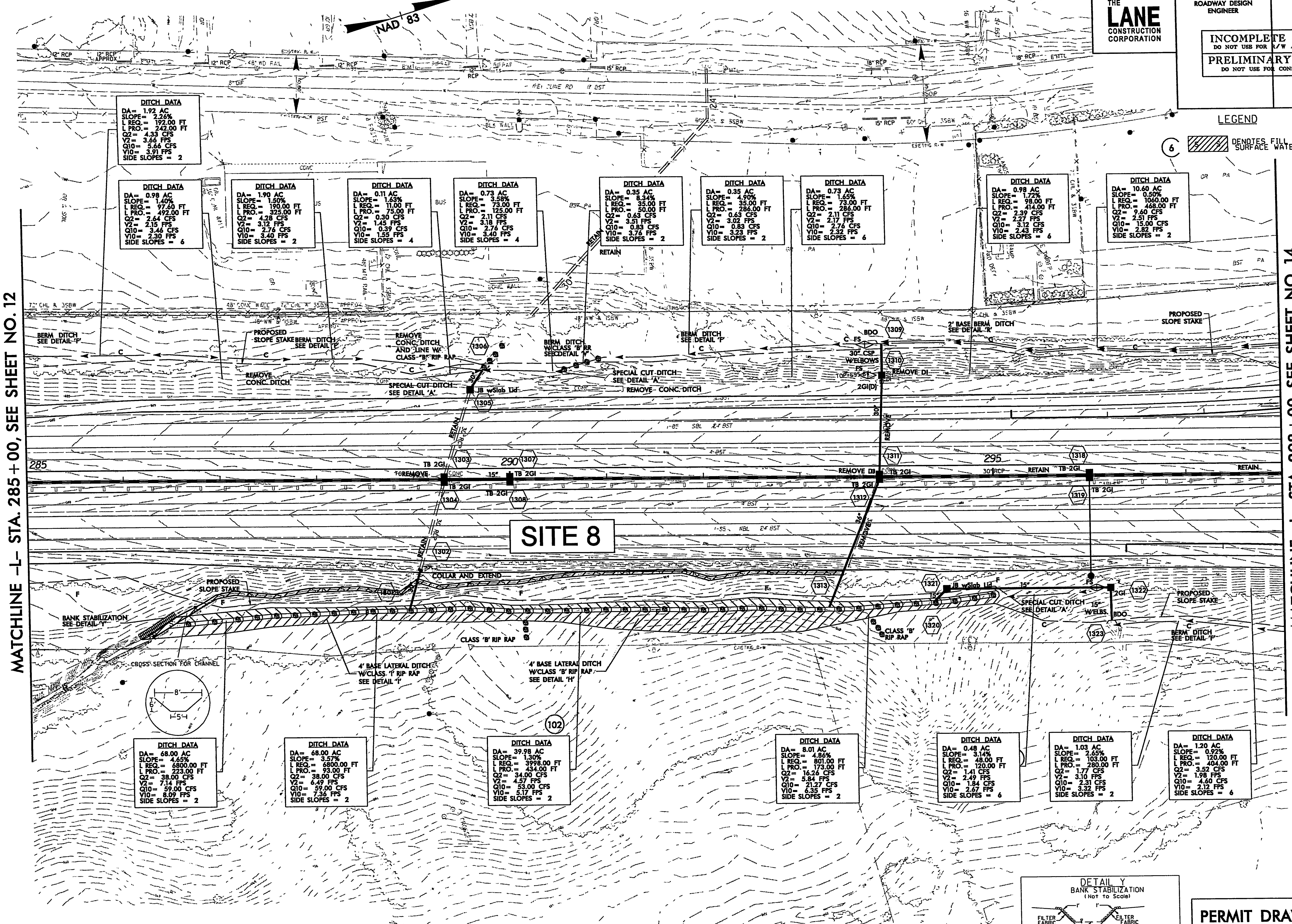
THE LANE CONSTRUCTION CORPORATION

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

LEGEND

(6) DENOTES FILL IN SURFACE WATER



DETAIL Y
BANK STABILIZATION
(Not to Scale)

FILTER FABRIC
NORMAL WATER SURFACE ELEVATION
* DO NOT PLACE RIP RAP BELOW NORMAL WATER SURFACE ELEVATION
Type of Liner= Class 'I' Rip-Rap
STA. 285+55 -L- RT

SEE SHEET NO. 58, 59 FOR -L- PROFILE.
SEE SHEET NO. 87 FOR -Y6RPB- PROFILE.
SEE SHEET NO. 89 FOR -Y6RPC- PROFILE.
DO NOT PLACE ROCK IN BED OF JURISDICTIONAL STREAMS.

PERMIT DRAWINGS
SHEET 23 OF 51

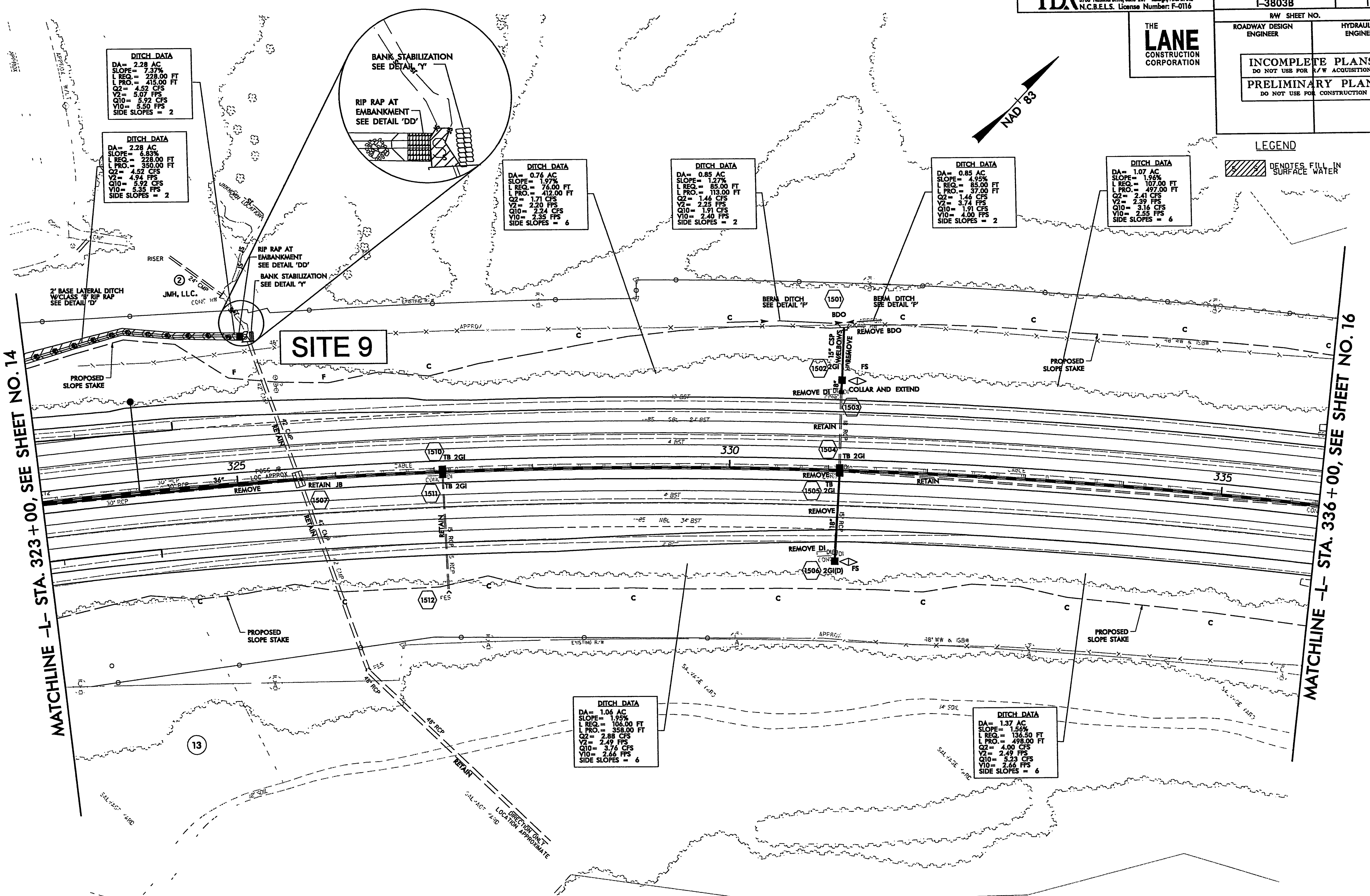
REVISIONS

PENTABLE: NCDOT_permits.tbl
PLOT DRIVER: NCDOT_pdf_color_eng_100.plt
USER: bsteffen DATE: 3/11/2011 TIME: 12:21:14 PM SCALE: 1:100
FILE: Mktg_Charlotte\Charlotte_Trans_Design_Build\Lane_I-3803B_I-85_Widening\I-3803B\Hydraulics\PERMITS_Enviromental\Drawings\I3803B_HYD_PRM_PLANSHEETS.dgn

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

LEGEND
DENOTES FILL IN SURFACE WATER



DETAIL DD
RIP RAP AT EMBANKMENT
(Not to Scale)
Ditch Grade
Est. 10 Tons
Type of Liner= Class 'I' Rip-Rap
STA. 325+15 -L- LT

DETAIL Y
BANK STABILIZATION
(Not to Scale)
FILTER FABRIC
NORMAL WATER SURFACE ELEVATION
* DO NOT PLACE RIP RAP BELOW NORMAL WATER SURFACE ELEVATION
Type of Liner= Class 'I' Rip-Rap
STA. 325+25 -L- LT

SEE SHEET NO. 61, 62 FOR -L- PROFILE.
SEE SHEET NO. 85 FOR -Y6RPA- PROFILE.
SEE SHEET NO. 90 FOR -Y6RPD- PROFILE.
DO NOT PLACE ROCK IN BED OF JURISDICTIONAL STREAMS.

REVISIONS

PLOT DRIVER: NCDOT_pdf_color_eng_100.plt PENTABLE: NCDOT_permits_NOCON.tbl
USER: bsteffen DATE: 3/11/2011 TIME: 12:31:47 PM SCALE: 1:100
FILE: Mktg_Charlotte\Charlotte_Trans_Design_Build\Lane_I-3803B_I-85_Widening\I-3803B\Hydraulics\PERMITS_Enviromental\Drawings\I3803B_HYD_PRM_PLANSHEETS.dgn

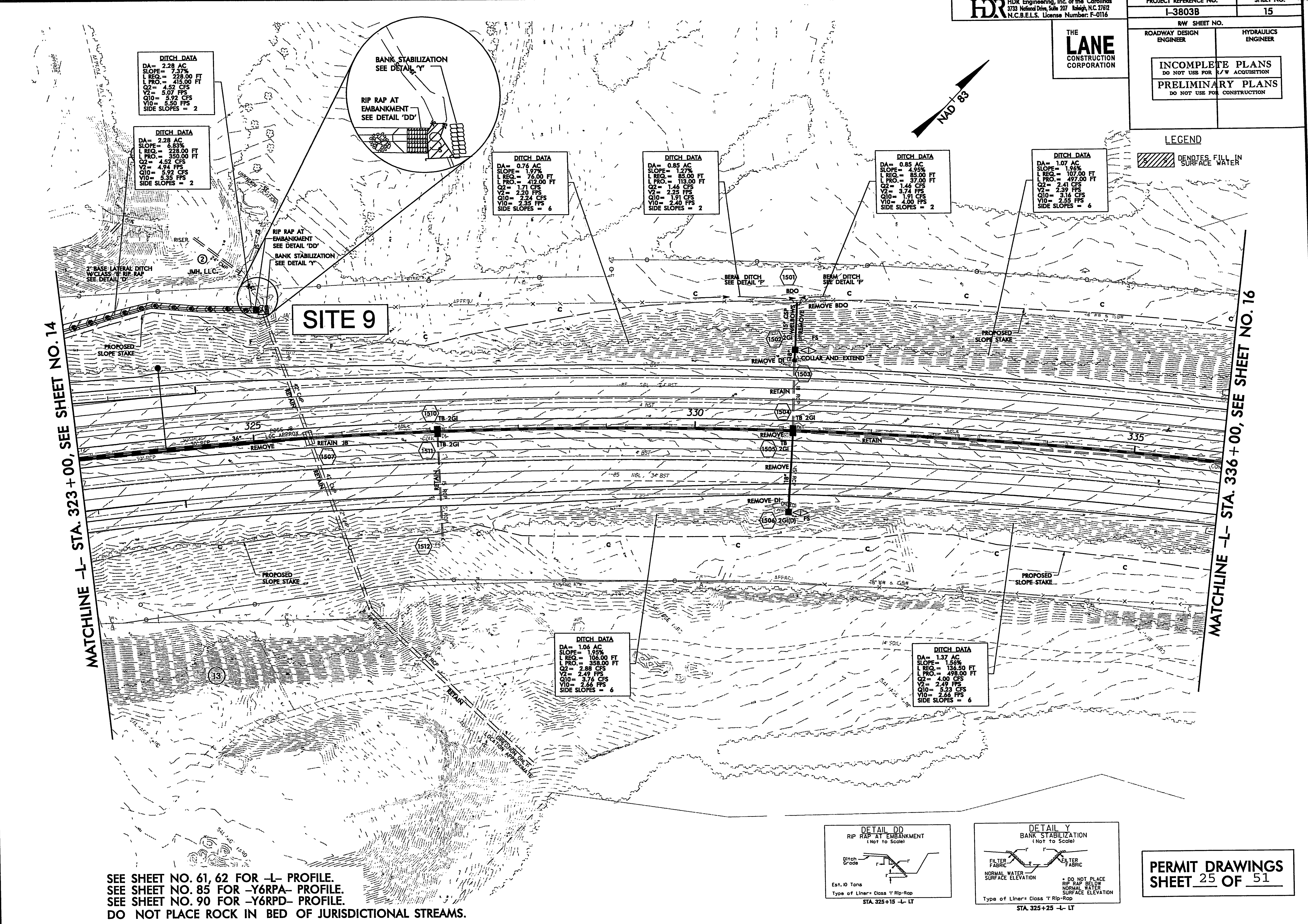
HDR Engineering, Inc. of the Carolinas
3733 National Drive, Suite 207 Raleigh, N.C. 27612
N.C.B.E.L.S. License Number: F-0116

PROJECT REFERENCE NO.	SHEET NO.
I-3803B	15
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

THE LANE CONSTRUCTION CORPORATION

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



SEE SHEET NO. 61, 62 FOR -L- PROFILE.
SEE SHEET NO. 85 FOR -Y6RPA- PROFILE.
SEE SHEET NO. 90 FOR -Y6RPD- PROFILE.
DO NOT PLACE ROCK IN BED OF JURISDICTIONAL STREAMS.

PERMIT DRAWINGS
SHEET 25 OF 51

REVISIONS

PLOT DRIVER: NCDOT_pdf_color_eng_100 plt PENTABLE: NCDOT_permits tbl
USER: bsteffen DATE: 3/11/2011 TIME: 12:21:50 PM SCALE: 1:100
FILE: Mktg_Charlotte\Charlotte_Trans_Design_Build\Lane_I-3803B_I-85_Widening\I-3803B\Hydraulics\PERMITS_Environmental\Drawings\I3803B_HYD_PRM_PLANSHEETS.dgn

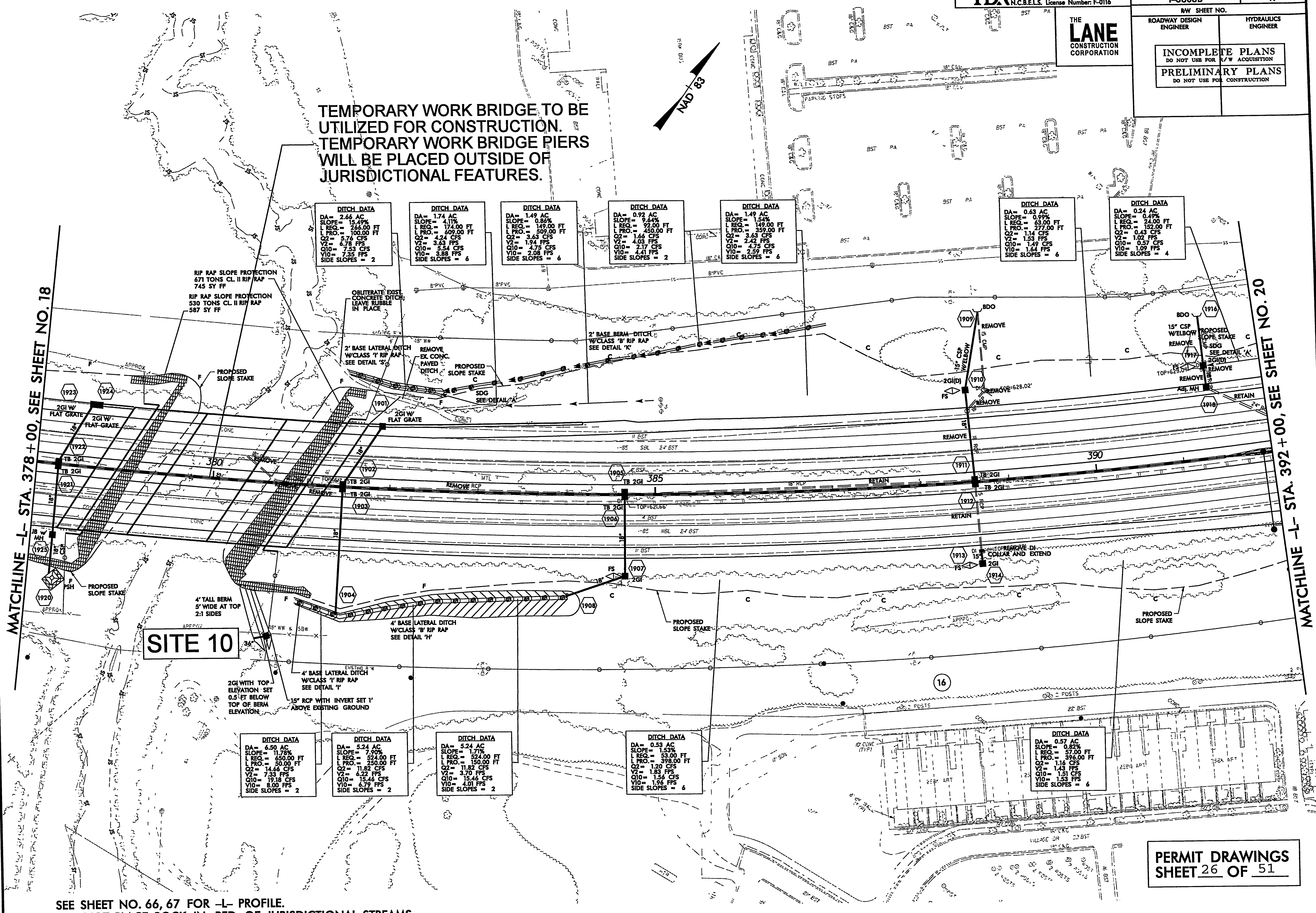
HDR Engineering, Inc. of the Carolinas
3733 National Drive, Suite 207 Raleigh, N.C. 27612
N.C.B.E.L.S. License Number: F-0116

THE LANE CONSTRUCTION CORPORATION

PROJECT REFERENCE NO.	SHEET NO.
I-3803B	19
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



SEE SHEET NO. 66, 67 FOR -L- PROFILE.
DO NOT PLACE ROCK IN BED OF JURISDICTIONAL STREAMS.

PERMIT DRAWINGS
SHEET 26 OF 51

REVISIONS

PENTABLE: NCDOT_permits_NOCON.tbl
PLOT DRIVER: NCDOT_pdf_color_eng_100.plt
USER: bsteffen DATE: 3/11/2011 TIME: 12:32:16 PM SCALE: 1:100
FILE: Mktg_Charlotte\Charlotte_Trans_Design_Build\Lane_I-3803B_I-85_Widening\I-3803B_Hydraulics\PERMITS_Environmental\Drawings\I3803B_HYD_PRM_PLANSHEETS.dgn

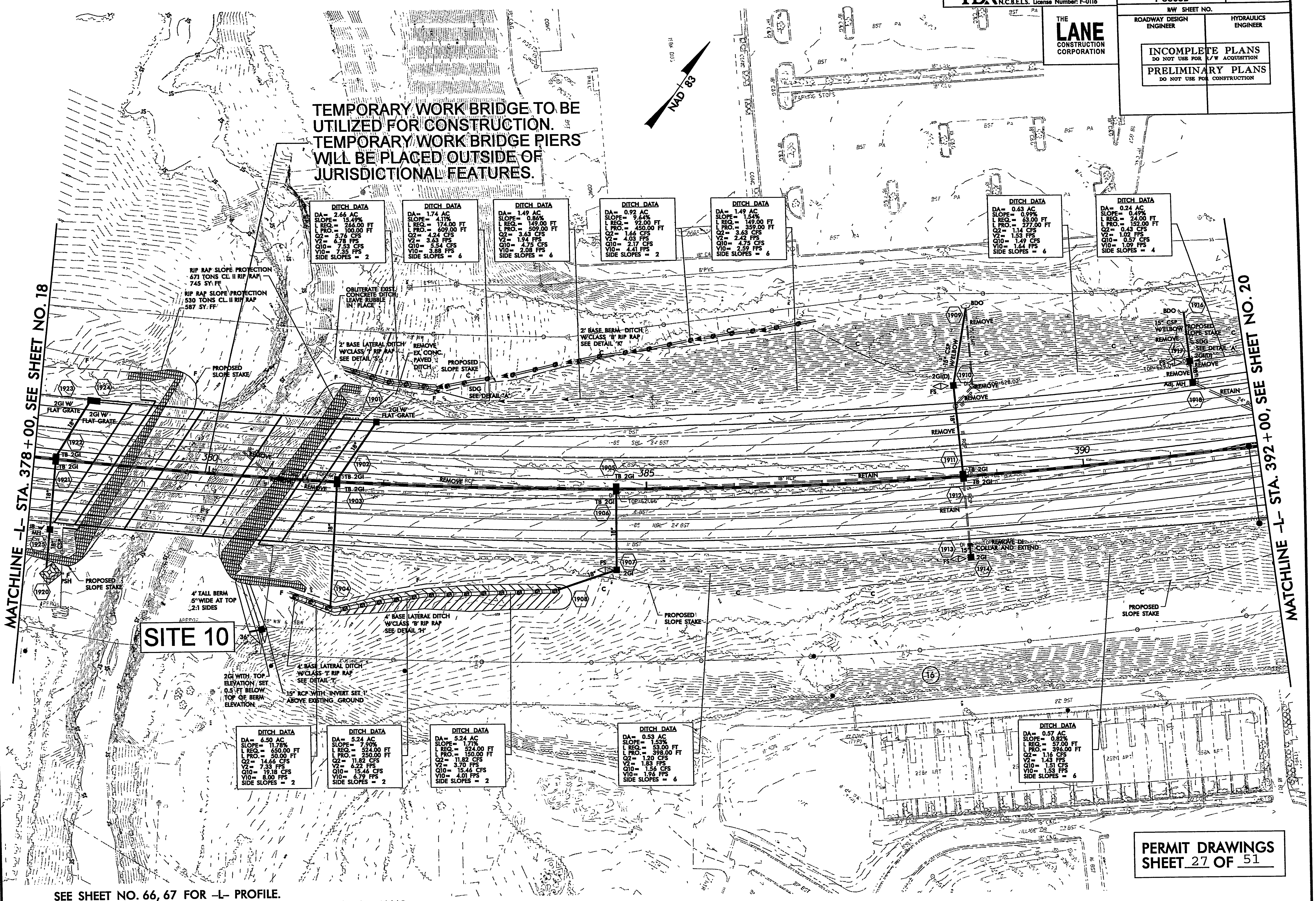
HDR Engineering, Inc. of the Carolinas
3733 National Drive, Suite 207 Raleigh, N.C. 27612
N.C.B.E.L.S. License Number: F-0116

THE LANE CONSTRUCTION CORPORATION

PROJECT REFERENCE NO.	SHEET NO.
I-3803B	19
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



PERMIT DRAWINGS
SHEET 27 OF 51

SEE SHEET NO. 66, 67 FOR -L- PROFILE.
DO NOT PLACE ROCK IN BED OF JURISDICTIONAL STREAMS.

REVISIONS

PLOT DRIVER: NCDOT_pdf_color_eng_100.plt PENTABLE: NCDOT_permits.tbl
USER: bsteffen DATE: 3/11/2011 TIME: 12:22:32 PM SCALE: 1:100
FILE: Mktg_Charlotte\Charlotte_Trans_Design_Build\Lane_I-3803B_I-85_Widening\I-3803B\Hydraulics\PERMITS_Environmental\Drawings\I3803B_HYD_PRM_PLANSHEETS.dgn

HDR Engineering, Inc. of the Carolinas
3733 National Drive, Suite 207 Raleigh, N.C. 27612
N.C.B.E.L.S. License Number: F-0116

THE LANE CONSTRUCTION CORPORATION

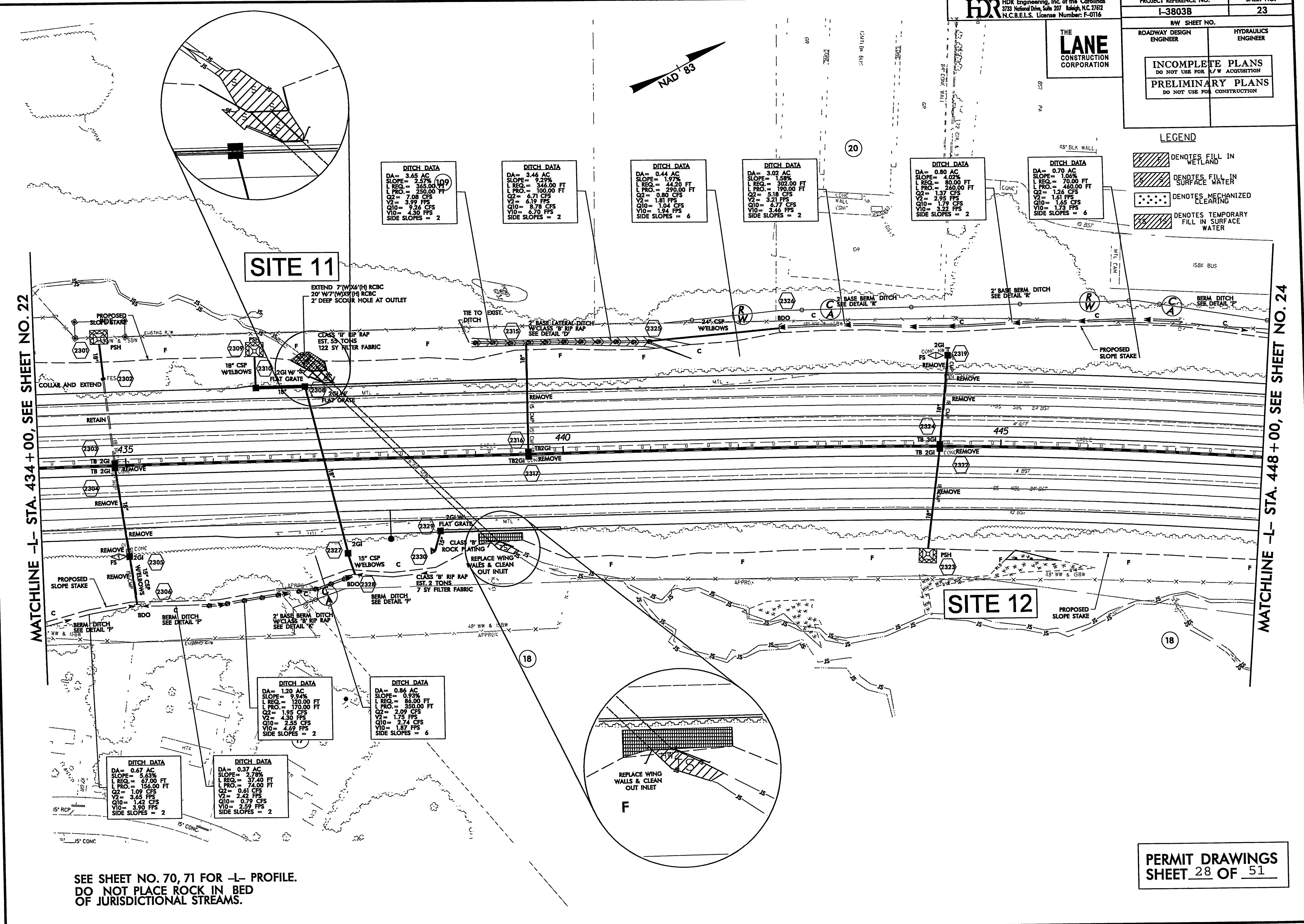
PROJECT REFERENCE NO.	SHEET NO.
I-3803B	23
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

LEGEND

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



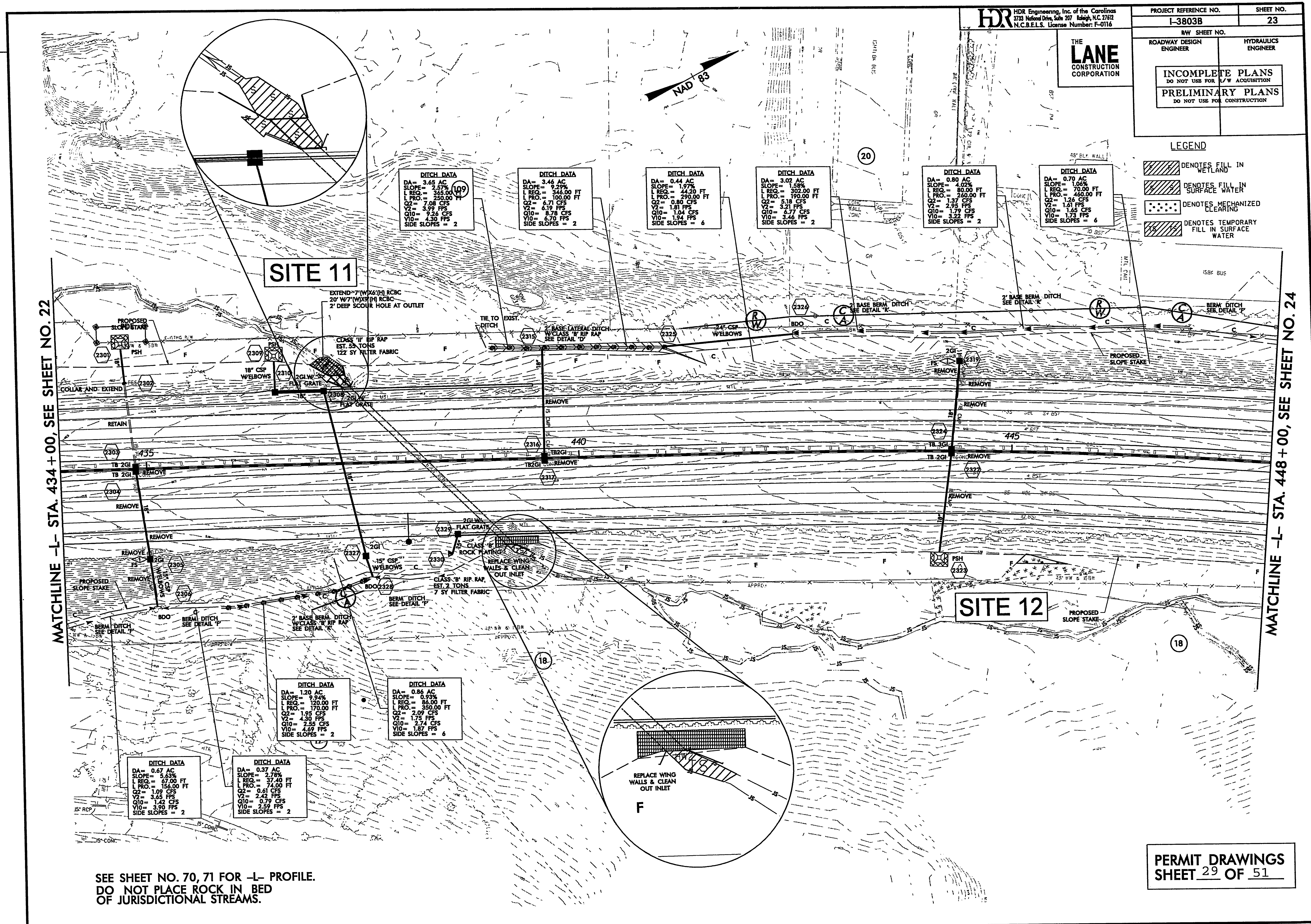
DITCH DATA	DA	SLOPE	L REQ.	L PRO.	Q2	V2	Q10	V10	SIDE SLOPES
	3.65 AC	2.57%	365.00 FT	250.00 FT	7.08 CFS	3.99 FPS	9.26 CFS	4.30 FPS	2
	3.46 AC	9.29%	346.00 FT	100.00 FT	6.71 CFS	6.19 FPS	8.78 CFS	6.70 FPS	2
	0.44 AC	1.97%	44.20 FT	290.00 FT	0.80 CFS	1.81 FPS	1.04 CFS	1.94 FPS	6
	3.02 AC	1.58%	302.00 FT	190.00 FT	5.18 CFS	3.21 FPS	6.77 CFS	3.46 FPS	2
	0.80 AC	4.02%	80.00 FT	260.00 FT	1.37 CFS	2.95 FPS	1.79 CFS	3.22 FPS	2
	0.70 AC	1.06%	70.00 FT	460.00 FT	1.26 CFS	1.61 FPS	1.65 CFS	1.73 FPS	6
	1.20 AC	9.94%	120.00 FT	170.00 FT	1.95 CFS	4.30 FPS	2.55 CFS	4.69 FPS	2
	0.86 AC	0.93%	86.00 FT	350.00 FT	2.09 CFS	1.75 FPS	2.74 CFS	1.87 FPS	6
	0.67 AC	5.63%	67.00 FT	156.00 FT	1.09 CFS	3.65 FPS	1.42 CFS	3.90 FPS	2
	0.37 AC	2.78%	37.40 FT	74.00 FT	0.61 CFS	2.42 FPS	0.79 CFS	2.59 FPS	2

SEE SHEET NO. 70, 71 FOR -L- PROFILE.
DO NOT PLACE ROCK IN BED OF JURISDICTIONAL STREAMS.

PERMIT DRAWINGS
SHEET 28 OF 51

REVISIONS

PLOT DRIVER: NCDOT_pdf_color_eng.100.plt
PENTABLE: NCDOT_permits_NOCON.tbl
USER: bsteffen DATE: 3/11/2011 TIME: 12:32:48 PM SCALE: 1:100
FILE: Mktg_Charlotte\Charlotte_Trans_Design_Build\Lane_I-3803B_I-85_Widening\I-3803B\Hydraulics\PERMITS_Environmental\Drawings\I3803B_HYD_PRM_PLANSHEETS.dgn



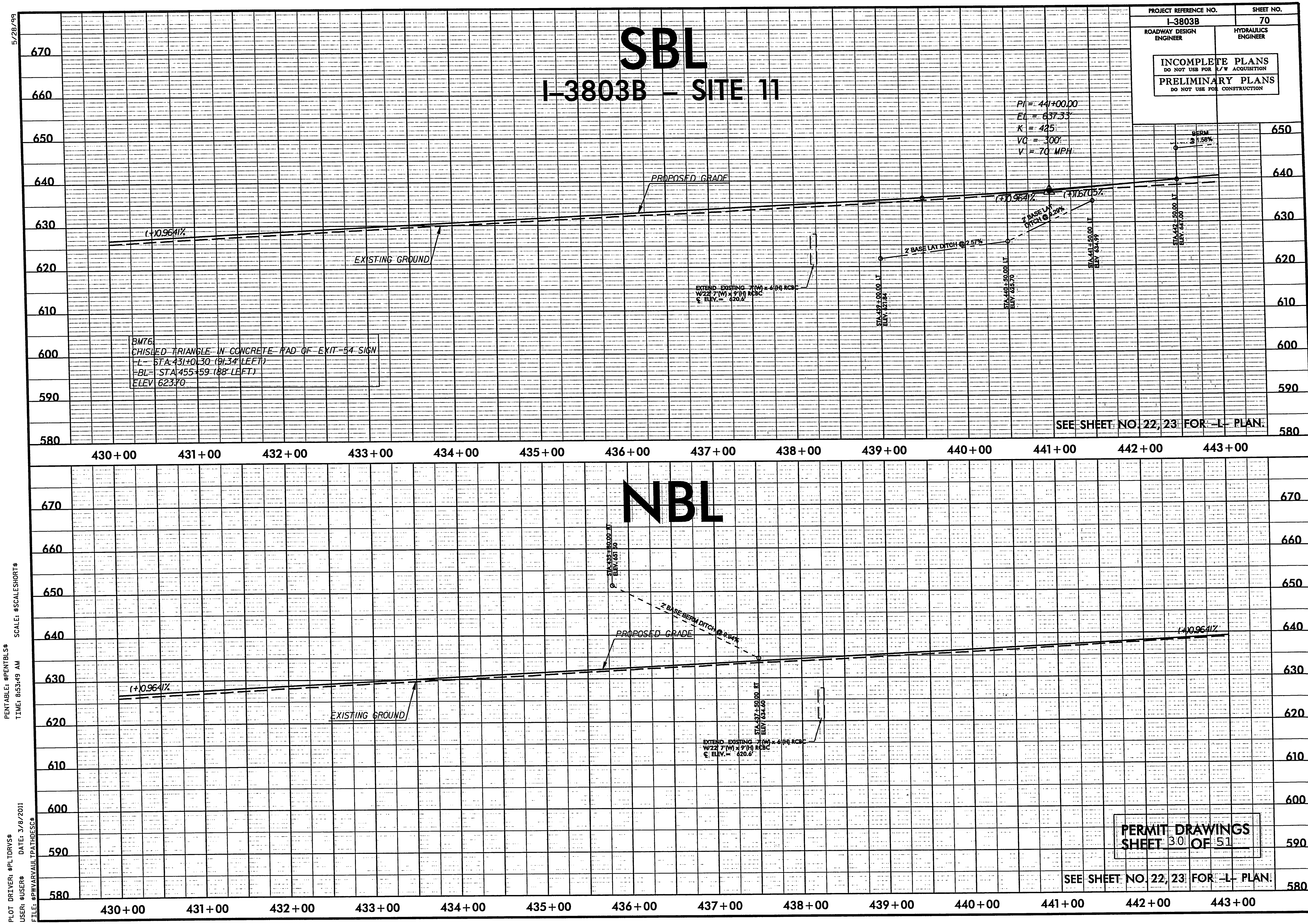
REVISIONS

PLOT DRIVER: NCDOT_pdf_color_eng_100.plt PENTABLE: NCDOT_permits.tbl
USER: bsteffen DATE: 3/11/2011 TIME: 12:23:11 PM SCALE: 1:100
FILE: Mktg_Charlotte\Charlotte_Trans_Design_Build\Lane_I-3803B_I-85_Widening\I-3803B\Hydraulics\PERMITS_Environmental\Drawings\I3803B_HYD_PRM_PLANSHEETS.dgn

PROJECT REFERENCE NO.	SHEET NO.
I-3803B	70
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



PERMIT DRAWINGS
SHEET 30 OF 51

5/28/99

PLOT DRIVER: $PLTDRVS$ DATE: 3/8/2011
USER: $USER$ TIME: 8:53:49 AM
FILE: $PWVARVAULTPATHDESC$
PENTABLE: $PENTBLS$ SCALE: $SCALESHORT$

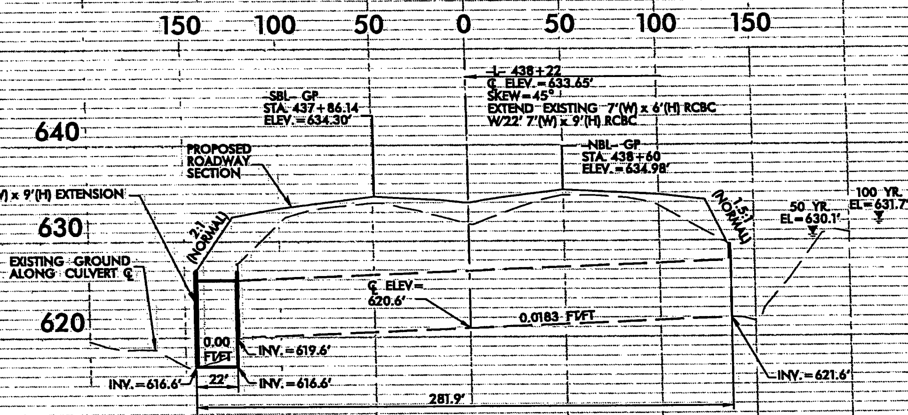
PROJECT REFERENCE NO.	SHEET NO.
I-3803B	

ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

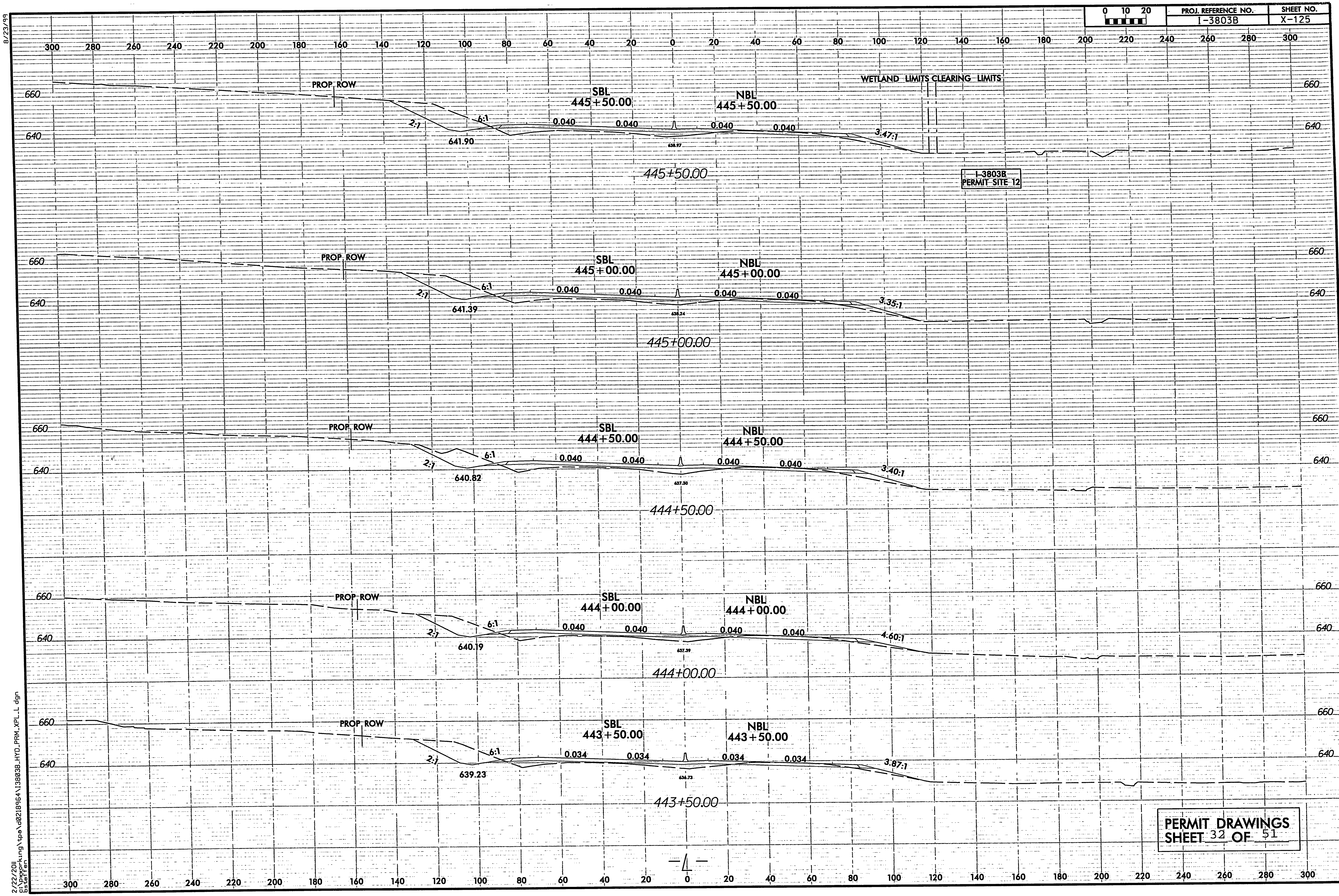
I-3803B SITE 11



PROFILE ALONG ℄ OF CULVERT

PERMIT DRAWINGS
SHEET 31 OF 51

PLOT DRIVER: $PLTDRVS$ DATE: 2/22/2011
USER: $USER$ TIME: 9:41:46 AM
FILE: $PWVARVAULTPATHDESC$
PENTABLE: $PENTBLS$ SCALE: $SCALESHORT$

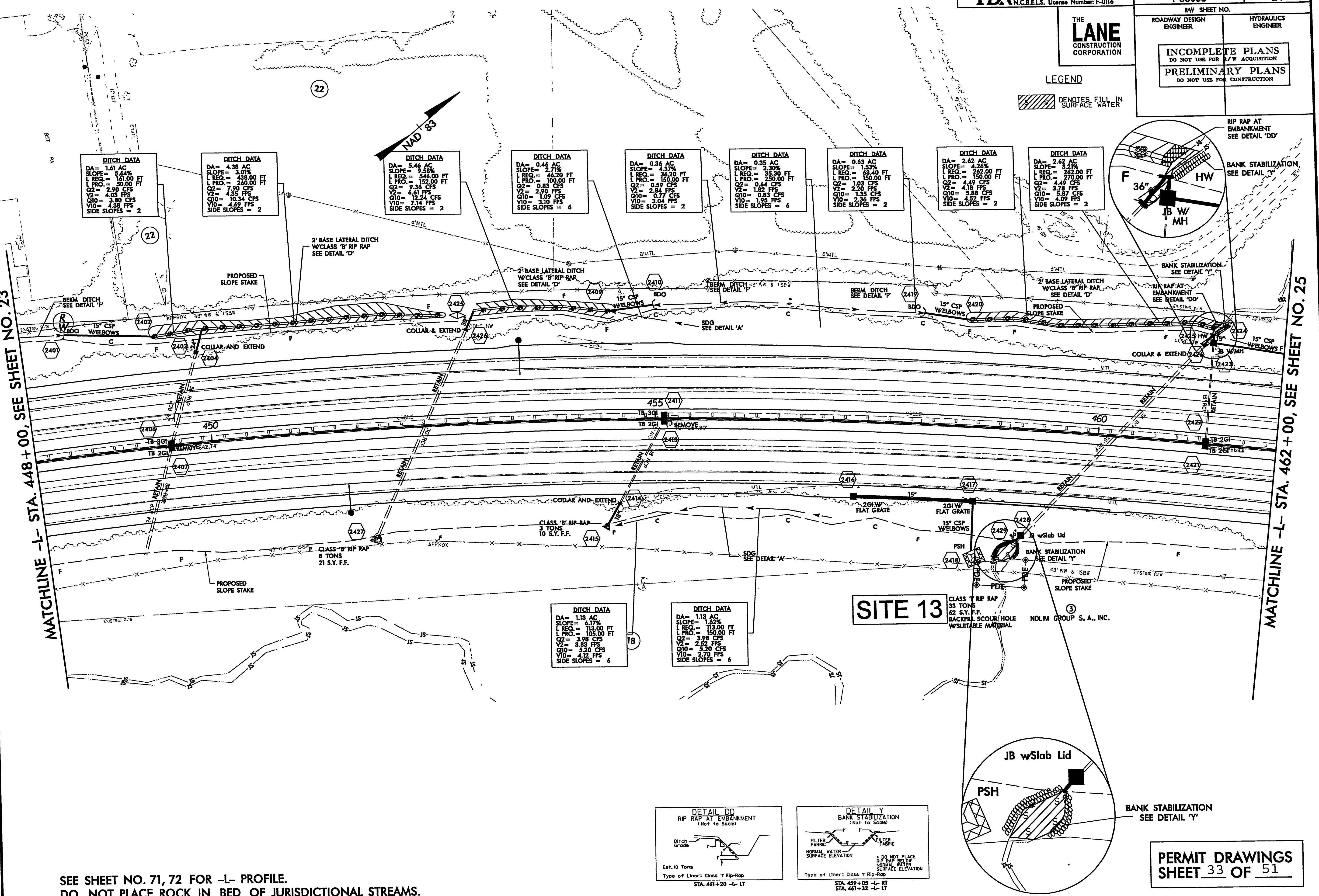


PROJ. REFERENCE NO.
I-3803B
SHEET NO.
X-125
0 10 20
8/23/99
WETLAND LIMITS
CLEARING LIMITS
I-3803B
PERMIT SITE 12
PROP ROW
SBL
445+50.00
NBL
445+50.00
6:1
2:1
0.040
3.47:1
641.90
445+50.00
SBL
445+00.00
NBL
445+00.00
3.35:1
641.39
445+00.00
SBL
444+50.00
NBL
444+50.00
3.40:1
640.82
444+50.00
SBL
444+00.00
NBL
444+00.00
4.60:1
640.19
444+00.00
SBL
443+50.00
NBL
443+50.00
0.034
3.87:1
639.23
443+50.00
660
640
300 280 260 240 220 200 180 160 140 120 100 80 60 40 20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300
PERMIT DRAWINGS
SHEET 32 OF 51
2/22/2011

HDR Engineering, Inc. of the Carolinas 3733 National Drive, Suite 207 Raleigh, N.C. 27612 N.C.B.E.L.S. License Number: F-0116	PROJECT REFERENCE NO.	SHEET NO.
	I-3803B	24
	R/W SHEET NO.	
THE LANE CONSTRUCTION CORPORATION	ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



SEE SHEET NO. 71, 72 FOR -L- PROFILE.
DO NOT PLACE ROCK IN BED OF JURISDICTIONAL STREAMS.

PERMIT DRAWINGS
SHEET 33 OF 51

REVISIONS

PLOT DRIVER: NCDOT_pdf_color_eng_100.plt PENTABLE: NCDOT_permits_NOCON.tbl
USER: bsteffen DATE: 3/11/2011 TIME: 12:33:18 PM SCALE: 1:100
FILE: Mktg_Charlotte\Charlotte_Trans_Design_Build\Lane_I-3803B_I-85_Widening\I-3803B\Hydraulics\PERMITS_Environmental\Drawings\I3803B_HYD_PRM_PLANSHEETS.dgn

HDR Engineering, Inc. of the Carolinas
3733 National Drive, Suite 207 Raleigh, N.C. 27612
N.C.B.E.L.S. License Number: F-0116

PROJECT REFERENCE NO.	SHEET NO.
I-3803B	24
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

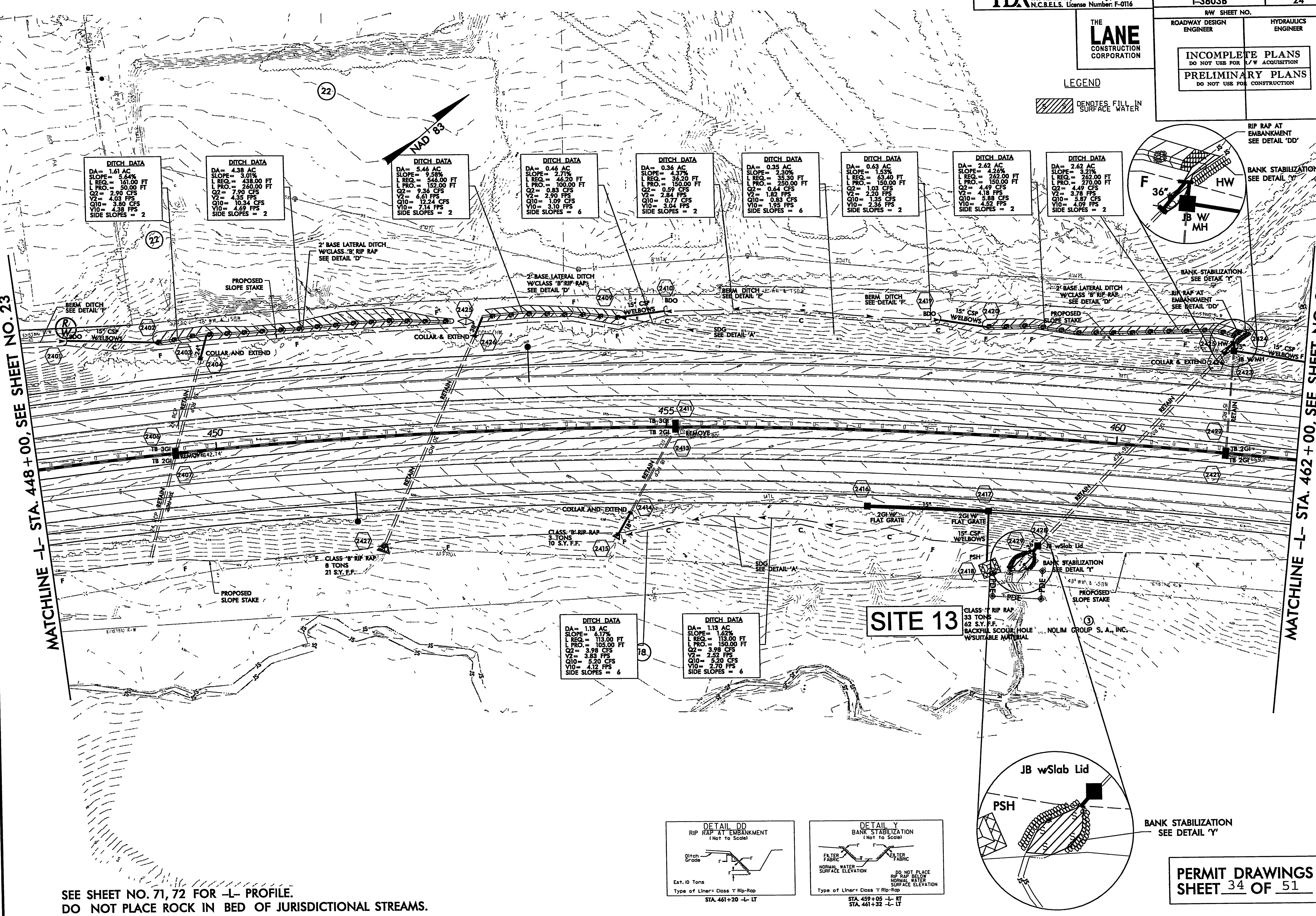
THE LANE CONSTRUCTION CORPORATION

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

LEGEND

DENOTES FILL IN SURFACE WATER



SEE SHEET NO. 71, 72 FOR -L- PROFILE.
DO NOT PLACE ROCK IN BED OF JURISDICTIONAL STREAMS.

PERMIT DRAWINGS
SHEET 34 OF 51

REVISIONS

PLOT DRIVER: NCDOT_pdf_color_eng_100.plt
USER: bsteffen DATE: 3/11/2011
FILE: Mktg_Charlotte\Charlotte_Trans_Design_Build\Lane_I-3803B_I-85_Widening\I-3803B\Hydraulics\PERMITS_Enviromental\Drawings\I3803B_HYD_PRM_PLANSHEETS.dgn
PENTABLE: NCDOT_permits.tbl
TIME: 12:24:05 PM SCALE: 1:100

HDR Engineering, Inc. of the Carolinas
3733 National Drive, Suite 207 Raleigh, N.C. 27612
N.C.B.E.L.S. License Number: F-0116

THE LANE CONSTRUCTION CORPORATION

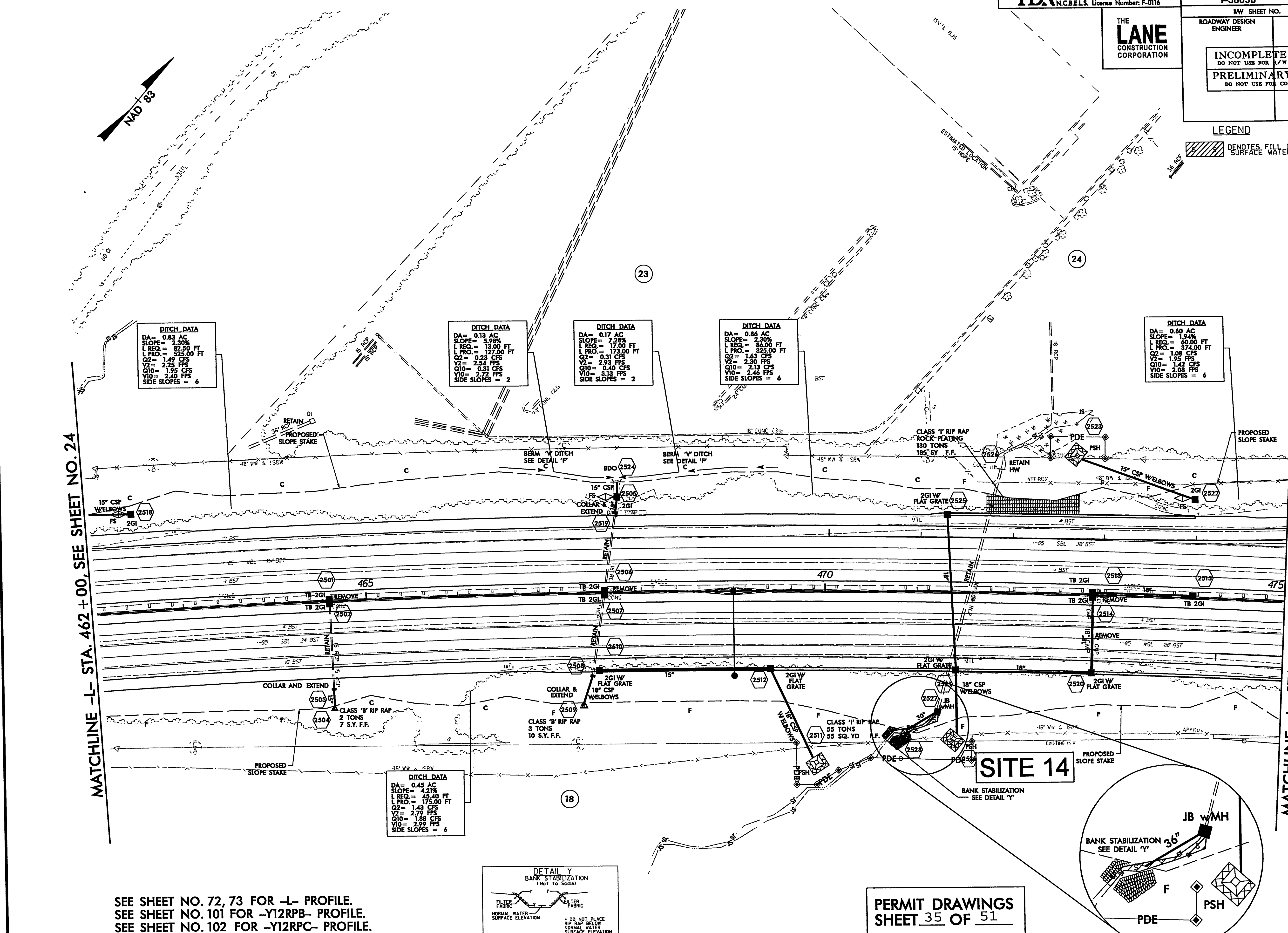
PROJECT REFERENCE NO.	SHEET NO.
I-3803B	25
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

LEGEND

DENOTES FILL IN SURFACE WATER



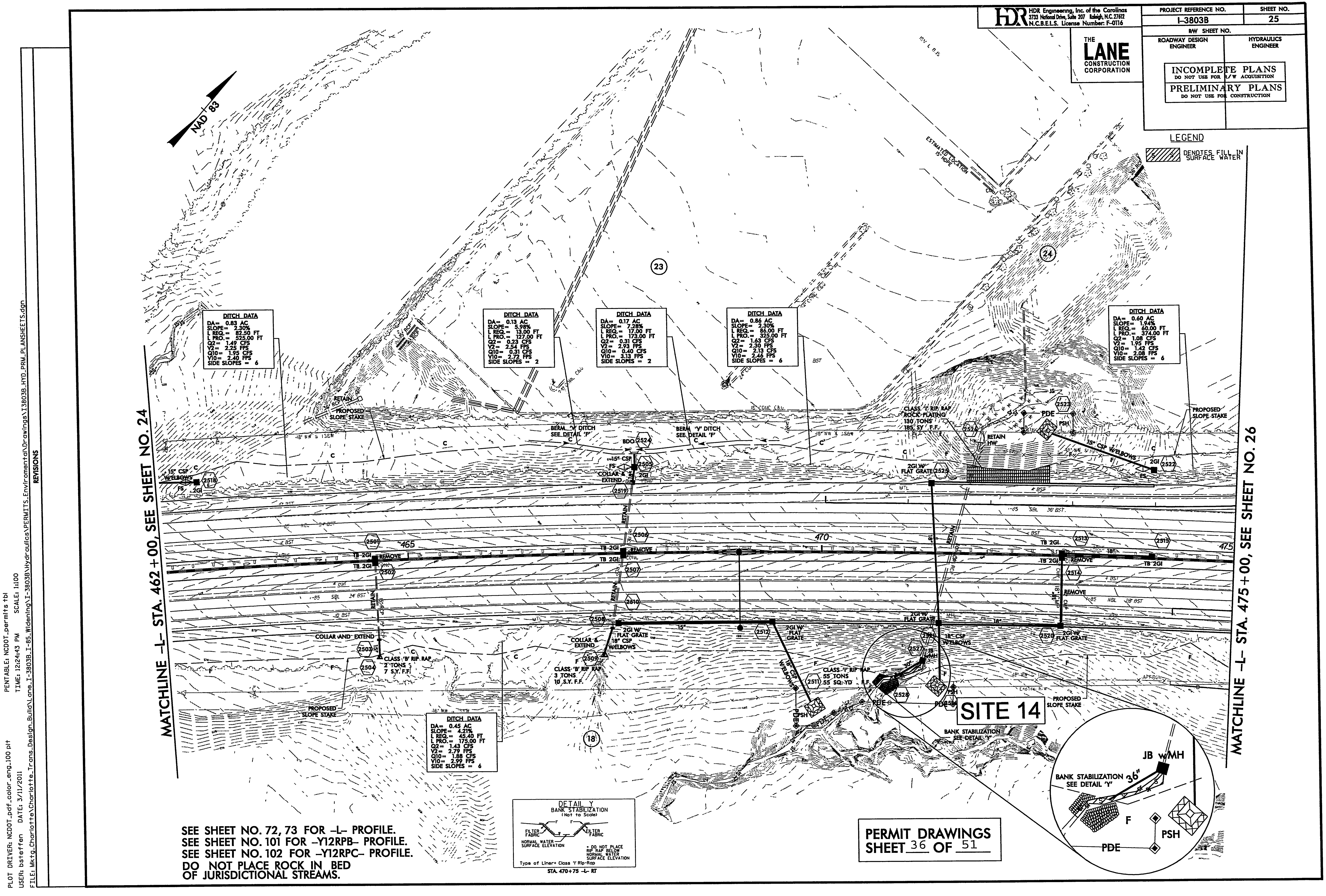
DETAIL Y
BANK STABILIZATION
(Not to Scale)
FILTER FABRIC
NORMAL WATER SURFACE ELEVATION
* DO NOT PLACE RIP RAP BELOW NORMAL WATER SURFACE ELEVATION
Type of Liner= Class 'I' Rip-Rap
STA. 470+75 -L- RT

SEE SHEET NO. 72, 73 FOR -L- PROFILE.
SEE SHEET NO. 101 FOR -Y12RPB- PROFILE.
SEE SHEET NO. 102 FOR -Y12RPC- PROFILE.
DO NOT PLACE ROCK IN BED OF JURISDICTIONAL STREAMS.

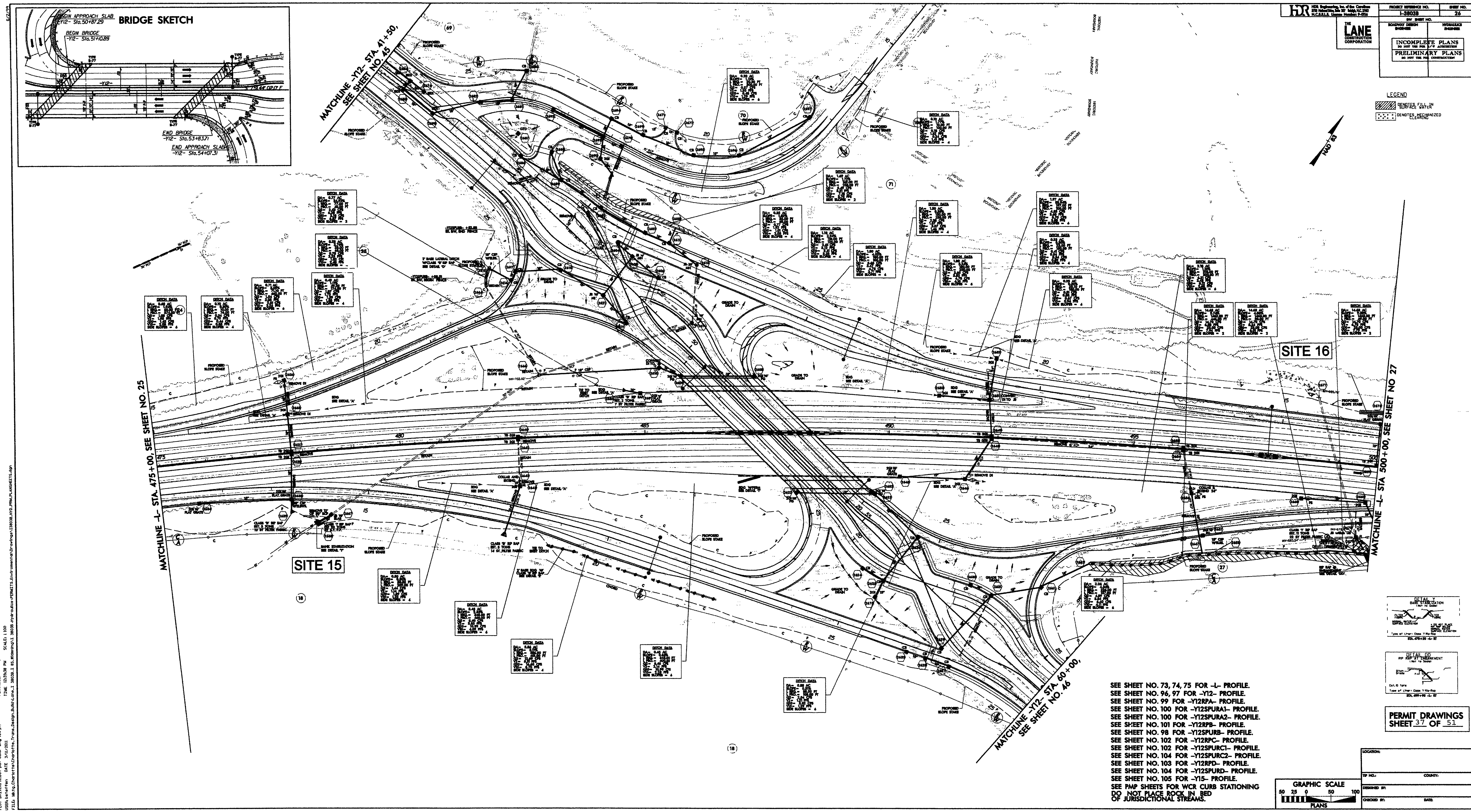
PERMIT DRAWINGS
SHEET 35 OF 51

REVISIONS

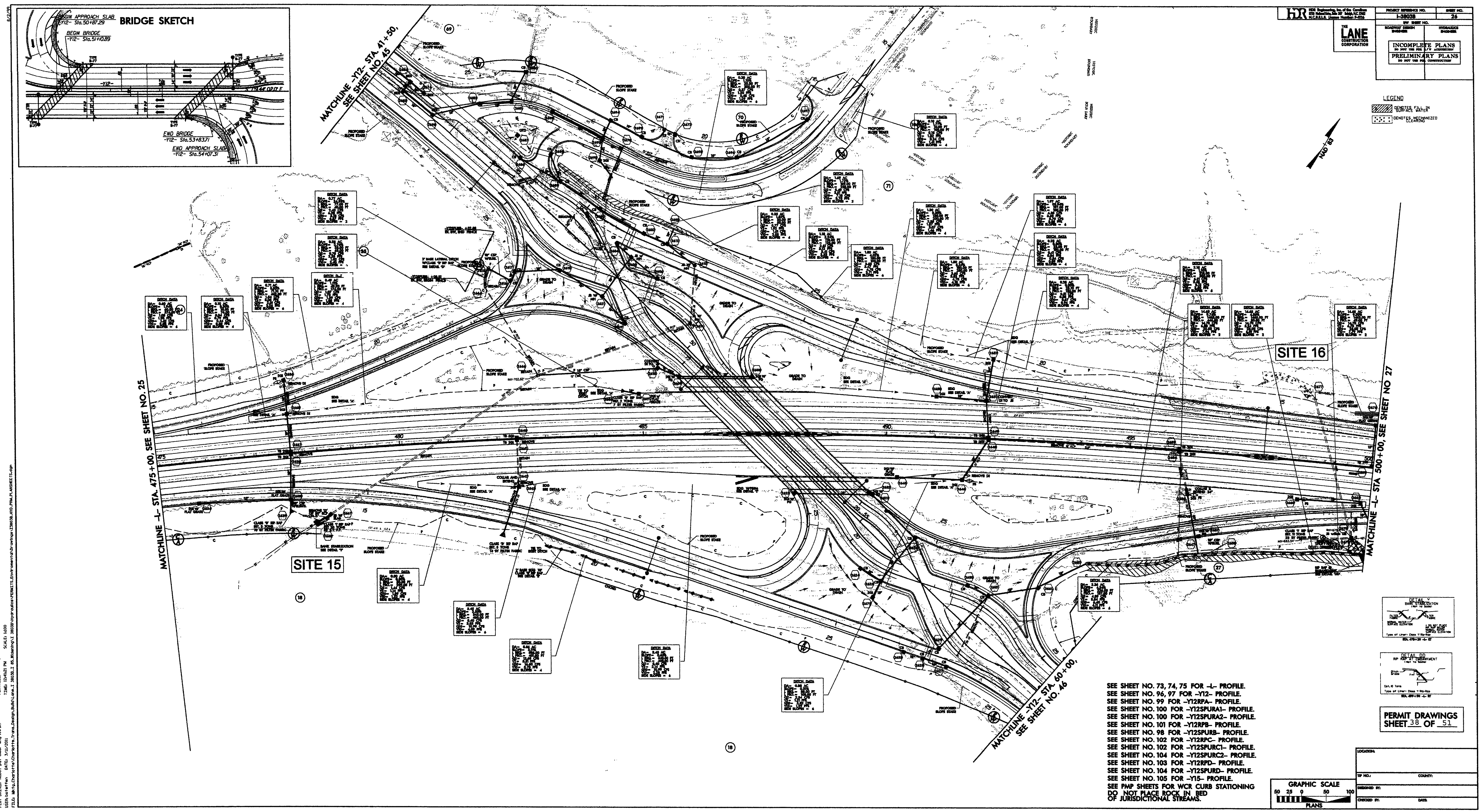
PLOT DRIVER: NCDOT_pdf_color_eng_100.plt PENTABLE: NCDOT_permits_NOCON.tbl
USER: bsteffen DATE: 3/11/2011 TIME: 12:33:51 PM SCALE: 1:100
FILE: Mktg_Charlotte\Charlotte_Trans_Design_Build\Lane_I-3803B_I-85_Widening\I-3803B\Hydraulics\PERMITS_Enviromental\Drawings\I3803B_HYD_PRM_PLANSHEETS.dgn



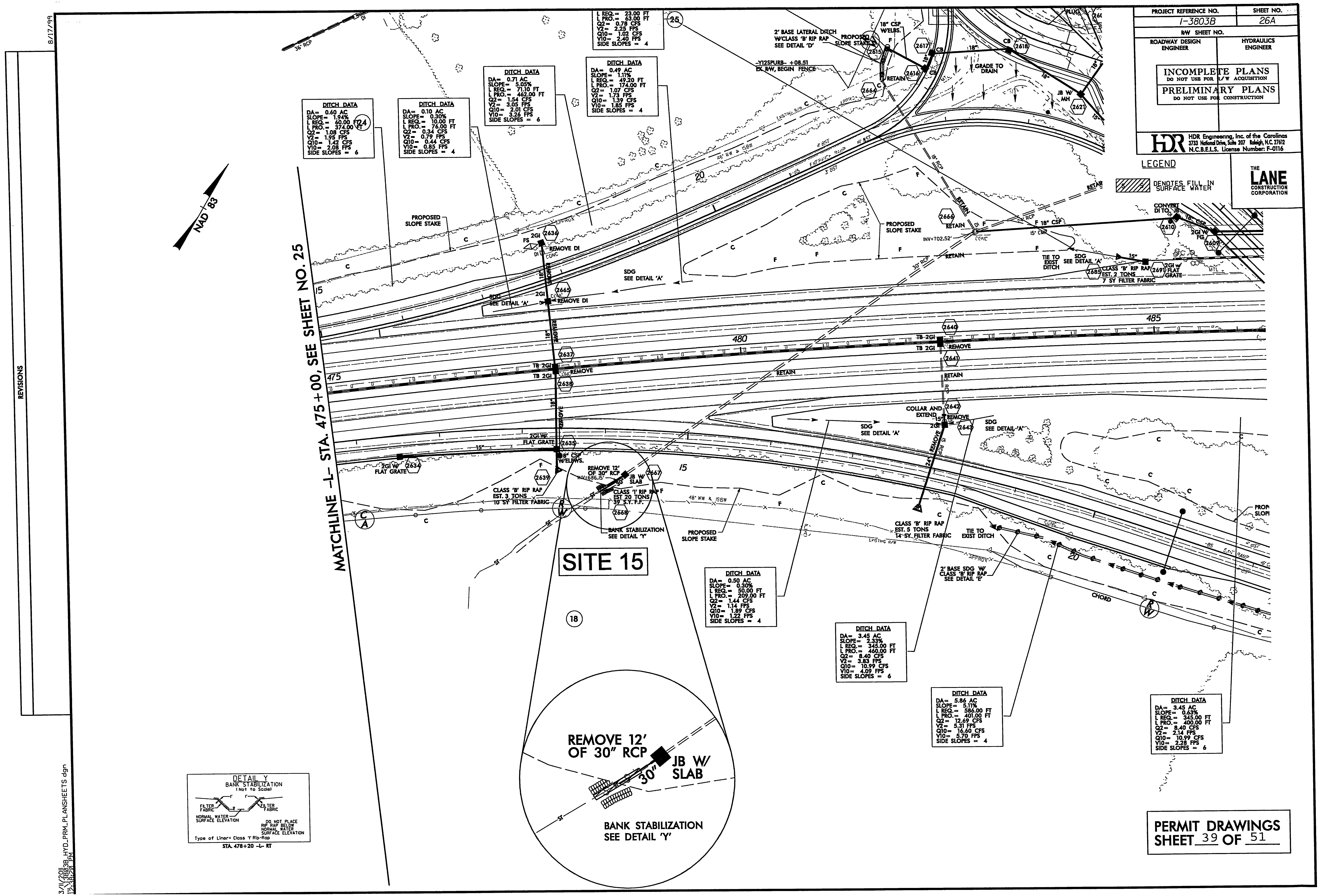
HDR Engineering, Inc. of the Carolinas
3733 National Drive, Suite 207 Raleigh, N.C. 27612
N.C.B.E.L.S. License Number: F-0116
PROJECT REFERENCE NO. I-3803B
SHEET NO. 25
R/W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
THE LANE CONSTRUCTION CORPORATION
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
LEGEND
DENOTES FILL IN SURFACE WATER
NAD 83
MATCHLINE -L- STA. 462+00, SEE SHEET NO. 24
MATCHLINE -L- STA. 475+00, SEE SHEET NO. 26
DITCH DATA
DA= 0.83 AC
SLOPE= 2.30%
L REQ.= 82.50 FT
L PRO.= 525.00 FT
Q2= 1.49 CFS
V2= 2.25 FPS
Q10= 1.95 CFS
V10= 2.40 FPS
SIDE SLOPES = 6
DITCH DATA
DA= 0.13 AC
SLOPE= 5.98%
L REQ.= 13.00 FT
L PRO.= 127.00 FT
Q2= 0.23 CFS
V2= 2.54 FPS
Q10= 0.31 CFS
V10= 2.72 FPS
SIDE SLOPES = 2
DITCH DATA
DA= 0.17 AC
SLOPE= 7.28%
L REQ.= 17.00 FT
L PRO.= 173.00 FT
Q2= 0.31 CFS
V2= 2.93 FPS
Q10= 0.40 CFS
V10= 3.13 FPS
SIDE SLOPES = 2
DITCH DATA
DA= 0.86 AC
SLOPE= 2.30%
L REQ.= 86.00 FT
L PRO.= 325.00 FT
Q2= 1.63 CFS
V2= 2.30 FPS
Q10= 2.13 CFS
V10= 2.46 FPS
SIDE SLOPES = 6
DITCH DATA
DA= 0.60 AC
SLOPE= 1.94%
L REQ.= 60.00 FT
L PRO.= 374.00 FT
Q2= 1.08 CFS
V2= 1.95 FPS
Q10= 1.42 CFS
V10= 2.08 FPS
SIDE SLOPES = 6
DITCH DATA
DA= 0.45 AC
SLOPE= 4.21%
L REQ.= 45.40 FT
L PRO.= 175.00 FT
Q2= 1.43 CFS
V2= 2.79 FPS
Q10= 1.88 CFS
V10= 2.99 FPS
SIDE SLOPES = 6
CLASS 'I' RIP RAP ROCK PLATING
130 TONS
185 SY F.F.
CLASS 'B' RIP RAP
2 TONS
7 S.Y. F.F.
CLASS 'B' RIP RAP
3 TONS
10 S.Y. F.F.
CLASS 'I' RIP RAP
55 TONS
55 SQ. YD. F.F.
BERM 'V' DITCH SEE DETAIL 'F'
PROPOSED SLOPE STAKE
COLLAR AND EXTEND
15" CSP W/ELBOWS
18" CSP W/ELBOWS
2GI W/ FLAT GRATE
TB 2GI
REMOVE
RETAIN
JB W/MH
PDE
PSH
SITE 14
BANK STABILIZATION SEE DETAIL 'Y'
DETAIL Y
BANK STABILIZATION
(Not to Scale)
FILTER FABRIC
NORMAL WATER SURFACE ELEVATION
* DO NOT PLACE RIP RAP BELOW NORMAL WATER SURFACE ELEVATION
Type of Liner= Class 'I' Rip-Rap
STA. 470+75 -L- RT
SEE SHEET NO. 72, 73 FOR -L- PROFILE.
SEE SHEET NO. 101 FOR -Y12RPB- PROFILE.
SEE SHEET NO. 102 FOR -Y12RPC- PROFILE.
DO NOT PLACE ROCK IN BED OF JURISDICTIONAL STREAMS.
PERMIT DRAWINGS
SHEET 36 OF 51
REVISIONS
PLOT DRIVER: NCDOT_pdf_color_eng_100.plt
PENTABLE: NCDOT_permits.tbl
USER: bsteffen DATE: 3/11/2011 TIME: 12:24:43 PM SCALE: 1:100



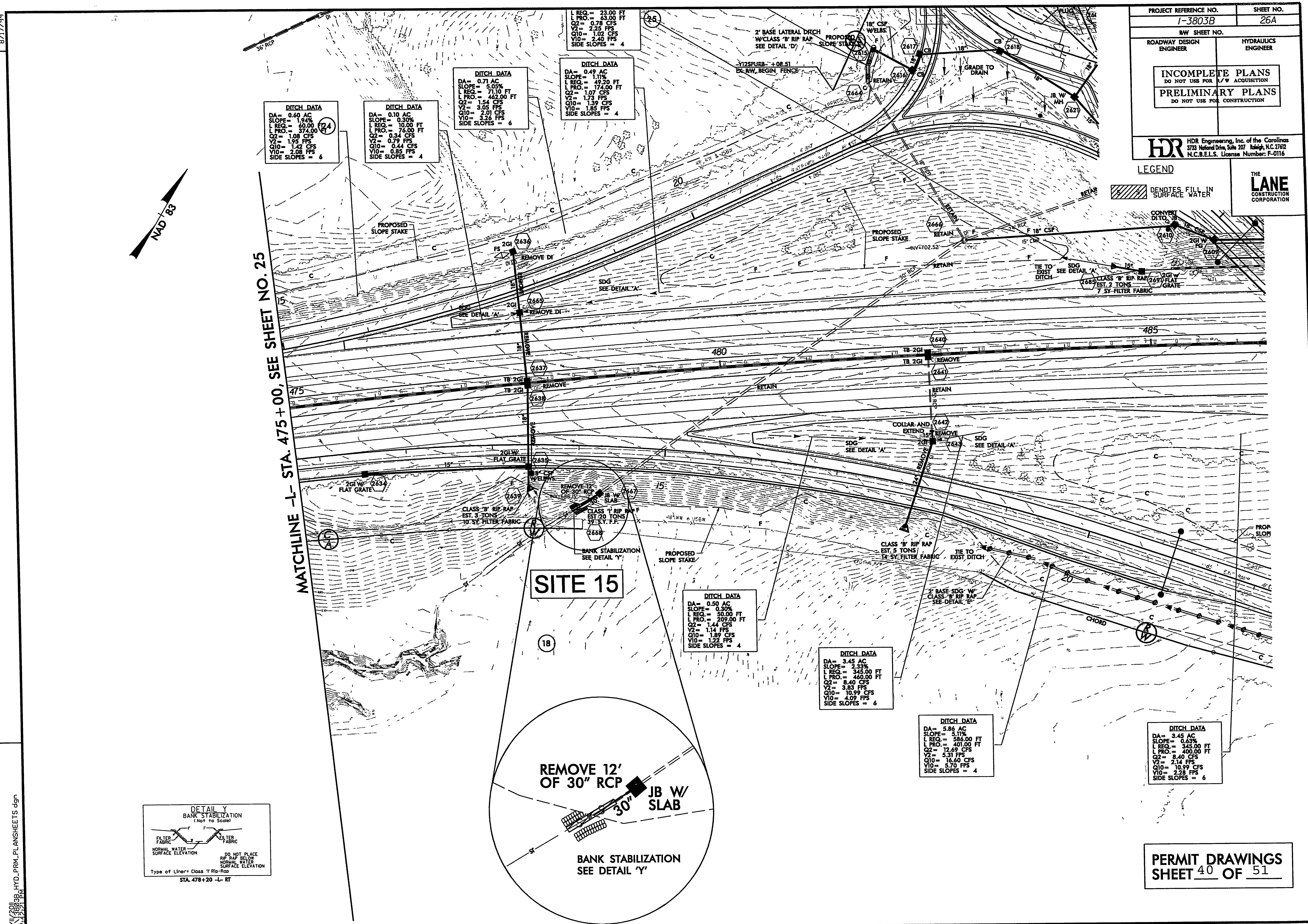
BRIDGE SKETCH
BEGIN APPROACH SLAB -Y12- Sta.50+87.29
BEGIN BRIDGE -Y12- Sta.51+02.89
END BRIDGE -Y12- Sta.53+83.71
END APPROACH SLAB -Y12- Sta.54+07.31
MATCHLINE -Y12- STA. 41+50, SEE SHEET NO. 45
MATCHLINE -L- STA. 475+00, SEE SHEET NO. 25
MATCHLINE -L- STA. 500+00, SEE SHEET NO. 27
MATCHLINE -Y12- STA. 60+00, SEE SHEET NO. 46
SITE 15
SITE 16
DITCH DATA
PROPOSED SLOPE STAKE
GRADE TO DRAIN
LEGEND
DENOTES FILL IN SURFACE WATER
DENOTES MECHANIZED CLEARING
NAD 83
PROJECT REFERENCE NO. I-3803B
SHEET NO. 26
LANE CONSTRUCTION CORPORATION
INCOMPLETE PLANS
PRELIMINARY PLANS
DETAIL 'F'
DETAIL 'DD'
SEE SHEET NO. 73, 74, 75 FOR -L- PROFILE.
SEE SHEET NO. 96, 97 FOR -Y12- PROFILE.
SEE SHEET NO. 99 FOR -Y12RPA- PROFILE.
SEE SHEET NO. 100 FOR -Y12SPURA1- PROFILE.
SEE SHEET NO. 100 FOR -Y12SPURA2- PROFILE.
SEE SHEET NO. 101 FOR -Y12RPB- PROFILE.
SEE SHEET NO. 98 FOR -Y12SPURB- PROFILE.
SEE SHEET NO. 102 FOR -Y12RPC- PROFILE.
SEE SHEET NO. 102 FOR -Y12SPURC1- PROFILE.
SEE SHEET NO. 104 FOR -Y12SPURC2- PROFILE.
SEE SHEET NO. 103 FOR -Y12RPD- PROFILE.
SEE SHEET NO. 104 FOR -Y12SPURD- PROFILE.
SEE SHEET NO. 105 FOR -Y15- PROFILE.
SEE PMP SHEETS FOR WCR CURB STATIONING
DO NOT PLACE ROCK IN BED OF JURISDICTIONAL STREAMS.
GRAPHIC SCALE
50 25 0 50 100
PLANS
PERMIT DRAWINGS SHEET 37 OF 51

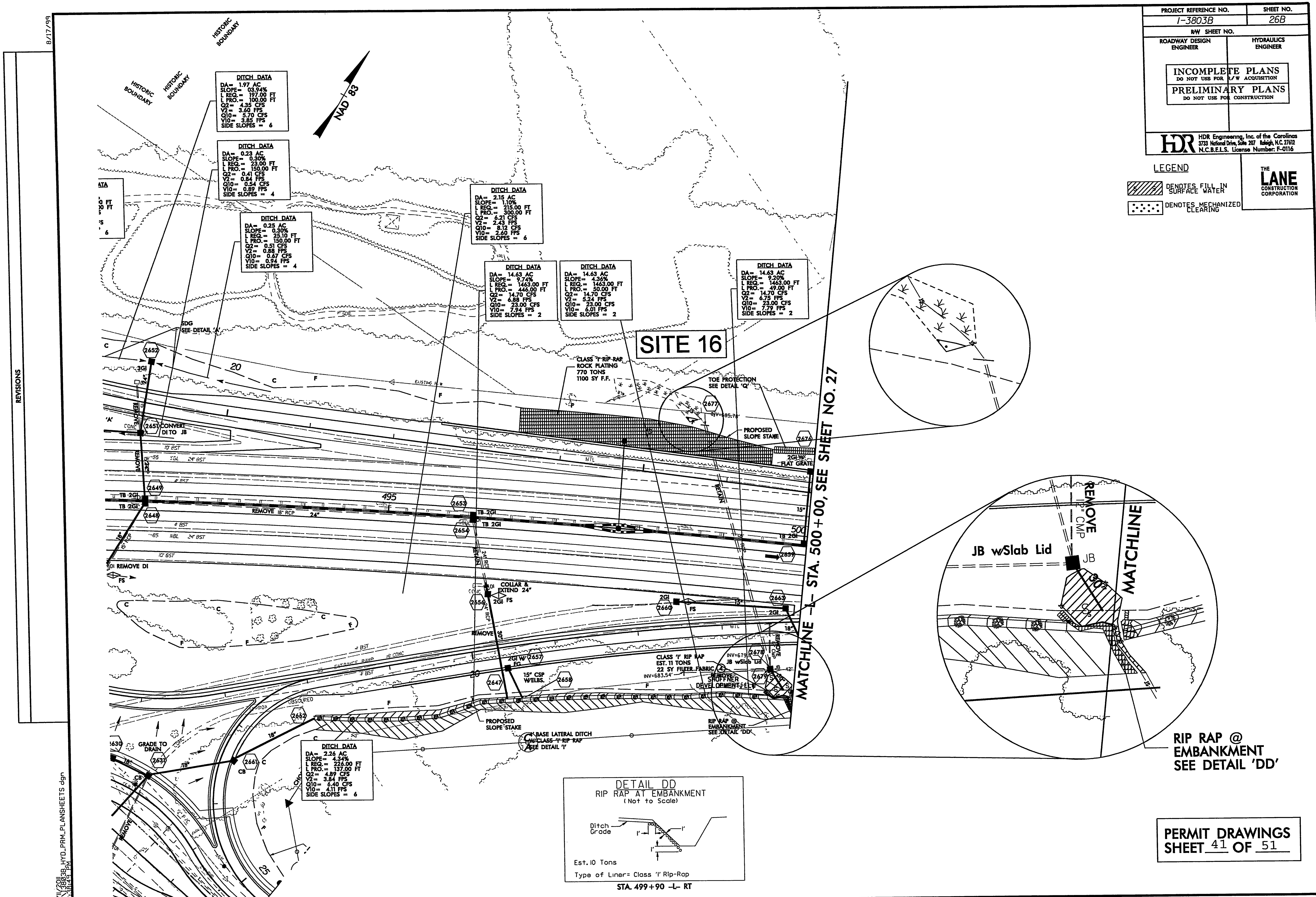


BRIDGE SKETCH
BEGIN APPROACH SLAB -Y12- Sta.50+87.29
BEGIN BRIDGE -Y12- Sta.51+10.89
END BRIDGE -Y12- Sta.53+83.71
END APPROACH SLAB -Y12- Sta.54+07.31
-Y12-
HDR
LANE CONSTRUCTION CORPORATION
PROJECT REFERENCE NO.
SHEET NO.
I-3802B
26
INCOMPLETE PLANS
PRELIMINARY PLANS
LEGEND
DENOTES FILL IN SURFACE WATER
DENOTES MECHANIZED CLEARING
NAD 83
MATCHLINE -Y12- STA. 41+50, SEE SHEET NO. 45
MATCHLINE -L- STA. 475+00, SEE SHEET NO. 25
MATCHLINE -L- STA. 500+00, SEE SHEET NO. 27
MATCHLINE -Y12- STA. 60+00, SEE SHEET NO. 46
SITE 15
SITE 16
DITCH DATA
PROPOSED SLOPE STAKE
GRADE TO DRAIN
SEE SHEET NO. 73, 74, 75 FOR -L- PROFILE.
SEE SHEET NO. 96, 97 FOR -Y12- PROFILE.
SEE SHEET NO. 99 FOR -Y12RPA- PROFILE.
SEE SHEET NO. 100 FOR -Y12SPURA1- PROFILE.
SEE SHEET NO. 100 FOR -Y12SPURA2- PROFILE.
SEE SHEET NO. 101 FOR -Y12RPB- PROFILE.
SEE SHEET NO. 98 FOR -Y12SPURB- PROFILE.
SEE SHEET NO. 102 FOR -Y12RPC- PROFILE.
SEE SHEET NO. 102 FOR -Y12SPURC1- PROFILE.
SEE SHEET NO. 104 FOR -Y12SPURC2- PROFILE.
SEE SHEET NO. 103 FOR -Y12RPD- PROFILE.
SEE SHEET NO. 104 FOR -Y12SPURD- PROFILE.
SEE SHEET NO. 105 FOR -Y15- PROFILE.
SEE PMP SHEETS FOR WCR CURB STATIONING
DO NOT PLACE ROCK IN BED OF JURISDICTIONAL STREAMS.
GRAPHIC SCALE
50 25 0 50 100
PLANS
PERMIT DRAWINGS
SHEET 38 OF 51
LOCATION:
TIP NO.:
COUNTY:
DESIGNED BY:
CHECKED BY:
DATE:

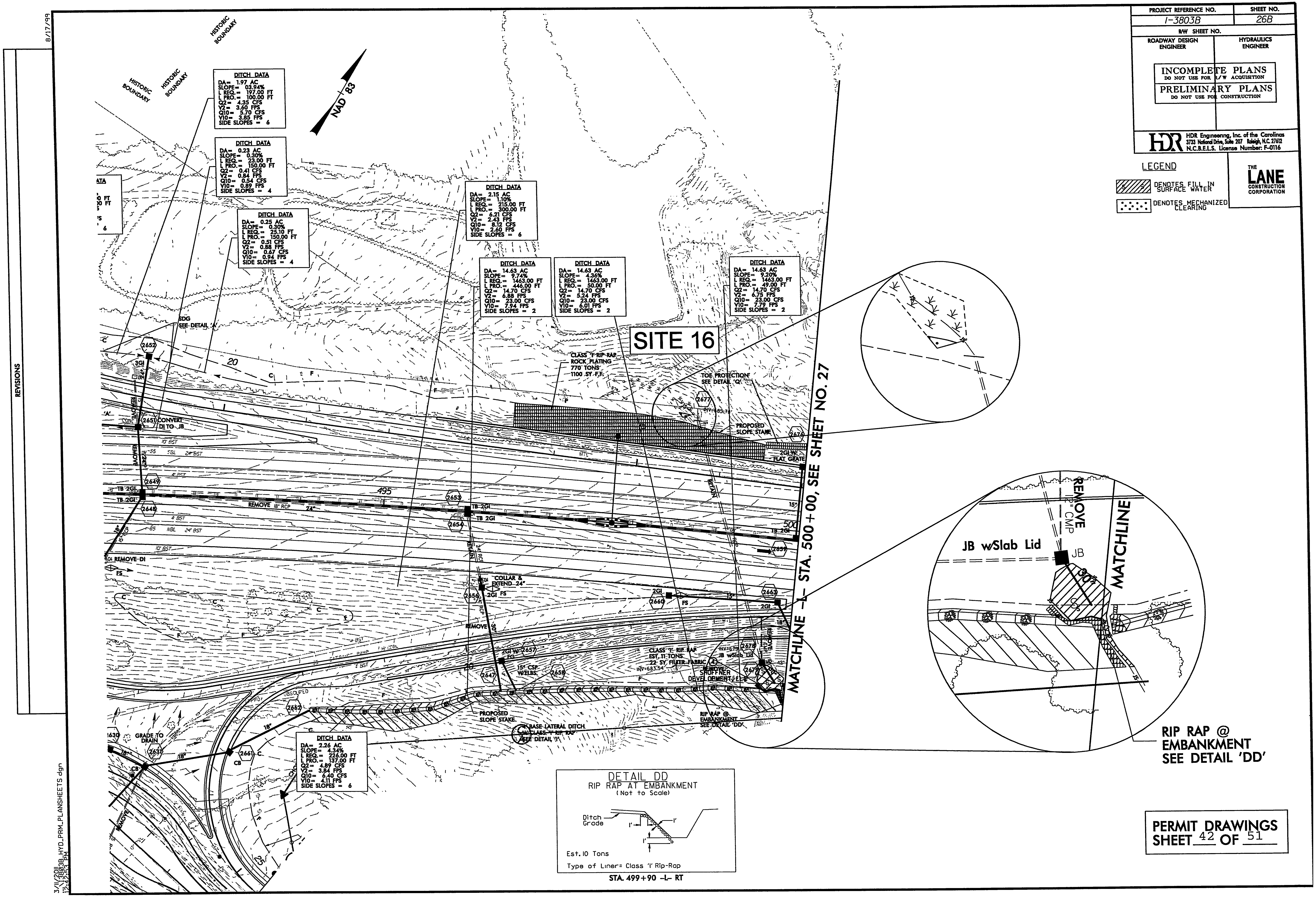


PROJECT REFERENCE NO. I-3803B
SHEET NO. 26A
R/W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION
HDR Engineering, Inc. of the Carolinas 3733 National Drive, Suite 207 Raleigh, N.C. 27612 N.C.B.E.L.S. License Number: F-0116
LEGEND
DENOTES FILL IN SURFACE WATER
THE LANE CONSTRUCTION CORPORATION
REVISIONS
8/17/99
NAD 83
MATCHLINE -L- STA. 475+00, SEE SHEET NO. 25
SITE 15
DITCH DATA
DA= 0.60 AC
SLOPE= 1.94%
L REQ.= 60.00 FT
L PRO.= 374.00 FT
Q2= 1.08 CFS
V2= 1.95 FPS
Q10= 1.42 CFS
V10= 2.08 FPS
SIDE SLOPES = 6
DITCH DATA
DA= 0.10 AC
SLOPE= 0.30%
L REQ.= 10.00 FT
L PRO.= 76.00 FT
Q2= 0.34 CFS
V2= 0.79 FPS
Q10= 0.44 CFS
V10= 0.85 FPS
SIDE SLOPES = 4
DITCH DATA
DA= 0.71 AC
SLOPE= 5.05%
L REQ.= 71.10 FT
L PRO.= 462.00 FT
Q2= 1.54 CFS
V2= 3.05 FPS
Q10= 2.01 CFS
V10= 3.26 FPS
SIDE SLOPES = 6
DITCH DATA
DA= 0.49 AC
SLOPE= 1.11%
L REQ.= 49.20 FT
L PRO.= 174.00 FT
Q2= 1.07 CFS
V2= 1.73 FPS
Q10= 1.39 CFS
V10= 1.85 FPS
SIDE SLOPES = 4
L REQ.= 23.00 FT
L PRO.= 63.00 FT
Q2= 0.78 CFS
V2= 2.25 FPS
Q10= 1.02 CFS
V10= 2.40 FPS
SIDE SLOPES = 4
DITCH DATA
DA= 0.50 AC
SLOPE= 0.30%
L REQ.= 50.00 FT
L PRO.= 209.00 FT
Q2= 1.44 CFS
V2= 1.14 FPS
Q10= 1.89 CFS
V10= 1.22 FPS
SIDE SLOPES = 4
DITCH DATA
DA= 3.45 AC
SLOPE= 2.33%
L REQ.= 345.00 FT
L PRO.= 460.00 FT
Q2= 8.40 CFS
V2= 3.83 FPS
Q10= 10.99 CFS
V10= 4.09 FPS
SIDE SLOPES = 6
DITCH DATA
DA= 5.86 AC
SLOPE= 5.11%
L REQ.= 586.00 FT
L PRO.= 401.00 FT
Q2= 12.69 CFS
V2= 5.31 FPS
Q10= 16.60 CFS
V10= 5.70 FPS
SIDE SLOPES = 4
DITCH DATA
DA= 3.45 AC
SLOPE= 0.63%
L REQ.= 345.00 FT
L PRO.= 400.00 FT
Q2= 8.40 CFS
V2= 2.14 FPS
Q10= 10.99 CFS
V10= 2.28 FPS
SIDE SLOPES = 6
2' BASE LATERAL DITCH W/CLASS 'B' RIP RAP SEE DETAIL 'D'
-Y12SPURB- +08.51 EX R/W, BEGIN FENCE
PROPOSED SLOPE STAKE
SDG SEE DETAIL 'A'
REMOVE DI
RETAIN
REMOVE
GRADE TO DRAIN
JB W/ MH
CONVERT DI TO JB
TIE TO EXIST DITCH
CLASS 'B' RIP RAP EST. 2 TONS 7 SY FILTER FABRIC
2GI W/ FLAT GRATE
COLLAR AND EXTEND
CLASS 'B' RIP RAP EST. 3 TONS 10 SY FILTER FABRIC
REMOVE 12' OF 30" RCP
JB W/ SLAB
CLASS 'I' RIP RAP EST 20 TONS 39 S.Y. F.F.
BANK STABILIZATION SEE DETAIL 'Y'
CLASS 'B' RIP RAP EST. 5 TONS 14 SY FILTER FABRIC
2' BASE SDG W/ CLASS 'B' RIP RAP SEE DETAIL 'E'
CHORD
DETAIL Y
BANK STABILIZATION
(Not to Scale)
FILTER FABRIC
NORMAL WATER SURFACE ELEVATION
DO NOT PLACE RIP RAP BELOW NORMAL WATER SURFACE ELEVATION
Type of Liner= Class 'I' Rip-Rap
STA. 478+20 -L- RT
3/11/2011
I-3803B_HYD_PRM_PLANSHEETS.dgn
PERMIT DRAWINGS
SHEET 39 OF 51


PROJECT REFERENCE NO. I-3803B
SHEET NO. 26A
R/W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION
HDR Engineering, Inc. of the Carolinas 3733 National Drive, Suite 207 Raleigh, N.C. 27612 N.C.B.E.L.S. License Number: F-0116
LEGEND
DENOTES FILL IN SURFACE WATER
THE LANE CONSTRUCTION CORPORATION
MATCHLINE -L- STA. 475+00, SEE SHEET NO. 25
NAD 83
DITCH DATA DA= 0.60 AC SLOPE= 1.94% L REQ.= 60.00 FT L PRO.= 374.00 FT Q2= 1.08 CFS V2= 1.95 FPS Q10= 1.42 CFS V10= 2.08 FPS SIDE SLOPES = 6
DITCH DATA DA= 0.10 AC SLOPE= 0.30% L REQ.= 10.00 FT L PRO.= 76.00 FT Q2= 0.34 CFS V2= 0.79 FPS Q10= 0.44 CFS V10= 0.85 FPS SIDE SLOPES = 4
DITCH DATA DA= 0.71 AC SLOPE= 5.05% L REQ.= 71.10 FT L PRO.= 462.00 FT Q2= 1.54 CFS V2= 3.05 FPS Q10= 2.01 CFS V10= 3.26 FPS SIDE SLOPES = 6
DITCH DATA DA= 0.49 AC SLOPE= 1.11% L REQ.= 49.20 FT L PRO.= 174.00 FT Q2= 1.07 CFS V2= 1.73 FPS Q10= 1.39 CFS V10= 1.85 FPS SIDE SLOPES = 4
L REQ.= 23.00 FT L PRO.= 63.00 FT Q2= 0.78 CFS V2= 2.25 FPS Q10= 1.02 CFS V10= 2.40 FPS SIDE SLOPES = 4
DITCH DATA DA= 0.50 AC SLOPE= 0.30% L REQ.= 50.00 FT L PRO.= 209.00 FT Q2= 1.44 CFS V2= 1.14 FPS Q10= 1.89 CFS V10= 1.22 FPS SIDE SLOPES = 4
DITCH DATA DA= 3.45 AC SLOPE= 2.33% L REQ.= 345.00 FT L PRO.= 460.00 FT Q2= 8.40 CFS V2= 3.83 FPS Q10= 10.99 CFS V10= 4.09 FPS SIDE SLOPES = 6
DITCH DATA DA= 5.86 AC SLOPE= 5.11% L REQ.= 586.00 FT L PRO.= 401.00 FT Q2= 12.69 CFS V2= 5.31 FPS Q10= 16.60 CFS V10= 5.70 FPS SIDE SLOPES = 4
DITCH DATA DA= 3.45 AC SLOPE= 0.63% L REQ.= 345.00 FT L PRO.= 400.00 FT Q2= 8.40 CFS V2= 2.14 FPS Q10= 10.99 CFS V10= 2.28 FPS SIDE SLOPES = 6
2' BASE LATERAL DITCH W/CLASS 'B' RIP RAP SEE DETAIL 'D'
GRADE TO DRAIN
PROPOSED SLOPE STAKE
REMOVE DI
SDG SEE DETAIL 'A'
RETAIN
TIE TO EXIST DITCH
CLASS 'B' RIP RAP EST. 2 TONS 7 SY FILTER FABRIC
2GI W/ FLAT GRATE
COLLAR AND EXTEND
CLASS 'B' RIP RAP EST. 3 TONS 10 SY FILTER FABRIC
REMOVE 12' OF 30" RCP
JB W/ SLAB
CLASS 'I' RIP RAP EST 20 TONS 39 S.Y. F.F.
BANK STABILIZATION SEE DETAIL 'Y'
SITE 15
CLASS 'B' RIP RAP EST. 5 TONS 14 SY FILTER FABRIC
2' BASE SDG W/ CLASS 'B' RIP RAP SEE DETAIL 'E'
CHORD
REMOVE 12' OF 30" RCP
JB W/ SLAB
BANK STABILIZATION SEE DETAIL 'Y'
DETAIL Y BANK STABILIZATION (Not to Scale)
FILTER FABRIC
NORMAL WATER SURFACE ELEVATION
DO NOT PLACE RIP RAP BELOW NORMAL WATER SURFACE ELEVATION
Type of Liner= Class 'I' Rip-Rap
STA. 478+20 -L- RT
REVISIONS
8/17/99
3/11/2011 I3803B_HYD_PRM_PLANSHEETS.dgn
PERMIT DRAWINGS SHEET 40 OF 51



PROJECT REFERENCE NO. I-3803B
SHEET NO. 26B
R/W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
HDR Engineering, Inc. of the Carolinas
3733 National Drive, Suite 207 Raleigh, N.C. 27612
N.C.B.E.L.S. License Number: F-0116
THE LANE CONSTRUCTION CORPORATION
LEGEND
DENOTES FILL IN SURFACE WATER
DENOTES MECHANIZED CLEARING
8/17/99
REVISIONS
HISTORIC BOUNDARY
NAD 83
DITCH DATA
DA= 1.97 AC
SLOPE= 03.94%
L REQ.= 197.00 FT
L PRO.= 100.00 FT
Q2= 4.35 CFS
V2= 3.60 FPS
Q10= 5.70 CFS
V10= 3.85 FPS
SIDE SLOPES = 6
DITCH DATA
DA= 0.23 AC
SLOPE= 0.30%
L REQ.= 23.00 FT
L PRO.= 150.00 FT
Q2= 0.41 CFS
V2= 0.84 FPS
Q10= 0.54 CFS
V10= 0.89 FPS
SIDE SLOPES = 4
DITCH DATA
DA= 0.25 AC
SLOPE= 0.30%
L REQ.= 25.10 FT
L PRO.= 150.00 FT
Q2= 0.51 CFS
V2= 0.88 FPS
Q10= 0.67 CFS
V10= 0.94 FPS
SIDE SLOPES = 4
DITCH DATA
DA= 2.15 AC
SLOPE= 1.10%
L REQ.= 215.00 FT
L PRO.= 300.00 FT
Q2= 6.21 CFS
V2= 2.43 FPS
Q10= 8.12 CFS
V10= 2.60 FPS
SIDE SLOPES = 6
DITCH DATA
DA= 14.63 AC
SLOPE= 9.74%
L REQ.= 1463.00 FT
L PRO.= 446.00 FT
Q2= 14.70 CFS
V2= 6.88 FPS
Q10= 23.00 CFS
V10= 7.94 FPS
SIDE SLOPES = 2
DITCH DATA
DA= 14.63 AC
SLOPE= 4.36%
L REQ.= 1463.00 FT
L PRO.= 50.00 FT
Q2= 14.70 CFS
V2= 5.24 FPS
Q10= 23.00 CFS
V10= 6.01 FPS
SIDE SLOPES = 2
DITCH DATA
DA= 14.63 AC
SLOPE= 9.20%
L REQ.= 1463.00 FT
L PRO.= 49.00 FT
Q2= 14.70 CFS
V2= 6.75 FPS
Q10= 23.00 CFS
V10= 7.79 FPS
SIDE SLOPES = 2
DITCH DATA
DA= 2.26 AC
SLOPE= 4.34%
L REQ.= 226.00 FT
L PRO.= 137.00 FT
Q2= 4.89 CFS
V2= 3.84 FPS
Q10= 6.40 CFS
V10= 4.11 FPS
SIDE SLOPES = 6
SITE 16
SDG SEE DETAIL 'A'
CLASS 'I' RIP RAP ROCK PLATING 770 TONS 1100 SY F.F.
TOE PROTECTION SEE DETAIL 'Q'
PROPOSED SLOPE STAKE
2GI W/ FLAT GRATE
CONVERT DI TO JB
REMOVE
REMOVE 18" RCP
TB 2GI
REMOVE DI
COLLAR & EXTEND 24"
2GI W/ FG
15" CSP W/ELBS.
CLASS 'I' RIP RAP EST. 11 TONS 22 SY FILTER FABRIC
JB w/Slab Lid
REMOVE SHOFFNER DEVELOPMENT SIGN
RIP RAP @ EMBANKMENT SEE DETAIL 'DD'
BASE LATERAL DITCH W/CLASS 'I' RIP RAP SEE DETAIL 'I'
GRADE TO DRAIN
MATCHLINE -L- STA. 500+00, SEE SHEET NO. 27
REMOVE 18" CMP
JB w/Slab Lid
MATCHLINE
RIP RAP @ EMBANKMENT SEE DETAIL 'DD'
DETAIL DD
RIP RAP AT EMBANKMENT
(Not to Scale)
Ditch Grade
Est. 10 Tons
Type of Liner= Class 'I' Rip-Rap
STA. 499+90 -L- RT
PERMIT DRAWINGS
SHEET 41 OF 51
3/11/2011
I-3803B_HYD_PRM_PLANSHEETS.dgn


PROJECT REFERENCE NO. I-3803B
SHEET NO. 26B
R/W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
HDR Engineering, Inc. of the Carolinas
3733 National Drive, Suite 207 Raleigh, N.C. 27612
N.C.B.E.L.S. License Number: F-0116
THE LANE CONSTRUCTION CORPORATION
LEGEND
DENOTES FILL IN SURFACE WATER
DENOTES MECHANIZED CLEARING
REVISIONS
8/17/99
HISTORIC BOUNDARY
NAD 83
DITCH DATA
DA= 1.97 AC
SLOPE= 03.94%
L REQ.= 197.00 FT
L PRO.= 100.00 FT
Q2= 4.35 CFS
V2= 3.60 FPS
Q10= 5.70 CFS
V10= 3.85 FPS
SIDE SLOPES = 6
DITCH DATA
DA= 0.23 AC
SLOPE= 0.30%
L REQ.= 23.00 FT
L PRO.= 150.00 FT
Q2= 0.41 CFS
V2= 0.84 FPS
Q10= 0.54 CFS
V10= 0.89 FPS
SIDE SLOPES = 4
DITCH DATA
DA= 0.25 AC
SLOPE= 0.30%
L REQ.= 25.10 FT
L PRO.= 150.00 FT
Q2= 0.51 CFS
V2= 0.88 FPS
Q10= 0.67 CFS
V10= 0.94 FPS
SIDE SLOPES = 4
DITCH DATA
DA= 2.15 AC
SLOPE= 1.10%
L REQ.= 215.00 FT
L PRO.= 300.00 FT
Q2= 6.21 CFS
V2= 2.43 FPS
Q10= 8.12 CFS
V10= 2.60 FPS
SIDE SLOPES = 6
DITCH DATA
DA= 14.63 AC
SLOPE= 9.74%
L REQ.= 1463.00 FT
L PRO.= 446.00 FT
Q2= 14.70 CFS
V2= 6.88 FPS
Q10= 23.00 CFS
V10= 7.94 FPS
SIDE SLOPES = 2
DITCH DATA
DA= 14.63 AC
SLOPE= 4.36%
L REQ.= 1463.00 FT
L PRO.= 50.00 FT
Q2= 14.70 CFS
V2= 5.24 FPS
Q10= 23.00 CFS
V10= 6.01 FPS
SIDE SLOPES = 2
DITCH DATA
DA= 14.63 AC
SLOPE= 9.20%
L REQ.= 1463.00 FT
L PRO.= 49.00 FT
Q2= 14.70 CFS
V2= 6.75 FPS
Q10= 23.00 CFS
V10= 7.79 FPS
SIDE SLOPES = 2
SITE 16
SDG SEE DETAIL 'A'
CLASS 'I' RIP RAP ROCK PLATING 770 TONS 1100 SY F.F.
TOE PROTECTION SEE DETAIL 'Q'
PROPOSED SLOPE STAKE
2GI W/ FLAT GRATE
CONVERT DI TO JB
REMOVE 18" RCP
TB 2GI
REMOVE DI
COLLAR & EXTEND 24"
2GI FS
15" CSP W/ELBS
CLASS 'I' RIP RAP EST. 11 TONS 22 SY FILTER FABRIC
JB w/Slab Lid
REMOVE SNIFFNER DEVEL OPMENT SIGN
RIP RAP @ EMBANKMENT SEE DETAIL 'DD'
BASE LATERAL DITCH W/ CLASS 'I' RIP RAP SEE DETAIL 'I'
GRADE TO DRAIN
MATCHLINE -L- STA. 500+00, SEE SHEET NO. 27
REMOVE 12" CMP
JB w/Slab Lid
JB
MATCHLINE
RIP RAP @ EMBANKMENT SEE DETAIL 'DD'
DETAIL DD
RIP RAP AT EMBANKMENT
(Not to Scale)
Ditch Grade
Est. 10 Tons
Type of Liner= Class 'I' Rip-Rap
STA. 499+90 -L- RT
DITCH DATA
DA= 2.26 AC
SLOPE= 4.34%
L REQ.= 226.00 FT
L PRO.= 137.00 FT
Q2= 4.89 CFS
V2= 3.84 FPS
Q10= 6.40 CFS
V10= 4.11 FPS
SIDE SLOPES = 6
PERMIT DRAWINGS
SHEET 42 OF 51
3/11/2011
I:\3803B_HYD_PRM_PLANSHEETS.dgn

HDR Engineering, Inc. of the Carolinas
3733 National Drive, Suite 207 Raleigh, N.C. 27612
N.C.B.E.L.S. License Number: F-0116

THE LANE CONSTRUCTION CORPORATION

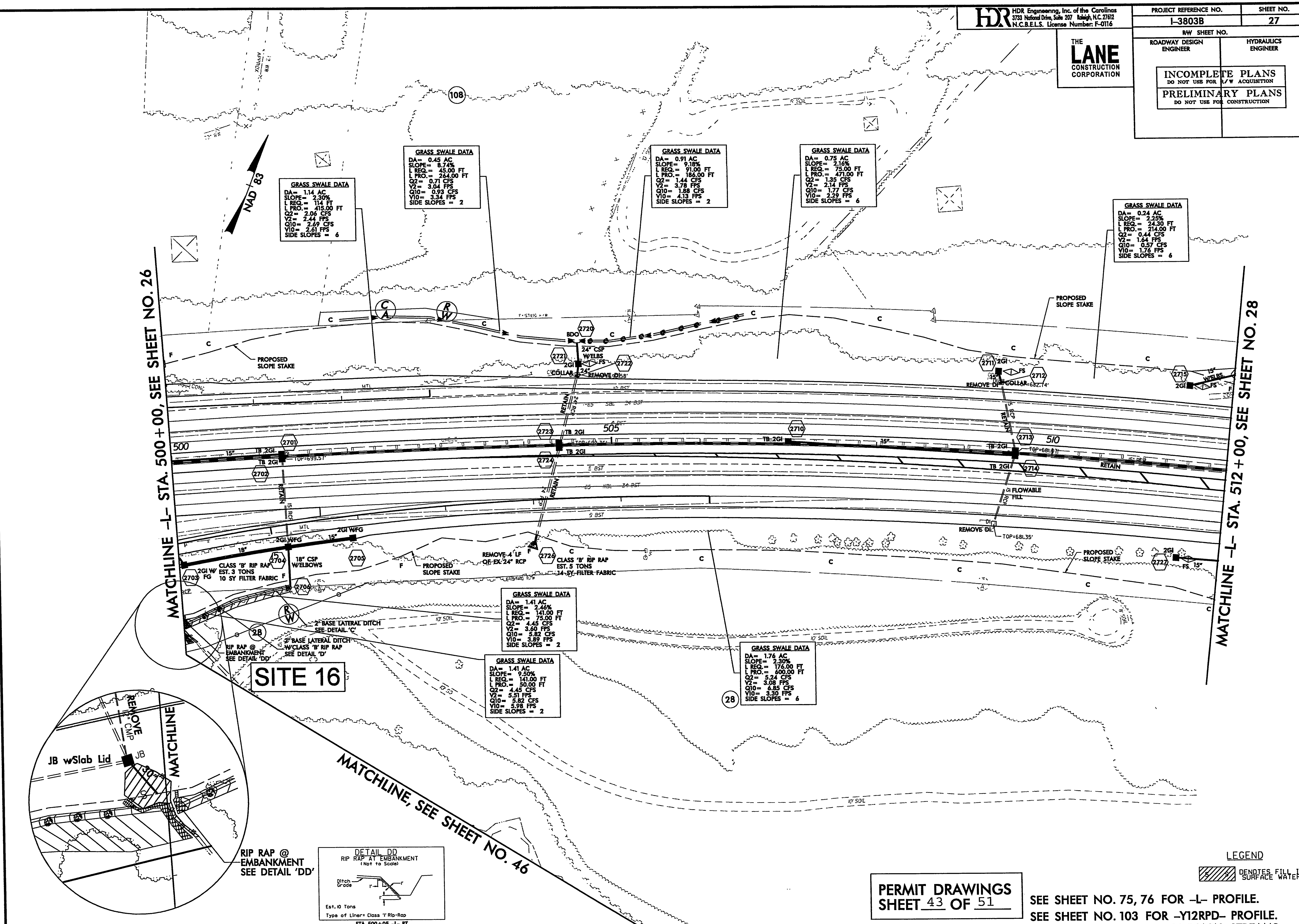
PROJECT REFERENCE NO.	SHEET NO.
I-3803B	27

R/W SHEET NO.

ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



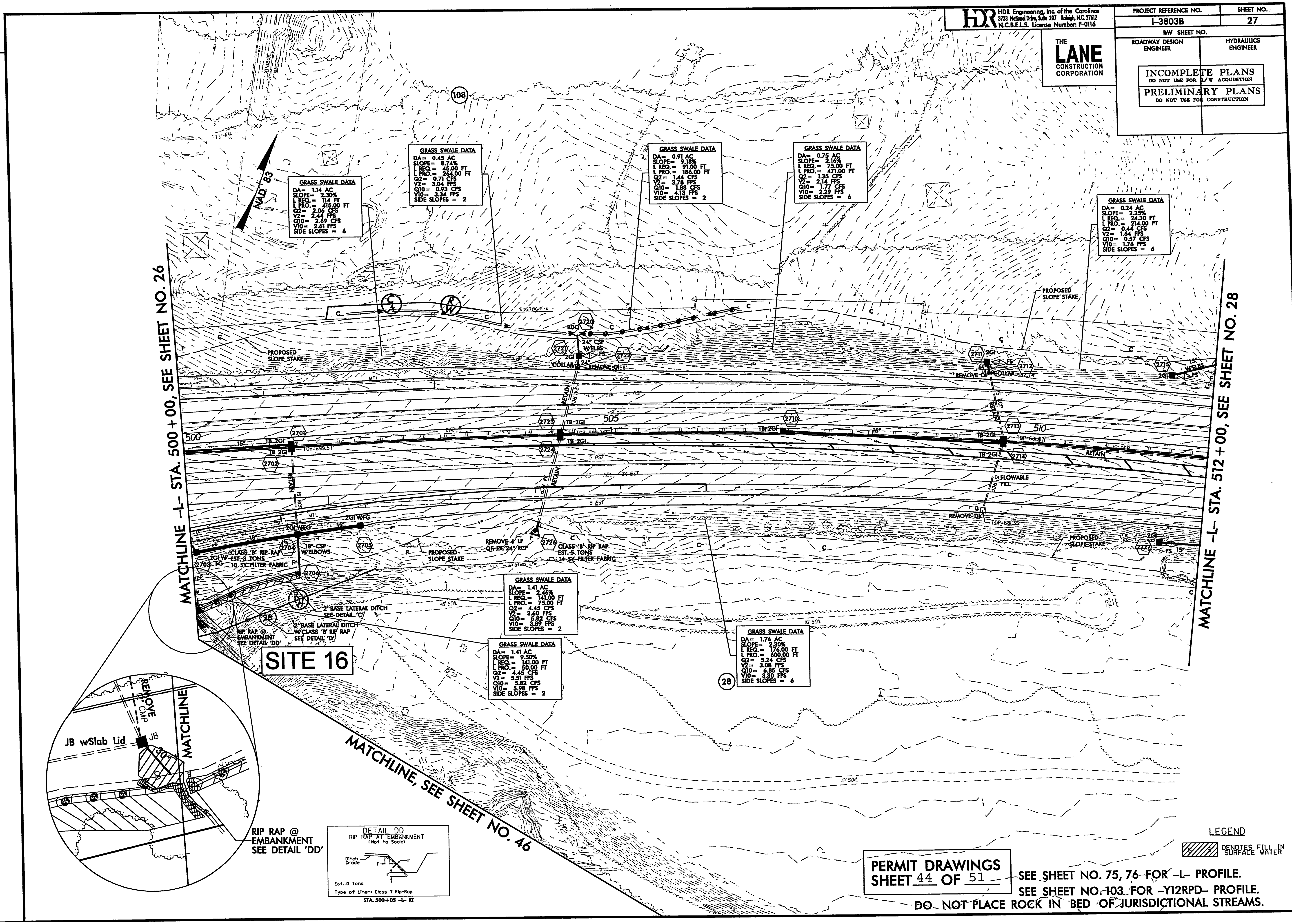
LEGEND
DENOTES FILL IN SURFACE WATER

PERMIT DRAWINGS
SHEET 43 OF 51

SEE SHEET NO. 75, 76 FOR -L- PROFILE.
SEE SHEET NO. 103 FOR -Y12RPD- PROFILE.
DO NOT PLACE ROCK IN BED OF JURISDICTIONAL STREAMS.

REVISIONS

PENTABLE: NCDOT_permits_NOCON.tbl
TIME: 1:18:44 PM SCALE: 1:100
PLOT DRIVER: NCDOT_pdf_color_eng_100.plt
USER: bsteffen DATE: 3/11/2011
FILE: Mktg_Charlotte_Trans_Design_Build\Lane_I-3803B_I-85_Widening\I-3803B\Hydraulics\PERMITS_Environmental\Drawings\I3803B_HYD_PRM_PLANSHEETS.dgn



REVISIONS

PLOT DRIVER: NCDOT_pdf_color_eng_100.plt PENTABLE: NCDOT_permits.tbl
USER: bsteffen DATE: 3/11/2011 TIME: 1:17:20 PM SCALE: 1:100
FILE: Mktg_Charlotte\Charlotte_Trans_Design_Build\Lane_I-3803B_I-85_Widening\I-3803B\Hydraulics\PERMITS_Environmental\Drawings\I3803B_HYD_PRM_PLANSHEETS.dgn

HDR Engineering, Inc. of the Carolinas
3733 National Drive, Suite 207 Raleigh, N.C. 27612
N.C.B.E.L.S. License Number: F-0116

PROJECT REFERENCE NO.	SHEET NO.
I-3803B	28

R/W SHEET NO.

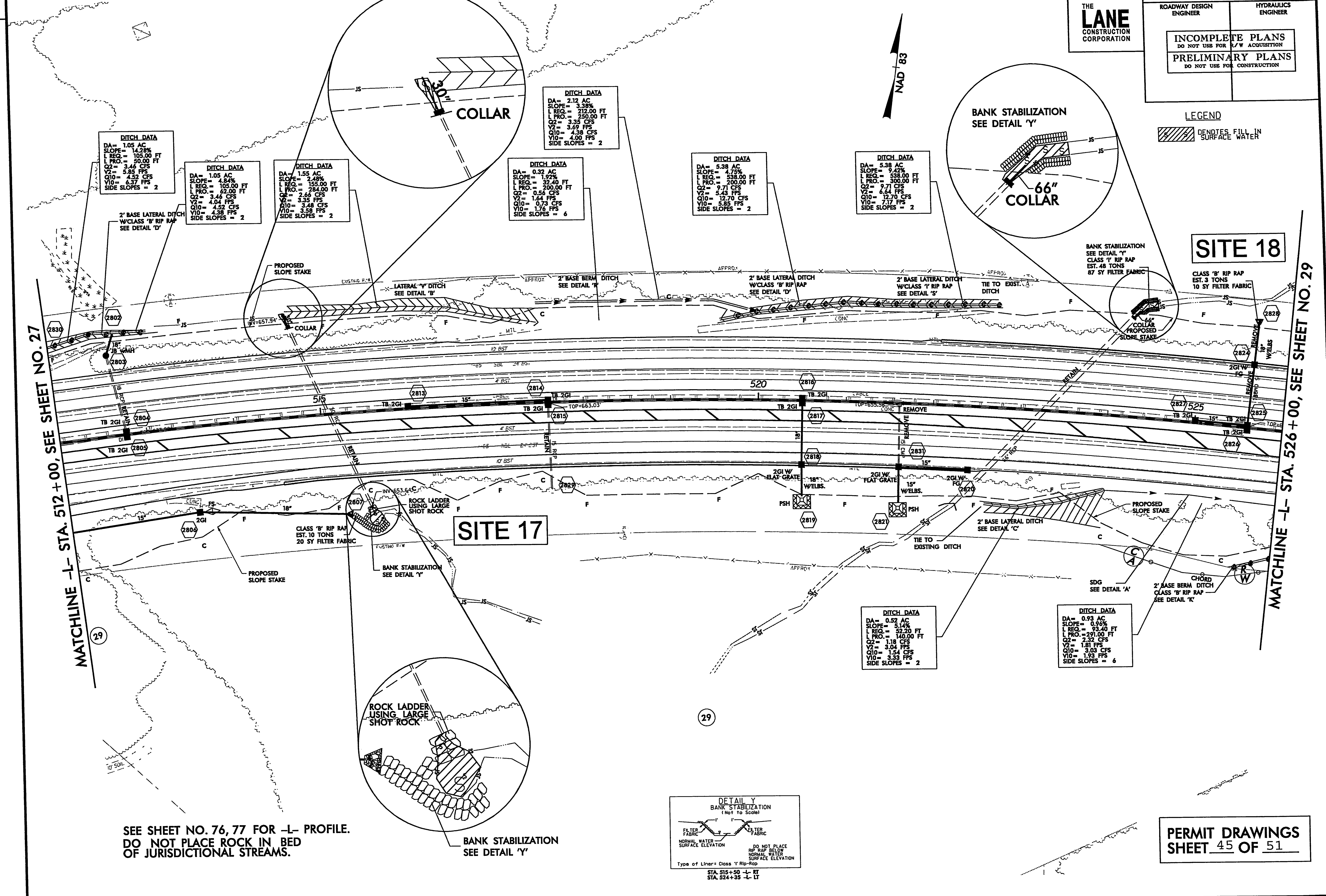
ROADWAY DESIGN ENGINEER

HYDRAULICS ENGINEER

THE LANE CONSTRUCTION CORPORATION

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



SEE SHEET NO. 76, 77 FOR -L- PROFILE.
DO NOT PLACE ROCK IN BED OF JURISDICTIONAL STREAMS.

PERMIT DRAWINGS
SHEET 45 OF 51

REVISIONS

PENTABLE: NCDOT_permits_NOCON +bl
TIME: 12:34:51 PM SCALE: 1:100
PLOT DRIVER: NCDOT_pdf_color_eng.100.plt
SER: bsteffen DATE: 3/11/2011
FILE: Mktg_Charlotte\Charlotte_Trans_Design_Build\Lane_I-3803B_I-85_Widening\I-3803B\Hydraulics\PERMITS_Enviromental\Drawings\I3803B_HYD_PRM_PLANSHEETS.dgn

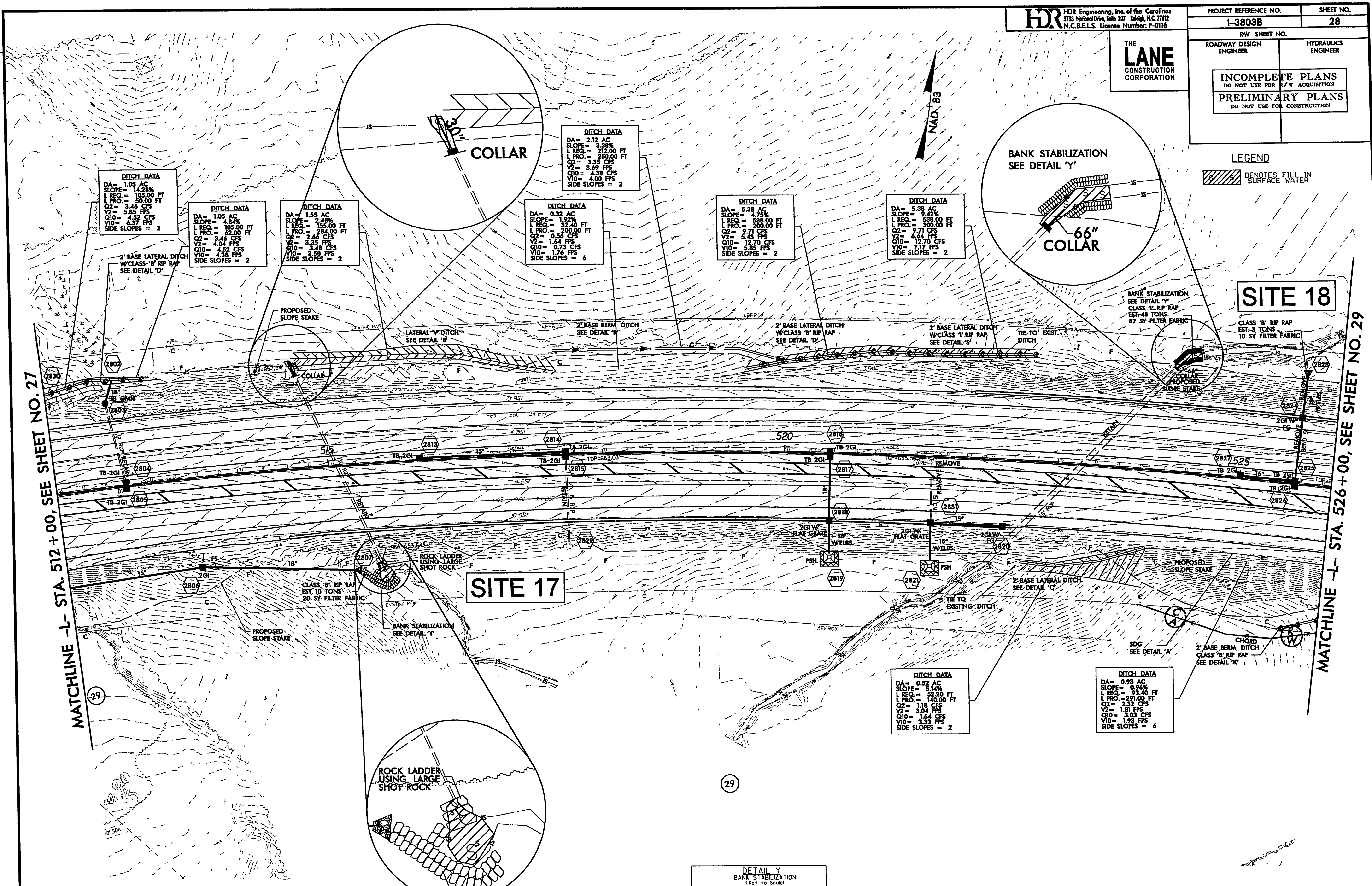
HDR Engineering, Inc. of the Carolinas
3733 National Drive, Suite 207 Raleigh, N.C. 27612
N.C.B.E.L.S. License Number: F-0116

PROJECT REFERENCE NO.	SHEET NO.
I-3803B	28
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

THE LANE CONSTRUCTION CORPORATION

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



SEE SHEET NO. 76, 77 FOR -L- PROFILE.
DO NOT PLACE ROCK IN BED OF JURISDICTIONAL STREAMS.

DETAIL Y
BANK STABILIZATION
(Not to Scale)
FILTER FABRIC
NORMAL WATER SURFACE ELEVATION
DO NOT PLACE RIP RAP BELOW NORMAL WATER SURFACE ELEVATION
Type of Liner: Class 'I' Rip-Rap
STA. 515+50 -L- RT
STA. 524+35 -L- LT

PERMIT DRAWINGS
SHEET 46 OF 51

REVISIONS

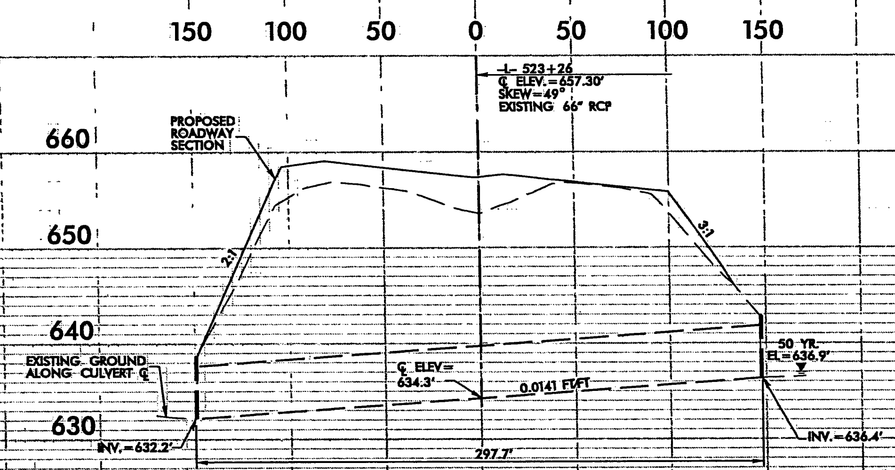
PLOT DRIVER: NCDOT.pdf.color_eng.100.plt PENTABLE: NCDOT.permits.tbl
USER: bsteffen DATE: 3/11/2011 TIME: 12:25:55 PM SCALE: 1:100
FILE: Mktg_Charlotte\Charlotte_Trans_Design_Build\Lane_I-3803B_I-85_Widening\I-3803B\Hydraulics\PERMITS_Enviromental\Drawings\I3803B_HYD_PRM_PLANSHEETS.dgn

I-3803B SITE 18

PROJECT REFERENCE NO.	SHEET NO.
I-3803B	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

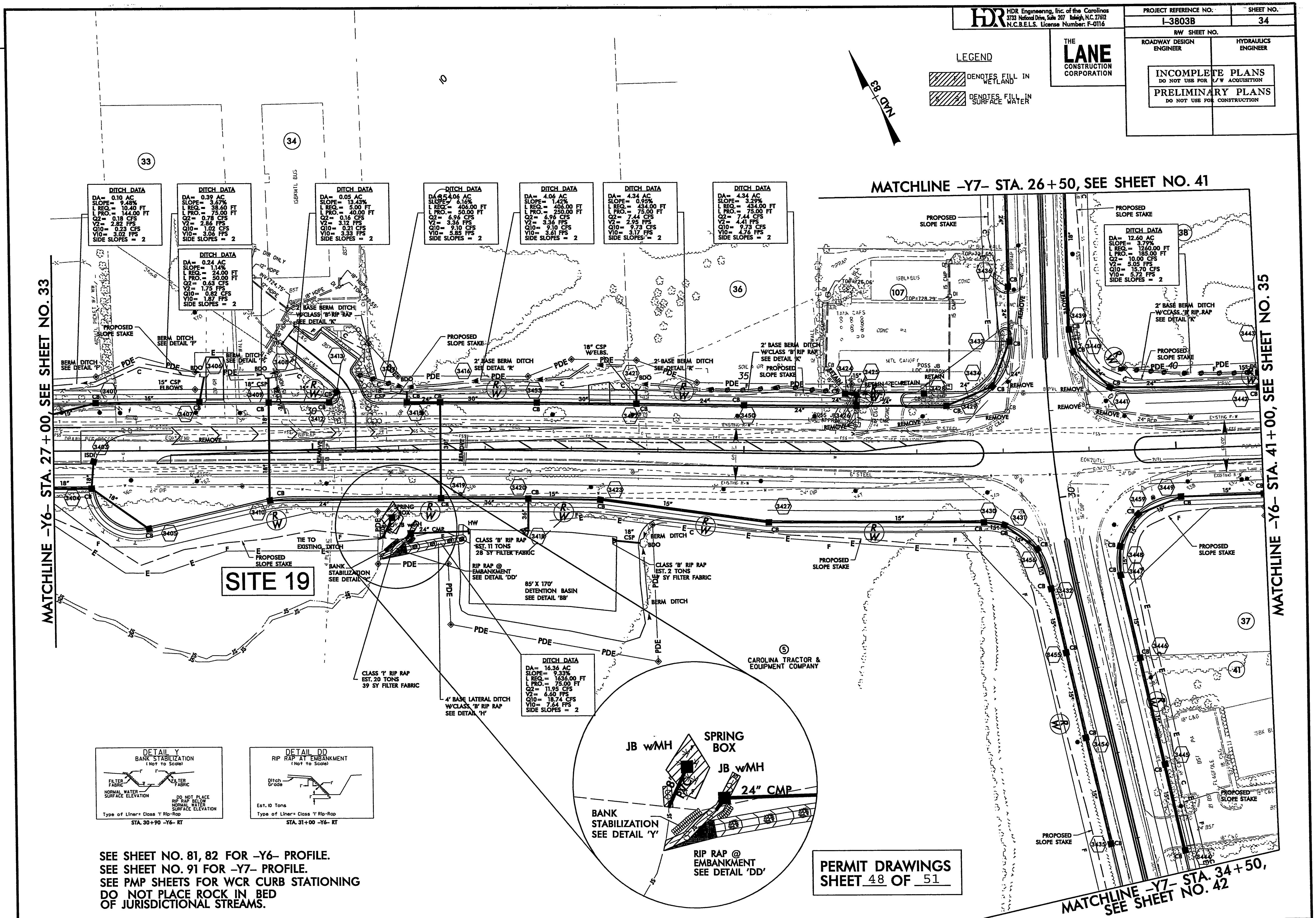
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



PROFILE ALONG ℄ OF 66" RCP

PERMIT DRAWINGS
SHEET 47 OF 51

PLOT DRIVER: $PLTDRVS$ USER: $USER$ FILE: $PWVARVAULTPATHDESC$
PENTABLE: $PENTBLS$ DATE: 2/22/2011 TIME: 9:42:16 AM SCALE: $SCALESHORT$



REVISIONS

PLOT DRIVER: NCDOT_pdf_color_eng_100.plt PENTABLE: NCDOT_permits_NOCON.tbl
USER: bsteffen DATE: 3/11/2011 TIME: 12:35:23 PM SCALE: 1:100
FILE: Nktg_Charlotte\Charlotte_Trans_Design_Build\Lane_I-3803B_I-85_Widening\I-3803B\Hydraulics\PERMITS_Environmental\Drawings\I3803B_HYD_PRM_PLANSHEETS.dgn

HDR Engineering, Inc. of the Carolinas
3733 National Drive, Suite 207 Raleigh, N.C. 27612
N.C.B.E.L.S. License Number: F-0116

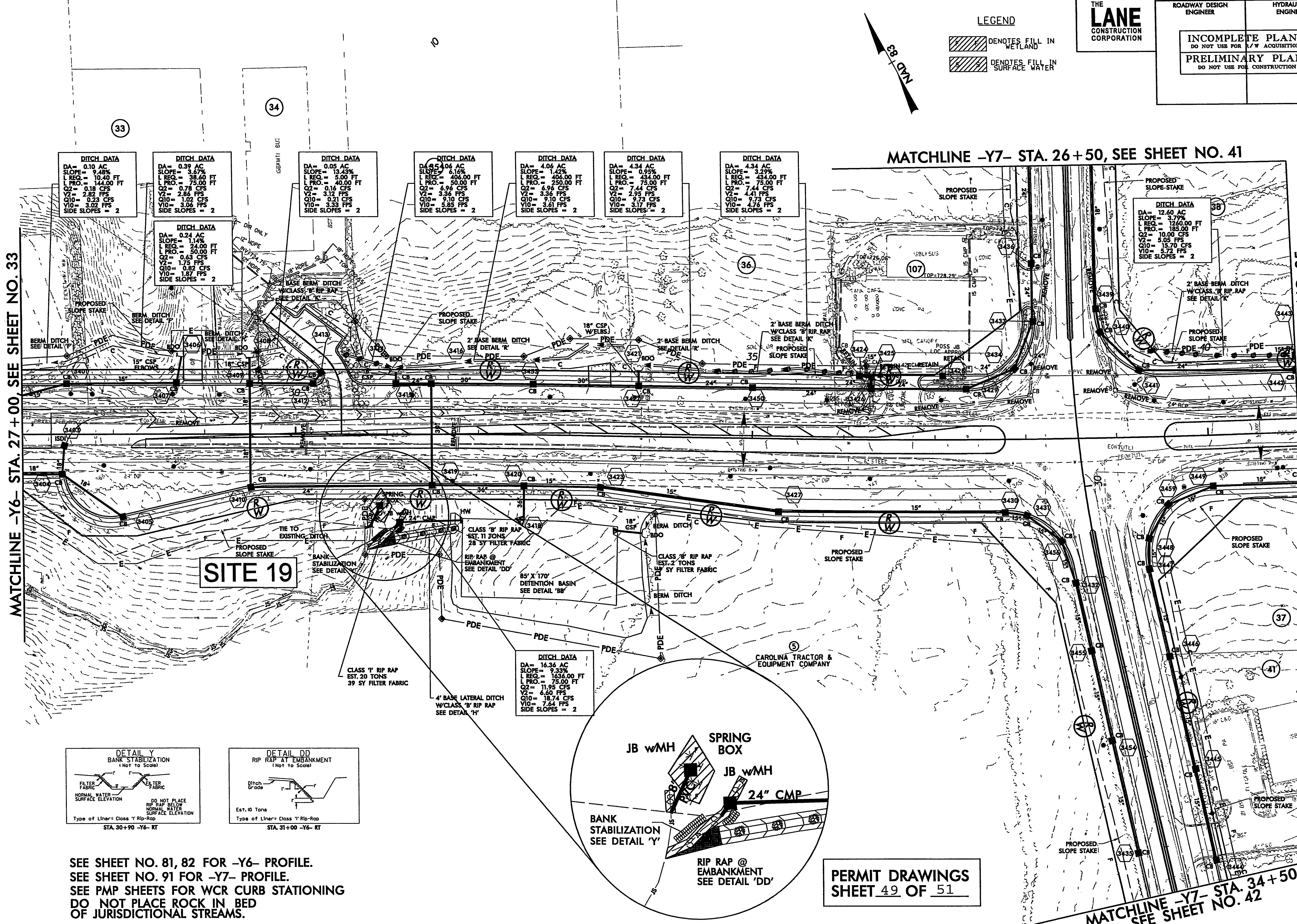
THE LANE CONSTRUCTION CORPORATION

PROJECT REFERENCE NO.	SHEET NO.
I-3803B	34
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

LEGEND
- DENOTES FILL IN WETLAND
- DENOTES FILL IN SURFACE WATER

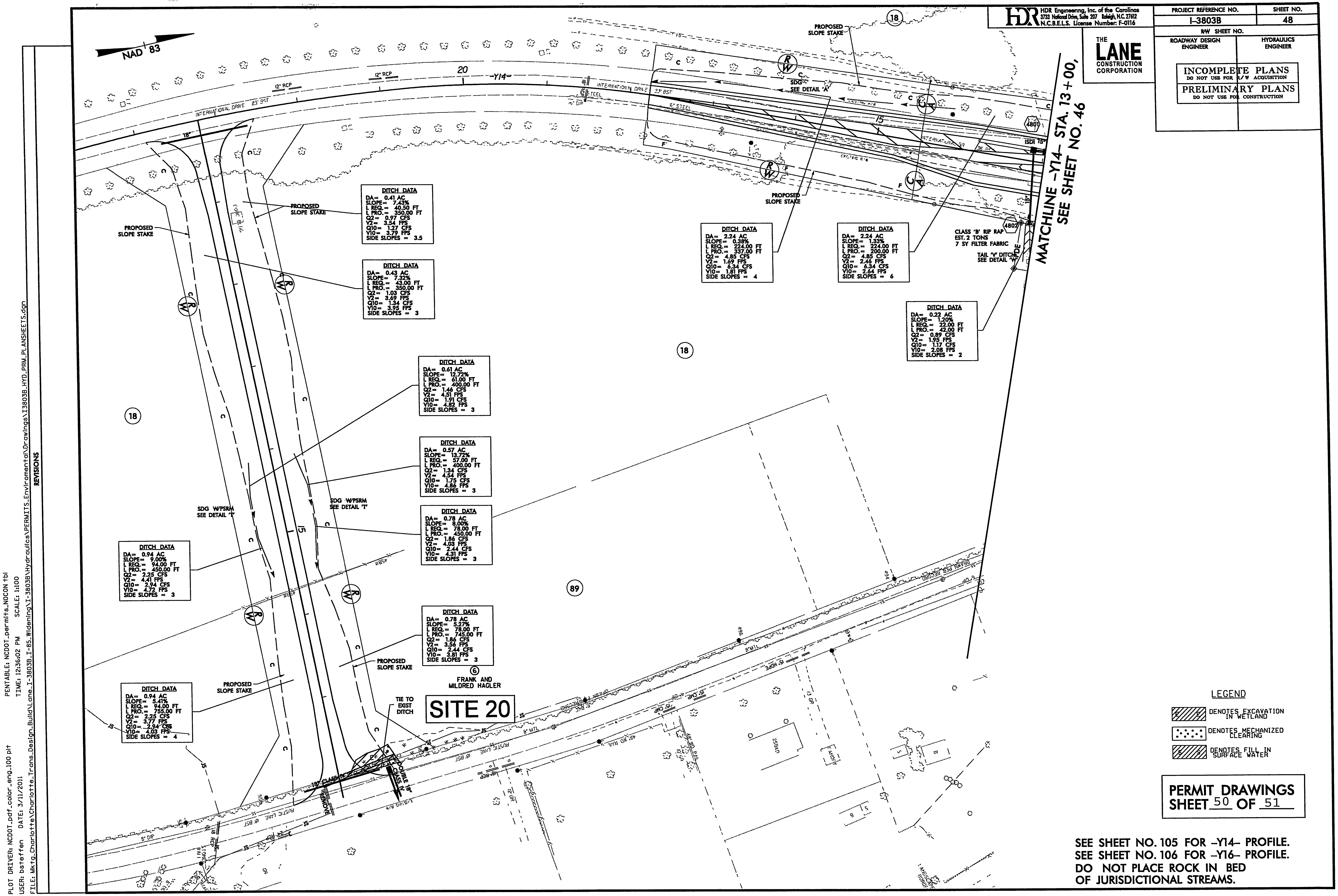


SEE SHEET NO. 81, 82 FOR -Y6- PROFILE.
SEE SHEET NO. 91 FOR -Y7- PROFILE.
SEE PMP SHEETS FOR WCR CURB STATIONING
DO NOT PLACE ROCK IN BED OF JURISDICTIONAL STREAMS.

PERMIT DRAWINGS
SHEET 49 OF 51

REVISIONS

PLOT DRIVER: NCDOT_pdf_color_eng_100.plt PENTABLE: NCDOT_permits.tbl
USER: bsteffen DATE: 3/11/2011 TIME: 12:26:32 PM SCALE: 1:100
FILE: Mktg_Charlotte\Charlotte_Trans_Design_Build\Lane_I-3803B_I-85_Widening\I-3803B\Hydraulics\PERMITS_Enviromental\Drawings\I3803B_HYD_PRM_PLANSHEETS.dgn


HDR Engineering, Inc. of the Carolinas
3733 National Drive, Suite 207 Raleigh, N.C. 27612
N.C.B.E.L.S. License Number: F-0116
PROJECT REFERENCE NO. I-3803B
SHEET NO. 48
R/W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
THE LANE CONSTRUCTION CORPORATION
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
NAD 83
-Y14-
INTERNATIONAL DRIVE
PROPOSED SLOPE STAKE
SDG SEE DETAIL 'A'
MATCHLINE -Y14- STA. 13+00, SEE SHEET NO. 46
CLASS 'B' RIP RAP
EST. 2 TONS
7 SY FILTER FABRIC
TAIL 'V' DITCH SEE DETAIL 'W'
DITCH DATA
DA= 0.41 AC
SLOPE= 7.43%
L REQ.= 40.50 FT
L PRO.= 350.00 FT
Q2= 0.97 CFS
V2= 3.54 FPS
Q10= 1.27 CFS
V10= 3.79 FPS
SIDE SLOPES = 3.5
DITCH DATA
DA= 0.43 AC
SLOPE= 7.32%
L REQ.= 43.00 FT
L PRO.= 350.00 FT
Q2= 1.03 CFS
V2= 3.69 FPS
Q10= 1.34 CFS
V10= 3.95 FPS
SIDE SLOPES = 3
DITCH DATA
DA= 2.24 AC
SLOPE= 0.38%
L REQ.= 224.00 FT
L PRO.= 337.00 FT
Q2= 4.85 CFS
V2= 1.69 FPS
Q10= 6.34 CFS
V10= 1.81 FPS
SIDE SLOPES = 4
DITCH DATA
DA= 2.24 AC
SLOPE= 1.55%
L REQ.= 224.00 FT
L PRO.= 200.00 FT
Q2= 4.85 CFS
V2= 2.46 FPS
Q10= 6.34 CFS
V10= 2.64 FPS
SIDE SLOPES = 6
DITCH DATA
DA= 0.22 AC
SLOPE= 1.20%
L REQ.= 22.00 FT
L PRO.= 42.00 FT
Q2= 0.89 CFS
V2= 1.95 FPS
Q10= 1.17 CFS
V10= 2.08 FPS
SIDE SLOPES = 2
DITCH DATA
DA= 0.61 AC
SLOPE= 12.72%
L REQ.= 61.00 FT
L PRO.= 400.00 FT
Q2= 1.46 CFS
V2= 4.51 FPS
Q10= 1.91 CFS
V10= 4.82 FPS
SIDE SLOPES = 3
DITCH DATA
DA= 0.57 AC
SLOPE= 13.72%
L REQ.= 57.00 FT
L PRO.= 400.00 FT
Q2= 1.34 CFS
V2= 4.54 FPS
Q10= 1.75 CFS
V10= 4.86 FPS
SIDE SLOPES = 3
DITCH DATA
DA= 0.78 AC
SLOPE= 8.00%
L REQ.= 78.00 FT
L PRO.= 450.00 FT
Q2= 1.86 CFS
V2= 4.03 FPS
Q10= 2.44 CFS
V10= 4.31 FPS
SIDE SLOPES = 3
DITCH DATA
DA= 0.94 AC
SLOPE= 9.00%
L REQ.= 94.00 FT
L PRO.= 450.00 FT
Q2= 2.25 CFS
V2= 4.41 FPS
Q10= 2.94 CFS
V10= 4.72 FPS
SIDE SLOPES = 3
DITCH DATA
DA= 0.78 AC
SLOPE= 5.27%
L REQ.= 78.00 FT
L PRO.= 745.00 FT
Q2= 1.86 CFS
V2= 3.56 FPS
Q10= 2.44 CFS
V10= 3.81 FPS
SIDE SLOPES = 3
DITCH DATA
DA= 0.94 AC
SLOPE= 5.41%
L REQ.= 94.00 FT
L PRO.= 755.00 FT
Q2= 2.25 CFS
V2= 3.77 FPS
Q10= 2.94 CFS
V10= 4.03 FPS
SIDE SLOPES = 4
SDG W/PSRM SEE DETAIL 'T'
6 FRANK AND MILDRED HAGLER
SITE 20
TIE TO EXIST DITCH
RUSTIC LANE
LEGEND
DENOTES EXCAVATION IN WETLAND
DENOTES MECHANIZED CLEARING
DENOTES FILL IN SURFACE WATER
PERMIT DRAWINGS SHEET 50 OF 51
SEE SHEET NO. 105 FOR -Y14- PROFILE.
SEE SHEET NO. 106 FOR -Y16- PROFILE.
DO NOT PLACE ROCK IN BED OF JURISDICTIONAL STREAMS.
REVISIONS
PLOT DRIVER: NCDOT_pdf_color_eng_100 plt
PENTABLE: NCDOT_permits_NOCON tbl
USER: bsteffen DATE: 3/11/2011 TIME: 12:36:02 PM SCALE: 1:100
FILE: Mktg_Charlotte\Charlotte_Trans_Design_Build\Lane_I-3803B_I-85_Widening\I-3803B\Hydraulics\PERMITS_Environmental\Drawings\I3803B_HYD_PRM_PLANSHEETS.dgn

PROJECT REFERENCE NO.	SHEET NO.
I-3803B	48

R/W SHEET NO.

ROADWAY DESIGN ENGINEER

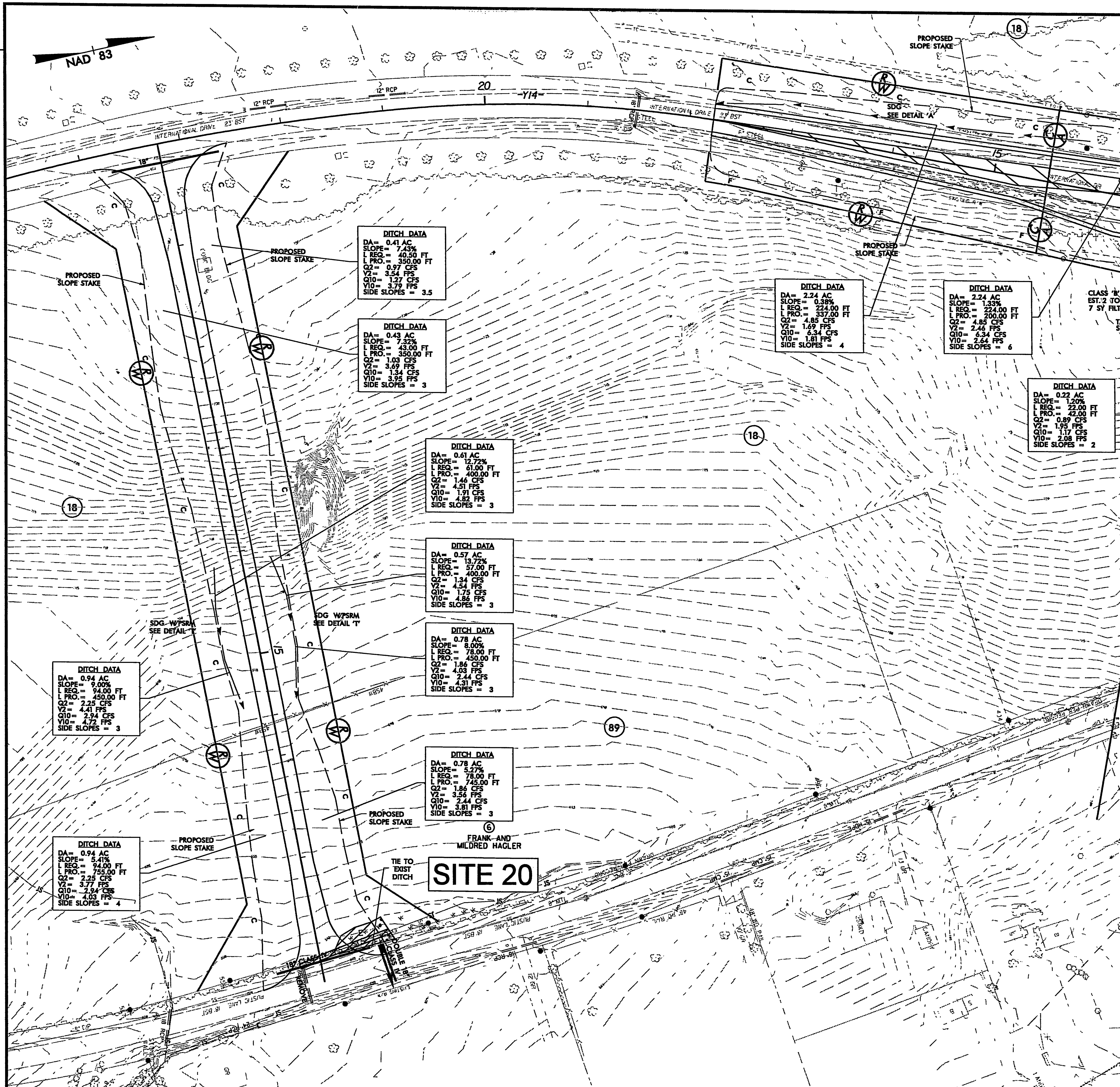
HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

HDR Engineering, Inc. of the Carolinas
3733 National Drive, Suite 207 Raleigh, N.C. 27612
N.C.B.E.L.S. License Number: F-0116

THE LANE CONSTRUCTION CORPORATION



LEGEND

DENOTES EXCAVATION IN WETLAND

DENOTES MECHANIZED CLEARING

DENOTES FILL IN SURFACE WATER

PERMIT DRAWINGS
SHEET 51 OF 51

SEE SHEET NO. 105 FOR -Y14- PROFILE.
SEE SHEET NO. 106 FOR -Y16- PROFILE.
DO NOT PLACE ROCK IN BED OF JURISDICTIONAL STREAMS.

REVISIONS

PLOT DRIVER: NCDOT_pdf_color_eng_100.plt PENTABLE: NCDOT_permits.tbl
USER: bsteffen DATE: 3/11/2011 TIME: 12:27:17 PM SCALE: 1:100
FILE: Mktg_Charlotte\Charlotte_Trans_Design_Build\Lane_I-3803B_I-85_Widening\I-3803B\Hydraulics\PERMITS_Enviromental\Drawings\I3803B_HYD_PRM_PLANSHEETS.dgn

TIP PROJECT: I-3803B

CONTRACT: C202522

09/08/99

PLOT DRIVER: $PLTDRVS$ USER: $USER$ FILE: $PWVARVAULTPATHDESC$

PENTABLE: $PENTBLS$ DATE: $DATE$ TIME: $TIME$ SCALE: $SCALESHORT$

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

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

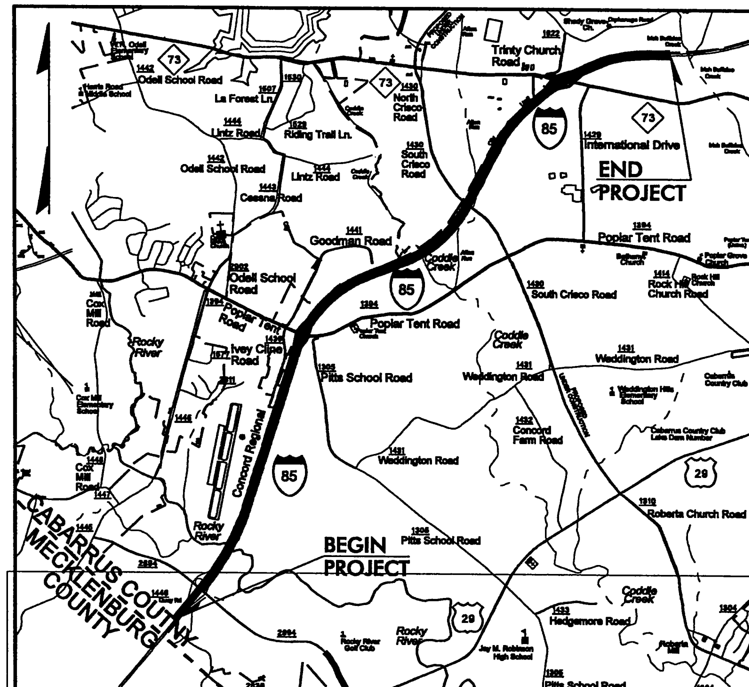
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	I-3803B	1	

STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION
34187.3.GV2	NHIMF-85-2(62)48	CONSTRUCTION

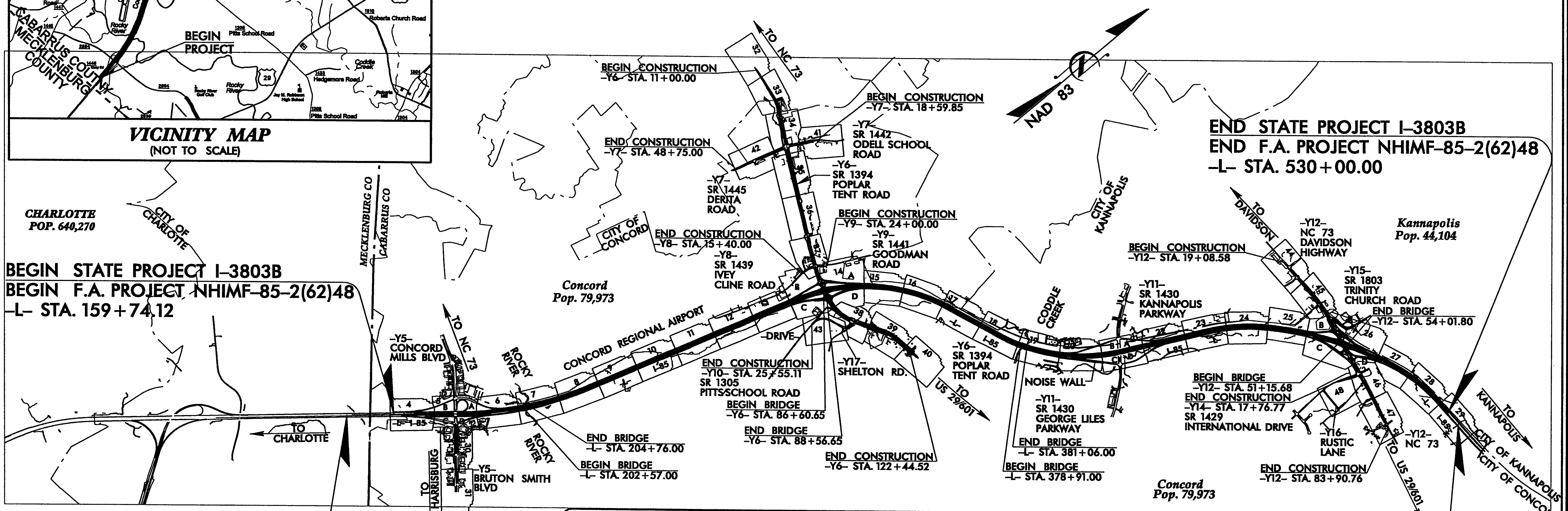
CABARRUS COUNTY

LOCATION: I-85 FROM SOUTH OF SR-2894 (BRUTON SMITH/CONCORD MILLS BLVD.) TO NORTH OF NC 73 (DAVIDSON HIGHWAY)

TYPE OF WORK: DESIGN-BUILD AS SPECIFIED IN THE SCOPE OF WORK CONTAINED IN THE REQUEST FOR PROPOSALS



VICINITY MAP
(NOT TO SCALE)



BEGIN CONSTRUCTION
-L- STA. 144+54.25

END CONSTRUCTION
-L- STA. 535+00.00

THIS PROJECT IS A CONTROLLED ACCESS PROJECT WITH ACCESS BEING LIMITED TO INTERCHANGES.
THIS PROJECT IS WITHIN THE MUNICIPAL BOUNDARIES OF CONCORD AND KANNAPOLIS.
CLEARING ON THIS PROJECT SHALL BE PERFORMED TO THE LIMITS ESTABLISHED BY METHOD III.

PROJECT PREPARED BY:

HDR Engineering, Inc. of the Carolinas
3733 National Drive, Suite 207 Raleigh, N.C. 27612
N.C.B.E.L.S. License Number: F-0116

THE LANE CONSTRUCTION CORPORATION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

GRAPHIC SCALES

50 25 0 50 100
PLANS

50 25 0 50 100
PROFILE (HORIZONTAL)

10 5 0 10 20
PROFILE (VERTICAL)

DESIGN DATA

ADT 2011 = 118,275
ADT 2031 = 189,775
DHV = 10 %
D = 60 %
T = 14 % *
V = 70 MPH
FUNCTIONAL CLASSIFICATION: INTERSTATE
* TTST=9% DUAL=5%

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT I-3803B	=	6.930 MILES
LENGTH STRUCTURE TIP PROJECT I-3803B	=	0.082 MILES
TOTAL LENGTH TIP PROJECT I-3803B	=	7.012 MILES

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

2006 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
JULY 23, 2010

LETTING DATE:
JULY 23, 2010

JONATHAN HENDERSON, P.E.
PROJECT ENGINEER

RONYELL THIGPEN, P.E.
PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER

SIGNATURE: P.E.

ROADWAY DESIGN ENGINEER

SIGNATURE: P.E.

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

P.E.
STATE HIGHWAY DESIGN ENGINEER

PROJECT REFERENCE NO.	SHEET NO.
I-3803B	I-B

Note: Not to Scale

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

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

CONVENTIONAL PLAN SHEET SYMBOLS

BOUNDARIES AND PROPERTY:

- Historic Boundary Line — HISTORIC BOUNDARY
- Voluntary Agricultural District Line — VAD
- State Line
- County Line
- Township Line
- City Line
- Reservation Line
- Property Line
- Existing Iron Pin — EIP
- Property Corner
- Property Monument — ECM
- Parcel/Sequence Number — 123
- Existing Fence Line
- Proposed Woven Wire Fence
- Proposed Chain Link Fence
- Proposed Barbed Wire Fence
- Existing Wetland Boundary — WLB
- Proposed Wetland Boundary — WLB
- Existing Endangered Animal Boundary — EAB
- Existing Endangered Plant Boundary — EPB

BUILDINGS AND OTHER CULTURE:

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

HYDROLOGY:

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

RAILROADS:

- Standard Gauge — CSX TRANSPORTATION
- RR Signal Milepost — MILEPOST 35
- Switch — SWITCH
- RR Abandoned
- RR Dismantled

RIGHT OF WAY:

- Baseline Control Point
- Existing Right of Way Marker
- Existing Right of Way Line
- Proposed Right of Way Line — R/W
- Proposed Right of Way Line with Iron Pin and Cap Marker — R/W
- Proposed Right of Way Line with Concrete or Granite Marker — R/W
- Existing Control of Access — C/A
- Proposed Control of Access — C/A
- Existing Easement Line — E
- Proposed Temporary Construction Easement — E
- Proposed Temporary Drainage Easement — TDE
- Proposed Permanent Drainage Easement — PDE
- Proposed Permanent Utility Easement — PUE
- Proposed Temporary Utility Easement — TUE
- Proposed Permanent Easement with Iron Pin and Cap Marker

ROADS AND RELATED FEATURES:

- Existing Edge of Pavement
- Existing Curb
- Proposed Slope Stakes Cut — C
- Proposed Slope Stakes Fill — F
- Proposed Wheel Chair Ramp — WCR
- Existing Metal Guardrail
- Proposed Guardrail
- Existing Cable Guiderail
- Proposed Cable Guiderail
- Equality Symbol
- Pavement Removal

VEGETATION:

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

EXISTING STRUCTURES:

MAJOR:

- Bridge, Tunnel or Box Culvert — CONC
- Bridge Wing Wall, Head Wall and End Wall — CONC WW

MINOR:

- Head and End Wall — CONC HW
- Pipe Culvert
- Footbridge
- Drainage Box: Catch Basin, DI or JB — CB
- Paved Ditch Gutter
- Storm Sewer Manhole — S
- Storm Sewer — S

UTILITIES:

POWER:

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

TELEPHONE:

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

WATER:

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

TV:

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

GAS:

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

SANITARY SEWER:

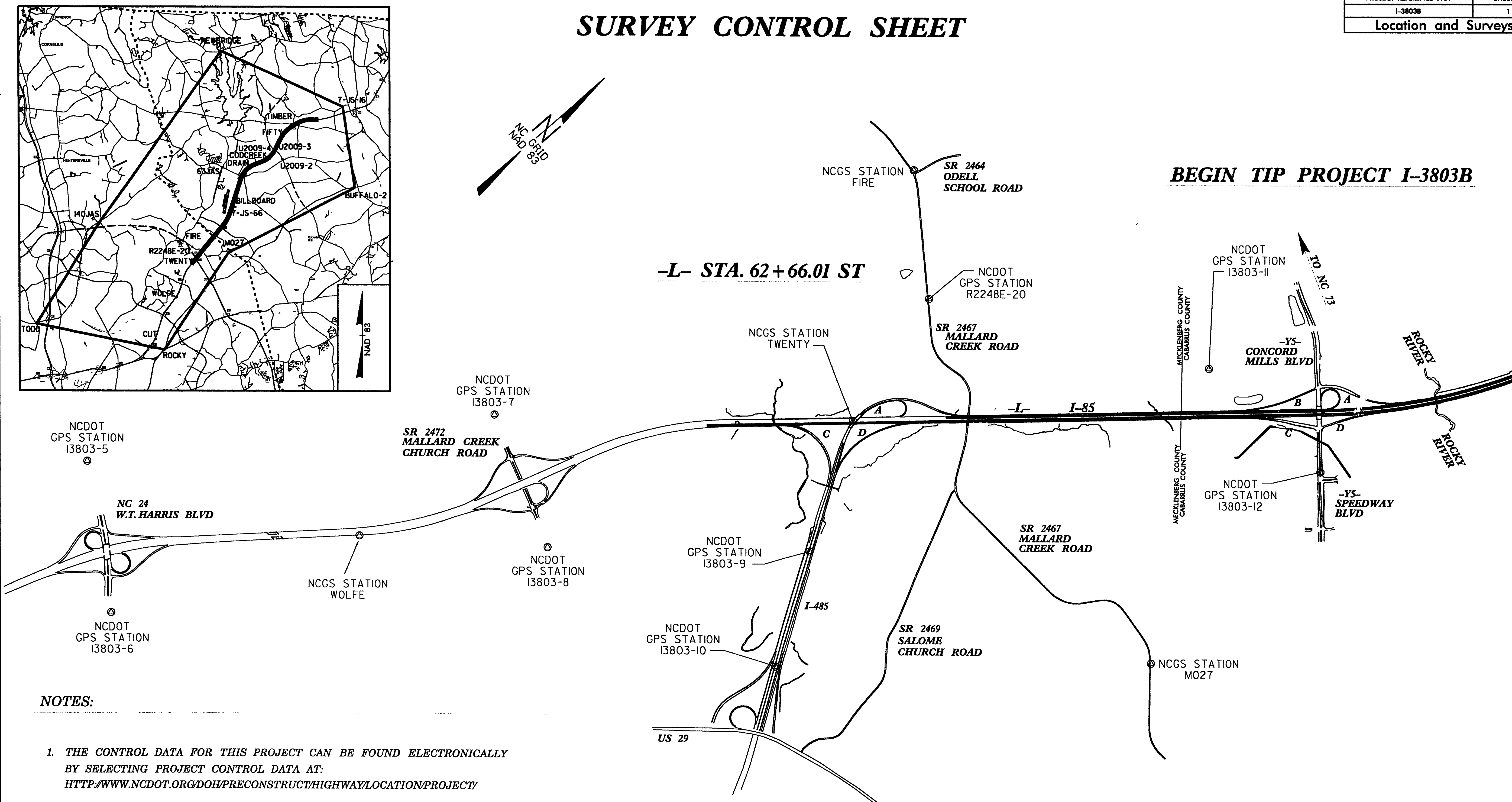
- Sanitary Sewer Manhole
- Sanitary Sewer Cleanout
- U/G Sanitary Sewer Line — SS
- Above Ground Sanitary Sewer — A/G Sanitary Sewer
- Recorded SS Forced Main Line — FSS
- Designated SS Forced Main Line (S.U.E.*) — FSS

MISCELLANEOUS:

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

PROJECT REFERENCE NO.	SHEET NO.
I-3803B	1C
Location and Surveys	

SURVEY CONTROL SHEET



NOTES:

1. THE CONTROL DATA FOR THIS PROJECT CAN BE FOUND ELECTRONICALLY BY SELECTING PROJECT CONTROL DATA AT: HTTP://WWW.NCDOT.ORG/DOH/PRECONSTRUCT/HIGHWAY/LOCATION/PROJECT/

   THE FILES TO BE FOUND ARE AS FOLLOWS:
   I3803B_LS_CONTROL.TXT
   I3803B_LS_LOCAL.TXT

   SITE CALIBRATION INFORMATION HAS NOT BEEN PROVIDED FOR THIS PROJECT. THE LOCAL FILE IS COMMA DELIMITED AND CAN BE USED IN CONJUNCTION WITH GROUND TIES TO PRODUCE A SITE CALIBRATION FOR THE END USER'S GPS EQUIPMENT. IF FURTHER INFORMATION IS NEEDED, PLEASE CONTACT THE LOCATION & SURVEYS UNIT.

⊚ INDICATES GEODETIC CONTROL MONUMENTS USED OR SET FOR HORIZONTAL PROJECT CONTROL BY THE NCDOT LOCATION AND SURVEYS UNIT.

PROJECT CONTROL ESTABLISHED USING GLOBAL POSITIONING SYSTEM.

NETWORK ESTABLISHED FROM EXISTING HARN MONUMENTATION

SEE SHEET 1D & 1F FOR LOCALIZED PROJECT COORDINATES OF GPS CONTROL POINTS

DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCGS FOR MONUMENT "M-027"
WITH NAD 83 STATE PLANE GRID COORDINATES OF
NORTHING: 587671.768(ft) EASTING: 1490741.425(ft)
ELEVATION: 715.199(ft)
THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.9998440
THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "M-027" TO -L- STATION 62+66.01 IS
S 70°27'44.7" W 9604.0007
ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES
VERTICAL DATUM USED IS NGVD 29

NOTE. DRAWING NOT TO SCALE

PROJECT REFERENCE NO.	SHEET NO.
I-3803B	1 D

Location and Surveys

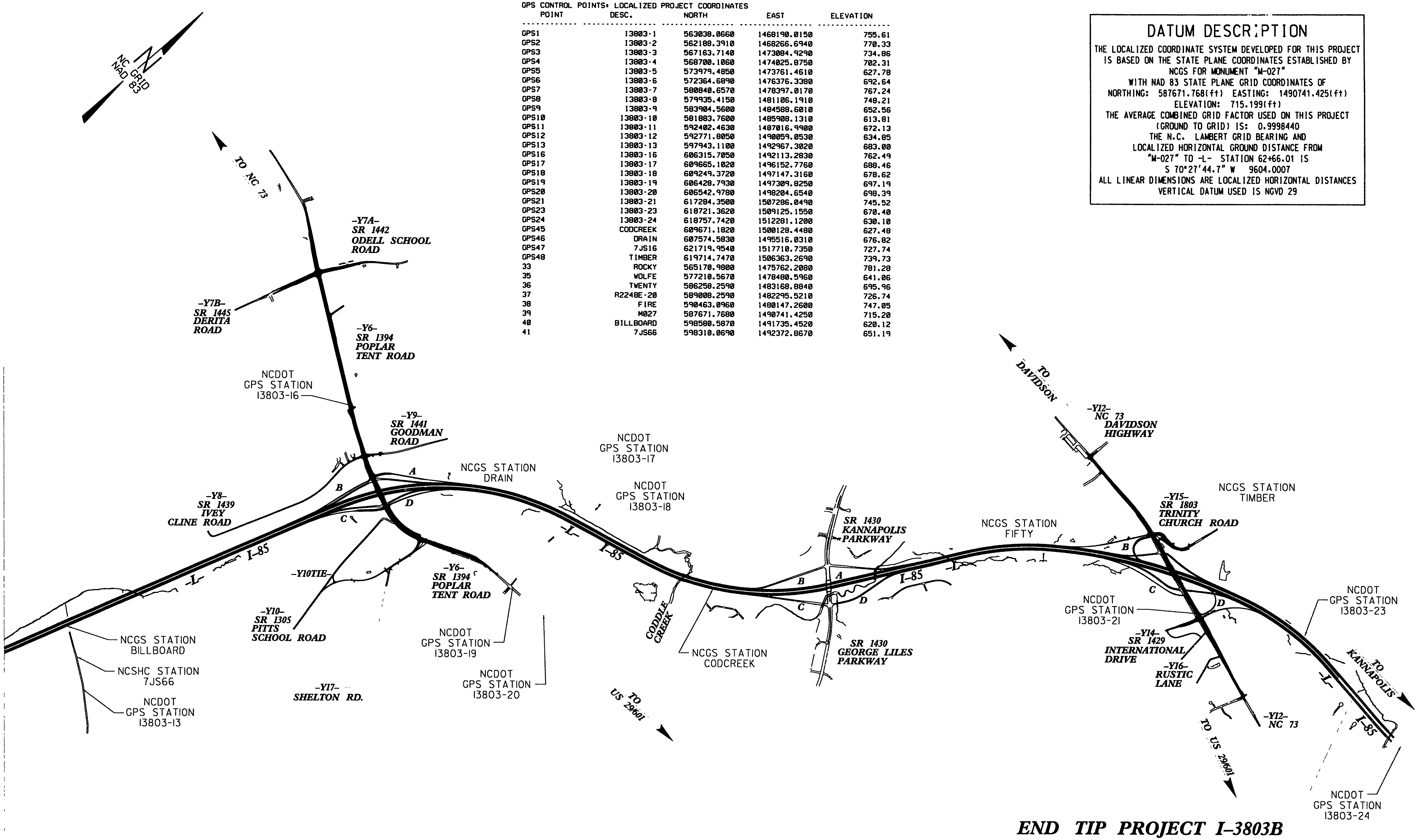
SURVEY CONTROL SHEET

GPS CONTROL POINTS: LOCALIZED PROJECT COORDINATES

POINT	DESC.	NORTH	EAST	ELEVATION
GPS1	13803-1	563038.0660	1468190.0150	755.61
GPS2	13803-2	562188.3910	1468266.6940	770.33
GPS3	13803-3	567163.7140	1473084.9290	734.86
GPS4	13803-4	568700.1060	1474025.8750	702.31
GPS5	13803-5	573979.4850	1473761.4610	627.78
GPS6	13803-6	572364.6890	1476376.3380	692.64
GPS7	13803-7	580840.6570	1478397.0170	767.24
GPS8	13803-8	579935.4150	1481106.1910	748.21
GPS9	13803-9	583904.5600	1484588.6010	652.56
GPS10	13803-10	581883.7600	1485908.1310	613.81
GPS11	13803-11	592402.4630	1487016.9900	672.13
GPS12	13803-12	592771.8050	1490059.0530	634.85
GPS13	13803-13	597943.1100	1492967.3020	683.00
GPS16	13803-16	606315.7050	1492113.2830	762.49
GPS17	13803-17	609665.1020	1496152.7760	688.46
GPS18	13803-18	609249.3720	1497147.3160	678.62
GPS19	13803-19	606428.7930	1497309.8250	697.19
GPS20	13803-20	606542.9780	1498204.6540	698.39
GPS21	13803-21	617284.3500	1507286.0490	745.52
GPS23	13803-23	618721.3620	1509125.1550	670.40
GPS24	13803-24	618757.7420	1512281.1200	630.10
GPS45	CODCREEK	609671.1820	1500128.4480	627.48
GPS46	DRAIN	607574.5830	1495516.0310	676.82
GPS47	7JS16	621719.9540	1517710.7350	727.74
GPS48	TIMBER	619714.7470	1506363.2690	739.73
33	ROCKY	565170.9800	1475762.2080	781.28
35	WOLFE	577210.5670	1478480.5960	641.06
36	TWENTY	586258.2590	1483168.8840	695.96
37	R2248E-20	589008.2590	1482295.5210	726.74
38	FIRE	590463.0960	1480147.2600	747.05
39	M027	587671.7680	1490741.4250	715.20
40	BILLBOARD	598580.5870	1491735.4520	620.12
41	7JS66	598310.0690	1492372.8670	651.19

DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCGS FOR MONUMENT "M-027"
WITH NAD 83 STATE PLANE GRID COORDINATES OF
NORTHING: 587671.768(ft) EASTING: 1490741.425(ft)
ELEVATION: 715.199(ft)
THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.9998440
THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "M-027" TO -L- STATION 62+66.01 IS
S 70°27'44.7" W 9604.0007
ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES
VERTICAL DATUM USED IS NGVD 29



END TIP PROJECT I-3803B

NOTE. DRAWING NOT TO SCALE

PROJECT REFERENCE NO.	SHEET NO.
I-3803B	1 E

Location and Surveys

SURVEY CONTROL SHEET

BL

POINT	DESC.	NORTH	EAST	ELEVATION	L STATION	OFFSET
35	WOLFE	577210.5670	1478480.5960	641.06	OUTSIDE PROJECT LIMITS	
115	BL 115	580289.8380	1479934.9010	742.00	16+79.12	139.80 RT
114	BL 114	581573.7320	1480058.3330	711.81	29+44.45	110.32 LT
113	BL 113	582323.9760	1480315.3730	702.83	37+31.18	94.81 LT
117	NCGS OLDROAD	583253.9230	1480698.7880	697.75	47+21.28	129.97 LT
112	BL 112	583315.3940	1480778.0620	685.34	48+11.95	90.22 LT
111	BL 111	584215.7630	1481390.8240	671.15	58+88.99	79.54 LT
110	BL 110	585319.6280	1482296.8210	654.45	73+15.26	76.63 LT
109	BL 109	586262.4200	1483067.9560	668.67	85+33.25	78.66 LT
36	TWENTY	586258.2590	1483168.8840	695.96	85+94.06	2.00 RT
108	BL 108	587123.2510	1483776.1640	683.26	96+47 96	77.33 LT
107	BL 107	587744.7970	1484279.7990	686.07	104+47 93	82.34 LT
106	BL 106	588407.0170	1484823.3300	680.21	113+04.64	82.31 LT
105	BL 105	589005.3890	1485320.4650	672.48	120+82.57	77.64 LT
104	BL 104	589804.7070	1485976.9710	661.40	131 16.94	77.25 LT
103	BL 103	590593.0550	1486624.6670	639.61	141 37.23	76.72 LT
102	BL 102	591385.2270	1487275.1230	625.19	151+62.23	76.48 LT
101	BL 101	592080.5690	1487833.5120	627.98	160+53.98	85.98 LT
100	BL 100	592790.6920	1488400.4400	625.71	169+62.56	98.25 LT
400	BY5-400	593473.3380	1489275.2060	638.67	180+45.21	144.86 RT
407	BL-407	594037.8170	1489541.1740	608.00	186+50.33	2.11 RT
45	BL-45	594761.1880	1490039.8090	605.95	195+29.10	1.64 LT
46	BL-46	595561.4000	1490533.0970	605.76	204+68.34	20.90 RT
47	BL-47	596337.6430	1490898.1360	602.21	213+25.06	11.86 RT
48	BL-48	597190.0960	1491228.5770	604.42	222+38.72	9.07 RT
49	BL-49	598082.7140	1491513.7740	614.47	231 75.55	9.88 RT
40	BILLBOARD	598580.5870	1491735.4520	620.12	237+16.87	73.08 RT
50	BL-50	598944.4720	1491776.5150	622.76	240+76.45	3.81 RT
51	BL-51	599861.6040	1492068.8500	632.67	250+39.03	9.48 RT
52	BL-52	600728.5270	1492338.6710	646.68	259+46.97	8.63 RT
53	BL-53	601710.6280	1492645.3790	664.81	269+75.85	8.65 RT
54	BL-54	602682.0570	1492949.4280	677.41	279+93.75	9.32 RT
55	BL-55	603536.4480	1493216.0200	688.88	288+88.77	9.12 RT
56	BL-56	604401.6940	1493486.8060	703.66	297+95.40	9.68 RT
57	BL-57	605322.4460	1493823.4380	716.10	307+77.90	10.72 RT
58	BL-58	606132.0460	1494269.6650	711.77	317+04.61	5.28 RT
59	BL-59	606882.9640	1494863.2540	694.20	326+63.38	0.25 RT
60	BL-60	607469.4300	1495514.4700	677.45	335+40.86	3.13 RT
GPS46	DRAIN	607574.5830	1495516.0310	676.82	336+05.65	79.36 LT
61	BL-61	607970.1370	1496274.5100	659.65	344+52.30	1.09 RT
62	BL-62	608358.3920	1497130.4630	641.12	353+92.99	3.15 LT
63	BL-63	608732.4110	1498115.2140	620.57	364+46.37	2.75 LT
64	BL-64	609056.6430	1498947.0080	608.36	373+39.32	1.23 LT
65	BL-65	609385.7960	1499614.1650	619.74	380+82.54	16.89 RT
GPS45	CODCREEK	609671.1820	1500128.4480	627.48	386+64.03	70.78 RT
66	BL-66	609797.0510	1500200.7650	628.40	387+97.37	15.77 RT
67	BL-67	610437.7330	1500874.4800	631.88	397+26.05	9.27 RT
419	BL-419	611184.4640	1501423.5860	623.91	406+53.85	10.65 LT
420	BL-420	612027.5630	1501901.0060	614.56	416+23.95	0.23 LT
421	BL-421	612757.3620	1502275.9220	617.90	424+44.42	0.21 LT
71	BL 71	613584.2950	1502696.2630	627.39	433+72.05	4.16 LT
72	BL 72	614414.6030	1503124.7530	636.39	443+06.36	3.34 LT
426	BL-426	615195.9030	1503620.0620	648.88	452+31.80	4.60 LT
GPS50	FIFTY	615340.7560	1503643.6150	654.23	453+59.91	74.58 LT
427	BL-427	616052.5350	1504410.4430	676.28	463+98.27	3.38 LT
75	BL 75	616513.8820	1504935.2130	692.57	470+96.87	4.45 LT
76	BL 76	616983.8360	1505546.4570	709.67	478+67.74	4.39 LT
77	BL 77	617347.7060	1506115.5710	718.30	485+43.35	11.52 RT
78	BL 78	617697.0210	1506702.2580	715.89	492+26.86	8.84 RT
79	BL 79	617983.8220	1507259.1810	706.43	498+53.86	9.08 RT
429	BL-429	618400.8650	1508235.3670	682.36	509+16.43	2.44 LT
GPS23	13803-23	618721.3620	1509125.1550	670.40	518+48.27	108.50 LT
GPSZ2	13802-2	618644.5030	1509336.4230	658.12	520+45.33	3.85 LT
430	BL-430	618660.5370	1509500.7120	655.31	522+10.30	2.81 LT
431	BL-431	618692.4790	1510719.4100	641.81	534+29.52	2.95 LT
463	BL-463	618710.3930	1511898.1170	630.82	OUTSIDE PROJECT LIMITS	
GPS24	13803-24	618757.7420	1512281.1200	630.10	OUTSIDE PROJECT LIMITS	

BY2

POINT	DESC.	NORTH	EAST	ELEVATION	L STATION	OFFSET
GPS7	13803-7	580840.6570	1478397.0170	767.24	17+65.54	1491.46 LT
120	NCGS MEK45	580440.5470	1479722.3070	741.88	17+62.50	107.09 LT
EO115	BL 115	580289.8380	1479934.9010	742.00	16+79.12	139.80 RT
GPS8	13803-8	579935.4150	1481106.1910	748.21	16+75.66	1363.54 RT

BY3

POINT	DESC.	NORTH	EAST	ELEVATION	L STATION	OFFSET
3	BL 3	586520.9210	1483192.6060	697.75	88+12.15	146.30 LT
EO36	TWENTY	586258.2590	1483168.8840	695.96	85+94.06	2.00 RT
300	B.SPIKE	586027.7970	1483229.8310	689.09	84+54.58	195.32 RT
2	BL-2	585579.3660	1483538.6060	671.01	83+03.84	718.49 RT
301	B.SPIKE	585245.4440	1483737.7130	663.98	81 72.03	1084.24 RT
1	BL 1	584740.4060	1484068.4220	664.72	79+91.44	1660.28 RT
302	B.SPIKE	584372.6940	1484277.9030	661.83	78+40.10	2055.49 RT
GPS9	13803-9	583904.5600	1484588.6010	652.56	76+75.34	2592.64 RT
GPS10	13803-10	581883.7600	1485908.1310	613.81	69+50.39	4894.65 RT

BY5

POINT	DESC.	NORTH	EAST	ELEVATION	Y5 STATION	OFFSET
406	BY5-406	594813.3310	1486857.9630	636.99	10+26.49	65.74 RT
405	BY5-405	594676.7600	1487243.6280	629.93	14+30.31	54.60 RT
404	BY5-404	594553.1900	1487929.2520	645.04	21+09.81	71.41 LT
401	BY5-401	594069.9200	1488535.8610	642.60	28+73.33	37.58 LT
EO400	BY5-400	593473.3380	1489275.2060	638.67	38+23.28	48.89 LT
13	BL-13	593354.6390	1489441.6450	635.86	40+27 19	63.46 LT
GPS12	13803-12	592771.8050	1490059.0530	634.85	48+74.41	7.67 LT
402	BY5-402	592336.9860	1490482.2590	627.10	54+77.64	57.78 RT
403	BY5-403	591866.7480	1491054.9530	609.39	62+18.65	55.28 RT

BY6

POINT	DESC.	NORTH	EAST	ELEVATION	Y6 STATION	OFFSET
417	BY6-417	608497.0030	1486956.8150	643.01	11+30.14	25.06 RT
416	BY6-416	608391.1310	1488086.9830	689.19	22+62.37	39.18 LT
415	BY6-415	608103.8160	1488565.7900	707.85	28+13.79	31.56 RT
414	BY6-414	607703.1460	1489440.0210	729.76	37+73.24	44.12 LT
413	BY6-413	607130.2010	1490372.5710	728.13	48+65.40	38.77 RT
GPS16	13803-16	606315.7050	1492113.2830	762.49	67+86.08	27.94 LT
412	BY6-412	605831.0400	1493059.7240	749.26	78+49.78	13.96 RT
411	BY6-411	605569.1370	1493687.3590	742.86	85+25.15	59.02 RT
410	BY6-410	605423.4340	1494688.3540	743.33	95+34.95	6.07 RT
409	BY6-409	605559.6160	1495280.2240	751.01	101+36.60	38.40 RT
408	BY6-408	606282.4830	1496506.8490	716.06	115+62.08	4.15 LT
GPS19	13803-19	606428.7930	1497309.8250	697.19	123+77.63	30.94 LT
GPS20	13803-20	606542.9780	1498204.6540	698.39	OUTSIDE PROJECT LIMITS	

BY7

POINT	DESC.	NORTH	EAST	ELEVATION	Y7B STATION	OFFSET
458	BY7-458	605720.7470	1488952.0880	718.22	OUTSIDE PROJECT LIMITS	
457	BY7-457	606535.4930	1489138.1690	726.75	21+46.73	28.30 RT
453	BY7-453	606937.2670	1489316.8320	733.36	17+11.06	31.12 LT

POINT	DESC.	NORTH	EAST	ELEVATION	Y7A STATION	OFFSET
EO414	BY6-414	607703.1460	1489440.0210	729.76	29+02.99	78.32 RT
454	BY7-454	607987.7630	1489709.8970	734.98	25+25.02	26.46 LT
455	BY7-455	608601.0910	1490000.5360	749.68	18+49.50	19.41 RT
456	BY7-456	609059.7290	1490497.1610	754.32	11+82.50	36.07 LT

BY8

POINT	DESC.	NORTH	EAST	ELEVATION	Y8 STATION	OFFSET
452	BY8-452	602231.3900	1492342.1660	727.89	47+20.75	18.92 LT
451	BY8-451	603320.3060	1492734.2540	700.33	35+67.55	26.42 LT
450	BY8-450	604500.2180	1493079.9980	718.86	23+41.56	28.12 LT
447	BY8-447	605442.2820	1492987.9740	741.45	13+99.54	14.98 RT
EO412	BY6-412	605831.0400	1493059.7240	749.26	10+13.23	55.68 RT

POINT	DESC.	NORTH	EAST	ELEVATION	Y9 STATION	OFFSET
448	BY9-448	606279.9450	1493447.4280	755.52	22+57.28	23.59 LT
449	BY9-449	607333.6100	1493920.7690	728.21	11+04.79	14.40 RT

DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCGS FOR MONUMENT "M-027"
WITH NAD 83 STATE PLANE GRID COORDINATES OF
NORTHING: 587671.768(ft) EASTING: 1490741.425(ft)
ELEVATION: 715.199(ft)
THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.9998440
THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "M-027" TO -L- STATION 62+66.01 IS
S 70°27'44.7" W 9604.0007
ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES
VERTICAL DATUM USED IS NGVD 29

PROJECT REFERENCE NO.	SHEET NO.
I-3803B	1 F
Location and Surveys	

SURVEY CONTROL SHEET

BY10

POINT	DESC.	NORTH	EAST	ELEVATION	Y10 STATION	OFFSET
446	BY10-446	602380.4040	1494949.3310	704.97	44·03.59	21.18 LT
445	BY10-445	602867.5350	1494791.3650	707.77	38·93.28	19.08 RT
444	BY10-444	603844.3360	1494564.4420	721.16	30·38.11	300.45 RT
443	BY10-443	604534.7410	1494464.6650	739.13	21 72.59	796.58 RT
442	BY10-442	605246.0720	1494372.4490	741.18	14·78.12	976.05 RT
E0410	BY6-410	605423.4340	1494688.3540	743.33	OUTSIDE PROJECT LIMITS	

BY10A

POINT	DESC.	NORTH	EAST	ELEVATION	Y10 STATION	OFFSET
441	BY10-441	604467.7680	1495453.8320	732.50	21 16.73	193.28 LT
440	BY10-440	604643.4820	1495311.2220	739.94	19·60.00	30.04 LT
439	BY10-439	605061.1320	1495347.4210	748.81	15·41.08	14.31 LT
E0409	BY6-409	605559.6160	1495280.2240	751.01	10·38.09	30.05 LT

BY11

POINT	DESC.	NORTH	EAST	ELEVATION	Y11 STATION	OFFSET
425	BY11-425	613136.5320	1500316.0450	686.36	17·23.14	42.22 RT
423	BY11-423	612364.3640	1500812.6870	674.54	26·35.32	62.24 RT
418	BY11-418	611276.9970	1502099.2410	641.68	43·10.15	43.69 RT
422	BY11-422	610872.4760	1502634.7090	643.64	49·79.62	34.20 LT
424	BY11-424	610307.8520	1503083.6480	683.15	56·98.55	46.52 LT

BY12

POINT	DESC.	NORTH	EAST	ELEVATION	Y12 STATION	OFFSET
472	BY12-472	617728.9970	1502062.2570	657.26	OUTSIDE PROJECT LIMITS	
471	BY12-471	617692.8200	1502563.9120	686.70	14·83.54	17.76 RT
470	BY12-470	617686.4330	1503175.9730	702.65	20·95.54	28.54 RT
438	BY12-438	617688.5840	1503678.0480	718.21	25·97.78	29.27 RT
437	BY12-437	617752.2200	1504371.4380	728.15	32·91.64	29.17 LT
432	BY12-432	617653.8220	1505448.5520	743.58	43·71.87	6.03 LT
428	BY12-428	617310.6280	1506788.7600	745.93	57·53.03	72.63 RT
GPS21	13803-21	617284.3500	1507286.0490	745.52	62·46.02	2.35 RT
433	BY12-433	617204.1000	1507681.9430	729.19	66·49.96	4.61 RT
434	BY12-434	617043.2550	1508241.0010	708.25	72·31.88	46.06 RT
435	BY12-435	616889.2330	1509253.3530	700.45	82·53.47	29.51 LT
436	BY12-436	616811.3830	1509653.3260	685.76	86·60.95	29.08 LT

BY20

POINT	DESC.	NORTH	EAST	ELEVATION	L STATION	OFFSET
E040	BILLBOARD	598580.5870	1491735.4520	620.12	OUTSIDE PROJECT LIMITS	
41	7JS66	598310.0690	1492372.8670	651.19	OUTSIDE PROJECT LIMITS	
GPS13	13803-13	597943.1100	1492967.3020	683.00	OUTSIDE PROJECT LIMITS	

BY21

POINT	DESC.	NORTH	EAST	ELEVATION	L STATION	OFFSET
GPS17	13803-17	609665.1020	1496152.7760	688.46	OUTSIDE PROJECT LIMITS	
GPS18	13803-18	609249.3720	1497147.3160	678.62	OUTSIDE PROJECT LIMITS	
E063	BL-63	608732.4110	1498115.2140	620.57	OUTSIDE PROJECT LIMITS	

R2248EBL

POINT	DESC.	NORTH	EAST	ELEVATION	L STATION	OFFSET
E352	NOT SET	590465.5885	1479845.8747	UNKNOWN	OUTSIDE PROJECT LIMITS	
E250	BL-50	590231.0523	1480283.1576	UNKNOWN	OUTSIDE PROJECT LIMITS	
E251	BL-51	589827.2571	1480667.5729	UNKNOWN	OUTSIDE PROJECT LIMITS	
E252	BL-52	589230.9985	1481151.5811	UNKNOWN	OUTSIDE PROJECT LIMITS	
E253	BL-53	588895.5890	1481347.5256	UNKNOWN	OUTSIDE PROJECT LIMITS	
E254	BL-54	588452.9029	1481633.0959	UNKNOWN	OUTSIDE PROJECT LIMITS	
E255	BL-55	588162.0144	1481822.3114	UNKNOWN	OUTSIDE PROJECT LIMITS	
E256	B.SPIKE	587744.8630	1482094.8207	UNKNOWN	OUTSIDE PROJECT LIMITS	
E257	B.SPIKE	587327.7346	1482367.3431	UNKNOWN	OUTSIDE PROJECT LIMITS	
EOU36	TWENTY	586258.2590	1483168.8840	695.96	OUTSIDE PROJECT LIMITS	

R2248EBY9

POINT	DESC.	NORTH	EAST	ELEVATION	L STATION	OFFSET
E0352		590465.5885	1479845.8747	UNKNOWN	OUTSIDE PROJECT LIMITS	
38	FIRE	590463.0960	1480147.2600	747.05	OUTSIDE PROJECT LIMITS	
E331	BY9-31	589782.8346	1481113.6153	UNKNOWN	OUTSIDE PROJECT LIMITS	
37	R2248E-20	589008.2590	1482295.5210	726.74	OUTSIDE PROJECT LIMITS	

GPS CONTROL POINTS: LOCALIZED PROJECT COORDINATES

POINT	DESC.	NORTH	EAST	ELEVATION
GPS1	13803-1	563038.0660	1468190.0150	755.61
GPS2	13803-2	562188.3910	1468266.6940	770.33
GPS3	13803-3	567163.7140	1473084.9290	734.86
GPS4	13803-4	568700.1060	1474025.8750	702.31
GPS5	13803-5	573979.4850	1473761.4610	627.78
GPS6	13803-6	572364.6890	1476376.3380	692.64
GPS7	13803-7	580840.6570	1478397.0170	767.24
GPS8	13803-8	579935.4150	1481106.1910	748.21
GPS9	13803-9	583904.5600	1484588.6010	652.56
GPS10	13803-10	581883.7600	1485908.1310	613.81
GPS11	13803-11	592402.4630	1487016.9900	672.13
GPS12	13803-12	592771.8050	1490059.0530	634.85
GPS13	13803-13	597943.1100	1492967.3020	683.00
GPS16	13803-16	606315.7050	1492113.2830	762.49
GPS17	13803-17	609665.1020	1496152.7760	688.46
GPS18	13803-18	609249.3720	1497147.3160	678.62
GPS19	13803-19	606428.7930	1497309.8250	697.19
GPS20	13803-20	606542.9780	1498204.6540	698.39
GPS21	13803-21	617284.3500	1507286.0490	745.52
GPS23	13803-23	618721.3620	1509125.1550	670.40
GPS24	13803-24	618757.7420	1512281.1200	630.10
GPS45	CODCREEK	609671.1820	1500128.4480	627.48
GPS46	DRAIN	607574.5830	1495516.0310	676.82
GPS47	7JS16	621719.9540	1517710.7350	727.74
GPS48	TIMBER	619714.7470	1506363.2690	739.73
33	ROCKY	565170.9800	1475762.2080	781.28
35	WOLFE	577210.5670	1478480.5960	641.06
36	TWENTY	586258.2590	1483168.8840	695.96
37	R2248E-20	589008.2590	1482295.5210	726.74
38	FIRE	590463.0960	1480147.2600	747.05
39	M027	587671.7680	1490741.4250	715.20
40	BILLBOARD	598580.5870	1491735.4520	620.12
41	7JS66	598310.0690	1492372.8670	651.19

DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT
IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY
NCGS FOR MONUMENT "M-027"
WITH NAD 83 STATE PLANE GRID COORDINATES OF
NORTHING: 587671.768(ft) EASTING: 1490741.425(ft)
ELEVATION: 715.199(ft)
THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT
(GROUND TO GRID) IS: 0.9998440
THE N.C. LAMBERT GRID BEARING AND
LOCALIZED HORIZONTAL GROUND DISTANCE FROM
"M-027" TO -L- STATION 62+66.01 IS
S 70°27'44.7" W 9604.0007
ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES
VERTICAL DATUM USED IS NGVD 29

NOTES:

1. *THE CONTROL DATA FOR THIS PROJECT CAN BE FOUND ELECTRONICALLY BY SELECTING PROJECT CONTROL DATA AT: HTTP://WWW.NCDOT.ORG/DOH/PRECONSTRUCT/HIGHWAY/LOCATION/PROJECT/*

THE FILES TO BE FOUND ARE AS FOLLOWS:
I3803B_LS_CONTROL.TXT
I3803B_LS_LOCAL.TXT

SITE CALIBRATION INFORMATION HAS NOT BEEN PROVIDED FOR THIS PROJECT. THE LOCAL FILE IS COMMA DELIMITED AND CAN BE USED IN CONJUNCTION WITH GROUND TIES TO PRODUCE A SITE CALIBRATION FOR THE END USER'S GPS EQUIPMENT. IF FURTHER INFORMATION IS NEEDED, PLEASE CONTACT THE LOCATION & SURVEYS UNIT.

PROJECT CONTROL ESTABLISHED USING GLOBAL POSITIONING SYSTEM. NETWORK ESTABLISHED FROM EXISTING HARN MONUMENTATION

PROJECT REFERENCE NO.	SHEET NO.
I-3803B	1 G

Location and Surveys

SURVEY CONTROL SHEET

BM5 ELEVATION 711.67
N 580949 E 1480127
L STATION 23·65 134 RIGHT
NW BOLT ON LIGHT POLE

BM6 ELEVATION 654.91
N 585319 E 1482494
L STATION 74·40 76 RIGHT
NW BOLT OF EXIT 48 SIGN

BM7 ELEVATION 665.53
N 589311 E 1485807
L STATION 126·27 104 RIGHT
RR SPIKE SET IN 13" OAK

BM8 ELEVATION 631.20
N 593408 E 1489198
L STATION 179·46 126 RIGHT
SCRIBED SQUARE ON SE BRIDGE SEAT

BM9 ELEVATION 615.16
N 598277 E 1491677
L STATION 234·10 108 RIGHT
RR SPIKE IN 10" MAPLE

BM10 ELEVATION 684.64
N 603247 E 1493212
L STATION 286·11 91 RIGHT
NW BOLT OF GAS FOOD SIGN

BM11 ELEVATION 665.13
N 607724 E 1496050
L STATION 341 31 100 RIGHT
RR SPIKE IN 10" MAPLE

BM20 ELEVATION 605.65
N 595601 E 1490450
L STATION 204·65 71 LEFT
SCRIBED SQUARE ON NE WW OF BRIDGE

BM21 ELEVATION 626.34
N 591027 E 1486979
L STATION 146·97 78 LEFT
X ON CONCRETE AT SW CORNER OF EXIT 48
3/4 MILE SIGN

BM22 ELEVATION 682.08
N 587484 E 1484023
L STATION 100·84 115 LEFT
RR SPIKE IN 5" HARDWOOD

BM23 ELEVATION 696.65
N 583242 E 1480702
L STATION 47·13 121 LEFT
RR SPIKE IN BASE OF DOUBLE 12" OAK

BM24 ELEVATION 677.62
N 578475 E 1479028
L STATION 10·00.03
S 25°37'08" W DIST 1336.06
NE BOLT ON EXIT 45A FOOD SIGN

BM31 ELEVATION 746.01
N 605285 E 1494503
Y6 STATION 93·59 145 RIGHT
NCSHC 7JS9

BM32 ELEVATION 753.11
N 605592 E 1493533
L STATION 308·95 367 LEFT
RR SPIKE IN BASE OF POWER/TEL POLE
•7191 LP2

BM33 ELEVATION 765.33
N 606198 E 1492183
Y6 STATION 69·02 45 RIGHT
RR SPIKE IN BASE OF 10" FENCE POST AT
AIRPORT

BM34 ELEVATION 739.28
N 606865 E 1491049
Y6 STATION 55·89 33 LEFT
RR SPIKE IN BASE OF POWER POLE •150 E

BM35 ELEVATION 727.44
N 607327 E 1490148
Y6 STATION 45·76 34 LEFT
RR SPIKE IN BASE OF POWER/TEL POLE
•149024 060715

BM36 ELEVATION 727.84
N 607621 E 1489405
Y7B STATION 10·30 75 RIGHT
RR SPIKE IN BASE OF TEL/POWER POLE

BM37 ELEVATION 707.61
N 608114 E 1488544
Y6 STATION 27·90 33 RIGHT
RR SPIKE IN BASE OF TEL/POWER POLE

BM38 ELEVATION 674.95
N 608472 E 1487588
Y6 STATION 17·59 38 LEFT
RR SPIKE IN BASE OF POWER POLE •148755
060833

BM39 ELEVATION 644.05
N 608561 E 1486814
Y6 STATION 10·00.00
N 25°38'50" W DIST 35.00
RR SPIKE IN BASE OF POWER POLE •148685
060845

BM40 ELEVATION 736.73
N 608015 E 1489661
Y7A STATION 25·24 29 RIGHT
RR SPIKE IN BASE OF TEL POLE

BM41 ELEVATION 756.84
N 608838 E 1490493
Y7A STATION 13·43 168 LEFT
RR SPIKE IN BASE OF POWER POLE

BM42 ELEVATION 727 95
N 606492 E 1489117
Y7B STATION 21·95 37 RIGHT
RR SPIKE IN BASE OF POWER POLE

BM43 ELEVATION 718.52
N 605719 E 1488956
Y7B STATION 29·73.49
S 55°57'55" E DIST 25.72
RR SPIKE IN BASE OF POWER POLE

BM44 ELEVATION 751.48
N 605909 E 1493087
Y9 STATION 27·59 62 RIGHT
RR SPIKE IN BASE OF POWER POLE

BM45 ELEVATION 729.21
N 607206 E 1493902
Y9 STATION 12·28 25 LEFT
RR SPIKE IN BASE OF POWER POLE •50T

BM46 ELEVATION 730.92
N 605033 E 1492993
Y8 STATION 18·04 37 RIGHT
RR SPIKE IN BASE OF POWER POLE

BM47 ELEVATION 701.90
N 603397 E 1492766
Y8 STATION 34·85 31 LEFT
RR SPIKE IN BASE OF POWER POLE

BM48 ELEVATION 710.99
N 602544 E 1492403
Y8 STATION 44·10 32 RIGHT
RR SPIKE IN BASE OF POWER POLE

BM49 ELEVATION 740.45
N 605652 E 1495270
Y6 STATION 101 73 47 LEFT
RR SPIKE IN BASE OF POWER POLE •149518
060563

BM50 ELEVATION 723.31
N 606013 E 1496152
Y6 STATION 111 16 94 RIGHT
RR SPIKE IN BASE OF TEL/POWER POLE •6841

BM51 ELEVATION 720.06
N 603851 E 1494536
Y10TIE STATION 13·79 45 LEFT
RR SPIKE IN BASE OF POWER POLE

BM52 ELEVATION 706.46
N 602459 E 1494052
Y10 STATION 43·05 56 RIGHT
RR SPIKE IN BASE OF POWER POLE

BM53 ELEVATION 730.84
N 604366 E 1495503
Y17 STATION 13·48 32 RIGHT
CHISLED SQUARE ON CORNER OF CONC WATER
BOX

BM54 ELEVATION 629.80
N 592761 E 1489933
Y5 STATION 47·84 81 RIGHT
CHISLED SQUARE ON CORNER OF CONC PAD OF
POWER BOX

BM55 ELEVATION 611.09
N 591941 E 1490944
Y5 STATION 60·86 68 RIGHT
CHISLED SQUARE ON CORNER OF CONC PAD OF
POWER BOX

BM56 ELEVATION 644.76
N 594316 E 1488302
Y5 STATION 25·37 78 LEFT
CHISLED SQUARE ON CORNER OF CONC
SIDEWALK

BM57 ELEVATION 637.18
N 594812 E 1486854
Y5 STATION 10·24 69 RIGHT
RR SPIKE IN POWER POLE, 0.7' UP FROM
BASE

BM59 ELEVATION 682.76
N 616136 E 1504679
L STATION 466·54 116 RIGHT
RR SPIKE IN ROOT OF 30" OAK

BM60 ELEVATION 722.06
N 617197 E 1506112
L STATION 484·59 137 RIGHT
RR SPIKE IN BASE OF 20" PINE

BM61 ELEVATION 730.20
N 617588 E 1506975
L STATION 494·17 234 RIGHT
RR SPIKE IN ROOT OF 14" PINE

BM62 ELEVATION 684.17
N 618554 E 1508434
L STATION 511·49 92 LEFT
RR SPIKE IN BASE OF 8" OAK

BM63 ELEVATION 654.34
N 618593 E 1509925
L STATION 526·33 87 RIGHT
RR SPIKE IN ROOT OF 20" OAK

BM64 ELEVATION 740.15
N 617253 E 1507477
Y12 STATION 64·39 4 LEFT
RR SPIKE IN BASE OF POWER POLE

BM65 ELEVATION 706.99
N 617094 E 1508235
Y12 STATION 72·13 2 LEFT
RR SPIKE IN BASE OF TEL/POWER POLE •4324

BM66 ELEVATION 702.43
N 616895 E 1509246
Y12 STATION 82·45 34 LEFT
RR SPIKE IN BASE OF TEL/POWER POLE •4130

BM67 ELEVATION 635.54
N 618802 E 1511143
L STATION 538·54 108 LEFT
RR SPIKE IN BASE OF 14" OAK

BM68 ELEVATION 631.40
N 618750 E 1512055
L STATION 540.00
N 85°59'4.20" E DIST 767.40
NAIL SET IN CONC WING WALL

BM70 ELEVATION 628.56
N 610711 E 1500958
L STATION 399·90 106 LEFT
RR SPIKE IN ROOT OF 16" OAK

BM71 ELEVATION 624.91
N 611901 E 1501696
L STATION 414·18 125 LEFT
RR SPIKE IN ROOT OF 18" OAK

BM72 ELEVATION 743.84
N 617688 E 1505447
Y12 STATION 43·65 40 LEFT
CHISLED CORNER OF CONC PAD OF POWER BOX

BM73 ELEVATION 729.73
N 617771 E 1504368
Y12 STATION 32·88 48 LEFT
RR SPIKE IN ROOT OF 20" OAK

BM74 ELEVATION 718.76
N 617684 E 1503669
Y12 STATION 25·89 34 RIGHT
RR SPIKE IN BASE OF POWER/TEL POLE •65T

BM75 ELEVATION 739.73
N 619715 E 1506363
L STATION 498·05 1939 LEFT
CITY OF CONCORD GPS CONTROL TIMBER 1991

BM76 ELEVATION 623.70
N 613383 E 1502495
L STATION 431·01 91 LEFT
CHISLED TRIANGLE IN CONC PAD OF EXIT·54
SIGN

BM77 ELEVATION 648.90
N 614615 E 1503127
L STATION 444·82 98 LEFT
RR SPIKE IN ROOT OF 28" OAK

BM78 ELEVATION 646.58
N 608157 E 1496934
L STATION 351·36 114 RIGHT
RR SPIKE IN BASE OF 16" PINE

BM79 ELEVATION 630.41
N 608632 E 1498126
L STATION 364·21 95 RIGHT
RR SPIKE IN BASE OF 20" SCALEYBARK

BM80 ELEVATION 614.70
N 609302 E 1499428
L STATION 378·80 5 LEFT
PAINTED BOLT ON METAL PLATE ON CONC
BASE OF CABLE GUIDERAIL

BM81 ELEVATION 717.14
N 604580 E 1493315
L STATION 299·14 207 LEFT
RR SPIKE IN BASE OF BILLBOARD SIGN POLE

BM82 ELEVATION 721.72
N 605363 E 1493963
L STATION 308·75 120 RIGHT
RR SPIKE IN ROOT OF 18" OAK

BM83 ELEVATION 712.77
N 606171 E 1494463
L STATION 318·48 142 RIGHT
RR SPIKE IN ROOT OF 20" OAK

BM84 ELEVATION 690.94
N 606857 E 1494991
L STATION 327·34 110 RIGHT
RR SPIKE IN ROOT OF 14" OAK

BM86 ELEVATION 636.08
N 599241 E 1491969
L STATION 244·17 99 RIGHT
RR SPIKE IN BASE OF 30" OAK

BM87 ELEVATION 652.33
N 600782 E 1492230
L STATION 259·66 111 LEFT
RR SPIKE IN BASE OF 26" OAK

BM88 ELEVATION 678.47
N 613072 E 1500464
L STATION 418·96 1755 LEFT
RR SPIKE IN BASE OF POWER POLE

BM89 ELEVATION 671.83
N 610463 E 1502981
L STATION 408·40 1693 RIGHT
RR SPIKE IN BASE OF TEL POLE •384

BM90 ELEVATION 675.67
N 602045 E 1492645
L STATION 272·94 91 LEFT
RR SPIKE IN BASE OF 8" PINE

BM91 ELEVATION 620.52
N 594267 E 1489914
L STATION 190·52 169 RIGHT
RR SPIKE IN BASE OF FENCE POST

BM92 ELEVATION 606.70
N 595387 E 1490429
L STATION 202·65 13 RIGHT
RR SPIKE IN BASE OF 20" OAK

BM93 ELEVATION 6[illegible]2.1[illegible]
N 596738 E 1491206
L STATION 218·09 143 RIG[illegible]
RR SPIKE IN BASE OF 24" [illegible]AK

BME29 ELEVATION [illegible]24.98
N 589679 E 1481380
L STATION 101·03 3551 LEFT
RR SPIKE IN ROOT 450 MM OAK

DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCGS FOR MONUMENT "M-027"
WITH NAD 83 STATE PLANE GRID COORDINATES OF
NORTHING: 587671.768(ft) EASTING: 1490741.425(ft)
ELEVATION: 715.199(ft)
THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.9998440
THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "M-027" TO -L- STATION 62+66.01 IS
S 70°27'44.7" W 9604.0007
ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES
VERTICAL DATUM USED IS NGVD 29

HDR Engineering, Inc. of the Carolinas
3733 National Drive, Suite 207 Raleigh, N.C. 27612
N.C.B.E.L.S. License Number: F-0116

THE LANE CONSTRUCTION CORPORATION

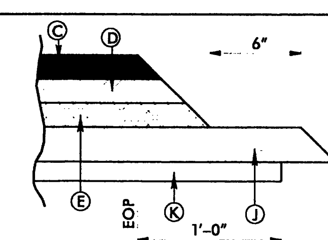
PROJECT REFERENCE NO.	SHEET NO.
I-3803B	2
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

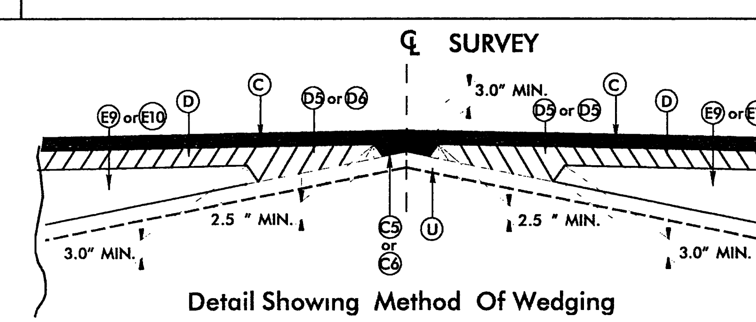
PAVEMENT SCHEDULE

A1	14.0" DOWELED JOINTED CONCRETE WITH 15' UNIFORM JOINT SPACING.	E4	PROP APPROX. 5.5" ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 627 LBS. PER SQ. YD	R2	2'-6" CONCRETE CURB AND GUTTER.
C1	PROP APPROX. 1.25 " ASPHALT CONCRETE SURFACE COURSE, TYPE SF9.5A, AT AN AVERAGE RATE OF 137.5 LBS. PER SQ. YD.	E5	PROP APPROX. 6.5 " ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 370.5 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.	R3	5" MONOLITHIC CONCRETE ISLAND.
C2	PROP APPROX. 1.5 " ASPHALT CONCRETE SURFACE COURSE, TYPE SF9.5C, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD.	E6	PROP APPROX. 7.0" ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 399 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.	R4	DOUBLE FACED CONCRETE BARRIER.
C3	PROP APPROX. 3.0" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.	E7	PROP APPROX. 8.0" ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.	R5	CONCRETE SHOULDER BERM GUTTER.
C4	PROP APPROX. 3.0" ASPHALT CONCRETE SURFACE COURSE TYPE S9.5C, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.	E8	PROP APPROX. 9.0" ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 513 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.	R6	CONCRETE EXPRESSWAY GUTTER.
C5	PROP VAR. DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 112 LBS. PER SQ. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NOT TO EXCEED 2" IN DEPTH.	E9	PROP VAR. DEPTH ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1" DEPTH TO BE PLACED IN LAYERS NOT LESS THAN 3.0" IN DEPTH OR GREATER THAN 5.5" IN DEPTH.	R7	1 BAR METAIL RAIL.
C6	PROP VAR. DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5C, AT AN AVERAGE RATE OF 112 LBS. PER SQ. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NOT TO EXCEED 2" IN DEPTH.	E10	PROP VAR. DEPTH ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD PER 1" DEPTH TO BE PLACED IN LAYERS NOT LESS THAN 3.0" IN DEPTH OR GREATER THAN 5.5" IN DEPTH.	S	4" CONCRETE SIDEWALK.
D1	PROP APPROX. 3.0" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0B, AT AN AVERAGE RATE OF 342 LBS. PER SQ. YD.	J1	PROP 6.0" DEPTH AGGREGATE BASE COURSE.	T	EARTH MATERIAL.
D2	PROP APPROX. 4.0" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0B, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD	J2	PROP 8.0" DEPTH AGGREGATE BASE COURSE.	T1	4" TOPSOIL W/ COMMON BERMUDA GRASS.
D3	PROP APPROX. 3.0" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0C, AT AN AVERAGE RATE OF 342 LBS. PER SQ. YD.	J3	PROP 10.0" DEPTH AGGREGATE BASE COURSE.	U	EXISTING PAVEMENT
D4	PROP APPROX. 4.0" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0C, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.	J4	PROP VARIABLE DEPTH AGGREGATE BASE COURSE.	W	VARIABLE DEPTH ASPHALT PAVEMENT (SEE WEDGING DETAIL)
D5	PROP VAR. DEPTH ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0B, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1" DEPTH, TO BE PLACED IN LAYERS NOT LESS THAN 2.25 " IN DEPTH OR	K	SUBGRADE STABILIZATION.	X	3" PERMEABLE ASPHALT DRAINAGE COURSE (PADC)
D6	PROP VAR. DEPTH ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0C, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD PER 1" DEPTH, TO BE PLACED IN LAYERS NOT LESS THAN 2.25 " IN DEPTH OR GREATER THAN 4" IN DEPTH.	P	PRIME COAT AT THE RATE OF 0.35 GAL. PER SQ. YD.	Y	PROPOSED MILLED RUMBLE STRIPS.
E1	PROP APPROX. 3.0" ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 342 LBS. PER SQ. YD.	R1	1'-6" CONCRETE CURB AND GUTTER.	Z	MILLING
E2	PROP APPROX. 4.0" ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.				
E3	PROP APPROX. 4.5" ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 513 LBS. PER SQ. YD.				

NOTE: PAVEMENT EDGE SLOPES ARE 1 1 UNLESS SHOWN OTHERWISE



Detail Showing Typical Edge of Pavement Construction and Subgrade Stabilization
TYPICAL EDGE OF PAVEMENT DETAIL



Detail Showing Method Of Wedging
STANDARD WEDGING DETAIL

HDR Engineering, Inc. of the Carolinas
3733 National Drive, Suite 207 Raleigh, N.C. 27612
N.C.B.E.L.S. License Number: F-0116

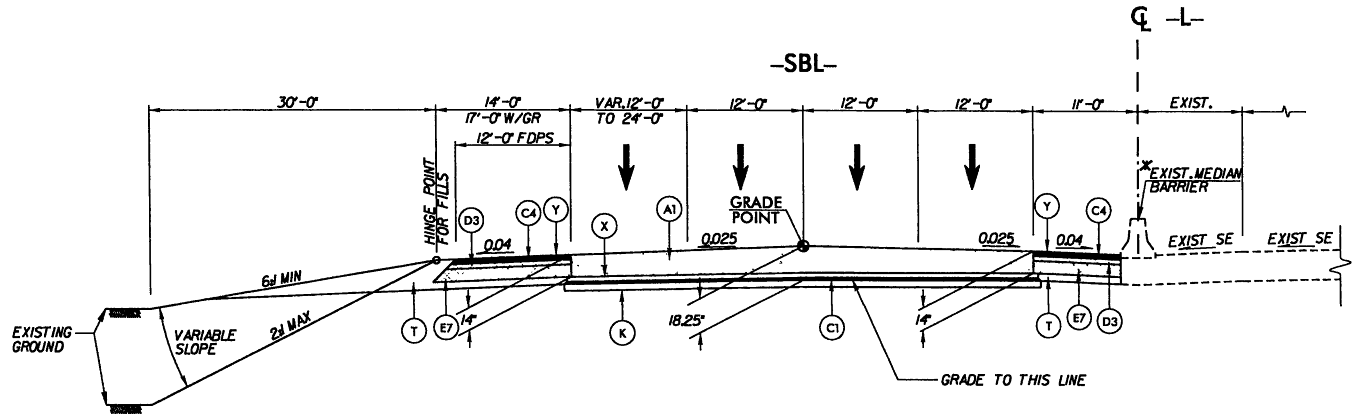
PROJECT REFERENCE NO.	SHEET NO.
I-3803B	2-A

ROADWAY DESIGN ENGINEER

PAVEMENT DESIGN ENGINEER

THE LANE CONSTRUCTION CORPORATION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



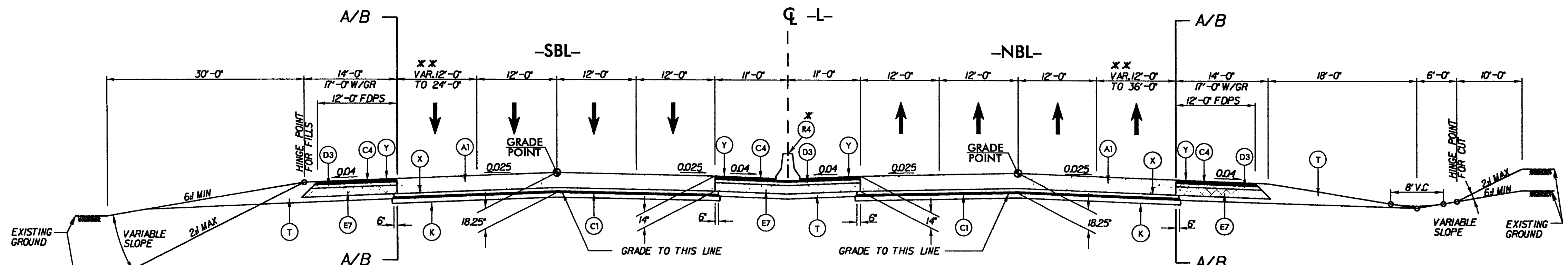
DETAIL H

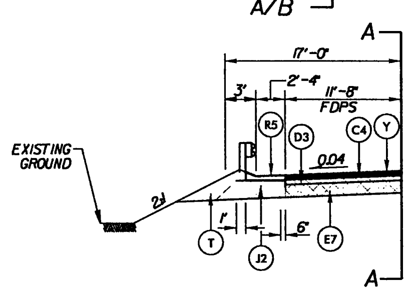
USE WITH TYPICAL SECTION NO.20

-Y6SPURA1- STA.23+97.02 TO STA.25+09.25 RT

TYPICAL SECTION NO. 1

LINE	FROM STATION	TO STATION
-L- SB	159+74.12	170+25.32





DETAIL A

USE WITH TYPICAL SECTION NO.2

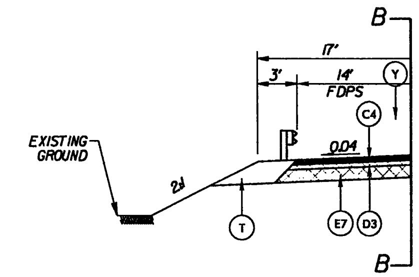
SEE PLANS FOR SHOULDER BERM GUTTER LOCATIONS

TYPICAL SECTION NO. 2

LINE	FROM STATION	TO STATION
-L-	170+25.32	202+57 +/- (BEGIN BRIDGE)
-L-	204+76 +/- (END BRIDGE)	378+91 +/- (BEGIN BRIDGE)
-L-	381+06 +/- (END BRIDGE)	530+00.00

* SEE SHEET 2-0 FOR TYPE OF MEDIAN BARRIER

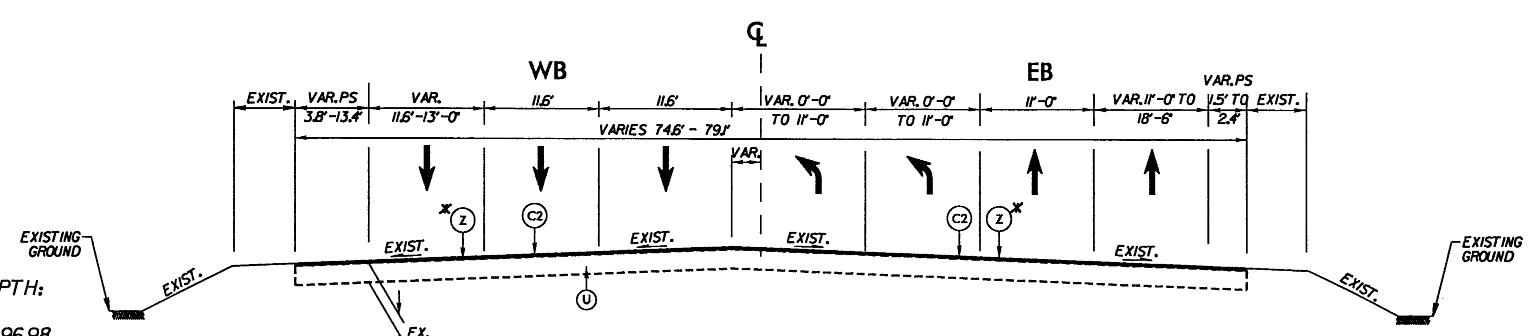
** SEE PLAN SHEETS FOR AUXILIARY LANE LOCATIONS



DETAIL B

USE WITH TYPICAL SECTION NO.2

SEE PLANS FOR SHOULDER BERM GUTTER LOCATIONS



*MILL EXISTING PAVEMENT 1.5" DEPTH:

-Y5- STA.38+43.51 TO STA.39+96.98

INCIDENTAL MILLING SHALL TAKE PLACE:

-Y5- STA.35+12.50 TO STA.35+37.50
-Y5- STA.38+18.51 TO 38+43.51

PORTION WITHIN -Y5LPA- TO BE RESURFACED ALONG EXISTING CURB & GUTTER

TYPICAL SECTION NO. 3

LINE	FROM STATION	TO STATION
-Y5-	32+15.66	35+37.50
-Y5-	38+18.51	39+96.98

A1	14" CONCRETE
C1	1.25" SF9.5A
C2	1.5" S9.5C
C3	3" S9.5B
C4	3" S9.5C
C5	VAR. S9.5B
C6	VAR. S9.5C
D1	3" I19.0B
D2	4" I19.0B
D3	3" I19.0C
D4	4" I19.0C
D5	VAR. I19.0B
D6	VAR. I19.0C
E1	3" B25.0B
E2	4" B25.0B
E3	4.5" B25.0C
E4	5.5" B25.0B
E5	6.5" B25.0B
E6	7" B25.0B
E7	8" B25.0C
E8	9" B25.0C
E9	VAR. B25.0B
E10	VAR. B25.0C
J1	6.0" ABC
J2	8" ABC
J3	10" ABC
J4	VAR. ABC
K	SUBGRADE STABILIZATION
P	PRIME COAT
R1	1'- 6" C & G
R2	2'- 6" C & G
R3	MONOLITHIC ISLAND
R4	DOUBLE FACED CONC. BARRIER
R5	SHOULDER BERM GUTTER
R6	EXPRESSWAY GUTTER
R7	1 BAR METAL RAIL
S	SIDEWALK
T	EARTH MATERIAL
T1	TOPSOIL
U	EXISTING PAVEMENT
W	WEDGING
X	3" PADC
Y	MILLED RUMBLE STRIPS
Z	MILLING

NOTE: PAVEMENT EDGE SLOPES ARE 1 1UNLESS SHOWN OTHERWISE

SEE SHEET 2 FOR TYPICAL EDGE OF PAVEMENT AND SUBGRADE STABILIZATION DETAIL.

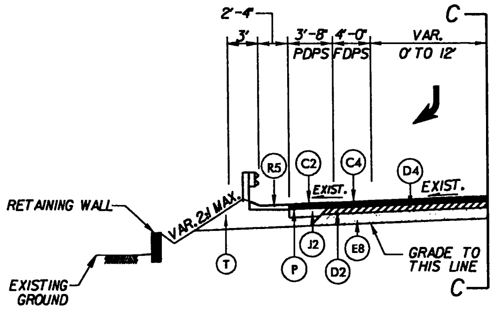
SEE SHEET 2 FOR STANDARD WEDGING DETAIL.

HDR Engineering, Inc. of the Carolinas
3733 National Drive, Suite 207 Raleigh, N.C. 27612
N.C.B.E.L.S. License Number: F-0116

THE LANE CONSTRUCTION CORPORATION

PROJECT REFERENCE NO.	SHEET NO.
I-3803B	2-B
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER

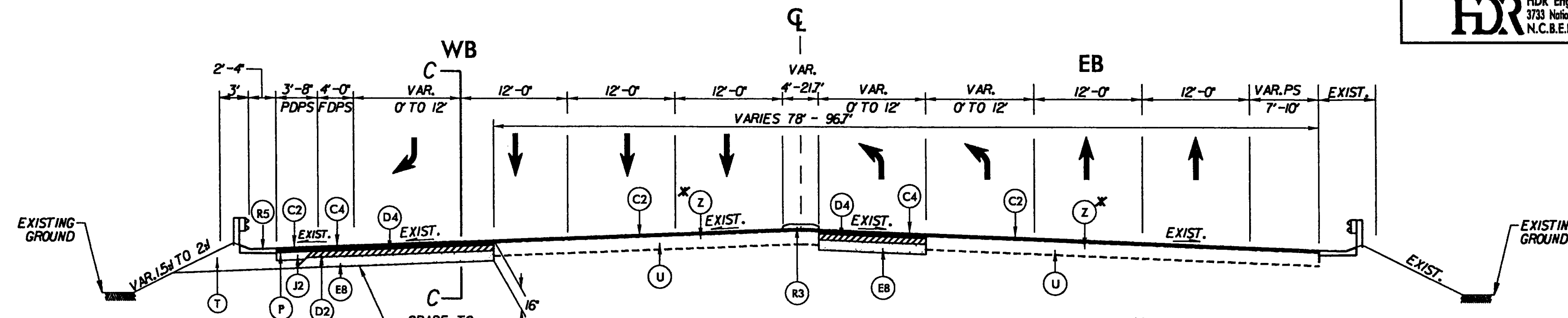
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



DETAIL C

USE WITH TYPICAL SECTION NO.4

-Y5- STA.41+50.00 TO STA.45+50.00 LT

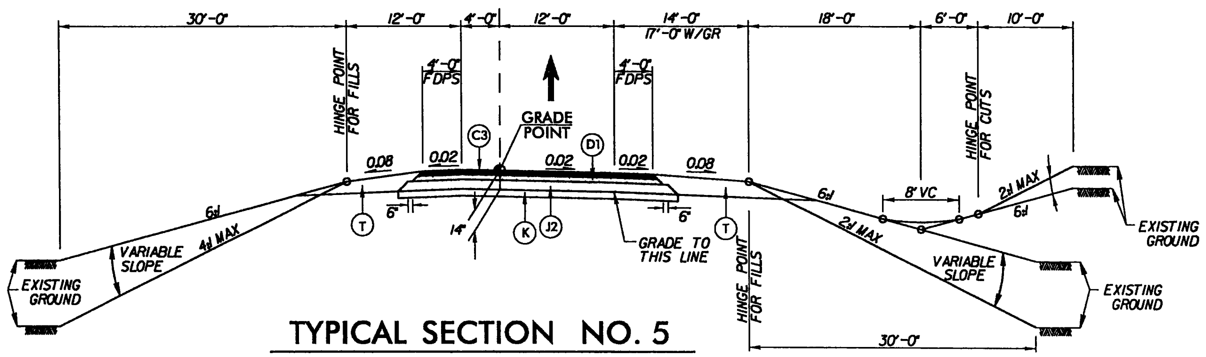


TYPICAL SECTION NO. 4

LINE	FROM STATION	TO STATION
-Y5-	39+96.98	49+74.79
** -Y5-	50+95.79	53+00.00

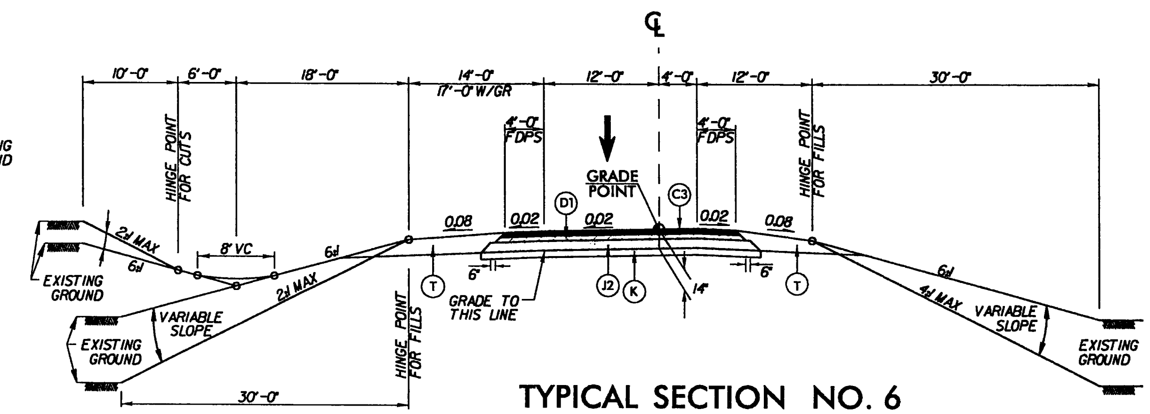
*MILL EXISTING PAVEMENT 1.5" DEPTH

**MILL AND RESURFACE EXISTING PAVEMENT AS SHOWN IN TYPICAL SECTION FOR PROPOSED WESTBOUND (LT) OUTSIDE THRU LANE AND RIGHT-TURN LANE AS SHOWN ON THE PLANS.



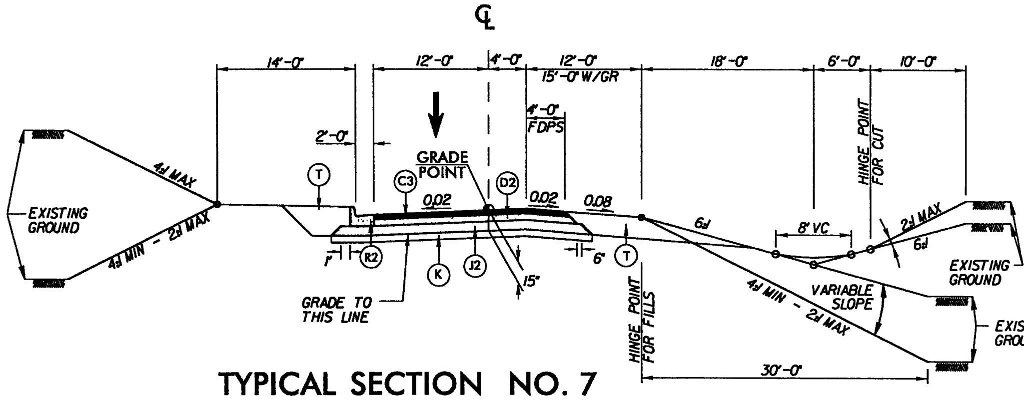
TYPICAL SECTION NO. 5

LINE	FROM STATION	TO STATION
-Y5RPA-	14+97 92	16+77.00



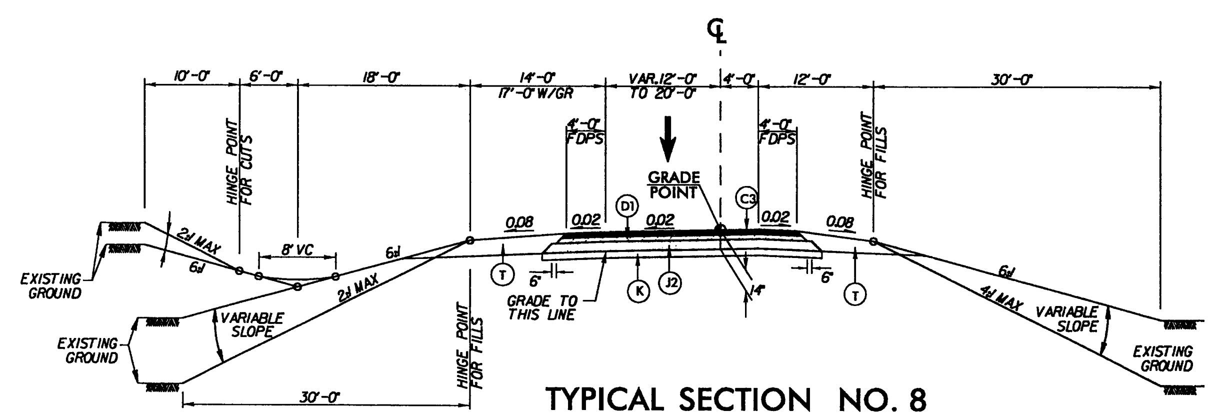
TYPICAL SECTION NO. 6

LINE	FROM STATION	TO STATION
-Y5RPB-	15+41.47	16+21.00



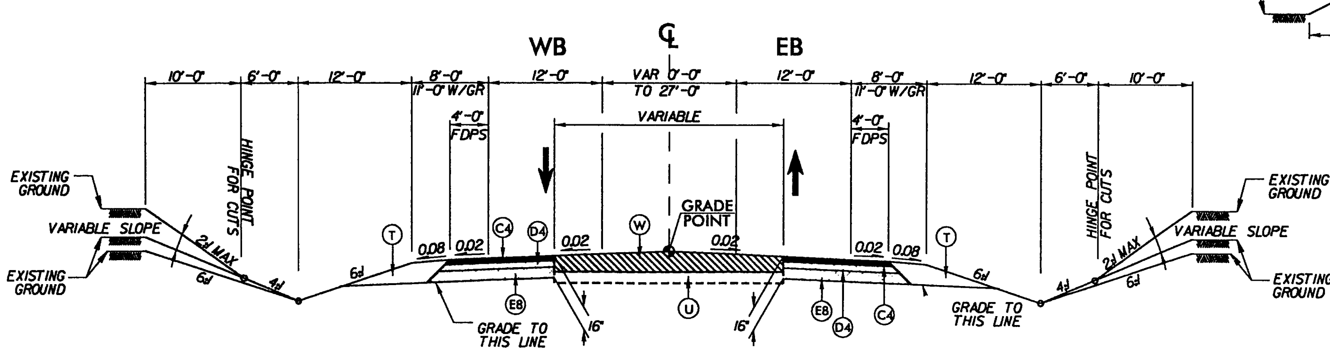
TYPICAL SECTION NO. 7

LINE	FROM STATION	TO STATION
-Y5LPA-	2+29 48	3+61.03



TYPICAL SECTION NO. 8

LINE	FROM STATION	TO STATION
-Y5RPD-	14+79.63	18+50.00



TYPICAL SECTION NO. 9

LINE	FROM STATION	TO STATION
-Y6-	11+00.00	23+55.97

A1	14" CONCRETE
C1	1.25" SF9.5A
C2	1.5" S9.5C
C3	3" S9.5B
C4	3" S9.5C
C5	VAR. S9.5B
C6	VAR. S9.5C
D1	3" I19.0B
D2	4" I19.0B
D3	3" I19.0C
D4	4" I19.0C
D5	VAR. I19.0B
D6	VAR. I19.0C
E1	3" B25.0B
E2	4" B25.0B
E3	4.5" B25.0C
E4	5.5" B25.0B
E5	6.5" B25.0B
E6	7" B25.0B
E7	8" B25.0C
E8	9" B25.0C
E9	VAR. B25.0B
E10	VAR. B25.0C
J1	6.0" ABC
J2	8" ABC
J3	10" ABC
J4	VAR. ABC
K	SUBGRADE STABILIZATION
P	PRIME COAT
R1	1'- 6" C & G
R2	2'- 6" C & G
R3	MONOLITHIC ISLAND
R4	DOUBLE FACED CONC. BARRIER
R5	SHOULDER BERM GUTTER
R6	EXPRESSWAY GUTTER
R7	1 BAR METAL RAIL
S	SIDEWALK
T	EARTH MATERIAL
T1	TOPSOIL
U	EXISTING PAVEMENT
W	WEDGING
X	3" PADC
Y	MILLED RUMBLE STRIPS
Z	MILLING

NOTE. PAVEMENT EDGE SLOPES ARE 1 1UNLESS SHOWN OTHERWISE

SEE SHEET 2 FOR TYPICAL EDGE OF PAVEMENT AND SUBGRADE STABILIZATION DETAIL.

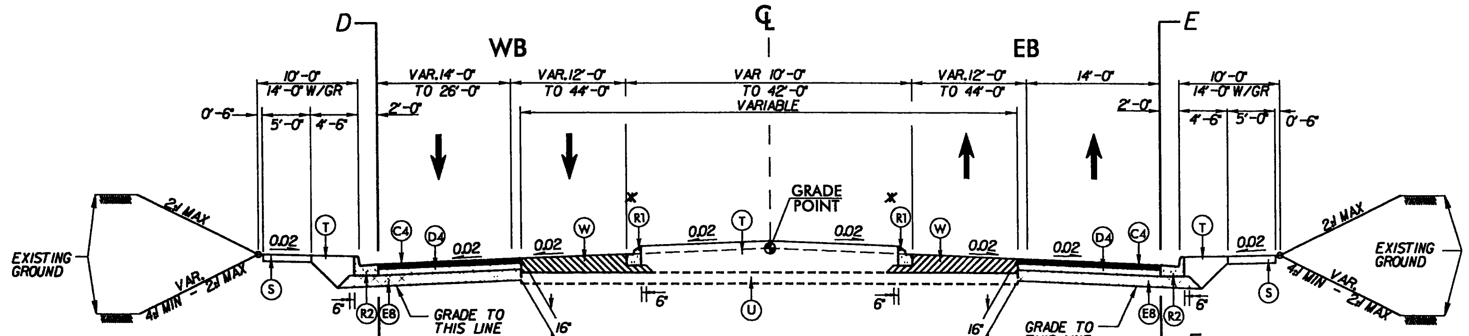
SEE SHEET 2 FOR STANDARD WEDGING DETAIL.

HDR Engineering, Inc. of the Carolinas
3733 National Drive, Suite 207 Raleigh, N.C. 27612
N.C.B.E.L.S. License Number: F-0116

THE LANE CONSTRUCTION CORPORATION

PROJECT REFERENCE NO.	SHEET NO.
I-3803B	2-C
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER

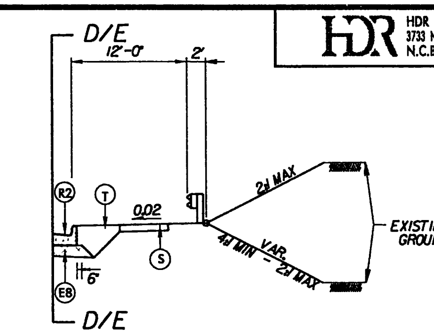
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



TYPICAL SECTION NO. 10

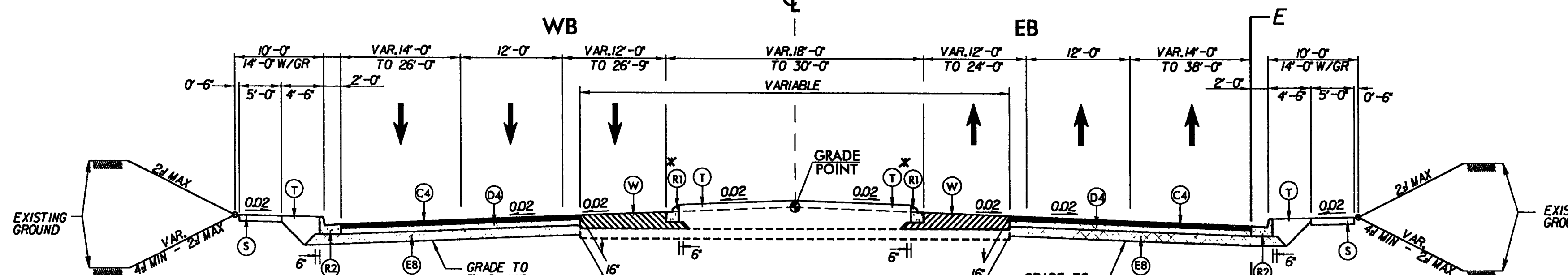
LINE	FROM STATION	TO STATION
-Y6- WB	23+55.97	36+36.60
-Y6- WB	57+53.89	82+34.70
-Y6- WB	108+80.20	115+50.00
-Y6- EB	26+31.60	27+46.60
-Y6- EB	51+98.49	79+66.42
-Y6- EB	104+79.01	115+40.18

*4' MONOLITHIC CONCRETE ISLANDS ARE TO BE CONSTRUCTED IN THE MEDIAN AT LEFT-TURN LANES AS FOLLOWS:
-Y6- STA.27+31.60 TO STA.28+38.57
-Y6- STA.56+74.00 TO STA.57+68.89
-Y6- STA.60+14.00 TO STA.60+36.20
-Y6- STA.67+37.00 TO STA.69+47.00
-Y6- STA.78+00.00 TO STA.79+40.00
-Y6- STA.107+55.00 TO STA.109+65.00



DETAIL D/E

USE WITH TYPICAL SECTION NO. 10 & 11
-Y6- STA.23+98.61 TO STA.31+35.81 RT
-Y6- STA.68+17.99 TO STA.70+86.10 RT
-Y6- STA.81+90.66 TO STA.82+34.70 RT

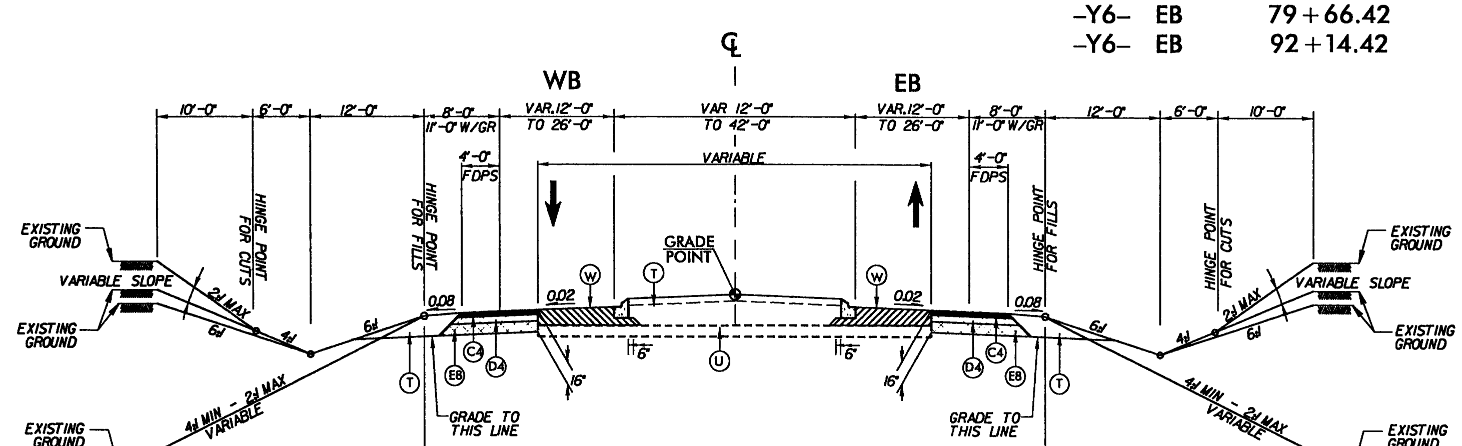


TYPICAL SECTION NO. 11

LINE	FROM STATION	TO STATION
-Y6- WB	36+36.60	57+53.89
-Y6- WB	92+14.42	108+80.20
-Y6- EB	27+46.60	51+98.49
-Y6- EB	79+66.42	82+34.70
-Y6- EB	92+14.42	104+79.01

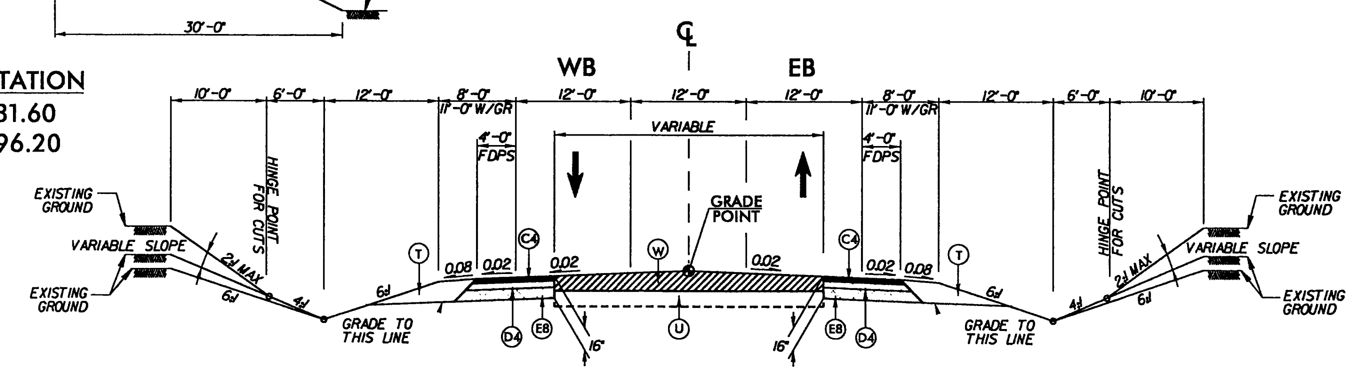
*4' MONOLITHIC CONCRETE ISLANDS ARE TO BE CONSTRUCTED IN THE MEDIAN AT LEFT-TURN LANES AS FOLLOWS:

-Y6- STA.100+52.00 TO STA.101+91.00



TYPICAL SECTION NO. 12

LINE	FROM STATION	TO STATION
-Y6- EB	23+55.97	26+31.60
-Y6-	115+40.18	119+96.20



TYPICAL SECTION NO. 13

LINE	FROM STATION	TO STATION
-Y6-	119+96.20	122+44.52

A1	14" CONCRETE
C1	1.25" SF9.5A
C2	1.5" S9.5C
C3	3" S9.5B
C4	3" S9.5C
C5	VAR. S9.5B
C6	VAR. S9.5C
D1	3" I19.0B
D2	4" I19.0B
D3	3" I19.0C
D4	4" I19.0C
D5	VAR. I19.0B
D6	VAR. I19.0C
E1	3" B25.0B
E2	4" B25.0B
E3	4.5" B25.0C
E4	5.5" B25.0B
E5	6.5" B25.0B
E6	7" B25.0B
E7	8" B25.0C
E8	9" B25.0C
E9	VAR. B25.0B
E10	VAR. B25.0C
J1	6.0" ABC
J2	8" ABC
J3	10" ABC
J4	VAR. ABC
K	SUBGRADE STABILIZATION
P	PRIME COAT
R1	1'- 6" C & G
R2	2'- 6" C & G
R3	MONOLITHIC ISLAND
R4	DOUBLE FACED CONC. BARRIER
R5	SHOULDER BERM GUTTER
R6	EXPRESSWAY GUTTER
R7	1 BAR METAL RAIL
S	SIDEWALK
T	EARTH MATERIAL
T1	TOPSOIL
U	EXISTING PAVEMENT
W	WEDGING
X	3" PADC
Y	MILLED RUMBLE STRIPS
Z	MILLING

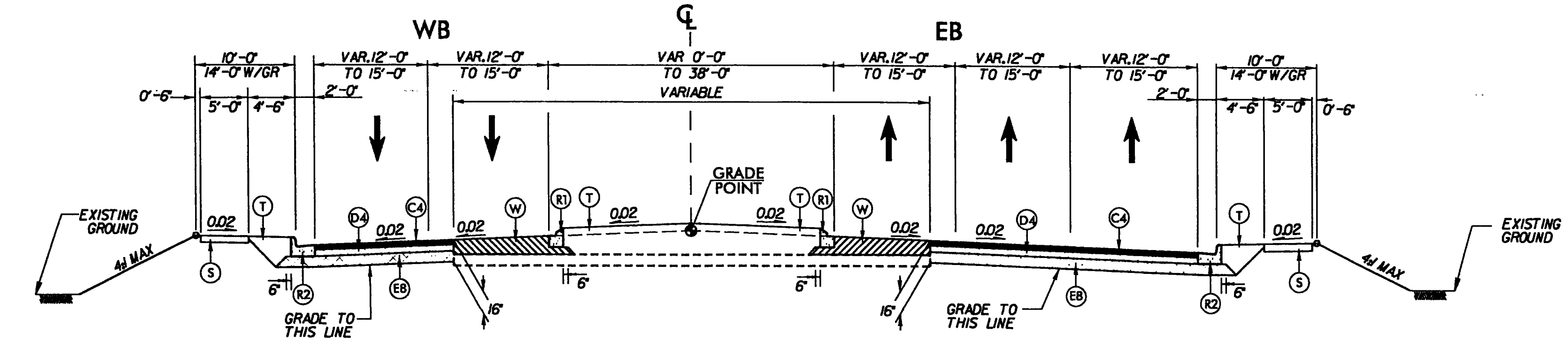
NOTE: PAVEMENT EDGE SLOPES ARE 1 1UNLESS SHOWN OTHERWISE
SEE SHEET 2 FOR TYPICAL EDGE OF PAVEMENT AND SUBGRADE STABILIZATION DETAIL.
SEE SHEET 2 FOR STANDARD WEDGING DETAIL.

HDR Engineering, Inc. of the Carolinas
3733 National Drive, Suite 207 Raleigh, N.C. 27612
N.C.B.E.L.S. License Number: F-0116

PROJECT REFERENCE NO.	SHEET NO.
I-3803B	2-D
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER

THE LANE CONSTRUCTION CORPORATION

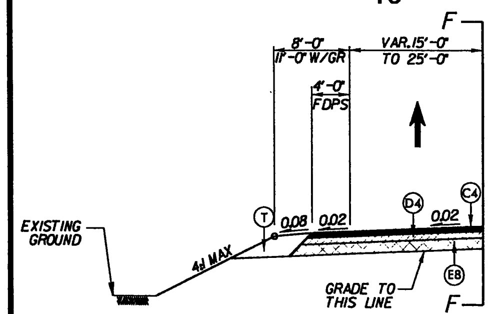
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



TYPICAL SECTION NO. 14

LINE	FROM STATION	TO STATION
-Y6-	82+34.70	84+38.42
*-Y6-	90+20.34	90+77.42

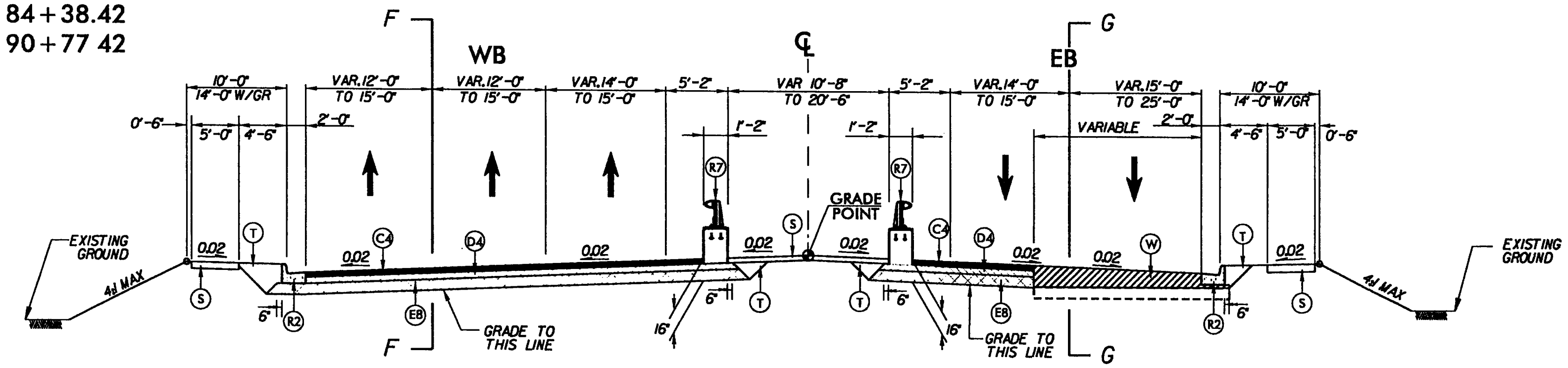
*TRAFFIC FLOW ARROWS ARE OPPOSITE THAN SHOWN IN TYPICAL SECTION.



DETAIL F

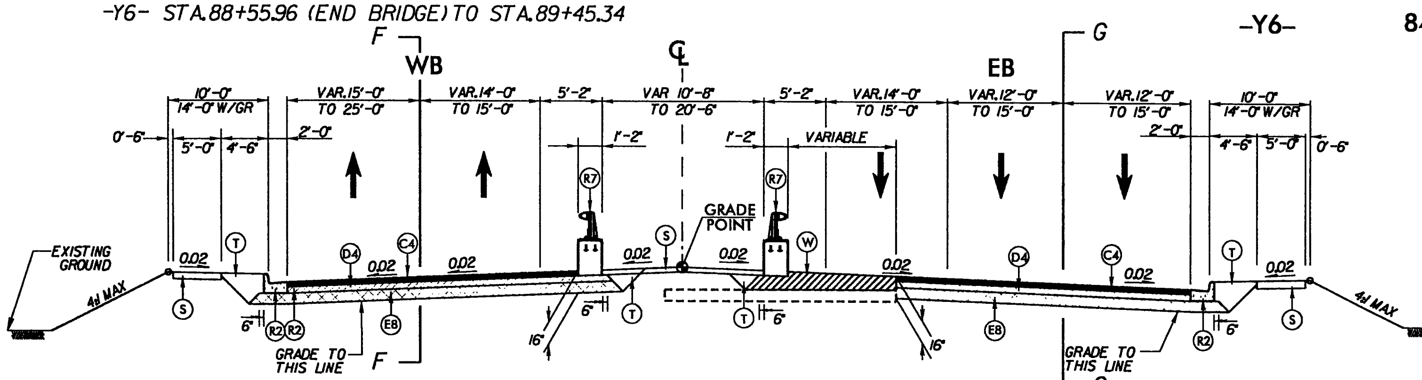
USE WITH TYPICAL SECTION NO 15 & 16

-Y6- STA.85+47.80 TO STA.86+60.96 (BEGIN BRIDGE)
-Y6- STA.88+55.96 (END BRIDGE) TO STA.89+45.34



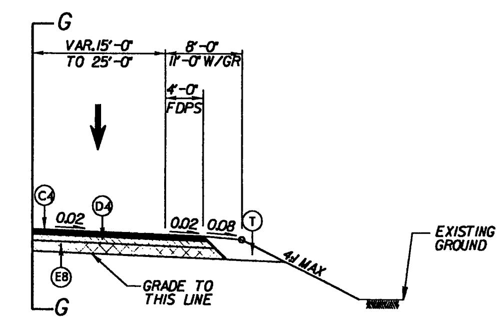
TYPICAL SECTION NO. 15

LINE	FROM STATION	TO STATION
-Y6-	84+91.87	86+60.96 (BEGIN BRIDGE)



TYPICAL SECTION NO. 16

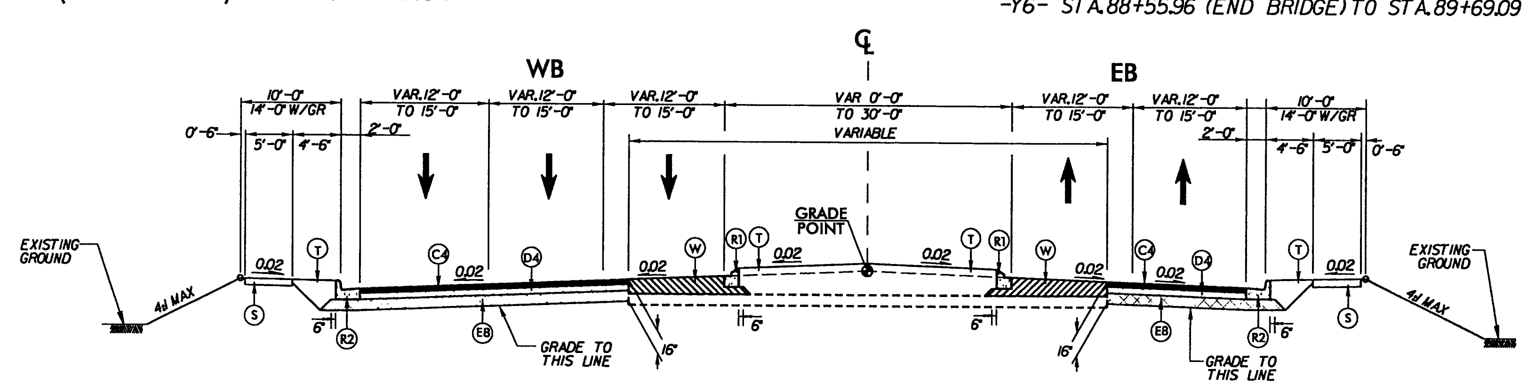
LINE	FROM STATION	TO STATION
-Y6-	88+55.96 (END BRIDGE)	90+20.34



DETAIL G

USE WITH TYPICAL SECTION NO 15 & 16

-Y6- STA.85+57.56 TO STA.86+60.96 (BEGIN BRIDGE)
-Y6- STA.88+55.96 (END BRIDGE) TO STA.89+69.09



TYPICAL SECTION NO. 17

LINE	FROM STATION	TO STATION
*-Y6-	84+38.42	84+91.87
-Y6-	90+77.42	92+14.42

*TRAFFIC FLOW ARROWS ARE OPPOSITE THAN SHOWN IN TYPICAL SECTION.

A1	14" CONCRETE
C1	1.25" SF9.5A
C2	1.5" S9.5C
C3	3" S9.5B
C4	3" S9.5C
C5	VAR. S9.5B
C6	VAR. S9.5C
D1	3" I19.0B
D2	4" I19.0B
D3	3" I19.0C
D4	4" I19.0C
D5	VAR. I19.0B
D6	VAR. I19.0C
E1	3" B25.0B
E2	4" B25.0B
E3	4.5" B25.0C
E4	5.5" B25.0B
E5	6.5" B25.0B
E6	7" B25.0B
E7	8" B25.0C
E8	9" B25.0C
E9	VAR. B25.0B
E10	VAR. B25.0C
J1	6.0" ABC
J2	8" ABC
J3	10" ABC
J4	VAR. ABC
K	SUBGRADE STABILIZATION
P	PRIME COAT
R1	1'-6" C & G
R2	2'-6" C & G
R3	MONOLITHIC ISLAND
R4	DOUBLE FACED CONC. BARRIER
R5	SHOULDER BERM GUTTER
R6	EXPRESSWAY GUTTER
R7	1 BAR METAL RAIL
S	SIDEWALK
T	EARTH MATERIAL
T1	TOPSOIL
U	EXISTING PAVEMENT
W	WEDGING
X	3" PADC
Y	MILLED RUMBLE STRIPS
Z	MILLING

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

SEE SHEET 2 FOR TYPICAL EDGE OF PAVEMENT AND SUBGRADE STABILIZATION DETAIL.

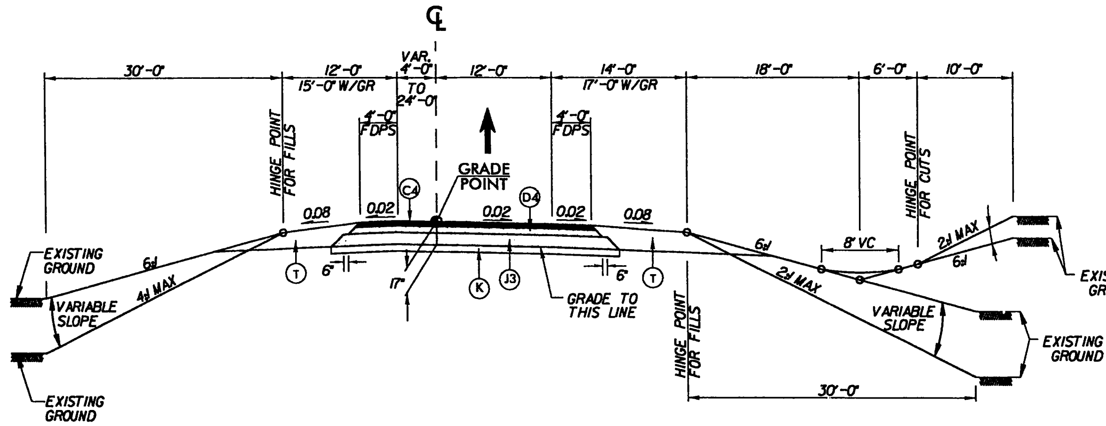
SEE SHEET 2 FOR STANDARD WEDGING DETAIL.

HDR Engineering, Inc. of the Carolinas
3733 National Drive, Suite 207 Raleigh, N.C. 27612
N.C.B.E.L.S. License Number: F-0116

THE LANE CONSTRUCTION CORPORATION

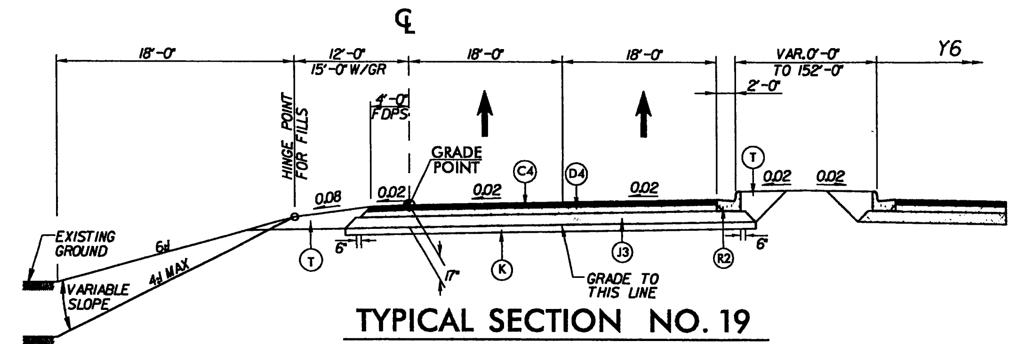
PROJECT REFERENCE NO.	SHEET NO.
I-3803B	2-E
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



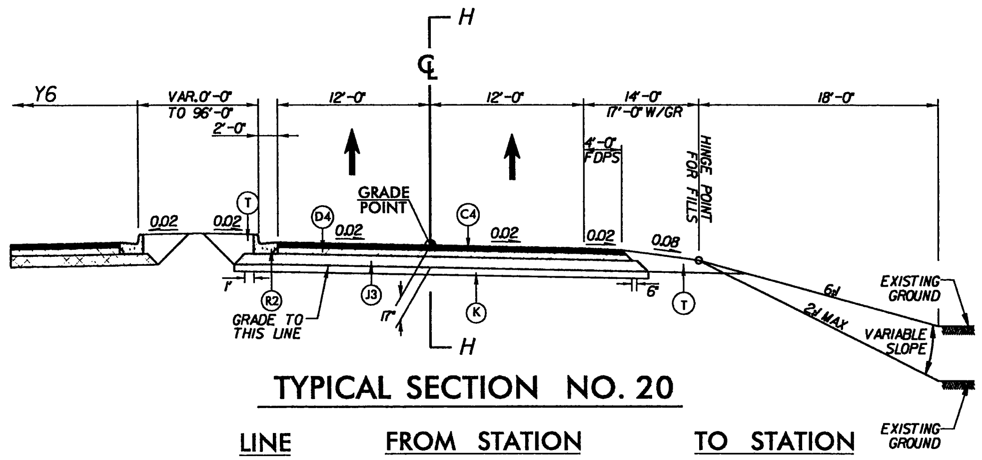
TYPICAL SECTION NO. 18

LINE	FROM STATION	TO STATION
-Y6RPA-	15+39.51	22+17.52



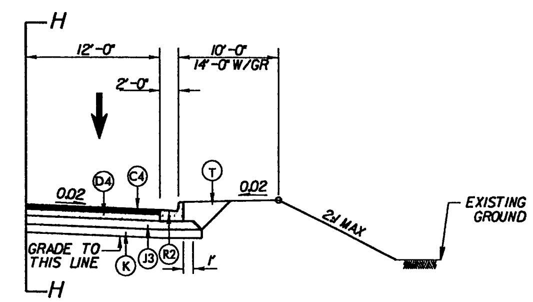
TYPICAL SECTION NO. 19

LINE	FROM STATION	TO STATION
-Y6SPURA2-	23+16.44	24+12.06



TYPICAL SECTION NO. 20

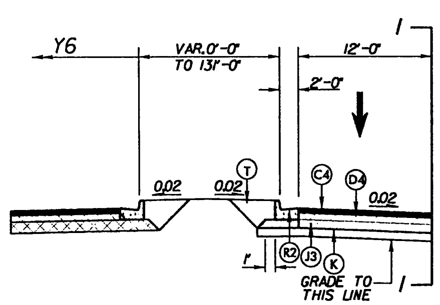
LINE	FROM STATION	TO STATION
-Y6SPURA1-	22+17.52	25+09.25



DETAIL H

USE WITH TYPICAL SECTION NO. 20

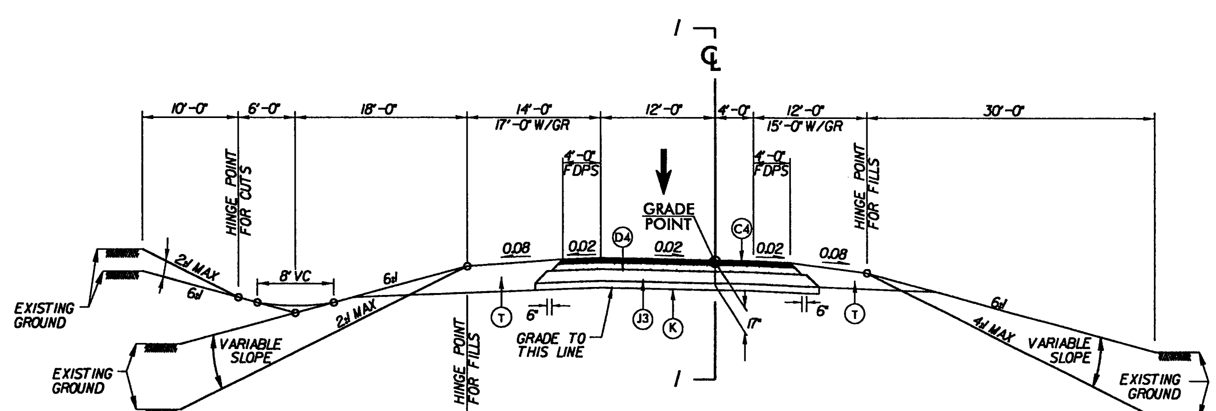
-Y6SPURA1- STA.23+97.02 TO STA.25+09.25 RT



DETAIL I

USE WITH TYPICAL SECTION NO. 21

-Y6RPB- STA.23+68.15 TO STA.24+89.88 LT



TYPICAL SECTION NO. 21

LINE	FROM STATION	TO STATION
-Y6RPB-	15+07.19	24+89.88

A1	14" CONCRETE
C1	1.25" SF9.5A
C2	1.5" S9.5C
C3	3" S9.5B
C4	3" S9.5C
C5	VAR. S9.5B
C6	VAR. S9.5C
D1	3" I19.0B
D2	4" I19.0B
D3	3" I19.0C
D4	4" I19.0C
D5	VAR. I19.0B
D6	VAR. I19.0C
E1	3" B25.0B
E2	4" B25.0B
E3	4.5" B25.0C
E4	5.5" B25.0B
E5	6.5" B25.0B
E6	7" B25.0B
E7	8" B25.0C
E8	9" B25.0C
E9	VAR. B25.0B
E10	VAR. B25.0C
J1	6.0" ABC
J2	8" ABC
J3	10" ABC
J4	VAR. ABC
K	SUBGRADE STABILIZATION
P	PRIME COAT
R1	1'- 6" C & G
R2	2'- 6" C & G
R3	MONOLITHIC ISLAND
R4	DOUBLE FACED CONC. BARRIER
R5	SHOULDER BERM GUTTER
R6	EXPRESSWAY GUTTER
R7	1 BAR METAL RAIL
S	SIDEWALK
T	EARTH MATERIAL
T1	TOPSOIL
U	EXISTING PAVEMENT
W	WEDGING
X	3" PADC
Y	MILLED RUMBLE STRIPS
Z	MILLING

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

SEE SHEET 2 FOR TYPICAL EDGE OF PAVEMENT AND SUBGRADE STABILIZATION DETAIL.

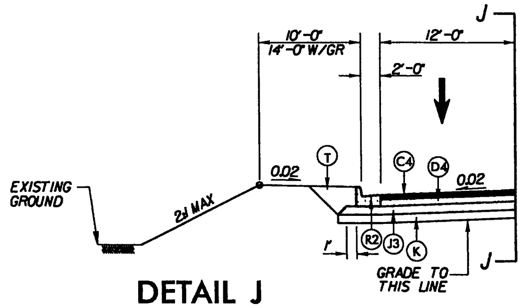
SEE SHEET 2 FOR STANDARD WEDGING DETAIL.

PROJECT REFERENCE NO.	SHEET NO.
I-3803B	2-F
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER

HDR Engineering, Inc. of the Carolinas
3733 National Drive, Suite 207 Raleigh, N.C. 27612
N.C.B.E.L.S. License Number: F-0116

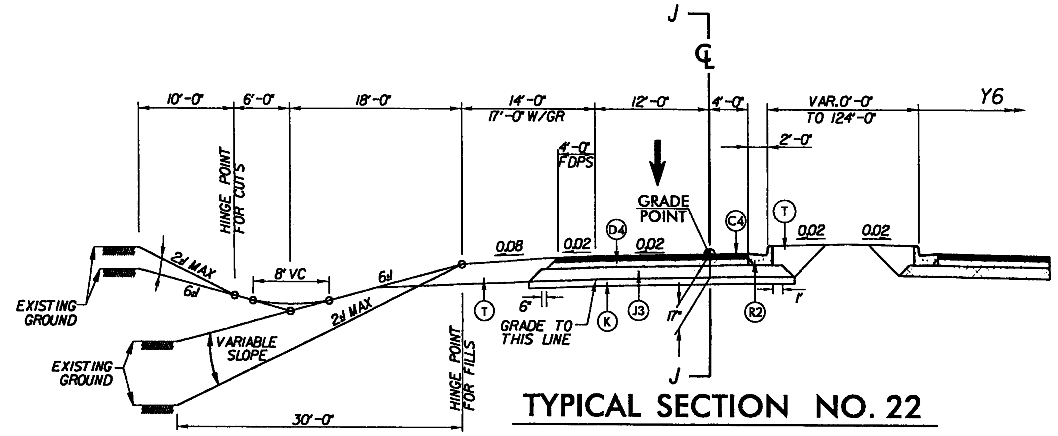
THE LANE CONSTRUCTION CORPORATION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



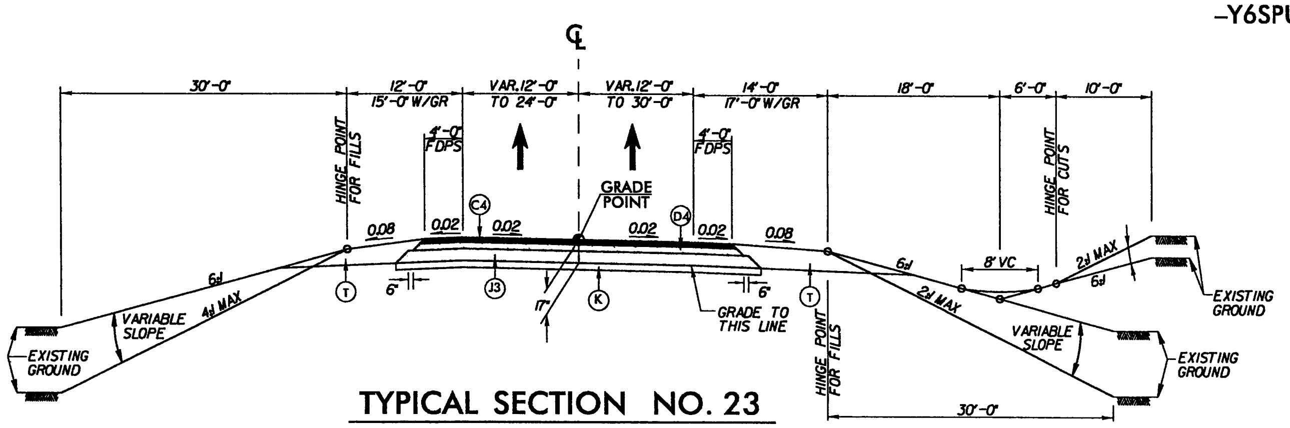
DETAIL J

USE WITH TYPICAL SECTION NO. 22
-Y6SPURB- STA.24+20.13 TO STA.25+04.58 LT



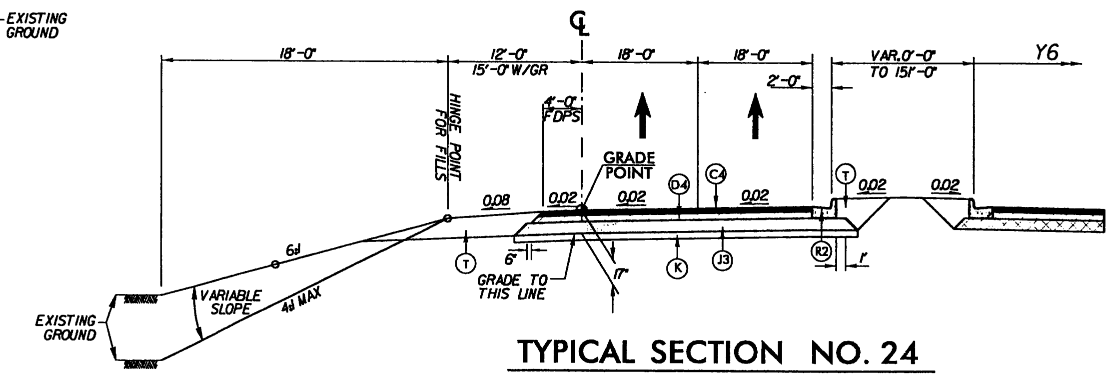
TYPICAL SECTION NO. 22

LINE	FROM STATION	TO STATION
-Y6SPURB-	23+71.22	25+04.58



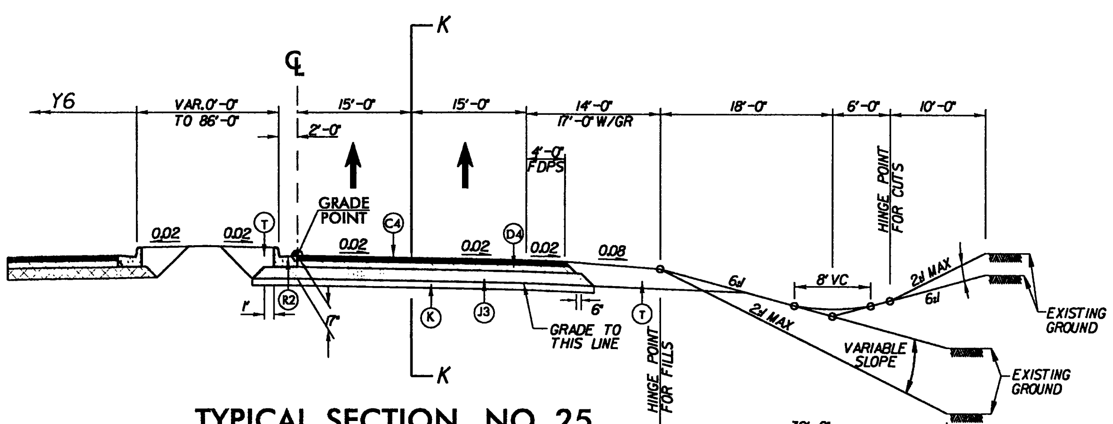
TYPICAL SECTION NO. 23

LINE	FROM STATION	TO STATION
-Y6RPC-	14+89.34	22+27.64



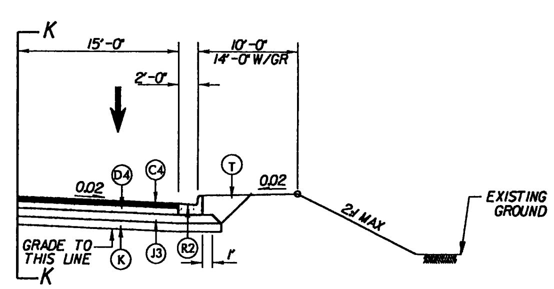
TYPICAL SECTION NO. 24

LINE	FROM STATION	TO STATION
-Y6SPURC-	22+68.90	23+48.71



TYPICAL SECTION NO. 25

LINE	FROM STATION	TO STATION
-Y6RPC-	22+27.64	24+53.81



DETAIL K

USE WITH TYPICAL SECTION NO 25
-Y6RPC- STA.23+38.63 TO STA.24+53.81 RT

A1	14" CONCRETE
C1	1.25" SF9.5A
C2	1.5" S9.5C
C3	3" S9.5B
C4	3" S9.5C
C5	VAR. S9.5B
C6	VAR. S9.5C
D1	3" I19.0B
D2	4" I19.0B
D3	3" I19.0C
D4	4" I19.0C
D5	VAR. I19.0B
D6	VAR. I19.0C
E1	3" B25.0B
E2	4" B25.0B
E3	4.5" B25.0C
E4	5.5" B25.0B
E5	6.5" B25.0B
E6	7" B25.0B
E7	8" B25.0C
E8	9" B25.0C
E9	VAR. B25.0B
E10	VAR. B25.0C
J1	6.0" ABC
J2	8" ABC
J3	10" ABC
J4	VAR. ABC
K	SUBGRADE STABILIZATION
P	PRIME COAT
R1	1'- 6" C & G
R2	2'- 6" C & G
R3	MONOLITHIC ISLAND
R4	DOUBLE FACED CONC. BARRIER
R5	SHOULDER BERM GUTTER
R6	EXPRESSWAY GUTTER
R7	1 BAR METAL RAIL
S	SIDEWALK
T	EARTH MATERIAL
T1	TOPSOIL
U	EXISTING PAVEMENT
W	WEDGING
X	3" PADC
Y	MILLED RUMBLE STRIPS
Z	MILLING

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

SEE SHEET 2 FOR TYPICAL EDGE OF PAVEMENT AND SUBGRADE STABILIZATION DETAIL.

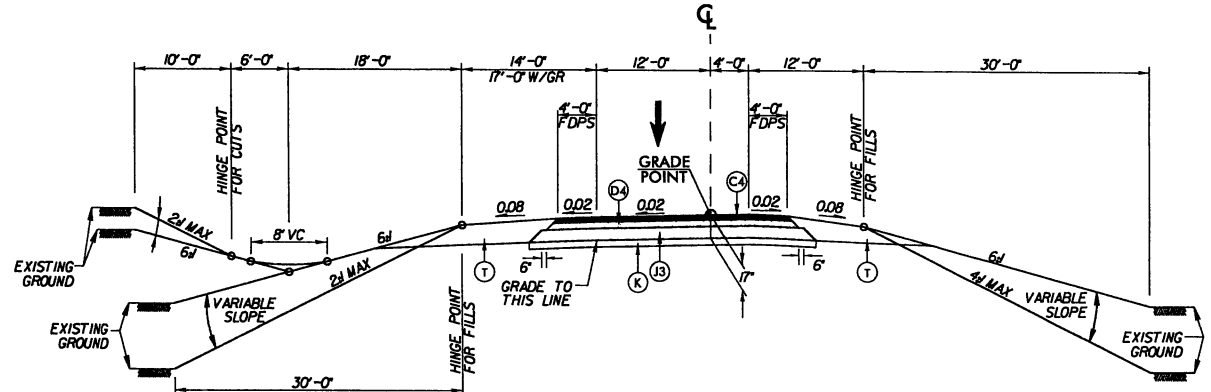
SEE SHEET 2 FOR STANDARD WEDGING DETAIL.

PROJECT REFERENCE NO.	SHEET NO.
I-3803B	2-G
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER

HDR Engineering, Inc. of the Carolinas
3733 National Drive, Suite 207 Raleigh, N.C. 27612
N.C.B.E.L.S. License Number: F-0116

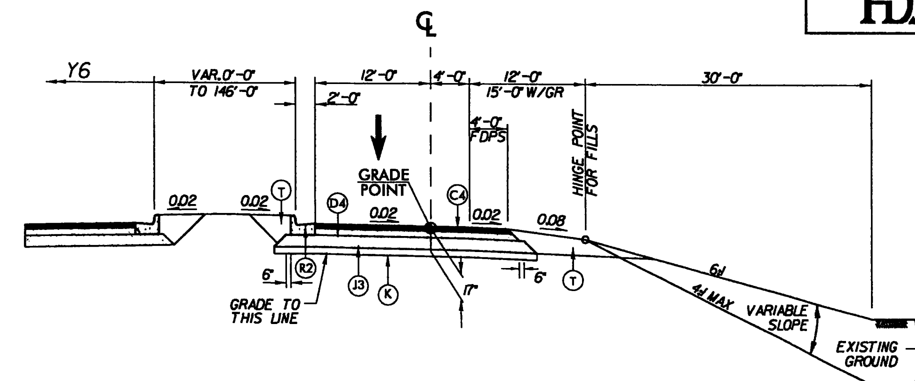
THE LANE CONSTRUCTION CORPORATION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



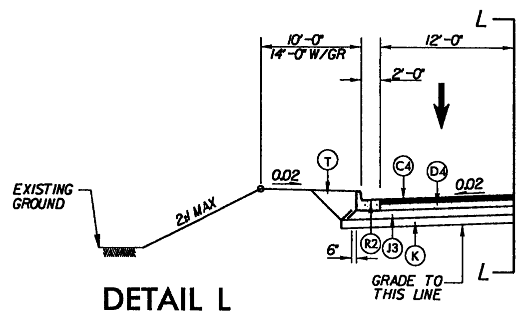
TYPICAL SECTION NO. 26

LINE	FROM STATION	TO STATION
-Y6RPD-	15+14.41	21+50.83



TYPICAL SECTION NO. 27

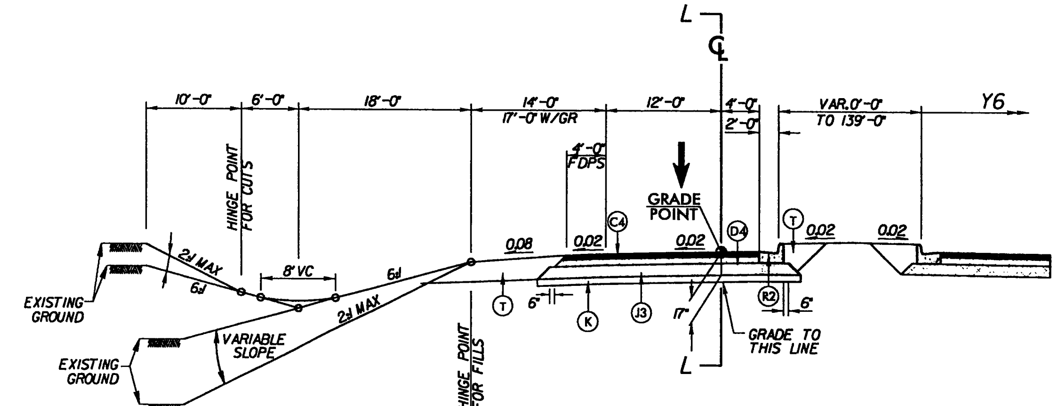
LINE	FROM STATION	TO STATION
-Y6RPD-	21+50.83	22+89.27



DETAIL L

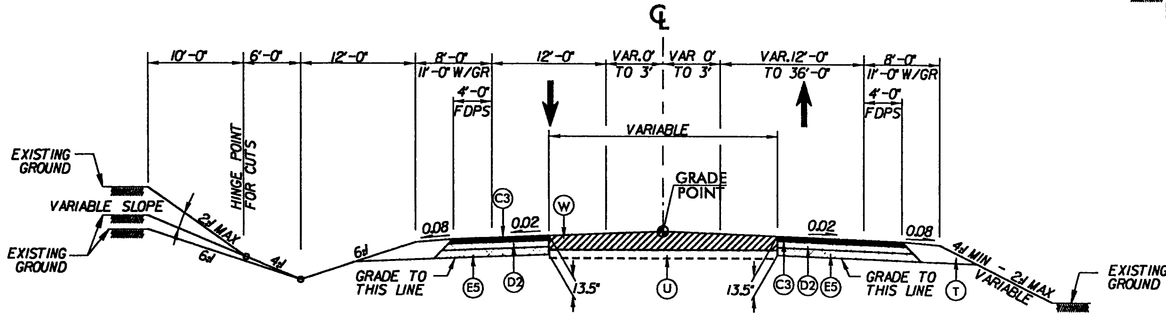
USE WITH TYPICAL SECTION NO.28

-Y6SPURD- STA.22+00.00 TO STA.23+03.08 LT



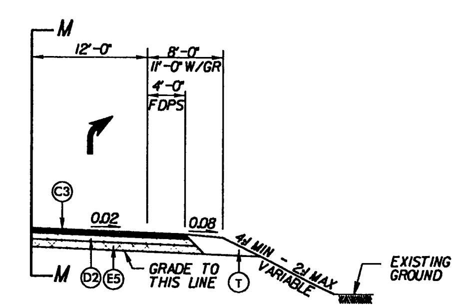
TYPICAL SECTION NO. 28

LINE	FROM STATION	TO STATION
-Y6SPURD-	21+53.38	23+03.08



TYPICAL SECTION NO. 29

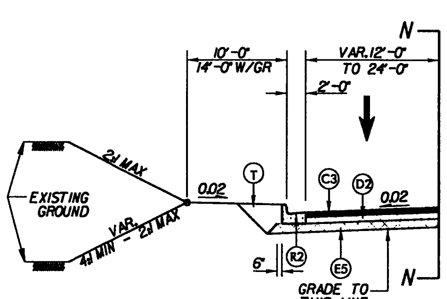
LINE	FROM STATION	TO STATION
-Y7-	18+59.85	20+89.07



DETAIL M

USE WITH TYPICAL SECTION NO.30

-Y7- STA.20+89.07 TO STA.21+36.44 RT

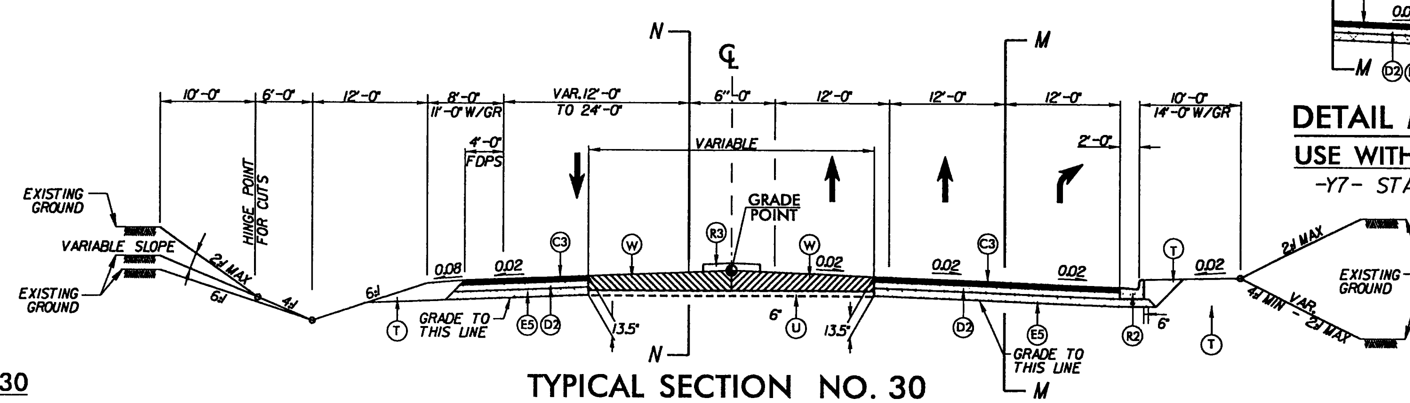


DETAIL N

USE WITH TYPICAL SECTION NO. 30

-Y7- STA.23+69.85 TO STA.28+94.44 LT

TWO THROUGH LANES FROM STA.26+19.85 TO 28+94.44 LT



TYPICAL SECTION NO. 30

LINE	FROM STATION	TO STATION
-Y7-	20+89.07	28+94.44

A1	14" CONCRETE
C1	1.25" SF9.5A
C2	1.5" S9.5C
C3	3" S9.5B
C4	3" S9.5C
C5	VAR. S9.5B
C6	VAR. S9.5C
D1	3" I19.0B
D2	4" I19.0B
D3	3" I19.0C
D4	4" I19.0C
D5	VAR. I19.0B
D6	VAR. I19.0C
E1	3" B25.0B
E2	4" B25.0B
E3	4.5" B25.0C
E4	5.5" B25.0B
E5	6.5" B25.0B
E6	7" B25.0B
E7	8" B25.0C
E8	9" B25.0C
E9	VAR. B25.0B
E10	VAR. B25.0C
J1	6.0" ABC
J2	8" ABC
J3	10" ABC
J4	VAR. ABC
K	SUBGRADE STABILIZATION
P	PRIME COAT
R1	1'- 6" C & G
R2	2'- 6" C & G
R3	MONOLITHIC ISLAND
R4	DOUBLE FACED CONC. BARRIER
R5	SHOULDER BERM GUTTER
R6	EXPRESSWAY GUTTER
R7	1 BAR METAL RAIL
S	SIDEWALK
T	EARTH MATERIAL
T1	TOPSOIL
U	EXISTING PAVEMENT
W	WEDGING
X	3" PADC
Y	MILLED RUMBLE STRIPS
Z	MILLING

NOTE: PAVEMENT EDGE SLOPES ARE 1 1UNLESS SHOWN OTHERWISE

SEE SHEET 2 FOR TYPICAL EDGE OF PAVEMENT AND SUBGRADE STABILIZATION DETAIL.

SEE SHEET 2 FOR STANDARD WEDGING DETAIL.

HDR Engineering, Inc. of the Carolinas
3733 National Drive, Suite 207 Raleigh, N.C. 27612
N.C.B.E.L.S. License Number: F-0116

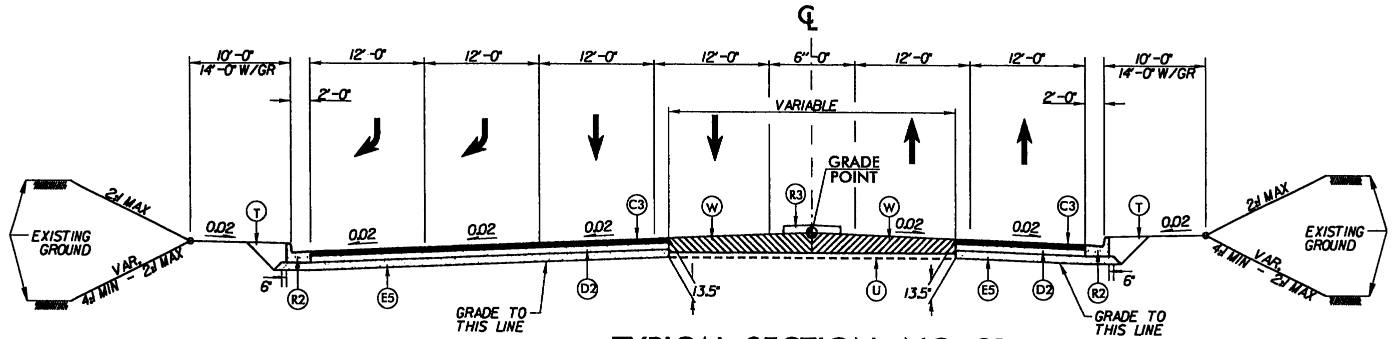
PROJECT REFERENCE NO.	SHEET NO.
I-3803B	2-H

THE LANE CONSTRUCTION CORPORATION

ROADWAY DESIGN ENGINEER

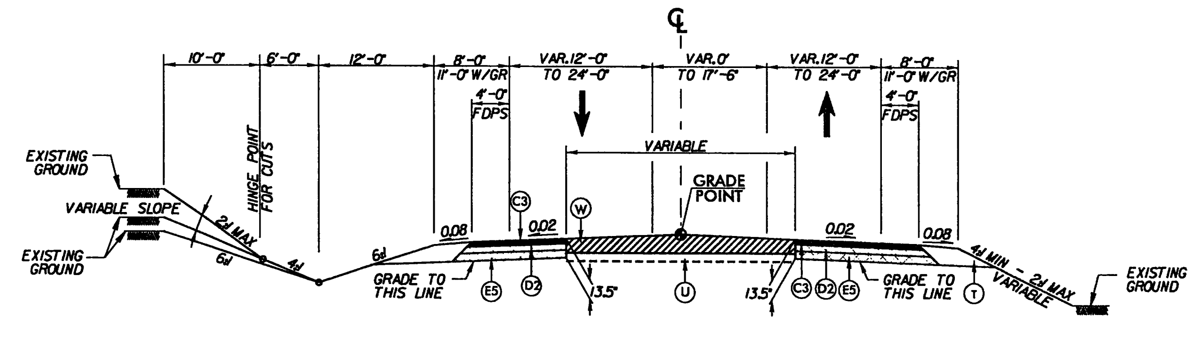
PAVEMENT DESIGN ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



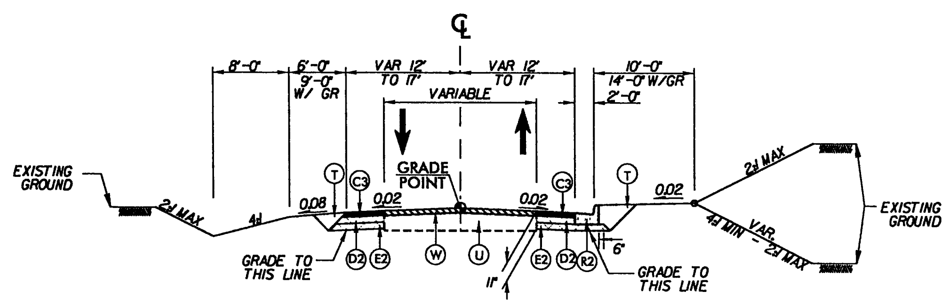
TYPICAL SECTION NO. 31

LINE	FROM STATION	TO STATION
-Y7-	30+00.91	40+20.37



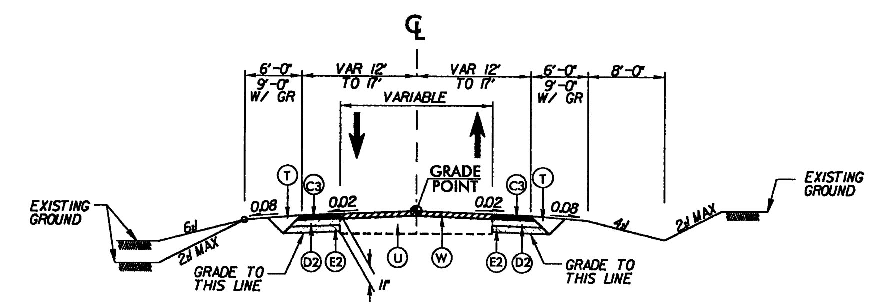
TYPICAL SECTION NO. 32

LINE	FROM STATION	TO STATION
-Y7-	40+20.37	47+75.00



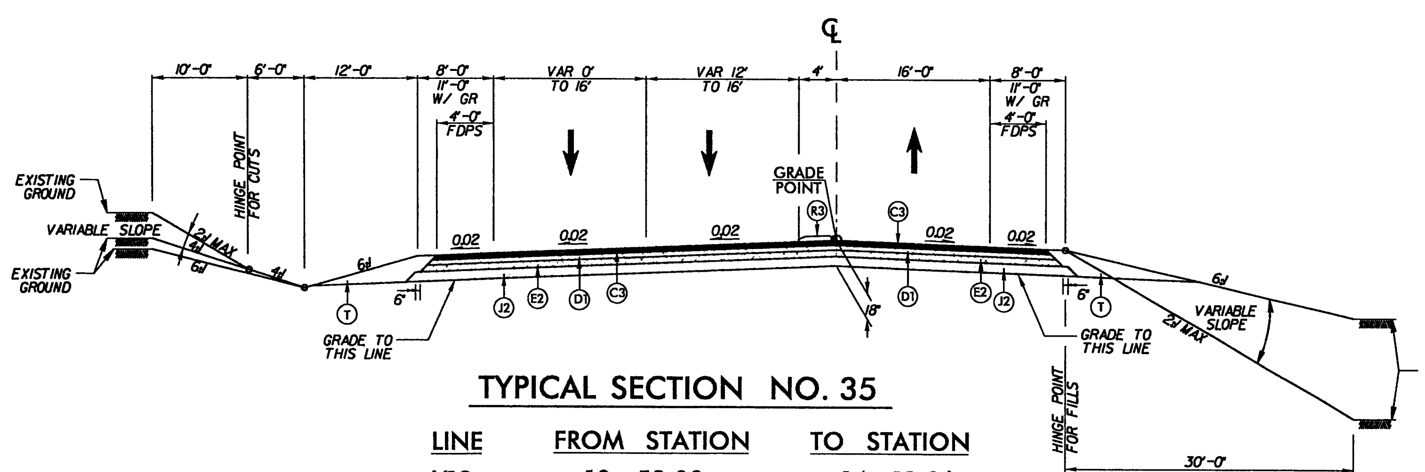
TYPICAL SECTION NO. 33

LINE	FROM STATION	TO STATION
-Y8-	10+41.00	15+40.00



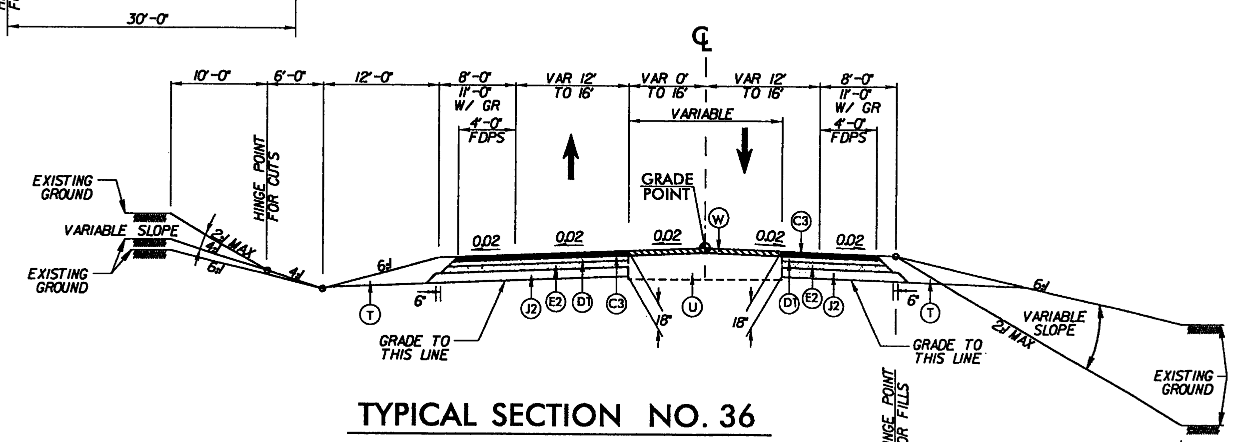
TYPICAL SECTION NO. 34

LINE	FROM STATION	TO STATION
-Y9-	24+00.00	27+82.10



TYPICAL SECTION NO. 35

LINE	FROM STATION	TO STATION
-Y10-	10+53.00	14+12.86



TYPICAL SECTION NO. 36

LINE	FROM STATION	TO STATION
-Y10-	14+12.86	25+55.11

A1	14" CONCRETE
C1	1.25" SF9.5A
C2	1.5" S9.5C
C3	3" S9.5B
C4	3" S9.5C
C5	VAR. S9.5B
C6	VAR. S9.5C
D1	3" I19.0B
D2	4" I19.0B
D3	3" I19.0C
D4	4" I19.0C
D5	VAR. I19.0B
D6	VAR. I19.0C
E1	3" B25.0B
E2	4" B25.0B
E3	4.5" B25.0C
E4	5.5" B25.0B
E5	6.5" B25.0B
E6	7" B25.0B
E7	8" B25.0C
E8	9" B25.0C
E9	VAR. B25.0B
E10	VAR. B25.0C
J1	6.0" ABC
J2	8" ABC
J3	10" ABC
J4	VAR. ABC
K	SUBGRADE STABILIZATION
P	PRIME COAT
R1	1'- 6" C & G
R2	2'- 6" C & G
R3	MONOLITHIC ISLAND
R4	DOUBLE FACED CONC. BARRIER
R5	SHOULDER BERM GUTTER
R6	EXPRESSWAY GUTTER
R7	1 BAR METAL RAIL
S	SIDEWALK
T	EARTH MATERIAL
T1	TOPSOIL
U	EXISTING PAVEMENT
W	WEDGING
X	3" PADC
Y	MILLED RUMBLE STRIPS
Z	MILLING

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

SEE SHEET 2 FOR TYPICAL EDGE OF PAVEMENT AND SUBGRADE STABILIZATION DETAIL.

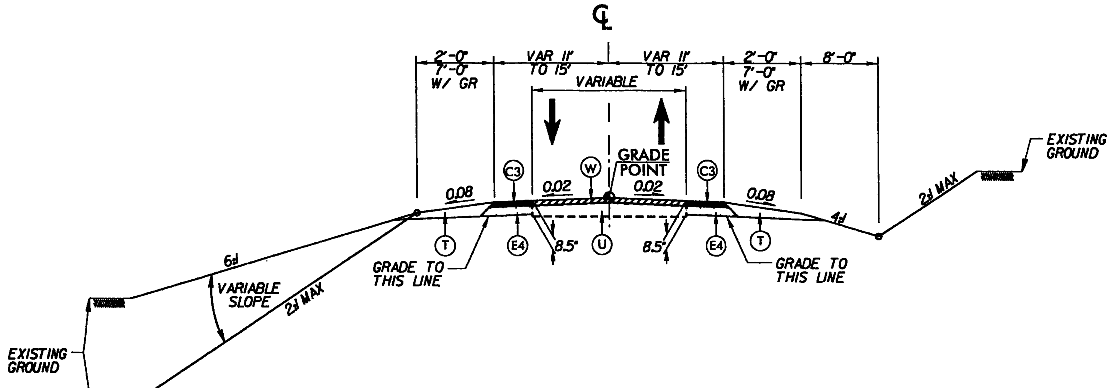
SEE SHEET 2 FOR STANDARD WEDGING DETAIL.

HDR Engineering, Inc. of the Carolinas
3733 National Drive, Suite 207 Raleigh, N.C. 27612
N.C.B.E.L.S. License Number: F-0116

THE LANE CONSTRUCTION CORPORATION

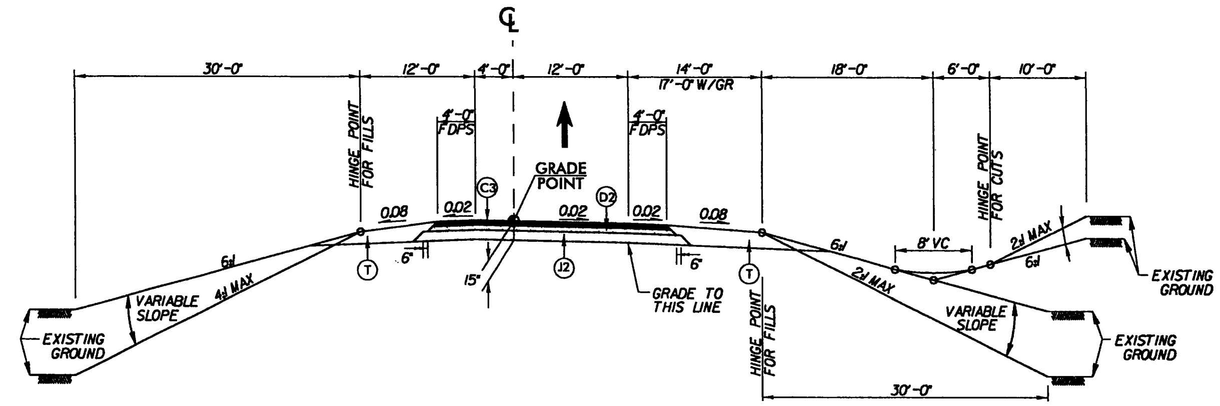
PROJECT REFERENCE NO.	SHEET NO.
I-3830B	2-I
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



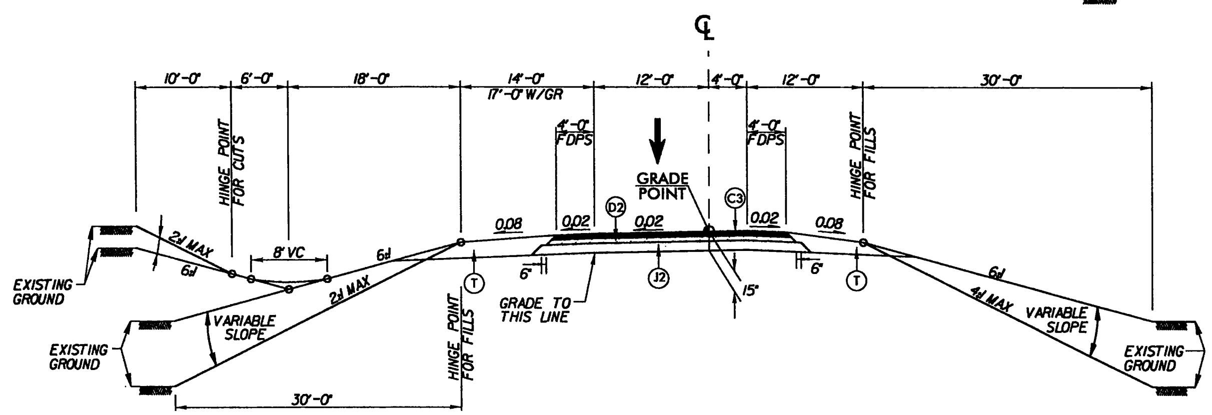
TYPICAL SECTION NO. 37

LINE	FROM STATION	TO STATION
-DRIVE-	10+25.00	11+79.60
-Y17-	10+35.00	12+01.22



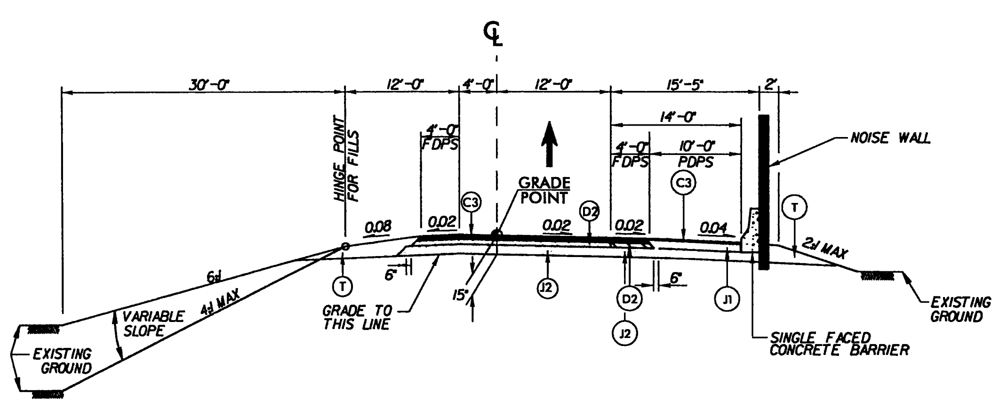
TYPICAL SECTION NO. 38

LINE	FROM STATION	TO STATION
-Y11RPA-	13+67.40	14+25.00



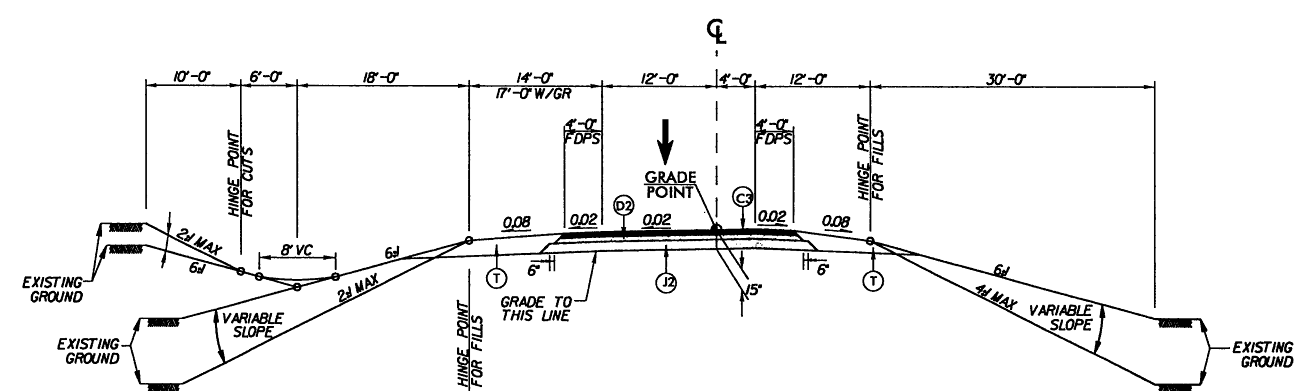
TYPICAL SECTION NO. 39

LINE	FROM STATION	TO STATION
-Y11RPB-	14+23.44	15+05.82



TYPICAL SECTION NO. 40

LINE	FROM STATION	TO STATION
-Y11RPC-	16+33.47	24+00.00



TYPICAL SECTION NO. 41

LINE	FROM STATION	TO STATION
-Y11RPD-	13+81.58	16+65.52

A1	14" CONCRETE
C1	1.25" SF9.5A
C2	1.5" S9.5C
C3	3" S9.5B
C4	3" S9.5C
C5	VAR. S9.5B
C6	VAR. S9.5C
D1	3" I19.0B
D2	4" I19.0B
D3	3" I19.0C
D4	4" I19.0C
D5	VAR. I19.0B
D6	VAR. I19.0C
E1	3" B25.0B
E2	4" B25.0B
E3	4.5" B25.0C
E4	5.5" B25.0B
E5	6.5" B25.0B
E6	7" B25.0B
E7	8" B25.0C
E8	9" B25.0C
E9	VAR. B25.0B
E10	VAR. B25.0C
J1	6.0" ABC
J2	8" ABC
J3	10" ABC
J4	VAR. ABC
K	SUBGRADE STABILIZATION
P	PRIME COAT
R1	1'- 6" C & G
R2	2'- 6" C & G
R3	MONOLITHIC ISLAND
R4	DOUBLE FACED CONC. BARRIER
R5	SHOULDER BERM GUTTER
R6	EXPRESSWAY GUTTER
R7	1 BAR METAL RAIL
S	SIDEWALK
T	EARTH MATERIAL
T1	TOPSOIL
U	EXISTING PAVEMENT
W	WEDGING
X	3" PADC
Y	MILLED RUMBLE STRIPS
Z	MILLING

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

SEE SHEET 2 FOR TYPICAL EDGE OF PAVEMENT AND SUBGRADE STABILIZATION DETAIL.

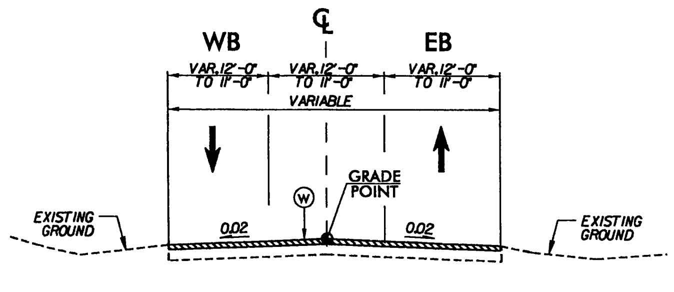
SEE SHEET 2 FOR STANDARD WEDGING DETAIL.

HDR Engineering, Inc. of the Carolinas
3733 National Drive, Suite 207 Raleigh, N.C. 27612
N.C.B.E.L.S. License Number: F-0116

THE LANE CONSTRUCTION CORPORATION

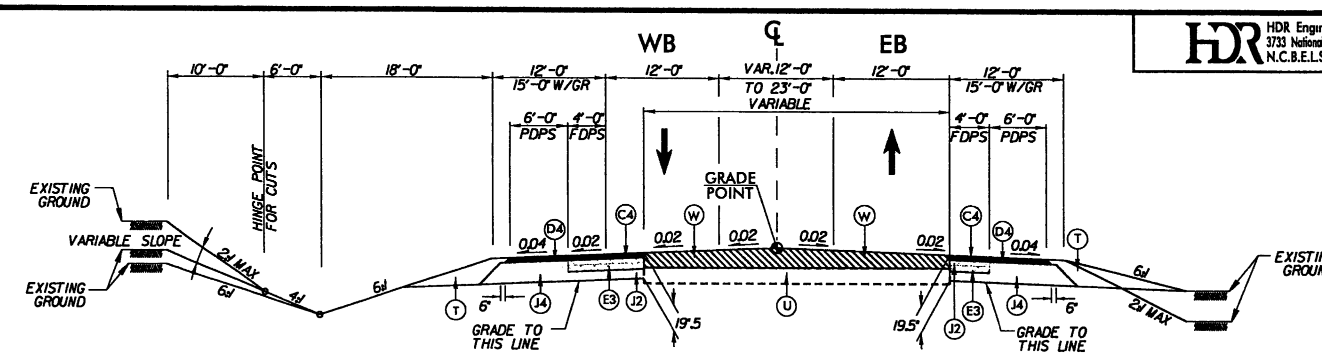
PROJECT REFERENCE NO.	SHEET NO.
I-3803B	2-J
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



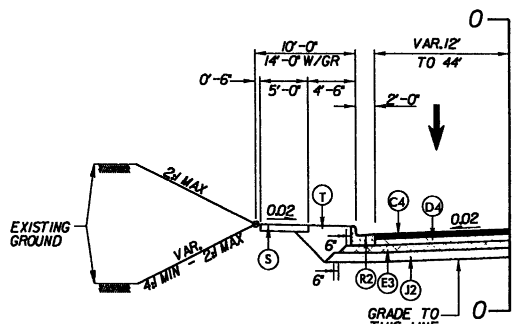
TYPICAL SECTION NO. 42

LINE	FROM STATION	TO STATION
-Y12-	19+08.58	21+75.28
-Y12-	82+28.76	83+90.76



TYPICAL SECTION NO. 43

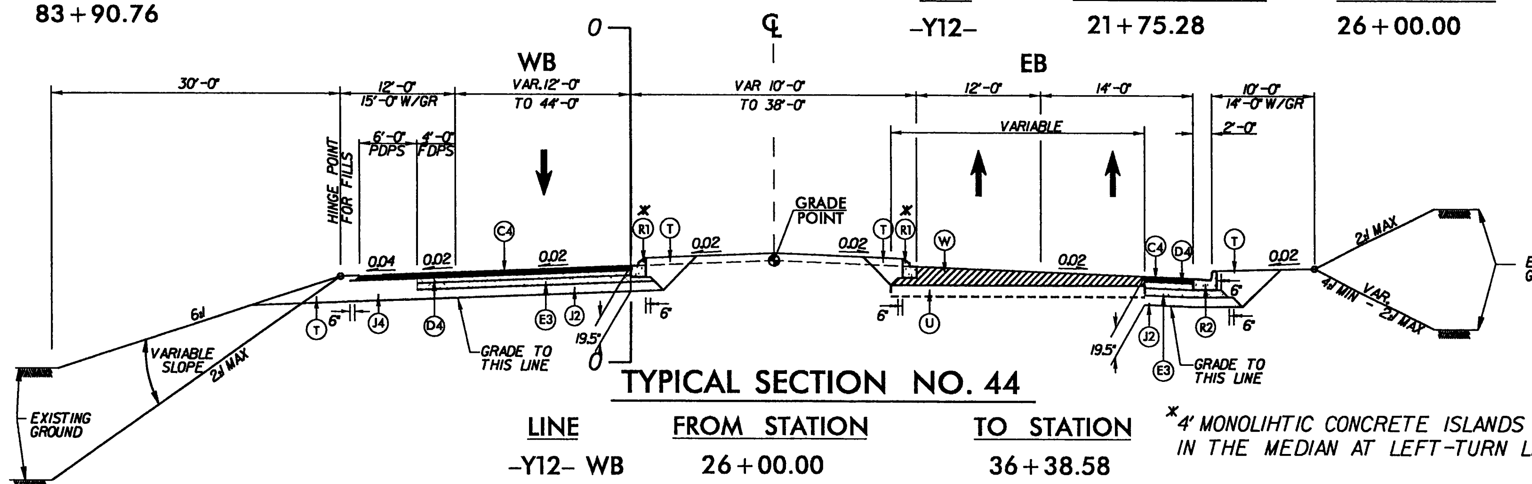
LINE	FROM STATION	TO STATION
-Y12-	21+75.28	26+00.00



DETAIL O

USE WITH TYPICAL SECTION NO 44

-Y12- STA.33+38.35 TO STA.36+38.58 LT

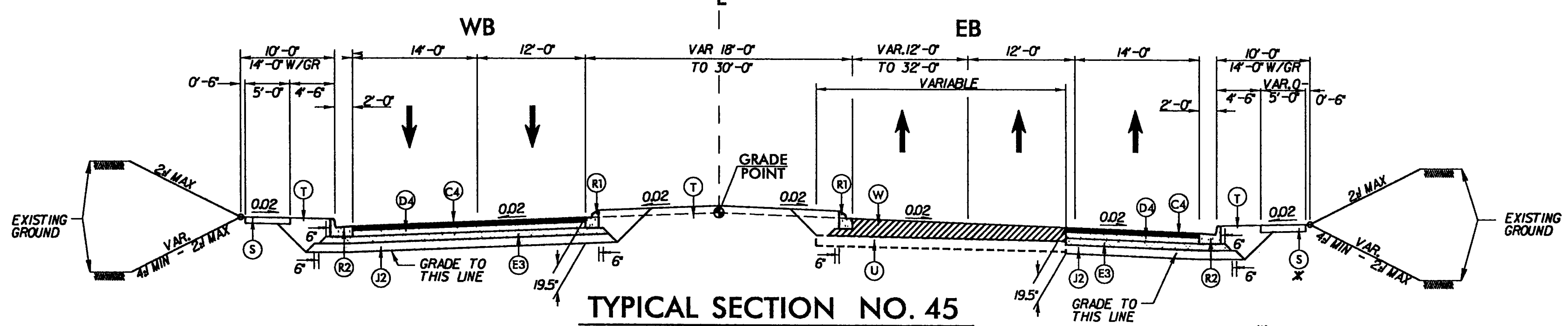


TYPICAL SECTION NO. 44

LINE	FROM STATION	TO STATION
-Y12- WB	26+00.00	36+38.58
-Y12- EB	26+00.00	29+73.58

*4' MONOLIHTIC CONCRETE ISLANDS ARE TO BE CONSTRUCTED IN THE MEDIAN AT LEFT-TURN LANES AS FOLLOWS:

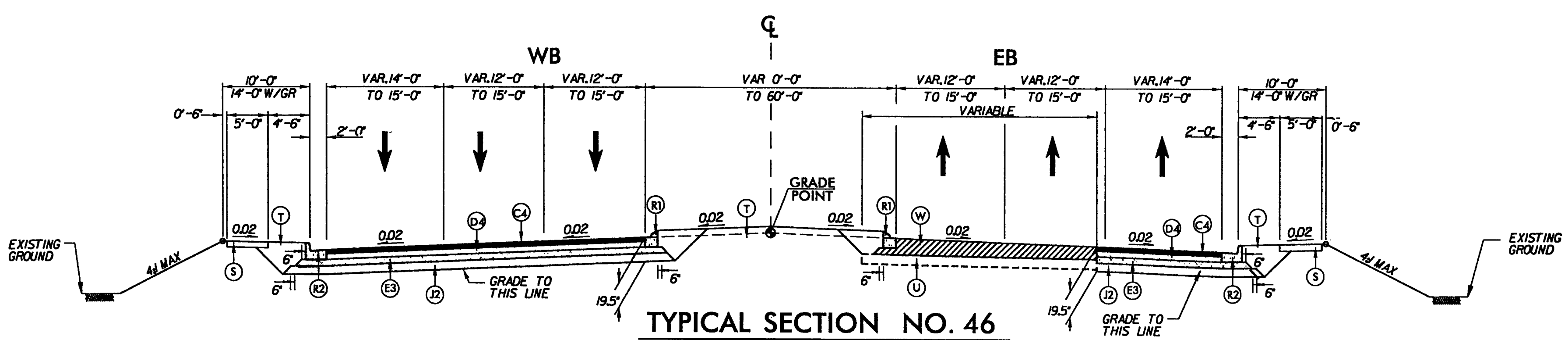
-Y12- STA.29+58.58 TO STA.30+66.86



TYPICAL SECTION NO. 45

LINE	FROM STATION	TO STATION
-Y12- EB	29+73.58	44+97.66
-Y12- WB	36+38.58	44+97.66

*NO SIDEWALKS AT THE LOCATIONS LISTED BELOW:
-Y12- STA.29+73.58 TO STA.37+03.02 RT



TYPICAL SECTION NO. 46

LINE	FROM STATION	TO STATION
-Y12-	44+97.66	48+62.02
-Y12-	56+13.13	59+91.69

A1	14" CONCRETE
C1	1.25" SF9.5A
C2	1.5" S9.5C
C3	3" S9.5B
C4	3" S9.5C
C5	VAR. S9.5B
C6	VAR. S9.5C
D1	3" I19.0B
D2	4" I19.0B
D3	3" I19.0C
D4	4" I19.0C
D5	VAR. I19.0B
D6	VAR. I19.0C
E1	3" B25.0B
E2	4" B25.0B
E3	4.5" B25.0C
E4	5.5" B25.0B
E5	6.5" B25.0B
E6	7" B25.0B
E7	8" B25.0C
E8	9" B25.0C
E9	VAR. B25.0B
E10	VAR. B25.0C
J1	6.0" ABC
J2	8" ABC
J3	10" ABC
J4	VAR. ABC
K	SUBGRADE STABILIZATION
P	PRIME COAT
R1	1'- 6" C & G
R2	2'- 6" C & G
R3	MONOLITHIC ISLAND
R4	DOUBLE FACED CONC. BARRIER
R5	SHOULDER BERM GUTTER
R6	EXPRESSWAY GUTTER
R7	1 BAR METAL RAIL
S	SIDEWALK
T	EARTH MATERIAL
T1	TOPSOIL
U	EXISTING PAVEMENT
W	WEDGING
X	3" PADC
Y	MILLED RUMBLE STRIPS
Z	MILLING

NOTE: PAVEMENT EDGE SLOPES ARE 1 1UNLESS SHOWN OTHERWISE

SEE SHEET 2 FOR TYPICAL EDGE OF PAVEMENT AND SUBGRADE STABILIZATION DETAIL.

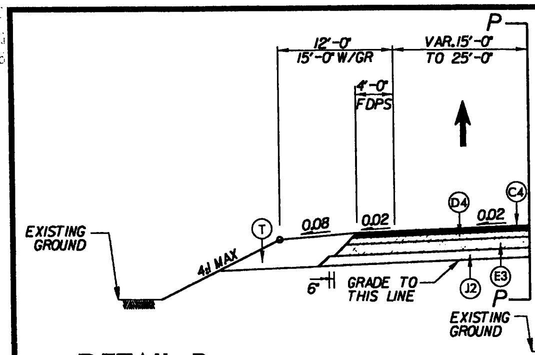
SEE SHEET 2 FOR STANDARD WEDGING DETAIL.

HDR Engineering, Inc. of the Carolinas
3733 National Drive, Suite 207 Raleigh, N.C. 27612
N.C.B.E.L.S. License Number: F-0116

PROJECT REFERENCE NO.	SHEET NO.
I-3803B	2-K
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER

THE LANE CONSTRUCTION CORPORATION

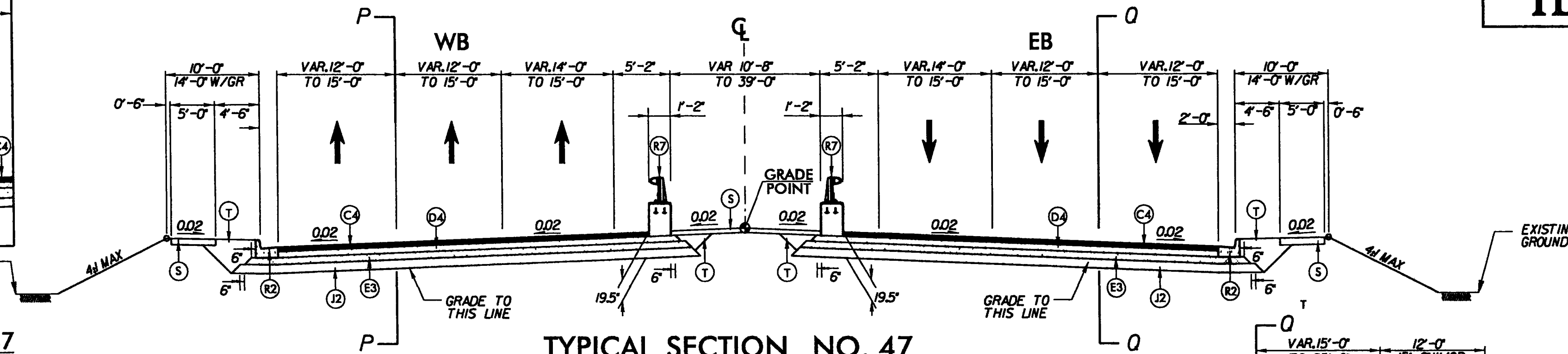
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



DETAIL P

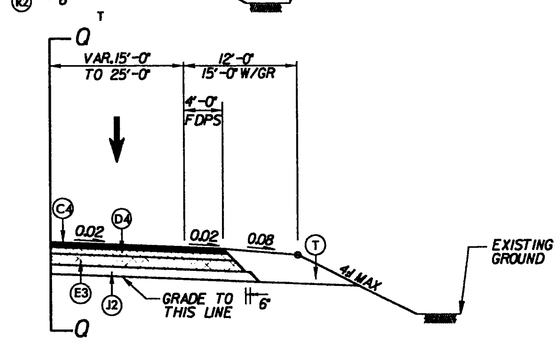
USE WITH TYPICAL SECTION NO 47

-Y12- STA.50+32.95 TO STA.51+10.89 (BEGIN BRIDGE)
-Y12- 53+83.71 (END BRIDGE) TO STA.56+01.92



TYPICAL SECTION NO. 47

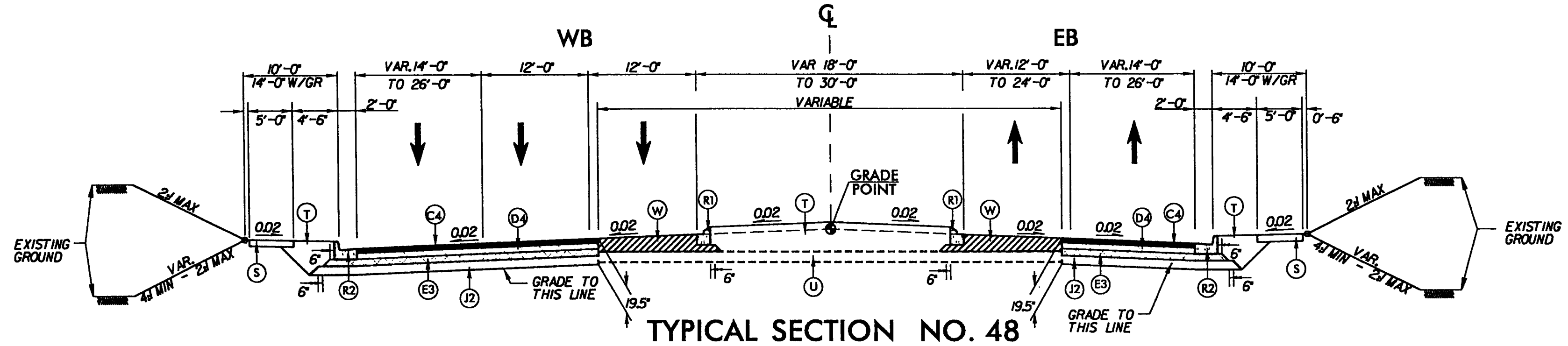
LINE	FROM STATION	TO STATION
-Y12-	48+62.02	51+10.89 (BEGIN BRIDGE)
-Y12-	53+83.71 (END BRIDGE)	56+13.13



DETAIL Q

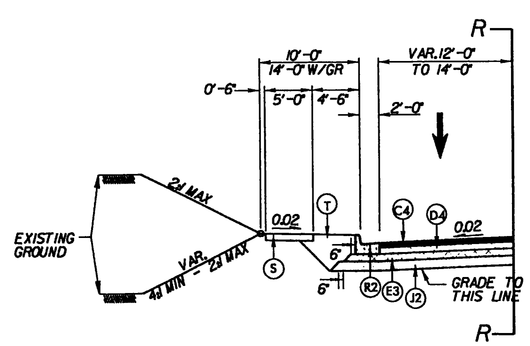
USE WITH TYPICAL SECTION NO. 47

-Y12- STA.48+74.91 TO STA.51+10.89 (BEGIN BRIDGE)
-Y12- 53+83.71 (END BRIDGE) TO STA.54+66.68



TYPICAL SECTION NO. 48

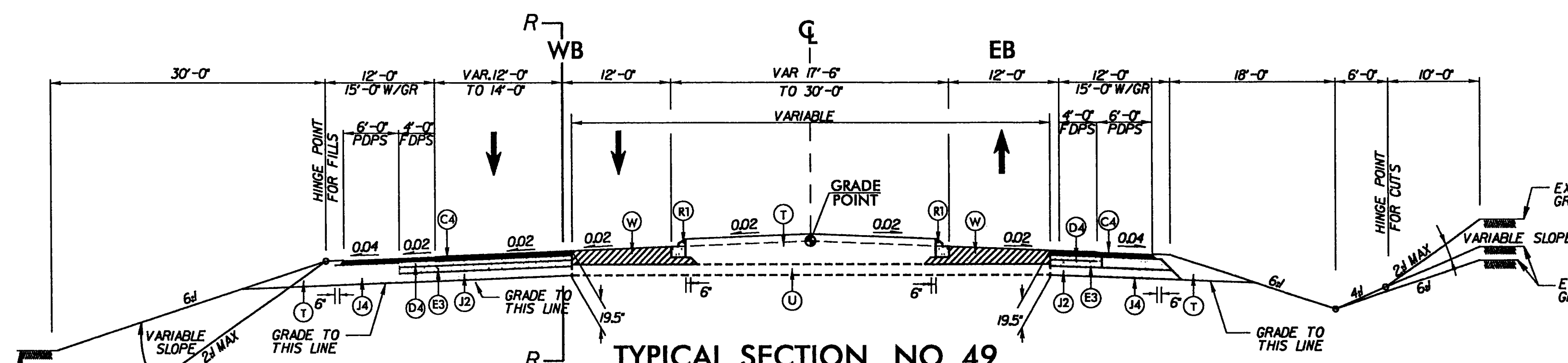
LINE	FROM STATION	TO STATION
-Y12- WB	59+91.69	66+96.76
-Y12- EB	59+91.69	73+09 40



DETAIL R

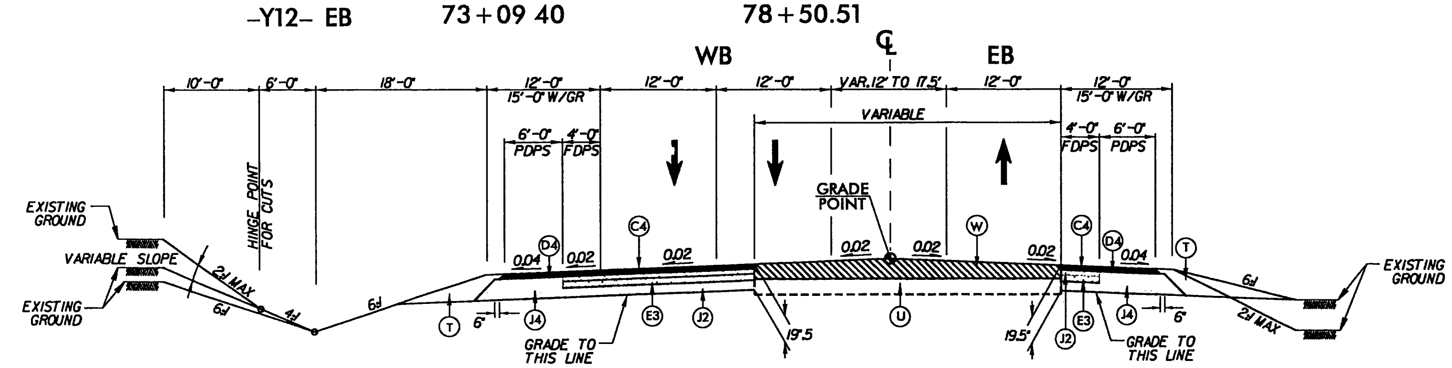
USE WITH TYPICAL SECTION NO. 49

-Y12- STA.66+96.76 TO STA.74+41.76 LT



TYPICAL SECTION NO. 49

LINE	FROM STATION	TO STATION
-Y12- WB	66+96.76	78+50.51
-Y12- EB	73+09 40	78+50.51



TYPICAL SECTION NO. 50

LINE	FROM STATION	TO STATION
-Y12-	78+50.51	82+28.76

A1	14" CONCRETE
C1	1.25" SF9.5A
C2	1.5" S9.5C
C3	3" S9.5B
C4	3" S9.5C
C5	VAR. S9.5B
C6	VAR. S9.5C
D1	3" I19.0B
D2	4" I19.0B
D3	3" I19.0C
D4	4" I19.0C
D5	VAR. I19.0B
D6	VAR. I19.0C
E1	3" B25.0B
E2	4" B25.0B
E3	4.5" B25.0C
E4	5.5" B25.0B
E5	6.5" B25.0B
E6	7" B25.0B
E7	8" B25.0C
E8	9" B25.0C
E9	VAR. B25.0B
E10	VAR. B25.0C
J1	6.0" ABC
J2	8" ABC
J3	10" A3C
J4	VAR. ABC
K	SUBGRADE STABILIZATION
P	PRIME COAT
R1	1'- 6" C & G
R2	2'- 6" C & G
R3	MONOLITHIC ISLAND
R4	DOUBLE FACED CONC. BARRIER
R5	SHOULDER BERM GUTTER
R6	EXPRESSWAY GUTTER
R7	1 BAR METAL RAIL
S	SIDEWALK
T	EARTH MATERIAL
T1	TOPSOIL
U	EXISTING PAVEMENT
W	WEDGING
X	3" PA[illegible]
Y	MILLED RUMBLE STRIPS
Z	MILLING

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

SEE SHEET 2 FOR TYPICAL EDGE OF PAVEMENT AND SUBGRADE STABILIZATION DETAIL.

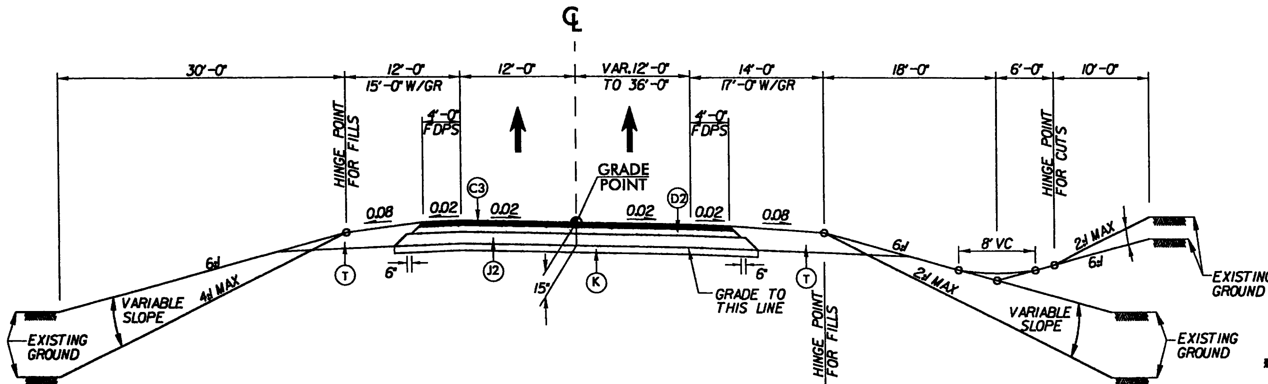
SEE SHEET 2 FOR STANDARD WEDGING DETAIL.

HDR Engineering, Inc. of the Carolinas
3733 National Drive, Suite 207 Raleigh, N.C. 27612
N.C.B.E.L.S. License Number: F-0116

THE LANE CONSTRUCTION CORPORATION

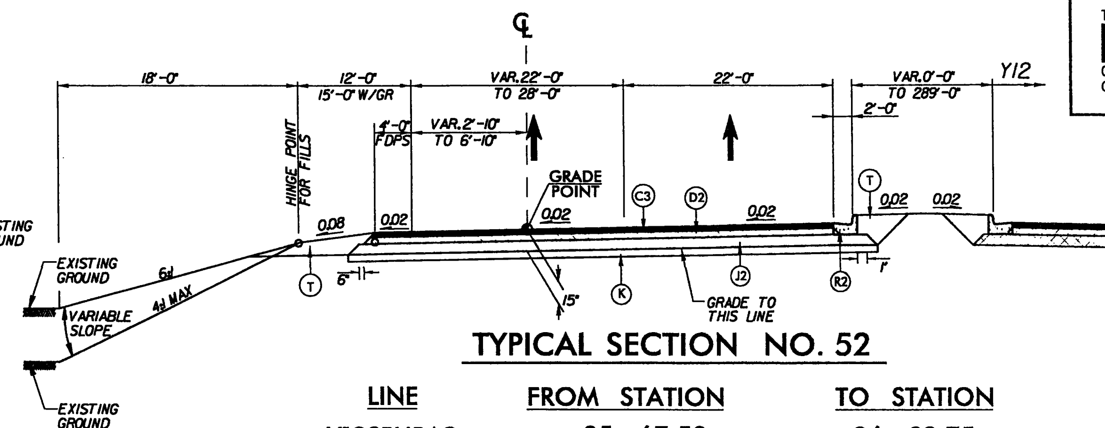
PROJECT REFERENCE NO.	SHEET NO.
I-3803B	2-L
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



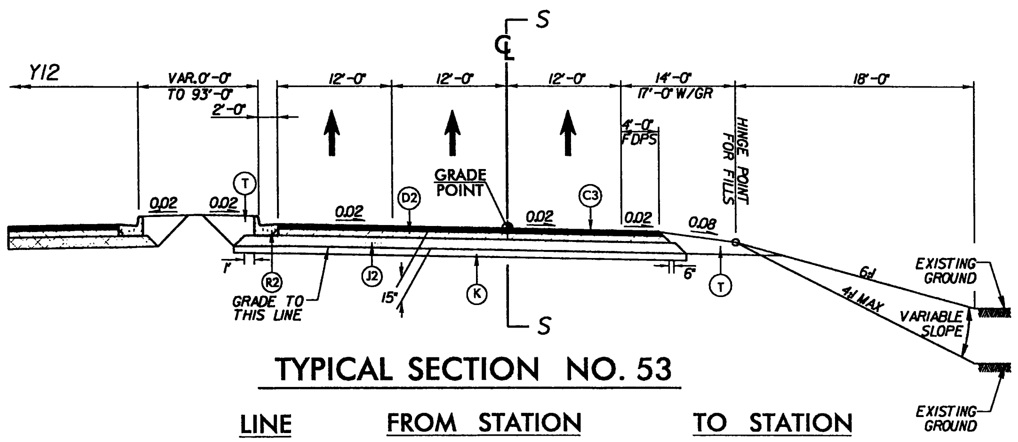
TYPICAL SECTION NO. 51

LINE	FROM STATION	TO STATION
-Y12RPA-	19+93.41	25+75.79



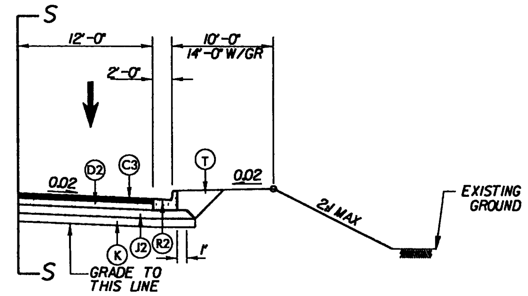
TYPICAL SECTION NO. 52

LINE	FROM STATION	TO STATION
-Y12SPURA2-	25+67.58	26+32.75



TYPICAL SECTION NO. 53

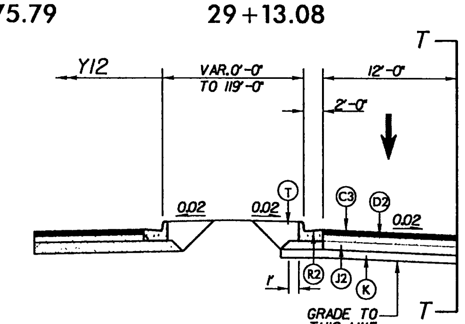
LINE	FROM STATION	TO STATION
-Y12SPURA1-	25+75.79	29+13.08



DETAIL S

USE WITH TYPICAL SECTION NO. 53

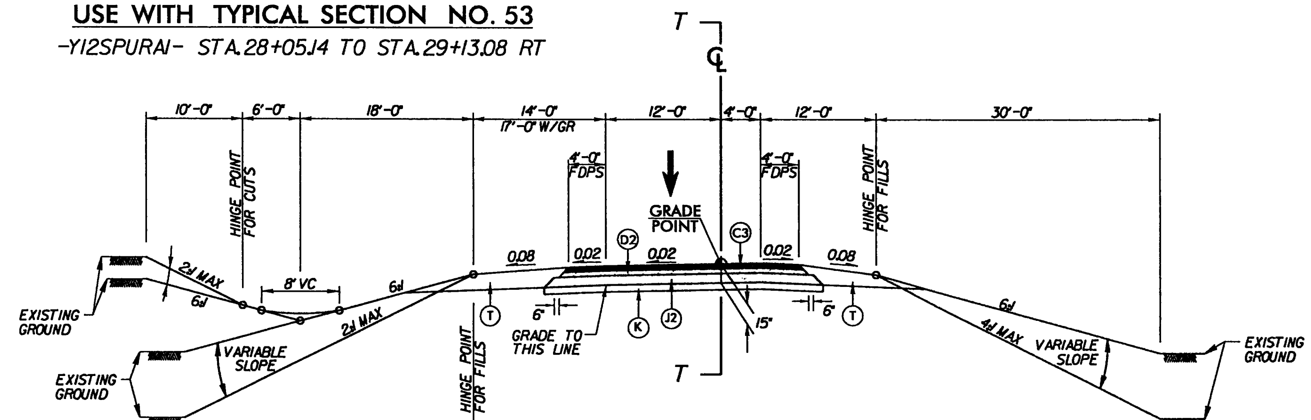
-Y12SPURA1- STA.28+05.14 TO STA.29+13.08 RT



DETAIL T

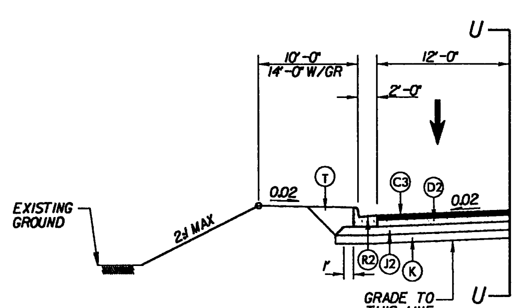
USE WITH TYPICAL SECTION NO 54

-Y12RPB- STA.22+69.81 TO STA.25+11.03 RT



TYPICAL SECTION NO. 54

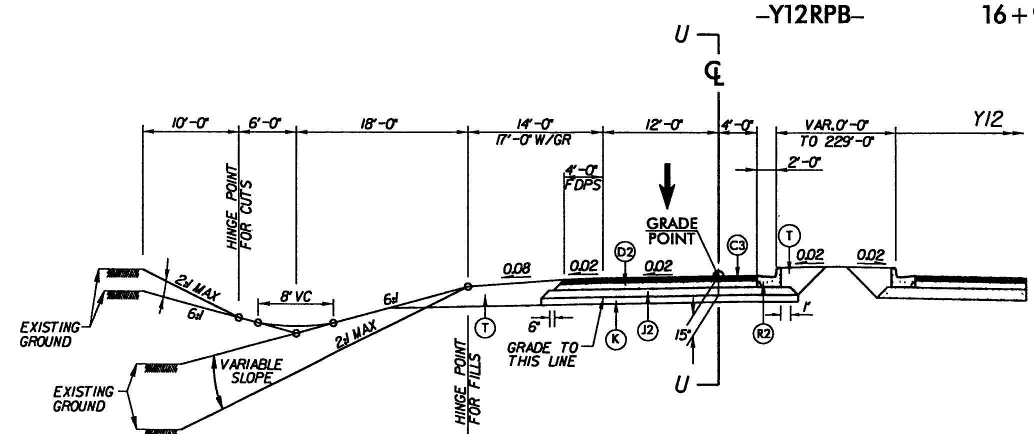
LINE	FROM STATION	TO STATION
-Y12RPB-	16+96.01	25+11.03



DETAIL U

USE WITH TYPICAL SECTION NO 55

-Y12SPURB- STA.23+19.11 TO STA.24+01.78 LT



TYPICAL SECTION NO. 55

LINE	FROM STATION	TO STATION
-Y12SPURB-	22+71.42	24+01.78

A1	14" CONCRETE
C1	1.25" SF9.5A
C2	1.5" S9.5C
C3	3" S9.5B
C4	3" S9.5C
C5	VAR. S9.5B
C6	VAR. S9.5C
D1	3" I19.0B
D2	4" I19.0B
D3	3" I19.0C
D4	4" I19.0C
D5	VAR. I19.0B
D6	VAR. I19.0C
E1	3" B25.0B
E2	4" B25.0B
E3	4.5" B25.0C
E4	5.5" B25.0B
E5	6.5" B25.0B
E6	7" B25.0B
E7	8" B25.0C
E8	9" B25.0C
E9	VAR. B25.0B
E10	VAR. B25.0C
J1	6.0" ABC
J2	8" ABC
J3	10" ABC
J4	VAR. ABC
K	SUBGRADE STABILIZATION
P	PRIME COAT
R1	1'- 6" C & G
R2	2'- 6" C & G
R3	MONOLITHIC ISLAND
R4	DOUBLE FACED CONC. BARRIER
R5	SHOULDER BERM GUTTER
R6	EXPRESSWAY GUTTER
R7	1 BAR METAL RAIL
S	SIDEWALK
T	EARTH MATERIAL
T1	TOPSOIL
U	EXISTING PAVEMENT
W	WEDGING
X	3" PADC
Y	MILLE[illegible] RUMBLE STRIPS
Z	MILLING

NOTE: PAVEMEN EDGE SLOPES ARE 1:1UNLESS SHOWN OTHERWISE

SEE SHEET 2 FOR TYPICAL EDGE OF PAVEMENT AND SUBGRADE STABILIZATION DETAIL.

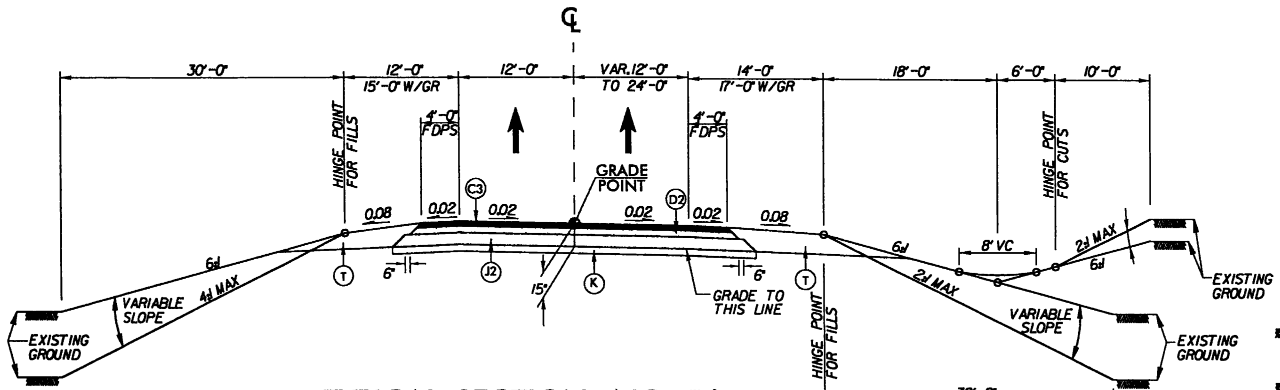
SEE SHEET 2 FOR STANDARD WEDGING DETAIL.

HDR Engineering, Inc. of the Carolinas
3733 National Drive, Suite 207 Raleigh, N.C. 27612
N.C.B.E.L.S. License Number: F-0116

THE LANE CONSTRUCTION CORPORATION

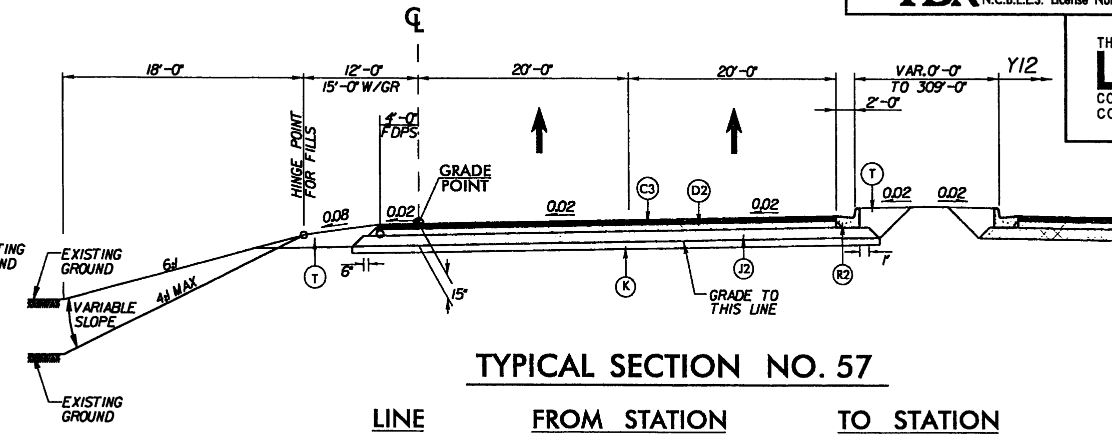
PROJECT REFERENCE NO.	SHEET NO.
I-3803B	2-M
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



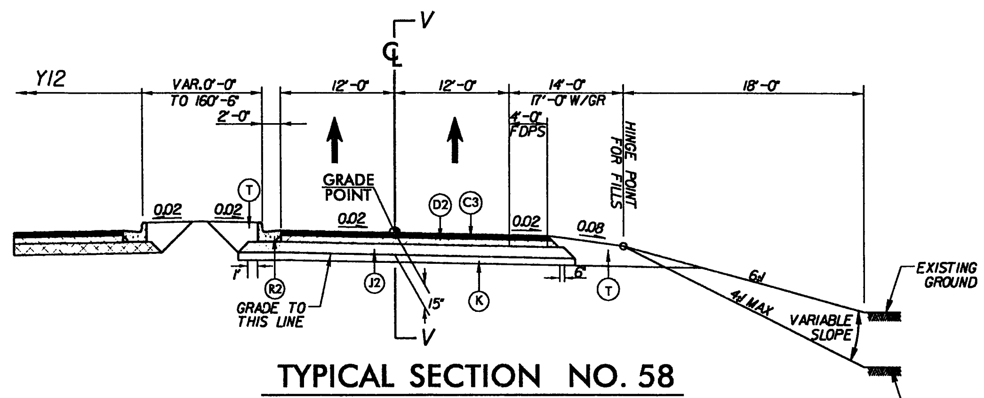
TYPICAL SECTION NO. 56

LINE	FROM STATION	TO STATION
-Y12RPC-	16+00.38	22+63.33



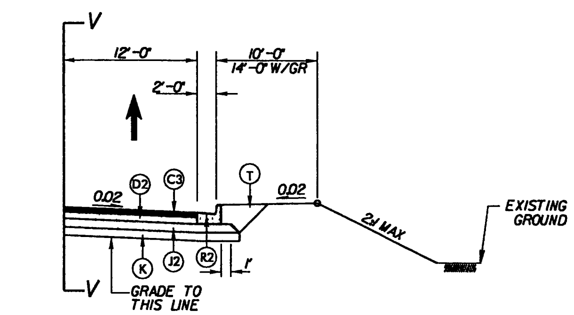
TYPICAL SECTION NO. 57

LINE	FROM STATION	TO STATION
-Y12SPURC3-	23+42.25	24+73.87



TYPICAL SECTION NO. 58

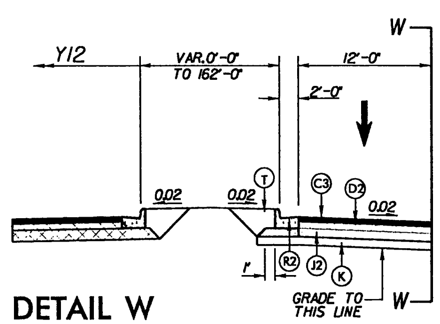
LINE	FROM STATION	TO STATION
-Y12SPURC1-	22+63.33	27+16.11



DETAIL V

USE WITH TYPICAL SECTION NO. 58

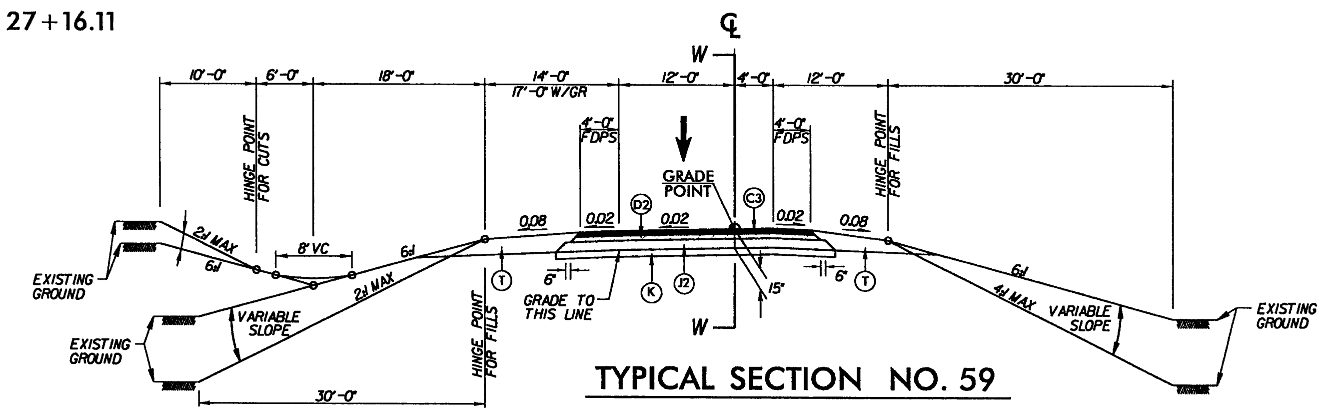
-Y12SPURC1- STA.25+52.98 TO STA.27+16.11 RT



DETAIL W

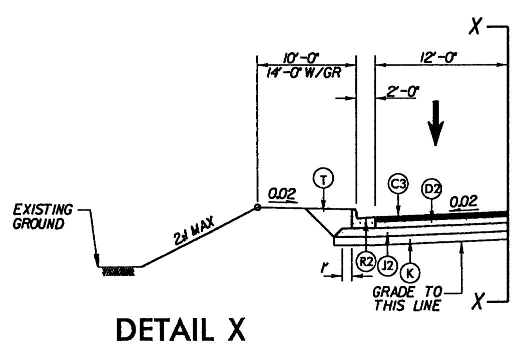
USE WITH TYPICAL SECTION NO. 59

-Y12RPD- STA.22+68.06 TO STA.25+43.20 LT



TYPICAL SECTION NO. 59

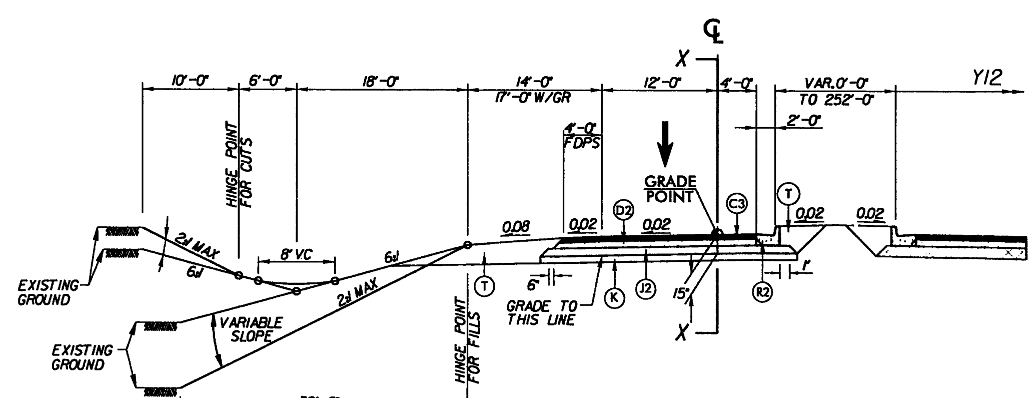
LINE	FROM STATION	TO STATION
-Y12RPD-	16+13.66	25+43.20



DETAIL X

USE WITH TYPICAL SECTION NO 60

-Y12SPURD- STA.23+40.00 TO STA.24+47.53 LT



TYPICAL SECTION NO. 60

LINE	FROM STATION	TO STATION
-Y12SPURD-	22+68.28	24+47.53

A1	14" CONCRETE
C1	1.25" SF9.5A
C2	1.5" S9.5C
C3	3" S9.5B
C4	3" S9.5C
C5	VAR. S9.5B
C6	VAR. S9.5C
D1	3" I19.0B
D2	4" I19.0B
D3	3" I19.0C
D4	4" I19.0C
D5	VAR. I19.0B
D6	VAR. I19.0C
E1	3" B25.0B
E2	4" B25.0B
E3	4.5" B25.0C
E4	5.5" B25.0B
E5	6.5" B25.0B
E6	7" B25.0B
E7	8" B25.0C
E8	9" B25.0C
E9	VAR. B25.0B
E10	VAR. B25.0C
J1	6.0" ABC
J2	8" ABC
J3	10" ABC
J4	VAR. ABC
K	SUBGRADE STABILIZATION
P	PRIME COAT
R1	1'- 6" C & G
R2	2'- 6" C & G
R3	MONOLITHIC ISLAND
R4	DOUBLE FACED CONC. BARRIER
R5	SHOULDER BERM GUTTER
R6	EXPRESSWAY GUTTER
R7	1 BAR METAL RAIL
S	SIDEWALK
T	EARTH MATERIAL
T1	TOPSOIL
U	EXISTING PAVEMENT
W	WEDGING
X	3" PADC
Y	MILLED RUMBLE STRIPS
Z	MILLING

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

SEE SHEET 2 FOR TYPICAL EDGE OF PAVEMENT AND SUBGRADE STABILIZATION DETAIL.

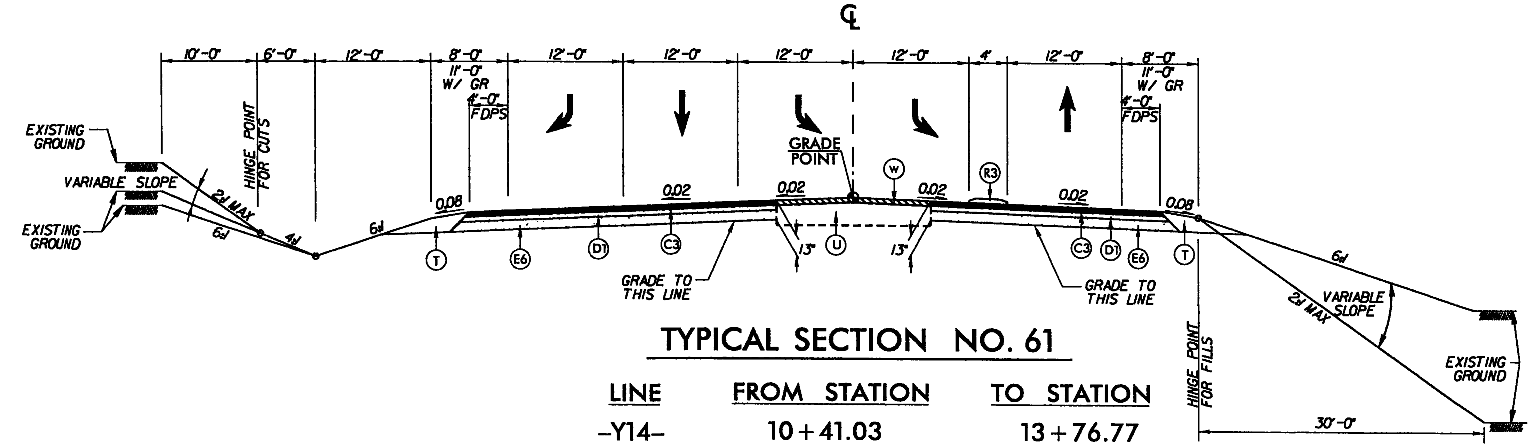
SEE SHEET 2 FOR STANDARD WEDGING DETAIL.

HDR Engineering, Inc. of the Carolinas
3733 National Drive, Suite 207 Raleigh, N.C. 27612
N.C.B.E.L.S. License Number: F-0116

PROJECT REFERENCE NO.	SHEET NO.
I-3803B	2-N
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER

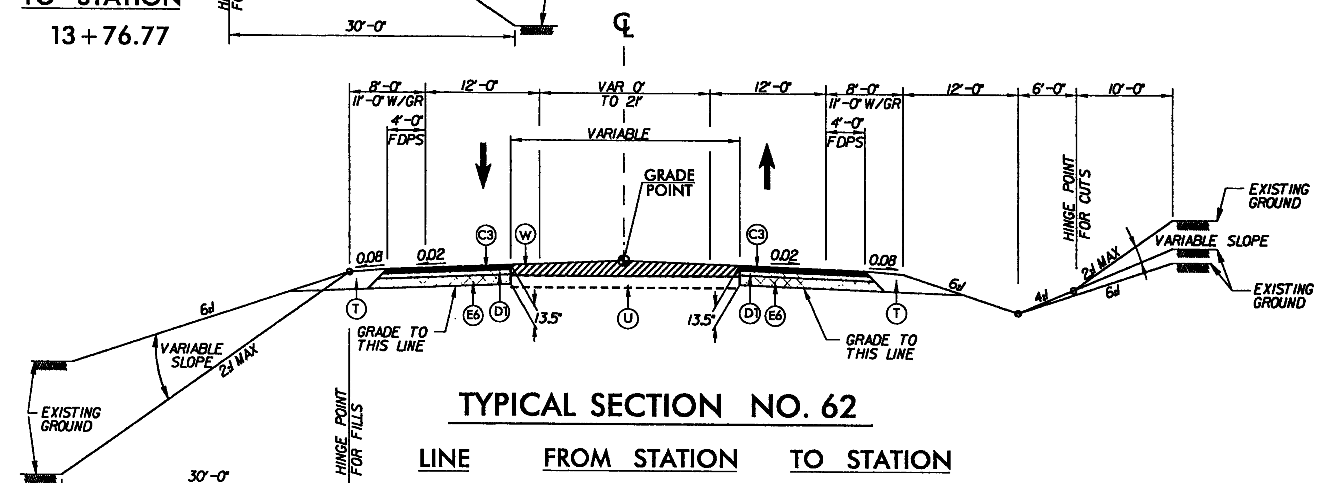
THE LANE CONSTRUCTION CORPORATION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



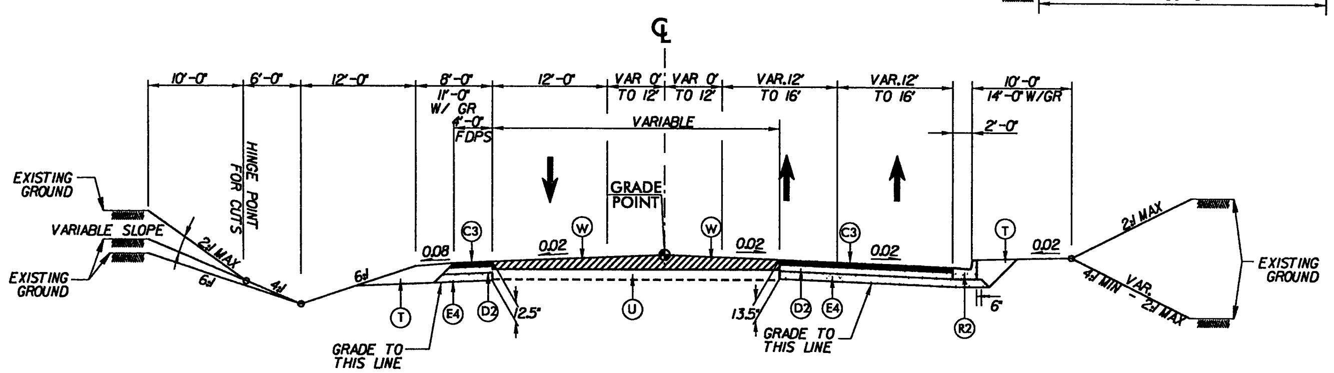
TYPICAL SECTION NO. 61

LINE	FROM STATION	TO STATION
-Y14-	10+41.03	13+76.77



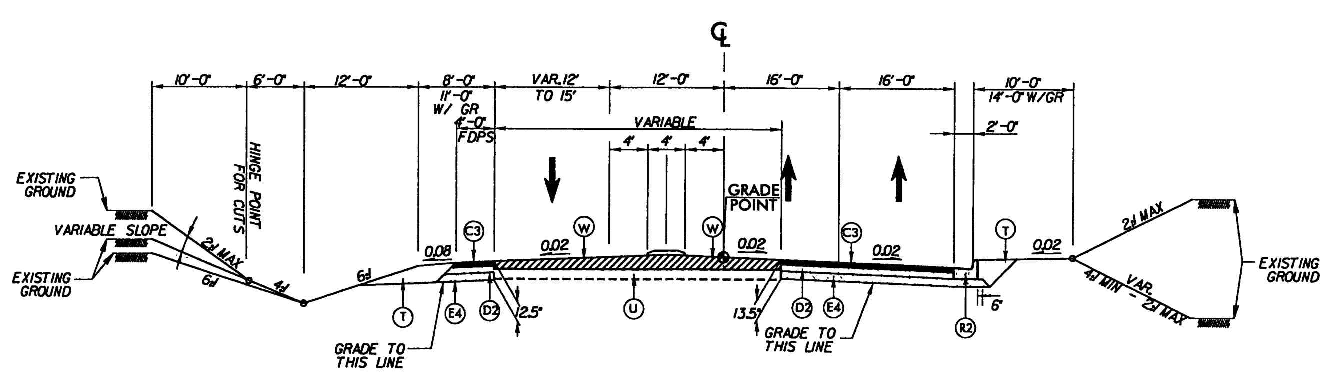
TYPICAL SECTION NO. 62

LINE	FROM STATION	TO STATION
-Y14-	13+76.77	17+76.77



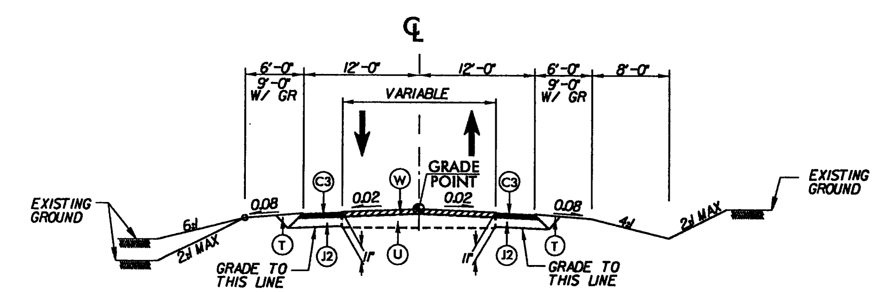
TYPICAL SECTION NO. 63

LINE	FROM STATION	TO STATION
-Y15-	16+00.00	19+51.01



TYPICAL SECTION NO. 64

LINE	FROM STATION	TO STATION
-Y15-	19+51.01	25+29.54



TYPICAL SECTION NO. 65

LINE	FROM STATION	TO STATION
-Y16-	10+11.93	18+12.82

A1	14" CONCRETE
C1	1.25" SF9.5A
C2	1.5" S9.5C
C3	3" S9.5B
C4	3" S9.5C
C5	VAR. S9.5B
C6	VAR. S9.5C
D1	3" I19.0B
D2	4" I19.0B
D3	3" I19.0C
D4	4" I19.0C
D5	VAR. I19.0B
D6	VAR. I19.0C
E1	3" B25.0B
E2	4" B25.0B
E3	4.5" B25.0C
E4	5.5" B25.0B
E5	6.5" B25.0B
E6	7" B25.0B
E7	8" B25.0C
E8	9" B25.0C
E9	VAR. B25.0B
E10	VAR. B25.0C
J1	6.0" ABC
J2	8" ABC
J3	10" ABC
J4	VAR. ABC
K	SUBGRADE STABILIZATION
P	PRIME COAT
R1	1'- 6" C & G
R2	2'- 6" C & G
R3	MONOLITHIC ISLAND
R4	DOUBLE FACED CONC. BARRIER
R5	SHOULDER BERM GUTTER
R6	EXPRESSWAY GUTTER
R7	1 BAR METAL RAIL
S	SIDEWALK
T	EARTH MATERIAL
T1	TOPSOIL
U	EXISTING PAVEMENT
W	WEDGING
X	3" PADC
Y	MILLED RUMBLE STRIPS
Z	MILLI[illegible]

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

SEE SHEET 2 FOR TYPICAL EDGE OF PAVEMENT AND SUBGRADE STABILIZATION DETAIL.

SEE SHEET 2 FOR STANDARD WEDGING DETAIL.

HDR Engineering, Inc. of the Carolinas
3733 National Drive, Suite 207 Raleigh, N.C. 27612
N.C.B.E.L.S. License Number: F-0116

PROJECT REFERENCE NO.	SHEET NO.
I-3803B	2-O

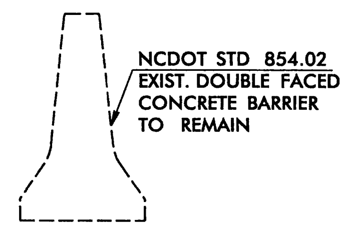
ROADWAY DESIGN ENGINEER

PAVEMENT DESIGN ENGINEER

THE LANE CONSTRUCTION CORPORATION

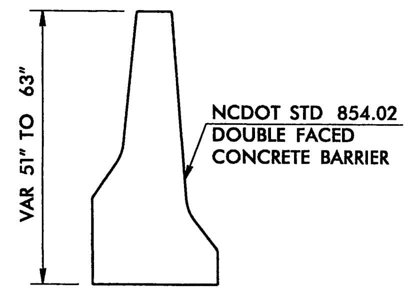
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

DOUBLE FACED CONCRETE BARRIER



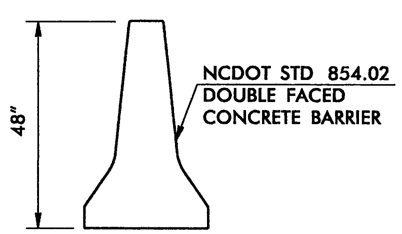
TYPE – T

LINE	FROM STATION	TO STATION
-L-	161+42.50	170+25.32
-L-	171+25.00	176+50.00



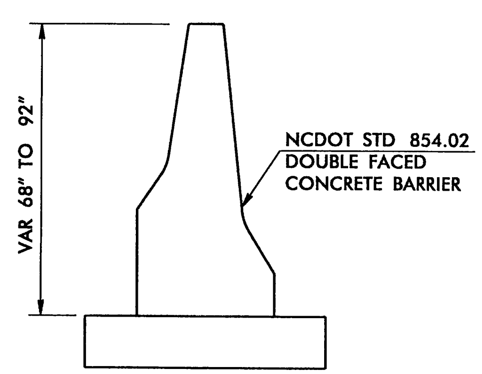
TYPE – T1

LINE	FROM STATION	TO STATION
-L-	170+25.32	171+25.00
-L-	176+50.00	178+96.00
-L-	180+95.00	185+00.00
-L-	197+00.00	198+07.50
-L-	198+92.50	212+00.00
-L-	223+50.00	228+50.00
-L-	297+50.00	301+50.00
-L-	303+50.00	309+29.00
-L-	311+50.00	319+50.00
-L-	337+00.00	344+50.00
-L-	350+00.00	355+50.00
-L-	367+50.00	391+47.50
-L-	392+32.50	397+00.00
-L-	406+50.00	410+00.00
-L-	412+84.00	415+50.00
-L-	439+50.00	445+50.00
-L-	450+00.00	468+57.50
-L-	469+42.50	486+21.00
-L-	489+13.00	497+32.5
-L-	498+17.50	522+00.00
-L-	524+50.00	530+00.00



TYPE – T

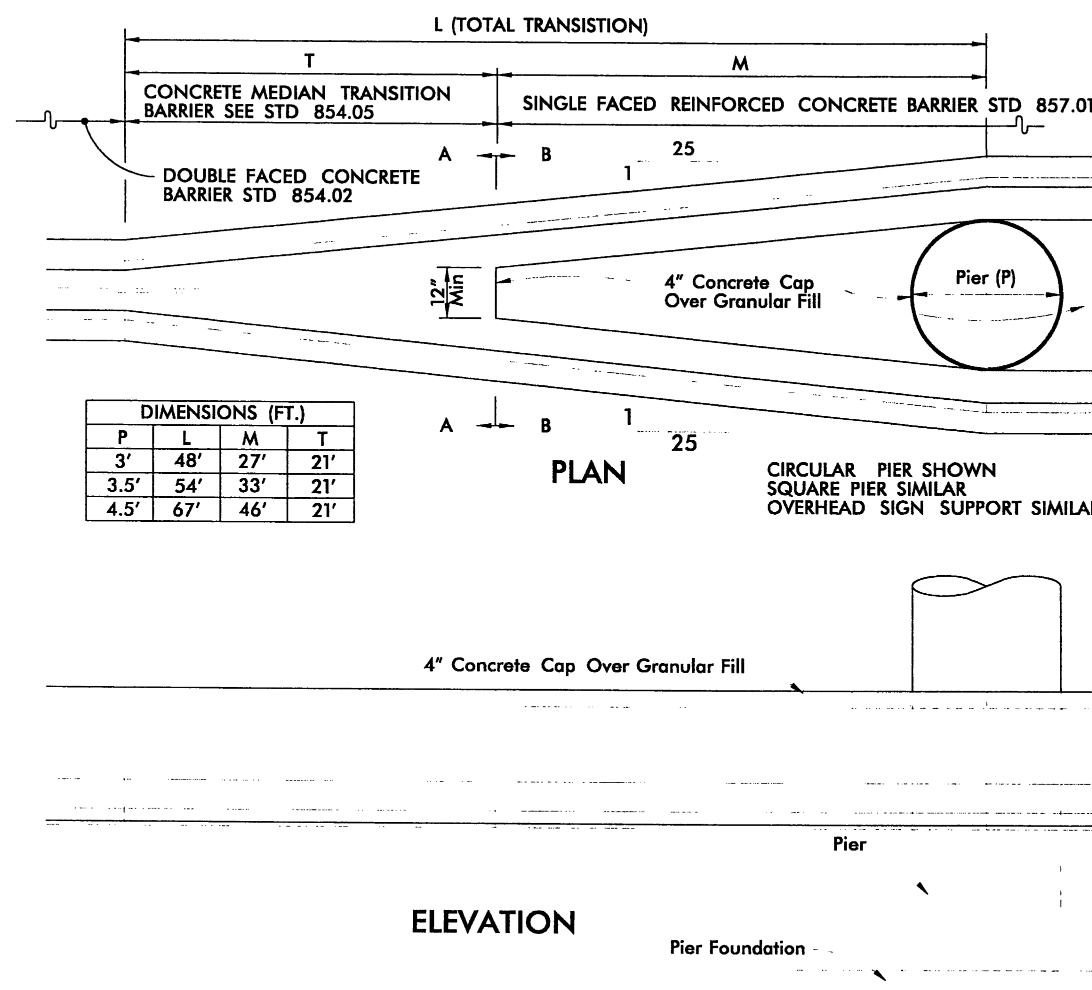
LINE	FROM STATION	TO STATION
-L-	159+74.00	160+57.50
-L-	185+00.00	197+00.00
-L-	212+00.00	223+50.00
-L-	228+50.00	297+50.00
-L-	344+50.00	350+00.00
-L-	355+50.00	367+50.00
-L-	397+00.00	406+50.00
-L-	415+50.00	426+57.50
-L-	427+42.50	439+50.00
-L-	445+50.00	450+00.00
-L-	522+00.00	524+50.00



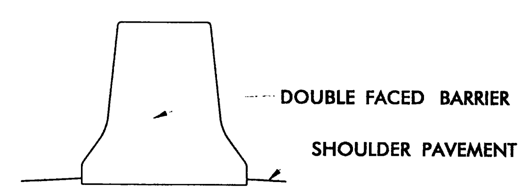
TYPE – T2

LINE	FROM STATION	TO STATION
-L-	301+50.00	303+50.00
-L-	319+50.00	337+00.00
-L-	410+00.00	410+80.00

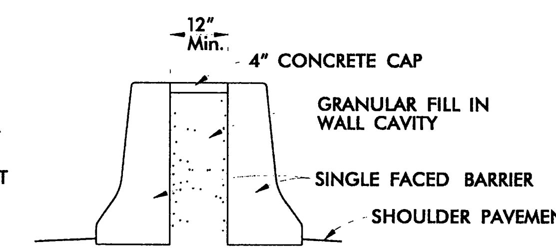
CONCRETE MEDIAN BARRIER WALL TRANSITIONS AT EXISTING PIERS AND OVERHEAD SIGN SUPPORTS



DIMENSIONS (FT.)			
P	L	M	T
3'	48'	27'	21'
3.5'	54'	33'	21'
4.5'	67'	46'	21'



SECTION A–A



SECTION B–B

CENTER TRANSITION

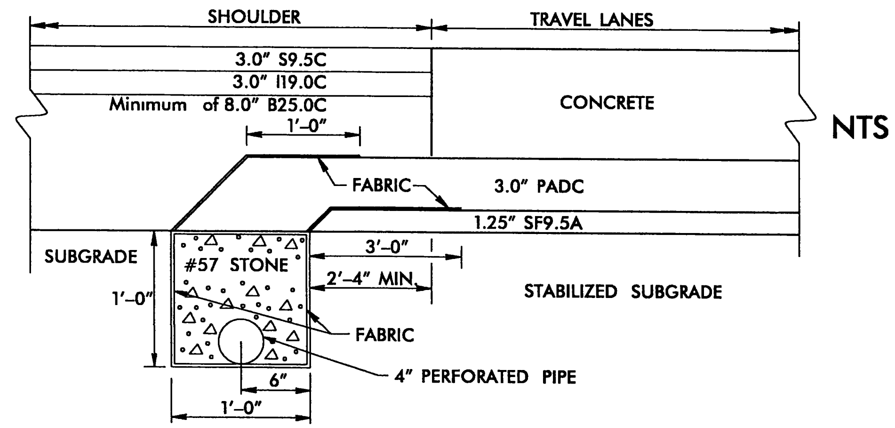
-L-	160+57.50	161+42.50	-L-	412+30.00	412+84.00
-L-	178+96.00	179+50.00	-L-	426+57.50	427+42.50
-L-	180+45.00	180+95.00	-L-	468+57.50	469+42.50
-L-	198+07.50	198+92.50	-L-	486+21.00	486+88.00
-L-	309+29.00	309+83.00	-L-	488+46.00	489+13.00
-L-	310+96.00	311+50.00	-L-	497+32.50	498+47.50
-L-	391+47.50	392+32.50			
-L-	410+80.00	411+34.00			

A1	14" CONCRETE
C1	1.25" SF9.5A
C2	1.5" S9.5C
C3	3" S9.5B
C4	3" S9.5C
C5	VAR. S9.5B
C6	VAR. S9.5C
D1	3" I19.0B
D2	4" I19.0B
D3	3" I19.0C
D4	4" I19.0C
D5	VAR. I19.0B
D6	VAR. I19.0C
E1	3" B25.0B
E2	4" B25.0B
E3	4.5" B25.0C
E4	5.5" B25.0B
E5	6.5" B25.0B
E6	7" B25.0B
E7	8" B25.0C
E8	9" B25.0C
E9	VAR. B25.0B
E10	VAR. B25.0C
J1	6.0" ABC
J2	8" ABC
J3	10" ABC
J4	VAR. ABC
K	SUBGRADE STABILIZATION
P	PRIME COAT
R1	1'- 6" C & G
R2	2'- 6" C & G
R3	MONOLITHIC ISLAND
R4	DOUBLE FACED CONC. BARRIER
R5	SHOULDER BERM GUTTER
R6	EXPRESSWAY GUTTER
R7	1 BAR METAL RAIL
S	SIDEWALK
T	EARTH MATERIAL
T1	TOPSOIL
U	EXISTING PAVEMENT
W	WEDGING
X	3" PADC
Y	MILLED RUMBLE STRIPS
Z	MILLING

NOTE: PAVEMENT EDGE SLOPES ARE 1:1 UNLESS SHOWN OTHERWISE
SEE SHEET 2 FOR TYPICAL EDGE OF PAVEMENT AND SUBGRADE STABILIZATION DETAIL.
SEE SHEET 2 FOR STANDARD WEDGING DETAIL.

HDR Engineering, Inc. of the Carolinas 3733 National Drive, Suite 207 Raleigh, N.C. 27612 N.C.B.E.L.S. License Number: F-0116	PROJECT REFERENCE NO.	SHEET NO.
	I-3803B	2-P
THE LANE CONSTRUCTION CORPORATION	ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



DETAIL OF SHOULDER DRAIN—MAINLINE SHOULDER

TO BE USED WITH TYPICAL SECTION NO 1

LINE	SIDE	FROM	TO
-L-	SBL, OUTSIDE	159+74	202+33

OUTLET: 159+74 (PAD), 165+25 (PAD), 168+25 (PAD), 171+25 (PAD), 172+83 (DI), 176+00 (PAD), 178+67 (DI), 181+51 (DI), 183+60 (JB), 185+57 (JB), 189+55 (DI), 192+00 (DI), 195+00 (DI), 198+75 (DI IN SAG), 199+54 (DI)

LINE	SIDE	FROM	TO
-L-	SBL, OUTSIDE	205+00	299+30

OUTLET: 207+58 (DI), 210+50 (PAD), 212+54 (DI), 215+50 (DI), 216+01 (DI IN SAG), 219+00 (PAD), 222+00 (PAD), 225+00 (PAD), 228+00 (PAD), 231+00 (PAD), 234+00 (PAD), 237+00 (PAD), 240+00 (PAD), 243+00 (PAD), 246+00 (PAD), 249+59 (DI), 252+06 (DI), 255+00 (PAD), 258+00 (PAD), 261+00 (PAD), 263+00 (PAD), 265+35 (DI), 269+00 (PAD), 272+06 (DI), 275+00 (PAD), 277+30 (DI), 280+50 (PAD), 284+08 (DI), 287+00 (PAD), 290+50 (PAD), 293+86 (DI), 297+50 (DI)

LINE	SIDE	FROM	TO
-L-	SBL, OUTSIDE	353+65	379+06

OUTLET: 357+85 (DI), 360+50 (PAD), 362+60 (DI), 365+61 (DI), 369+00 (DI), 372+56 (2 PADS IN SAG) 374+50 (PAD), 376+00 (DI)

LINE	SIDE	FROM	TO
-L-	SBL, OUTSIDE	381+73	440+93

OUTLET: 381+89 (DI), 385+00 (PAD), 388+59 (DI), 391+36 (JB), 395+00 (PAD), 398+00 (PAD), 401+63 (DI), 404+00 (PAD), 406+56 (JB), 409+00 (PAD), 411+16 (DI), 414+50 (PAD), 417+83 (2 PADS IN SAG), 420+00 (PAD), 422+50 (PAD), 425+50 (PAD), 428+50 (PAD), 431+50 (PAD), 434+50 (PAD), 437+58 (DI)

LINE	SIDE	FROM	TO
-L-	SBL, OUTSIDE	528+07	530+00

OUTLET: 530+00 (PAD)

LINE	SIDE	FROM	TO
-L-	SBL, MEDIAN	159+74	181+81

OUTLET: 165+00 (DI), 166+59 (DI), 172+00 (DI) 172+87 (DI), 178+00 (DI), 178+56 (DI) 181+81 (DI)

LINE	SIDE	FROM	TO
-L-	SBL, MEDIAN	226+61	369+03

OUTLET: 228+05 (DI), 230+00 (DI), 233+57 (DI) 238+07 (DI), 240+55 (DI), 245+36 (DI) 247+00 (DI), 252+06 (DI), 254+00 (DI) 259+07 (DI), 260+50 (DI), 265+32 (DI) 267+00 (DI), 272+00 (DI), 273+00 (DI) 278+00 (DI), 279+00 (DI), 284+07 (DI) 284+90 (DI), 289+32 (DI), 290+00 (DI) 293+82 (DI), 296+00 (DI), 298+55 (DI) 300+57 (DI), 304+58 (DI), 316+06 (DI) 320+50 (DI), 322+61 (DI), 325+63 (JB) 327+08 (DI), 331+11 (DI), 336+08 (DI), 340+59 (DI), 345+00 (DI), 347+00 (DI) 351+00 (DI), 353+59 (DI), 357+85 (DI) 362+00 (DI), 362+59 (DI), 365+60 (DI) 369+00 (DI)

LINE	SIDE	FROM	TO
-L-	SBL, MEDIAN	413+52	530+00

OUTLET: 415+60 (DI), 417+83 (DI IN SAG), 419+51 (DI) 422+59 (DI), 427+21 (DI), 431+63 (DI) 434+87 (DI), 439+60 (DI), 444+30 (DI) 449+54 (DI), 455+10 (DI), 461+21 (DI) 464+60 (DI), 467+60 (DI), 472+91 (DI) 474+00 (DI), 477+76 (DI), 482+41 (DI) 492+09 (DI), 494+05 (DI), 496+01 (DI) 499+00 (DI), 501+25 (DI), 504+40 (DI) 507+00 (DI), 509+58 (DI), 512+77 (DI) 515+00 (DI), 517+60 (DI), 520+50 (DI) 523+60 (DI), 525+60 (DI), 529+55 (DI)

LINE	SIDE	FROM	TO
-L-	NBL, OUTSIDE	170+25	181+69

OUTLET: 173+25 (PAD), 176+00 (PAD), 178+39 (DI) 181+69 (DI)

LINE	SIDE	FROM	TO
-L-	NBL, OUTSIDE	226+61	269+00

OUTLET: 226+61 (PAD), 228+34 (DI), 231+50 (PAD) 234+50 (PAD), 237+50 (PAD), 240+87 (DI) 243+00 (PAD), 245+22 (DI), 248+50 (PAD) 251+52 (DI), 254+00 (DI), 257+00 (PAD) 259+08 (DI), 262+00 (PAD), 265+30 (DI) 268+50 (PAD)

LINE	SIDE	FROM	TO
-L-	NBL, OUTSIDE	269+00	369+03

OUTLET: 272+08 (DI), 274+00 (DI), 278+07 (DI) 281+00 (PAD), 284+00 (PAD), 287+00 (PAD) 290+00 (PAD), 293+00 (PAD), 296+26 (DI) 298+83 (DI), 300+00 (DI), 302+50 (PAD) 304+53 (DI), 307+00 (PAD), 311+86 (DI) 315+82 (DI), 318+25 (DI), 320+50 (DI) 322+10 (DI), 325+00 (PAD), 328+00 (PAD) 331+08 (DI), 333+50 (PAD), 336+06 (DI) 339+00 (PAD), 341+41 (DI), 345+00 (DI) 346+42 (DI), 350+09 (JB), 353+00 (PAD) 356+00 (PAD), 359+00 (PAD), 362+60 (DI) 365+58 (DI), 369+03 (PAD)

LINE	SIDE	FROM	TO
-L-	NBL, OUTSIDE	413+52	530+00

OUTLET: 415+00 (PAD), 417+83 (2 PADS IN SAG), 420+50 (PAD) 423+50 (PAD), 426+50 (PAD), 429+50 (PAD) 431+50 (DI), 435+00 (DI), 438+00 (PAD) 441+00 (PAD), 444+00 (PAD), 447+00 (PAD) 450+00 (PAD), 453+00 (PAD), 455+50 (PAD) 457+27 (DI), 459+02 (JB), 462+00 (PAD) 465+00 (PAD), 467+54 (DI), 469+40 (DI) 472+50 (PAD), 475+77 (DI), 477+68 (DI) 479+50 (DI), 482+40 (DI), 485+00 (PAD) 491+50 (PAD), 495+00 (DI), 498+00 (PAD) 501+00 (PAD), 504+10 (DI), 507+00 (PAD) 509+31 (DI), 512+00 (PAD), 514+00 (DI) 517+00 (PAD), 520+50 (DI), 522+40 (DI) 524+50 (PAD), 526+91 (DI), 529+56 (DI)

LINE	SIDE	FROM	TO
-L-	NBL, MEDIAN	170+25	202+33

OUTLET: 172+00 (DI), 172+87 (DI), 178+00 (DI) 178+56 (DI), 181+81 (DI), 182+85 (DI IN SAG) 185+56 (DI), 189+57 (DI), 193+57 (DI) 196+50 (DI), 197+81 (DI IN SAG), 198+75 (DI) 201+20 (DI)

LINE	SIDE	FROM	TO
-L-	NBL, MEDIAN	205+00	299+31

OUTLET: 205+50 (DI), 209+38 (DI), 212+55 (DI) 215+10 (DI), 216+03 (DI IN SAG), 218+00 (DI) 221+86 (DI), 228+05 (DI), 230+00 (DI) 233+57 (DI), 238+07 (DI), 240+55 (DI) 245+36 (DI), 247+00 (DI), 252+06 (DI) 254+00 (DI), 259+07 (DI), 260+50 (DI) 265+32 (DI), 267+00 (DI), 272+07 (DI) 273+00 (DI), 278+07 (DI), 279+00 (DI) 284+07 (DI), 285+00 (DI), 289+32 (DI) 290+00 (DI), 293+82 (DI), 296+00 (DI) 298+55 (DI)

LINE	SIDE	FROM	TO
-L-	NBL, MEDIAN	381+23	440+93

OUTLET: 384+65 (DI), 388+61 (DI), 392+61 (DI) 399+00 (DI), 401+64 (DI), 406+40 (DI) 409+56 (DI), 412+92 (DI), 415+60 (DI) 417+83 (DI IN SAG), 419+51 (DI), 422+59 (DI) 427+21 (DI), 431+63 (DI), 434+87 (DI) 439+60 (DI)

LINE	SIDE	FROM	TO
-L-	NBL, MEDIAN	528+07	530+00

OUTLET: 529+55 (DI)

A1	14" CONCRETE
C1	1.25" SF9.5A
C2	1.5" S9.5C
C3	3" S9.5B
C4	3" S9.5C
C5	VAR. S9.5B
C6	VAR. S9.5C
D1	3" I19.0B
D2	4" I19.0B
D3	3" I19.0C
D4	4" I19.0C
D5	VAR. I19.0B
D6	VAR. I19.0C
E1	3" B25.0B
E2	4" B25.0B
E3	4.5" B25.0C
E4	5.5" B25.0B
E5	6.5" B25.0B
E6	7" B25.0B
E7	8" B25.0C
E8	9" B25.0C
E9	VAR. B25.0B
E10	VAR. B25.0C
J1	6.0" ABC
J2	8" ABC
J3	10" ABC
J4	VAR. ABC
K	SUBGRADE STABILIZATION
P	PRIME COAT
R1	1'- 6" C & G
R2	2'- 6" C & G
R3	MONOLITHIC ISLAND
R4	DOUBLE FACED CONC. BARRIER
R5	SHOULDER BERM GUTTER
R6	EXPRESSWAY GUTTER
R7	1 BAR METAL RAIL
S	SIDEWALK
T	EARTH MATERIAL
T1	TOPSOIL
U	EXISTING PAVEMENT
W	WEDGING
X	3" PADC
Y	MILLED RUMBLE STRIPS
Z	MILLING

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

SEE SHEET 2 FOR TYPICAL EDGE OF PAVEMENT AND SUBGRADE STABILIZATION DETAIL.

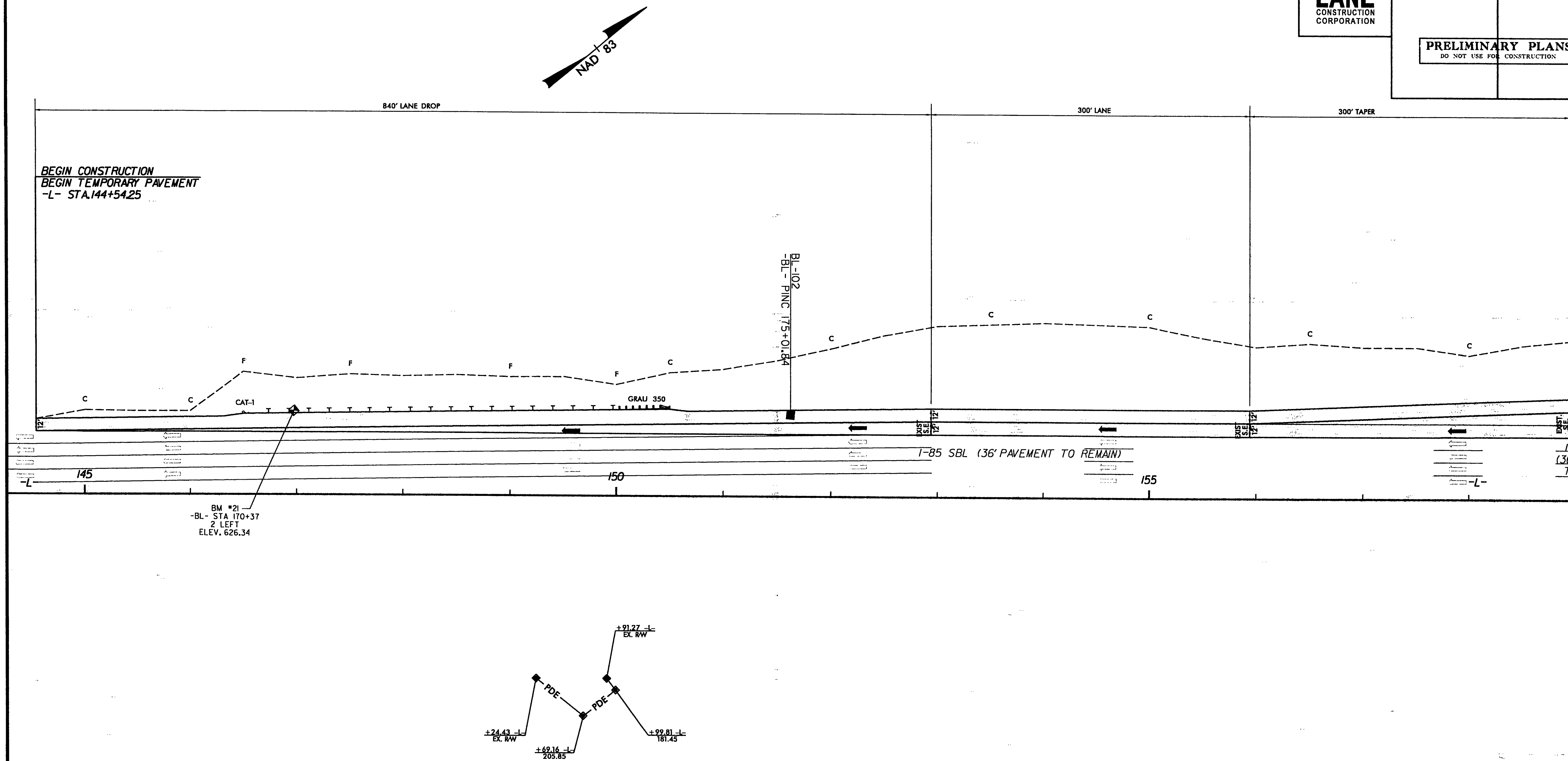
SEE SHEET [illegible] FOR STANDARD WEDGING DETAIL.

HDR Engineering, Inc. of the Carolinas
3733 National Drive, Suite 207 Raleigh, N.C. 27612
N.C.B.E.L.S. License Number: F-0116

PROJECT REFERENCE NO.	SHEET NO.
I-3803B	2-Q
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

THE LANE CONSTRUCTION CORPORATION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



MATCHLINE -L- STA. 159+00, SEE SHEET NO. 2-R

PAVEMENT TRANSITION DETAIL

REVISIONS

HDR Engineering, Inc. of the Carolinas
3733 National Drive, Suite 207 Raleigh, N.C. 27612
N.C.B.E.L.S. License Number: F-0116

THE LANE CONSTRUCTION CORPORATION

PROJECT REFERENCE NO.	SHEET NO.
I-3803B	2-R
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

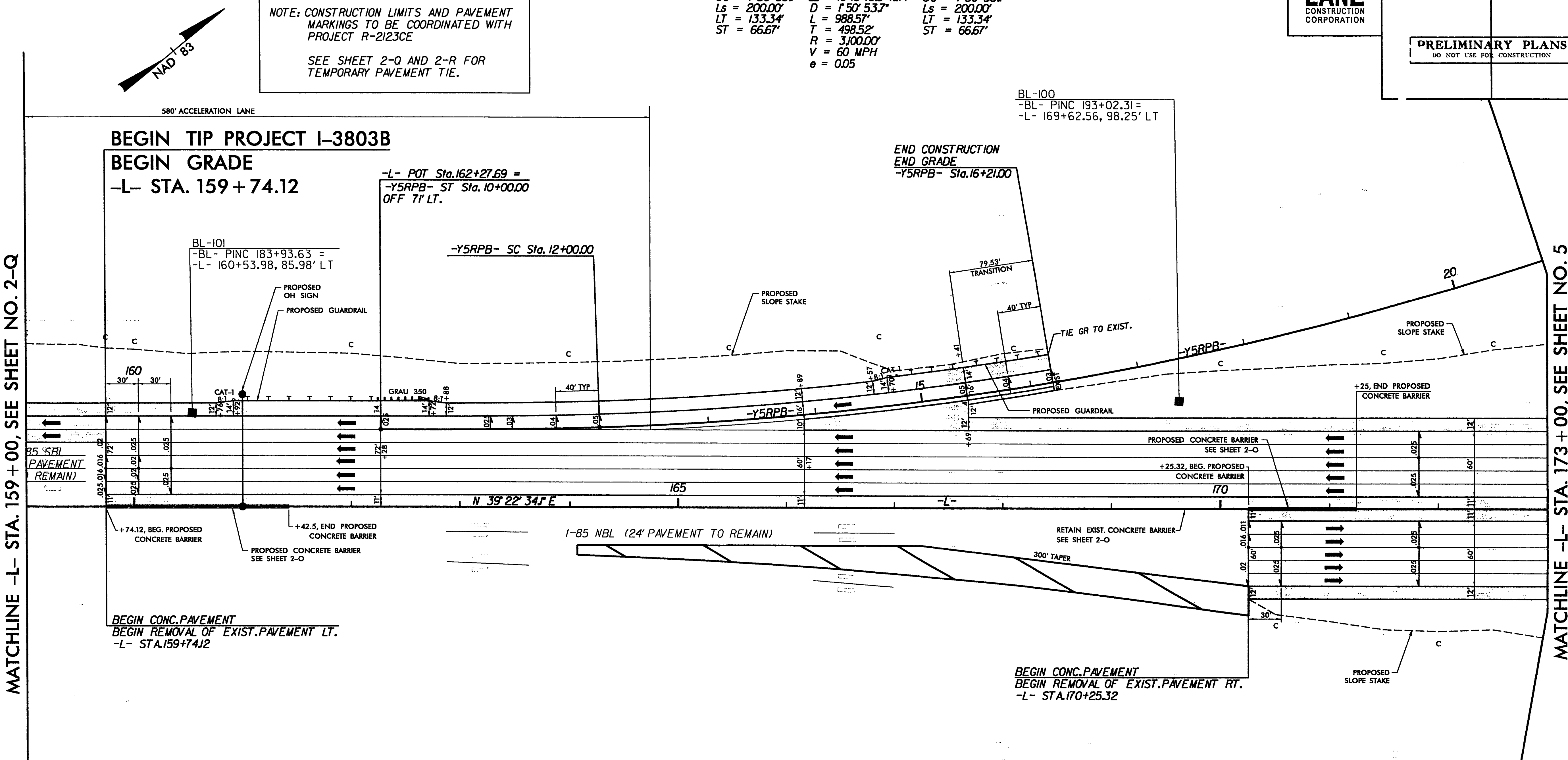
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

NOTE: CONSTRUCTION LIMITS AND PAVEMENT MARKINGS TO BE COORDINATED WITH PROJECT R-2123CE

SEE SHEET 2-Q AND 2-R FOR TEMPORARY PAVEMENT TIE.

-Y5RPB-

PIs Sta 11+33.34	PI Sta 16+98.52	PIs Sta 22+55.25
Θs = 1° 50' 53.7"	Δ = 18° 16' 16.8" (LT)	Θs = 1° 50' 53.7"
Ls = 200.00'	D = 1° 50' 53.7"	Ls = 200.00'
LT = 133.34'	L = 988.57'	LT = 133.34'
ST = 66.67'	T = 498.52'	ST = 66.67'
	R = 3,100.00'	
	V = 60 MPH	
	e = 0.05	



PAVEMENT TRANSITION DETAIL

SEE SHEET NO 49, 50 FOR -L- PROFILE.
SEE SHEET NO. 80 FOR -Y5RPB- PROFILE.

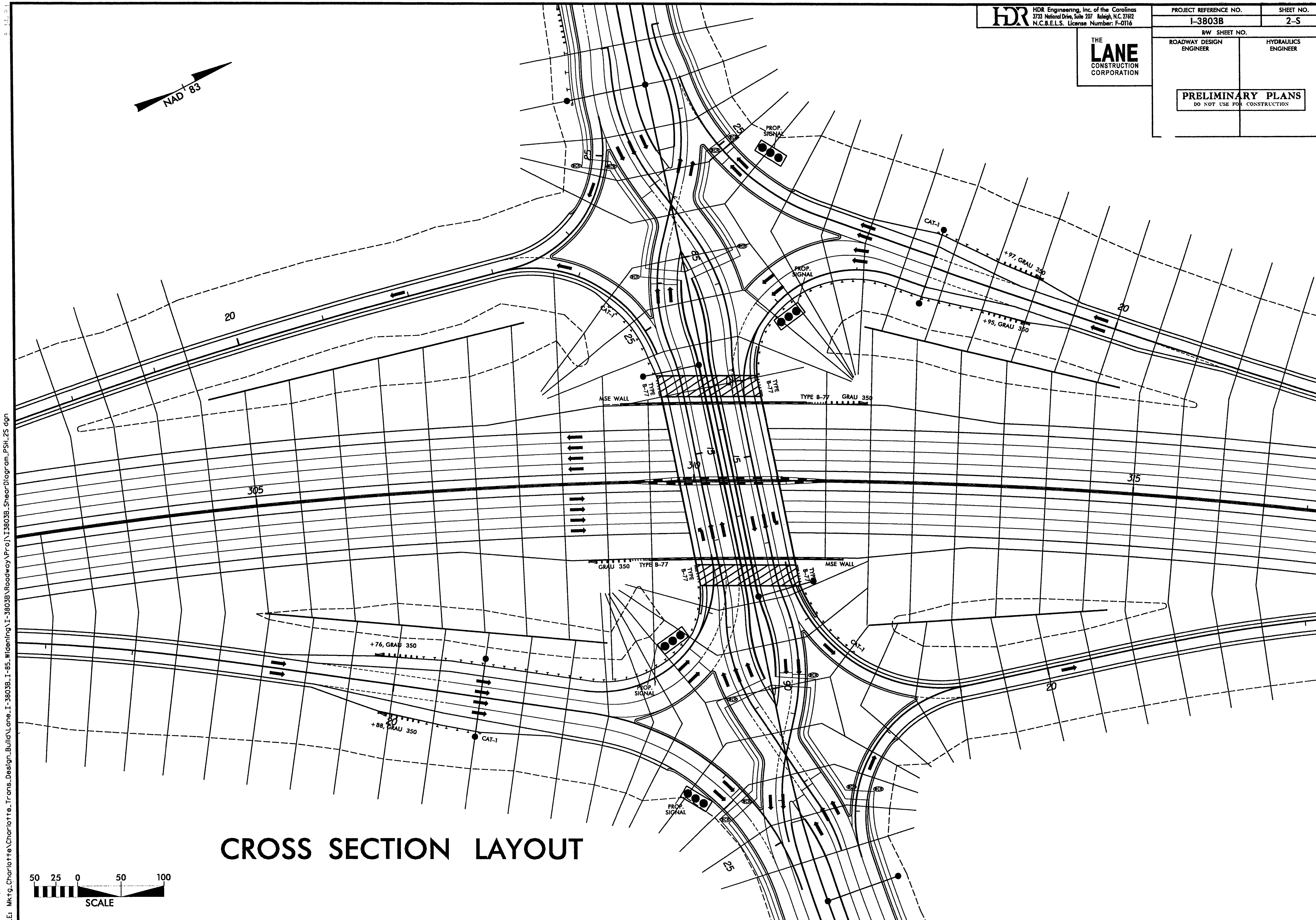
REVISIONS

PROJECT REFERENCE NO.	SHEET NO.
I-3803B	2-S
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

HDR Engineering, Inc. of the Carolinas
3733 National Drive, Suite 207 Raleigh, N.C. 27612
N.C.B.E.L.S. License Number: F-0116

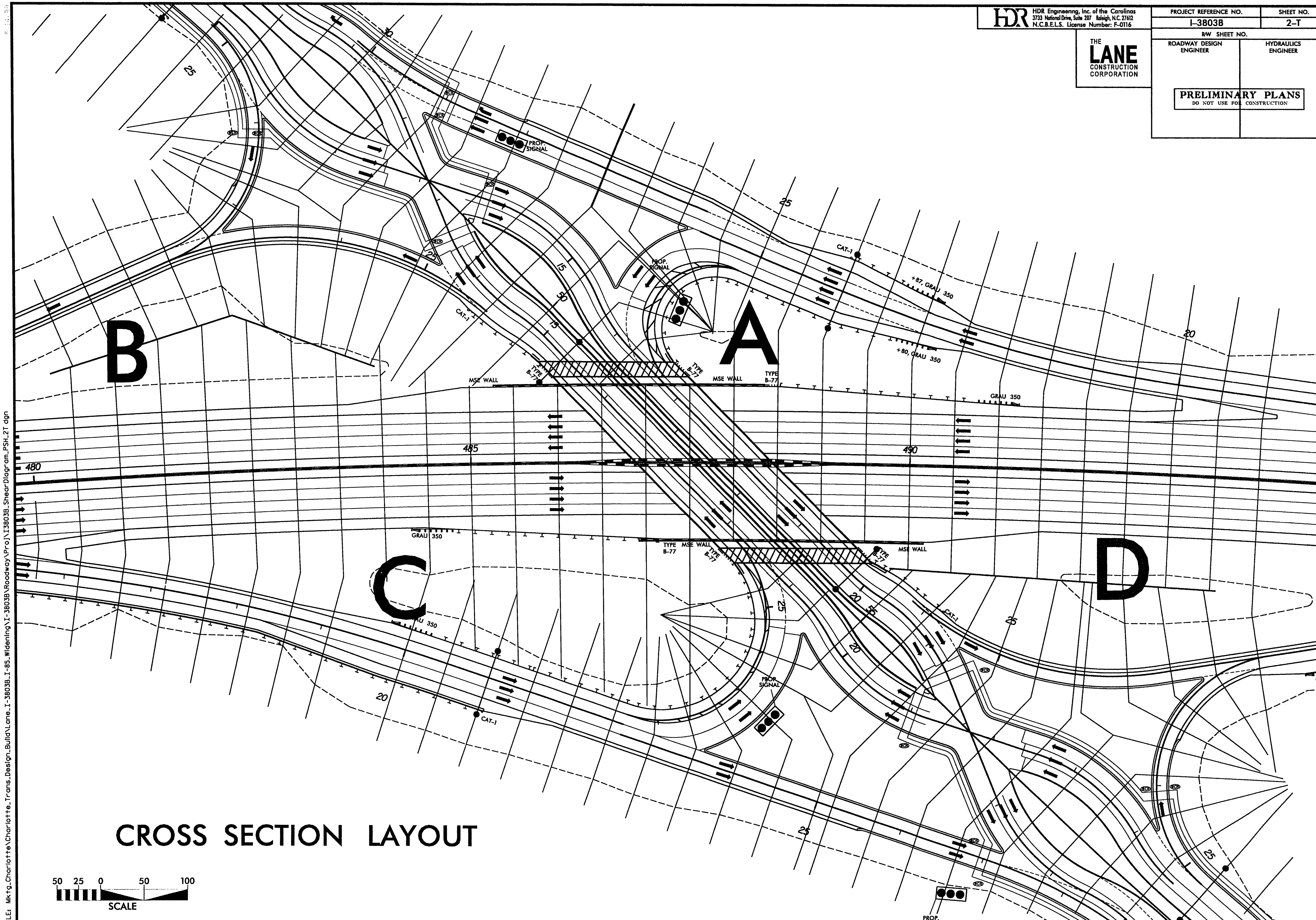
THE LANE CONSTRUCTION CORPORATION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



CROSS SECTION LAYOUT

PLOT DRIVER: NCDOT_pdf_mono_eng_50 plt PENTABLE: NCDOT_pshpfl tbl
USER: rthigpen DATE: 3/24/2011 TIME: 5:22:17 PM SCALE: half=100:1 - full=50:1
FILE: Mktg_Charlotte\Charlotte_Trans_Design_Build\Lane_I-3803B_I-85_Widening\I-3803B\Roadway\Proj\I3803B_ShearDiagram_PSH_2S dgn

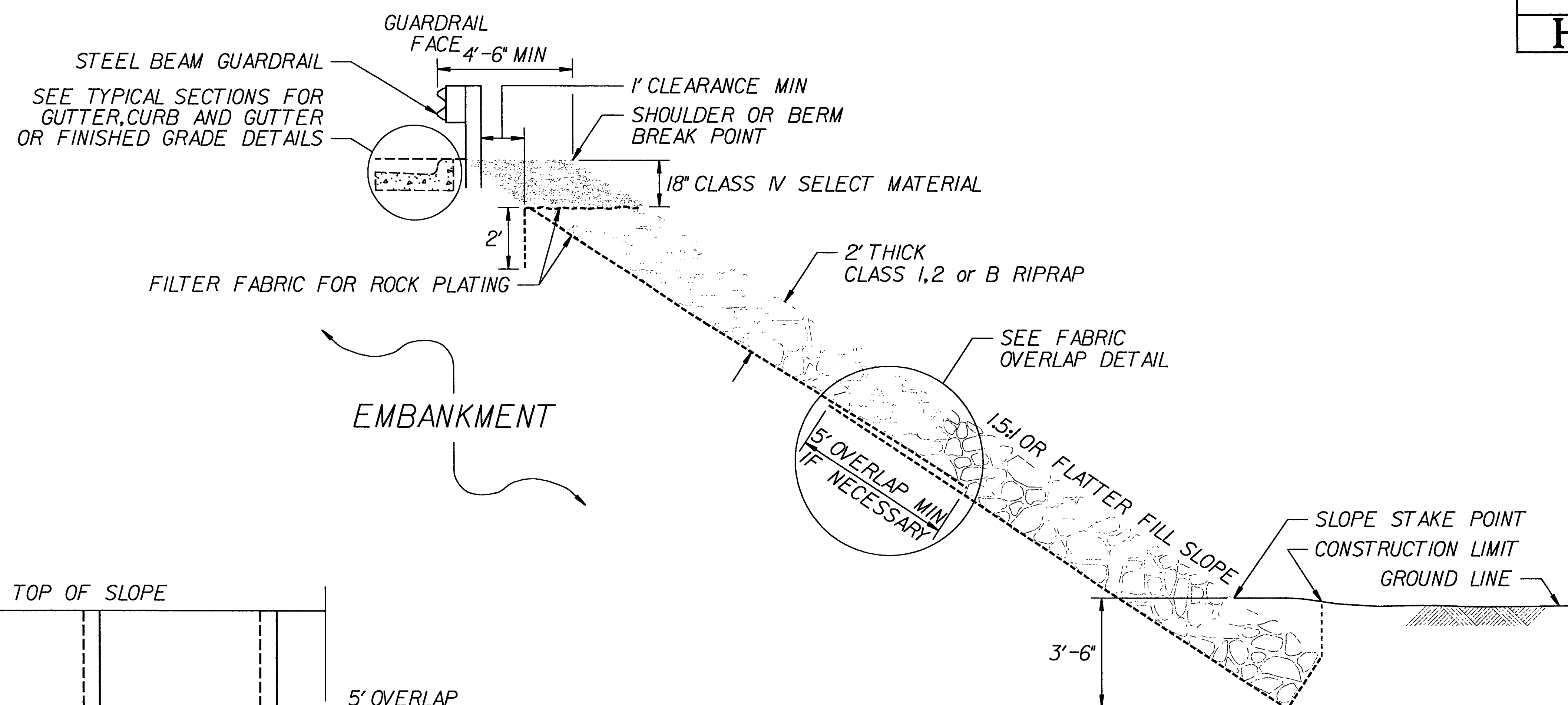


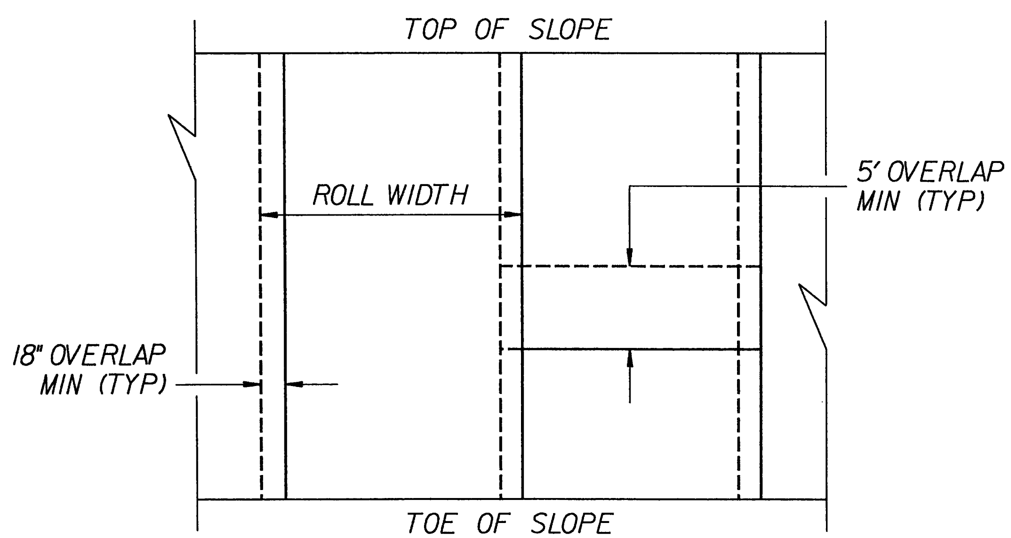
PLOT DRIVER: NCDOT_pdf_mono_eng_50.plt PENTABLE: NCDOT_pshpfl.tbl
USER: rthigpen DATE: 3/24/2011 TIME: 5:20:28 PM SCALE: half=100:1 - full=50:1
FILE: Mktg_Charlotte\Charlotte_Trans_Design_Build\Lane_I-3803B_I-85_Widening\I-3803B\Roadway\Proj\I3803B_ShearDiagram_PSH_2T.dgn

HDR Engineering, Inc. of the Carolinas
3733 National Drive, Suite 207 Raleigh, N.C. 27612
N.C.B.E.L.S. License Number: F-0116

THE LANE CONSTRUCTION CORPORATION

ROCK PLATING DETAIL





FABRIC OVERLAP DETAIL

(PLAN VIEW)

USE ROCK PLATING DETAIL NO. 2 AT THE FOLLOWING LOCATIONS:

STA 254+00 ± TO STA 255+50± -L- RT
STA 276+50 ± TO STA 277+00± -L- RT
STA 439+00 ± TO STA 439+50± -L- RT
STA 471+75 ± TO STA 472+75± -L- LT
STA 496+50 ± TO STA 499+50± -L- LT
EXTEND ROCK PLATING LIMITS TO SIDE SLOPES.

REVISIONS

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

HDR Engineering, Inc. of the Carolinas
3733 National Drive, Suite 207 Raleigh, N.C. 27612
N.C.B.E.L.S. License Number: F-0116

THE LANE CONSTRUCTION CORPORATION

PROJECT REFERENCE NO.	SHEET NO.
I-3803B	3
R/W SHEET NO.	

FOR R/W ACQUISTION ONLY
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

PARCEL INDEX SHEET

PARCEL NO.	SHEET NO.	PROPERTY OWNERS NAME	PARCEL NO.	SHEET NO.	PROPERTY OWNERS NAME	PARCEL NO.	SHEET NO.	PROPERTY OWNERS NAME
3	6	HAWKINS LAND & INVESTMENT COMPANY, LLC	37	34	VIRPUR JALARAM, LLC	68	45	DIMITRIOS AND CHRISTINE SKOTIDAS
4	11	CLAUDE B. BARBRE, JR AND BETTY JO S. BARBRE TRUSTEES	38	34	TIMES OIL CORPORATION	69	45	DIMITRIOS SKOTIDAS
5	13,14	LAWSON C. AND MARTHA B. BONDS	39	41	ATLANTIC BUSINESS CENTERS III, LLC	70	26,45	TRUSTEES OF ROWAN TECHNICAL COLLEGE
6	13,14	CLARKH. AND GINA M. KUHR	40	35	JUBA INVESTMENTS, LLC	71	45	CABARUS RESTAURANT GROUP LLC
7	14	CITY OF CONCORD	41	35	ARL FAMILY LTD PARTNERSHIP	72	26	HILLCREST FOODS INC.
8	14	UNITED OIL OF THE CAROLINAS, INC	42	35	OAKMONT BUSINESS PARTNERS II, LLC	73	26	AAC CONCORD 1, LP
9	14	ROSALIA, LLC.	43	35	VULCAN LANDS, INC.	74	46	JON B. ANDERSON
10	14	GRADY S. CARPENTER, JR AND JEFFERY C. CARPENTER	43A	35	VULCAN LANDS, INC.	75	46	DIANE P WHITE
11	14	POPLAR TENT PARTNERSHIP	44	35	CITY OF CONCORD	76	46	CARROLL M. SHOFFNER
12	14	SECURITY OIL CO. INC	45	14,37	FIVE COUSINS, LLC	77	46	CHARLES D. AND CAROL M. BARBEE
13	14,15,16	DONALD E. WHITAKER	46	14,37	TBMM, LLC.	78	46	REECE W. AND INEZ B. EASLEY
14	14	POPLAR TENT PARTNERSHIP	46A	38	A&D PROPERTIES LP	79	47	KENTON GLENN HOMEOWNERS ASSOCIATION, INC.
15	14,15	JMH, LLC.	47	38	UNITED OIL OF THE CAROLINAS, INC	80	47	CARROLL M. SHOFFNER
16	19	AFTON DEVELOPMENT COMPANY, LLC	48	38	THOMAS E. AND ANNA L. BARBEE	81	47	RAY M. AND BETTY B.CALLOWAY
17	23	CHARLES W. AND LORRAINE KIDD	49	38	OTN INVESTMENT, INC	82	47	AAC CONCORD I LIMITED PARTNERSHIP
18	23,24,25,26	NOLIM GROUP S. A., INC.	50	38	MARY POPLIN	83	47	OAK PARK HOMEOWNERS ASSOCIATION,INC.
19	23	FINAL PROPERTIES, LLC	51	38	MICHAEL D. AND PHAEDRA SIMMONS, HAROLD AND ADA H. SIMMONS	84	41	JKH PROPERTIES, LLC
20	23	FINAL PROPERTIES, LLC	52	38	POPLAR TENT PRESBYTERIAN CHURCH	85	41	MK REAL ESTATE HOLDINGS, LLC
21	23	BISCAYNE PROPERTIES, LLC	53	39	SHALYN, INC	86	41	MCLANE FOODSERVICE, INC
22	24	LICARD HOLDINGS, LLC	54	39	DONALD E. AND ANN D. FRISCH	87	41	PENSKE TRUCK LEASING COMPANY, LP
23	25	TARAKHAN HOLDINGS, LLC	54A	39	JAMES S. AND ONEDA M. HARRISON	88	42	WESTMORELAND DRIVE, LLC
24	25	PRIME BUSINESS, LLC	55	39	DONALD E. AND ANN D. FRISCH	89	48	FRANK AND MILDRED HAGLER
25	26	BAREFOOT OIL COMPANY OF CONCORD	56	43	DAVID AND MILAGROS ROQUE	90	9,10	KING'S WAY BAPTIST CHURCH OF CHARLOTTE, NORTH CAROLINA, INC
26	26	PROPST BROTHERS DISTRIBUTORS, INC.	57	43	THOMAS E. AND ANNA L. BARBEE	91	32	WILLIAM C. CASE
27	26	CATAWBA OIL CO. INC.	58	43	LAWSON C. AND MARTHA B. BONDS	92	32	KENNETH P JEPSON
28	26,27,28,29	CARROLL M. SHOFFNER	59	44	DOGWOOD PARTNERS I, LLC	93	32,33	NEIL C. GROGAN
29	33	CARROLL M. SHOFFNER	60	44	R.B. LEE JR	94	33	JANET G. GODFREY
30	33	HARRIS LAKE PROPERTIES	61	44	ANN D. FRISCH	95	33	CORRIHER WATER SERVICE, INC
31	33, 34, 42	CAROLINA TRACTOR & EQUIPMENT COMPANY	62	44	CITY OF KANNAPOLIS	96	33	POPLAR POINT ASSOCIATES, LLC
32	34	ANDREW DRUCKER	63	45	THE CONCORD TELEPHONE COMPANY	97	40	GABLE OAKS PROPERTY OWNERS ASSOCIATION
33	34	CONCORD TELEPHONE COMPANY	64	45	ANN D. FRISCH	98	42	FJC REAL PROPERTY. LLC
34	34	SUNSET STRORAGE CENTER, INC.	65	45	GM HOSPITALITY, LLC	99	42	EDWIN E. STARNES, SR
35	34	B & K OF CONCORD, LLC	66	45	JAMES E. AND BRENDA A. BREWER	100	42	HDYLE N. AND NANCY H. HOLLAND TRUST
36	34	TAYLOR OIL COMPANY, INC	67	45	RINGHAVER EQUIPMENT CO.	101	42	BRUCE A. SILVER

REVISIONS

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

PARCEL INDEX SHEET

HDR Engineering, Inc. of the Carolinas
3733 National Drive, Suite 207 Raleigh, N.C. 27612
N.C.B.E.L.S. License Number: F-0116

THE LANE CONSTRUCTION CORPORATION

PROJECT REFERENCE NO.	SHEET NO.
I-3803B	3A
R/W SHEET NO.	

FOR R/W ACQUISTION ONLY
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

PARCEL NO.	SHEET NO.	PROPERTY OWNERS NAME	PARCEL NO.	SHEET NO.	PROPERTY OWNERS NAME	PARCEL NO.	SHEET NO.	PROPERTY OWNERS NAME
102	13	BONDS FAMILY, LP						
103	5	CNL NET LEASE FUNDING 2001, LP						
104	5	SREE-KINGS GRANT LLC						
105	44	BGCS PROPERTY ASSOCIATES, LLC						
106	26	OUR GANG PROPERTIES, LLC						
107	34	ACCEL PROPERTIES, LLC						
108	27	JOSEPH B. GROOMS						
109	23	INVESTMENT INTERNATIONAL, LLC						
110	44	RED FEATHER, LLC						

REVISIONS

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

HDR Engineering, Inc. of the Carolinas
3733 National Drive, Suite 207 Raleigh, N.C. 27612
N.C.B.E.L.S. License Number: F-0116

THE LANE CONSTRUCTION CORPORATION

PROJECT REFERENCE NO.	SHEET NO.
I-3803B	3-B
R/W SHEET NO.	

FOR R/W ACQUISTION ONLY
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

RIGHT OF WAY AREA DATA SHEET

PARCEL NO.	PROPERTY OWNERS NAME	TOTAL ACREAGE	AREA TAKEN (AC)	AREA REMAINING RIGHT (AC)	AREA REMAINING LEFT (AC)	CONSTR. EASEMENT (AC)	PERMANENT DRAINAGE EASEMENT (AC)	TEMPORARY DRAINAGE EASEMENT (AC)
3	HAWKINS LAND & INVESTMENT COMPANY, LLC	22.26		22.26				
4	CLAUDE B. BARBRE, JR&BETTY JO S. BARBRE TRUSTEES	3.53		3.53			286.45 SF	
5	LAWSON C. AND MARTHA B. BONDS	16.43	0.12	16.30				
6	CLARKH. AND GINA M. KUHR	1.75			1.75			
7	CITY OF CONCORD							
8	UNITED OIL OF THE CAROLINAS, INC	4,463.41 SF		4,463.41 SF				
9	ROSALIA, LLC.							
10	GRADY S. CARPENTER, JR&JEFFERY C. CARPENTER	1.33		1.33				
11	POPLAR TENT PARTNERSHIP	6.12	0.46		5.65	174.51 SF		
12	SECURITY OIL CO. INC	1.57		1.57				
13	DONALD E. WHITAKER	26.66	0.32		26.34	0.11		
14	POPLAR TENT PARTNERSHIP	5.73	0.12		5.61			
15	JMH, LLC.	11.56		11.56				
16	AFTON DEVELOPMENT COMPANY, LLC	13.17		13.17			987.92 SF	
17	CHARLES W. AND LORRAINE KIDD	30,122.64 SF	358.49 SF	29,764.15 SF				
18	NOLIM GROUP S. A., INC.		3.94			3,212.64 SF	8,097.76 SF	
19	FINAL PROPERTIES, LLC	2.43	704.37 SF		2.41			
20	FINAL PROPERTIES, LLC	2.68	2,418.07 SF		2.63			
21	BISCAYNE PROPERTIES, LLC	5.54	0.17		5.37			
22	LICARD HOLDINGS, LLC	5.67			5.67			
23	TARAKHAN HOLDINGS, LLC	12.11			12.11			
24	PRIME BUSINESS, LLC	7.05	0.16		6.89		1,364.77 SF	
25	BAREFOOT OIL COMPANY OF CONCORD	5.05	4,225.51 SF		4.95			
26	PROPST BROTHERS DISTRIBUTORS, INC.	1.41	0.52	0.89		2,029.97 SF		
27	CATAWBA OIL CO. INC.	2.55	0.65	1.90		4,253.97 SF		
28	CARROLL M. SHOFFNER	12.78	0.31	12.47				
29	CARROLL M. SHOFFNER	14.64	2,035.87 SF	14.59				
30	HARRIS LAKE PROPERTIES	15.99	0.20	15.79		0.27		
31	CAROLINA TRACTOR & EQUIPMENT COMPANY	54.53	2.42	52.11		0.56	0.93 SF	
32	ANDREW DRUCKER	2.35	0.43		1.93	3,670.54 SF	1,661.60 SF	
33	CONCORD TELEPHONE COMPANY	1.18	0.13		1.05	1,024.68 SF	3,695.93 SF	
34	SUNSET STRORAGE CENTER, INC.	5.89	0.14		5.75	0.18	973.72 SF	
35	B & K OF CONCORD, LLC	3.75	0.27		3.47		0.16 SF	
36	TAYLOR OIL COMPANY, INC	3.11	0.33		2.79	3,271.30 SF	3,320.64 SF	

PARCEL NO.	PROPERTY OWNERS NAME	TOTAL ACREAGE (AC)	AREA TAKEN (AC)	AREA REMAINING RIGHT (AC)	AREA REMAINING LEFT (AC)	CONSTR. EASEMENT (AC)	PERMANENT DRAINAGE EASEMENT (AC)	TEMPORARY DRAINAGE EASEMENT (AC)
37	VIRPUR JALARAM, LLC	37,557.70 SF	12,409.56 SF		0.58	1,296.59 SF		
38	TIMES OIL CORPORATION	2.06	0.49		1.57	4,074.29 SF		
39	ATLANTIC BUSINESS CENTERS III, LLC	2.10	0.16		1.95	94.62 SF		
40	JUBA INVESTMENTS, LLC	6.04	0.57		5.47	3,083.74 SF	2,970.58 SF	
41	ARL FAMILY LTD PARTNERSHIP	5.77	0.51		5.27	0.13	260.00 SF	
42	OAKMONT BUSINESS PARTNERS II, LLC	14.24	0.68	13.55		0.43		
43	VULCAN LANDS, INC.	119.35	0.24		119.11		0.27	
43A	VULCAN LANDS, INC.	58.91	1.79		57.12	0.83	0.46	
44	CITY OF CONCORD		2.44					
45	FIVE COUSINS, LLC	30.22	0.18		30.04	0.13		
46	TBMM, LLC.	1.22	985.79 SF		1.19			
46A	A&D PROPERTIES LP	4.75	1.30	2.33	1.12	1,317.15 SF		
47	UNITED OIL OF THE CAROLINAS, INC	1.36	0.40	0.96		3,909.37 SF		
48	THOMAS E. AND ANNA L. BARBEE	3.87	1.73	0.83	1.31	0.14	807.76 SF	
49	OTN INVESTMENT, INC	2.26	0.35		1.91	0.12		
50	MARY POPLIN	27,396.78 SF	1,539.93 SF	25,856.85SF				
51	MICHAEL D. & PHAEDRA SIMMONS, HAROLD & ADA H. SIMMONS	41,562.70 SF			41,562.70 SF			
52	POPLAR TENT PRESBYTERIAN CHURCH	25.84	1.56	16.43	7.83	0.30	0.39	
53	SHALYN, INC	1.72	0.56		1.16	3,545.36 SF	200.00 SF	
54	DONALD E. AND ANN D. FRISCH	14,732.67 SF	2,316.10 SF	12,416.57 SF		678.40 SF	1,481.99 SF	
54A	JAMES S. AND ONEDA M. HARRISON	35,028.05 SF	4,923.09 SF	30,104.96SF		950.76 SF		
55	DONALD E. AND ANN D. FRISCH	40,138.91 SF	5,265.00 SF	34,873.91SF			700.16 SF	
56	DAVID AND MILAGROS ROQUE	1.07		1.07				
57	THOMAS E. AND ANNA L. BARBEE	1.82	0.69		1.12			
58	LAWSON C. AND MARTHA B. BONDS	6.74	0.30		6.44			
59	DOGWOOD PARTNERS I, LLC	8.11	0.15		7.95			
60	R.B. LEE JR	6,911.72 SF	2,614.67 SF	4,297.05 SF				
61	ANN D. FRISCH	21.75	1.12		20.62			
62	CITY OF KANNAPOLIS	31.74	0.45	31.29				
63	THE CONCORD TELEPHONE COMPANY	3,646.11 SF	768.78 SF	2,877.33 SF				
64	ANN D. FRISCH	21.12	1.29		19.82			
65	GM HOSPITALITY, LLC	2.09	0.14	1.96		2,977.65 SF		
66	JAMES E. AND BRENDA A. BREWER	42,437.66 SF	1,702.85 SF	40,734.81SF		4,956.03 SF		
67	RINGHAVER EQUIPMENT CO.	7.84	0.51		7.33			

REVISIONS

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

HDR Engineering, Inc. of the Carolinas
3733 National Drive, Suite 207 Raleigh, N.C. 27612
N.C.B.E.L.S. License Number: F-0116

THE LANE CONSTRUCTION CORPORATION

PROJECT REFERENCE NO.	SHEET NO.
I-3803B	3-C
RW SHEET NO.	

FOR R/W ACQUISTION ONLY
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

REVISIONS

RIGHT OF WAY AREA DATA SHEET

PARCEL NO.	PROPERTY OWNERS NAME	TOTAL ACREAGE (AC)	AREA TAKEN (AC)	AREA REMAINING RIGHT (AC)	AREA REMAINING LEFT (AC)	CONSTR. EASEMENT (AC)	PERMANENT DRAINAGE EASEMENT (AC)	TEMPORARY DRAINAGE EASEMENT (AC)
68	DIMITRIOS AND CHRISTINE SKOTIDAS	5,110.29 SF	1,492.72 SF		3,617.57 SF			
69	DIMITRIOS SKOTIDAS	1.57	0.24		1.33			
70	TRUSTEES OF ROWAN TECHNICAL COLLEGE	23.55	0.90	22.64		765.07 SF		
71	CABARUS RESTAURANT GROUP LLC	4.89	0.37		4.52			
72	HILLCREST FOODS INC.	29,096.84SF	10,690.20SF		18,406.64SF	564.53 SF		
73	AAC CONCORD 1, LP	3.67	0.46		3.21	1,296.66 SF		
74	JON B. ANDERSON	12,831.89 SF		12,831.89 SF		2,198.27 SF	328.97 SF	
75	DIANE P WHITE	21,255.72 SF		21,255.72 SF			1,477.25 SF	
76	CARROLL M. SHOFFNER	9.19	1.00		8.19	0.33	1,987.98 SF	
77	CHARLES D. AND CAROL M. BARBEE	41,432.93 SF		41,432.93 SF		3,622.55 SF	445.70 SF	
78	REECE W. AND INEZ B. EASLEY	34,038.61 SF		34,038.61 SF			6,797.38 SF	
79	KENTON GLENN HOMEOWNERS ASSOCIATION, INC.	1.29		1.29		3,640.43 SF		
80	CARROLL M. SHOFFNER	17.00	0.71		16.29	0.22		
81	RAY M. AND BETTY B.CALLOWAY	43.35	0.26	43.09		0.20		
82	AAC CONCORD I LIMITED PARTNERSHIP	1.43	0.37		1.06			
83	OAK PARK HOMEOWNERS ASSOCIATION,INC.	1.04	0.16	0.88		144.27 SF		
84	JKH PROPERTIES, LLC	4.29	0.23	4.06		0.11		
85	MK REAL ESTATE HOLDINGS, LLC	5.24	0.20		5.04	3,581.89 SF		
86	MCLANE FOODSERVICE, INC	28.18	0.23	27.95		2,176.67 SF		
87	PENSKE TRUCK LEASING COMPANY, LP	4.24	0.17		4.07			
88	WESTMORELAND DRIVE, LLC	8.11	0.23		7.88	0.15		
89	FRANK AND MILDRED HAGLER	5.16	0.72	4.44				
90	KING'S WAY BAPTIST CHURCH OF CHARLOTTE, NORTH CAROLINA, INC	30.81	3,580.14 SF	30.72				
91	WILLIAM C. CASE	20,478.51 SF	476.34 SF		20,002.17SF	2,114.67 SF		
92	KENNETH P JEPSON	20,440.97SF	505.01 SF		19,935.96SF	2,179.73 SF		
93	NEIL C. GROGAN	20,191.85 SF	773.23 SF		19,418.62 SF	2,120.68 SF		
94	JANET G. GODFREY	19,676.83 SF	960.87 SF		18,715.96 SF	1,801.83 SF		
95	CORRIHER WATER SERVICE, INC	38,367.85SF	3,467.10 SF		34,900.75SF	3,841.68 SF		
96	POPLAR POINT ASSOCIATES, LLC	3.29	0.33		2.96	0.17		
97	GABLE OAKS PROPERTY OWNERS ASSOCIATION	5,168.98 SF	3,022.08 SF	2,146.90 SF				
98	FJC REAL PROPERTY. LLC	10.21			10.21	0.12		
99	EDWIN E. STARNES, SR	37,718.96 SF	4,987.32 SF	32,731.64 SF		1,975.21 SF		
100	HDYLE N. AND NANCY H. HOLLAND TRUST	88.16	0.14	88.02				
101	BRUCE A. SILVER	2.17	2,168.06 SF	2.12				
102	BONDS FAMILY, LP	303.91		303.91				
103	CNL NET LEASE FUNDING 2001, LP	1.26		1.26		766.75 SF		
104	SREE-KINGS GRANT LLC	1.75		1.75		257.57 SF		
105	BGCS PROPERTY ASSOCIATES, LLC	7.11	0.23	6.88				
106	OUR GANG PROPERTIES, LLC	12.90	1,800.98 SF		2.63			
107	ACCEL PROPERTIES, LLC	1.04	0.34		0.71	2,018.14 SF	350.55 SF	
108	JOSEPH B GROOMS	7.22	2,323.15 SF		7.16			
109	INVESTMENT INTERNATIONAL, LLC	6.95			6.95		1,030.78 SF	
110	RED FEATHER, LLC	43.55		43.55			1,456.24 SF	

HDR Engineering, Inc. of the Carolinas
3733 National Drive, Suite 207 Raleigh, N.C. 27612
N.C.B.E.L.S. License Number: F-0116

PROJECT REFERENCE NO.	SHEET NO.
I-3803B	4
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

THE LANE CONSTRUCTION CORPORATION

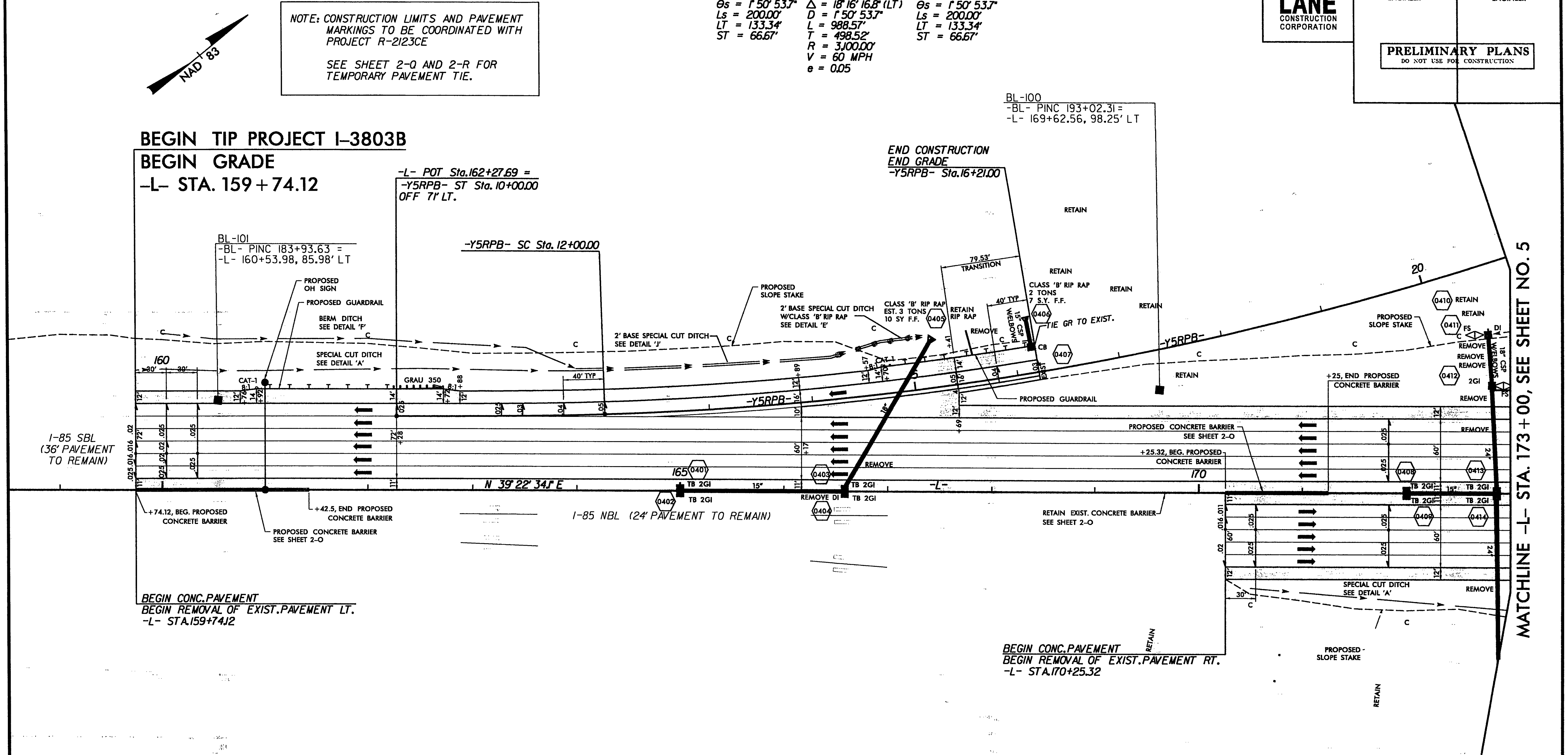
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

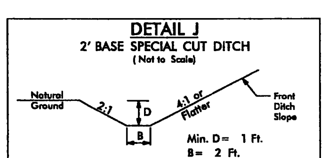
NOTE: CONSTRUCTION LIMITS AND PAVEMENT MARKINGS TO BE COORDINATED WITH PROJECT R-2123CE

SEE SHEET 2-Q AND 2-R FOR TEMPORARY PAVEMENT TIE.

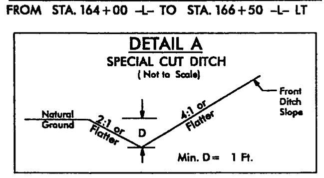
-Y5RPB-

PIs Sta 11+33.34	PI Sta 16+98.52	PIs Sta 22+55.25
θs = 1° 50' 53.7"	Δ = 18° 16' 16.8" (LT)	θs = 1° 50' 53.7"
Ls = 200.00'	D = 1° 50' 53.7"	Ls = 200.00'
LT = 133.34'	L = 988.57'	LT = 133.34'
ST = 66.67'	T = 498.52'	ST = 66.67'
	R = 3,100.00'	
	V = 60 MPH	
	e = 0.05	

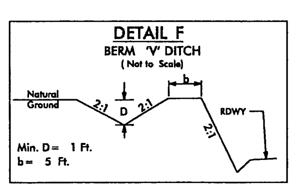




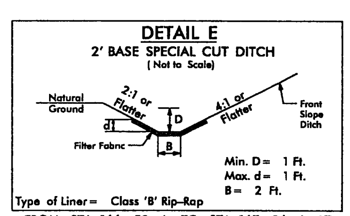
FROM STA. 164+00 -L- TO STA. 166+50 -L- LT



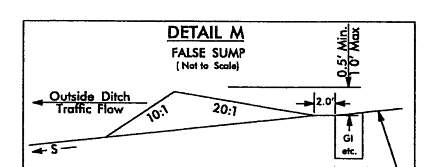
FROM STA. 159+74 -L- TO STA. 167+00 -L- LT
FROM STA. 170+50 -L- TO STA. 176+00 -L- RT

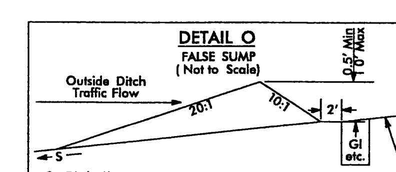


FROM STA. 160+00 -L- TO STA. 163+00 -L- LT



FROM STA. 166+50 -L- TO STA. 167+36 -L- LT





SEE SHEET NO. 49, 50 FOR -L- PROFILE.
SEE SHEET NO 80 FOR -Y5RPB- PROFILE.
DO NOT PLACE ROCK IN BED OF JURISDICTIONAL STREAMS.

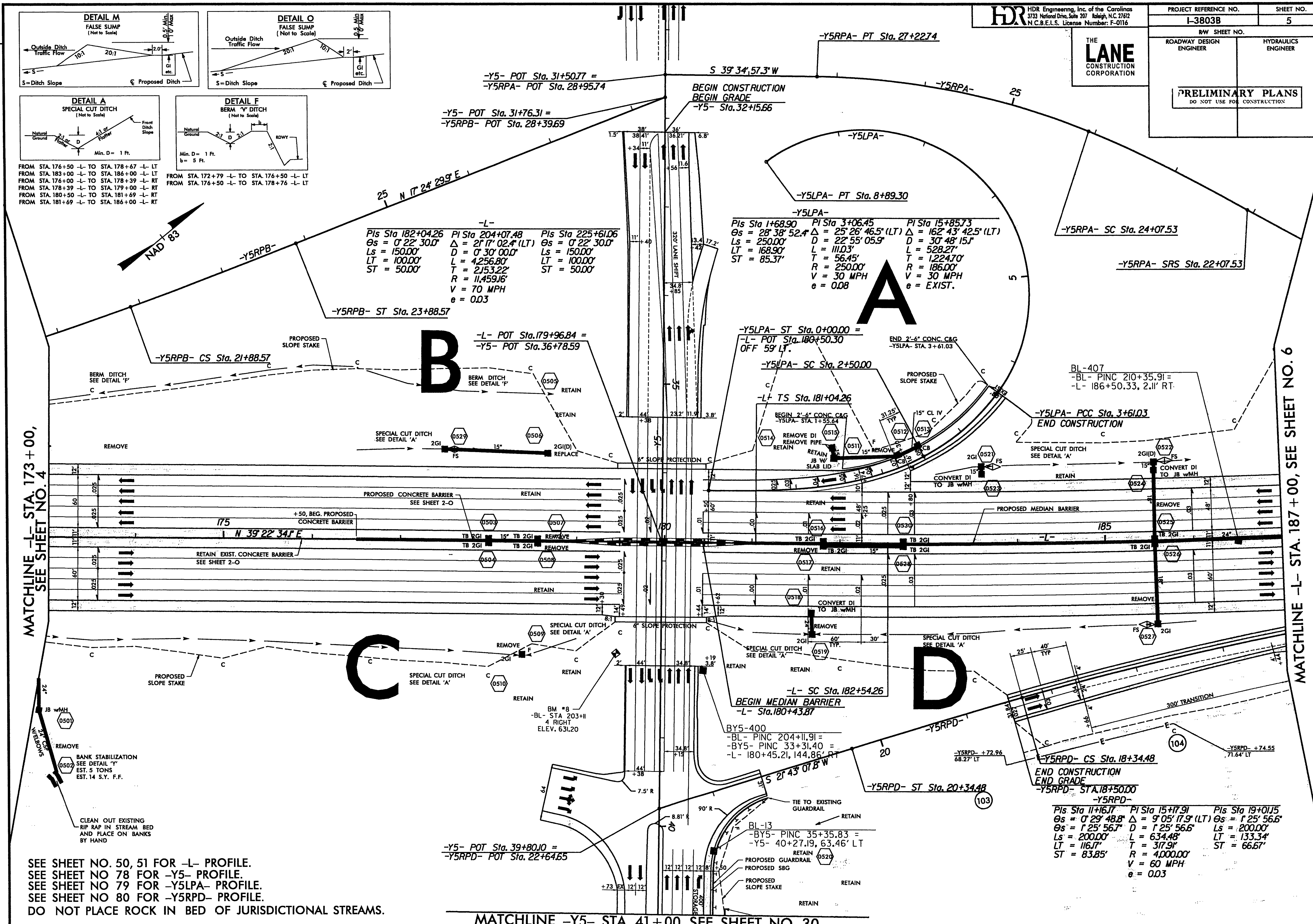
REVISIONS

HDR Engineering, Inc. of the Carolinas
3733 National Drive, Suite 207 Raleigh, N.C. 27612
N.C.B.E.L.S. License Number: F-0116

PROJECT REFERENCE NO.	SHEET NO.
I-3803B	5
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

THE LANE CONSTRUCTION CORPORATION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



-L-		
PIs Sta 182+04.26	PI Sta 204+07.48	PIs Sta 225+61.06
Θs = 0° 22' 30.0"	Δ = 21° 17' 02.4" (LT)	Θs = 0° 22' 30.0"
Ls = 150.00'	D = 0° 30' 00.0"	Ls = 150.00'
LT = 100.00'	L = 4,256.80'	LT = 100.00'
ST = 50.00'	T = 2,153.22'	ST = 50.00'
	R = 11,459.16'	
	V = 70 MPH	
	e = 0.03	

-Y5LPA-		
PIs Sta 1+68.90	PI Sta 3+06.45	PI Sta 15+85.73
Θs = 28° 38' 52.4"	Δ = 25° 26' 46.5" (LT)	Δ = 162° 43' 42.5" (LT)
Ls = 250.00'	D = 22° 55' 05.9"	D = 30° 48' 15.1"
LT = 168.90'	L = 111.03'	L = 528.27'
ST = 85.37'	T = 56.45'	T = 1,224.70'
	R = 250.00'	R = 186.00'
	V = 30 MPH	V = 30 MPH
	e = 0.08	e = EXIST.

-Y5RPD-		
PIs Sta 11+16.17	PI Sta 15+17.91	PIs Sta 19+01.15
Θs = 0° 29' 48.8"	Δ = 9° 05' 17.9" (LT)	Θs = 1° 25' 56.6"
Θs = 1° 25' 56.7"	D = 1° 25' 56.6"	Ls = 200.00'
Ls = 200.00'	L = 634.48'	LT = 133.34'
LT = 116.17'	T = 317.91'	ST = 66.67'
ST = 83.85'	R = 4,000.00'	
	V = 60 MPH	
	e = 0.03	

SEE SHEET NO. 50, 51 FOR -L- PROFILE.
SEE SHEET NO 78 FOR -Y5- PROFILE.
SEE SHEET NO 79 FOR -Y5LPA- PROFILE.
SEE SHEET NO 80 FOR -Y5RPD- PROFILE.
DO NOT PLACE ROCK IN BED OF JURISDICTIONAL STREAMS.

REVISIONS

HDR Engineering, Inc. of the Carolinas
3733 National Drive, Suite 207 Raleigh, N.C. 27612
N.C.B.E.L.S. License Number: F-0116

THE LANE CONSTRUCTION CORPORATION

PROJECT REFERENCE NO.	SHEET NO.
I-3803B	6
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

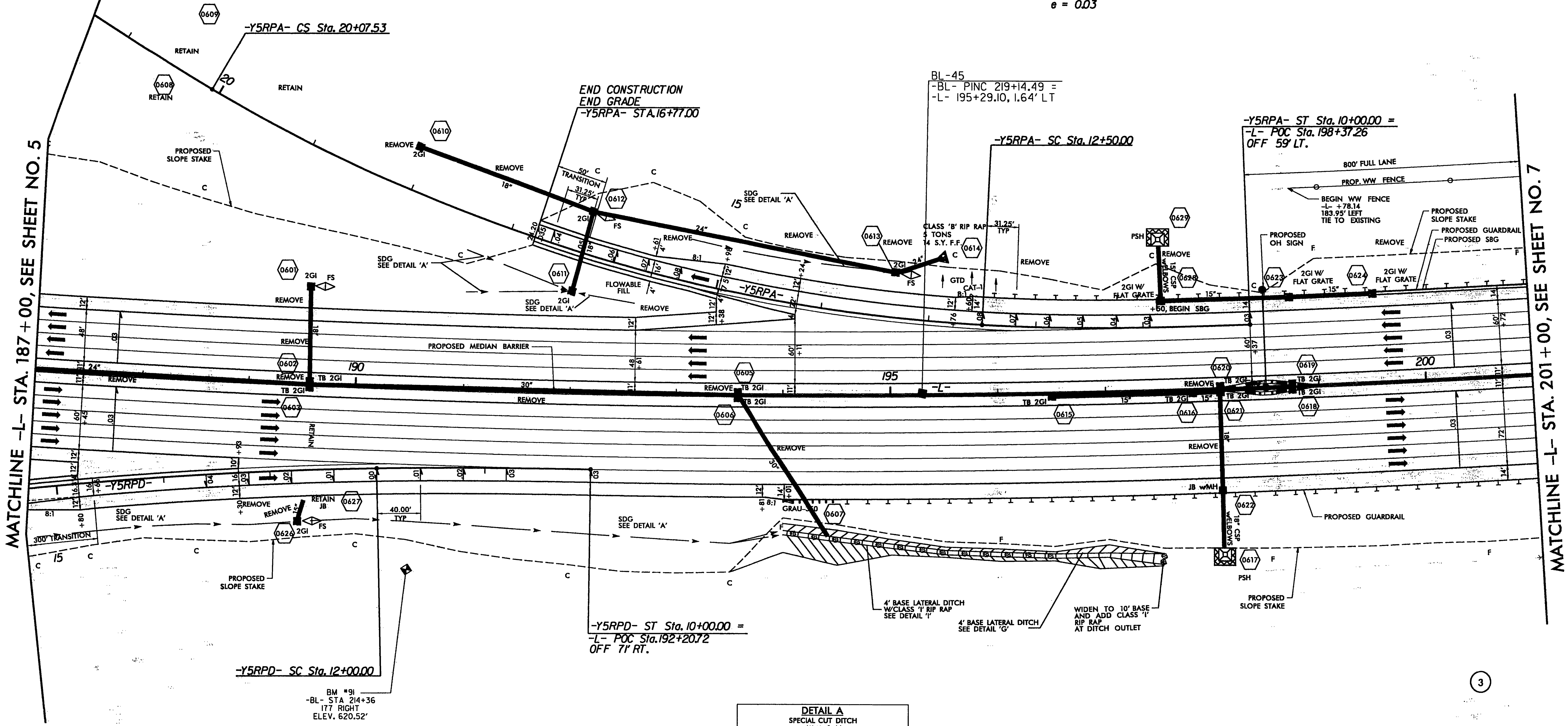
NAD 83

-Y5RPA-

PIs Sta 11+56.66	PI Sta 16+36.29	PIs Sta 20+74.22
θs = 0° 37' 41.2"	Δ = 27° 38' 43.1" (RT)	θs = 3° 38' 57.9"
θs = 4° 33' 42.7"	D = 3° 38' 57.9"	Ls = 200.00'
Ls = 250.00'	L = 757.53'	LT = 133.36'
LT = 156.66'	T = 386.29'	ST = 66.69'
ST = 93.49'	R = 1,570.00'	
	V = 60 MPH	
	e = 0.08	

-L-

PIs Sta 182+04.26	PI Sta 204+07.48	PIs Sta 225+61.06
θs = 0° 22' 30.0"	Δ = 21° 17' 02.4" (LT)	θs = 0° 22' 30.0"
Ls = 150.00'	D = 0° 30' 00.0"	Ls = 150.00'
LT = 100.00'	L = 4,256.80'	LT = 100.00'
ST = 50.00'	T = 2,153.22'	ST = 50.00'
	R = 11,459.16'	
	V = 70 MPH	
	e = 0.03	



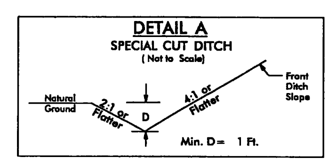
3

-Y5RPD-

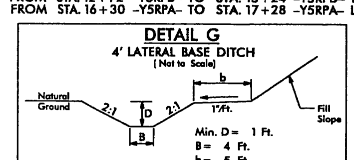
PIs Sta 11+16.17	PI Sta 15+17.91	PIs Sta 19+01.15
θs = 0° 29' 48.8"	Δ = 9° 05' 17.9" (LT)	θs = 1° 25' 56.6"
θs = 1° 25' 56.7"	D = 1° 25' 56.6"	Ls = 200.00'
Ls = 200.00'	L = 634.48'	LT = 133.34'
LT = 116.17'	T = 317.91'	ST = 66.67'
ST = 83.85'	R = 4,000.00'	
	V = 60 MPH	
	e = 0.03	

DO NOT PLACE ROCK IN BED OF JURISDICTIONAL STREAMS.

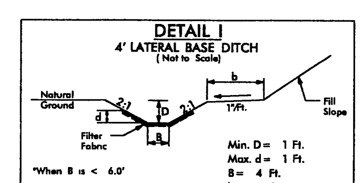
SEE SHEET NO 51, 52 FOR -L- PROFILE.
SEE SHEET NO 79 FOR -Y5RPA- PROFILE.
SEE SHEET NO. 80 FOR -Y5RPD- PROFILE.



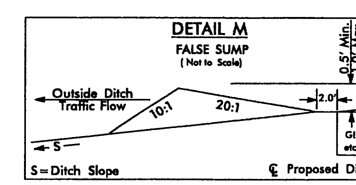
FROM STA. 189+50 -L- TO STA. 194+00 -L- RT
FROM STA. 191+00 -L- TO STA. 192+00 -L- LT
FROM STA. 192+00 -L- TO STA. 192+50 -L- LT
FROM STA. 13+35 -Y5RPA- TO STA. 15+33 -Y5RPA- RT
FROM STA. 12+72 -Y5RPD- TO STA. 15+24 -Y5RPD- LT
FROM STA. 16+30 -Y5RPA- TO STA. 17+28 -Y5RPA- LT

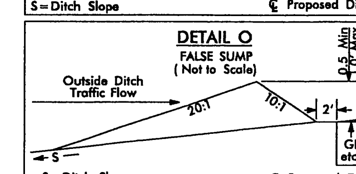


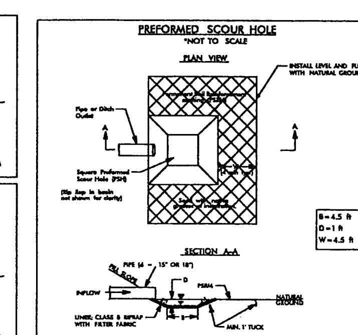
FROM STA. 196+50 -L- TO STA. 197+50 -L- RT



FROM STA. 194+00 -L- TO STA. 196+50 -L- RT







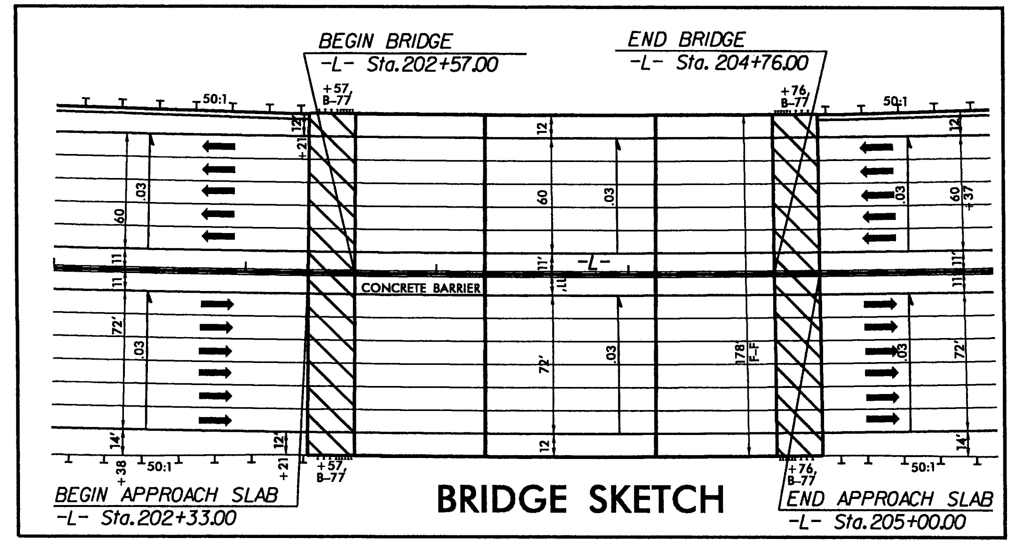
REVISIONS

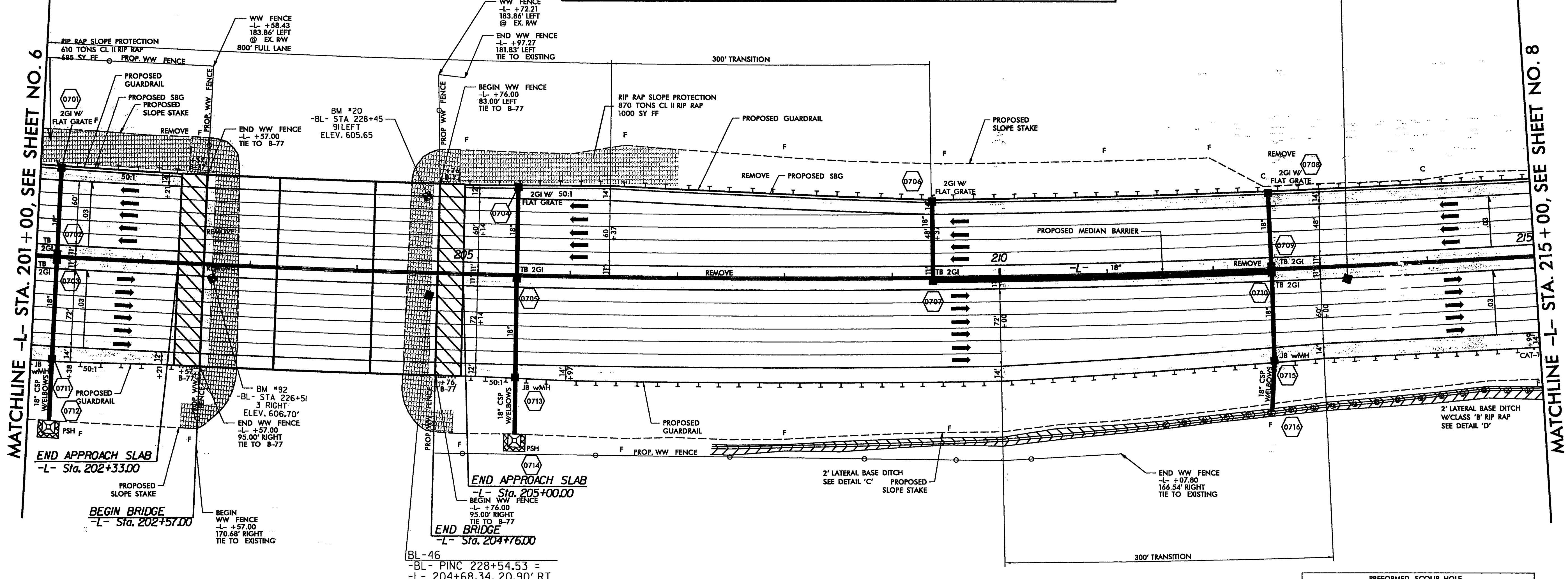
HDR Engineering, Inc. of the Carolinas
3733 National Drive, Suite 207 Raleigh, N.C. 27612
N.C.B.E.L.S. License Number: F-0116

PROJECT REFERENCE NO.	SHEET NO.
I-3803B	7
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

THE LANE CONSTRUCTION CORPORATION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

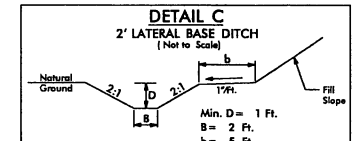




-L-

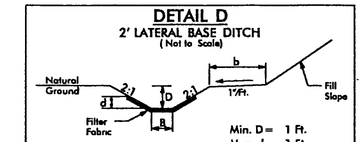
PIs Sta 182+04.26	PI Sta 204+07.48	PIs Sta 225+61.06
Θs = 0° 22' 30.0"	Δ = 21° 17' 02.4" (LT)	Θs = 0° 22' 30.0"
Ls = 150.00'	D = 0° 30' 00.0"	Ls = 150.00'
LT = 100.00'	L = 4,256.80'	LT = 100.00'
ST = 50.00'	T = 2,153.22'	ST = 50.00'
	R = 11,459.16'	
	V = 70 MPH	
	e = 0.03	

DETAIL C
2' LATERAL BASE DITCH
(Not to Scale)



FROM STA. 207+26 -L- TO STA. 213+50 -L- RT

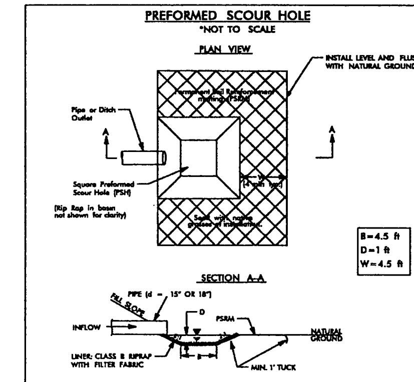
DETAIL D
2' LATERAL BASE DITCH
(Not to Scale)



*When B is < 6.0'
Type of Liner= CLASS 'B' Rip-Rap

FROM STA. 213+50 -L- TO STA. 215+00 -L- RT

PREFORMED SCOUR HOLE
*NOT TO SCALE



SEE SHEET NO 52, 53 FOR -L- PROFILE.
DO NOT PLACE ROCK IN BED OF JURISDICTIONAL STREAMS.

REVISIONS

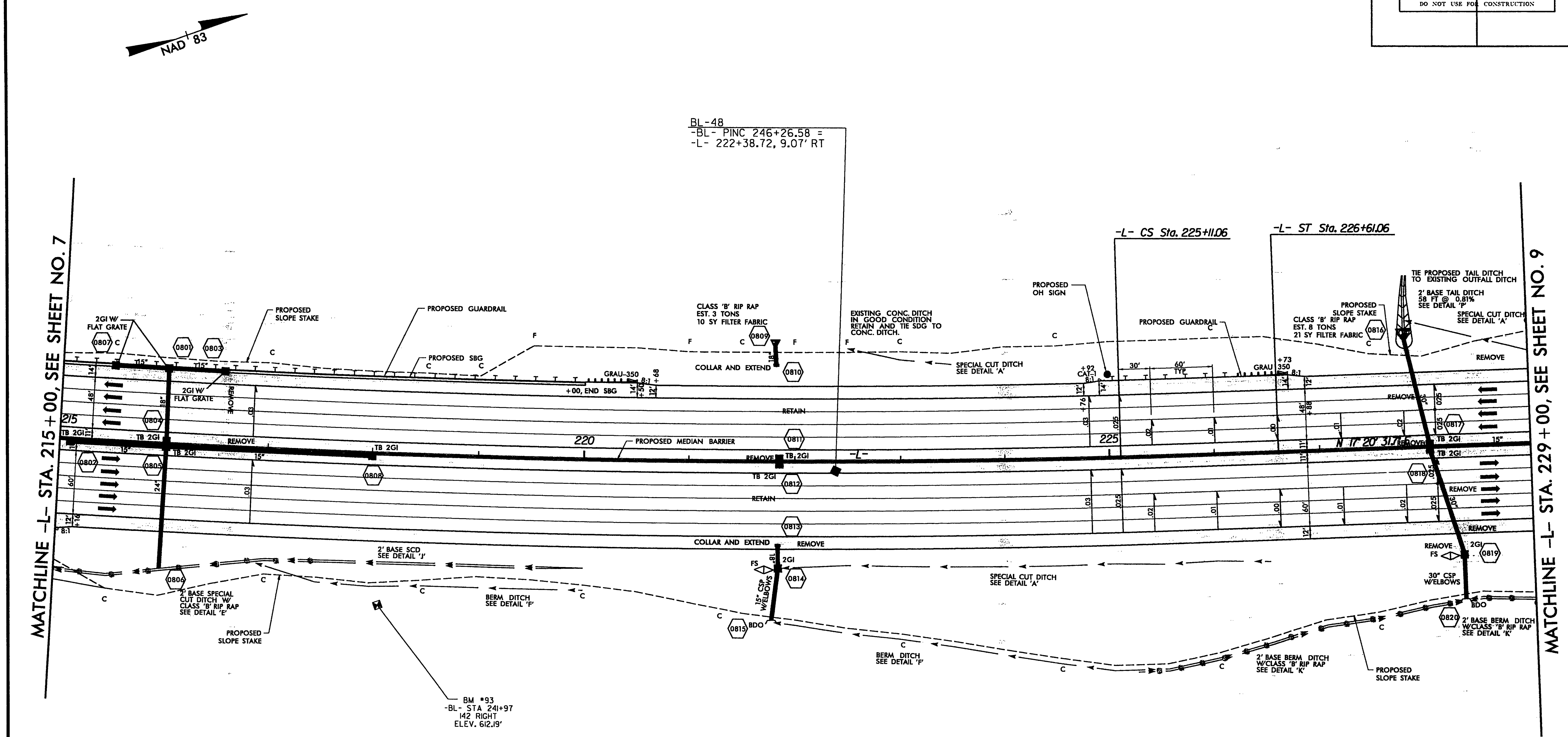
HDR Engineering, Inc. of the Carolinas
3733 National Drive, Suite 207 Raleigh, N.C. 27612
N.C.B.E.L.S. License Number: F-0116

PROJECT REFERENCE NO.	SHEET NO.
I-3803B	8
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

THE LANE CONSTRUCTION CORPORATION

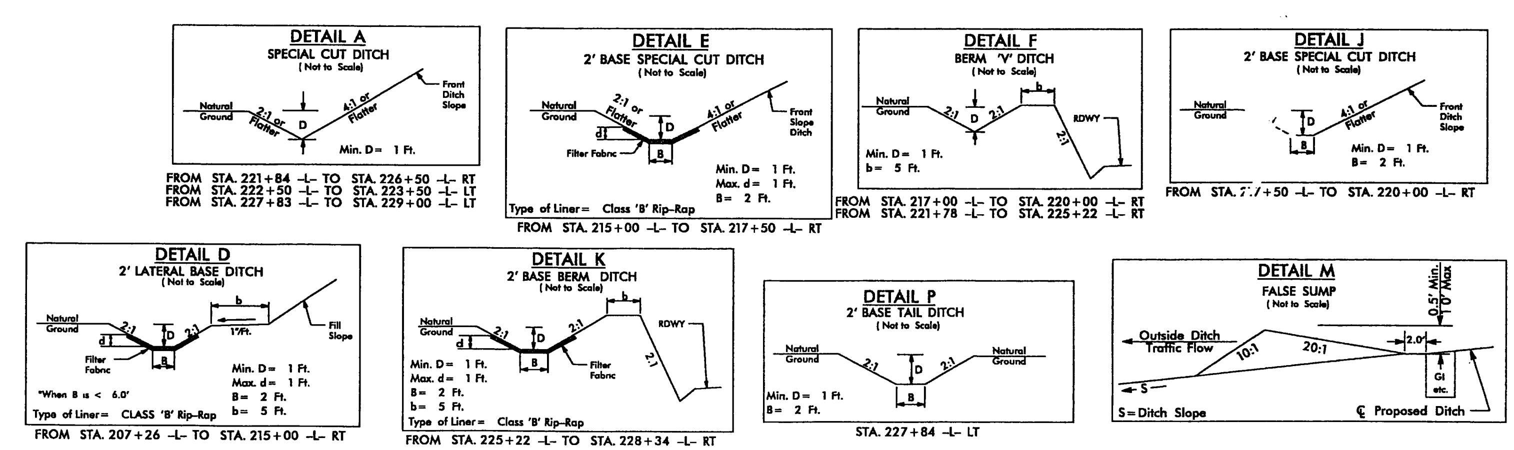
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

REVISIONS



-L-

PIs Sta 182+04.26	PI Sta 204+07.48	PIs Sta 225+61.06
Θs = 0° 22' 30.0"	Δ = 21° 17' 02.4" (LT)	Θs = 0° 22' 30.0"
Ls = 150.00'	D = 0° 30' 00.0"	Ls = 150.00'
LT = 100.00'	L = 4,256.80'	LT = 100.00'
ST = 50.00'	T = 2,153.22'	ST = 50.00'
	R = 11,459.16'	
	V = 70 MPH	
	e = 0.03	



SEE SHEET NO. 53, 54 FOR -L- PROFILE.
DO NOT PLACE ROCK IN BED OF JURISDICTIONAL STREAMS.

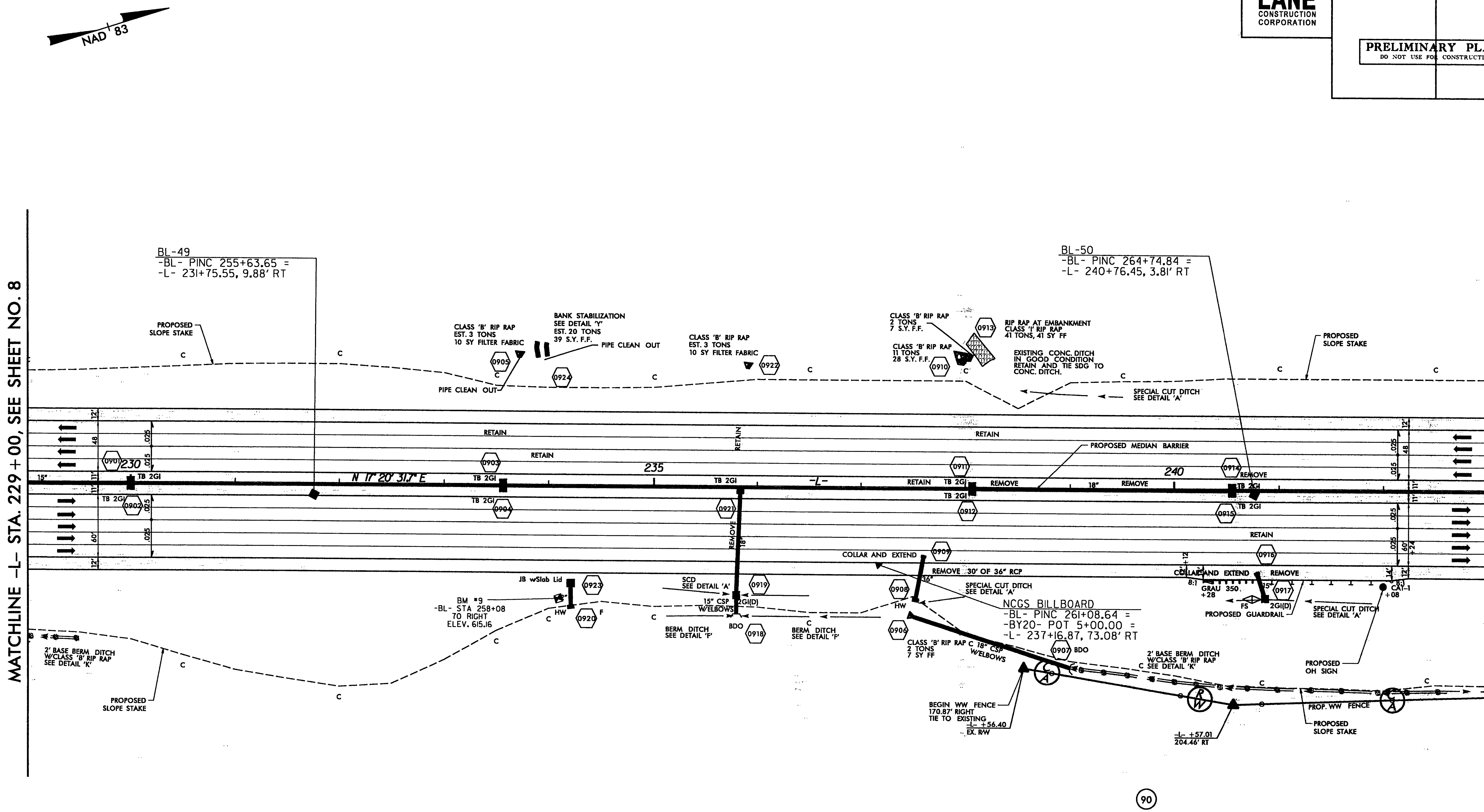
HDR Engineering, Inc. of the Carolinas
3733 National Drive, Suite 207 Raleigh, N.C. 27612
N.C.B.E.L.S. License Number: F-0116

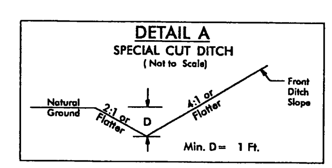
THE LANE CONSTRUCTION CORPORATION

PROJECT REFERENCE NO.	SHEET NO.
I-3803B	9
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

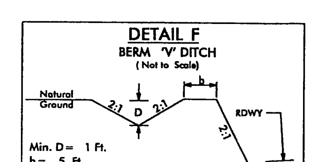
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

REVISIONS

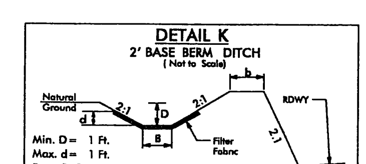




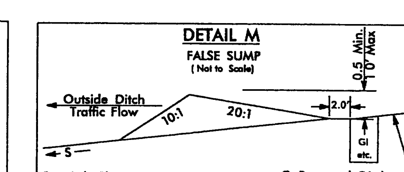
FROM STA. 238+50 -L- TO STA. 239+50 -L- LT
FROM STA. 235+00 -L- TO STA. 235+80 -L- RT
FROM STA. 237+55 -L- TO STA. 238+00 -L- RT
FROM STA. 240+50 -L- TO STA. 242+00 -L- RT



FROM STA. 235+00 -L- TO STA. 235+80 -L- RT
FROM STA. 235+80 -L- TO STA. 237+14 -L- RT



FROM STA. 228+34 -L- TO STA. 229+50 -L- RT
FROM STA. 239+00 -L- TO STA. 242+62 -L- RT



SEE SHEET NO. 54, 55 FOR -L- PROFILE.
DO NOT PLACE ROCK IN BED OF JURISDICTIONAL STREAMS.

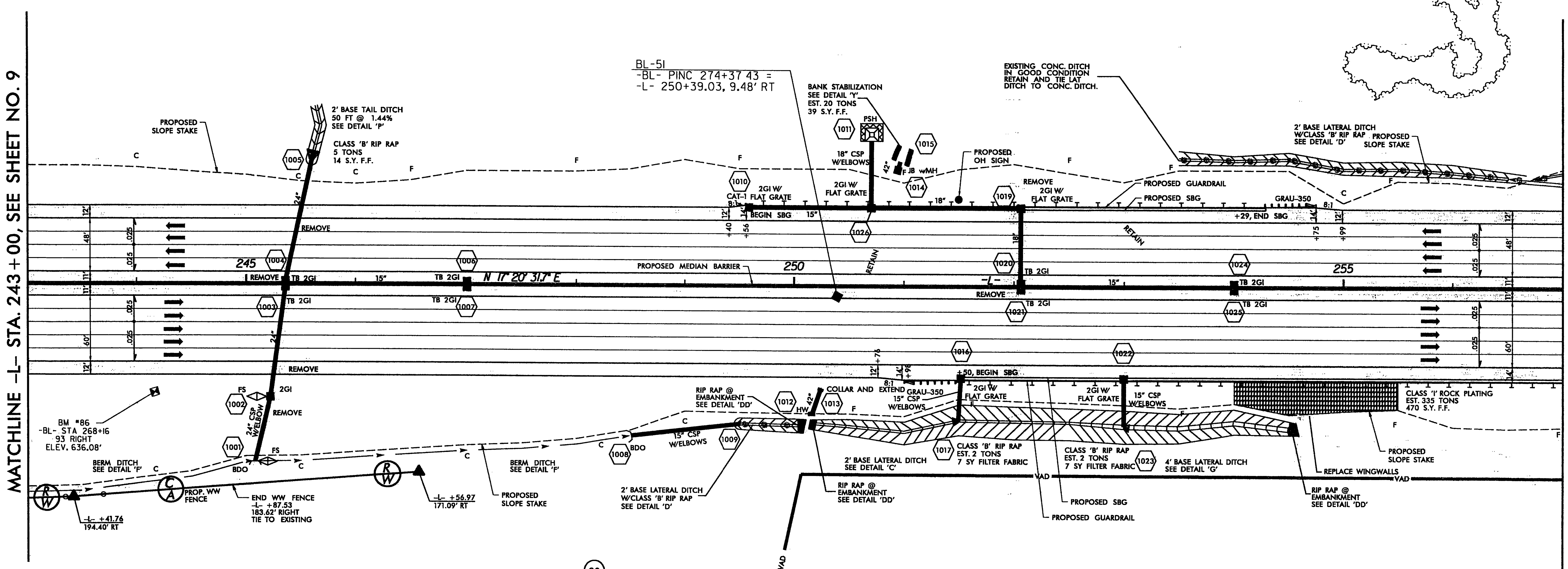
HDR Engineering, Inc. of the Carolinas
3733 National Drive, Suite 207 Raleigh, N.C. 27612
N.C.B.E.L.S. License Number: F-0116

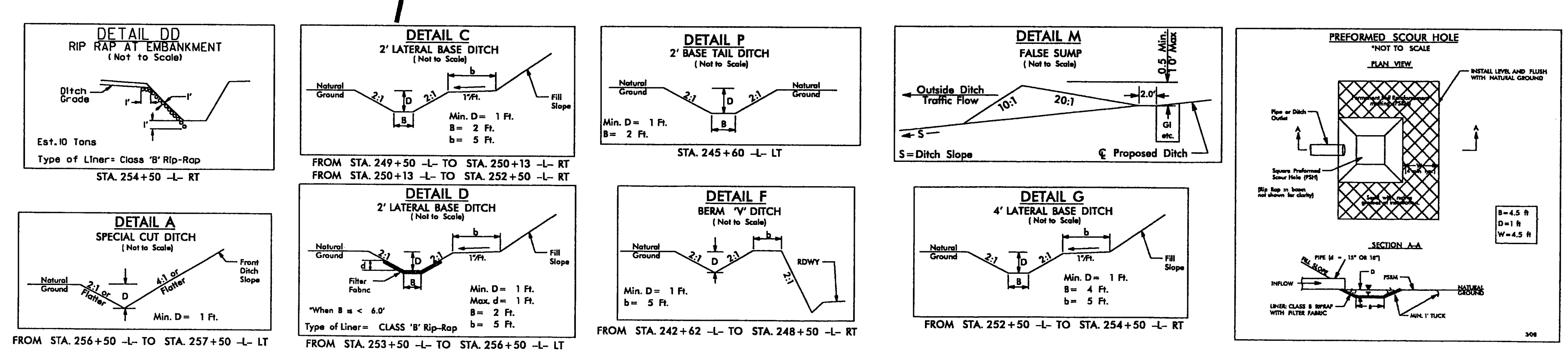
THE LANE CONSTRUCTION CORPORATION

PROJECT REFERENCE NO.	SHEET NO.
I-3803B	10
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

REVISIONS





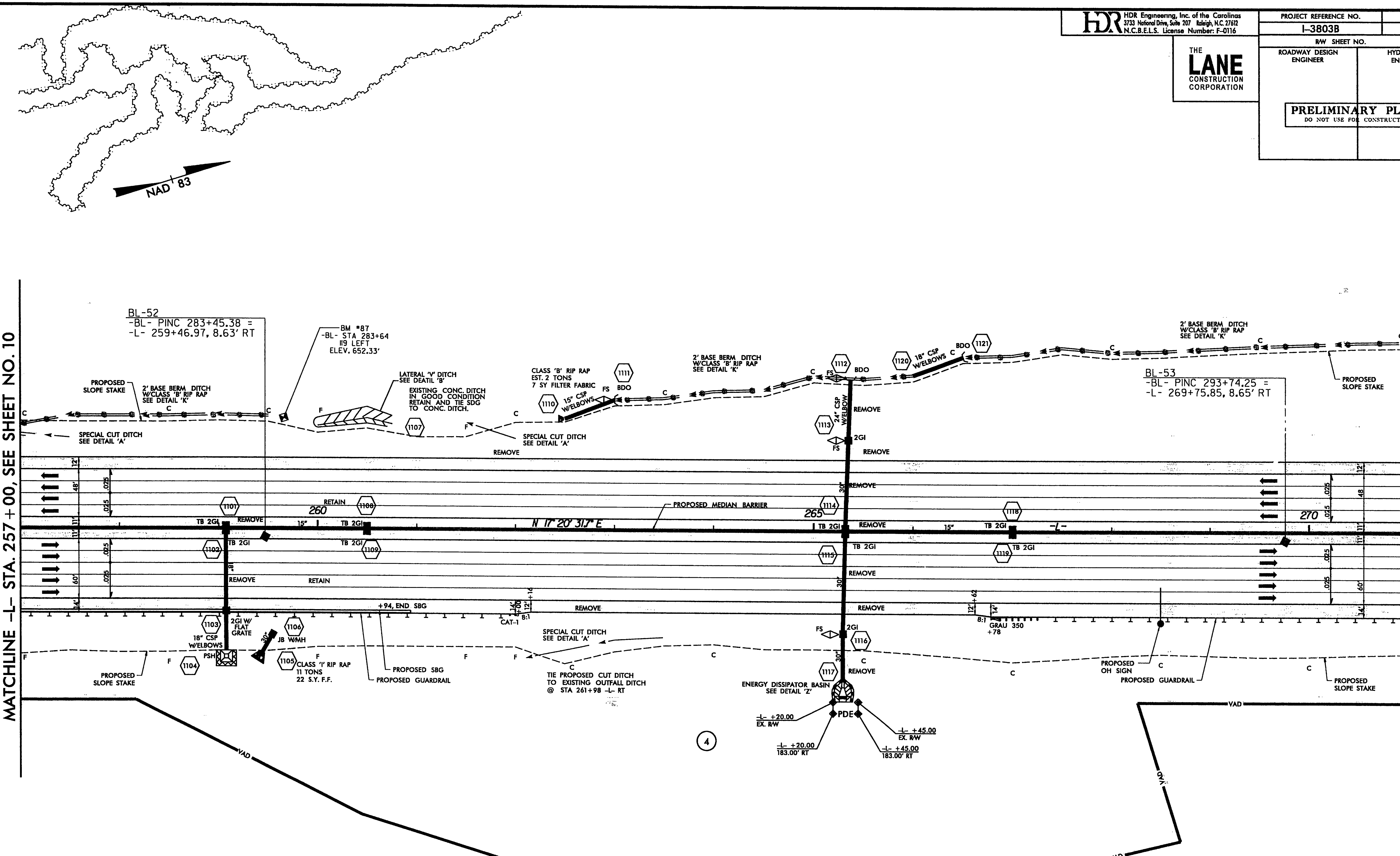
SEE SHEET NO. 55, 56 FOR -L- PROFILE.
DO NOT PLACE ROCK IN BED OF JURISDICTIONAL STREAMS.

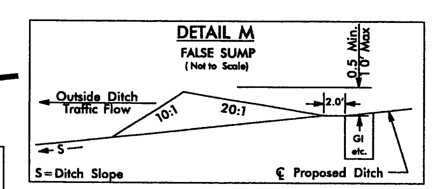
HDR Engineering, Inc. of the Carolinas
3733 National Drive, Suite 207 Raleigh, N.C. 27612
N.C.B.E.L.S. License Number: F-0116

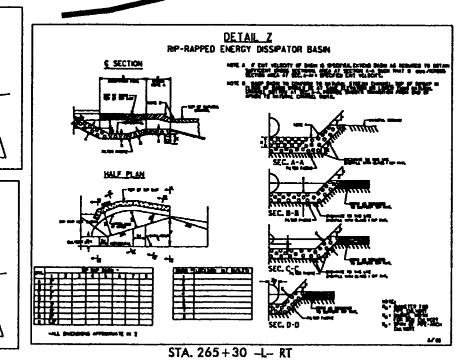
THE LANE CONSTRUCTION CORPORATION

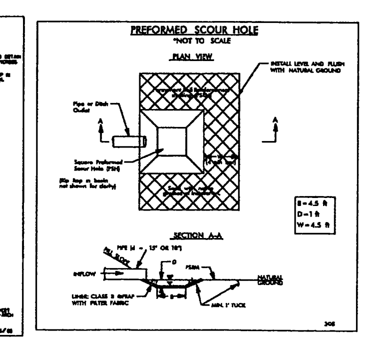
PROJECT REFERENCE NO.	SHEET NO.
I-3803B	11
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

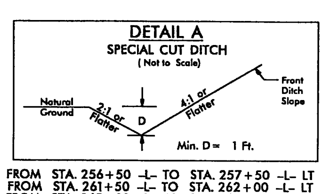
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

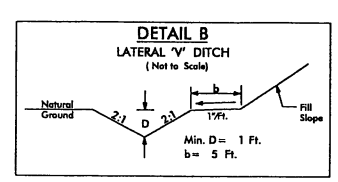


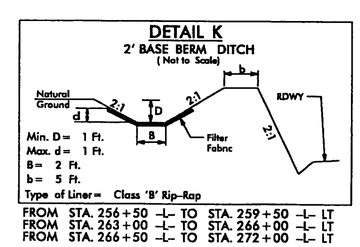


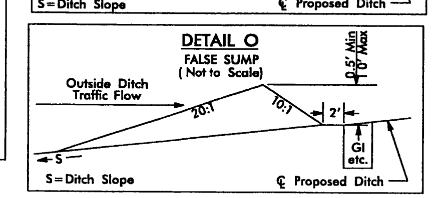






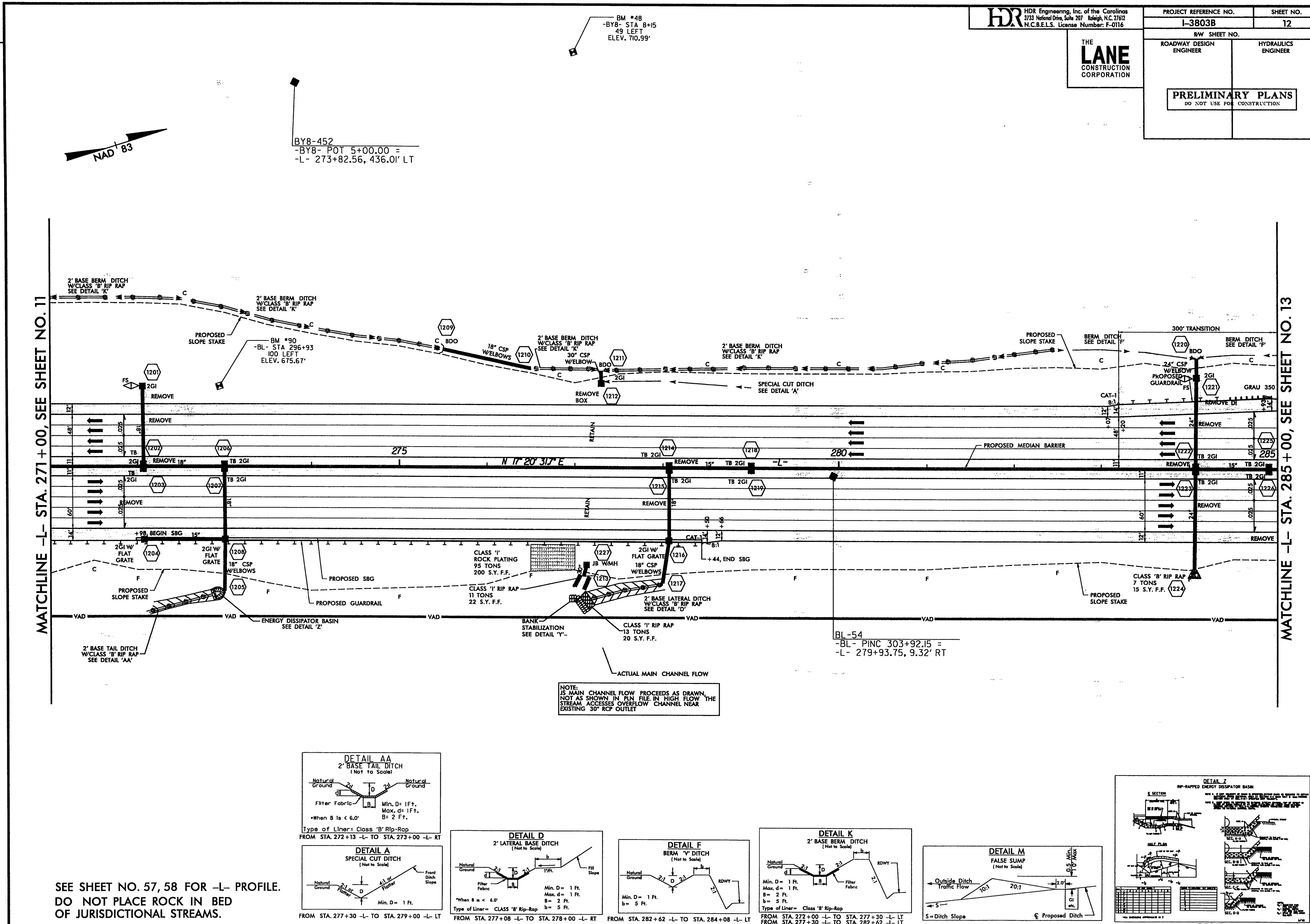






SEE SHEET NO. 56, 57 FOR -L- PROFILE.
DO NOT PLACE ROCK IN BED OF JURISDICTIONAL STREAMS.

REVISIONS



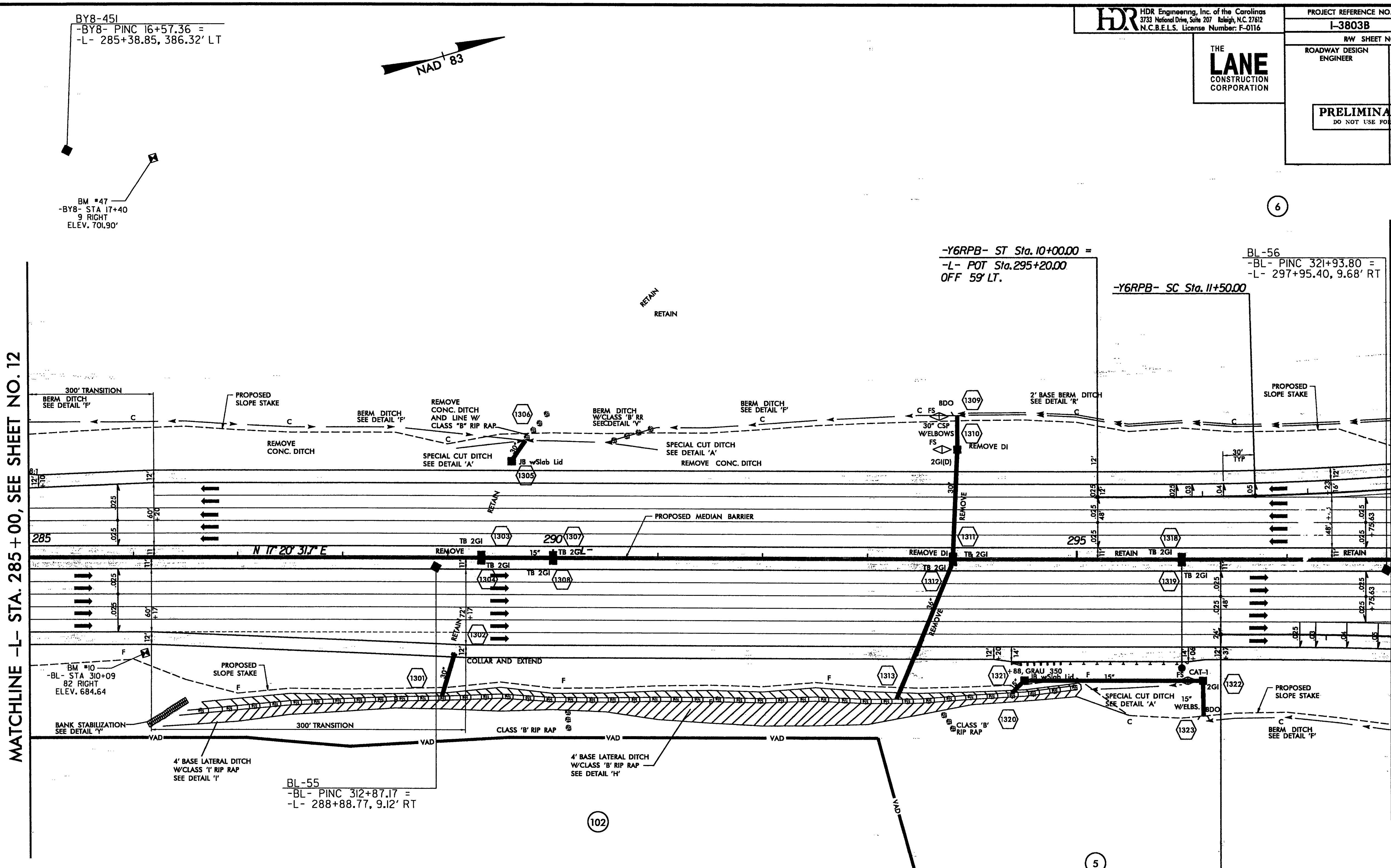
HDR Engineering, Inc. of the Carolinas
3733 National Drive, Suite 207 Raleigh, N.C. 27612
N.C.B.E.L.S. License Number: F-0116
THE LANE CONSTRUCTION CORPORATION
PROJECT REFERENCE NO.
I-3803B
SHEET NO.
12
R/W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
BM #48
-BY8- STA 8+15
49 LEFT
ELEV. 710.99'
NAD 83
BY8-452
-BY8- POT 5+00.00 =
-L- 273+82.56, 436.01' LT
BM #90
-BL- STA 296+93
100 LEFT
ELEV. 675.67'
MATCHLINE -L- STA. 271+00, SEE SHEET NO. 11
MATCHLINE -L- STA. 285+00, SEE SHEET NO. 13
2' BASE BERM DITCH W/CLASS 'B' RIP RAP SEE DETAIL 'K'
PROPOSED SLOPE STAKE
18" CSP W/ELBOWS
30" CSP W/ELBOW
SPECIAL CUT DITCH SEE DETAIL 'A'
BERM DITCH SEE DETAIL 'F'
300' TRANSITION
24" CSP W/ELBOW
PROPOSED GUARDRAIL
GRAU 350
PROPOSED MEDIAN BARRIER
N 17° 20' 31.7" E
275
280
285
-L-
REMOVE
RETAIN
+98, BEGIN SBG
+44, END SBG
PROPOSED SBG
PROPOSED GUARDRAIL
ENERGY DISSIPATOR BASIN SEE DETAIL 'Z'
2' BASE TAIL DITCH W/CLASS 'B' RIP RAP SEE DETAIL 'AA'
CLASS 'I' ROCK PLATING 95 TONS 200 S.Y. F.F.
CLASS 'I' RIP RAP 11 TONS 22 S.Y. F.F.
BANK STABILIZATION SEE DETAIL 'Y'
CLASS 'I' RIP RAP 13 TONS 20 S.Y. F.F.
2' BASE LATERAL DITCH W/CLASS 'B' RIP RAP SEE DETAIL 'D'
CLASS 'B' RIP RAP 7 TONS 15 S.Y. F.F.
BL-54
-BL- PINC 303+92.15 =
-L- 279+93.75, 9.32' RT
ACTUAL MAIN CHANNEL FLOW
NOTE: JS MAIN CHANNEL FLOW PROCEEDS AS DRAWN, NOT AS SHOWN IN PLN FILE. IN HIGH FLOW THE STREAM ACCESSES OVERFLOW CHANNEL NEAR EXISTING 30" RCP OUTLET
DETAIL AA
2' BASE TAIL DITCH (Not to Scale)
Type of Liner= Class 'B' Rip-Rap
FROM STA. 272+13 -L- TO STA. 273+00 -L- RT
DETAIL A
SPECIAL CUT DITCH (Not to Scale)
FROM STA. 277+30 -L- TO STA. 279+00 -L- LT
DETAIL D
2' LATERAL BASE DITCH (Not to Scale)
Type of Liner= CLASS 'B' Rip-Rap
FROM STA. 277+08 -L- TO STA. 278+00 -L- RT
DETAIL F
BERM 'V' DITCH (Not to Scale)
FROM STA. 282+62 -L- TO STA. 284+08 -L- LT
DETAIL K
2' BASE BERM DITCH (Not to Scale)
Type of Liner= Class 'B' Rip-Rap
FROM STA. 272+00 -L- TO STA. 277+30 -L- LT
FROM STA. 277+30 -L- TO STA. 282+62 -L- LT
DETAIL M
FALSE SUMP (Not to Scale)
DETAIL Z
RIP-RAPPED ENERGY DISSIPATOR BASIN
SEE SHEET NO. 57, 58 FOR -L- PROFILE.
DO NOT PLACE ROCK IN BED OF JURISDICTIONAL STREAMS.
REVISIONS

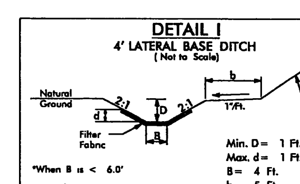
HDR Engineering, Inc. of the Carolinas
3733 National Drive, Suite 207 Raleigh, N.C. 27612
N.C.B.E.L.S. License Number: F-0116

THE LANE CONSTRUCTION CORPORATION

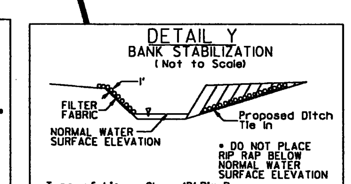
PROJECT REFERENCE NO.	SHEET NO.
I-3803B	13
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

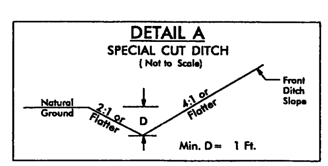




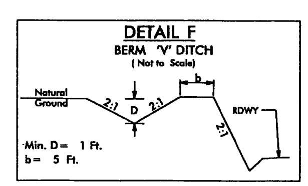
FROM STA. 286+70 -L- TO STA. 288+93 -L- RT



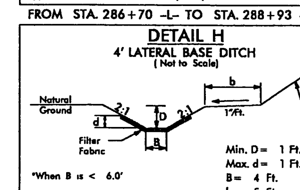
STA. 286+50 -L- RT



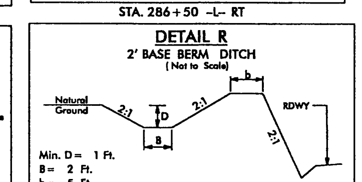
FROM STA. 289+00 -L- TO STA. 289+75 -L- LT
FROM STA. 289+75 -L- TO STA. 291+00 -L- LT
FROM STA. 295+00 -L- TO STA. 296+20 -L- RT



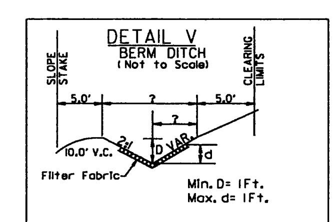
FROM STA. 284+08 -L- TO STA. 286+50 -L- LT
FROM STA. 286+50 -L- TO STA. 289+75 -L- LT
FROM STA. 291+00 -L- TO STA. 293+86 -L- LT
FROM STA. 296+20 -L- TO STA. 299+00 -L- RT



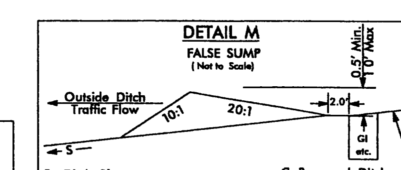
FROM STA. 288+93 -L- TO STA. 295+00 -L- RT

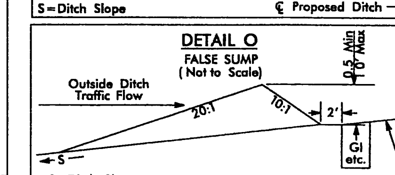


FROM STA. 293+86 -L- TO STA. 298+54 -L- LT



FROM STA. 290+50 -L- TO STA. 291+00 -L- LT





SEE SHEET NO. 58, 59 FOR -L- PROFILE.
SEE SHEET NO 87 FOR -Y6RPB- PROFILE.
SEE SHEET NO. 89 FOR -Y6RPC- PROFILE.
DO NOT PLACE ROCK IN BED OF JURISDICTIONAL STREAMS.

REVISIONS

HDR Engineering, Inc. of the Carolinas
3733 National Drive, Suite 207 Raleigh, N.C. 27612
N.C.B.E.L.S. License Number: F-0116

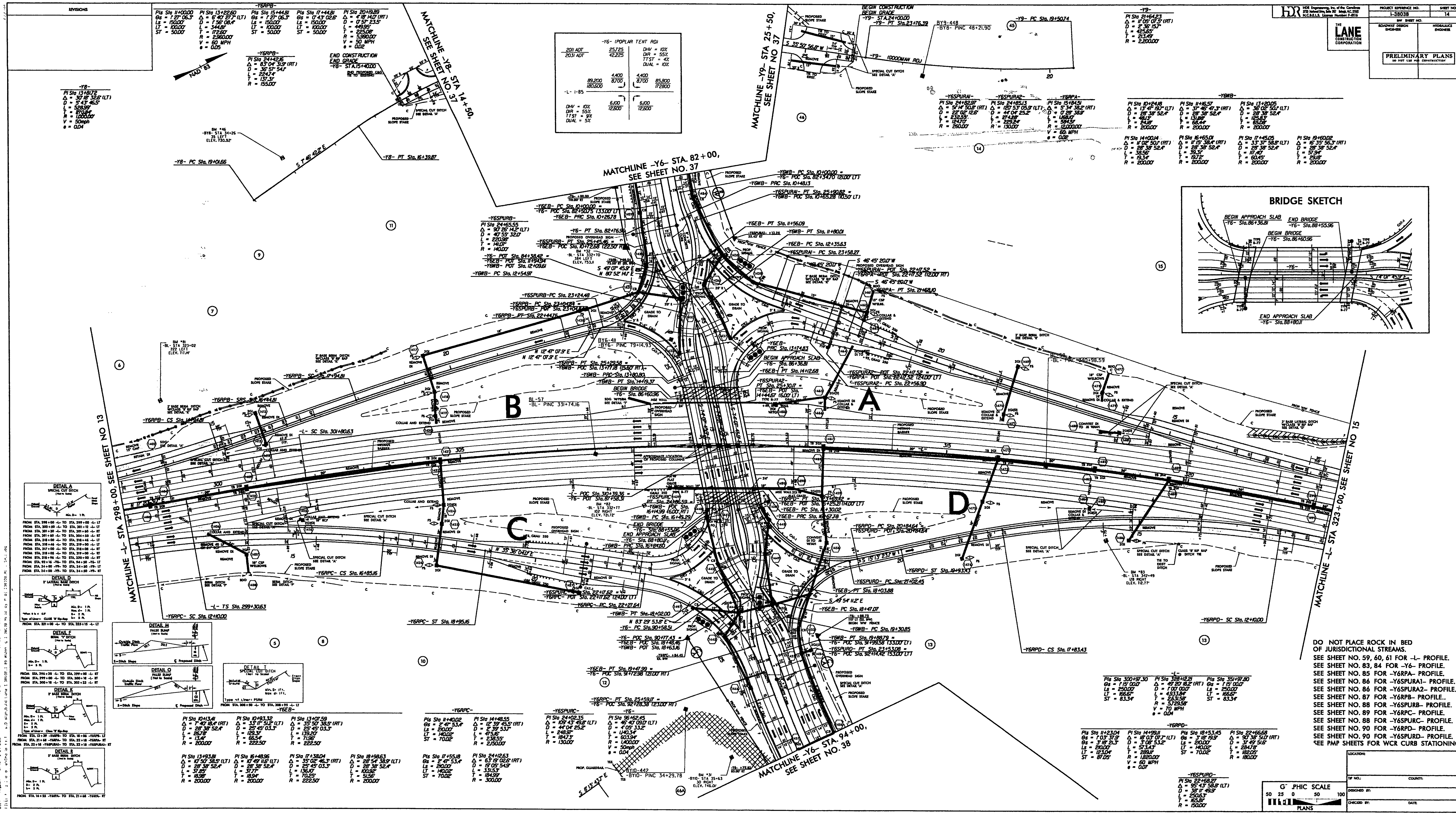
THE LANE CONSTRUCTION CORPORATION

PROJECT REFERENCE NO.	SHEET NO.
I-3803B	14

R/W SHEET NO.

ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



DO NOT PLACE ROCK IN BED OF JURISDICTIONAL STREAMS.
SEE SHEET NO. 59, 60, 61 FOR -L- PROFILE.
SEE SHEET NO. 83, 84 FOR -Y6- PROFILE.
SEE SHEET NO. 85 FOR -Y6RPA- PROFILE.
SEE SHEET NO. 86 FOR -Y6SPURA1- PROFILE.
SEE SHEET NO. 86 FOR -Y6SPURA2- PROFILE.
SEE SHEET NO. 87 FOR -Y6RPB- PROFILE..
SEE SHEET NO. 88 FOR -Y6SPURB- PROFILE.
SEE SHEET NO. 89 FOR -Y6RPC- PROFILE.
SEE SHEET NO. 88 FOR -Y6SPURC- PROFILE.
SEE SHEET NO. 90 FOR -Y6RPD- PROFILE.
SEE SHEET NO. 90 FOR -Y6SPURD- PROFILE.
SEE PMP SHEETS FOR WCR CURB STATIONING

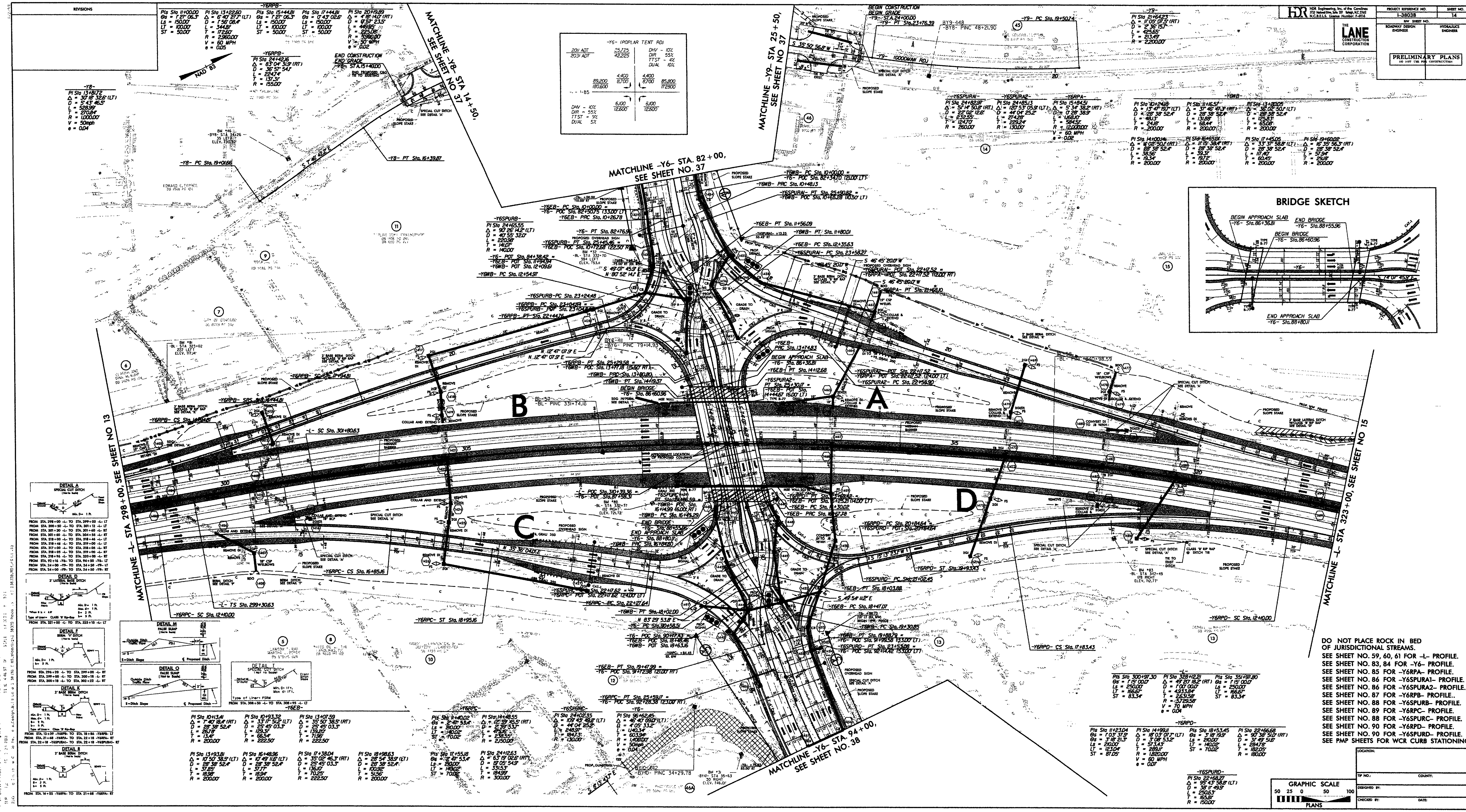
LOCATION:

TIP NO.: COUNTY:

DESIGNED BY:

CHECKED BY: DATE:

GRAPHIC SCALE
50 25 0 50 100
PLANS



PROJECT REFERENCE NO.
I-3803B
SHEET NO.
14
THE LANE CONSTRUCTION CORPORATION
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
REVISIONS
MATCHLINE -Y8- STA 14+50, SEE SHEET NO 37
MATCHLINE -Y6- STA. 82+00, SEE SHEET NO. 37
MATCHLINE -Y9- STA 25+50, SEE SHEET NO 37
MATCHLINE -L- STA 298+00, SEE SHEET NO 13
MATCHLINE -L- STA 323+00, SEE SHEET NO 15
MATCHLINE -Y6- STA. 94+00, SEE SHEET NO. 38
NAD 83
BRIDGE SKETCH
BEGIN APPROACH SLAB
END BRIDGE
BEGIN BRIDGE
END APPROACH SLAB
BEGIN CONSTRUCTION
BEGIN GRADE
END CONSTRUCTION
END GRADE
A
B
C
D
DETAIL A
SPECIAL CUT DITCH
DETAIL D
2' LATERAL BASE DITCH
DETAIL F
BERM "V" DITCH
DETAIL E
2' BASE BERM DITCH
DETAIL B
3' BASE BERM DITCH
DETAIL M
FALSE SUMP
DETAIL O
FALSE SUMP
DO NOT PLACE ROCK IN BED OF JURISDICTIONAL STREAMS.
SEE SHEET NO. 59, 60, 61 FOR -L- PROFILE.
SEE SHEET NO. 83, 84 FOR -Y6- PROFILE.
SEE SHEET NO. 85 FOR -Y6RPA- PROFILE.
SEE SHEET NO. 86 FOR -Y6SPURA1- PROFILE.
SEE SHEET NO. 86 FOR -Y6SPURA2- PROFILE.
SEE SHEET NO. 87 FOR -Y6RPB- PROFILE.
SEE SHEET NO. 88 FOR -Y6SPURB- PROFILE.
SEE SHEET NO. 88 FOR -Y6SPURC- PROFILE.
SEE SHEET NO. 89 FOR -Y6RPC- PROFILE.
SEE SHEET NO. 90 FOR -Y6RPD- PROFILE.
SEE SHEET NO. 90 FOR -Y6SPURD- PROFILE.
SEE PMP SHEETS FOR WCR CURB STATIONING
GRAPHIC SCALE
50 25 0 50 100
PLANS
LOCATION:
TIP NO.:
COUNTY:
DESIGNED BY:
CHECKED BY:
DATE:

HDR Engineering, Inc. of the Carolinas
3733 National Drive, Suite 207 Raleigh, N.C. 27612
N.C.B.E.L.S. License Number: F-0116

THE LANE CONSTRUCTION CORPORATION

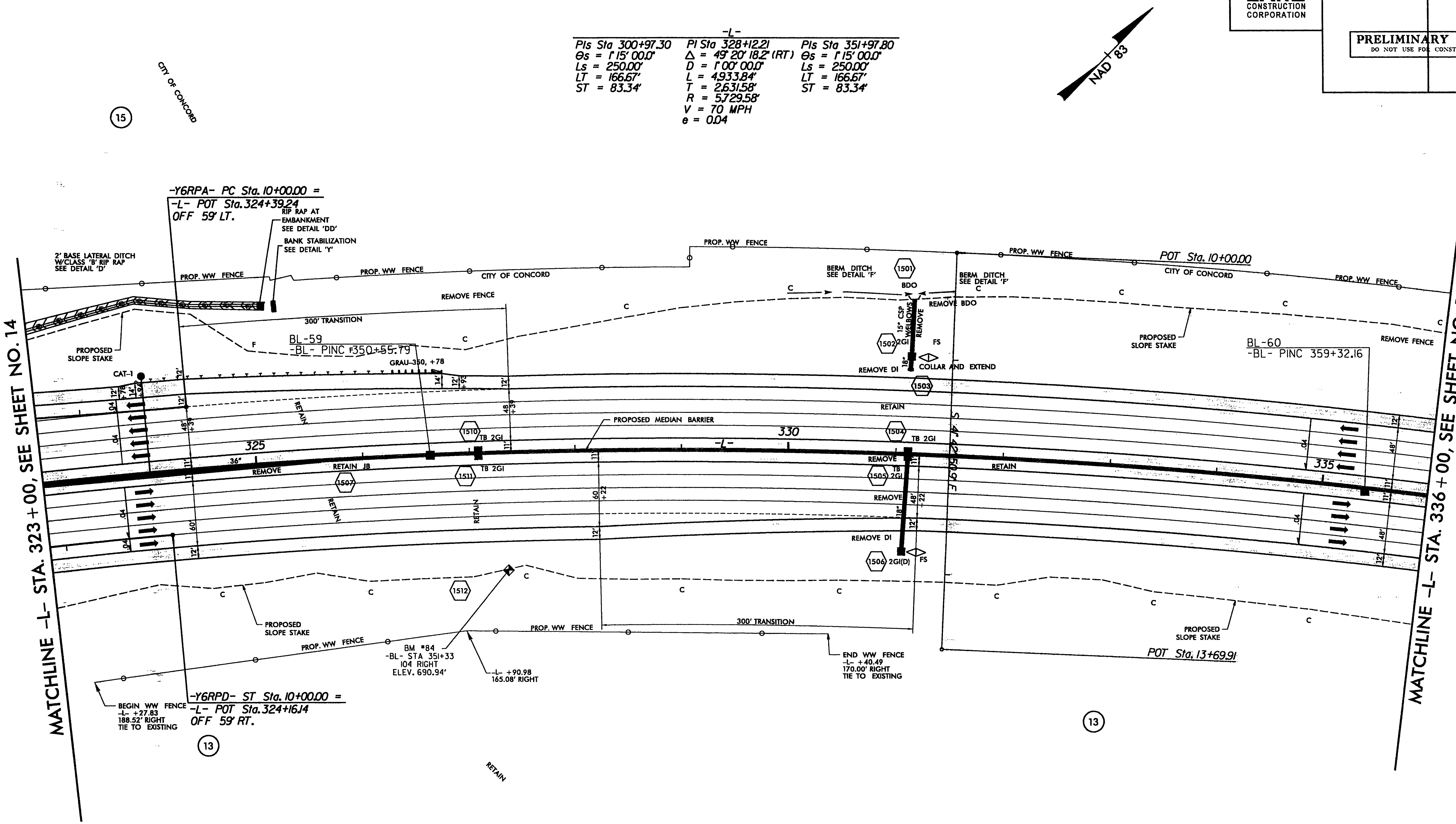
PROJECT REFERENCE NO.	SHEET NO.
I-3803B	15
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

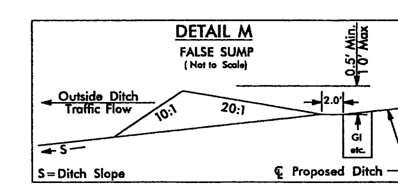
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

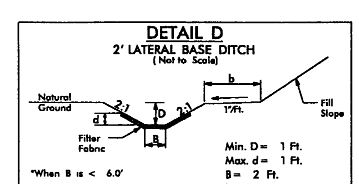
REVISIONS

-L-

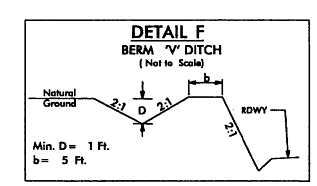
PIs Sta 300+97.30	PI Sta 328+12.21	PIs Sta 351+97.80
θs = 1° 15' 00.0"	Δ = 49° 20' 18.2" (RT)	θs = 1° 15' 00.0"
Ls = 250.00'	D = 1° 00' 00.0"	Ls = 250.00'
LT = 166.67'	L = 4,933.84'	LT = 166.67'
ST = 83.34'	T = 2,631.58'	ST = 83.34'
	R = 5,729.58'	
	V = 70 MPH	
	e = 0.04	



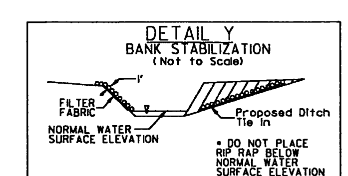




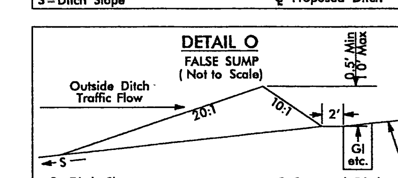
FROM STA. 321+00 -L- TO STA. 325+15 -L- LT



FROM STA. 330+00 -L- TO STA. 331+13 -L- LT
FROM STA. 331+13 -L- TO STA. 331+50 -L- LT



STA. 325+25 -L- LT



SEE SHEET NO. 61, 62 FOR -L- PROFILE.
SEE SHEET NO. 85 FOR -Y6RPA- PROFILE.
SEE SHEET NO. 90 FOR -Y6RPD- PROFILE.
DO NOT PLACE ROCK IN BED OF JURISDICTIONAL STREAMS.

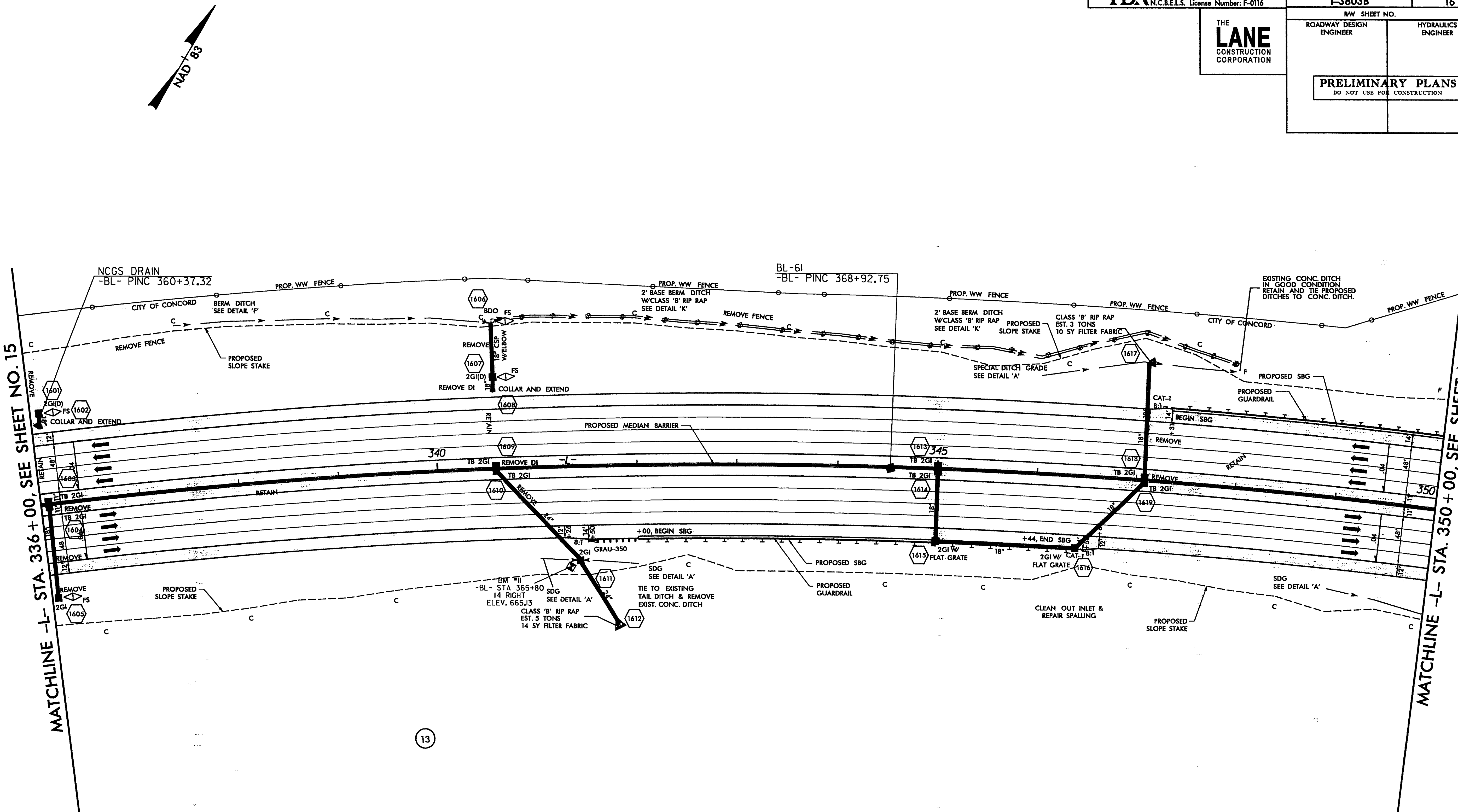
HDR Engineering, Inc. of the Carolinas
3733 National Drive, Suite 207 Raleigh, N.C. 27612
N.C.B.E.L.S. License Number: F-0116

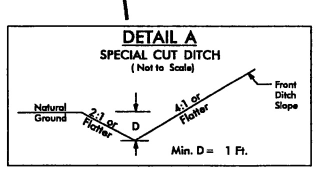
THE LANE CONSTRUCTION CORPORATION

PROJECT REFERENCE NO.	SHEET NO.
I-3803B	16
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

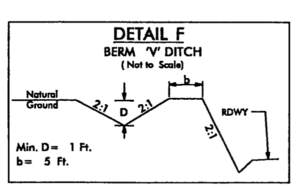
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

REVISIONS

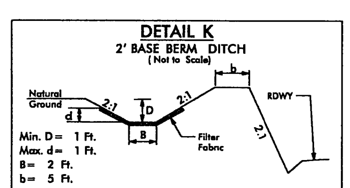




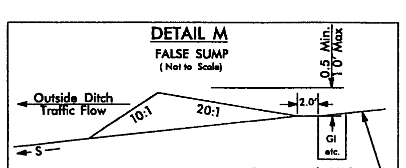
FROM STA. 346+00 -L- TO STA. 348+00 -L- LT
FROM STA. 341+00 -L- TO STA. 342+00 -L- RT
FROM STA. 349+00 -L- TO STA. 350+09 -L- RT

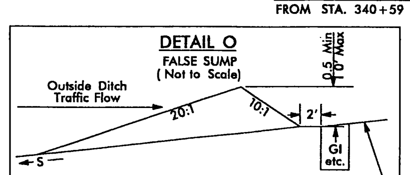


FROM STA. 337+50 -L- TO STA. 340+59 -L- LT



FROM STA. 340+59 -L- TO STA. 348+00 -L- RT





-L-

PIs Sta 300+97.30	PI Sta 328+12.21	PIs Sta 351+97.80
Θs = 1°15' 00.0"	Δ = 49° 20' 18.2" (RT)	Θs = 1°15' 00.0"
Ls = 250.00'	D = 1° 00' 00.0"	Ls = 250.00'
LT = 166.67'	L = 4,933.84'	LT = 166.67'
ST = 83.34'	T = 2,631.58'	ST = 83.34'
	R = 5,729.58'	
	V = 70 MPH	
	e = 0.04	

SEE SHEET NO 62, 63 FOR -L- PROFILE.
DO NOT PLACE ROCK IN BED OF JURISDICTIONAL STREAMS.

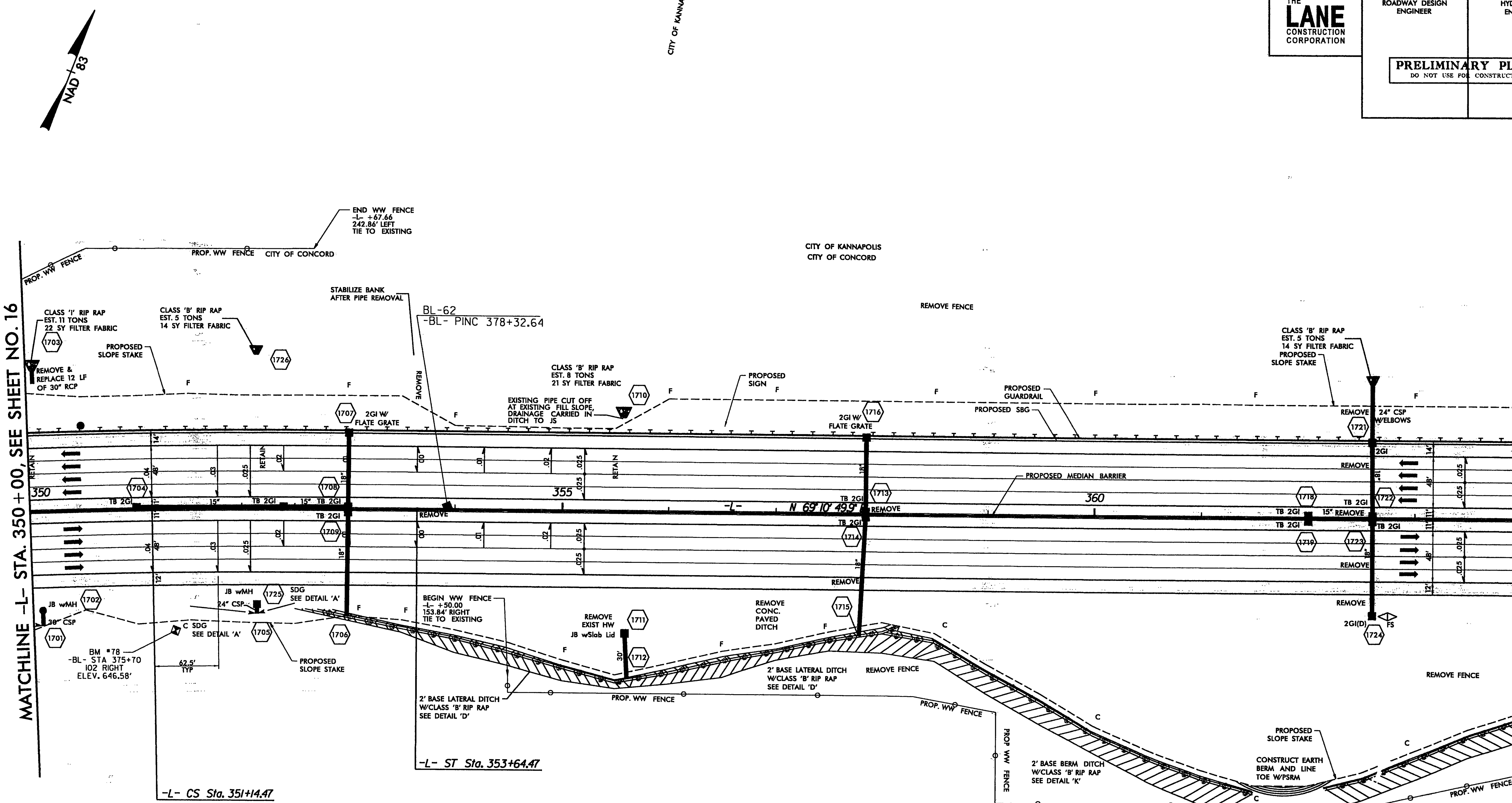
HDR Engineering, Inc. of the Carolinas
3733 National Drive, Suite 207 Raleigh, N.C. 27612
N.C.B.E.L.S. License Number: F-0116

PROJECT REFERENCE NO.	SHEET NO.
I-3803B	17
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

THE LANE CONSTRUCTION CORPORATION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

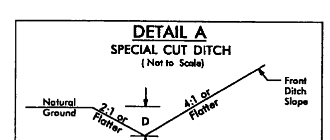
REVISIONS



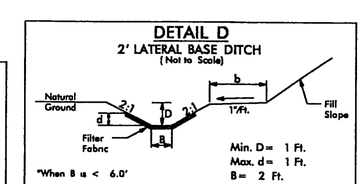
-L-

PIs Sta 300+97.30	PI Sta 328+12.21	PIs Sta 351+97.80
Θs = 1°15' 00.0"	Δ = 49° 20' 18.2" (RT)	Θs = 1°15' 00.0"
Ls = 250.00'	D = 1°00' 00.0"	Ls = 250.00'
LT = 166.67'	L = 4,933.84'	LT = 166.67'
ST = 83.34'	T = 2,631.58'	ST = 83.34'
	R = 5,729.58'	
	V = 70 MPH	
	e = 0.04	

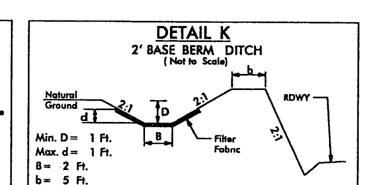
SEE SHEET NO 63, 64 FOR -L- PROFILE.
DO NOT PLACE ROCK IN BED OF JURISDICTIONAL STREAMS.



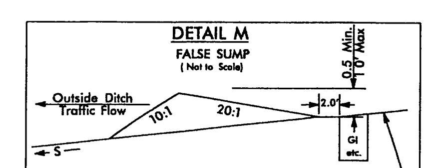
FROM STA. 351+50 -L- TO STA. 352+14 -L- RT
FROM STA. 352+14 -L- TO STA. 353+00 -L- RT

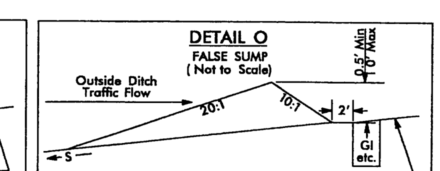


FROM STA. 353+50 -L- TO STA. 355+61 -L- RT
FROM STA. 355+61 -L- TO STA. 358+50 -L- RT



FROM STA. 358+00 -L- TO STA. 361+50 -L- RT
FROM STA. 362+15 -L- TO STA. 365+53 -L- RT





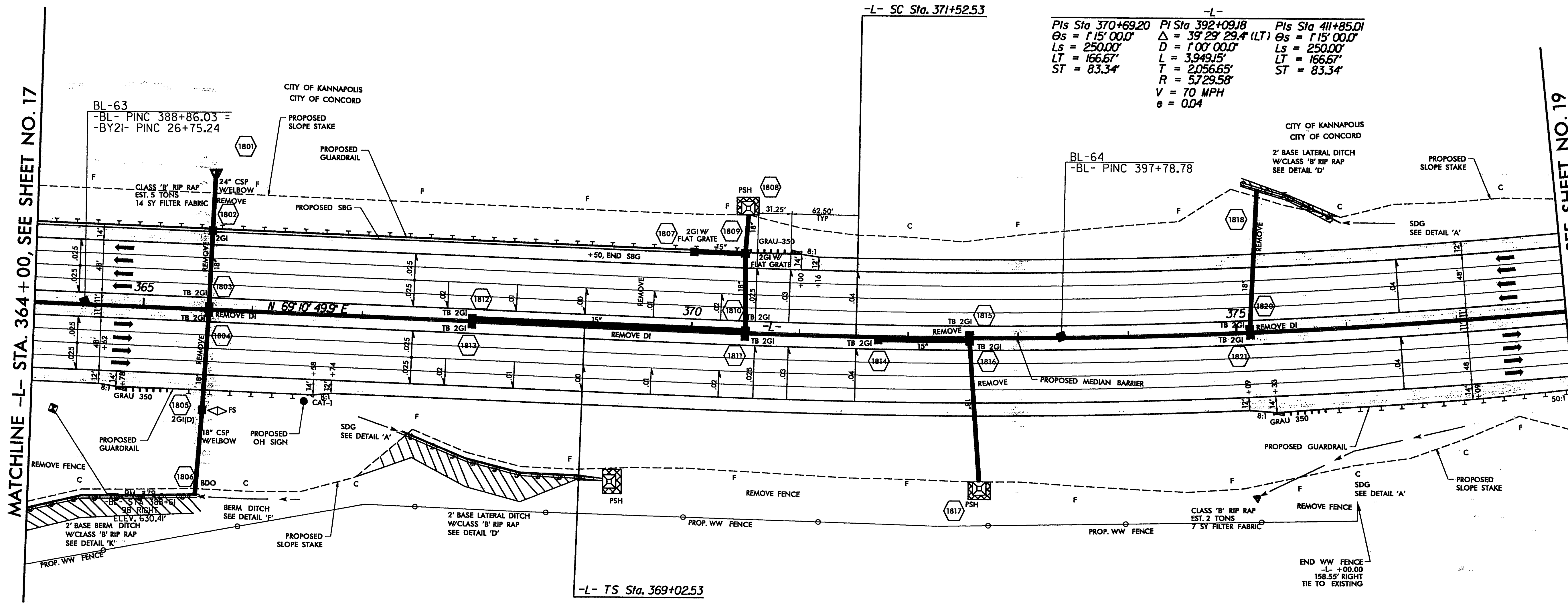
HDR Engineering, Inc. of the Carolinas
3733 National Drive, Suite 207 Raleigh, N.C. 27612
N.C.B.E.L.S. License Number: F-0116

THE LANE CONSTRUCTION CORPORATION

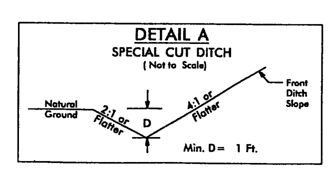
PROJECT REFERENCE NO.	SHEET NO.
I-3803B	18
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

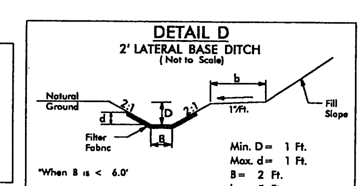
REVISIONS



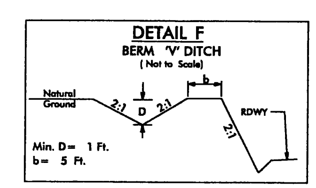
SEE SHEET NO. 64, 65 FOR -L- PROFILE.
DO NOT PLACE ROCK IN BED OF JURISDICTIONAL STREAMS.



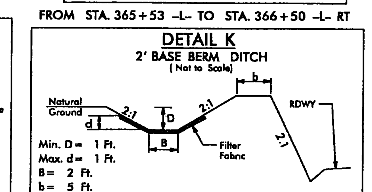
FROM STA. 367+00 -L- TO STA. 367+50 -L- RT
FROM STA. 376+00 -L- TO STA. 376+50 -L- LT
FROM STA. 375+00 -L- TO STA. 377+00 -L- RT



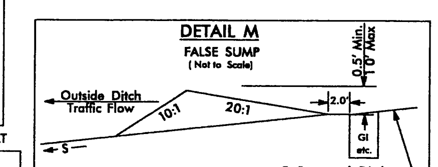
FROM STA. 367+50 -L- TO STA. 369+00 -L- RT
FROM STA. 375+07 -L- TO STA. 376+00 -L- LT

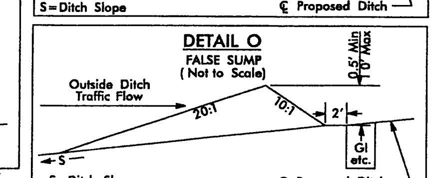


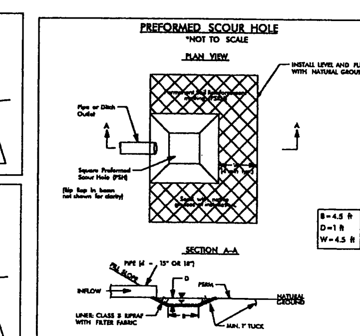
FROM STA. 365+53 -L- TO STA. 366+50 -L- RT



FROM STA. 362+15 -L- TO STA. 365+53 -L- RT







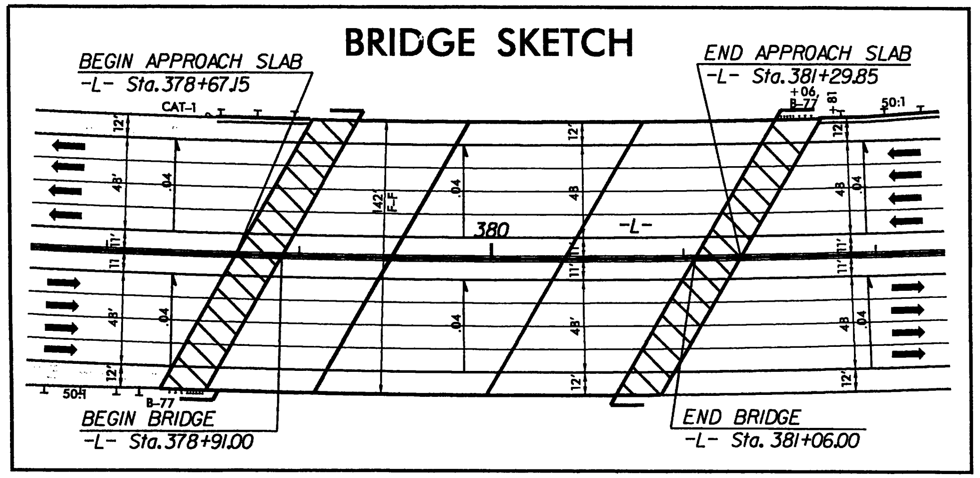
HDR Engineering, Inc. of the Carolinas
3733 National Drive, Suite 207 Raleigh, N.C. 27612
N.C.B.E.L.S. License Number: F-0116

THE LANE CONSTRUCTION CORPORATION

PROJECT REFERENCE NO.	SHEET NO.
I-3803B	19
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

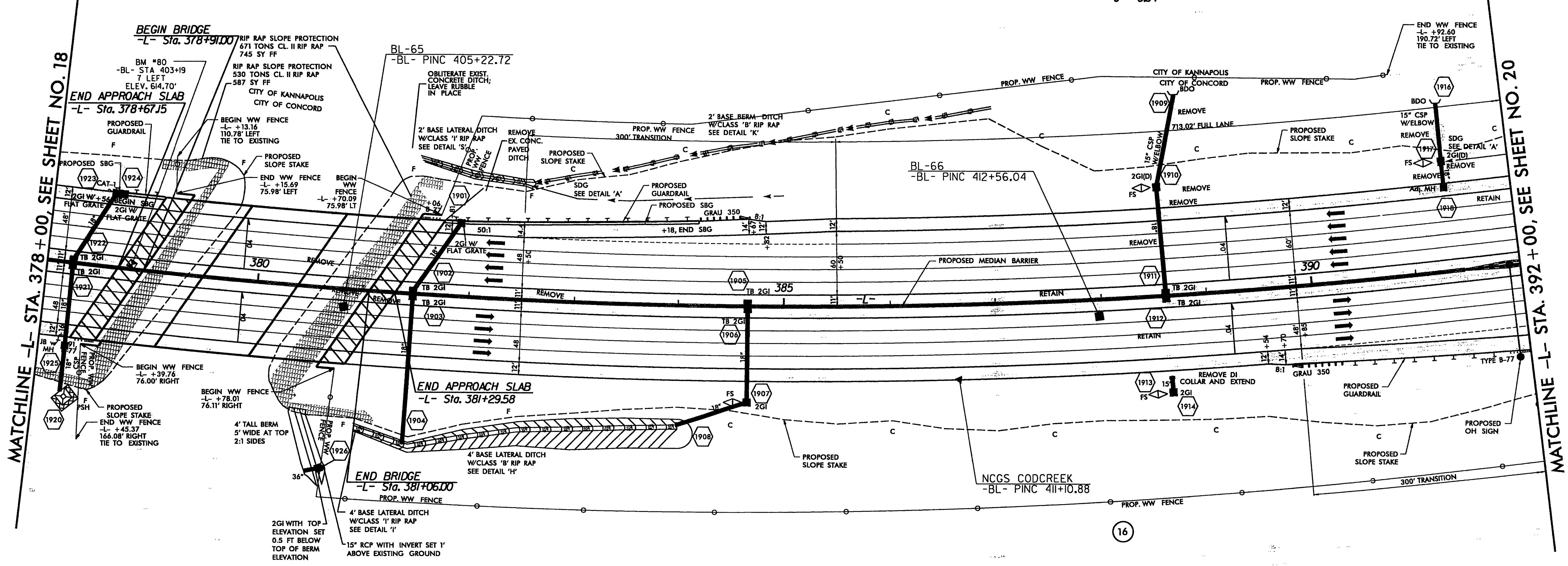
BRIDGE SKETCH

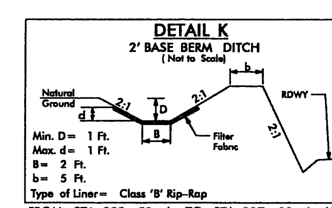


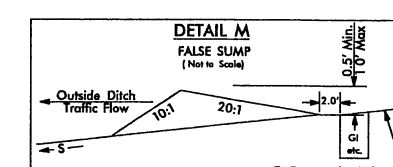
NAD 83

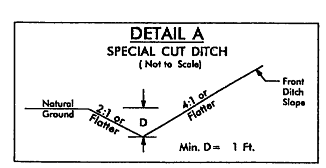
-L-

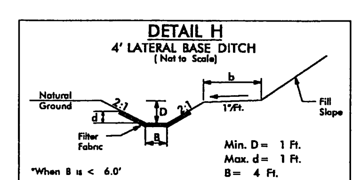
PIs Sta 370+69.20	PI Sta 392+09.18	PIs Sta 411+85.01
θs = 1° 15' 00.0"	Δ = 39° 29' 29.4" (LT)	θs = 1° 15' 00.0"
Ls = 250.00'	D = 1° 00' 00.0"	Ls = 250.00'
LT = 166.67'	L = 3,949.15'	LT = 166.67'
ST = 83.34'	T = 2,056.65'	ST = 83.34'
	R = 5,729.58'	
	V = 70 MPH	
	e = 0.04	

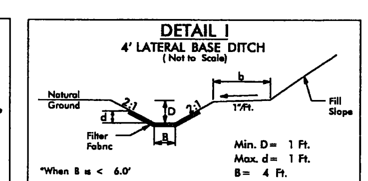


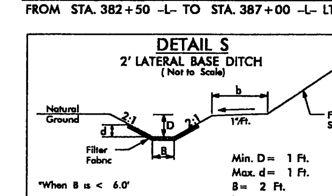

DETAIL K
2' BASE BERM DITCH (Not to Scale)
Min. D= 1 Ft. Max. d= 1 Ft. B= 2 Ft. b= 5 Ft. Type of Liner= Class 'B' Rip-Rap
FROM STA. 382+50 -L- TO STA. 387+00 -L- LT

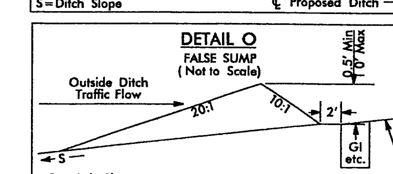

DETAIL M
FALSE SUMP (Not to Scale)
S=Ditch Slope


DETAIL A
SPECIAL CUT DITCH (Not to Scale)
Min. D= 1 Ft.
FROM STA. 382+50 -L- TO STA. 385+00 -L- LT
FROM STA. 391+36 -L- TO STA. 392+88 -L- LT


DETAIL H
4' LATERAL BASE DITCH (Not to Scale)
Min. D= 1 Ft. Max. d= 1 Ft. B= 4 Ft. b= 5 Ft.
Type of Liner= CLASS 'B' Rip-Rap
FROM STA. 381+50 -L- TO STA. 384+00 -L- RT


DETAIL I
4' LATERAL BASE DITCH (Not to Scale)
Min. D= 1 Ft. Max. d= 1 Ft. B= 4 Ft. b= 5 Ft.
Type of Liner= CLASS 'I' Rip-Rap
FROM STA. 381+00 -L- TO STA. 381+50 -L- RT


DETAIL S
2' LATERAL BASE DITCH (Not to Scale)
Min. D= 1 Ft. Max. d= 1 Ft. B= 2 Ft. b= 5 Ft.
Type of Liner= CLASS 'I' Rip-Rap
FROM STA. 381+50 -L- TO STA. 382+50 -L- LT


DETAIL O
FALSE SUMP (Not to Scale)
S=Ditch Slope

SEE SHEET NO 66, 67 FOR -L- PROFILE.
DO NOT PLACE ROCK IN BED OF JURISDICTIONAL STREAMS.

REVISIONS

PROJECT REFERENCE NO.	SHEET NO.
I-3803B	20
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

HDR Engineering, Inc. of the Carolinas
3733 National Drive, Suite 207 Raleigh, N.C. 27612
N.C.B.E.L.S. License Number: F-0116

THE LANE CONSTRUCTION CORPORATION

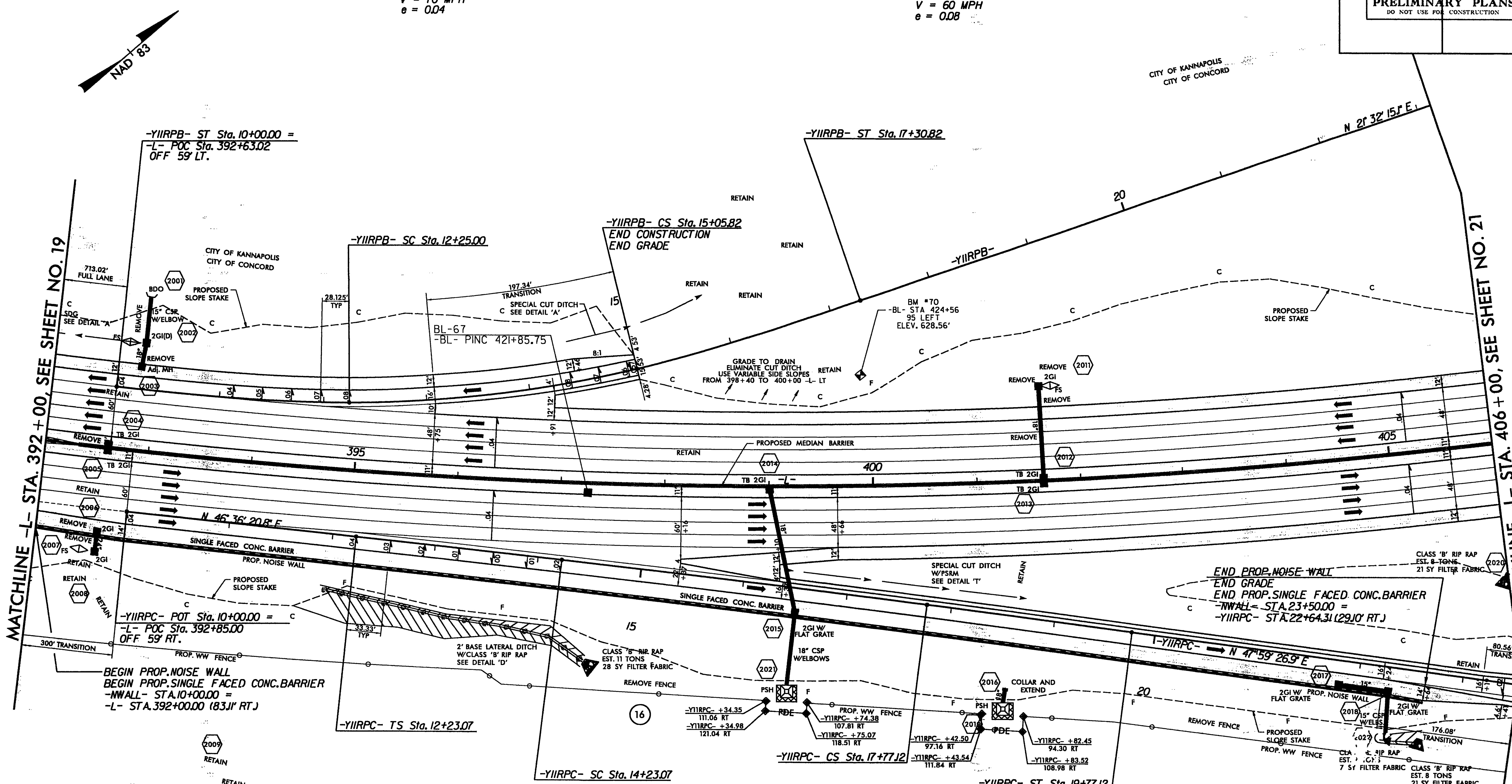
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

-L-

PIs Sta 370+69.20	PI Sta 392+09.18	PIs Sta 411+85.01
Θs = 1° 15' 00.0"	Δ = 39° 29' 29.4" (LT)	Θs = 1° 15' 00.0"
Ls = 250.00'	D = 1° 00' 00.0"	Ls = 250.00'
LT = 166.67'	L = 3,949.15'	LT = 166.67'
ST = 83.34'	T = 2,056.65'	ST = 83.34'
	R = 5,729.58'	
	V = 70 MPH	
	e = 0.04	

-Y11RPB-

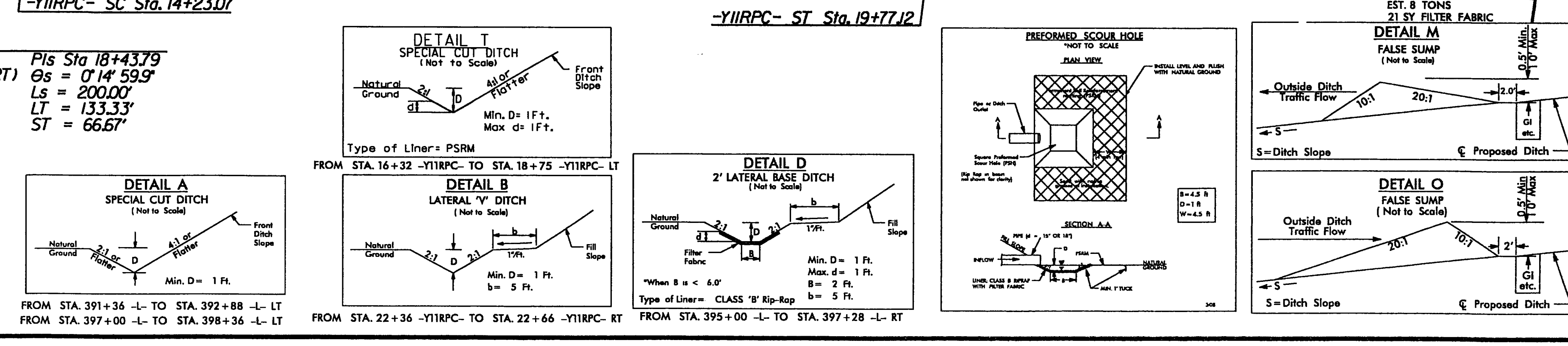
PIs Sta 11+37.02	PI Sta 13+66.06	PIs Sta 15+80.89
Θs = 1° 08' 07.4"	Δ = 13° 24' 30.2" (LT)	Θs = 5° 22' 17.3"
Θs = 5° 22' 22.0"	D = 4° 46' 28.7"	Ls = 225.00'
Ls = 225.00'	L = 280.82'	LT = 150.07'
LT = 137.02'	T = 141.06'	ST = 75.06'
ST = 88.21'	R = 1,200.00'	
	V = 60 MPH	
	e = 0.08	



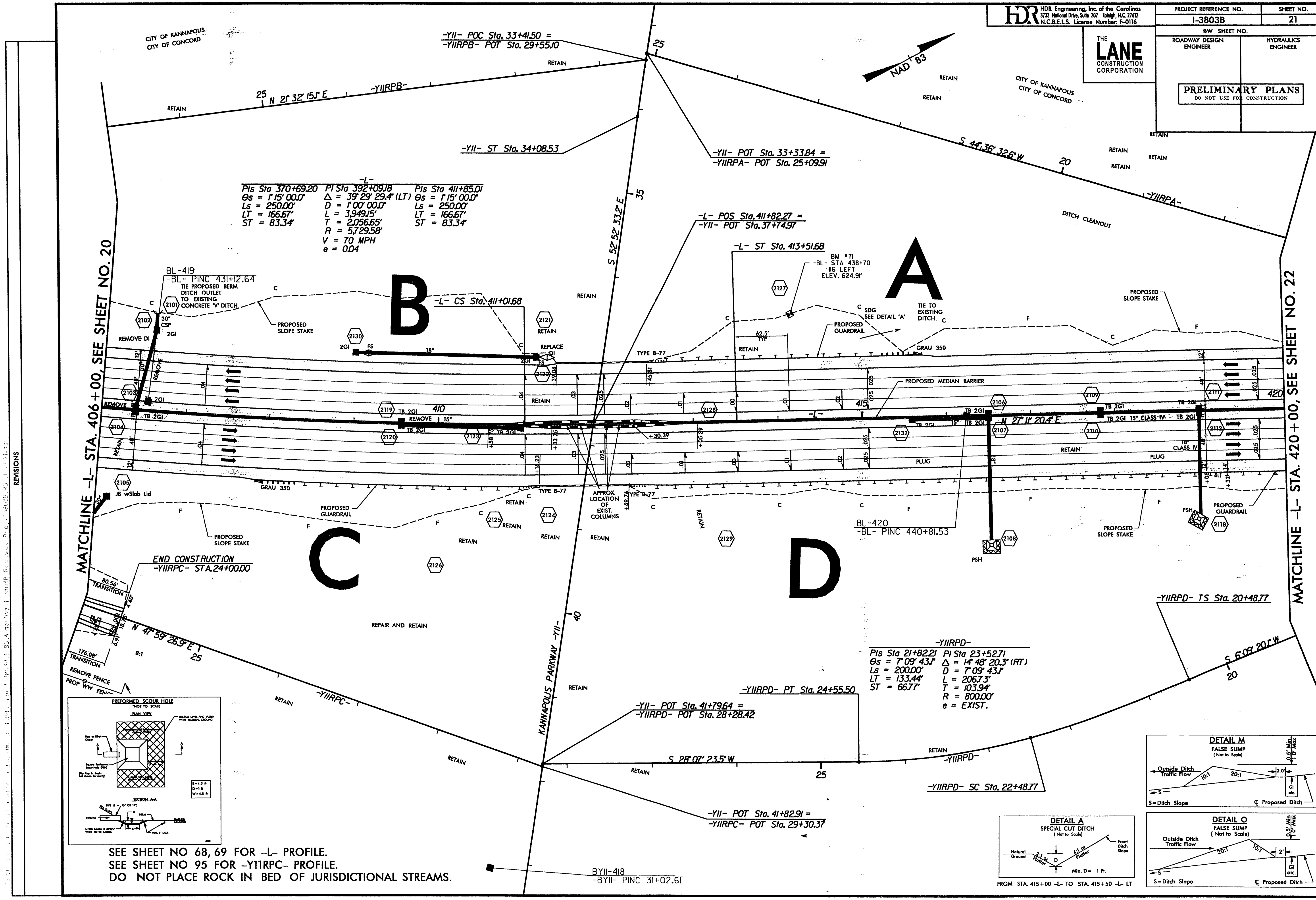
-Y11RPC-

PIs Sta 13+56.41	PI Sta 16+00.10	PIs Sta 18+43.79
Θs = 0° 14' 59.9"	Δ = 0° 53' 06.2" (RT)	Θs = 0° 14' 59.9"
Ls = 200.00'	D = 0° 14' 59.9"	Ls = 200.00'
LT = 133.33'	L = 354.05'	LT = 133.33'
ST = 66.67'	T = 177.03'	ST = 66.67'
	R = 22,920.00'	
	V = 60 MPH	
	e = 0.02	

SEE SHEET NO 67, 68 FOR -L- PROFILE.
SEE SHEET NO. 94 FOR -Y11RPB- PROFILE.
SEE SHEET NO. 95 FOR -Y11RPC- PROFILE.
DO NOT PLACE ROCK IN BED OF JURISDICTIONAL STREAMS.



REVISIONS


HDR Engineering, Inc. of the Carolinas
3733 National Drive, Suite 207 Raleigh, N.C. 27612
N.C.B.E.L.S. License Number: F-0116
THE LANE CONSTRUCTION CORPORATION
PROJECT REFERENCE NO. I-3803B
SHEET NO. 21
R/W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
NAD 83
CITY OF KANNAPOLIS
CITY OF CONCORD
-YII- POC Sta. 33+41.50 =
-YIIRPB- POT Sta. 29+55.10
N 21° 32' 15.1" E
-YIIRPB-
-YII- ST Sta. 34+08.53
-YII- POT Sta. 33+33.84 =
-YIIRPA- POT Sta. 25+09.91
S 44° 36' 32.6" W
-YIIRPA-
S 52° 52' 33.2" E
DITCH CLEANOUT
-L-
PIs Sta 370+69.20
θs = 1° 15' 00.0"
Ls = 250.00'
LT = 166.67'
ST = 83.34'
PI Sta 392+09.18
Δ = 39° 29' 29.4" (LT)
D = 1° 00' 00.0"
L = 3,949.15'
T = 2,056.65'
R = 5,729.58'
V = 70 MPH
e = 0.04
PIs Sta 411+85.01
θs = 1° 15' 00.0"
Ls = 250.00'
LT = 166.67'
ST = 83.34'
-L- POS Sta. 411+82.27 =
-YII- POT Sta. 37+74.97
-L- ST Sta. 413+51.68
-L- CS Sta. 411+01.68
BM #71
-BL- STA 438+70
116 LEFT
ELEV. 624.91'
BL-419
-BL- PINC 431+12.64
TIE PROPOSED BERM DITCH OUTLET TO EXISTING CONCRETE 'V' DITCH
PROPOSED SLOPE STAKE
SDG SEE DETAIL 'A'
TIE TO EXISTING DITCH
PROPOSED GUARDRAIL
GRAU 350
TYPE B-77
PROPOSED MEDIAN BARRIER
N 27° 11' 20.4" E
APPROX. LOCATION OF EXIST. COLUMNS
REPLACE DI
REMOVE DI
JB w/Slab Lid
PSH
PLUG
RETAIN
A
B
C
D
MATCHLINE -L- STA. 406+00, SEE SHEET NO. 20
MATCHLINE -L- STA. 420+00, SEE SHEET NO. 22
BL-420
-BL- PINC 440+81.53
END CONSTRUCTION
-YIIRPC- STA.24+00.00
N 47° 59' 26.9" E
REMOVE FENCE
PROP WW FENCE
REPAIR AND RETAIN
KANNAPOLIS PARKWAY -YII-
-YIIRPD- TS Sta. 20+48.77
S 6° 09' 20.1" W
-YIIRPD-
PIs Sta 21+82.21
θs = 7° 09' 43.1"
Ls = 200.00'
LT = 133.44'
ST = 66.77'
PI Sta 23+52.71
Δ = 14° 48' 20.3" (RT)
D = 7° 09' 43.1"
L = 206.73'
T = 103.94'
R = 800.00'
e = EXIST.
-YIIRPD- PT Sta. 24+55.50
-YII- POT Sta. 41+79.64 =
-YIIRPD- POT Sta. 28+28.42
S 28° 07' 23.5" W
-YIIRPD- SC Sta. 22+48.77
-YII- POT Sta. 41+82.91 =
-YIIRPC- POT Sta. 29+30.37
-YIIRPC-
BYII-418
-BYII- PINC 31+02.61
PREFORMED SCOUR HOLE
PLAN VIEW
SECTION A-A
DETAIL M
FALSE SUMP
(Not to Scale)
DETAIL O
FALSE SUMP
(Not to Scale)
Outside Ditch Traffic Flow
S=Ditch Slope
℄ Proposed Ditch
DETAIL A
SPECIAL CUT DITCH
(Not to Scale)
Natural Ground
Front Ditch Slope
Min. D= 1 Ft.
FROM STA. 415+00 -L- TO STA. 415+50 -L- LT
SEE SHEET NO 68, 69 FOR -L- PROFILE.
SEE SHEET NO 95 FOR -Y11RPC- PROFILE.
DO NOT PLACE ROCK IN BED OF JURISDICTIONAL STREAMS.
REVISIONS

HDR Engineering, Inc. of the Carolinas
3733 National Drive, Suite 207 Raleigh, N.C. 27612
N.C.B.E.L.S. License Number: F-0116

PROJECT REFERENCE NO.	SHEET NO.
I-3803B	22
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

THE LANE CONSTRUCTION CORPORATION

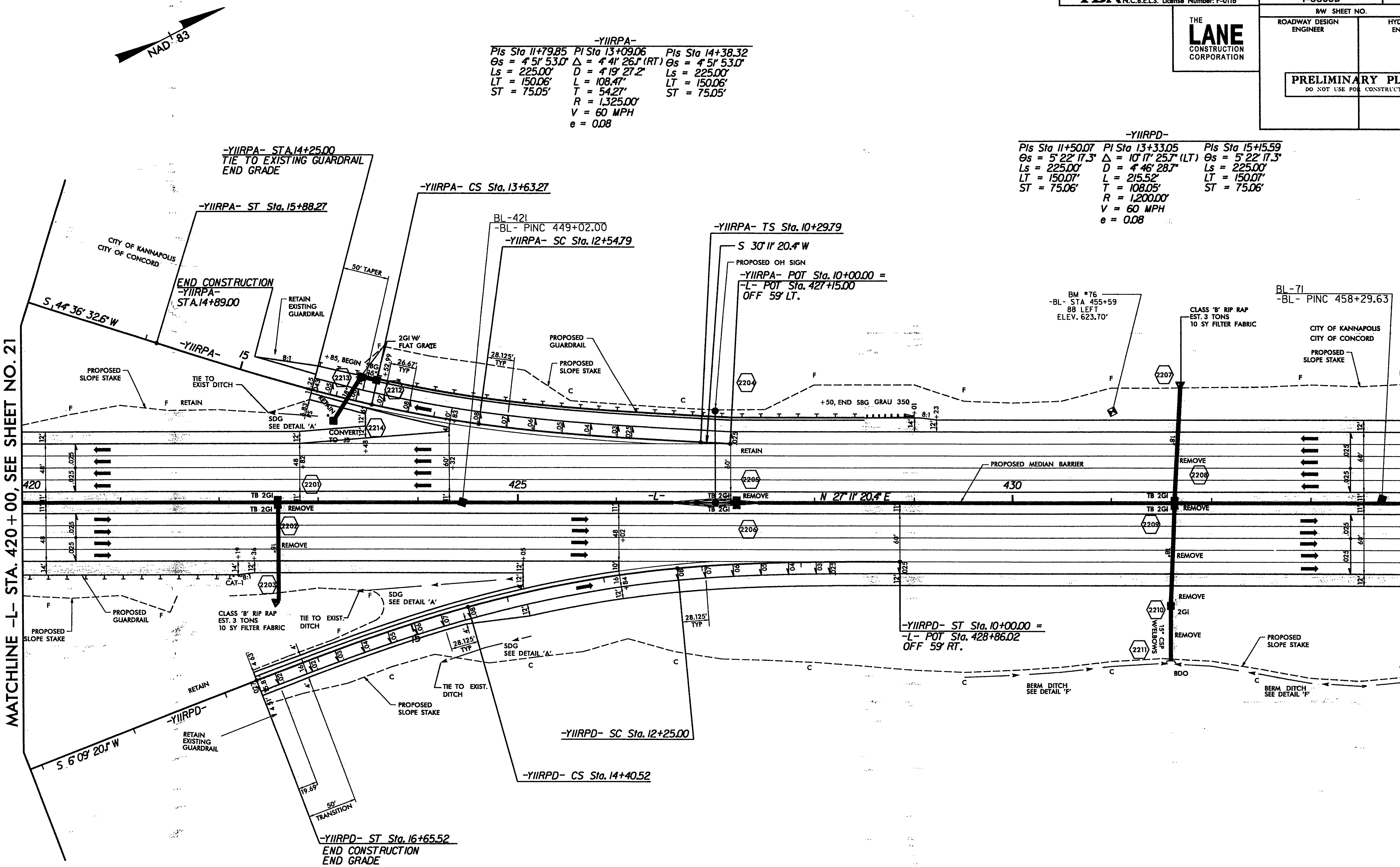
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

-Y11RPA-

PIs Sta 11+79.85	PI Sta 13+09.06	PIs Sta 14+38.32
Θs = 4° 51' 53.0"	Δ = 4° 41' 26.1" (RT)	Θs = 4° 51' 53.0"
Ls = 225.00'	D = 4° 19' 27.2"	Ls = 225.00'
LT = 150.06'	L = 108.47'	LT = 150.06'
ST = 75.05'	T = 54.27'	ST = 75.05'
	R = 1,325.00'	
	V = 60 MPH	
	e = 0.08	

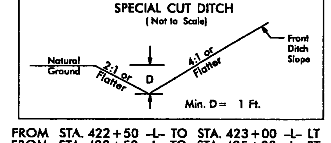
-Y11RPD-

PIs Sta 11+50.07	PI Sta 13+33.05	PIs Sta 15+15.59
Θs = 5° 22' 17.3"	Δ = 10° 17' 25.7" (LT)	Θs = 5° 22' 17.3"
Ls = 225.00'	D = 4° 46' 28.7"	Ls = 225.00'
LT = 150.07'	L = 215.52'	LT = 150.07'
ST = 75.06'	T = 108.05'	ST = 75.06'
	R = 1,200.00'	
	V = 60 MPH	
	e = 0.08	



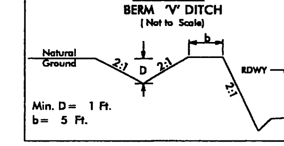
SEE SHEET NO. 69, 70 FOR -L- PROFILE.
SEE SHEET NO. 94 FOR -Y11RPA- PROFILE.
SEE SHEET NO. 95 FOR -Y11RPD- PROFILE.
DO NOT PLACE ROCK IN BED OF JURISDICTIONAL STREAMS.

DETAIL A
SPECIAL CUT DITCH
(Not to Scale)



FROM STA. 422+50 -L- TO STA. 423+00 -L- LT
FROM STA. 423+50 -L- TO STA. 425+00 -L- RT
FROM STA. 13+85 -Y11RPD- TO STA. 14+85 -Y11RPD- LT

DETAIL F
BERM 'V' DITCH
(Not to Scale)



FROM STA. 429+75 -L- TO STA. 431+59 -L- RT
FROM STA. 431+59 -L- TO STA. 433+50 -L- RT

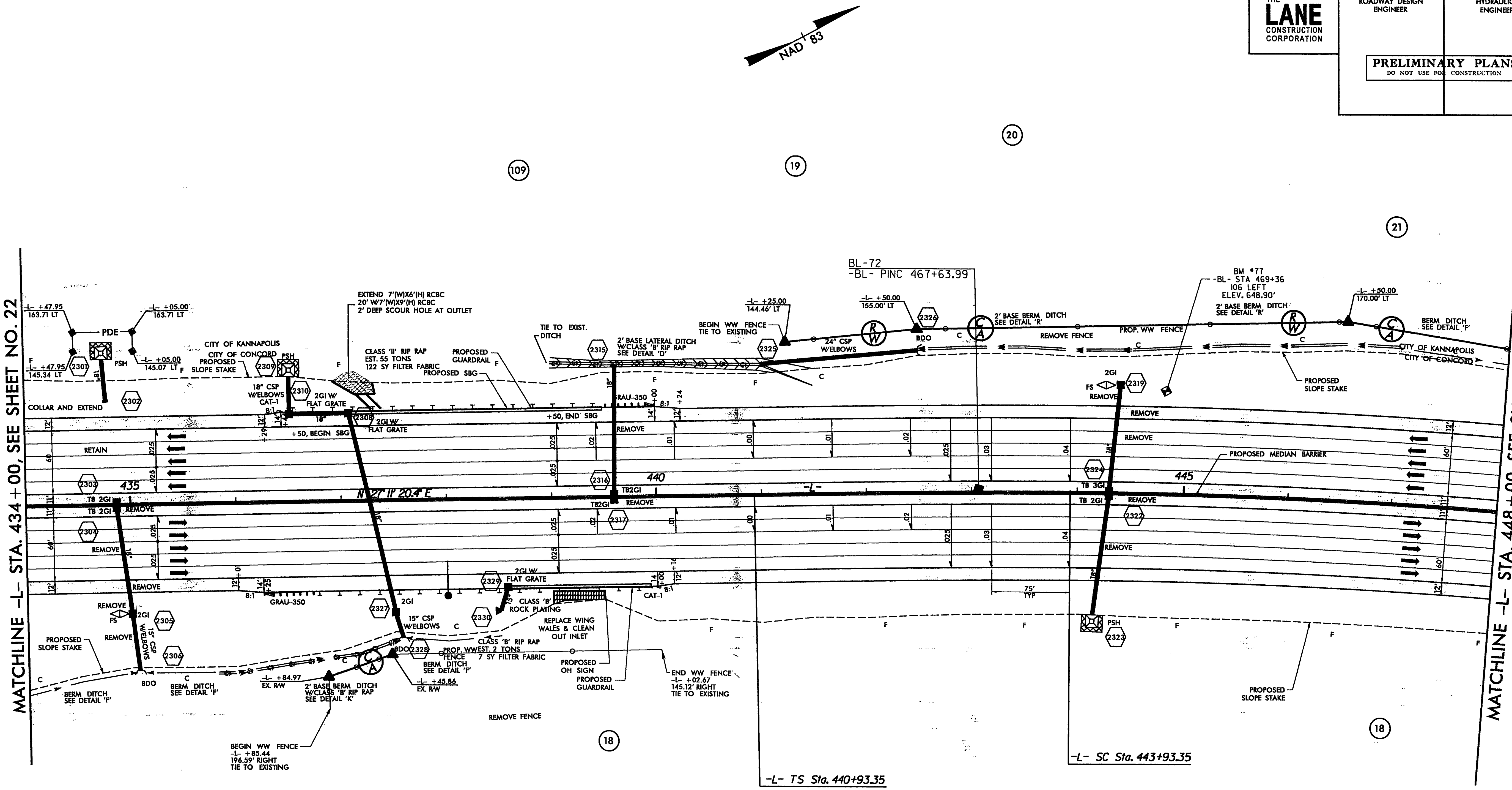
REVISIONS

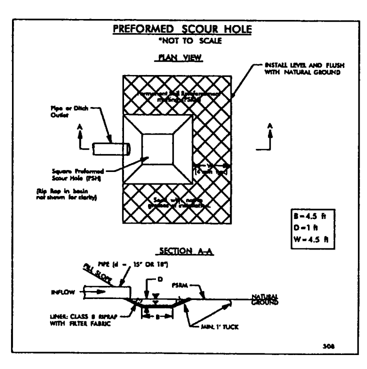
HDR Engineering, Inc. of the Carolinas
3733 National Drive, Suite 207 Raleigh, N.C. 27612
N.C.B.E.L.S. License Number: F-0116

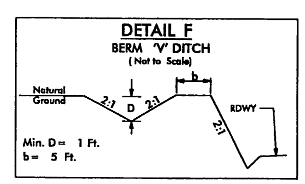
THE LANE CONSTRUCTION CORPORATION

PROJECT REFERENCE NO.	SHEET NO.
I-3803B	23
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

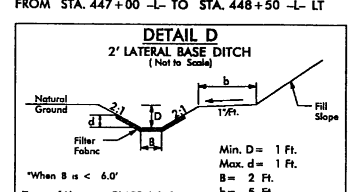
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



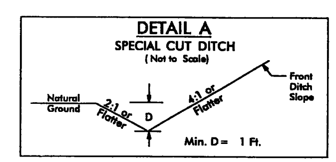




FROM STA. 433+50 -L- TO STA. 435+06 -L- RT
FROM STA. 435+06 -L- TO STA. 435+80 -L- RT
FROM STA. 437+50 -L- TO STA. 438+50 -L- RT
FROM STA. 447+00 -L- TO STA. 448+50 -L- LT



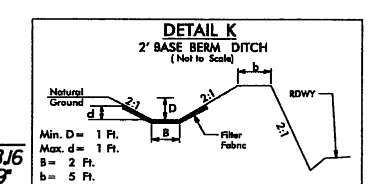
FROM STA. 439+00 -L- TO STA. 441+50 -L- LT



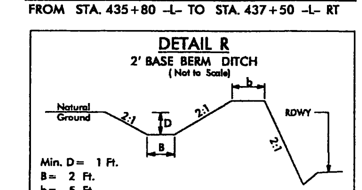
FROM STA. 441+00 -L- TO STA. 441+50 -L- LT

-L-

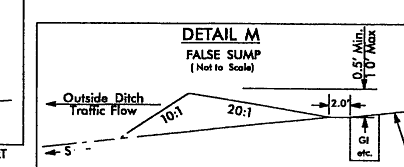
PIs Sta 442+93.36	PI Sta 451+53.50	PIs Sta 460+38.16
Θs = 1° 30' 00.0"	Δ = 15° 06' 52.7" (RT)	Θs = 0° 44' 59.9"
Ls = 300.00'	D = 1° 00' 00.0"	Θs = 1° 30' 00.1"
LT = 200.01'	L = 1,511.46'	Ls = 300.00'
ST = 100.01'	T = 760.14'	LT = 166.69'
	R = 5,729.58'	ST = 133.35'
	V = 70 MPH	
	e = 0.04	

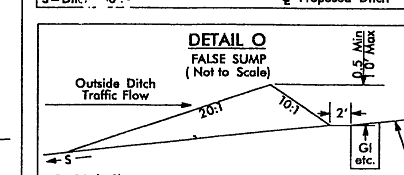


FROM STA. 435+80 -L- TO STA. 437+50 -L- RT



FROM STA. 442+50 -L- TO STA. 447+00 -L- LT





SEE SHEET NO 70, 71 FOR -L- PROFILE.
DO NOT PLACE ROCK IN BED OF JURISDICTIONAL STREAMS.

REVISIONS

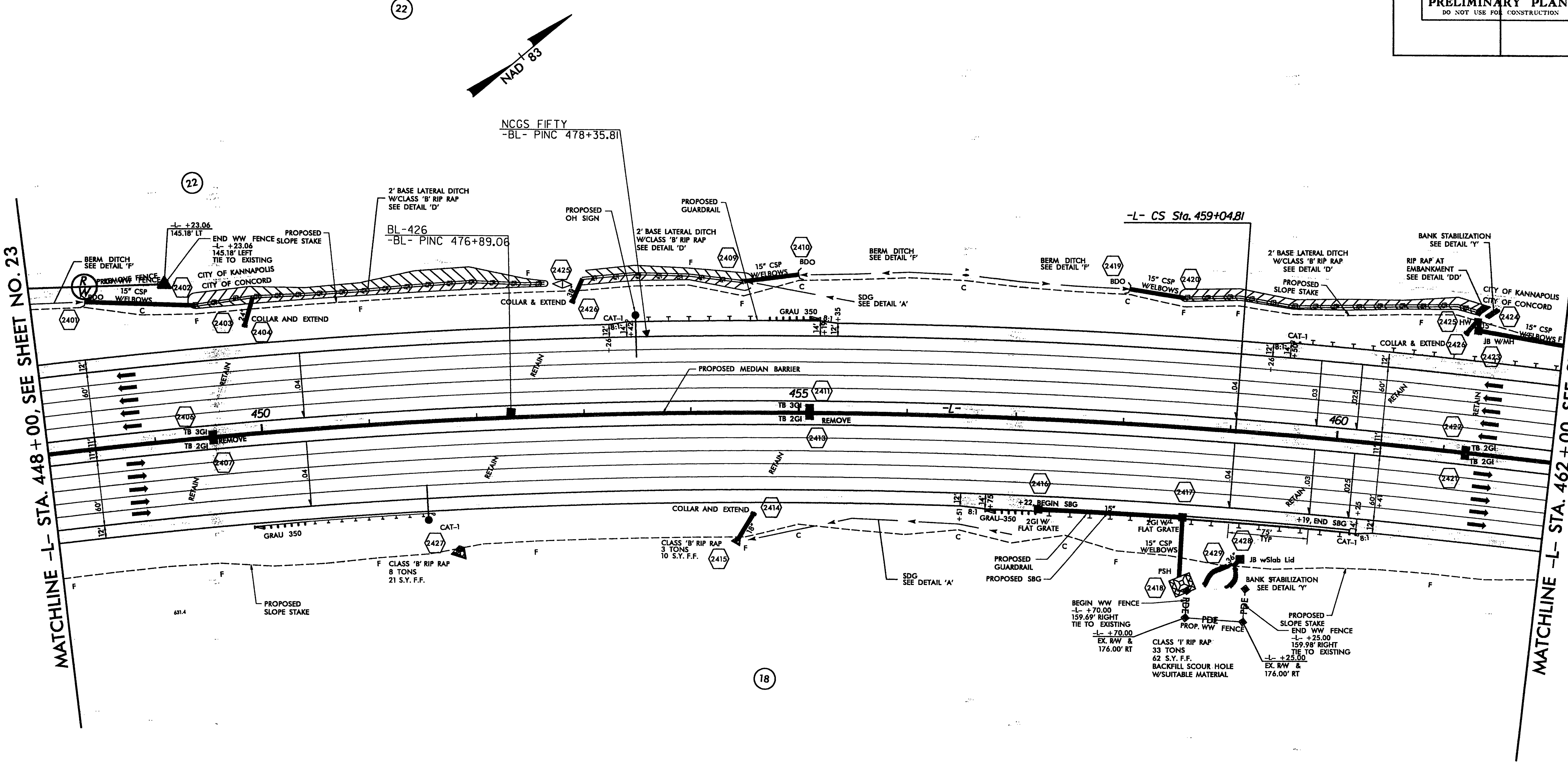
HDR Engineering, Inc. of the Carolinas
3733 National Drive, Suite 207 Raleigh, N.C. 27612
N.C.B.E.L.S. License Number: F-0116

THE LANE CONSTRUCTION CORPORATION

PROJECT REFERENCE NO.	SHEET NO.
I-3803B	24
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

REVISIONS

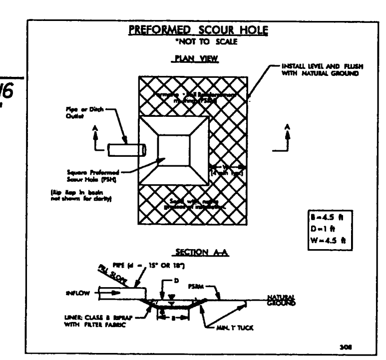


-L-

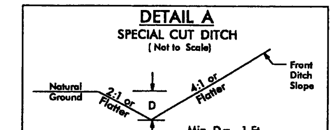
Pls Sta 442+93.36	PI Sta 451+53.50	Pls Sta 460+38.16
Θs = 1° 30' 00.0"	Δ = 15° 06' 52.7" (RT)	Θs = 0° 44' 59.9"
Ls = 300.00'	D = 1° 00' 00.0"	Θs = 1° 30' 00.1"
LT = 200.01'	L = 1,511.46'	Ls = 300.00'
ST = 100.01'	T = 760.14'	LT = 166.69'
	R = 5,729.58'	ST = 133.35'
	V = 70 MPH	
	e = 0.04	

SEE SHEET NO. 71, 72 FOR -L- PROFILE.
DO NOT PLACE ROCK IN BED OF JURISDICTIONAL STREAMS.

PREFORMED SCOUR HOLE
*NOT TO SCALE

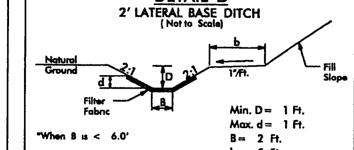


DETAIL A
SPECIAL CUT DITCH
(Not to Scale)



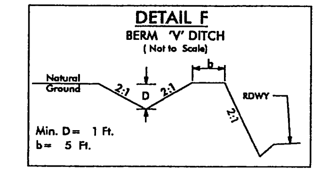
FROM STA. 454+50 -L- TO STA. 455+50 -L- LT
FROM STA. 454+45 -L- TO STA. 457+00 -L- RT

DETAIL D
2' LATERAL BASE DITCH
(Not to Scale)



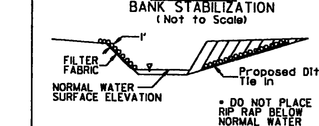
FROM STA. 449+50 -L- TO STA. 450+00 -L- LT
FROM STA. 450+00 -L- TO STA. 452+60 -L- LT
FROM STA. 452+98 -L- TO STA. 454+50 -L- LT
FROM STA. 458+50 -L- TO STA. 461+20 -L- LT

DETAIL F
BERM 'V' DITCH
(Not to Scale)



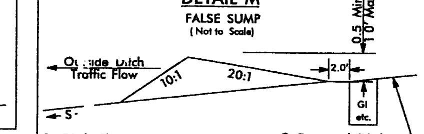
FROM STA. 447+00 -L- TO STA. 448+50 -L- LT
FROM STA. 455+00 -L- TO STA. 456+50 -L- LT
FROM STA. 456+50 -L- TO STA. 458+00 -L- LT

DETAIL Y
BANK STABILIZATION
(Not to Scale)



STA. 461+30 -L- LT

DETAIL M
FALSE SUMP
(Not to Scale)



PROJECT REFERENCE NO.	SHEET NO.
I-3803B	25

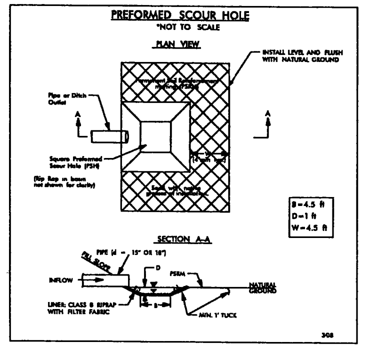
R/W SHEET NO.

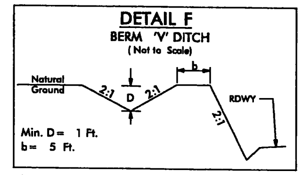
ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER

HDR Engineering, Inc. of the Carolinas
3733 National Drive, Suite 207 Raleigh, N.C. 27612
N.C.B.E.L.S. License Number: F-0116

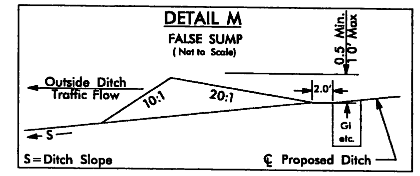
THE LANE CONSTRUCTION CORPORATION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



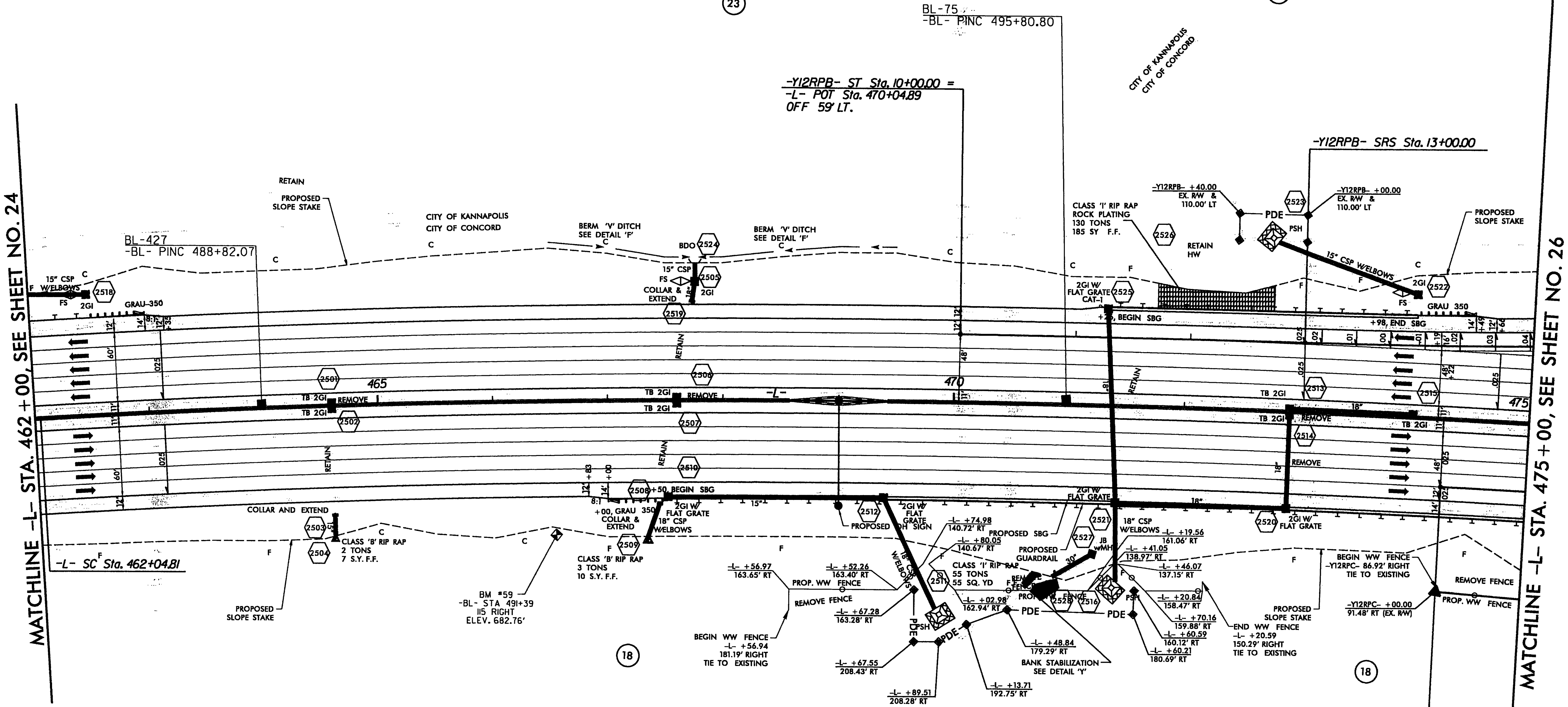


FROM STA. 466+50 -L- TO STA. 467+77 -L- LT
FROM STA. 467+77 -L- TO STA. 469+50 -L- LT



-Y12-

PIs Sta 11+00.00	PIs Sta 14+90.06
Θs = 0° 44' 46.2"	Θs = 4° 17' 49.9"
Ls = 300.00'	Ls = 285.00'
LT = 200.00'	LT = 190.06'
ST = 100.00'	ST = 95.05'

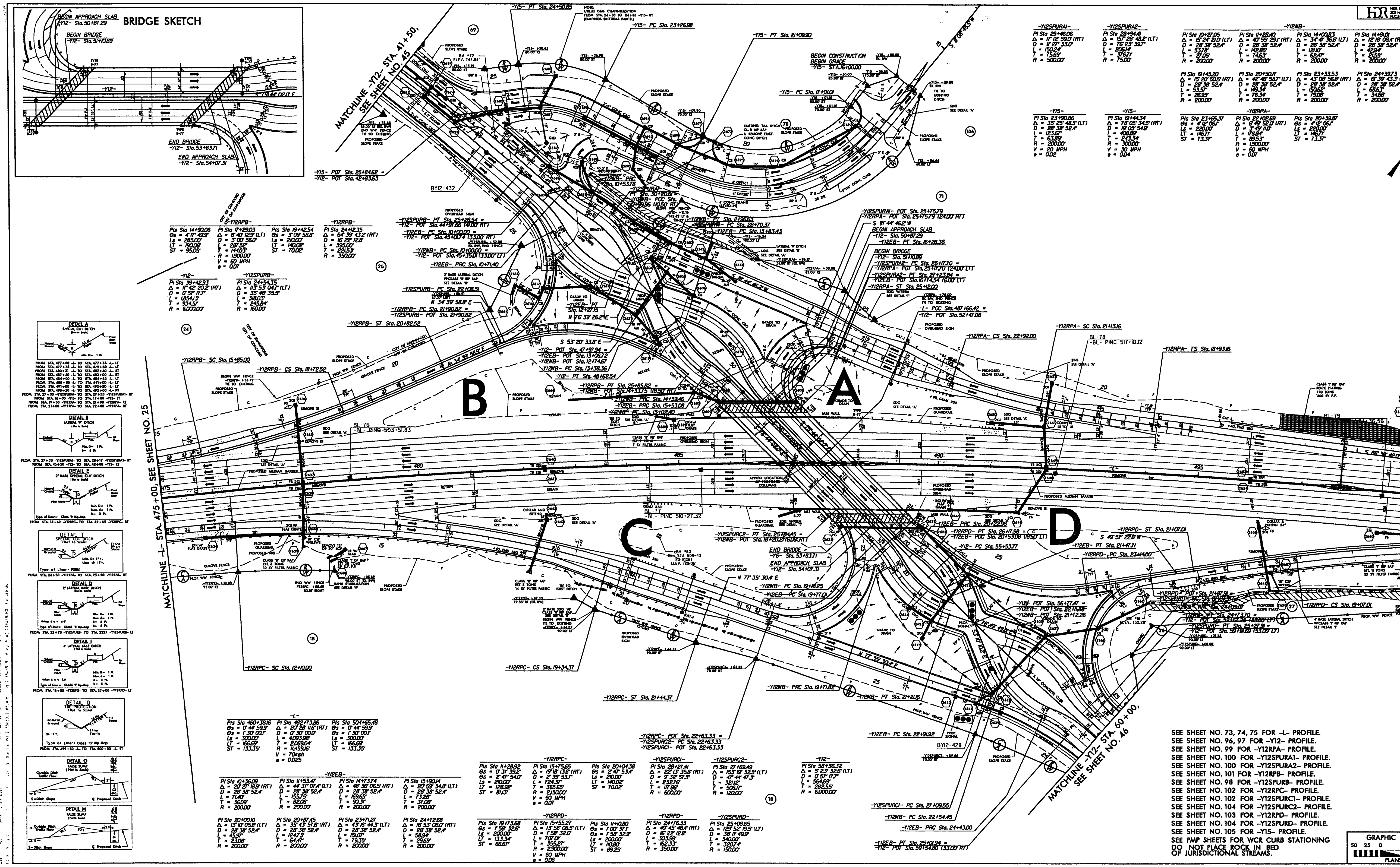


-L-

PIs Sta 460+38.16	PI Sta 482+73.86	PIs Sta 504+65.48
Θs = 0° 44' 59.9"	Δ = 20° 28' 11.6" (RT)	Θs = 0° 44' 59.9"
Θs = 1° 30' 00.1"	D = 0° 30' 00.0"	Θs = 1° 30' 00.1"
Ls = 300.00'	L = 4,093.98'	Ls = 300.00'
LT = 166.69'	T = 2,069.04'	LT = 166.69'
ST = 133.35'	R = 11,459.16'	ST = 133.35'
	V = 70mph	
	e = 0.025	

SEE SHEET NO. 72, 73 FOR -L- PROFILE.
SEE SHEET NO. 101 FOR -Y12RPB- PROFILE.
SEE SHEET NO. 102 FOR -Y12RPC- PROFILE.
DO NOT PLACE ROCK IN BED OF JURISDICTIONAL STREAMS.

REVISIONS



HDR Engineering, Inc. of the Carolinas 3733 National Drive, Suite 207 Raleigh, N.C. 27612 N.C.B.E.L.S. License Number: F-0116	PROJECT REFERENCE NO.	SHEET NO.
THE LANE CONSTRUCTION CORPORATION	I-3803B	26
	R/W SHEET NO.	
	ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

SEE SHEET NO. 73, 74, 75 FOR -L- PROFILE.
SEE SHEET NO. 96, 97 FOR -Y12- PROFILE.
SEE SHEET NO. 99 FOR -Y12RPA- PROFILE.
SEE SHEET NO. 100 FOR -Y12SPURA1- PROFILE.
SEE SHEET NO. 100 FOR -Y12SPURA2- PROFILE.
SEE SHEET NO. 101 FOR -Y12RPB- PROFILE.
SEE SHEET NO. 98 FOR -Y12SPURB- PROFILE.
SEE SHEET NO. 102 FOR -Y12RPC- PROFILE.
SEE SHEET NO. 102 FOR -Y12SPURC1- PROFILE.
SEE SHEET NO. 104 FOR -Y12SPURC2- PROFILE.
SEE SHEET NO. 103 FOR -Y12RPD- PROFILE.
SEE SHEET NO. 104 FOR -Y12SPURD- PROFILE.
SEE SHEET NO. 105 FOR -Y15- PROFILE.
SEE PMP SHEETS FOR WCR CURB STATIONING
DO NOT PLACE ROCK IN BED
OF JURISDICTIONAL STREAMS.

GRAPHIC SCALE
50 25 0 50 100
PLANS

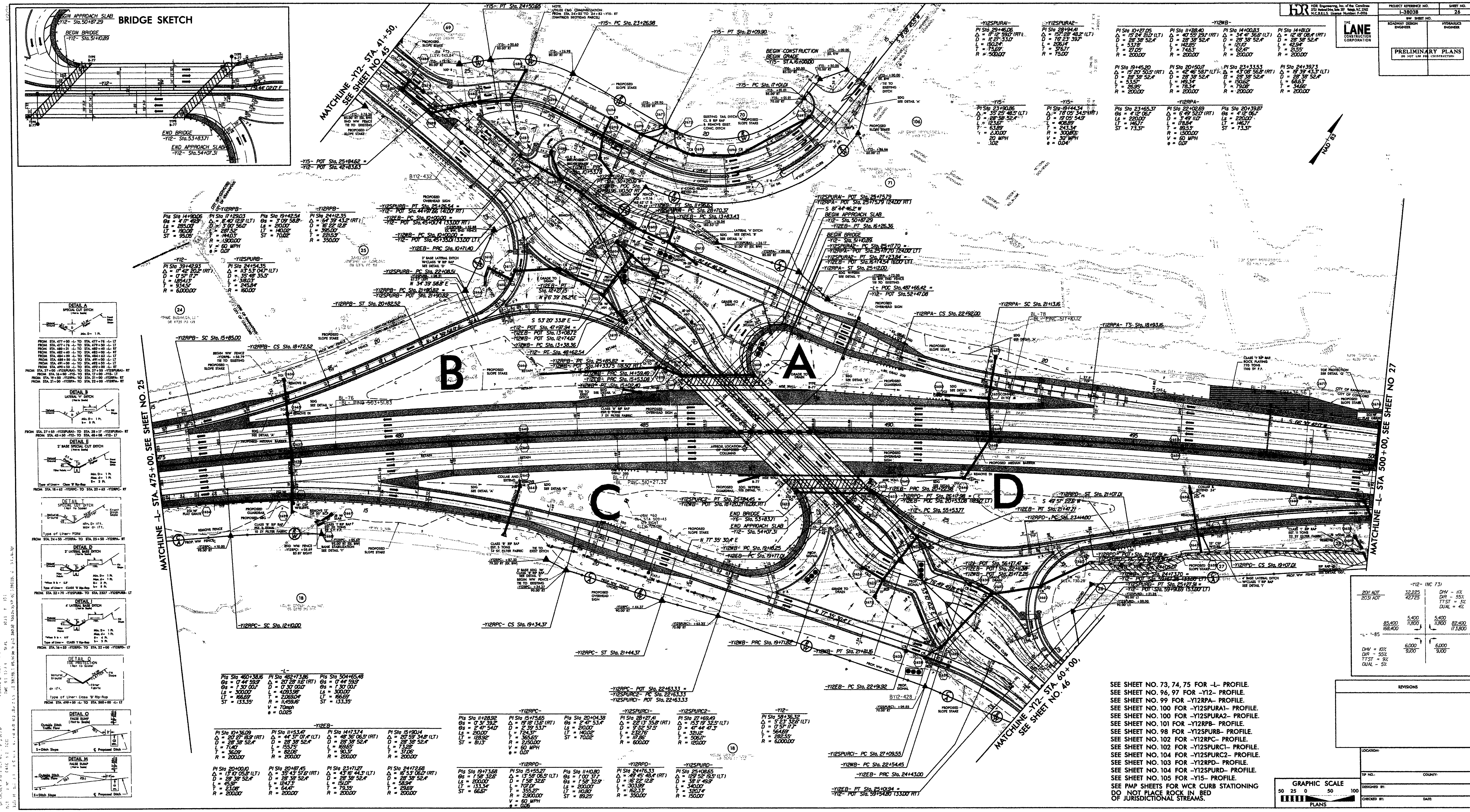
REVISIONS

LOCATION:

TIP NO.: COUNTY:

DESIGNED BY:

CHECKED BY: DATE:


HDR Engineering, Inc. of the Carolinas
N.C.B.E.L.S. License Number: F-0116
PROJECT REFERENCE NO.
I-3803B
SHEET NO.
26
R/W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
THE LANE CONSTRUCTION CORPORATION
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
BRIDGE SKETCH
A
B
C
D
MATCHLINE -L- STA. 475+00, SEE SHEET NO. 25
MATCHLINE -L- STA. 500+00, SEE SHEET NO. 27
MATCHLINE -Y12- STA. 41+50, SEE SHEET NO. 45
MATCHLINE -Y12- STA. 60+00, SEE SHEET NO. 46
SEE SHEET NO. 73, 74, 75 FOR -L- PROFILE.
SEE SHEET NO. 96, 97 FOR -Y12- PROFILE.
SEE SHEET NO. 99 FOR -Y12RPA- PROFILE.
SEE SHEET NO. 100 FOR -Y12SPURA1- PROFILE.
SEE SHEET NO. 100 FOR -Y12SPURA2- PROFILE.
SEE SHEET NO. 101 FOR -Y12RPB- PROFILE.
SEE SHEET NO. 98 FOR -Y12SPURB- PROFILE.
SEE SHEET NO. 102 FOR -Y12RPC- PROFILE.
SEE SHEET NO. 102 FOR -Y12SPURC1- PROFILE.
SEE SHEET NO. 104 FOR -Y12SPURC2- PROFILE.
SEE SHEET NO. 103 FOR -Y12RPD- PROFILE.
SEE SHEET NO. 104 FOR -Y12SPURD- PROFILE.
SEE SHEET NO. 105 FOR -Y15- PROFILE.
SEE PMP SHEETS FOR WCR CURB STATIONING
DO NOT PLACE ROCK IN BED OF JURISDICTIONAL STREAMS.
GRAPHIC SCALE
50 25 0 50 100
PLANS
REVISIONS
LOCATION:
TIP NO.:
COUNTY:
DESIGNED BY:
CHECKED BY:
DATE:
DHV = 10%
DIR - 55%
TTST = 9%
DUAL - 5%

HDR Engineering, Inc. of the Carolinas
3733 National Drive, Suite 207 Raleigh, N.C. 27612
N.C.B.E.L.S. License Number: F-0116

THE LANE CONSTRUCTION CORPORATION

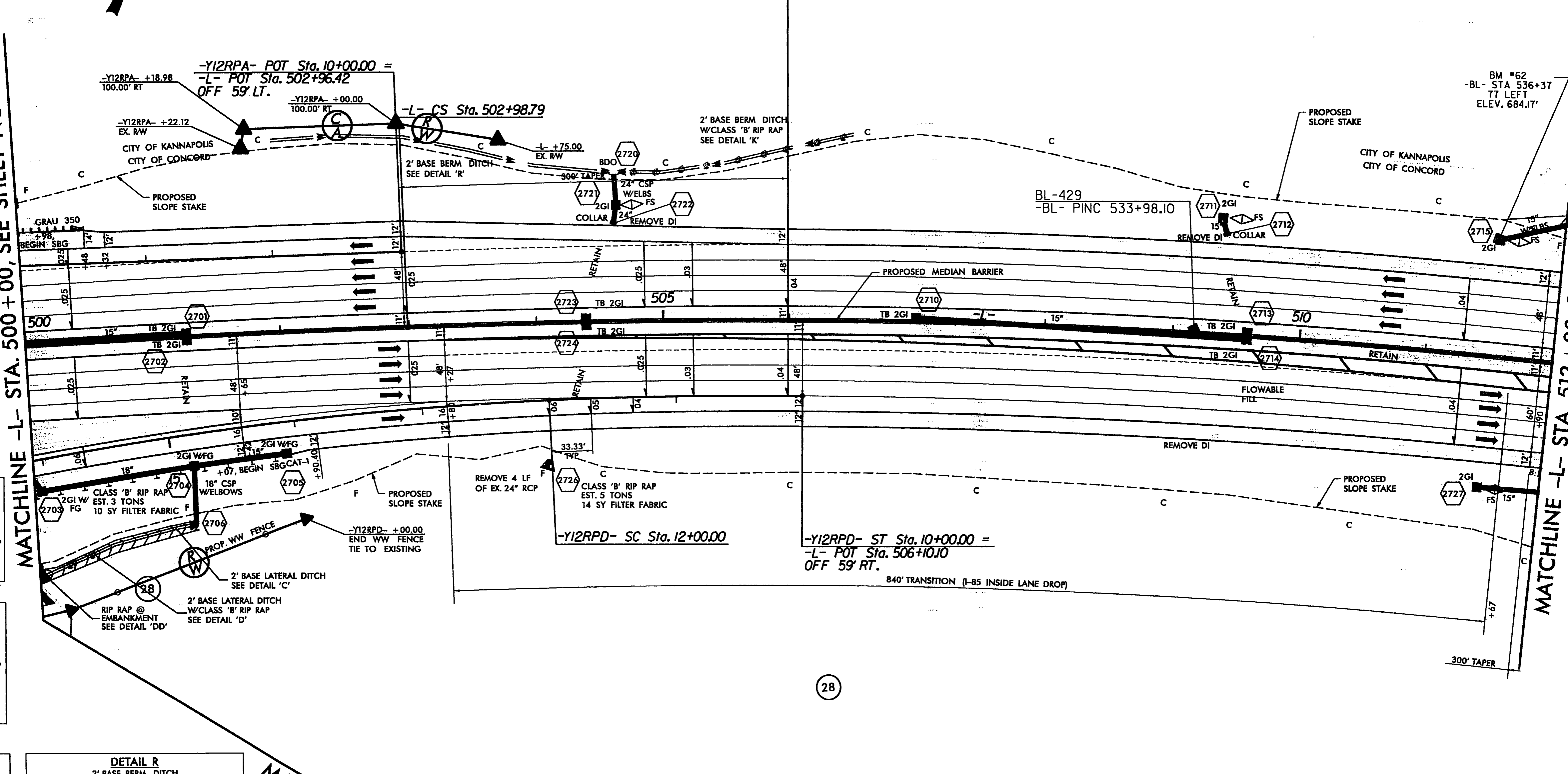
PROJECT REFERENCE NO.	SHEET NO.
I-3803B	27
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

REVISIONS

-L-

Pls Sta 460+38.16	PI Sta 482+73.86	Pls Sta 504+65.48
Θs = 0° 44' 59.9"	Δ = 20° 28' 11.6" (RT)	Θs = 0° 44' 59.9"
Θs = 1° 30' 00.1"	D = 0° 30' 00.0"	Θs = 1° 30' 00.1"
Ls = 300.00'	L = 4,093.98'	Ls = 300.00'
LT = 166.69'	T = 2,069.04'	LT = 166.69'
ST = 133.35'	R = 11,459.16'	ST = 133.35'
	V = 70mph	
	e = 0.025	

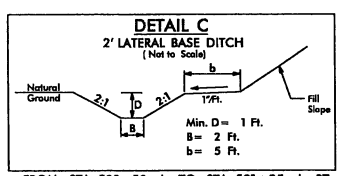


MATCHLINE -L- STA. 500+00, SEE SHEET NO. 26

MATCHLINE -L- STA. 512+00, SEE SHEET NO. 28

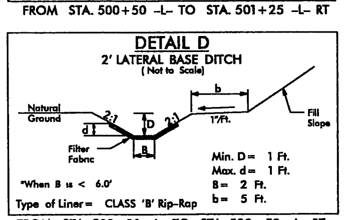
MATCHLINE, SEE SHEET NO. 46

DETAIL C



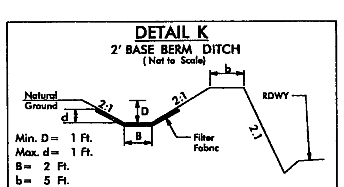
FROM STA. 500+50 -L- TO STA. 501+25 -L- RT

DETAIL D



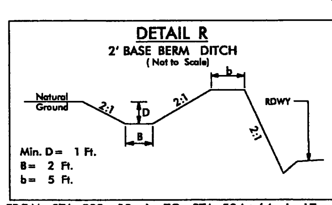
FROM STA. 500+00 -L- TO STA. 500+50 -L- RT

DETAIL K



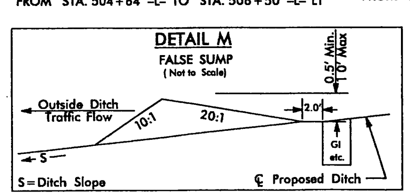
FROM STA. 504+64 -L- TO STA. 506+50 -L- RT

DETAIL R

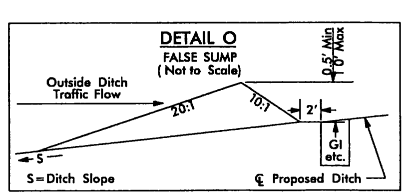


FROM STA. 502+00 -L- TO STA. 504+64 -L- LT

DETAIL M



DETAIL O



-Y12RPD-

Pls Sta 19+73.68	PI Sta 15+55.27	Pls Sta 11+10.80
Θs = 1° 58' 32.6"	Δ = 13° 58' 06.5" (LT)	Θs = 1° 00' 37.1"
Ls = 200.00'	D = 1° 58' 32.6"	Θs = 1° 58' 32.9"
LT = 133.34'	L = 707.01'	Ls = 200.00'
ST = 66.67'	T = 355.27'	LT = 110.80'
	R = 2,900.00'	ST = 89.25'
	V = 60 MPH	
	e = 0.06	

-L-

Pls Sta 504+65.48	PI Sta 515+61.72	Pls Sta 526+06.82
Θs = 0° 44' 59.9"	Δ = 19° 04' 48.9" (RT)	Θs = 1° 30' 00.0"
Θs = 1° 30' 00.1"	D = 1° 00' 00.0"	Ls = 300.00'
Ls = 300.00'	L = 1,908.02'	LT = 200.01'
LT = 166.69'	T = 962.93'	ST = 100.01'
ST = 133.35'	R = 5,729.58'	
	V = 70 MPH	
	e = 0.04	

SEE SHEET NO 75, 76 FOR -L- PROFILE.

SEE SHEET NO 103 FOR -Y12RPD- PROFILE.

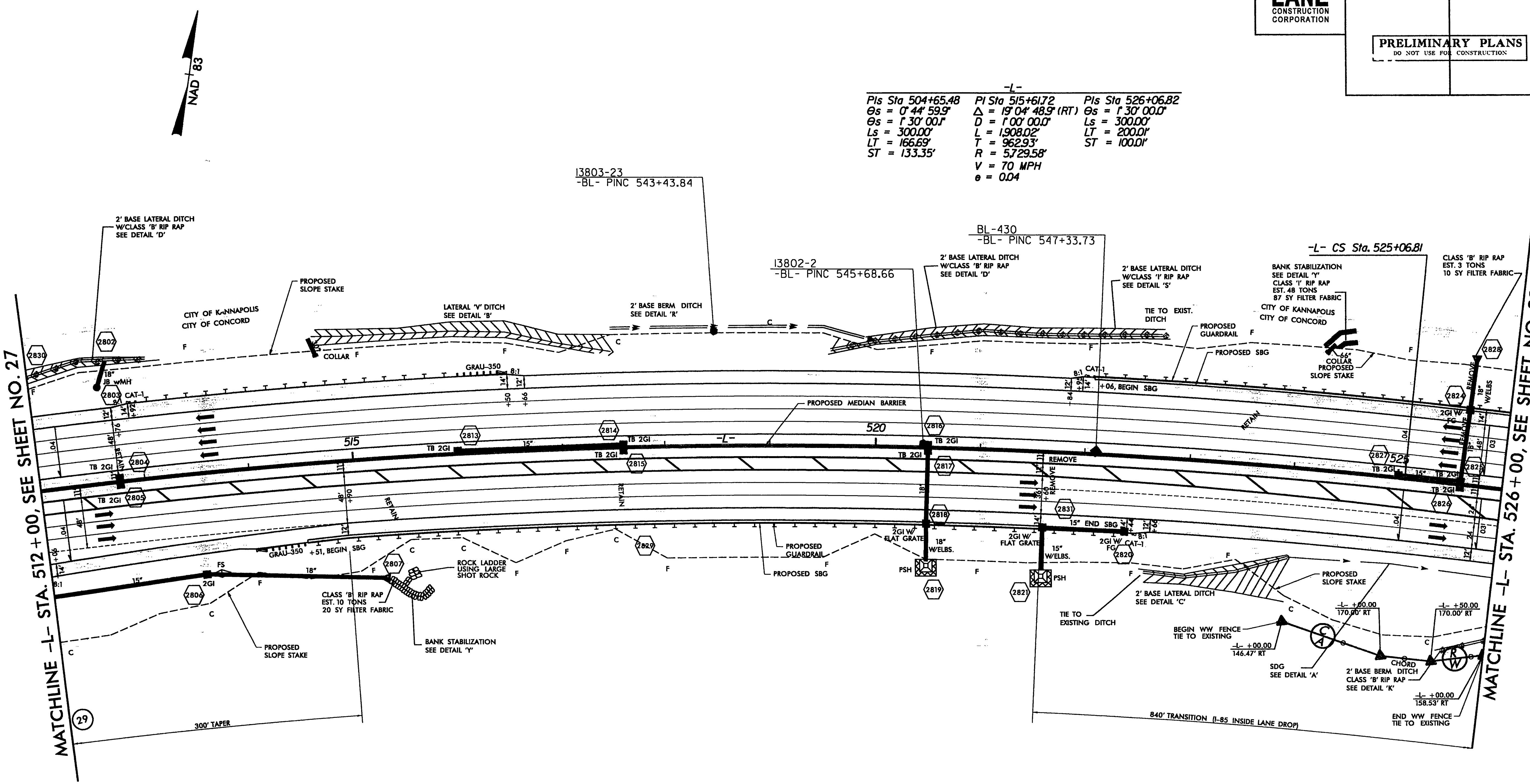
DO NOT PLACE ROCK IN BED OF JURISDICTIONAL STREAMS.

HDR Engineering, Inc. of the Carolinas
3733 National Drive, Suite 207 Raleigh, N.C. 27612
N.C.B.E.L.S. License Number: F-0116

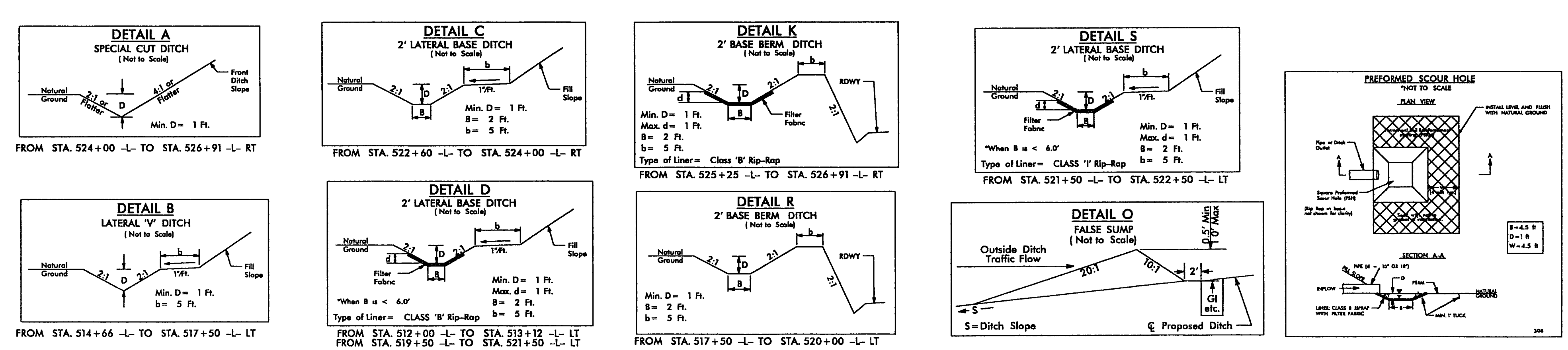
THE LANE CONSTRUCTION CORPORATION

PROJECT REFERENCE NO.	SHEET NO.
I-3803B	28
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



SEE SHEET NO. 76, 77 FOR -L- PROFILE.
DO NOT PLACE ROCK IN BED OF JURISDICTIONAL STREAMS.



REVISIONS

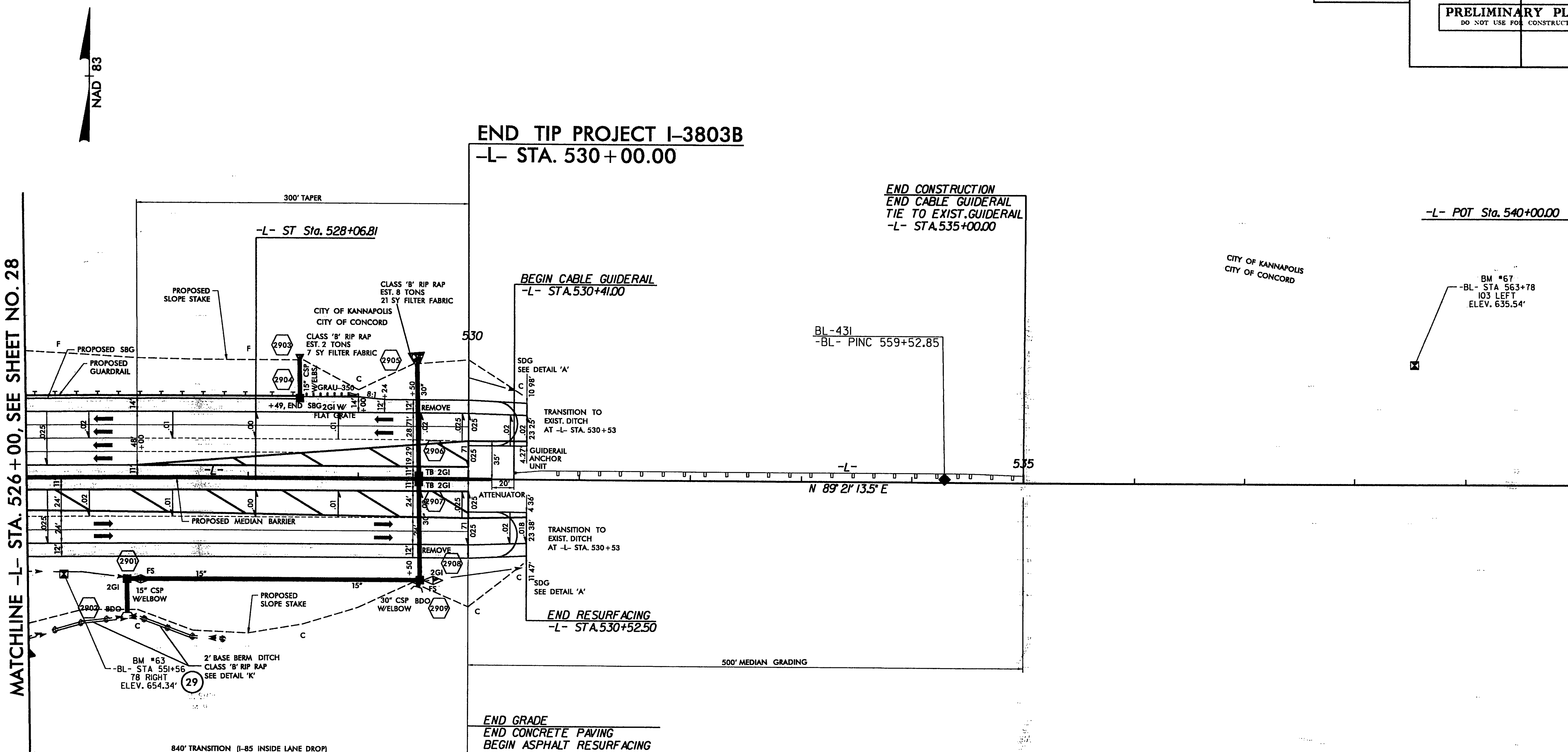
HDR Engineering, Inc. of the Carolinas
3733 National Drive, Suite 207 Raleigh, N.C. 27612
N.C.B.E.L.S. License Number: F-0116

THE LANE CONSTRUCTION CORPORATION

PROJECT REFERENCE NO.	SHEET NO.
I-3803B	29
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

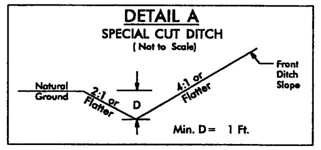
REVISIONS



-L-

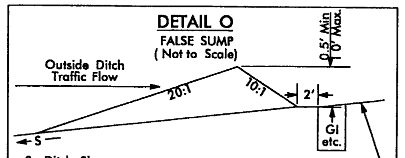
Pls Sta 504+65.48	PI Sta 515+61.72	Pls Sta 526+06.82
θs = 0°44' 59.9"	Δ = 19° 04' 48.9" (RT)	θs = 1° 30' 00.0"
θs = 1° 30' 00.1"	D = 1° 00' 00.0"	Ls = 300.00'
Ls = 300.00'	L = 1,908.02'	LT = 200.01'
LT = 166.69'	T = 962.93'	ST = 100.01'
ST = 133.35'	R = 5,729.58'	
	V = 70 MPH	
	e = 0.04	

DETAIL A
SPECIAL CUT DITCH
(Not to Scale)

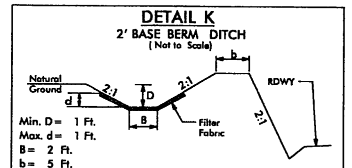


FROM STA. 529+56 -L- TO STA. 530+53 -L- RT
FROM STA. 530+00 -L- TO STA. 530+53 -L- LT

DETAIL O
FALSE SUMP
(Not to Scale)



DETAIL K
2' BASE BERM DITCH
(Not to Scale)



FROM STA. 525+25 -L- TO STA. 526+91 -L- RT
FROM STA. 526+91 -L- TO STA. 527+75 -L- RT

SEE SHEET NO. 77 FOR -L- PROFILE.
DO NOT PLACE ROCK IN BED OF JURISDICTIONAL STREAMS.

PROJECT REFERENCE NO.	SHEET NO.
I-3803B	30

HDR Engineering, Inc. of the Carolinas
3733 National Drive, Suite 207 Raleigh, N.C. 27612
N.C.B.E.L.S. License Number: F-0116

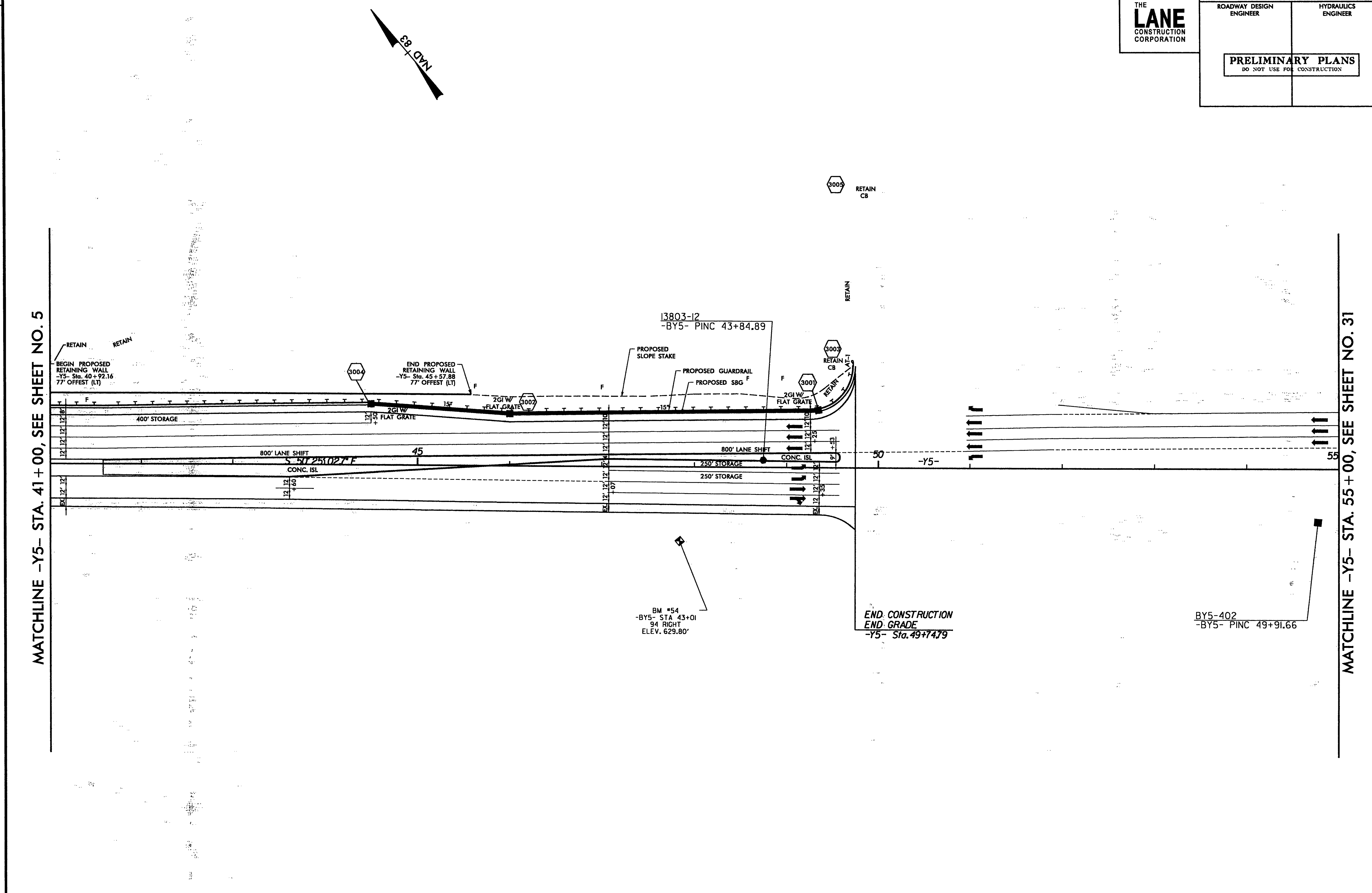
THE LANE CONSTRUCTION CORPORATION

R/W SHEET NO.

ROADWAY DESIGN ENGINEER

HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



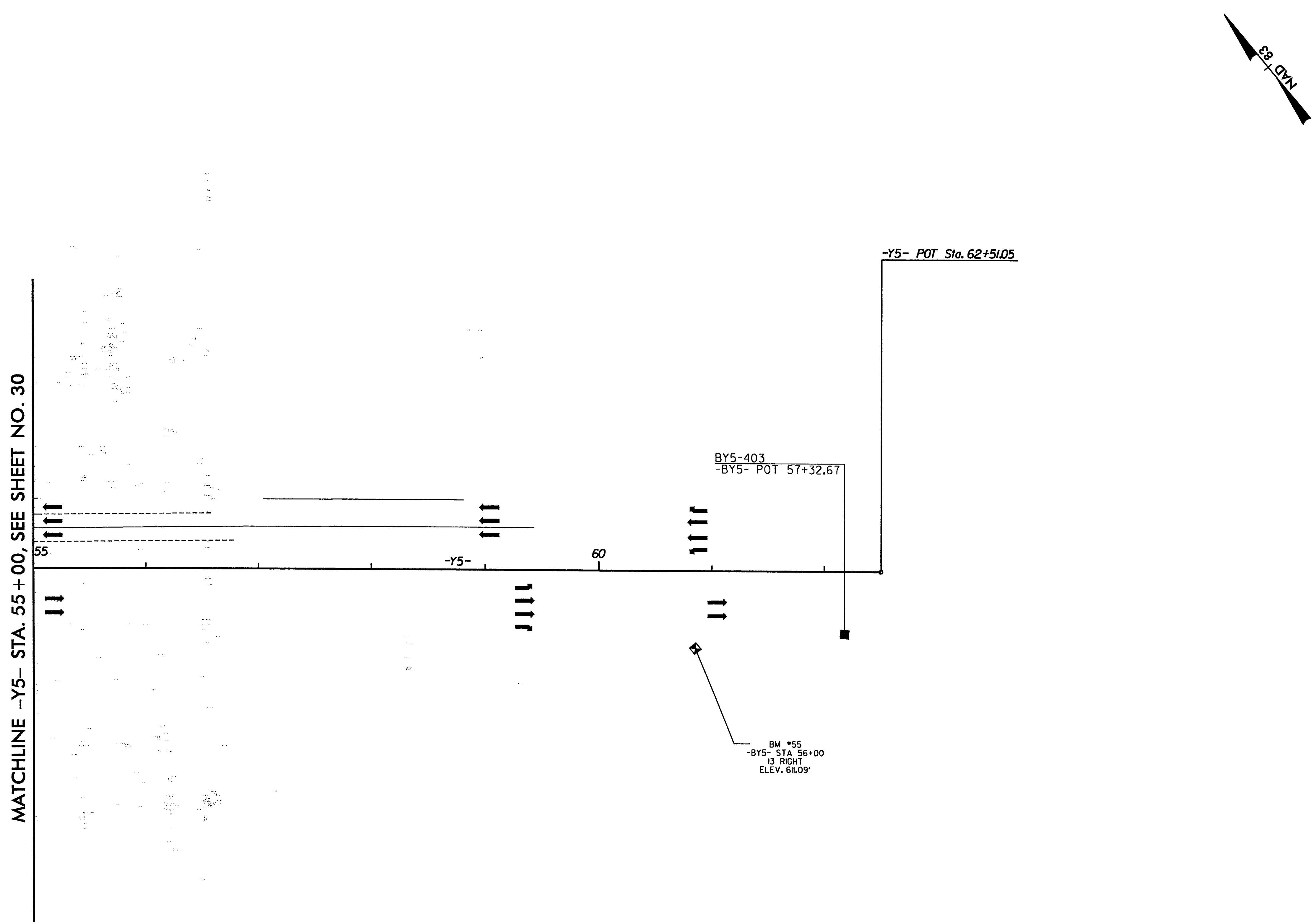
SEE SHEET NO. 78 FOR -Y5- PROFILE.
DO NOT PLACE ROCK IN BED OF JURISDICTIONAL STREAMS.

HDR Engineering, Inc. of the Carolinas
3733 National Drive, Suite 207 Raleigh, N.C. 27612
N.C.B.E.L.S. License Number: F-0116

PROJECT REFERENCE NO.	SHEET NO.
I-3803B	31
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

THE LANE CONSTRUCTION CORPORATION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



REVISIONS

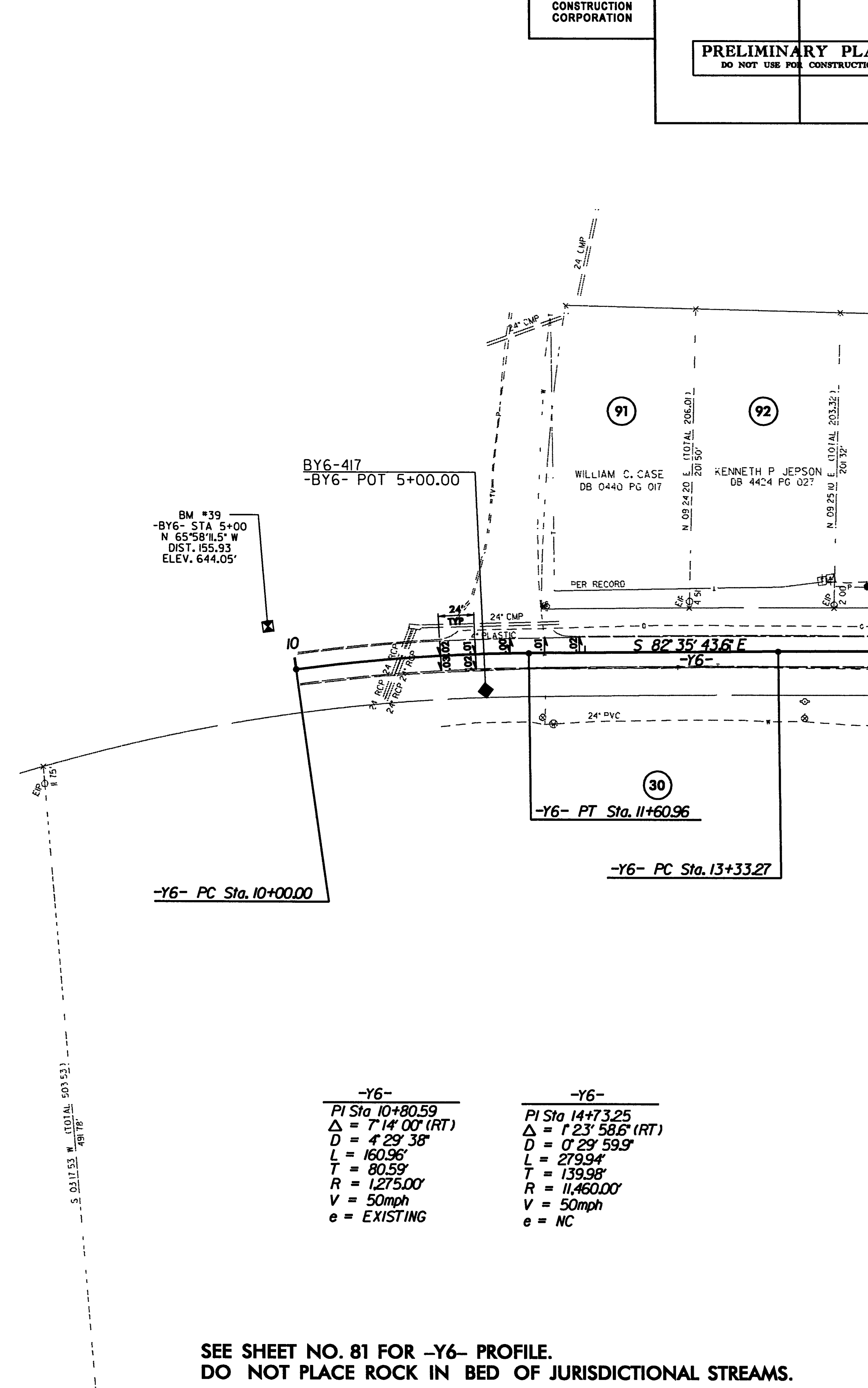
SEE SHEET NO. 78 FOR -Y5- PROFILE.
DO NOT PLACE ROCK IN BED OF JURISDICTIONAL STREAMS.

HDR Engineering, Inc. of the Carolinas
3733 National Drive, Suite 207 Raleigh, N.C. 27612
N.C.B.E.L.S. License Number: F-0116

THE LANE CONSTRUCTION CORPORATION

PROJECT REFERENCE NO.	SHEET NO.
I-3803B	32
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



MATCHLINE -Y6- STA. 14+00, SEE SHEET NO. 33

-Y6-	-Y6-
PI Sta 10+80.59	PI Sta 14+73.25
Δ = 7° 14' 00" (RT)	Δ = 1° 23' 58.6" (RT)
D = 4° 29' 38"	D = 0° 29' 59.9"
L = 160.96'	L = 279.94'
T = 80.59'	T = 139.98'
R = 1,275.00'	R = 11,460.00'
V = 50mph	V = 50mph
e = EXISTING	e = NC

SEE SHEET NO. 81 FOR -Y6- PROFILE.
DO NOT PLACE ROCK IN BED OF JURISDICTIONAL STREAMS.

REVISIONS

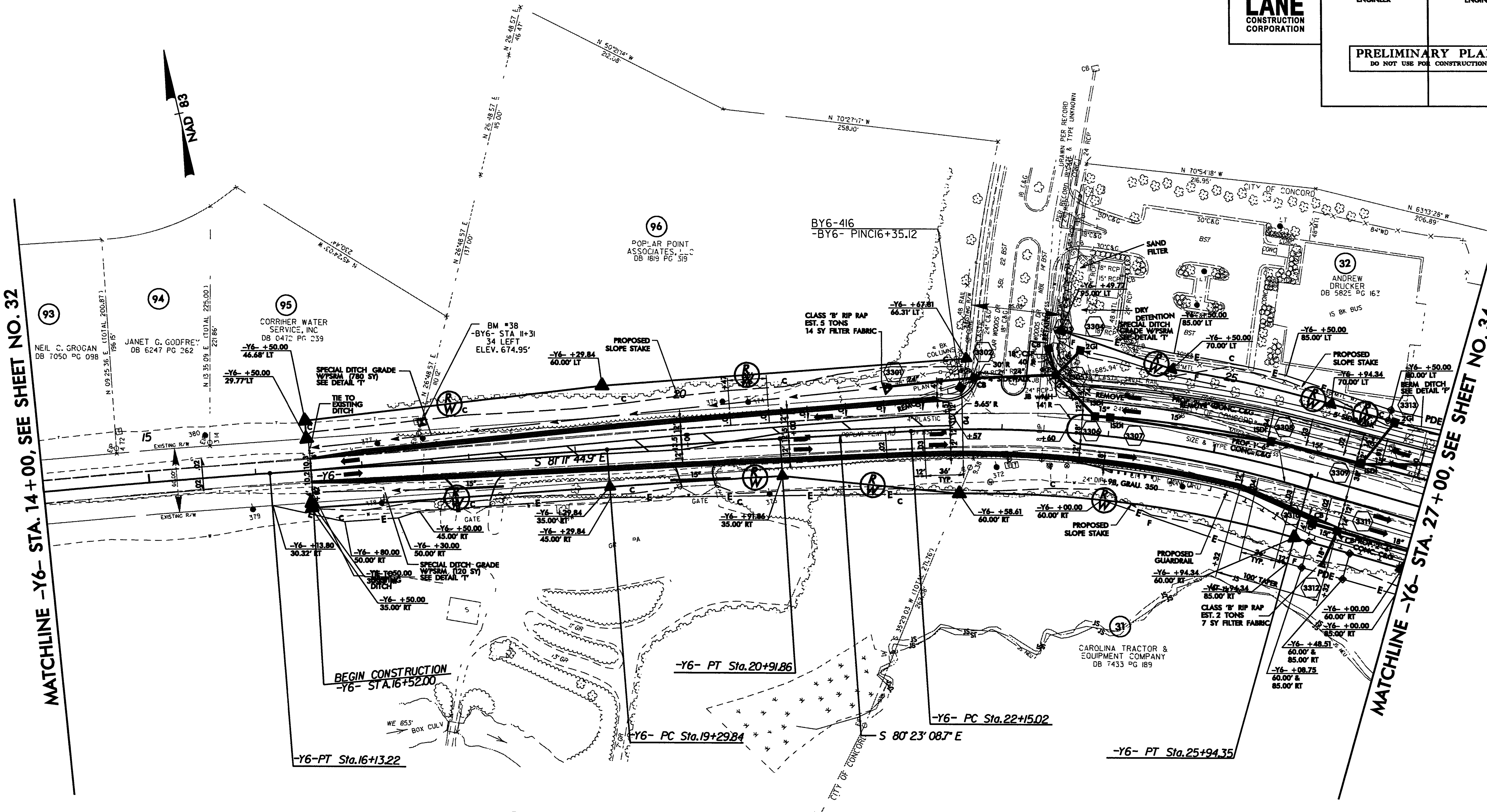
PLOT DRIVER: NCDOT_pdf_color_eng_100.plt PENTABLE: NCDOT_pshpfl+bl
USER: cmyers DATE: 3/29/2011 TIME: 1:20:40 PM SCALE: half=100:1 - full=50:1
FILE: Mktg_Charlotte\Charlotte_Trans_Design_Build\Lane_I-3803B_I-85_Widening\I-3803B\Roadway\Proj\I3803B_RDY_PSH_32.dgn

HDR Engineering, Inc. of the Carolinas
3733 National Drive, Suite 207 Raleigh, N.C. 27612
N.C.B.E.L.S. License Number: F-0116

PROJECT REFERENCE NO.	SHEET NO.
I-3803B	33
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

THE LANE CONSTRUCTION CORPORATION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



-Y6-	-Y6-	-Y6-
PI Sta 14+73.25	PI Sta 20+10.85	PI Sta 24+06.49
Δ = 1° 23' 58.6" (RT)	Δ = 0° 48' 36.2" (RT)	Δ = 19° 13' 59.3" (RT)
D = 0° 29' 59.9"	D = 0° 29' 59.9"	D = 5° 04' 13.5"
L = 279.94'	L = 162.02'	L = 379.32'
T = 139.98'	T = 81.01'	T = 191.46'
R = 11,460.00'	R = 11,460.00'	R = 1,130.00'
V = 50mph	V = 50mph	V = 50mph
e = NC	e = NC	e = 0.04

SEE SHEET NO. 81 FOR -Y6- PROFILE.
SEE PMP SHEETS FOR WCR CURB STATIONING
DO NOT PLACE ROCK IN BED OF JURISDICTIONAL STREAMS.

DETAIL T
SPECIAL CUT DITCH
(Not to Scale)
Natural Ground — Front Ditch Slope — 4:1 or Flatter
Min. D= 1Ft.
Max d= 1Ft.
Type of Liner= PSRM
FROM STA. 11+82 -Y6- TO STA. 22+00 -Y6- LT
FROM STA. 23+68 -Y6- TO STA. 25+00 -Y6- LT

DETAIL F
BERM 'V' DITCH
(Not to Scale)
Min. D= 1 Ft.
b= 5 Ft.
FROM STA. 26+56 -Y6- TO STA. 28+00 -Y6- LT

REVISIONS

PLOT DRIVER: NCDOT_pdf_color_eng_100 plt PENTABLE: NCDOT_pshpfl tbl
USER: cmyers DATE: 3/29/2011 TIME: 1:22:05 PM SCALE: half=100:1 - full=50:1
FILE: Mktg_Charlotte\Charlotte_Trans_Design_Build\Lane_I-3803B_I-85_Widening\I-3803B\Roadway\Proj\I3803B_RDY_PSH_33.dgn

HDR Engineering, Inc. of the Carolinas
3733 National Drive, Suite 207 Raleigh, N.C. 27612
N.C.B.E.L.S. License Number: F-0116

THE LANE CONSTRUCTION CORPORATION

PROJECT REFERENCE NO.	SHEET NO.
I-3803B	34
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

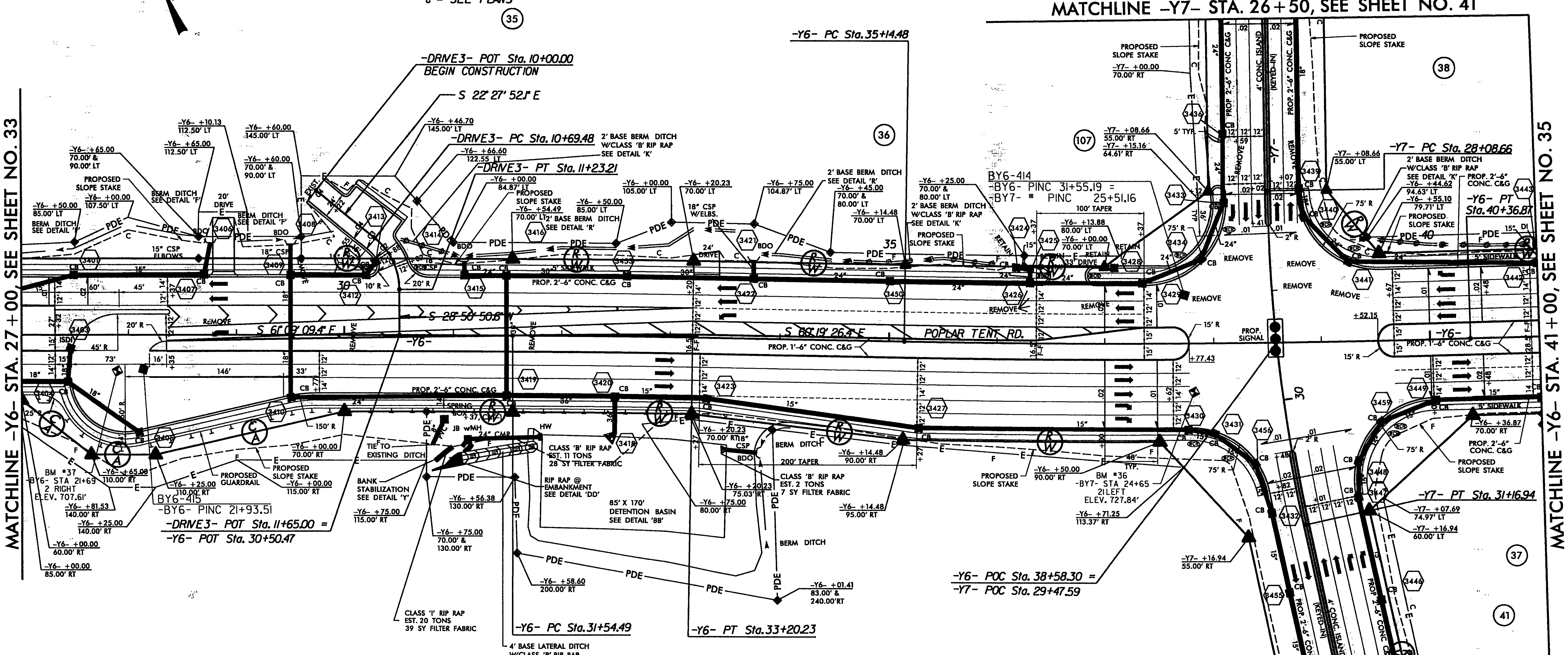
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

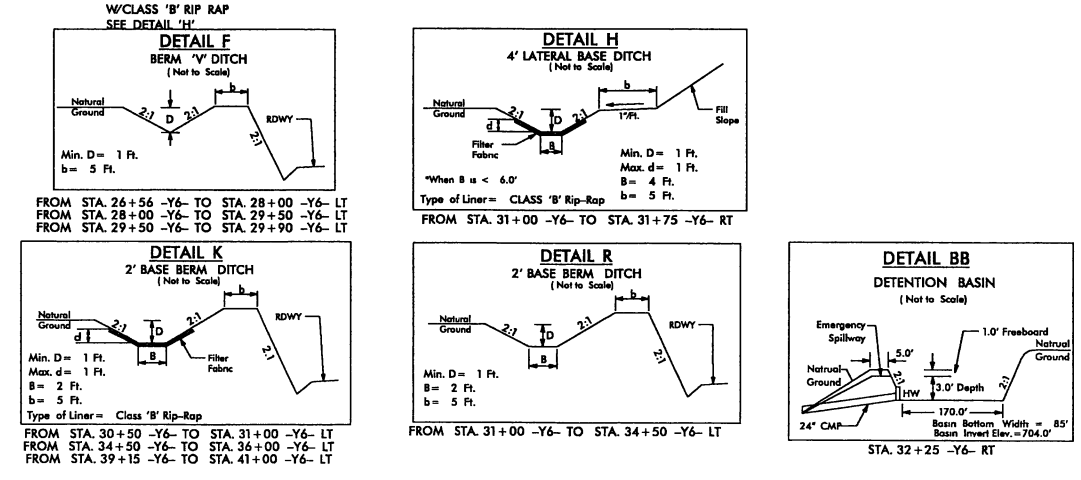
-Y6-
PI Sta 32+37.36
Δ = 0° 49' 43.0" (RT)
D = 0° 29' 59.9"
L = 165.74'
T = 82.87'
R = 11,460.00'
V = 50mph
e = NC

-Y6-
PI Sta 37+75.72
Δ = 2° 36' 42.2" (LT)
D = 0° 29' 59.9"
L = 522.38'
T = 261.24'
R = 11,460.00'
V = 50mph
e = NC

-Y7-
PI Sta 29+63.34
Δ = 11° 46' 30.9" (LT)
D = 3° 49' 11.0"
L = 308.28'
T = 154.68'
R = 1,500.00'
V = 50mph
e = SEE PLANS

-DRIVE3-
PI Sta 10+98.30
Δ = 51° 18' 42.7" (RT)
D = 95° 29' 34.7"
L = 53.73'
T = 28.82'
R = 60.00'





SEE SHEET NO. 81, 82 FOR -Y6- PROFILE.
SEE SHEET NO. 91 FOR -Y7- PROFILE.
SEE PMP SHEETS FOR WCR CURB STATIONING
DO NOT PLACE ROCK IN BED
OF JURISDICTIONAL STREAMS.

REVISIONS

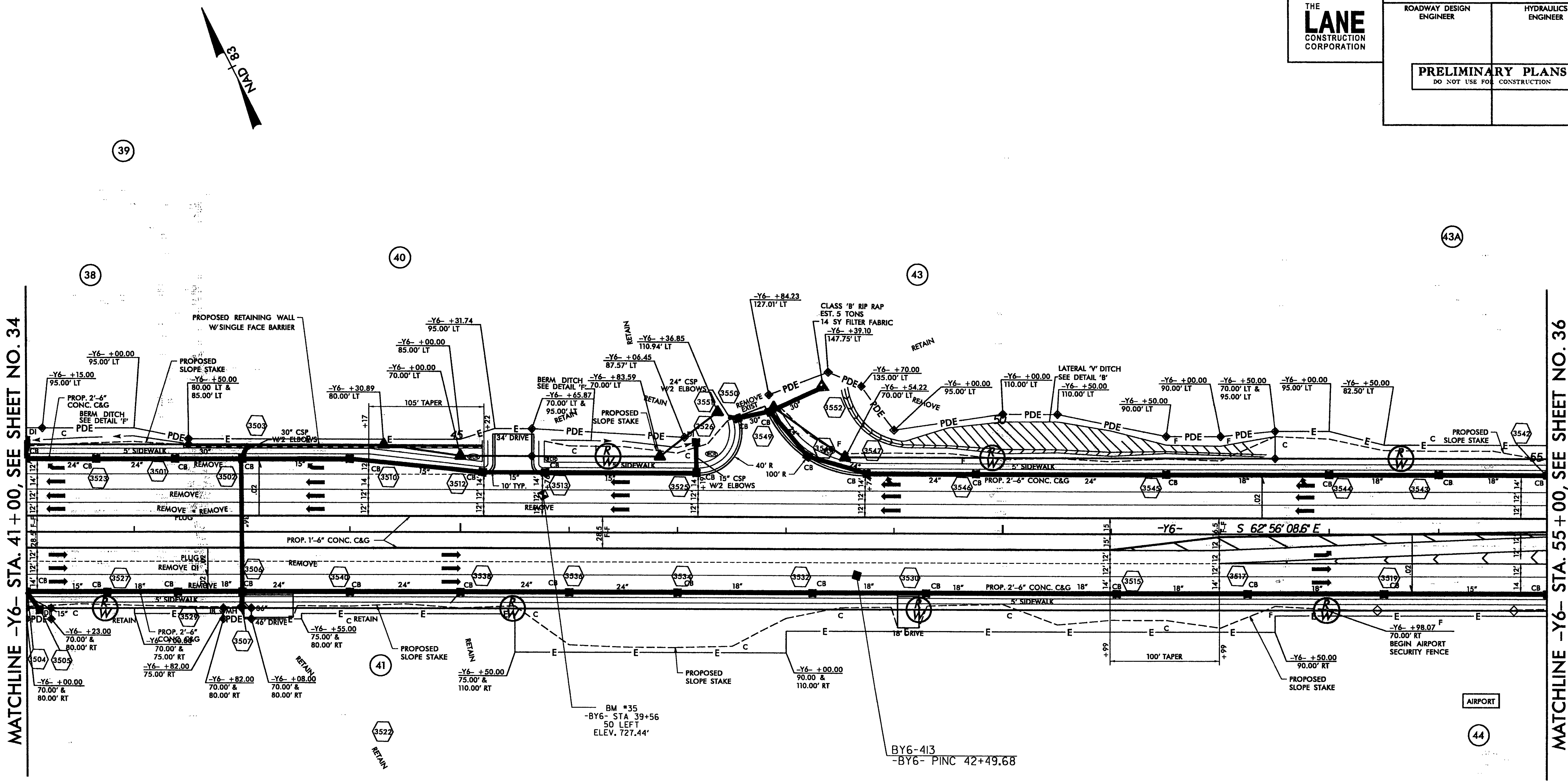
HDR Engineering, Inc. of the Carolinas
3733 National Drive, Suite 207 Raleigh, N.C. 27612
N.C.B.E.L.S. License Number: F-0116

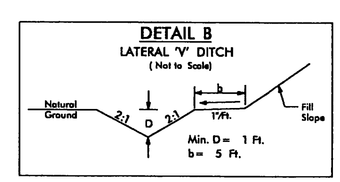
THE LANE CONSTRUCTION CORPORATION

PROJECT REFERENCE NO.	SHEET NO.
I-3803B	35
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

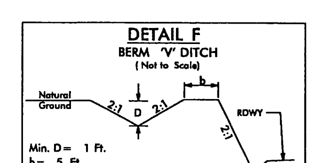
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

REVISIONS





FROM STA. 48+50 -Y6- TO STA. 52+25 -Y6- LT



FROM STA. 41+00 -Y6- TO STA. 42+50 -Y6- LT
FROM STA. 46+00 -Y6- TO STA. 47+17 -Y6- LT

SEE SHEET NO 82 FOR -Y6- PROFILE.
SEE PMP SHEETS FOR WCR CURB STATIONING
DO NOT PLACE ROCK IN BED OF JURISDICTIONAL STREAMS.

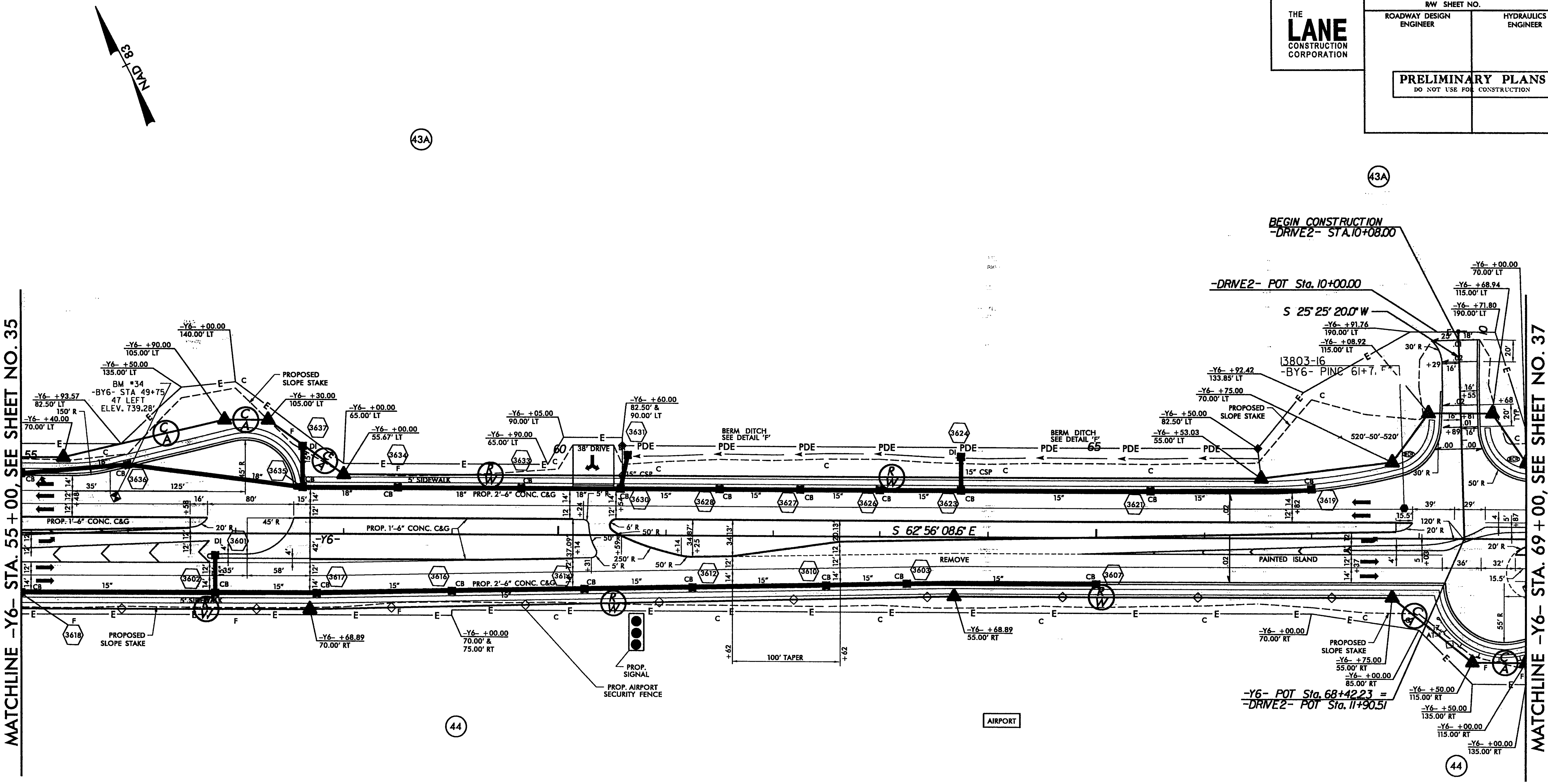
HDR Engineering, Inc. of the Carolinas
3733 National Drive, Suite 207 Raleigh, N.C. 27612
N.C.B.E.L.S. License Number: F-0116

THE LANE CONSTRUCTION CORPORATION

PROJECT REFERENCE NO.	SHEET NO.
I-3803B	36
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

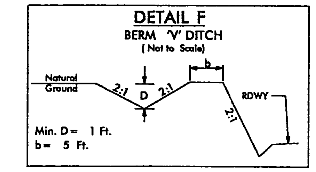
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

REVISIONS



SEE SHEET NO. 82, 83 FOR -Y6- PROFILE.
SEE PMP SHEETS FOR WCR CURB STATIONING
DO NOT PLACE ROCK IN BED OF JURISDICTIONAL STREAMS.

DETAIL F
BERM 'V' DITCH
(Not to Scale)



FROM STA. 60+65 -Y6- TO STA. 66+35 -Y6- LT

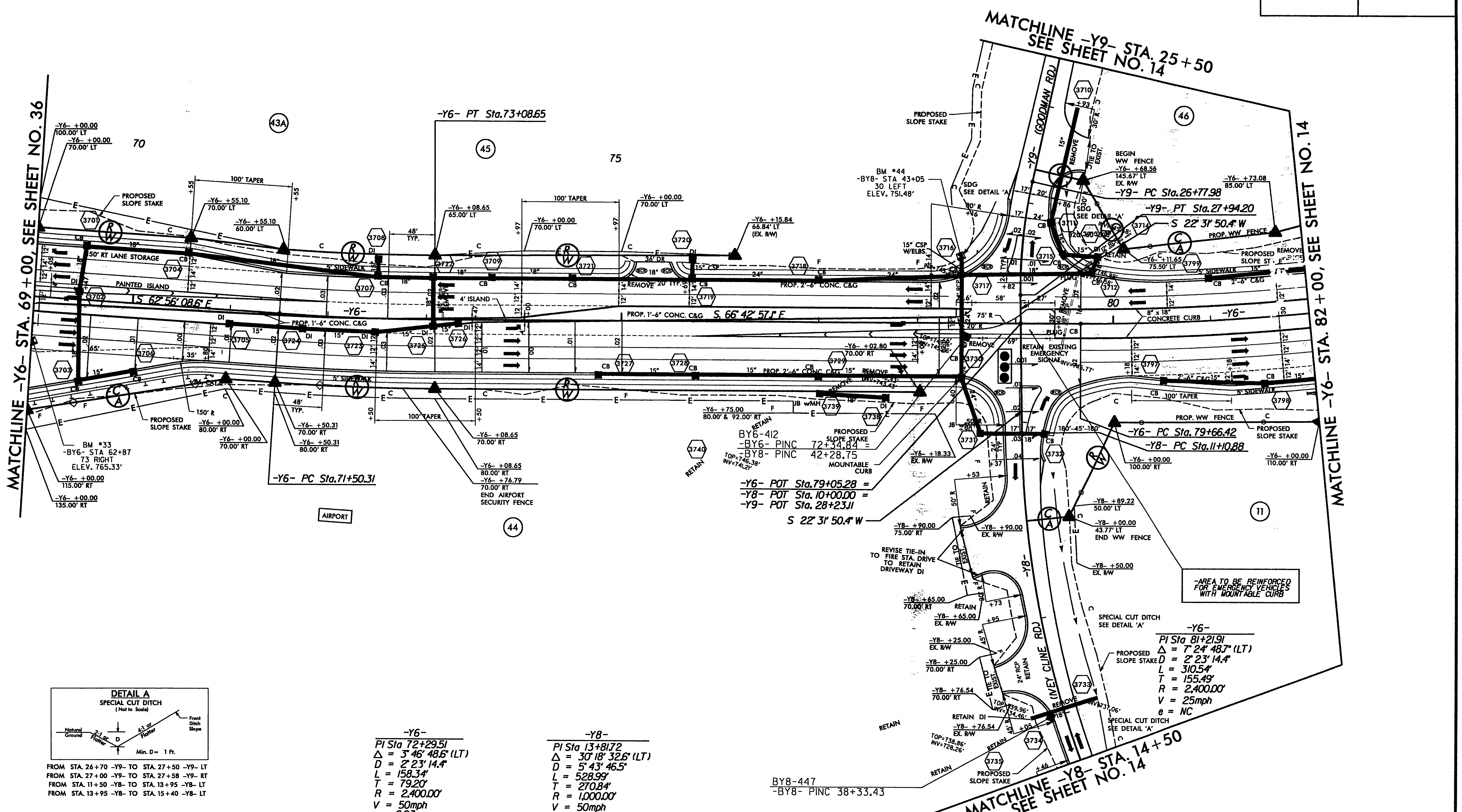
HDR Engineering, Inc. of the Carolinas
3733 National Drive, Suite 207 Raleigh, N.C. 27612
N.C.B.E.L.S. License Number: F-0116

THE LANE CONSTRUCTION CORPORATION

PROJECT REFERENCE NO.	SHEET NO.
I-3803B	37
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

-Y9-
PI Sta 27+36.35
Δ = 13° 19' 06.4" (LT)
D = 11° 27' 33.0"
L = 116.23'
T = 58.38'
R = 500.00'
V = 50mph
e = SEE PLANS



DETAIL A
SPECIAL CUT DITCH
(Not to Scale)

Natural Ground — 2:1 or Flatter — D — 4:1 or Flatter — Front Ditch Slope — Min. D= 1 Ft.

FROM STA. 26+70 -Y9- TO STA. 27+50 -Y9- LT
FROM STA. 27+00 -Y9- TO STA. 27+58 -Y9- RT
FROM STA. 11+50 -Y8- TO STA. 13+95 -Y8- LT
FROM STA. 13+95 -Y8- TO STA. 15+40 -Y8- LT

-Y6-
PI Sta 72+29.51
Δ = 3° 46' 48.6" (LT)
D = 2° 23' 14.4"
L = 158.34'
T = 79.20'
R = 2,400.00'
V = 50mph
e = 0.03

-Y8-
PI Sta 13+81.72
Δ = 30° 18' 32.6" (LT)
D = 5° 43' 46.5"
L = 528.99'
T = 270.84'
R = 1,000.00'
V = 50mph
e = 0.04

-Y6-
PI Sta 81+21.91
Δ = 7° 24' 48.7" (LT)
D = 2° 23' 14.4"
L = 310.54'
T = 155.49'
R = 2,400.00'
V = 25mph
e = NC

SEE SHEET NO. 83 FOR -Y6- PROFILE.
SEE SHEET NO. 92 FOR -Y8- PROFILE.
SEE SHEET NO. 92 FOR -Y9- PROFILE.
SEE PMP SHEETS FOR WCR CURB STATIONING
DO NOT PLACE ROCK IN BED OF JURISDICTIONAL STREAMS.

REVISIONS

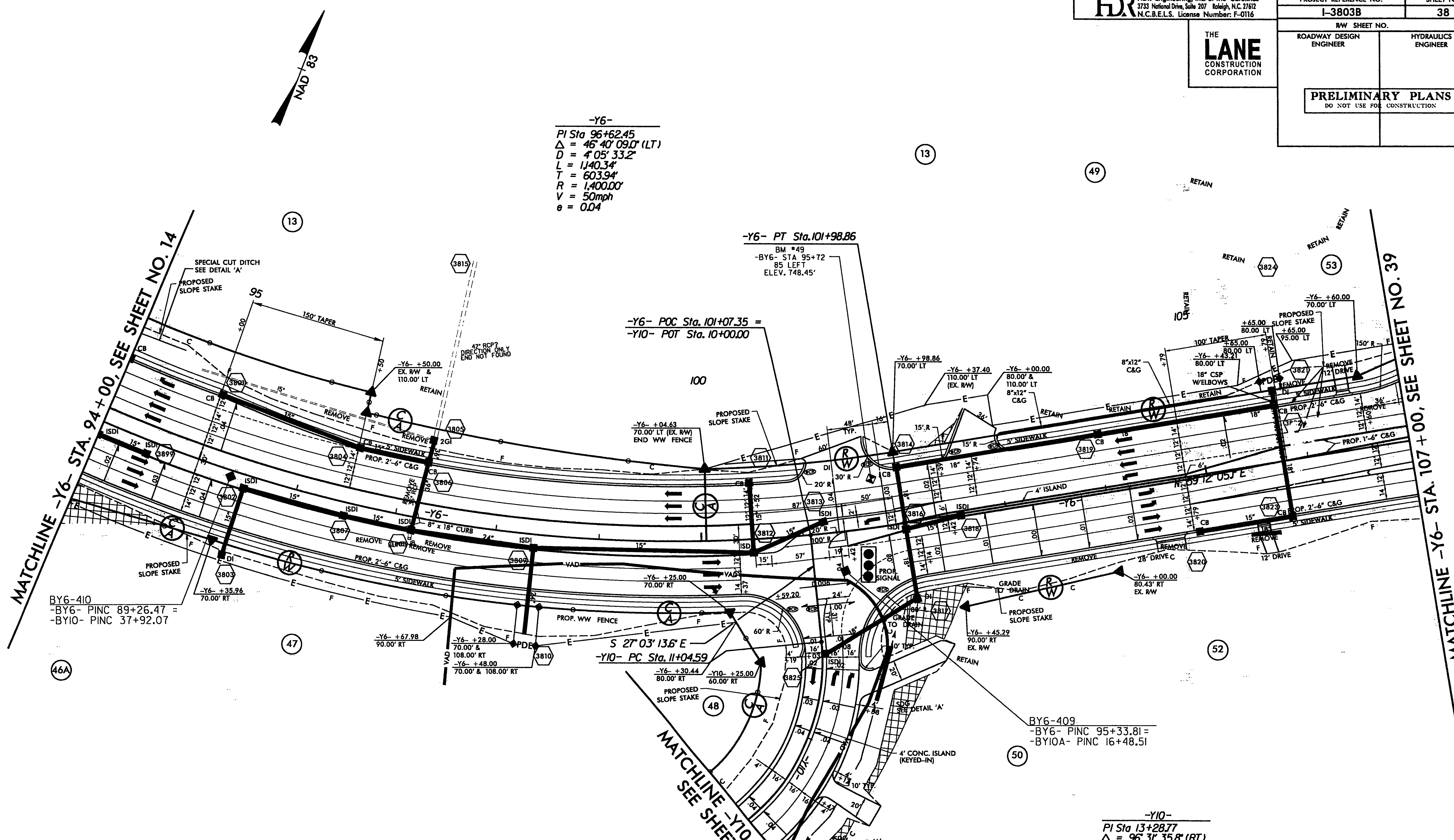
HDR Engineering, Inc. of the Carolinas
3733 National Drive, Suite 207 Raleigh, N.C. 27612
N.C.B.E.L.S. License Number: F-0116

THE LANE CONSTRUCTION CORPORATION

PROJECT REFERENCE NO.	SHEET NO.
I-3803B	38
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

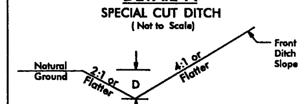
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

-Y6-
PI Sta 96+62.45
Δ = 46° 40' 09.0" (LT)
D = 4° 05' 33.2"
L = 1,140.34'
T = 603.94'
R = 1,400.00'
V = 50mph
e = 0.04



-Y10-
PI Sta 13+28.77
Δ = 96° 31' 35.8" (RT)
D = 28° 38' 52.4"
L = 336.94'
T = 224.19'
R = 200.00'
V = 25mph
e = 0.04

DETAIL A
SPECIAL CUT DITCH
(Not to Scale)



FROM STA. 92+16 -Y6- TO STA. 94+50 -Y6- LT
FROM STA. 11+00 -Y10- TO STA. 12+00 -Y10- LT
FROM STA. 12+00 -Y10- TO STA. 13+50 -Y10- LT

SEE SHEET NO. 84 FOR -Y6- PROFILE.
SEE SHEET NO. 93 FOR -Y10- PROFILE.
SEE PMP SHEETS FOR WCR CURB STATIONING
REMOVAL OF EXISTING PAVEMENT
DO NOT PLACE ROCK IN BED OF JURISDICTIONAL STREAMS.

REVISIONS

HDR Engineering, Inc. of the Carolinas
3733 National Drive, Suite 207 Raleigh, N.C. 27612
N.C.B.E.L.S. License Number: F-0116

PROJECT REFERENCE NO.	SHEET NO.
I-3803B	39

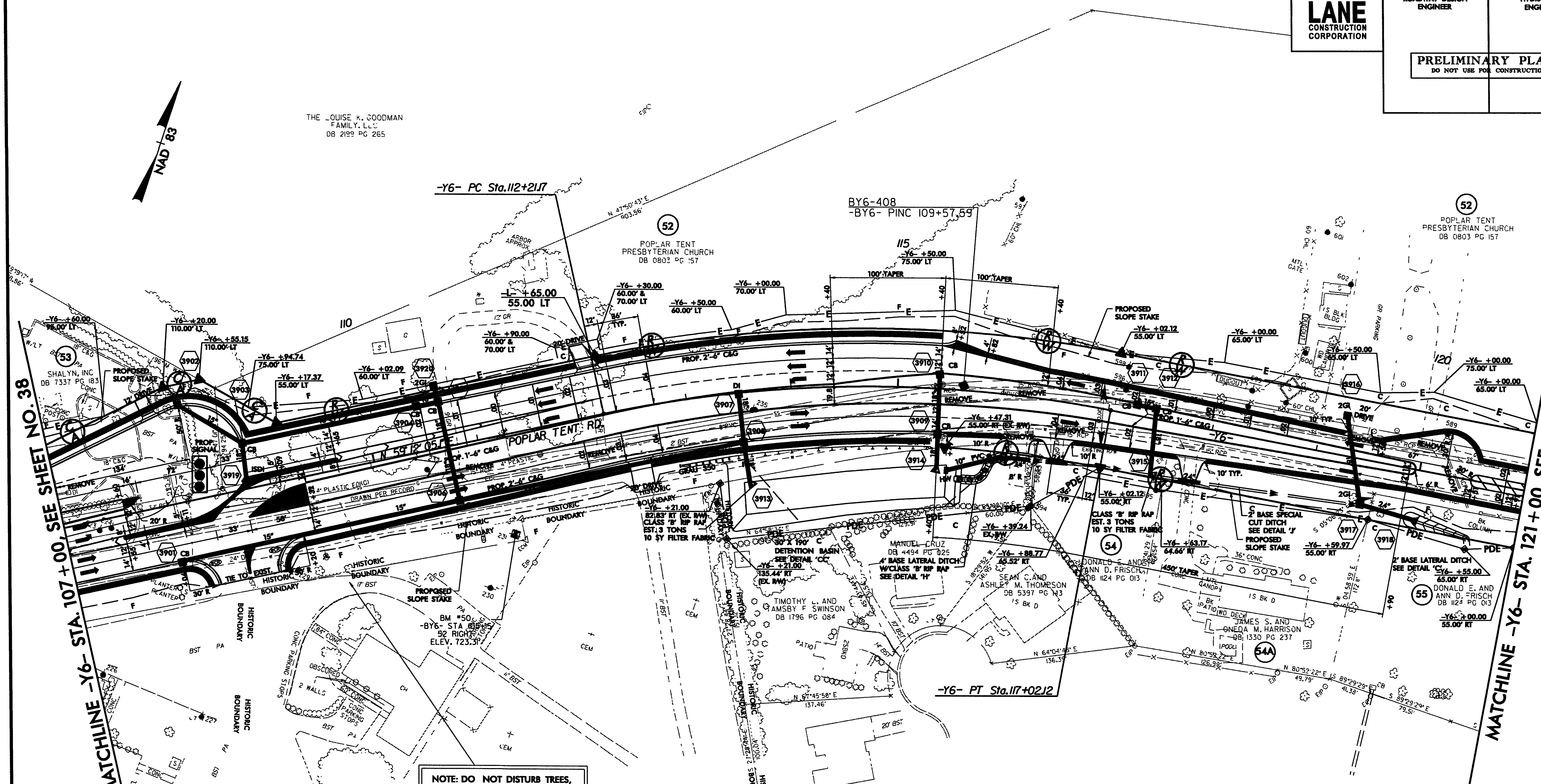
R/W SHEET NO.

ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER

THE LANE CONSTRUCTION CORPORATION

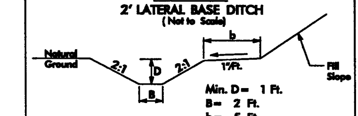
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

REVISIONS



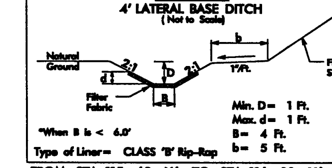
-Y6-
PI Sta 114+64.91
Δ = 22° 57' 49.3" (RT)
D = 4° 46' 28.7"
L = 480.95'
T = 243.75'
R = 1,200.00'
V = 50mph
e = 0.04

DETAIL C
2' LATERAL BASE DITCH
(Not to Scale)



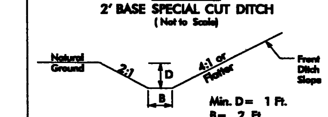
FROM STA. 120+00 -Y6- TO STA. 120+55 -Y6- RT

DETAIL H
4' LATERAL BASE DITCH
(Not to Scale)



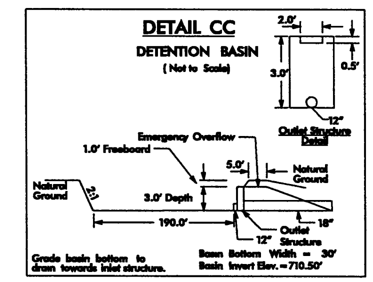
FROM STA. 115+60 -Y6- TO STA. 116+00 -Y6- RT

DETAIL J
2' BASE SPECIAL CUT DITCH
(Not to Scale)



FROM STA. 116+00 -Y6- TO STA. 119+69 -Y6- RT

DETAIL CC
DETENTION BASIN
(Not to Scale)



STA. 114+50 -Y6- RT

SEE SHEET NO. 84 FOR -Y6- PROFILE.
SEE PMP SHEETS FOR WCR CURB STATIONING
DO NOT PLACE ROCK IN BED OF JURISDICTIONAL STREAMS.

PLOT DRIVER: NCDOT_pdf_color_eng_100.plt
PENTABLE: NCDOT_pshpfl.tbl
USER: cmyers DATE: 3/29/2011 TIME: 9:07:51 AM SCALE: half=100:1 - full=50:1
FILE: Mktg_Charlotte\Charlotte_Trans_Design_Build\Lane_I-3803B_I-85_Widening\I-3803B\Roadway\Proj\I3803B_RDY_PSH_39.dgn

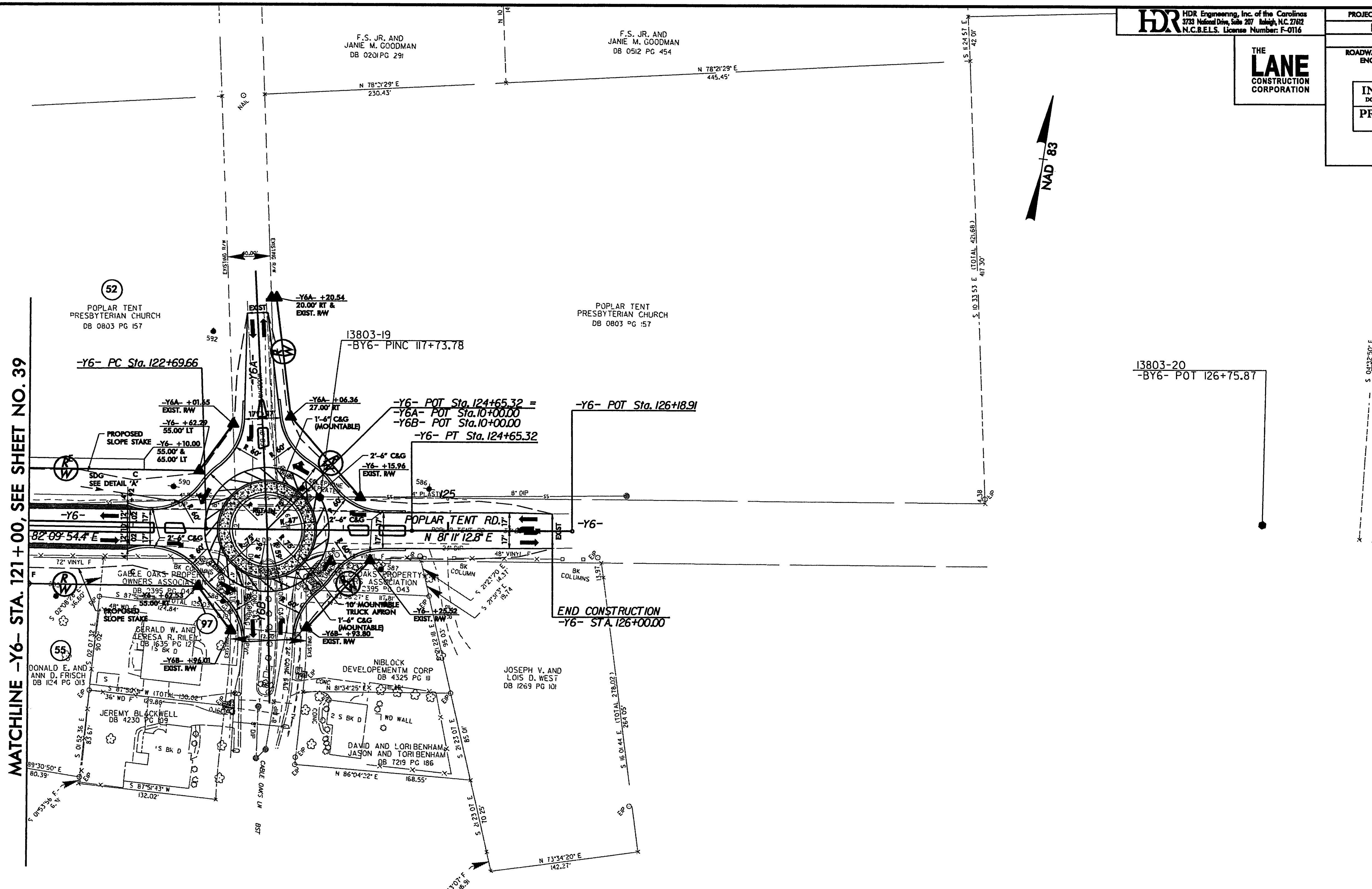
PROJECT REFERENCE NO.	SHEET NO.
I-3803B	40
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

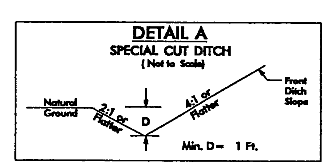
HDR Engineering, Inc. of the Carolinas
3733 National Drive, Suite 207 Raleigh, N.C. 27612
N.C.B.E.L.S. License Number: F-0116

THE LANE CONSTRUCTION CORPORATION

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION





FROM STA. 121+50 -Y6- TO STA. 122+45 -Y6- LT

SEE SHEET NO. 85 FOR -Y6- PROFILE.
DO NOT PLACE ROCK IN BED OF JURISDICTIONAL STREAMS.

REVISIONS

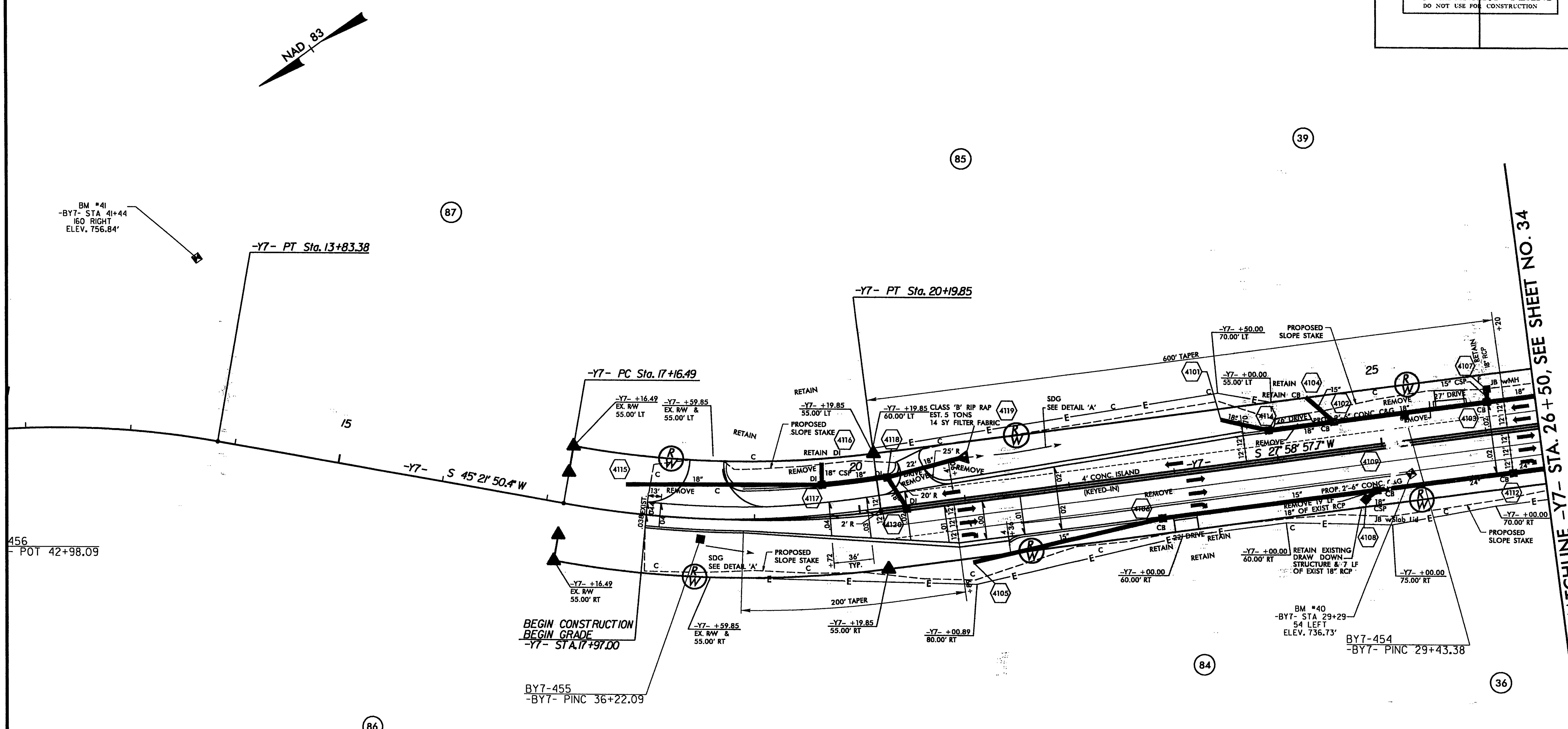
PLOT DRIVER: NCDOT_pdf_color_eng_100.plt PENTABLE: NCDOT_pshpfl.tbl
USER: charnden DATE: 3/16/2011 TIME: 4:47:34 PM SCALE: half=100:1 - full=50:1
FILE: Mktg_Charlotte\Charlotte_Trans_Design_Build\Lane_I-3803B_I-85_Widening\I-3803B\Roadway\Proj\I3803B_RDY_PSH_40.dgn

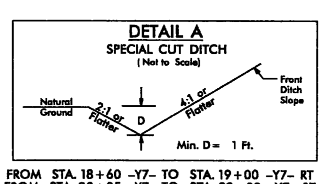
HDR Engineering, Inc. of the Carolinas
3733 National Drive, Suite 207 Raleigh, N.C. 27612
N.C.B.E.L.S. License Number: F-0116

THE LANE CONSTRUCTION CORPORATION

PROJECT REFERENCE NO.	SHEET NO.
I-3803B	41
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION





-Y7-
PI Sta 11+94.81
Δ = 25° 06' 13.6" (RT)
D = 6° 32' 53.1"
L = 383.38'
T = 194.81'
R = 875.00'

-Y7-
PI Sta 18+69.34
Δ = 17° 22' 52.8" (LT)
D = 5° 43' 46.5"
L = 303.36'
T = 152.85'
R = 1,000.00'
V = 40mph
e = 0.04

SEE SHEET NO. 91 FOR -Y7- PROFILE.
DO NOT PLACE ROCK IN BED OF JURISDICTIONAL STREAMS.

REVISIONS

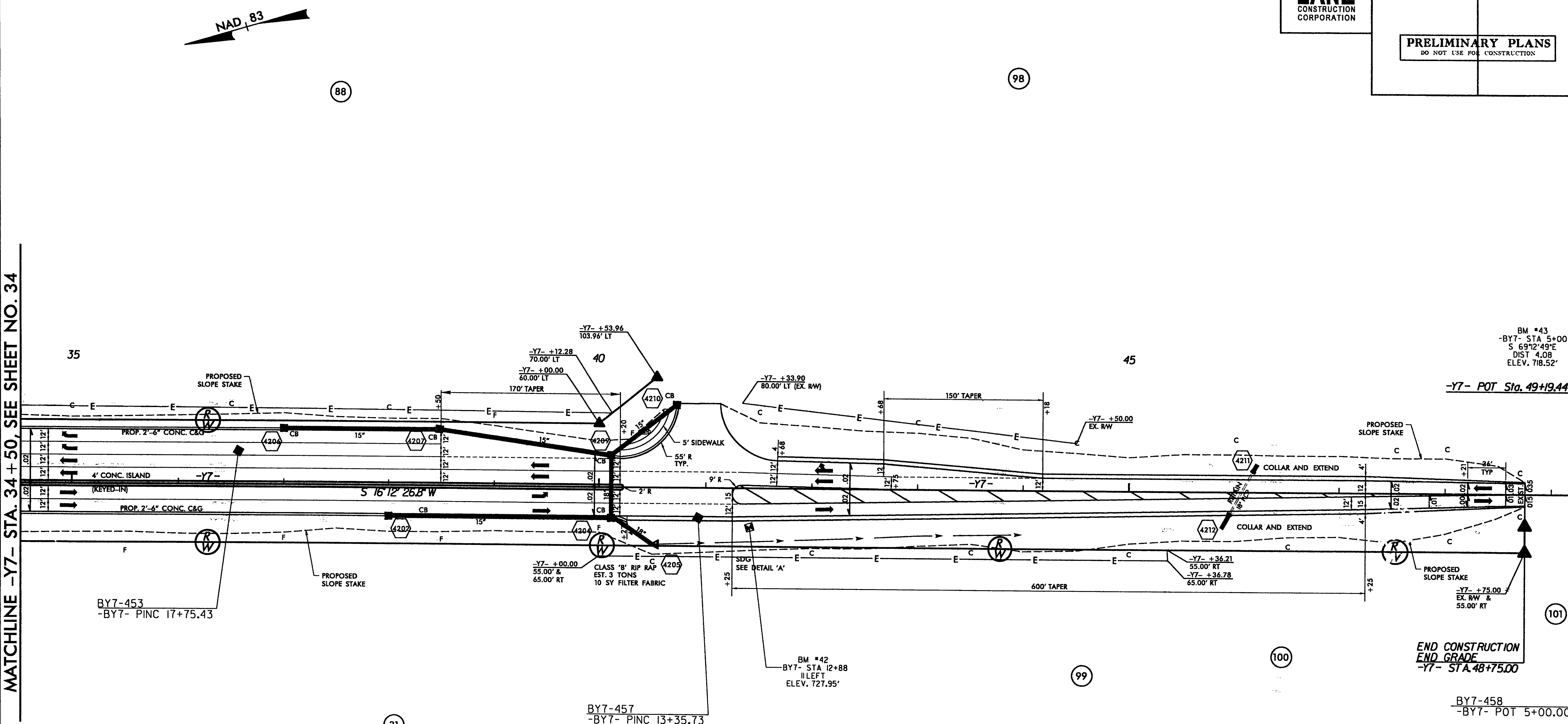
HDR Engineering, Inc. of the Carolinas
3733 National Drive, Suite 207 Raleigh, N.C. 27612
N.C.B.E.L.S. License Number: F-0116

PROJECT REFERENCE NO.	SHEET NO.
I-3803B	42
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

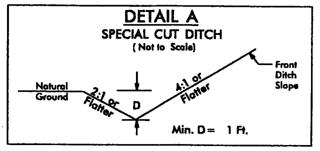
THE LANE CONSTRUCTION CORPORATION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

REVISIONS



DETAIL A
SPECIAL CUT DITCH
(Not to Scale)



FROM STA. 40+50 -Y7- TO STA. 44+00 -Y7- RT

SEE SHEET NO. 91, 92 FOR -Y7- PROFILE.
SEE PMP SHEETS FOR WCR CURB STATIONING
DO NOT PLACE ROCK IN BED OF JURISDICTIONAL STREAMS.

HDR Engineering, Inc. of the Carolinas
3733 National Drive, Suite 207 Raleigh, N.C. 27612
N.C.B.E.L.S. License Number: F-0116

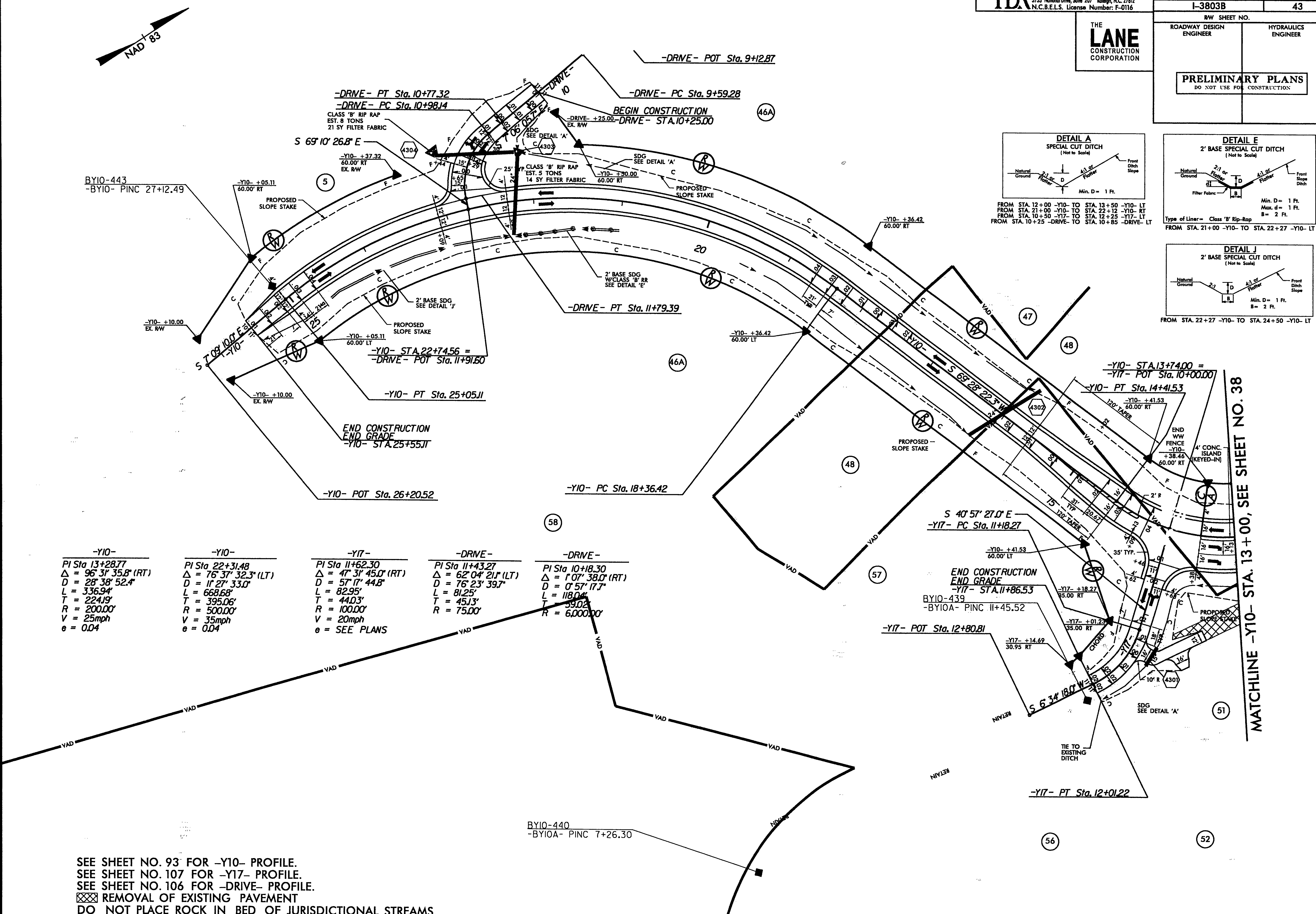
THE LANE CONSTRUCTION CORPORATION

PROJECT REFERENCE NO.	SHEET NO.
I-3803B	43

R/W SHEET NO.

ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



-Y10-	-Y10-	-Y17-	-DRIVE-	-DRIVE-
PI Sta 13+28.77	PI Sta 22+31.48	PI Sta 11+62.30	PI Sta 11+43.27	PI Sta 10+18.30
Δ = 96° 31' 35.8" (RT)	Δ = 76° 37' 32.3" (LT)	Δ = 47° 31' 45.0" (RT)	Δ = 62° 04' 21.1" (LT)	Δ = 1° 07' 38.0" (RT)
D = 28° 38' 52.4"	D = 11° 27' 33.0"	D = 57° 17' 44.8"	D = 76° 23' 39.7"	D = 0° 57' 17.7"
L = 336.94'	L = 668.68'	L = 82.95'	L = 81.25'	L = 118.04'
T = 224.19'	T = 395.06'	T = 44.03'	T = 45.13'	T = 59.02'
R = 200.00'	R = 500.00'	R = 100.00'	R = 75.00'	R = 6,000.00'
V = 25mph	V = 35mph	V = 20mph		
e = 0.04	e = 0.04	e = SEE PLANS		

SEE SHEET NO. 93 FOR -Y10- PROFILE.
SEE SHEET NO. 107 FOR -Y17- PROFILE.
SEE SHEET NO. 106 FOR -DRIVE- PROFILE.
REMOVAL OF EXISTING PAVEMENT
DO NOT PLACE ROCK IN BED OF JURISDICTIONAL STREAMS.

REVISIONS

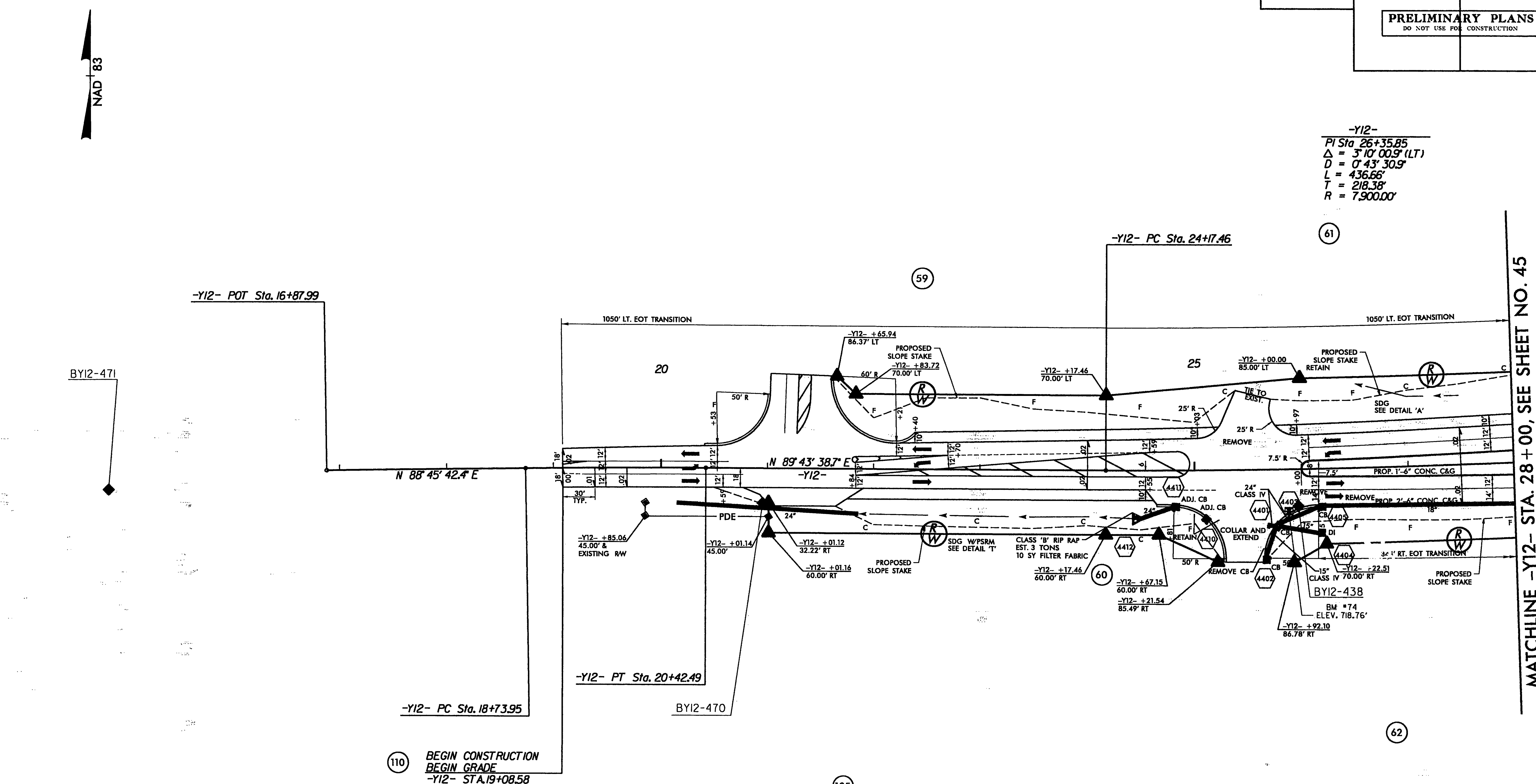
HDR Engineering, Inc. of the Carolinas
3733 National Drive, Suite 207 Raleigh, N.C. 27612
N.C.B.E.L.S. License Number: F-0116

THE LANE CONSTRUCTION CORPORATION

PROJECT REFERENCE NO.	SHEET NO.
I-3803B	44
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

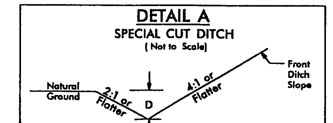
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

REVISIONS



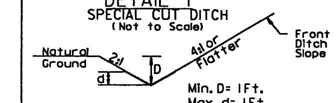
-Y12-
PI Sta 19+58.22
Δ = 0° 57' 56.2" (RT)
D = 0° 34' 22.6"
L = 168.53'
T = 84.27'
R = 10,000.00'

DETAIL A
SPECIAL CUT DITCH
(Not to Scale)



FROM STA. 26+50 -Y12- TO STA. 27+50 -Y12- LT

DETAIL T
SPECIAL CUT DITCH
(Not to Scale)



Type of Liner= PSRM
FROM STA. 22+00 -Y12- TO STA. 24+50 -Y12- RT

SEE SHEET NO 96 FOR -Y12- PROFILE.
DO NOT PLACE ROCK IN BED OF JURISDICTIONAL STREAMS.

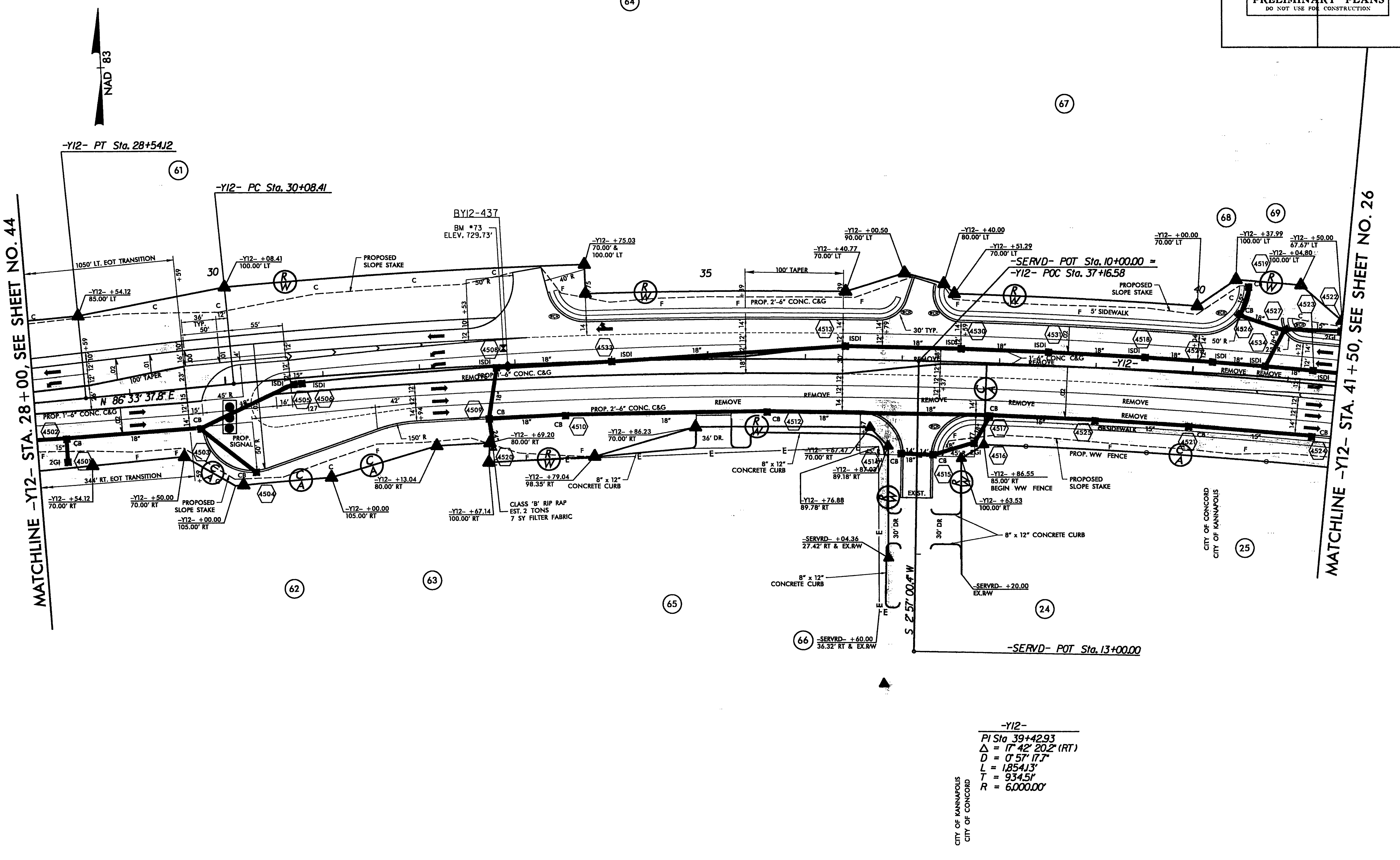
HDR Engineering, Inc. of the Carolinas
3733 National Drive, Suite 207 Raleigh, N.C. 27612
N.C.B.E.L.S. License Number: F-0116

THE LANE CONSTRUCTION CORPORATION

PROJECT REFERENCE NO.	SHEET NO.
I-3803B	45
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

REVISIONS



SEE SHEET NO. 96 FOR -Y12- PROFILE.
SEE PMP SHEETS FOR WCR CURB STATIONING
DO NOT PLACE ROCK IN BED OF JURISDICTIONAL STREAMS.

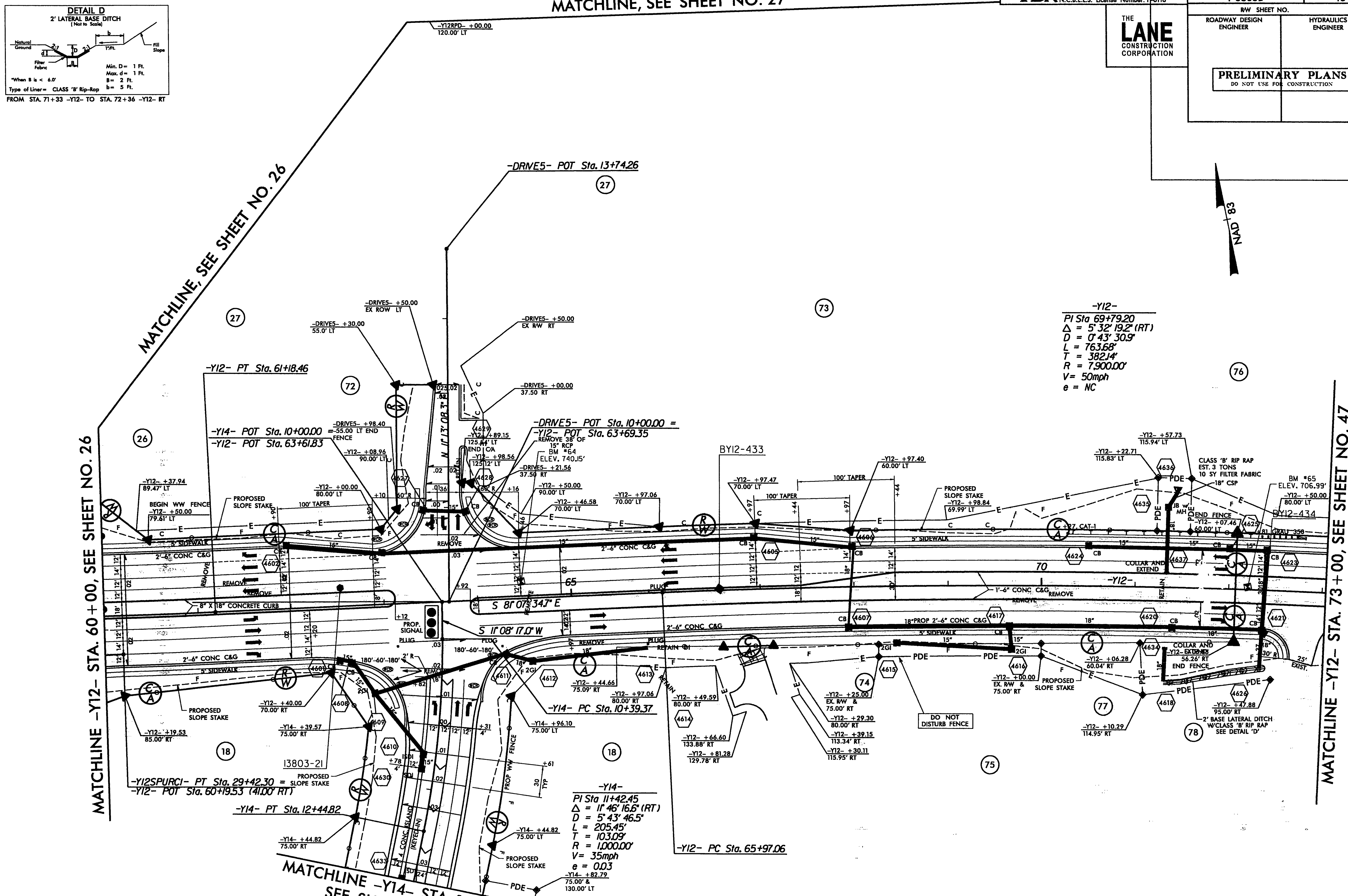
HDR Engineering, Inc. of the Carolinas
3733 National Drive, Suite 207 Raleigh, N.C. 27612
N.C.B.E.L.S. License Number: F-0116

THE LANE CONSTRUCTION CORPORATION

PROJECT REFERENCE NO.	SHEET NO.
I-3803B	46
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

REVISIONS



SEE SHEET NO. 97 FOR -Y12- PROFILE.
SEE SHEET NO. 105 FOR -Y14- PROFILE.
SEE PMP SHEETS FOR WCR CURB STATIONING
REMOVAL OF EXISTING PAVEMENT
DO NOT PLACE ROCK IN BED OF JURISDICTIONAL STREAMS.

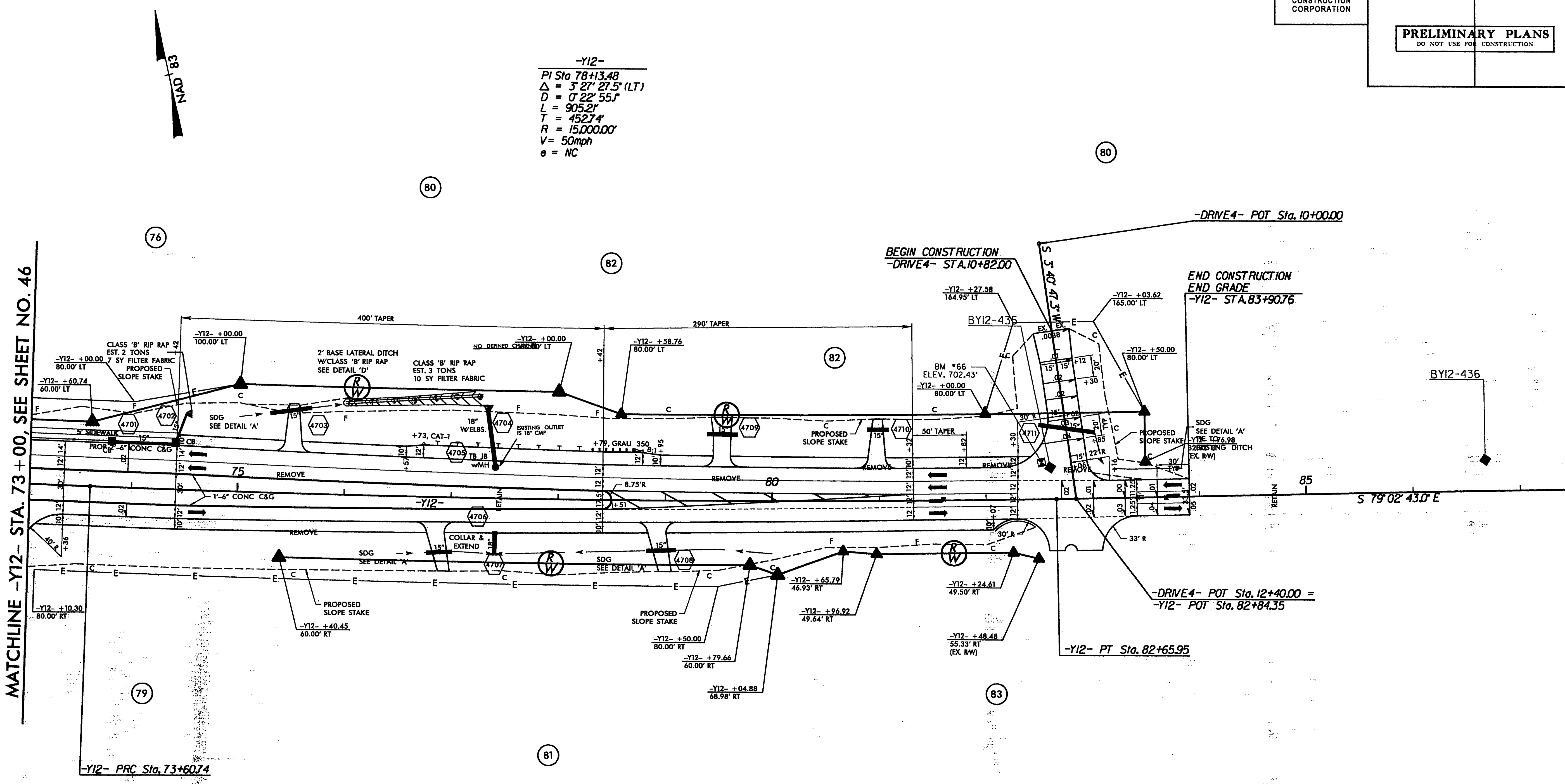
HDR Engineering, Inc. of the Carolinas
3733 National Drive, Suite 207 Raleigh, N.C. 27612
N.C.B.E.L.S. License Number: F-0116

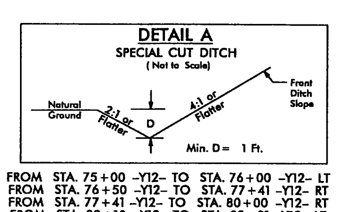
THE LANE CONSTRUCTION CORPORATION

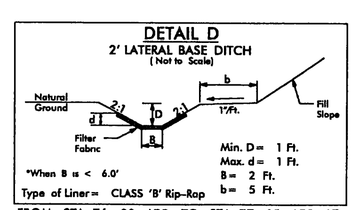
PROJECT REFERENCE NO.	SHEET NO.
I-3803B	47
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

REVISIONS







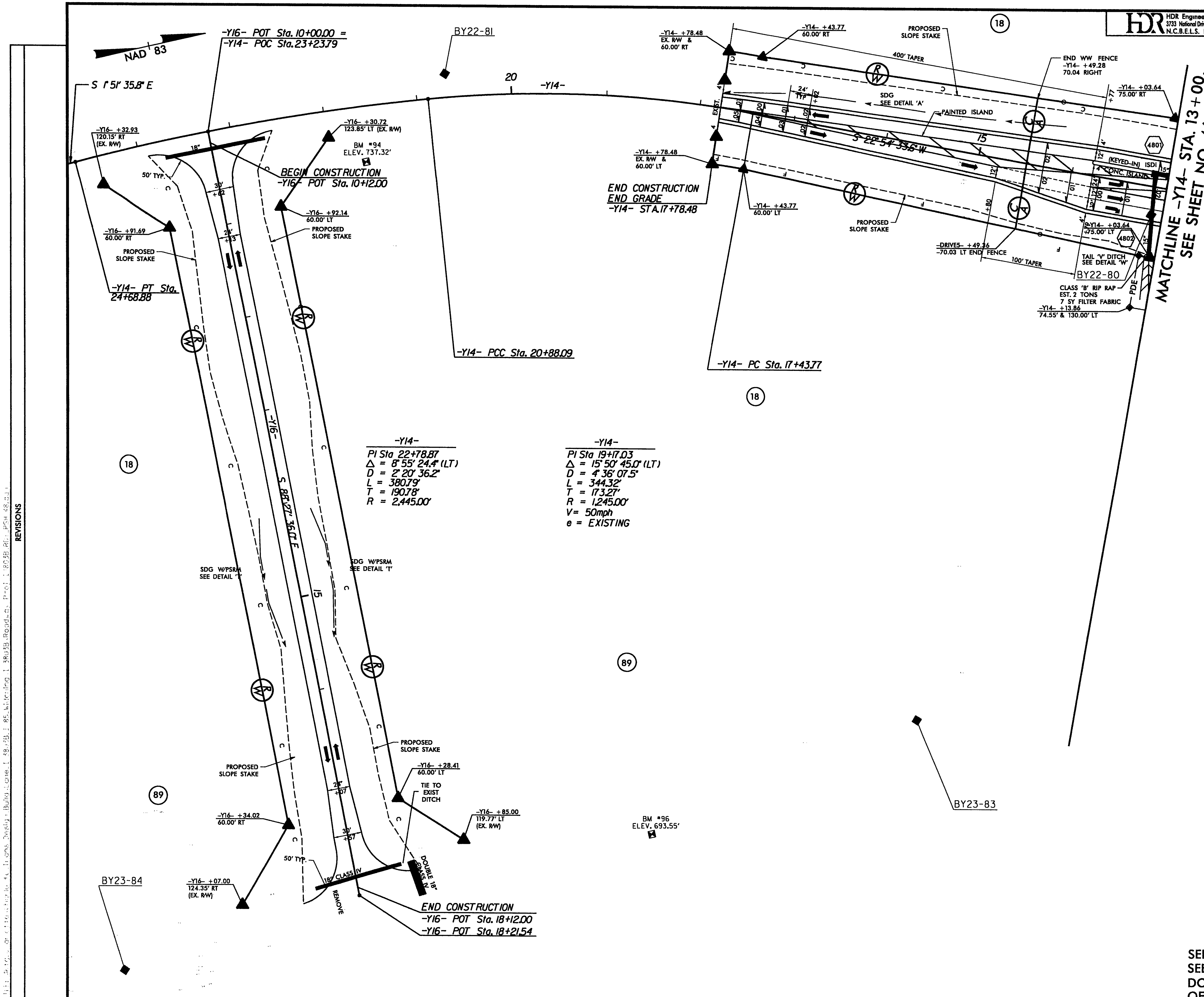
SEE SHEET NO 97, 98 FOR -Y12- PROFILE.
DO NOT PLACE ROCK IN BED OF JURISDICTIONAL STREAMS.

PROJECT REFERENCE NO.	SHEET NO.
I-3803B	48
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

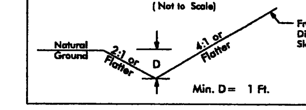
HDR Engineering, Inc. of the Carolinas
3733 National Drive, Suite 207 Raleigh, N.C. 27612
N.C.B.E.L.S. License Number: F-0116

THE LANE CONSTRUCTION CORPORATION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

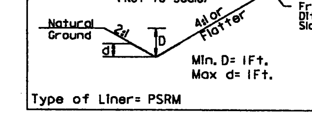


DETAIL A
SPECIAL CUT DITCH
(Not to Scale)



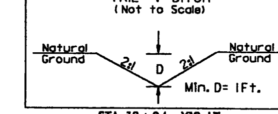
FROM STA. 14+00 -Y14- TO STA. 17+77 -Y14- RT

DETAIL T
SPECIAL CUT DITCH
(Not to Scale)



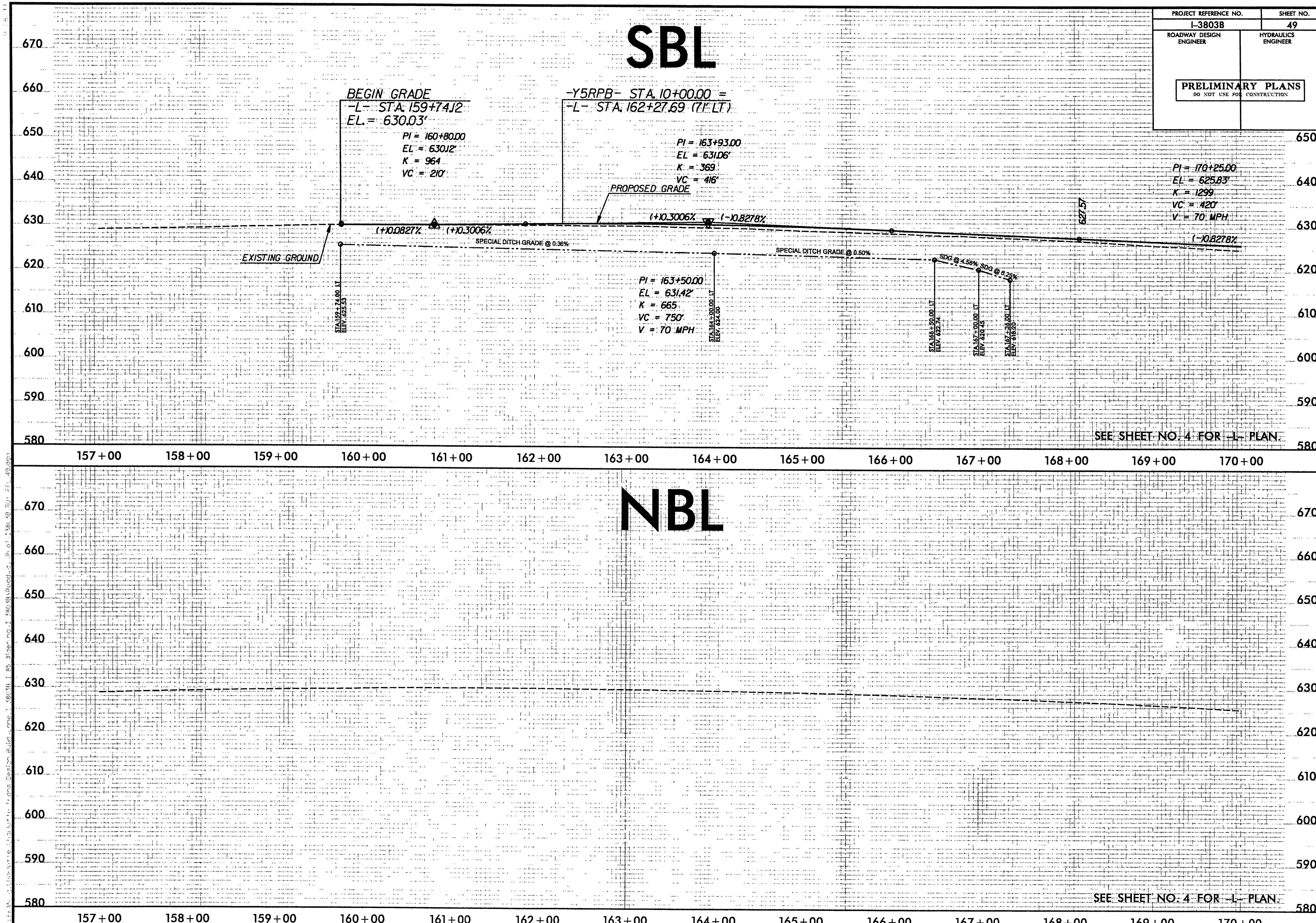
FROM STA. 14+00 -Y16- TO STA. 15+00 -Y16- LT
FROM STA. 14+00 -Y16- TO STA. 15+00 -Y16- RT

DETAIL W
TAIL "V" DITCH
(Not to Scale)

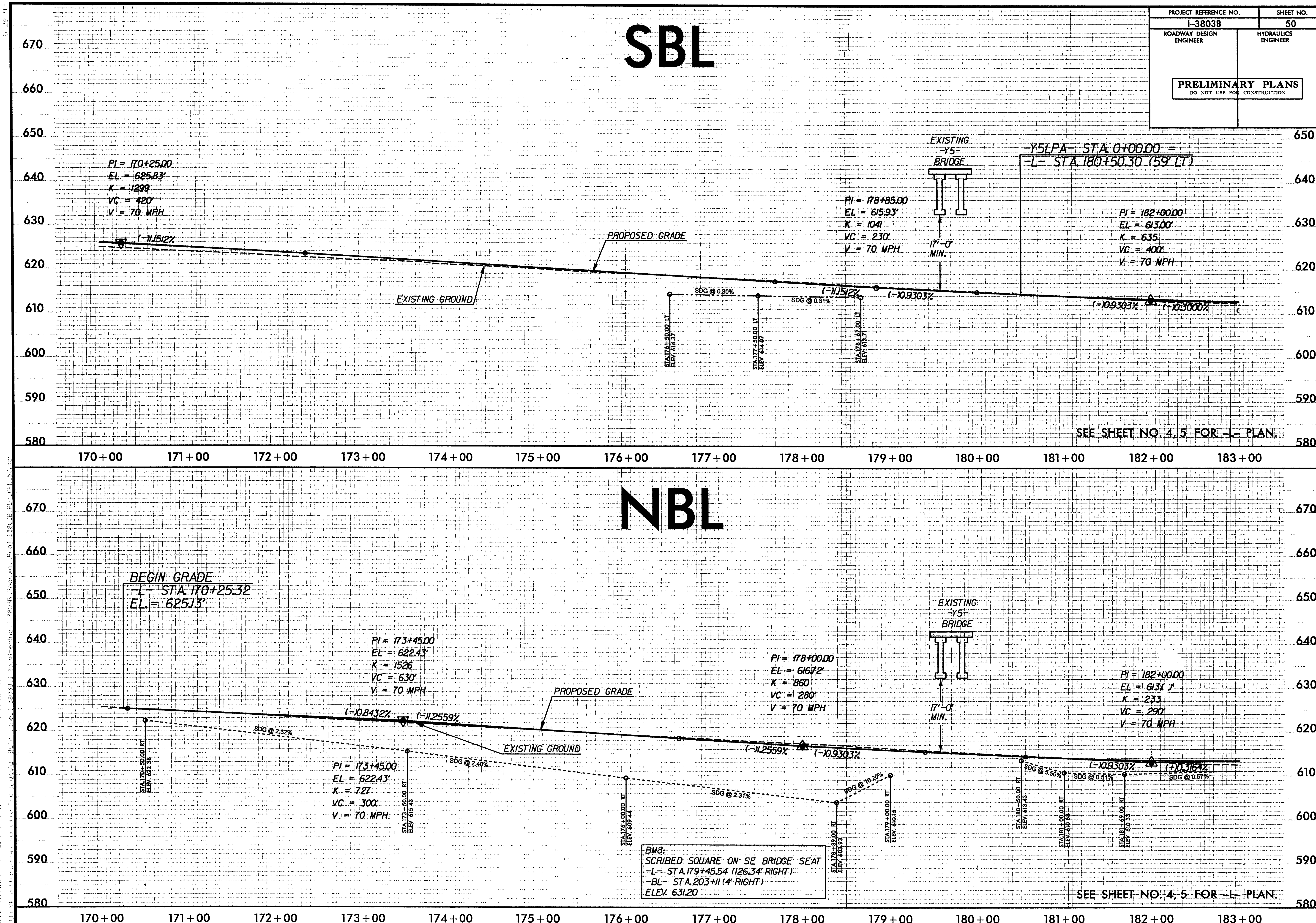


STA. 13+04 -Y12-LT

SEE SHEET NO 105 FOR -Y14- PROFILE.
SEE SHEET NO 106 FOR -Y16- PROFILE.
DO NOT PLACE ROCK IN BED OF JURISDICTIONAL STREAMS.

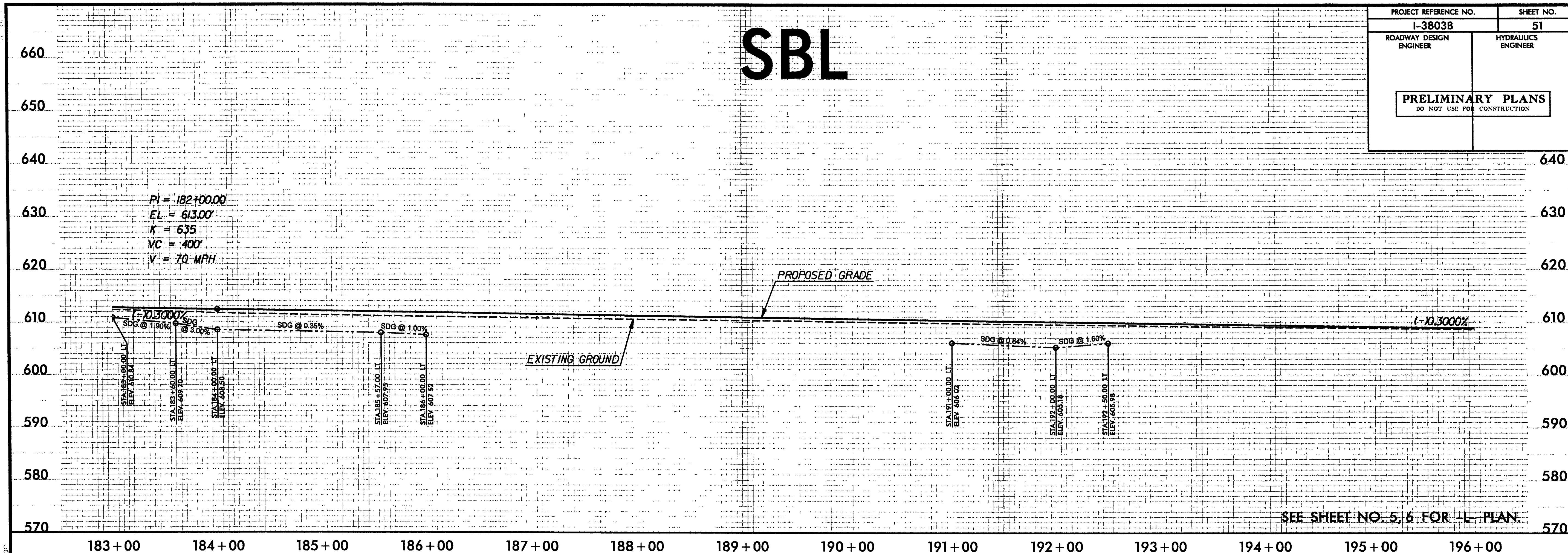


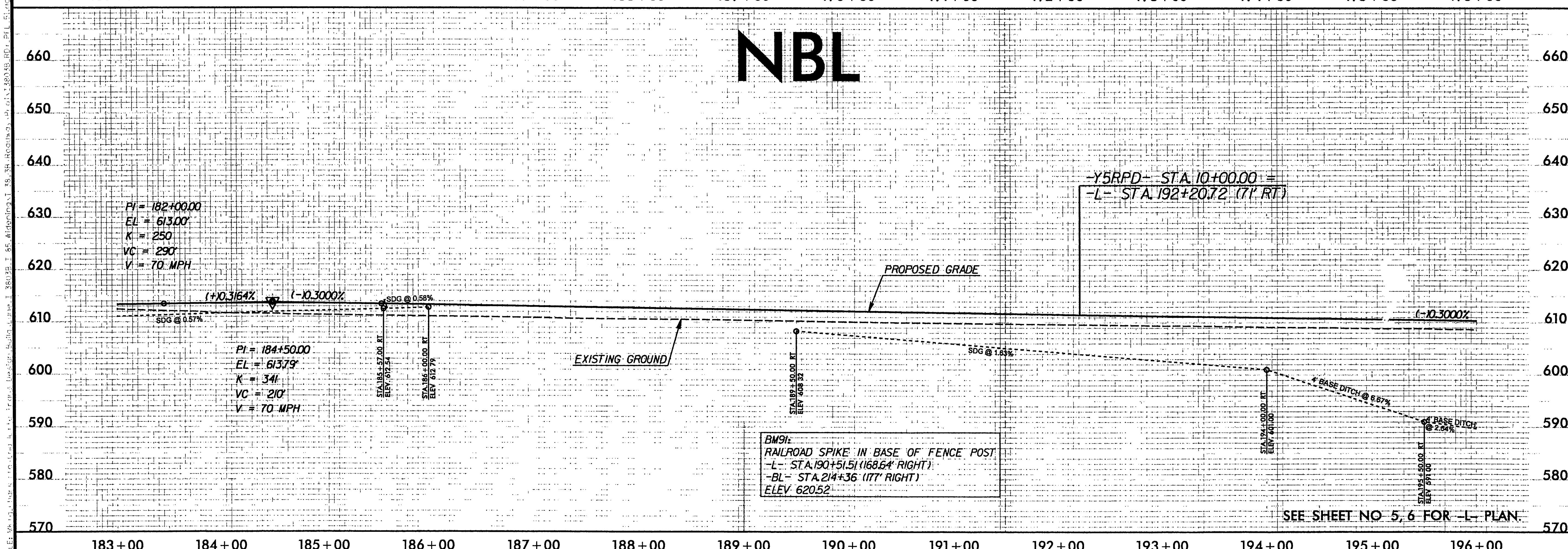
PROJECT REFERENCE NO.
I-3803B
SHEET NO.
49
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
SBL
BEGIN GRADE
-L- STA. 159+74.12
EL. = 630.03'
PI = 160+80.00
EL = 630.12'
K = 964
VC = 210'
-Y5RPB- STA. 10+00.00 =
-L- STA. 162+27.69 (71' LT)
PI = 163+93.00
EL = 631.06'
K = 369
VC = 416'
PROPOSED GRADE
PI = 170+25.00
EL = 625.83'
K = 1299
VC = 420'
V = 70 MPH
627.57
(+)0.0827%
(+)0.3006%
(+)0.3006%
(-)0.8278%
(-)0.8278%
EXISTING GROUND
SPECIAL DITCH GRADE @ 0.36%
SPECIAL DITCH GRADE @ 0.50%
SDG @ 4.58%
SDG @ 6.25%
PI = 163+50.00
EL = 631.42'
K = 665
VC = 750'
V = 70 MPH
SEE SHEET NO. 4 FOR -L- PLAN.
157+00
158+00
159+00
160+00
161+00
162+00
163+00
164+00
165+00
166+00
167+00
168+00
169+00
170+00
NBL
SEE SHEET NO. 4 FOR -L- PLAN.

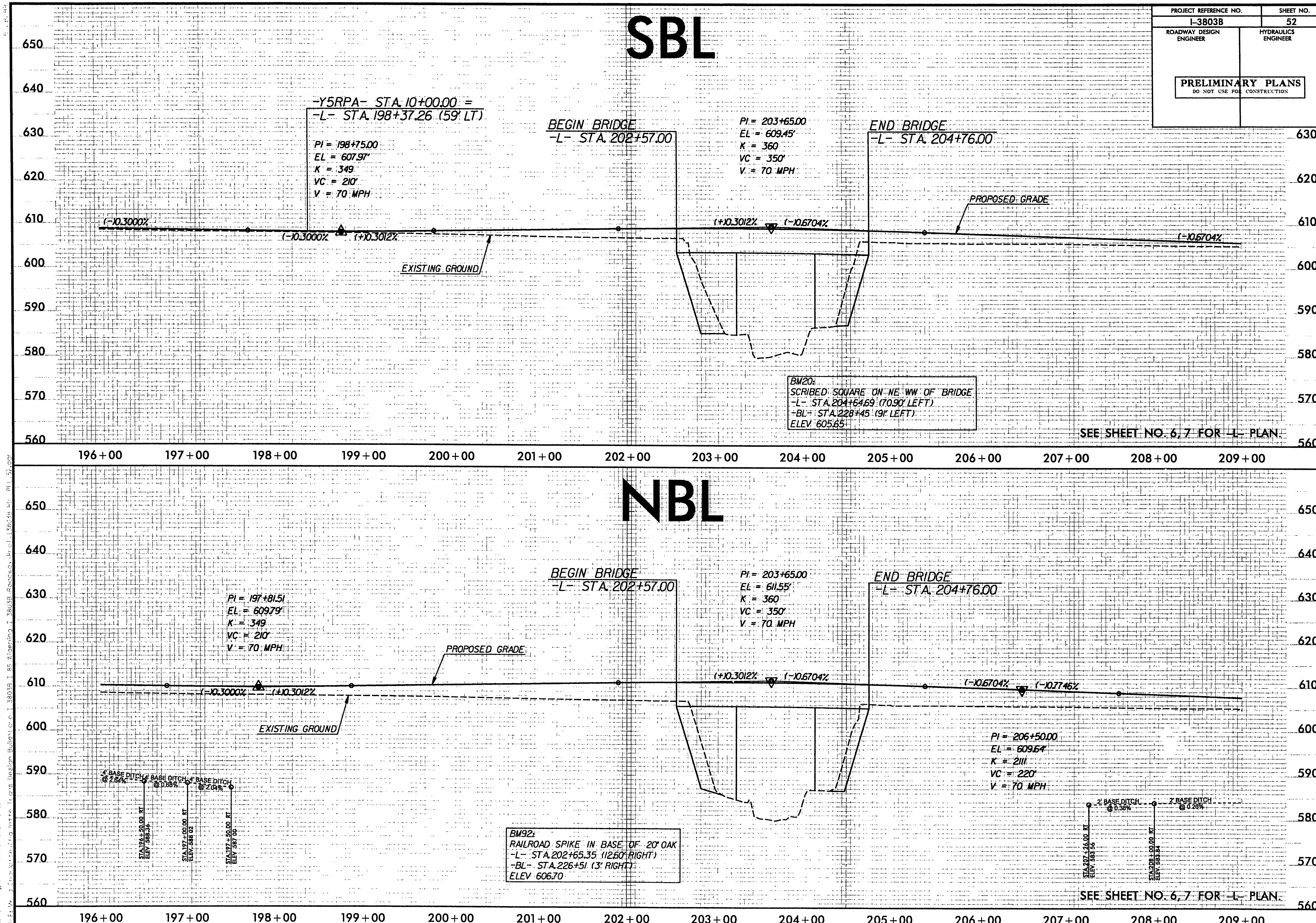

PROJECT REFERENCE NO.
I-3803B
SHEET NO.
50
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
SBL
PI = 170+25.00
EL = 625.83'
K = 1299
VC = 420'
V = 70 MPH
(-)1.1512%
PROPOSED GRADE
EXISTING GROUND
EXISTING
-Y5-
BRIDGE
-Y5LPA- STA. 0+00.00 =
-L- STA. 180+50.30 (59' LT)
PI = 178+85.00
EL = 615.93'
K = 1041
VC = 230'
V = 70 MPH
17'-0" MIN.
PI = 182+00.00
EL = 613.00'
K = 635
VC = 400'
V = 70 MPH
SDG @ 0.30%
SDG @ 0.31%
(-)1.1512%
(-)0.9303%
(-)0.9303%
(-)0.3000%
STA.176+50.00 LT ELEV. 614.37
STA.177+50.00 LT ELEV. 614.07
STA.178+67.00 LT ELEV. 613.71
SEE SHEET NO. 4, 5 FOR -L- PLAN.
NBL
BEGIN GRADE
-L- STA. 170+25.32
EL. = 625.13'
PI = 173+45.00
EL = 622.43'
K = 1526
VC = 630'
V = 70 MPH
(-)0.8432%
(-)1.2559%
PROPOSED GRADE
EXISTING GROUND
SDG @ 2.32%
SDG @ 2.40%
SDG @ 2.31%
SDG @ 10.20%
PI = 173+45.00
EL = 622.43'
K = 727
VC = 300'
V = 70 MPH
EXISTING
-Y5-
BRIDGE
PI = 178+00.00
EL = 616.72'
K = 860
VC = 280'
V = 70 MPH
17'-0" MIN.
(-)1.2559%
(-)0.9303%
PI = 182+00.00
EL = 613.1'
K = 233
VC = 290'
V = 70 MPH
(-)0.9303%
(+)0.3164%
SDG @ 0.57%
SDG @ 0.51%
SDG @ 0.57%
STA.170+50.00 RT ELEV. 622.38
STA.173+50.00 RT ELEV. 615.43
STA.176+00.00 RT ELEV. 609.44
STA.178+39.00 RT ELEV. 603.93
STA.179+00.00 RT ELEV. 610.15
STA.180+50.00 RT ELEV. 613.43
STA.181+00.00 RT ELEV. 610.88
STA.181+69.00 RT ELEV. 610.33
BM8:
SCRIBED SQUARE ON SE BRIDGE SEAT
-L- STA. 179+45.54 (126.34' RIGHT)
-BL- STA. 203+11 (4' RIGHT)
ELEV. 631.20
SEE SHEET NO. 4, 5 FOR -L- PLAN.
170+00
171+00
172+00
173+00
174+00
175+00
176+00
177+00
178+00
179+00
180+00
181+00
182+00
183+00
580
590
600
610
620
630
640
650
660
670

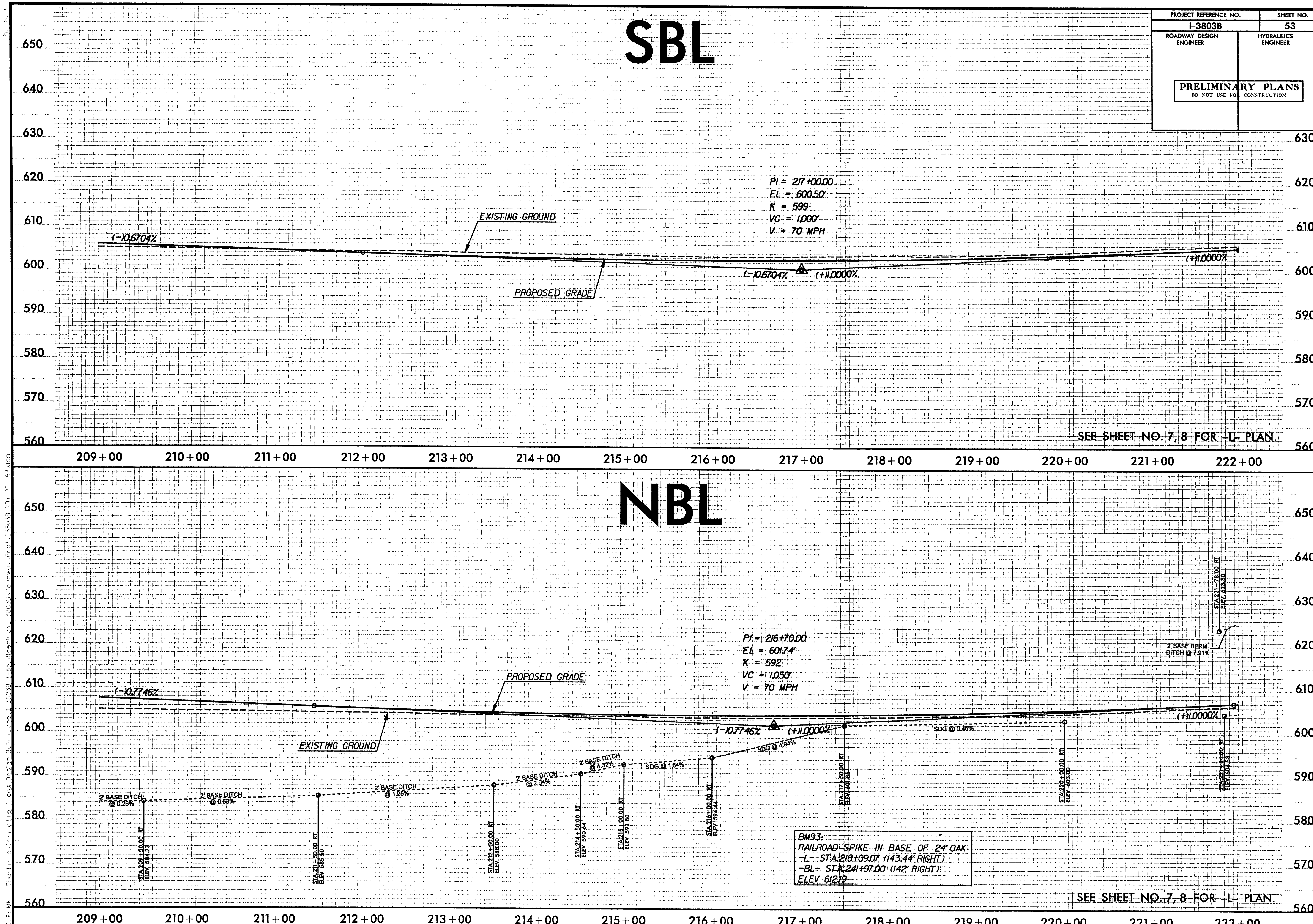
PROJECT REFERENCE NO.	SHEET NO.
I-3803B	51
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

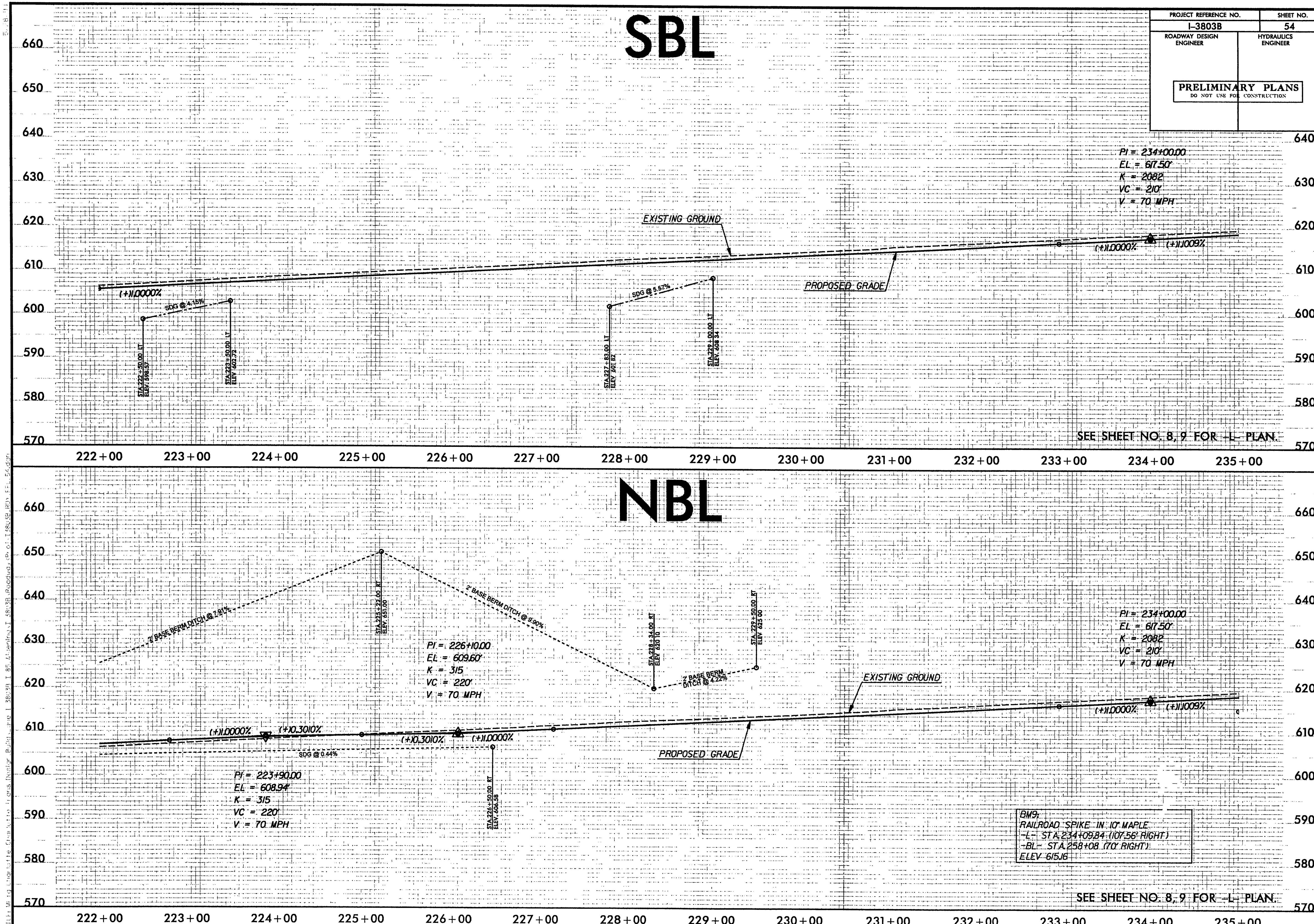


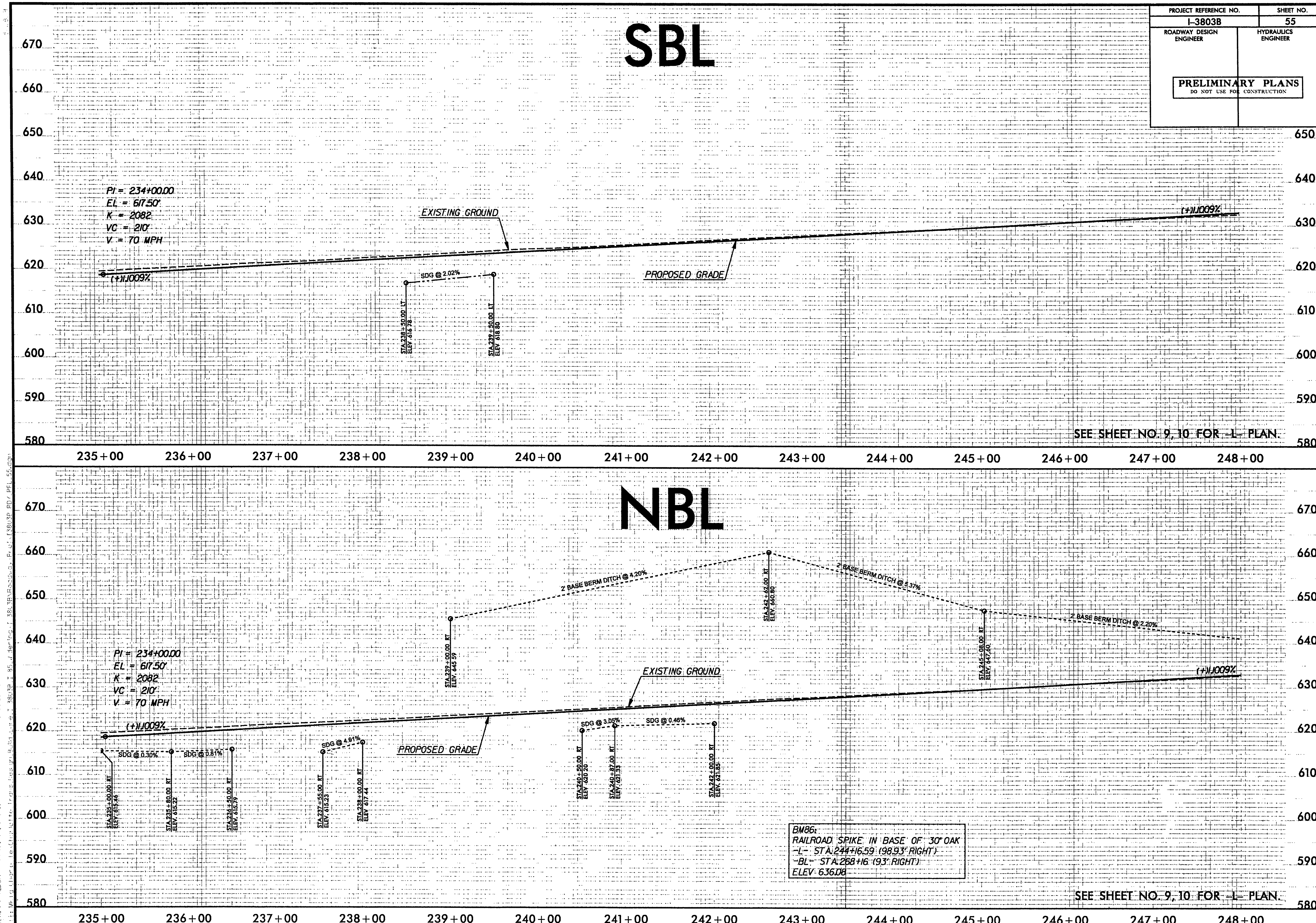



PROJECT REFERENCE NO.
I-3803B
SHEET NO.
52
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
SBL
-Y5RPA- STA. 10+00.00 =
-L- STA. 198+37.26 (59' LT)
PI = 198+75.00
EL = 607.97'
K = 349
VC = 210'
V = 70 MPH
BEGIN BRIDGE
-L- STA. 202+57.00
PI = 203+65.00
EL = 609.45'
K = 360
VC = 350'
V = 70 MPH
END BRIDGE
-L- STA. 204+76.00
PROPOSED GRADE
(-)0.3000%
(-)0.3000%
(+)0.3012%
(+)0.3012%
(-)0.6704%
(-)0.6704%
EXISTING GROUND
BM20:
SCRIBED SQUARE ON NE WW OF BRIDGE
-L- STA. 204+64.69 (70.90' LEFT)
-BL- STA. 228+45 (91' LEFT)
ELEV 605.65
SEE SHEET NO. 6, 7 FOR -L- PLAN.
NBL
BEGIN BRIDGE
-L- STA. 202+57.00
PI = 203+65.00
EL = 611.55'
K = 360
VC = 350'
V = 70 MPH
END BRIDGE
-L- STA. 204+76.00
PI = 197+81.51
EL = 609.79'
K = 349
VC = 210'
V = 70 MPH
PROPOSED GRADE
(-)0.3000%
(+)0.3012%
(+)0.3012%
(-)0.6704%
(-)0.6704%
(-)0.7746%
EXISTING GROUND
PI = 206+50.00
EL = 609.64'
K = 2111
VC = 220'
V = 70 MPH
4' BASE DITCH @ 2.64%
4' BASE DITCH @ 0.68%
4' BASE DITCH @ 2.04%
2' BASE DITCH @ 0.38%
2' BASE DITCH @ 0.28%
BM92:
RAILROAD SPIKE IN BASE OF 20" OAK
-L- STA. 202+65.35 (12.60' RIGHT)
-BL- STA. 226+51 (3' RIGHT)
ELEV 606.70
SEE SHEET NO. 6, 7 FOR -L- PLAN.
196+00
197+00
198+00
199+00
200+00
201+00
202+00
203+00
204+00
205+00
206+00
207+00
208+00
209+00
560
570
580
590
600
610
620
630
640
650

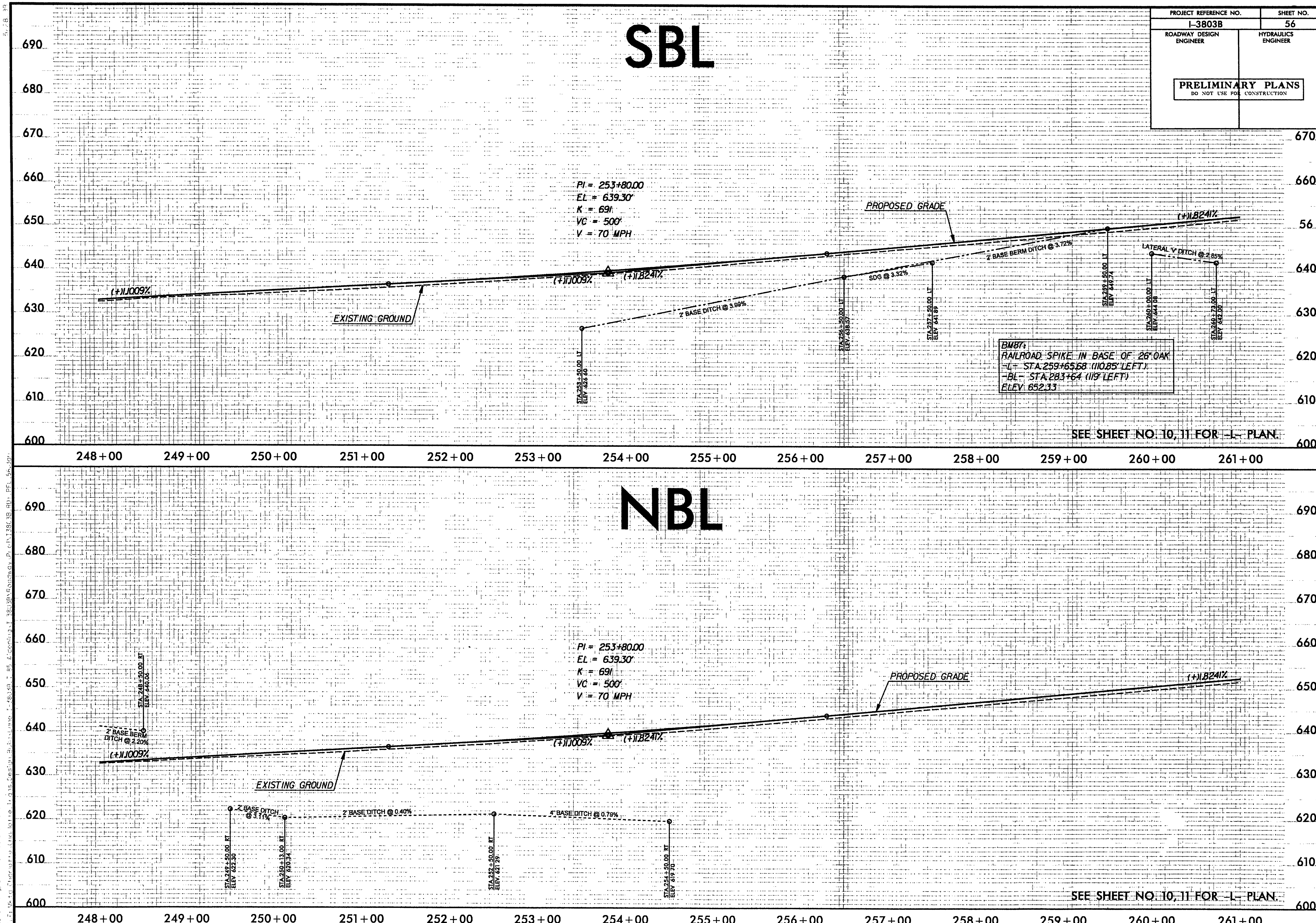


PROJECT REFERENCE NO.
I-3803B
SHEET NO.
53
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
SBL
PI = 217+00.00
EL = 600.50'
K = 599
VC = 1,000'
V = 70 MPH
EXISTING GROUND
PROPOSED GRADE
(-)0.6704%
(-)0.6704%
(+)1.0000%
(+)1.0000%
SEE SHEET NO. 7, 8 FOR -L- PLAN.
209+00
210+00
211+00
212+00
213+00
214+00
215+00
216+00
217+00
218+00
219+00
220+00
221+00
222+00
NBL
PI = 216+70.00
EL = 601.74'
K = 592
VC = 1,050'
V = 70 MPH
PROPOSED GRADE
EXISTING GROUND
(-)0.7746%
(-)0.7746%
(+)1.0000%
(+)1.0000%
2' BASE BERM DITCH @ 7.91%
2' BASE DITCH @ 0.28%
2' BASE DITCH @ 0.63%
2' BASE DITCH @ 1.25%
2' BASE DITCH @ 2.64%
2' BASE DITCH @ 4.32%
SDG @ 1.64%
SDG @ 4.94%
SDG @ 0.46%
STA 209+50.00 RT ELEV 584.23
STA 211+50.00 RT ELEV 585.50
STA 213+50.00 RT ELEV 588.00
STA 214+50.00 RT ELEV 590.64
STA 215+00.00 RT ELEV 592.80
STA 216+00.00 RT ELEV 594.44
STA 217+50.00 RT ELEV 601.88
STA 220+30.00 RT ELEV 603.00
STA 221+84.00 RT ELEV 604.53
STA 221+78.00 RT ELEV 623.80
BM93:
RAILROAD SPIKE IN BASE OF 24" OAK
-L- STA 218+09.07 (143.44' RIGHT)
-BL- STA 241+97.00 (142' RIGHT)
ELEV 612.19
SEE SHEET NO. 7, 8 FOR -L- PLAN.

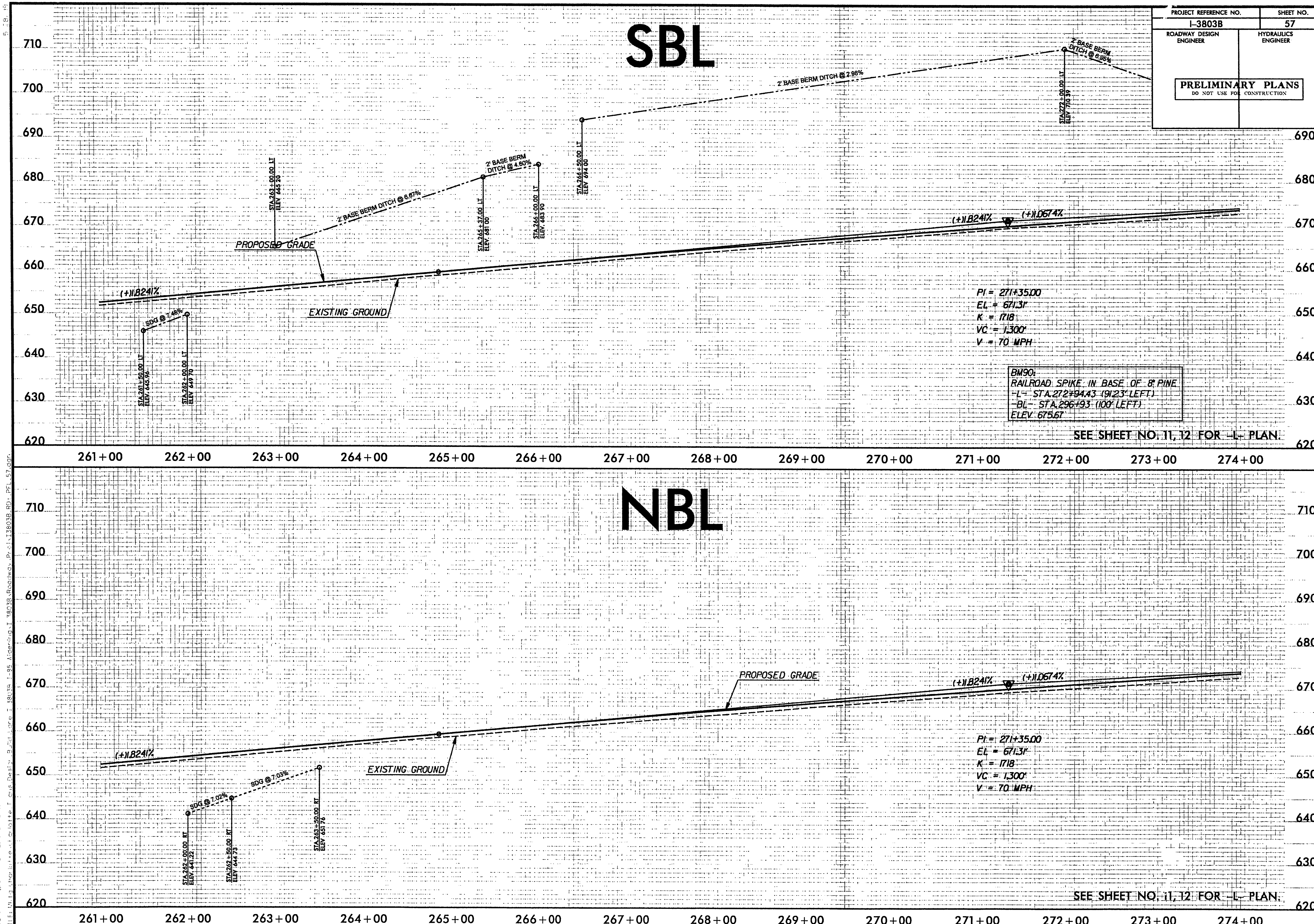

PROJECT REFERENCE NO.
SHEET NO.
I-3803B
54
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
SBL
PI = 234+00.00
EL = 617.50'
K = 2082
VC = 210'
V = 70 MPH
EXISTING GROUND
PROPOSED GRADE
(+)1.0000%
(+)1.1009%
SDG @ 4.15%
SDG @ 5.57%
STA.222+50.00 LT ELEV. 598.57
STA.223+50.00 LT ELEV. 602.72
STA.227+83.00 LT ELEV. 601.82
STA.229+00.00 LT ELEV. 608.34
SEE SHEET NO. 8, 9 FOR -L- PLAN.
222+00
223+00
224+00
225+00
226+00
227+00
228+00
229+00
230+00
231+00
232+00
233+00
234+00
235+00
NBL
2' BASE BERM DITCH @ 7.81%
2' BASE BERM DITCH @ 8.90%
2' BASE BERM DITCH @ 4.22%
STA.225+22.00 RT ELEV. 651.00
STA.228+34.00 RT ELEV. 620.10
STA.229+50.00 RT ELEV. 625.00
STA.226+50.00 RT ELEV. 606.58
PI = 226+10.00
EL = 609.60'
K = 315
VC = 220'
V = 70 MPH
PI = 223+90.00
EL = 608.94'
K = 315
VC = 220'
V = 70 MPH
PI = 234+00.00
EL = 617.50'
K = 2082
VC = 210'
V = 70 MPH
(+)1.0000%
(+)0.3010%
(+)0.3010%
(+)1.0000%
(+)1.0000%
(+)1.1009%
SDG @ 0.44%
EXISTING GROUND
PROPOSED GRADE
BM9:
RAILROAD SPIKE IN 10" MAPLE
-L- STA.234+09.84 (107.56' RIGHT)
-BL- STA.258+08 (70' RIGHT)
ELEV 615.16
SEE SHEET NO. 8, 9 FOR -L- PLAN.
570
580
590
600
610
620
630
640
650
660



PROJECT REFERENCE NO.
I-3803B
SHEET NO.
55
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
SBL
PI = 234+00.00
EL = 617.50'
K = 2082
VC = 210'
V = 70 MPH
EXISTING GROUND
PROPOSED GRADE
(+)1.1009%
SDG @ 2.02%
SEE SHEET NO. 9, 10 FOR -L- PLAN.
NBL
PI = 234+00.00
EL = 617.50'
K = 2082
VC = 210'
V = 70 MPH
EXISTING GROUND
PROPOSED GRADE
(+)1.1009%
2' BASE BERM DITCH @ 4.20%
2' BASE BERM DITCH @ 5.37%
2' BASE BERM DITCH @ 2.20%
SDG @ 0.30%
SDG @ 0.81%
SDG @ 4.91%
SDG @ 3.05%
SDG @ 0.46%
BM86:
RAILROAD SPIKE IN BASE OF 30" OAK
-L- STA.244+16.59 (98.93' RIGHT)
-BL- STA.268+16 (93' RIGHT)
ELEV 636.08
SEE SHEET NO. 9, 10 FOR -L- PLAN.
235+00
236+00
237+00
238+00
239+00
240+00
241+00
242+00
243+00
244+00
245+00
246+00
247+00
248+00



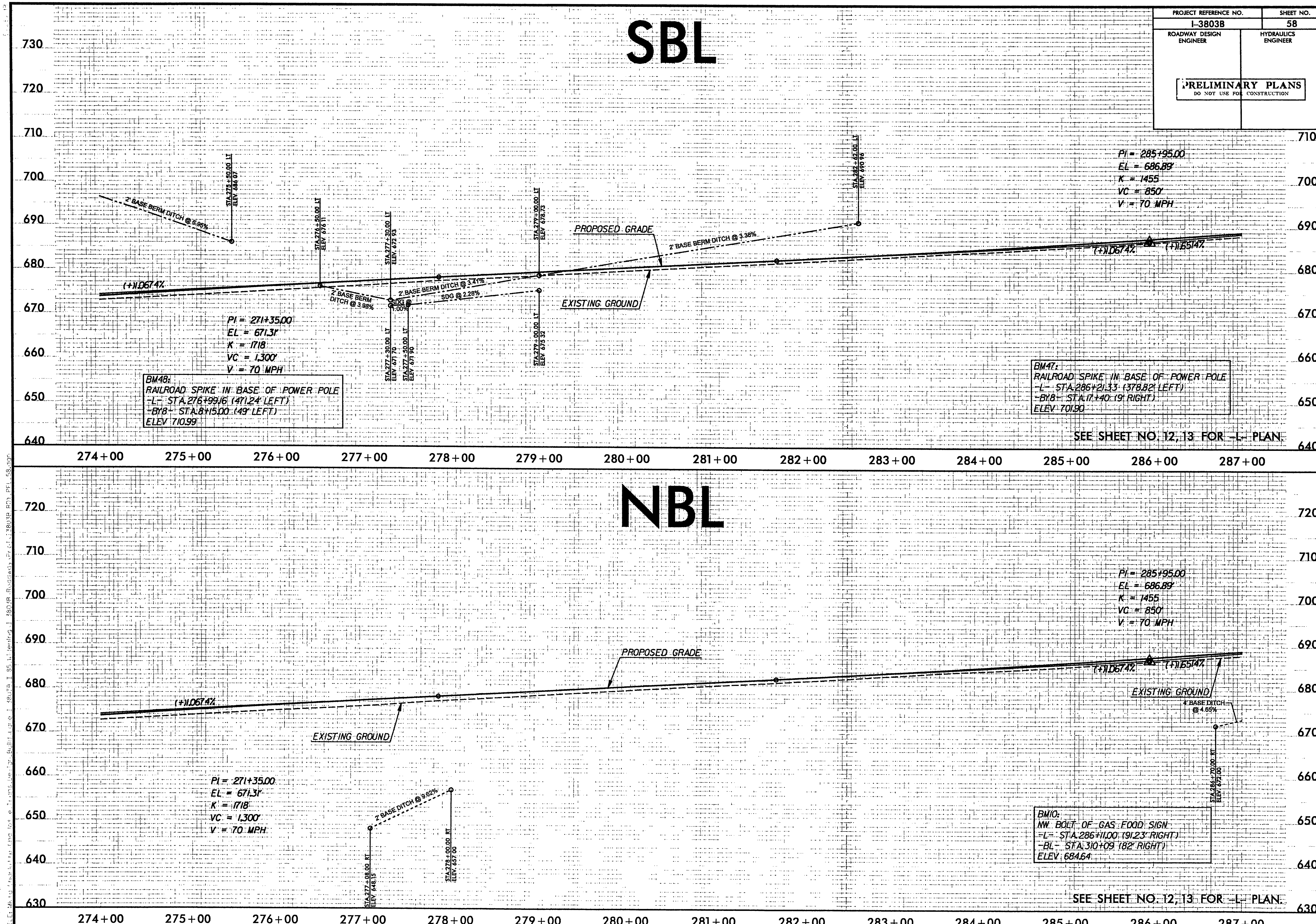
PROJECT REFERENCE NO.
I-3803B
SHEET NO.
56
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
SBL
PI = 253+80.00
EL = 639.30'
K = 691
VC = 500'
V = 70 MPH
PROPOSED GRADE
EXISTING GROUND
(+)1.1009%
(+)1.8241%
2' BASE DITCH @ 3.99%
SDG @ 3.32%
2' BASE BERM DITCH @ 3.72%
LATERAL 'V' DITCH @ 2.85%
BM87:
RAILROAD SPIKE IN BASE OF 26" OAK
-L- STA.259+65.68 (110.85' LEFT)
-BL- STA.283+64 (119' LEFT)
ELEV 652.33
SEE SHEET NO. 10, 11 FOR -L- PLAN.
248+00
249+00
250+00
251+00
252+00
253+00
254+00
255+00
256+00
257+00
258+00
259+00
260+00
261+00
NBL
PI = 253+80.00
EL = 639.30'
K = 691
VC = 500'
V = 70 MPH
PROPOSED GRADE
EXISTING GROUND
(+)1.1009%
(+)1.8241%
2' BASE BERM DITCH @ 2.20%
2' BASE DITCH @ 3.11%
2' BASE DITCH @ 0.40%
4' BASE DITCH @ 0.79%
SEE SHEET NO. 10, 11 FOR -L- PLAN.

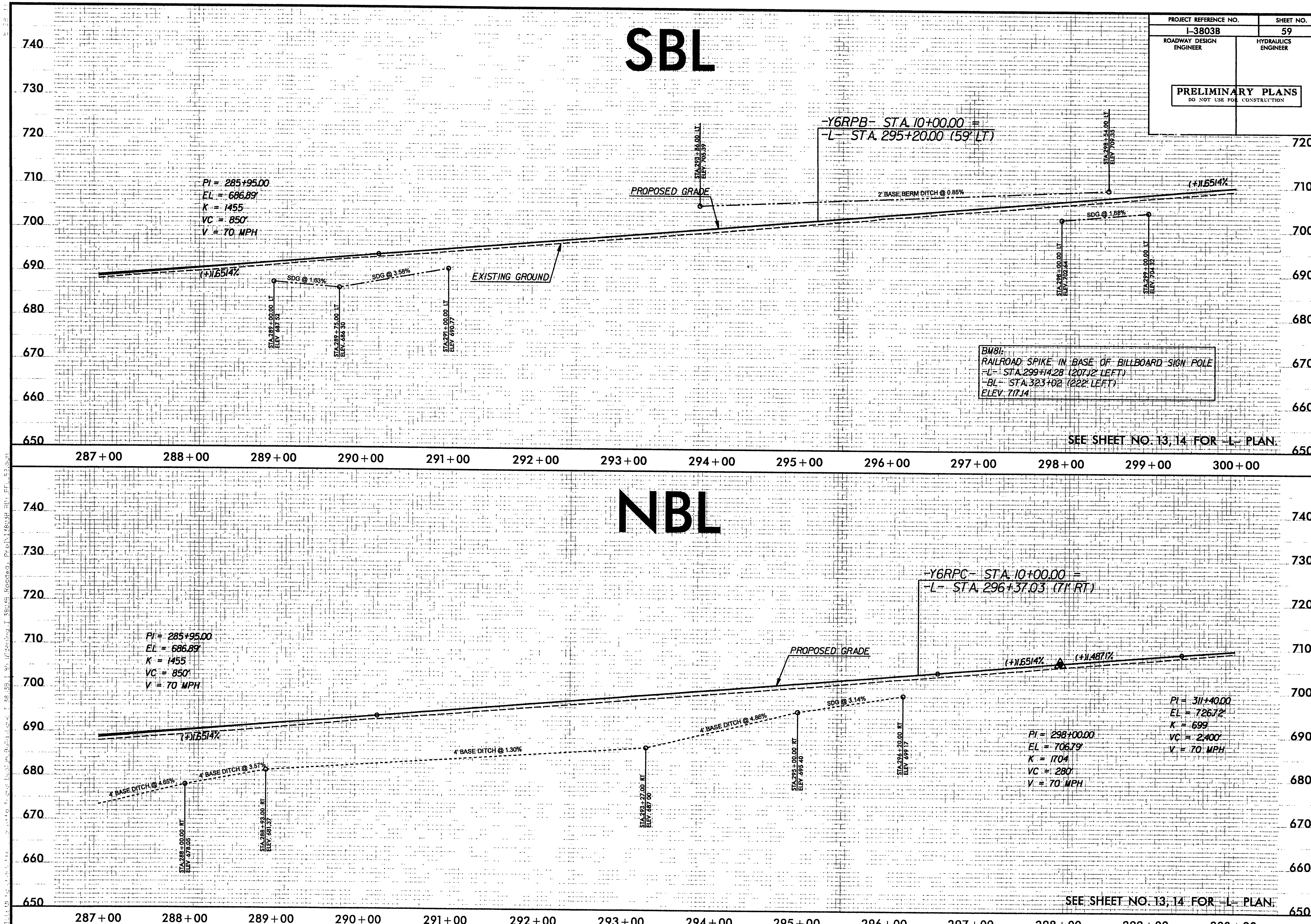


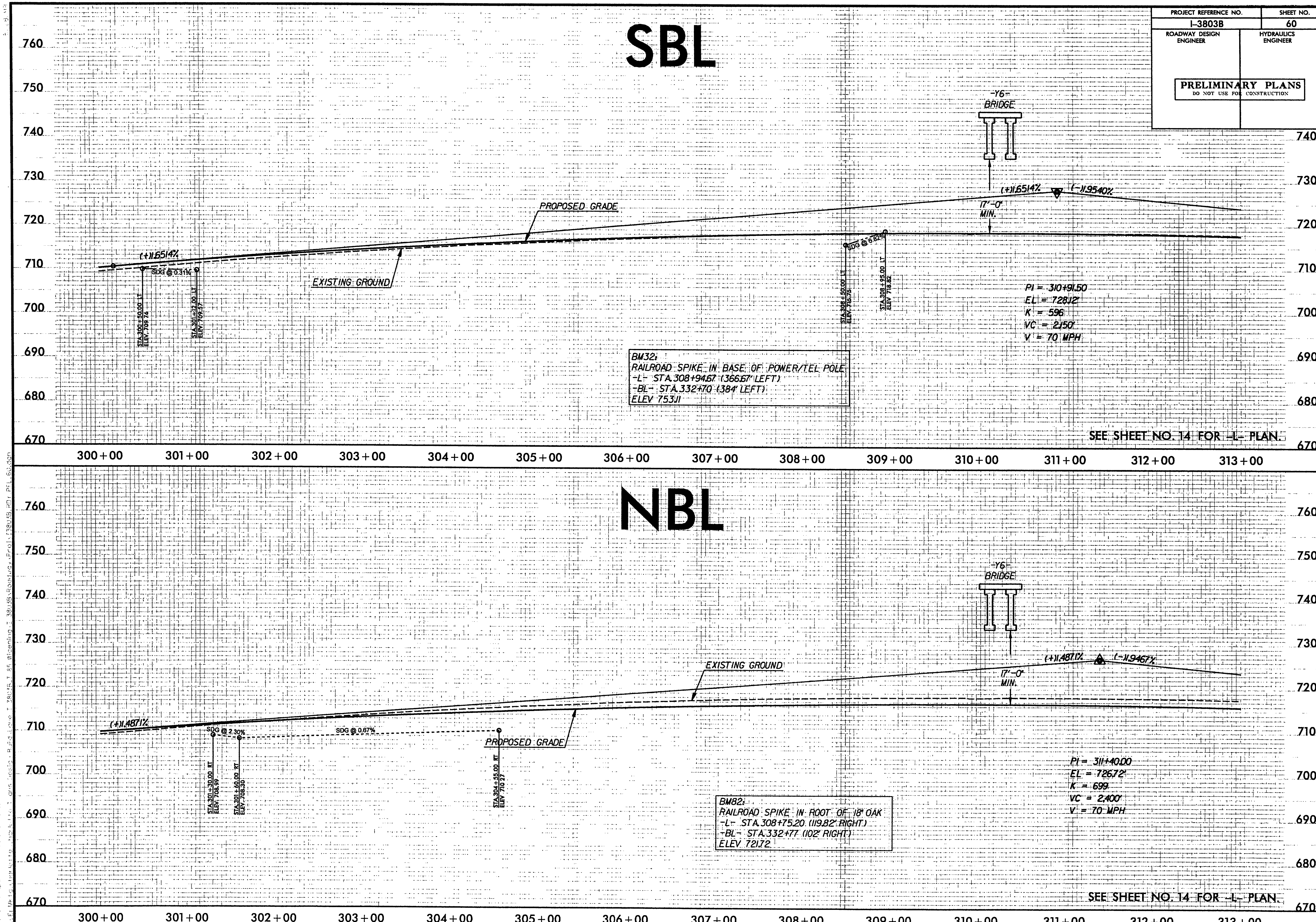
PROJECT REFERENCE NO. I-3803B
SHEET NO. 57
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
SBL
PROPOSED GRADE
EXISTING GROUND
(+)1.8241%
(+)1.8241%
(+)1.0674%
2' BASE BERM DITCH @ 6.67%
2' BASE BERM DITCH @ 4.60%
2' BASE BERM DITCH @ 2.98%
2' BASE BERM DITCH @ 6.95%
SDG @ 7.46%
STA.261+50.00 LT ELEV. 645.95
STA.262+00.00 LT ELEV. 649.70
STA.263+00.00 LT ELEV. 665.20
STA.265+37.00 LT ELEV. 681.00
STA.266+00.00 LT ELEV. 683.90
STA.266+50.00 LT ELEV. 694.00
STA.272+00.00 LT ELEV. 710.39
PI = 271+35.00
EL = 671.31'
K = 17.18
VC = 1,300'
V = 70 MPH
BM90:
RAILROAD SPIKE IN BASE OF 8" PINE
-L- STA.272+94.43 (91.23' LEFT)
-BL- STA.296+93 (100' LEFT)
ELEV. 675.67
SEE SHEET NO. 11, 12 FOR -L- PLAN.
NBL
PROPOSED GRADE
EXISTING GROUND
(+)1.8241%
(+)1.8241%
(+)1.0674%
SDG @ 7.02%
SDG @ 7.03%
STA.262+00.00 RT ELEV. 641.22
STA.262+50.00 RT ELEV. 644.73
STA.263+50.00 RT ELEV. 651.76
PI = 271+35.00
EL = 671.31'
K = 17.18
VC = 1,300'
V = 70 MPH
SEE SHEET NO. 11, 12 FOR -L- PLAN.
620 630 640 650 660 670 680 690 700 710
261+00 262+00 263+00 264+00 265+00 266+00 267+00 268+00 269+00 270+00 271+00 272+00 273+00 274+00

PROJECT REFERENCE NO.	SHEET NO.
I-3803B	58
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

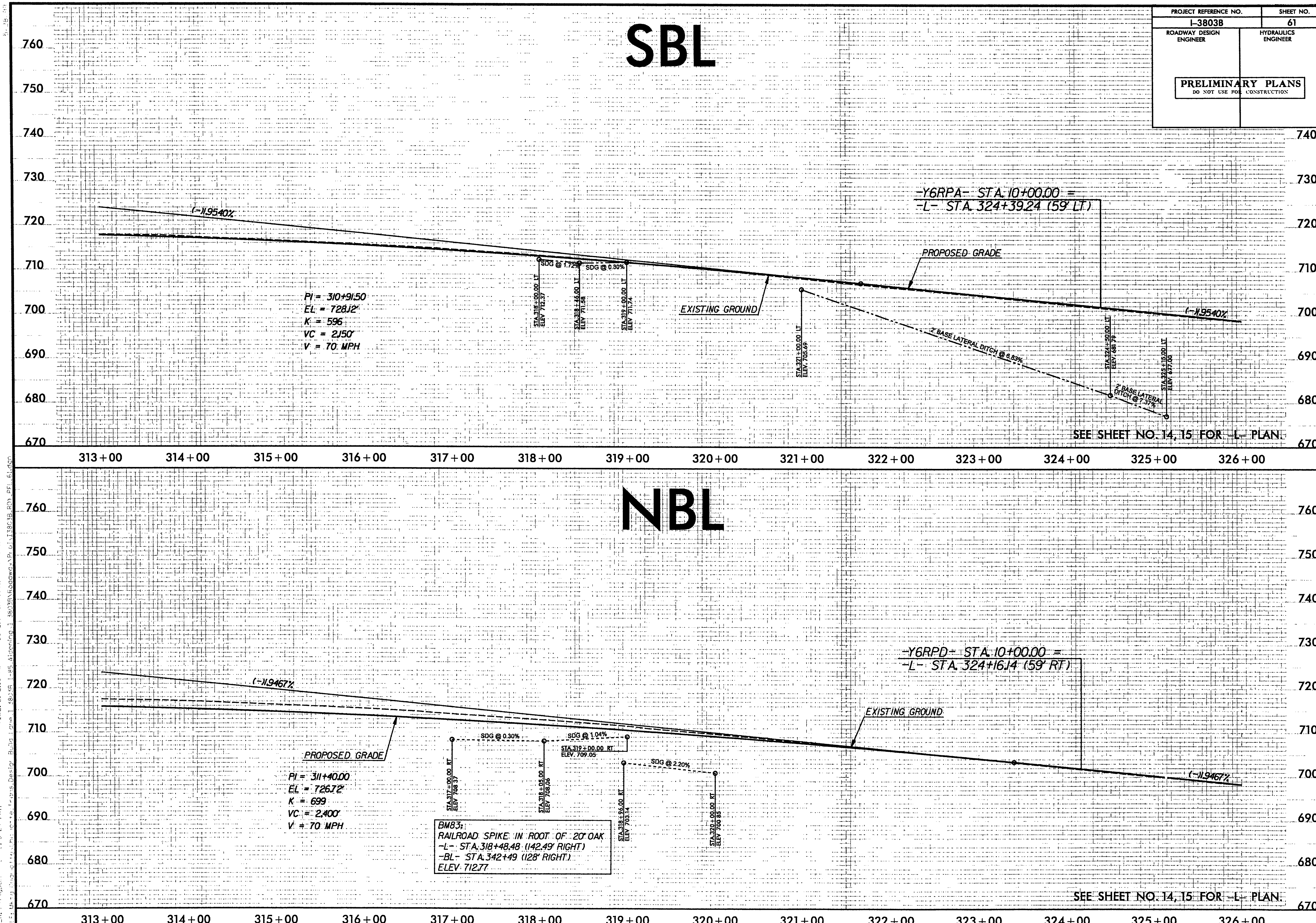



PROJECT REFERENCE NO.
I-3803B
SHEET NO.
59
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
SBL
-Y6RPB- STA. 10+00.00 =
-L- STA. 295+20.00 (59' LT)
PI = 285+95.00
EL = 686.89'
K = 1455
VC = 850'
V = 70 MPH
PROPOSED GRADE
EXISTING GROUND
(+)1.6514%
SDG @ 1.63%
SDG @ 3.58%
2' BASE BERM DITCH @ 0.85%
SDG @ 1.88%
STA 289+00.00 LT ELEV. 687.52
STA 289+75.00 LT ELEV. 686.30
STA 291+00.00 LT ELEV. 690.77
STA 293+86.00 LT ELEV. 705.39
STA 298+00.00 LT ELEV. 702.64
STA 298+54.00 LT ELEV. 709.35
STA 299+00.00 LT ELEV. 704.32
BM81:
RAILROAD SPIKE IN BASE OF BILLBOARD SIGN POLE
-L- STA. 299+14.28 (207.12' LEFT)
-BL- STA. 323+02 (222' LEFT)
ELEV. 717.14
SEE SHEET NO. 13, 14 FOR -L- PLAN.
650
660
670
680
690
700
710
720
730
740
287+00
288+00
289+00
290+00
291+00
292+00
293+00
294+00
295+00
296+00
297+00
298+00
299+00
300+00
NBL
-Y6RPC- STA. 10+00.00 =
-L- STA. 296+37.03 (71' RT)
PI = 285+95.00
EL = 686.89'
K = 1455
VC = 850'
V = 70 MPH
PROPOSED GRADE
(+)1.6514%
(+)1.4871%
4' BASE DITCH @ 4.65%
4' BASE DITCH @ 3.57%
4' BASE DITCH @ 1.30%
4' BASE DITCH @ 4.86%
SDG @ 3.14%
STA 288+00.00 RT ELEV. 678.05
STA 288+93.00 RT ELEV. 681.37
STA 293+27.00 RT ELEV. 687.00
STA 295+00.00 RT ELEV. 695.40
STA 296+20.00 RT ELEV. 699.17
PI = 298+00.00
EL = 706.79'
K = 1704
VC = 280'
V = 70 MPH
PI = 311+40.00
EL = 726.72'
K = 699
VC = 2,400'
V = 70 MPH
SEE SHEET NO. 13, 14 FOR -L- PLAN.
650
660
670
680
690
700
710
720
730
740
287+00
288+00
289+00
290+00
291+00
292+00
293+00
294+00
295+00
296+00
297+00
298+00
299+00
300+00


PROJECT REFERENCE NO. I-3803B
SHEET NO. 60
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
SBL
-Y6- BRIDGE
(+)1.6514% (-)1.9540%
17'-0" MIN.
PROPOSED GRADE
(+)1.6514%
SDG @ 0.31%
EXISTING GROUND
SDG @ 6.82%
STA.300+50.00 LT ELEV. 709.74
STA.301+12.00 LT ELEV. 709.57
STA.308+50.00 LT ELEV. 715.75
STA.309+00.00 LT ELEV. 718.82
PI = 310+91.50
EL = 728.12'
K = 596
VC = 2,150'
V = 70 MPH
BM32:
RAILROAD SPIKE IN BASE OF POWER/TEL POLE
-L- STA.308+94.67 (366.67' LEFT)
-BL- STA.332+70 (384' LEFT)
ELEV 753.11
SEE SHEET NO. 14 FOR -L- PLAN.
NBL
-Y6- BRIDGE
(+)1.4871% (-)1.9467%
EXISTING GROUND
17'-0" MIN.
(+)1.4871%
SDG @ 2.30%
SDG @ 0.67%
PROPOSED GRADE
STA.301+30.00 RT ELEV. 708.99
STA.301+60.00 RT ELEV. 708.30
STA.304+55.00 RT ELEV. 710.27
PI = 311+40.00
EL = 726.72'
K = 699
VC = 2,400'
V = 70 MPH
BM82:
RAILROAD SPIKE IN ROOT OF 18" OAK
-L- STA.308+75.20 (119.82' RIGHT)
-BL- STA.332+77 (102' RIGHT)
ELEV 721.72
SEE SHEET NO. 14 FOR -L- PLAN.
300+00 301+00 302+00 303+00 304+00 305+00 306+00 307+00 308+00 309+00 310+00 311+00 312+00 313+00
670 680 690 700 710 720 730 740 750 760

PROJECT REFERENCE NO.	SHEET NO.
I-3803B	61
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



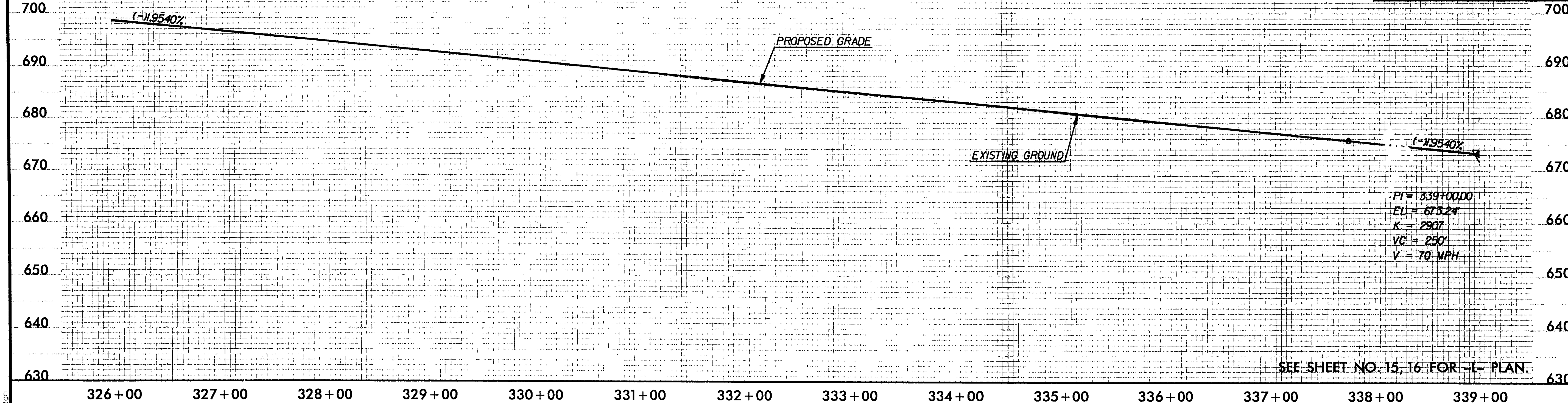
PROJECT REFERENCE NO.	SHEET NO.
I-3803B	62

ROADWAY DESIGN ENGINEER

HYDRAULICS ENGINEER

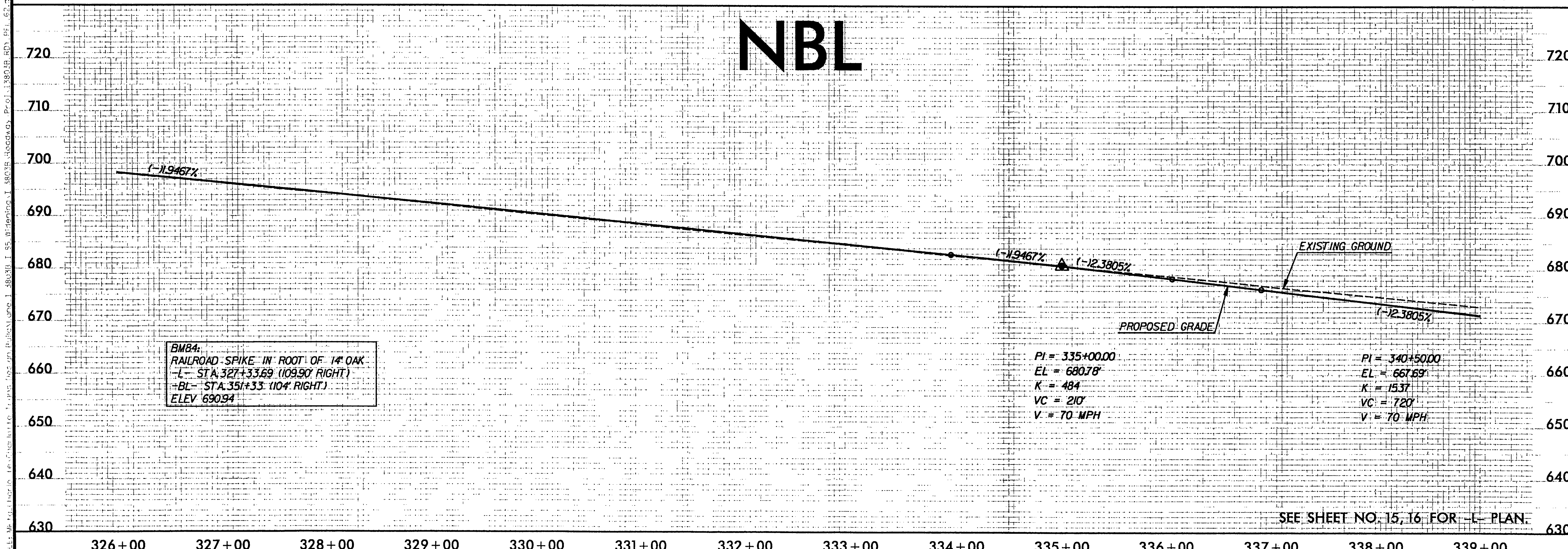
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

SBL



SEE SHEET NO. 15, 16 FOR -L- PLAN.

NBL

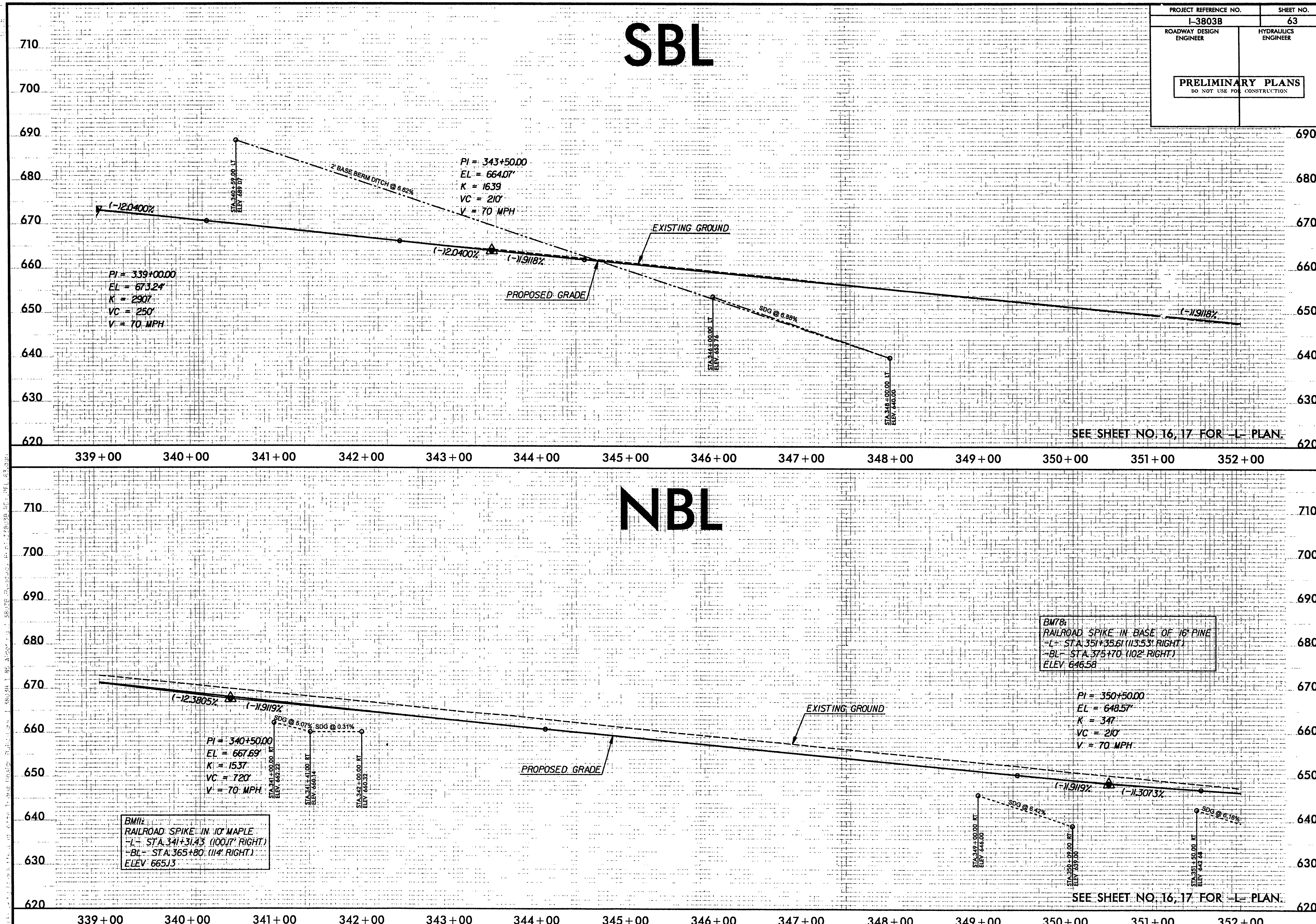


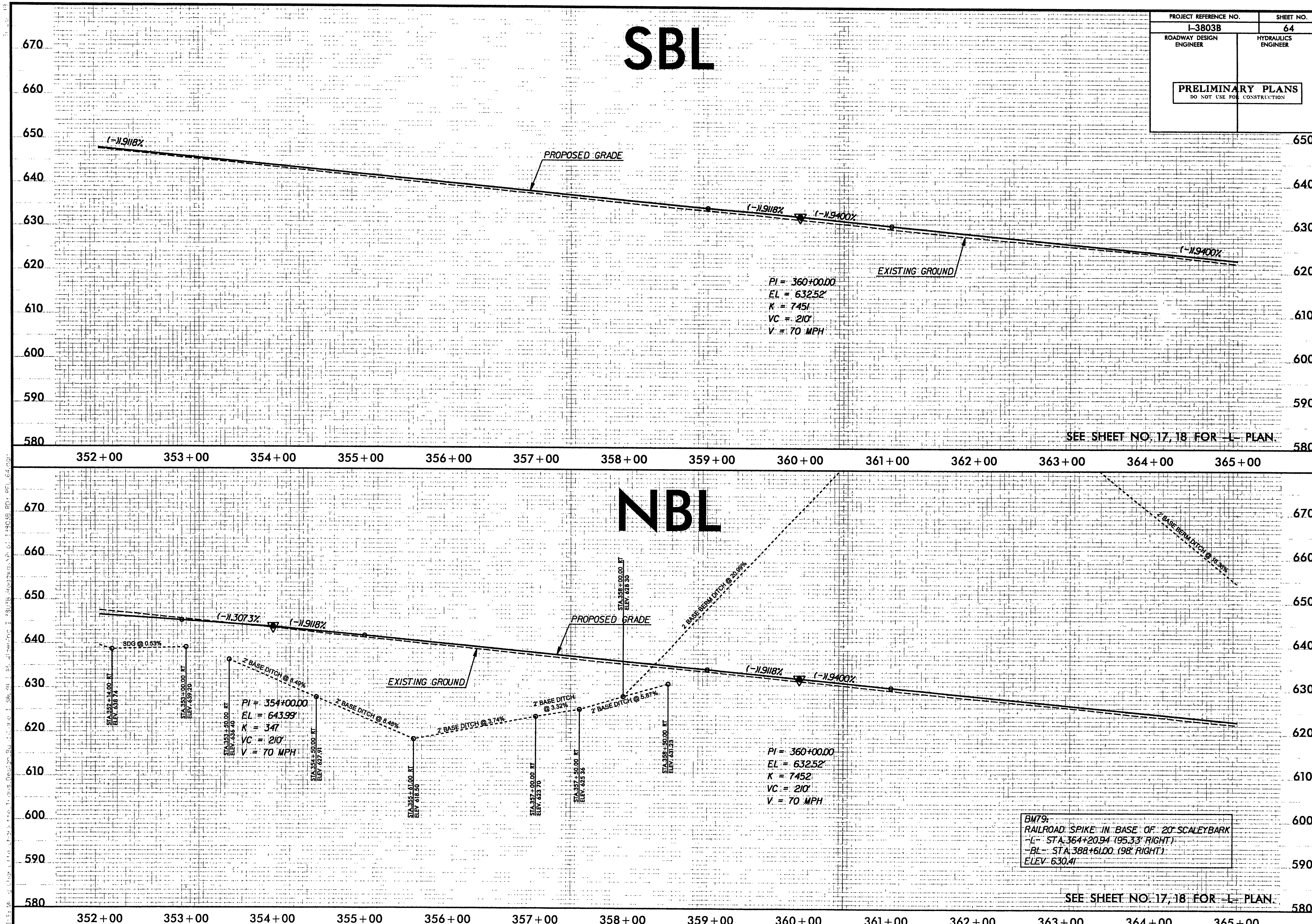
BM84:
RAILROAD SPIKE IN ROOT OF 14" OAK
-L- STA.327+33.69 (109.90' RIGHT)
-BL- STA.351+33 (104' RIGHT)
ELEV 690.94

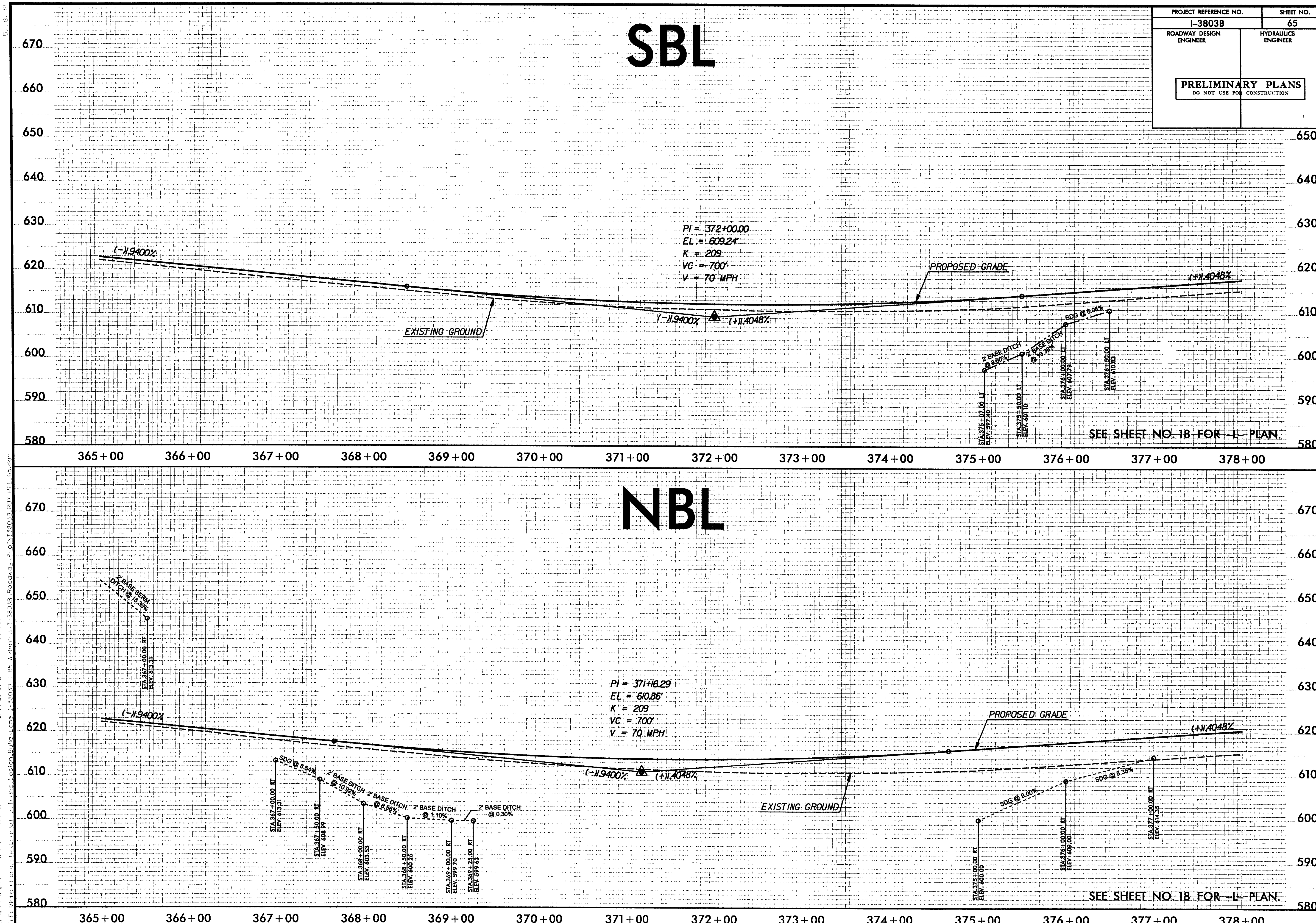
SEE SHEET NO. 15, 16 FOR -L- PLAN.

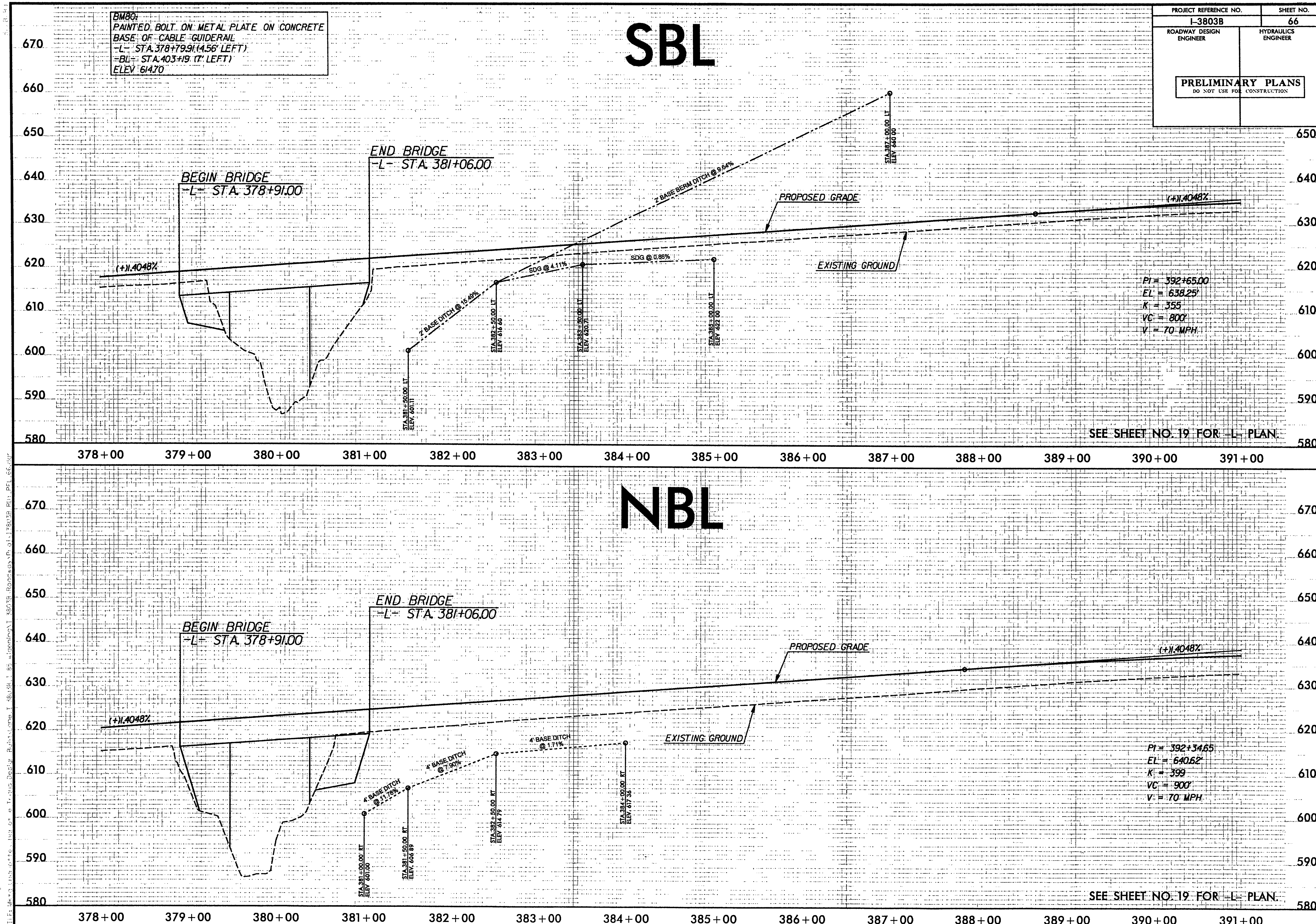
PROJECT REFERENCE NO.	SHEET NO.
I-3803B	63
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

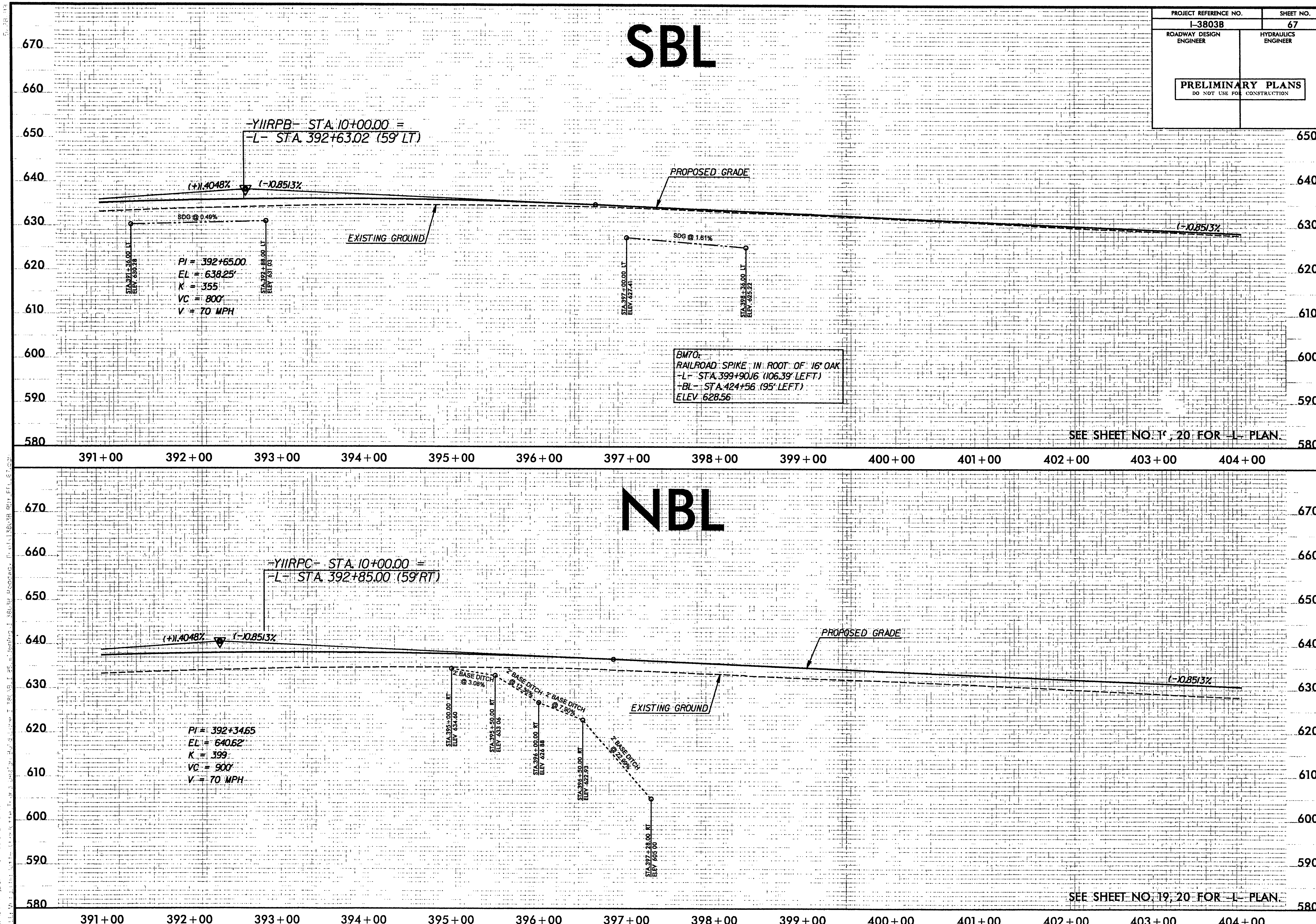


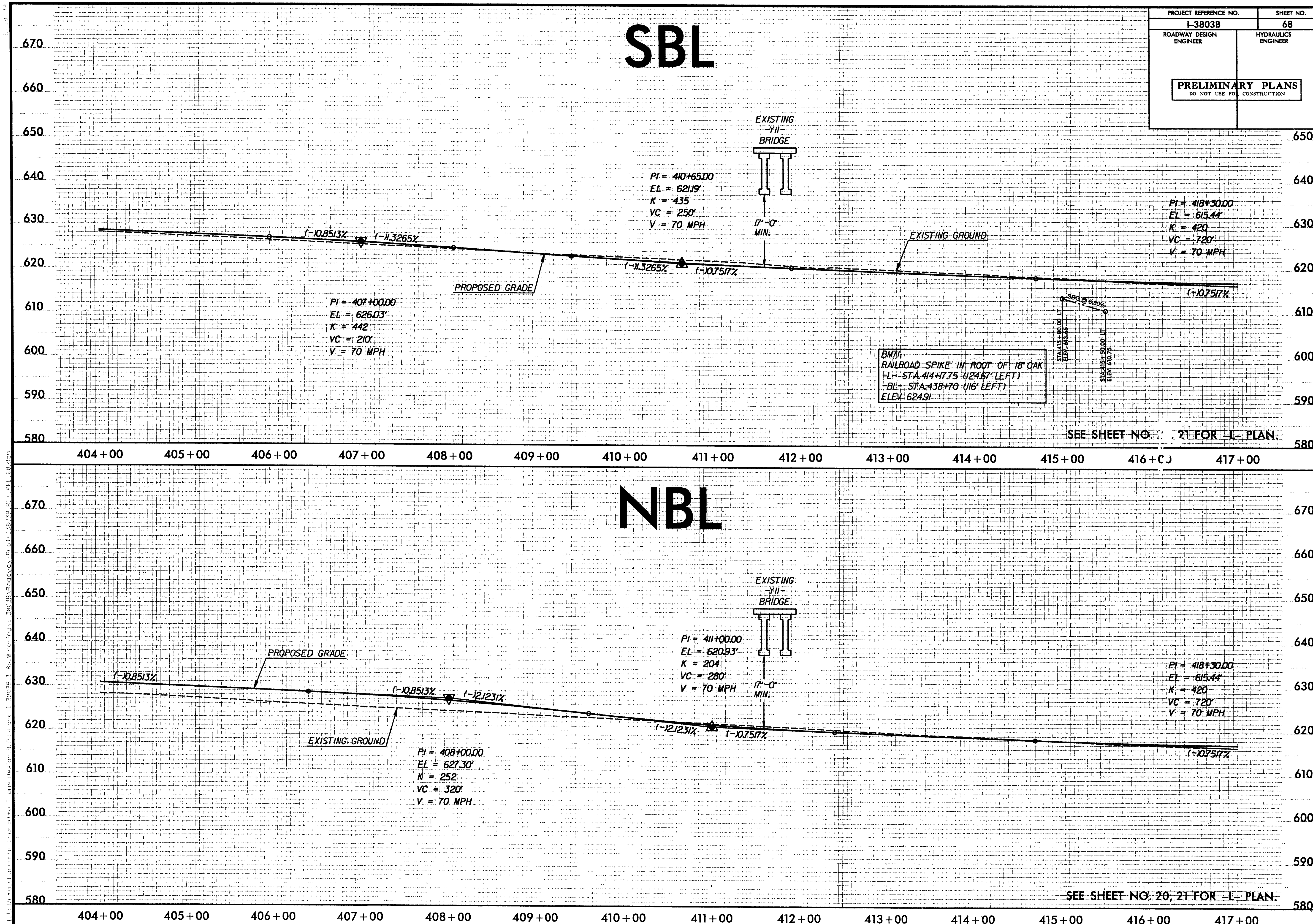

PROJECT REFERENCE NO.
I-3803B
SHEET NO.
64
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
SBL
(-)1.9118%
PROPOSED GRADE
(-)1.9118%
(-)1.9400%
(-)1.9400%
EXISTING GROUND
PI = 360+00.00
EL = 632.52'
K = 7451
VC = 210'
V = 70 MPH
SEE SHEET NO. 17, 18 FOR -L- PLAN.
670
660
650
640
630
620
610
600
590
580
352+00
353+00
354+00
355+00
356+00
357+00
358+00
359+00
360+00
361+00
362+00
363+00
364+00
365+00
NBL
(-)1.3073%
(-)1.9118%
PROPOSED GRADE
EXISTING GROUND
SDG @ 0.53%
STA.352+14.00 RT ELEV. 638.74
STA.353+00.00 RT ELEV. 639.20
STA.353+50.00 RT ELEV. 636.40
2' BASE DITCH @ 8.49%
PI = 354+00.00
EL = 643.99'
K = 347
VC = 210'
V = 70 MPH
STA.354+50.00 RT ELEV. 627.91
2' BASE DITCH @ 8.48%
STA.355+61.00 RT ELEV. 618.50
2' BASE DITCH @ 3.74%
STA.357+00.00 RT ELEV. 623.70
2' BASE DITCH @ 3.32%
STA.357+50.00 RT ELEV. 625.36
2' BASE DITCH @ 5.87%
STA.358+00.00 RT ELEV. 628.30
STA.358+50.00 RT ELEV. 631.23
2' BASE BERM DITCH @ 20.99%
2' BASE BERM DITCH @ 16.36%
(-)1.9118%
(-)1.9400%
PI = 360+00.00
EL = 632.52'
K = 7452
VC = 210'
V = 70 MPH
BM79:
RAILROAD SPIKE IN BASE OF 20" SCALEYBARK
-L- STA.364+20.94 (95.33' RIGHT)
-BL- STA.388+61.00 (98' RIGHT)
ELEV. 630.41
SEE SHEET NO. 17, 18 FOR -L- PLAN.


PROJECT REFERENCE NO.
I-3803B
SHEET NO.
65
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
SBL
PI = 372+00.00
EL = 609.24'
K = 209
VC = 700'
V = 70 MPH
(-)1.9400%
(+)1.4048%
PROPOSED GRADE
EXISTING GROUND
2' BASE DITCH
SDG @ 6.08%
SEE SHEET NO. 18 FOR -L- PLAN.
NBL
PI = 371+16.29
EL = 610.86'
K = 209
VC = 700'
V = 70 MPH
(-)1.9400%
(+)1.4048%
PROPOSED GRADE
EXISTING GROUND
2' BASE BERM DITCH @ 16.28%
SDG @ 8.84%
2' BASE DITCH @ 10.92%
2' BASE DITCH @ 6.56%
2' BASE DITCH @ 1.10%
2' BASE DITCH @ 0.30%
SDG @ 9.00%
SDG @ 5.35%
SEE SHEET NO. 18 FOR -L- PLAN.
670
660
650
640
630
620
610
600
590
580
365+00
366+00
367+00
368+00
369+00
370+00
371+00
372+00
373+00
374+00
375+00
376+00
377+00
378+00

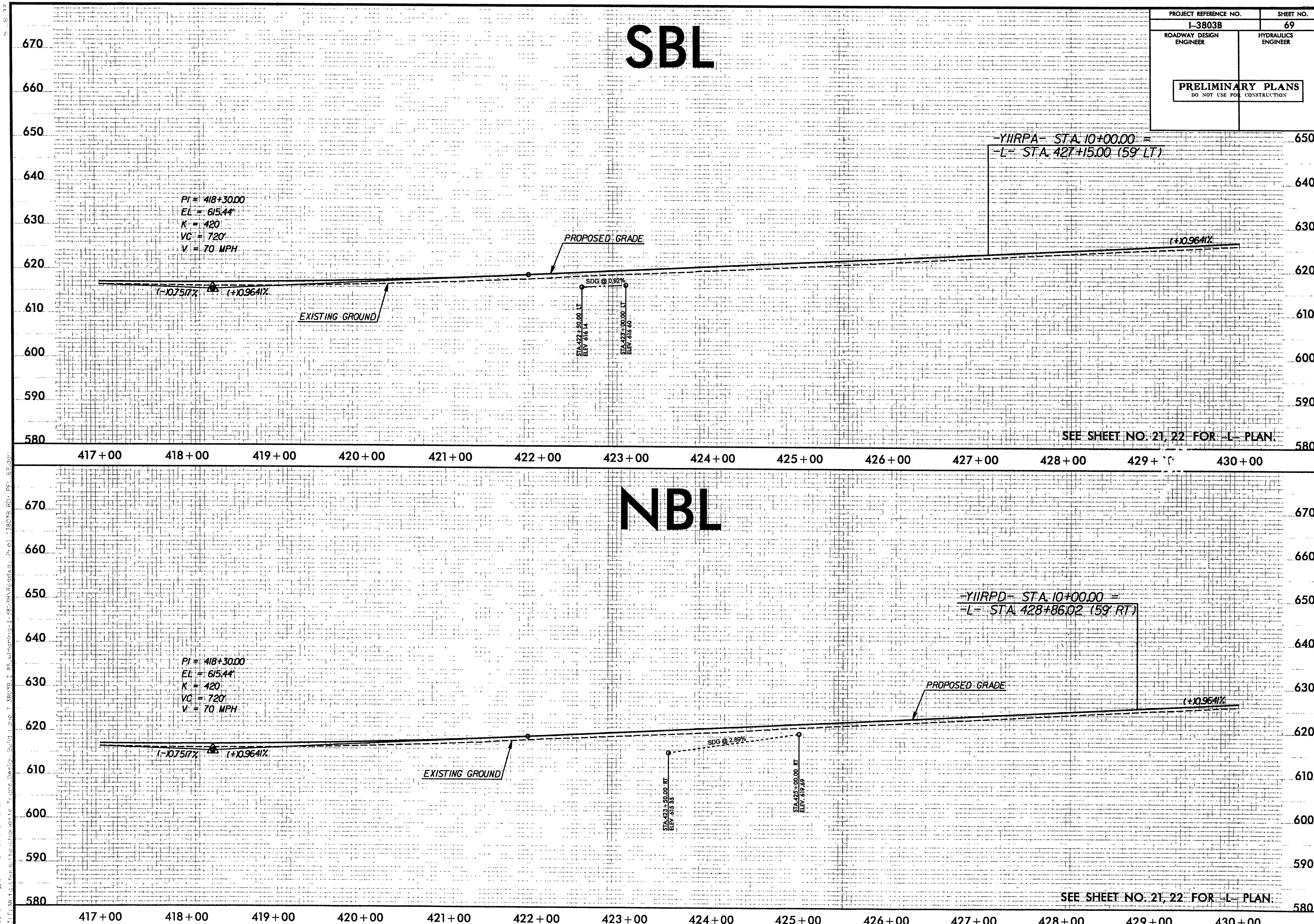


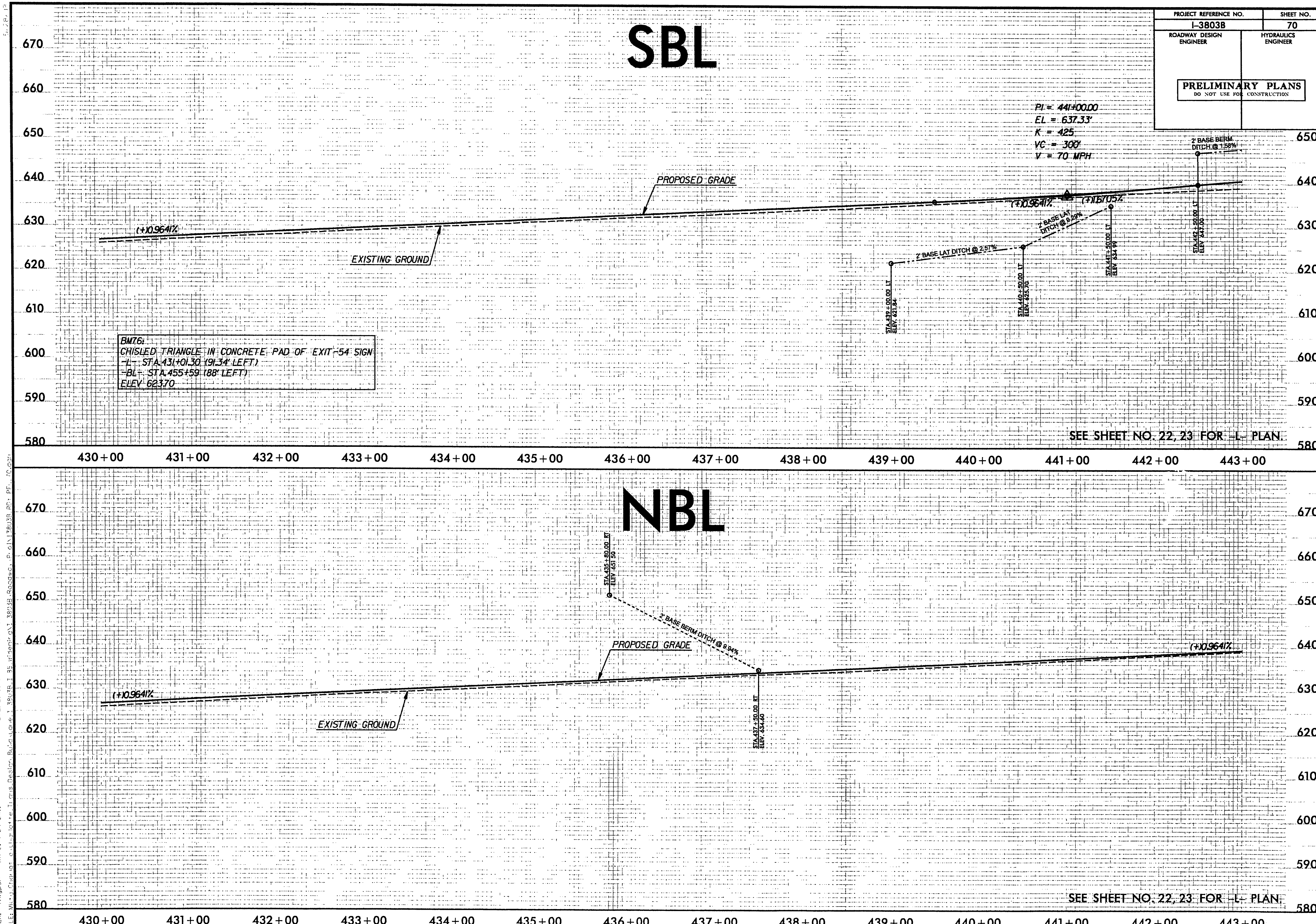
PROJECT REFERENCE NO. I-3803B
SHEET NO. 66
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
BM80:
PAINTED BOLT ON METAL PLATE ON CONCRETE
BASE OF CABLE GUIDERAIL
-L- STA.378+79.91 (4.56' LEFT)
-BL- STA.403+19 (7' LEFT)
ELEV 614.70
SBL
BEGIN BRIDGE
-L- STA. 378+91.00
END BRIDGE
-L- STA. 381+06.00
(+)1.4048%
2' BASE BERM DITCH @ 9.64%
PROPOSED GRADE
EXISTING GROUND
2' BASE DITCH @ 15.49%
SDG @ 4.11%
SDG @ 0.86%
STA.381+50.00 LT ELEV. 601.11
STA.382+50.00 LT ELEV. 616.60
STA.383+50.00 LT ELEV. 620.71
STA.385+00.00 LT ELEV. 622.00
STA.387+00.00 LT ELEV. 640.00
PI = 392+65.00
EL = 638.25'
K = 355
VC = 800'
V = 70 MPH
SEE SHEET NO. 19 FOR -L- PLAN.
NBL
BEGIN BRIDGE
-L- STA. 378+91.00
END BRIDGE
-L- STA. 381+06.00
(+)1.4048%
PROPOSED GRADE
EXISTING GROUND
4' BASE DITCH @ 11.78%
4' BASE DITCH @ 7.90%
4' BASE DITCH @ 1.71%
STA.381+00.00 RT ELEV. 601.00
STA.381+50.00 RT ELEV. 606.89
STA.382+50.00 RT ELEV. 614.79
STA.384+00.00 RT ELEV. 617.36
PI = 392+34.65
EL = 640.62'
K = 399
VC = 900'
V = 70 MPH
SEE SHEET NO. 19 FOR -L- PLAN.
670
660
650
640
630
620
610
600
590
580
378+00
379+00
380+00
381+00
382+00
383+00
384+00
385+00
386+00
387+00
388+00
389+00
390+00
391+00


PROJECT REFERENCE NO. I-3803B
SHEET NO. 67
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
SBL
-Y11RPB- STA. 10+00.00 =
-L- STA. 392+63.02 (59' LT)
(+)1.4048%
(-)0.8513%
PROPOSED GRADE
SDG @ 0.49%
EXISTING GROUND
SDG @ 1.61%
(-)0.8513%
PI = 392+65.00
EL = 638.25'
K = 355
VC = 800'
V = 70 MPH
BM70:
RAILROAD SPIKE IN ROOT OF 16" OAK
-L- STA. 399+90.16 (106.39' LEFT)
-BL- STA. 424+56 (95' LEFT)
ELEV 628.56
SEE SHEET NO. 19, 20 FOR -L- PLAN.
NBL
-Y11RPC- STA. 10+00.00 =
-L- STA. 392+85.00 (59' RT)
(+)1.4048%
(-)0.8513%
PROPOSED GRADE
2' BASE DITCH @ 3.08%
2' BASE DITCH @ 12.38%
2' BASE DITCH @ 7.90%
2' BASE DITCH @ 22.89%
EXISTING GROUND
(-)0.8513%
PI = 392+34.65
EL = 640.62'
K = 399
VC = 900'
V = 70 MPH
SEE SHEET NO. 19, 20 FOR -L- PLAN.
391+00
392+00
393+00
394+00
395+00
396+00
397+00
398+00
399+00
400+00
401+00
402+00
403+00
404+00
580
590
600
610
620
630
640
650
660
670



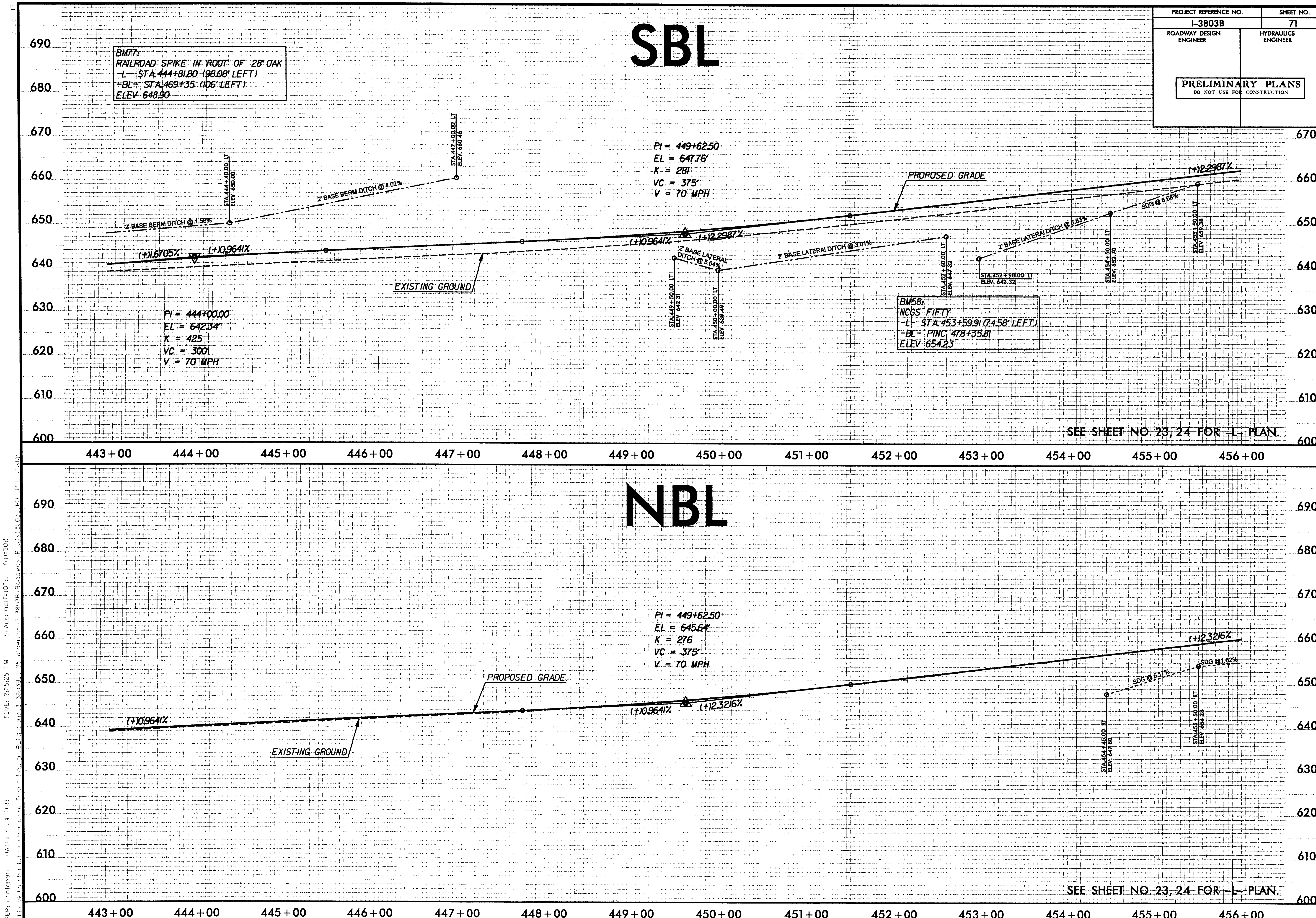
PROJECT REFERENCE NO.
I-3803B
SHEET NO.
68
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
SBL
EXISTING -Y11- BRIDGE
PI = 410+65.00
EL = 621.19'
K = 435
VC = 250'
V = 70 MPH
17'-0" MIN.
PI = 418+30.00
EL = 615.44'
K = 420
VC = 720'
V = 70 MPH
EXISTING GROUND
(-)0.8513%
(-)1.3265%
(-)1.3265%
(-)0.7517%
(-)0.7517%
PROPOSED GRADE
PI = 407+00.00
EL = 626.03'
K = 442
VC = 210'
V = 70 MPH
SDG @ 5.80%
STA 415+00.00 LT ELEV 613.46
STA 415+50.00 LT ELEV 610.75
BM71:
RAILROAD SPIKE IN ROOT OF 18" OAK
-L- STA 414+17.75 (124.67' LEFT)
-BL- STA 438+70 (116' LEFT)
ELEV 624.91
SEE SHEET NO. 21 FOR -L- PLAN.
NBL
EXISTING -Y11- BRIDGE
PI = 411+00.00
EL = 620.93'
K = 204
VC = 280'
V = 70 MPH
17'-0" MIN.
PI = 418+30.00
EL = 615.44'
K = 420
VC = 720'
V = 70 MPH
PROPOSED GRADE
(-)0.8513%
(-)0.8513%
(-)2.1231%
(-)2.1231%
(-)0.7517%
(-)0.7517%
EXISTING GROUND
PI = 408+00.00
EL = 627.30'
K = 252
VC = 320'
V = 70 MPH
SEE SHEET NO. 20, 21 FOR -L- PLAN.
670
660
650
640
630
620
610
600
590
580
404+00
405+00
406+00
407+00
408+00
409+00
410+00
411+00
412+00
413+00
414+00
415+00
416+00
417+00


PROJECT REFERENCE NO. I-3803B
SHEET NO. 69
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
SBL
-YIIRPA- STA. 10+00.00 =
-L- STA. 427+15.00 (59' LT)
PI = 418+30.00
EL = 615.44'
K = 420
VC = 720'
V = 70 MPH
PROPOSED GRADE
(+)0.9641%
(-)0.7517%
(+)0.9641%
EXISTING GROUND
SDG @ 0.92%
STA.422+50.00 LT
ELEV 616.14
STA.423+00.00 LT
ELEV. 616.60
SEE SHEET NO. 21, 22 FOR -L- PLAN.
417+00 418+00 419+00 420+00 421+00 422+00 423+00 424+00 425+00 426+00 427+00 428+00 429+00 430+00
NBL
-YIIRPD- STA. 10+00.00 =
-L- STA. 428+86.02 (59' RT)
PI = 418+30.00
EL = 615.44'
K = 420
VC = 720'
V = 70 MPH
PROPOSED GRADE
(+)0.9641%
(-)0.7517%
(+)0.9641%
EXISTING GROUND
SDG @ 2.89%
STA.423+50.00 RT
ELEV 615.35
STA.425+00.00 RT
ELEV. 619.69
SEE SHEET NO. 21, 22 FOR -L- PLAN.
417+00 418+00 419+00 420+00 421+00 422+00 423+00 424+00 425+00 426+00 427+00 428+00 429+00 430+00


PROJECT REFERENCE NO.
I-3803B
SHEET NO.
70
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
SBL
PI = 441+00.00
EL = 637.33'
K = 425
VC = 300'
V = 70 MPH
PROPOSED GRADE
EXISTING GROUND
(+)0.9641%
(+)0.9641%
(+)1.5705%
2' BASE BERM DITCH @ 1.58%
2' BASE LAT DITCH @ 2.57%
2' BASE LAT DITCH @ 8.29%
STA.439+00.00 LT ELEV. 621.84
STA.440+50.00 LT ELEV. 625.70
STA.441+50.00 LT ELEV. 634.99
STA.442+50.00 LT ELEV. 647.00
BM76:
CHISLED TRIANGLE IN CONCRETE PAD OF EXIT 54 SIGN
-L- STA.431+01.30 (91.34' LEFT)
-BL- STA.455+59 (88' LEFT)
ELEV 623.70
SEE SHEET NO. 22, 23 FOR -L- PLAN.
NBL
STA.435+80.00 RT ELEV 651.50
2' BASE BERM DITCH @ 9.94%
PROPOSED GRADE
EXISTING GROUND
(+)0.9641%
(+)0.9641%
STA.437+50.00 RT ELEV. 634.60
SEE SHEET NO. 22, 23 FOR -L- PLAN.
580
590
600
610
620
630
640
650
660
670
430+00
431+00
432+00
433+00
434+00
435+00
436+00
437+00
438+00
439+00
440+00
441+00
442+00
443+00

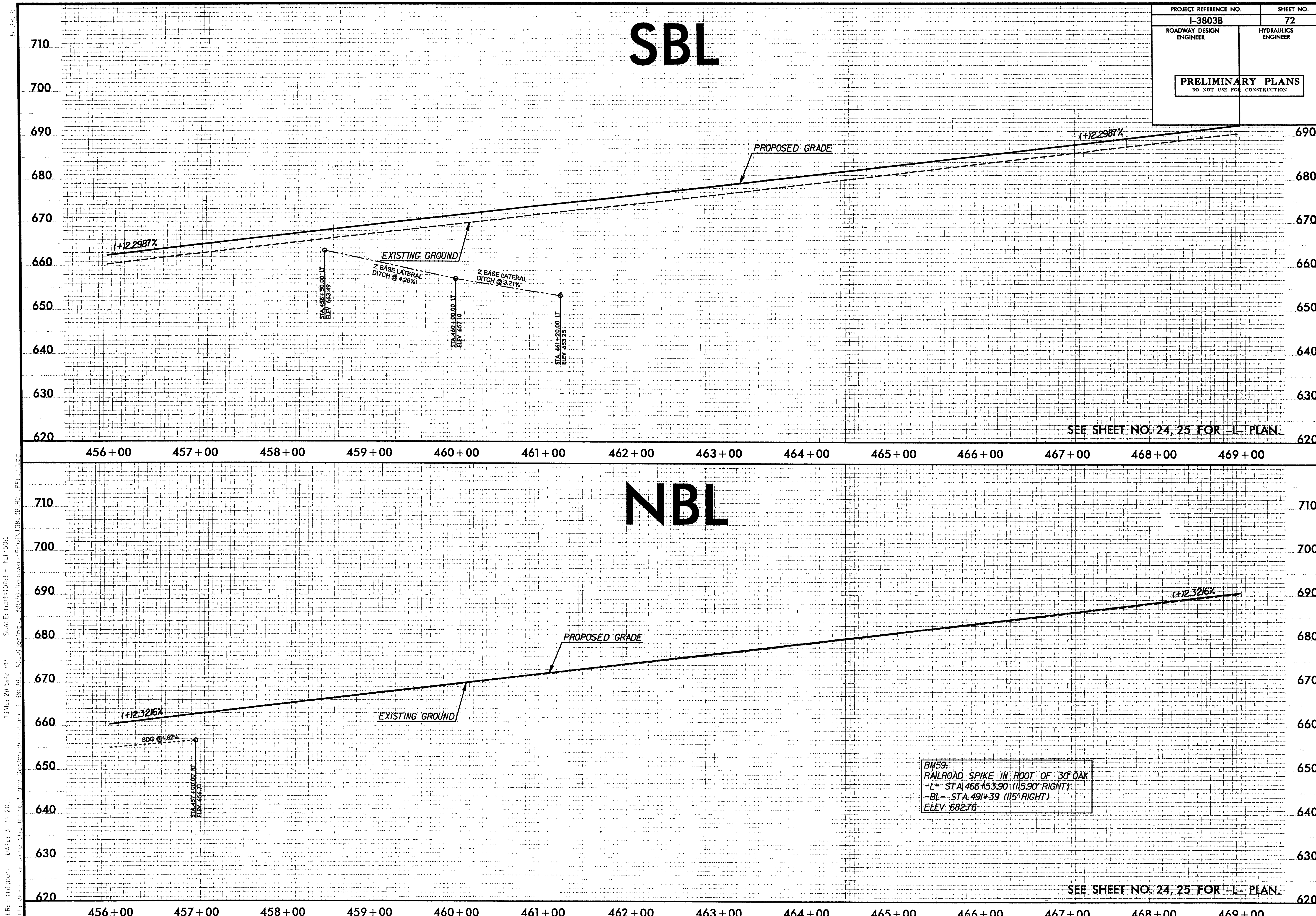
PROJECT REFERENCE NO.	SHEET NO.
I-3803B	71
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



PROJECT REFERENCE NO.	SHEET NO.
I-3803B	72
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

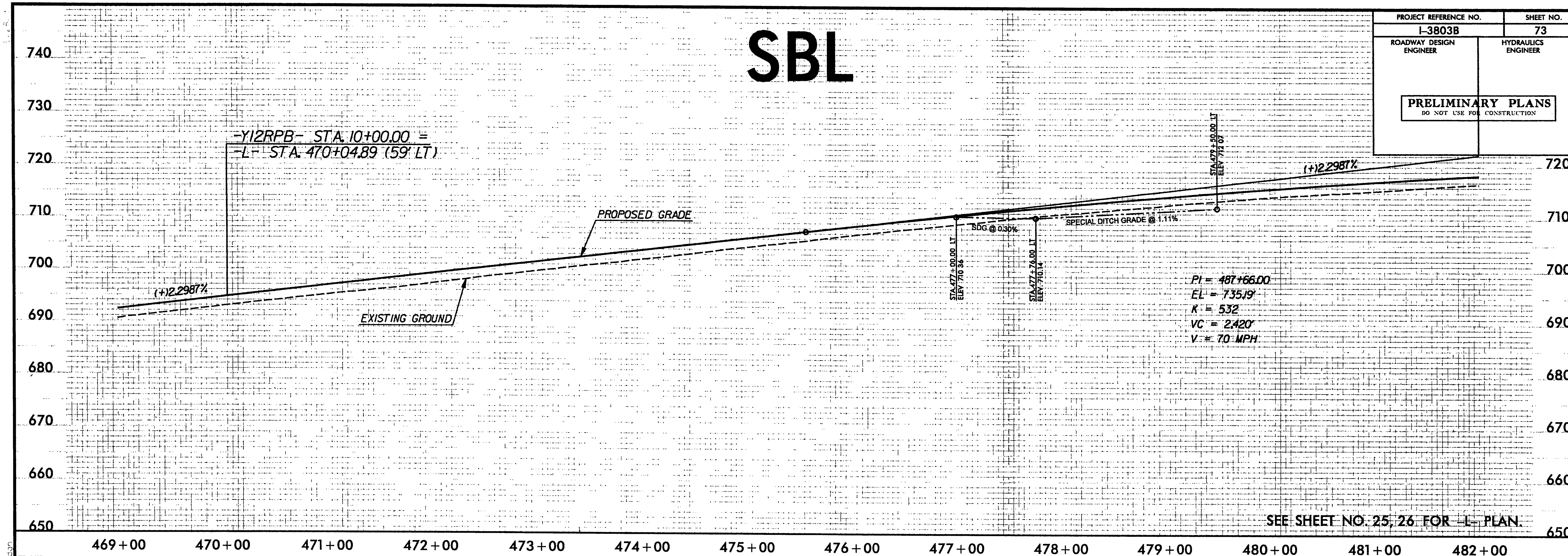
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



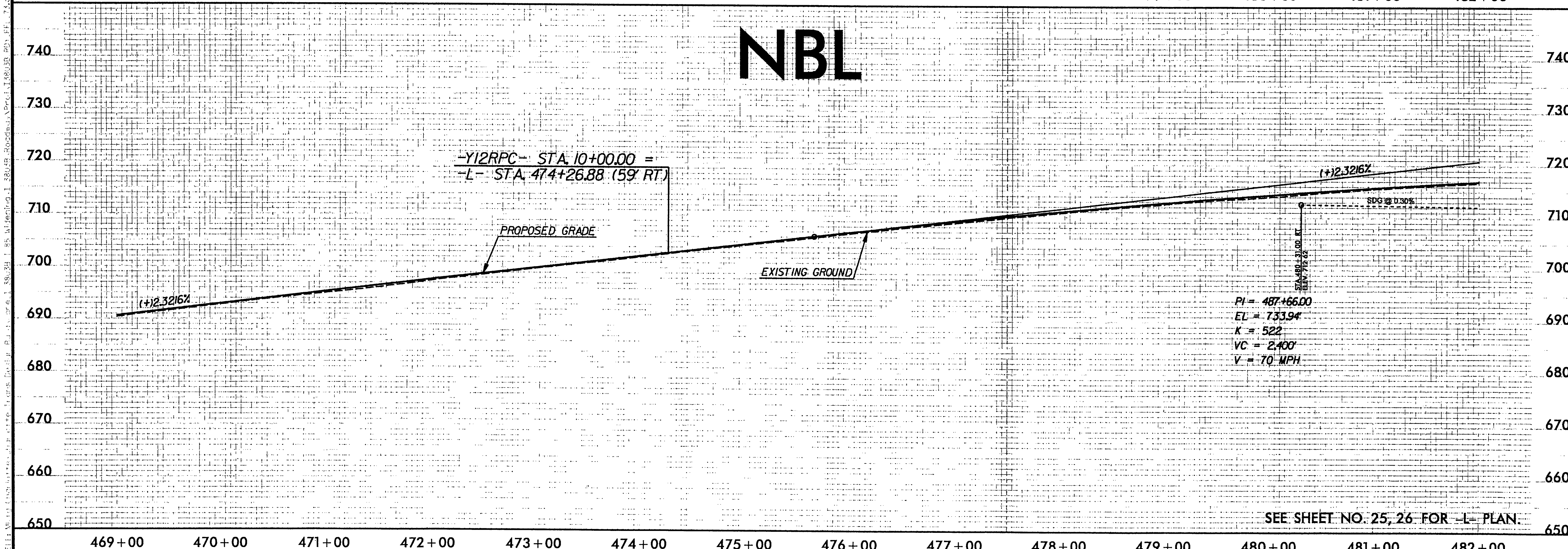
PROJECT REFERENCE NO.	SHEET NO.
I-3803B	73
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

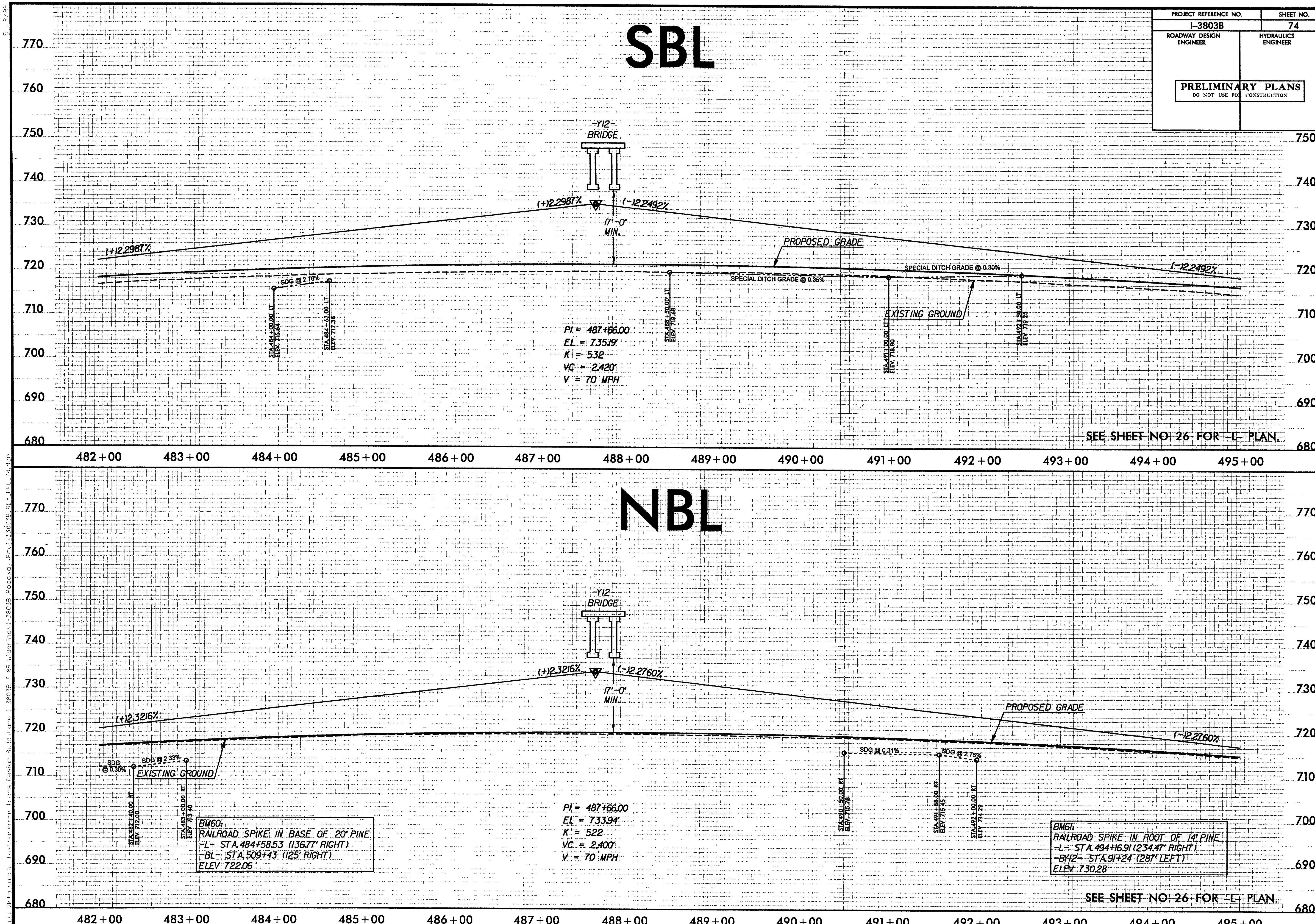
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

SBL



NBL




PROJECT REFERENCE NO.
I-3803B
SHEET NO.
74
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
SBL
-Y12-
BRIDGE
(+)2.2987%
(-)2.2492%
17'-0" MIN.
PROPOSED GRADE
SPECIAL DITCH GRADE @ 0.30%
SPECIAL DITCH GRADE @ 0.35%
SDG @ 2.76%
EXISTING GROUND
STA.484+00.00 LT ELEV. 715.64
STA.484+63.00 LT ELEV. 717.38
STA.488+50.00 LT ELEV. 719.68
STA.491+00.00 LT ELEV. 718.80
STA.492+50.00 LT ELEV. 719.23
PI = 487+66.00
EL = 735.19'
K = 532
VC = 2,420'
V = 70 MPH
SEE SHEET NO. 26 FOR -L- PLAN.
NBL
-Y12-
BRIDGE
(+)2.3216%
(-)2.2760%
17'-0" MIN.
PROPOSED GRADE
SDG @ 0.30%
SDG @ 2.35%
EXISTING GROUND
SDG @ 0.31%
SDG @ 2.76%
STA.482+40.00 RT ELEV. 712.00
STA.483+00.00 RT ELEV. 713.40
STA.490+50.00 RT ELEV. 715.78
STA.491+58.00 RT ELEV. 715.45
STA.492+00.00 RT ELEV. 714.29
PI = 487+66.00
EL = 733.94'
K = 522
VC = 2,400'
V = 70 MPH
BM60:
RAILROAD SPIKE IN BASE OF 20" PINE
-L- STA.484+58.53 (136.77' RIGHT)
-BL- STA.509+43 (125' RIGHT)
ELEV 722.06
BM61:
RAILROAD SPIKE IN ROOT OF 14" PINE
-L- STA.494+16.91 (234.47' RIGHT)
-BY12- STA.91+24 (287' LEFT)
ELEV 730.28
SEE SHEET NO. 26 FOR -L- PLAN.
770
760
750
740
730
720
710
700
690
680
482+00
483+00
484+00
485+00
486+00
487+00
488+00
489+00
490+00
491+00
492+00
493+00
494+00
495+00

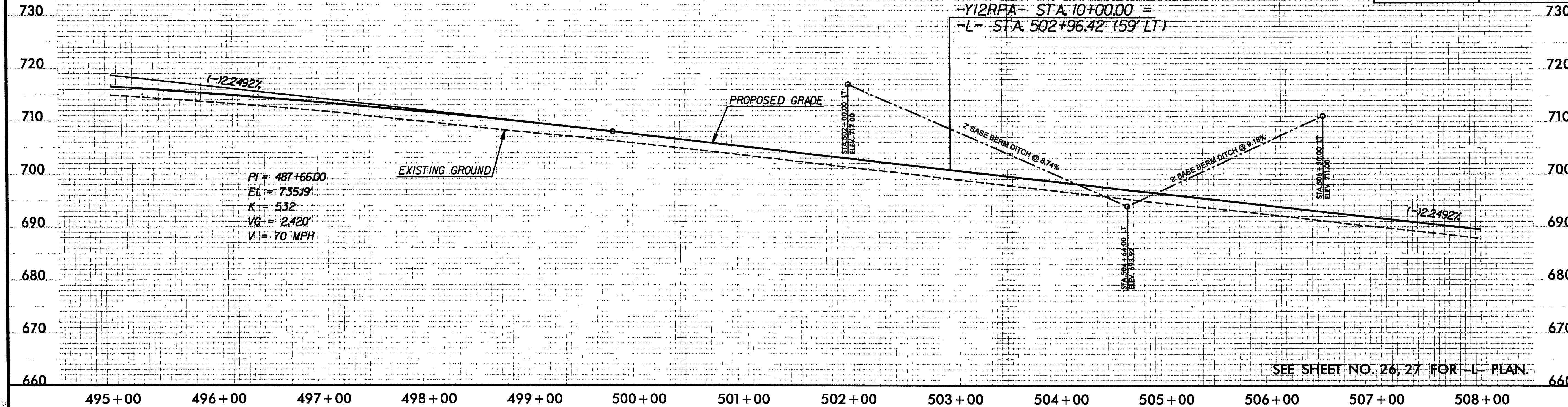
PROJECT REFERENCE NO.	SHEET NO.
I-3803B	75

ROADWAY DESIGN ENGINEER

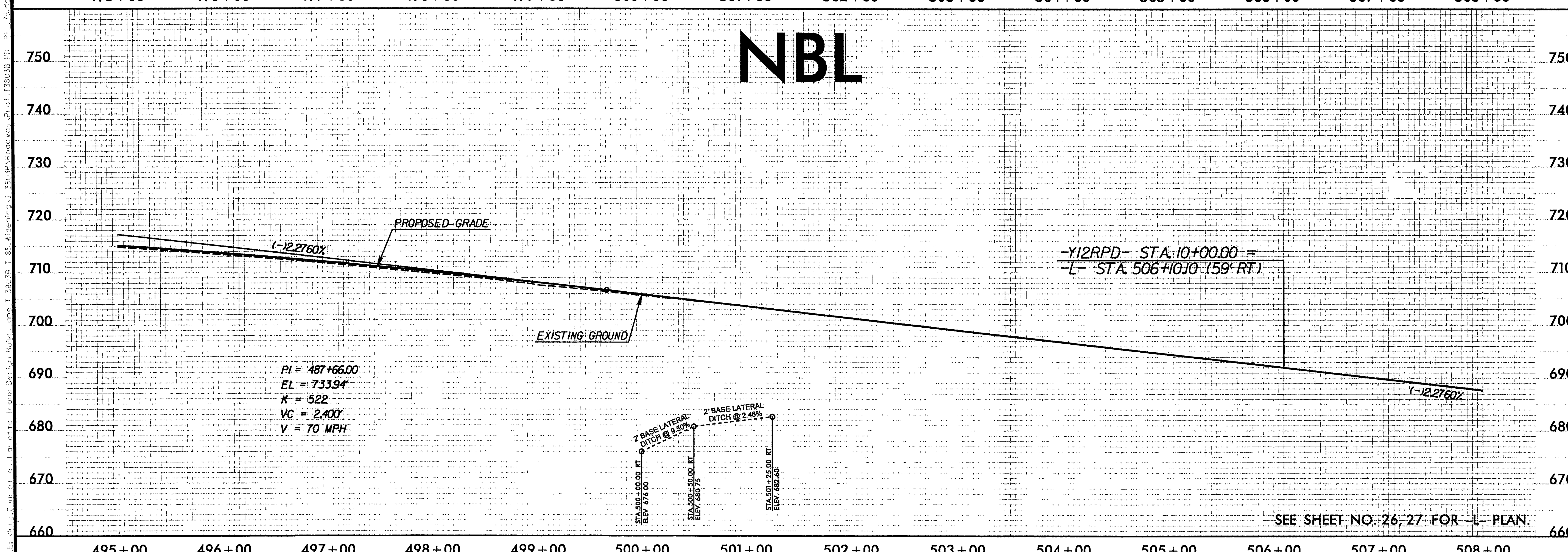
HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

SBL



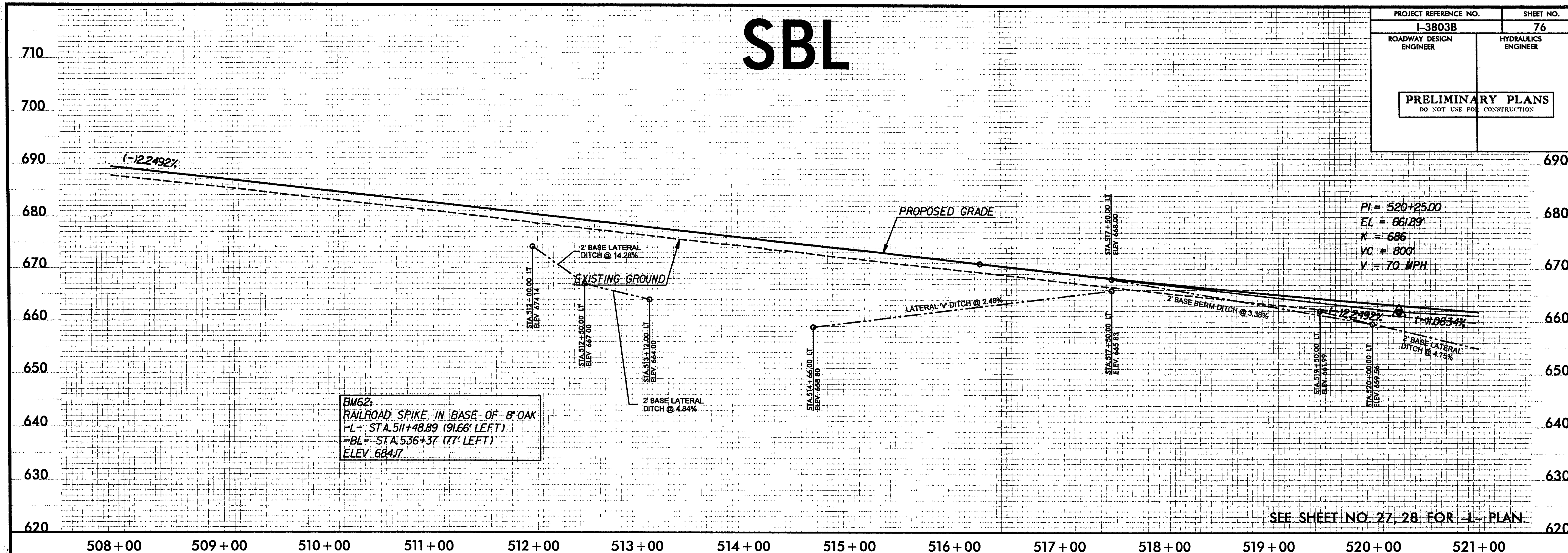
NBL



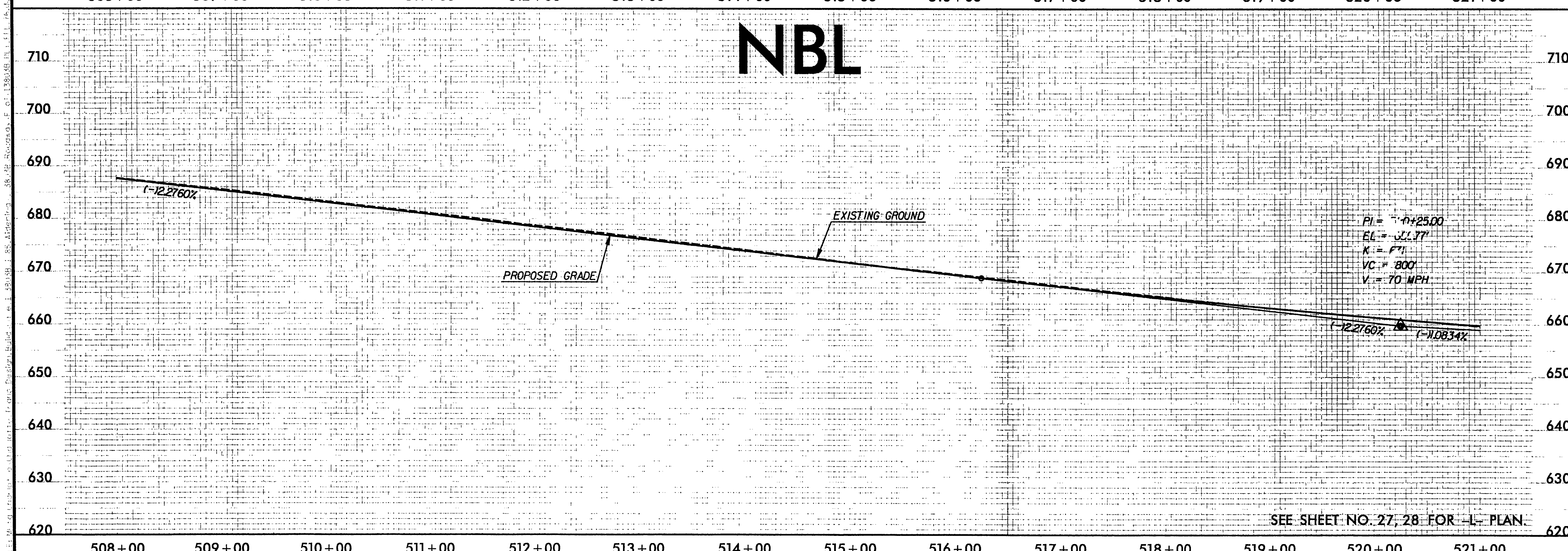
PROJECT REFERENCE NO.	SHEET NO.
I-3803B	76
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

SBL

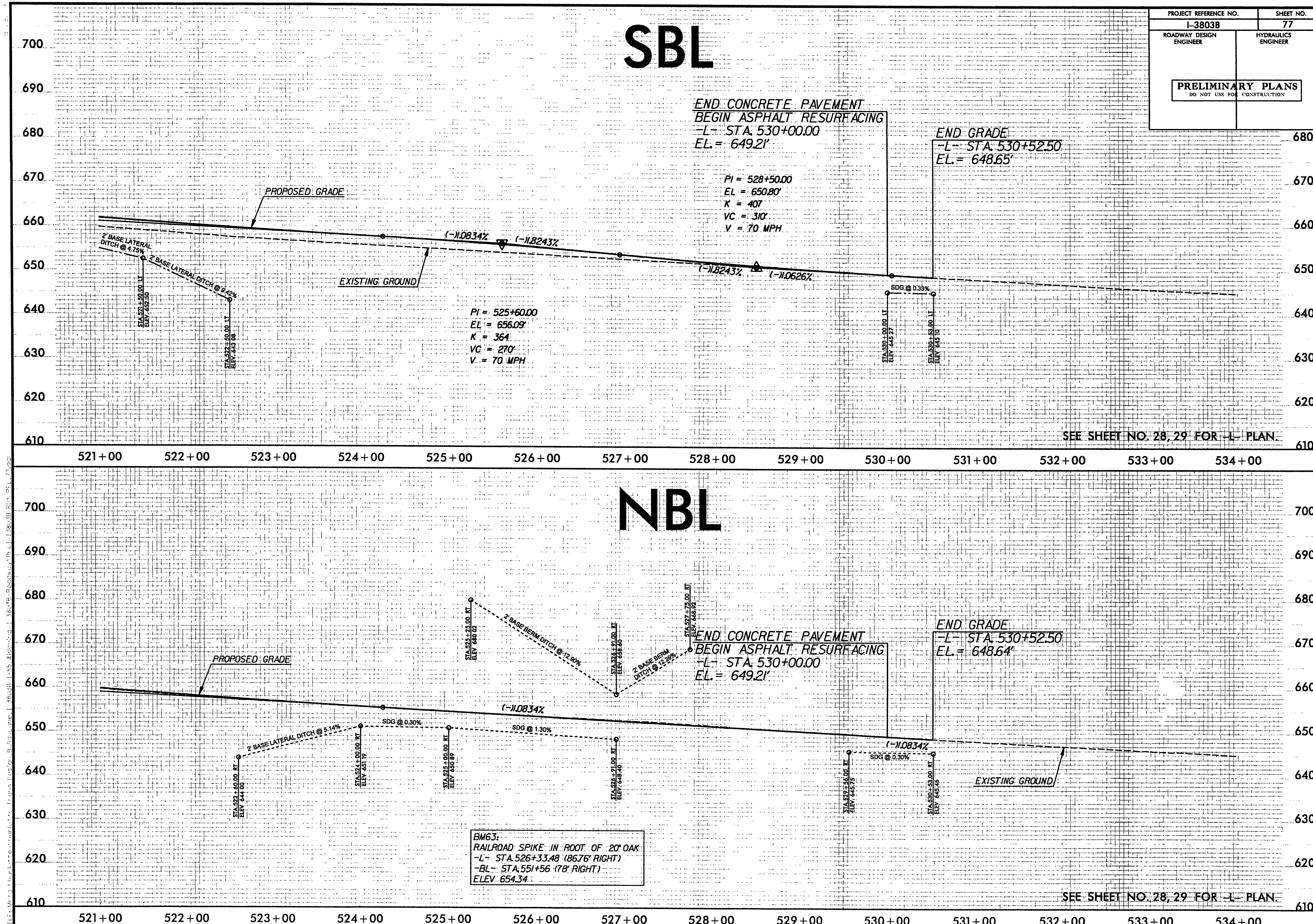


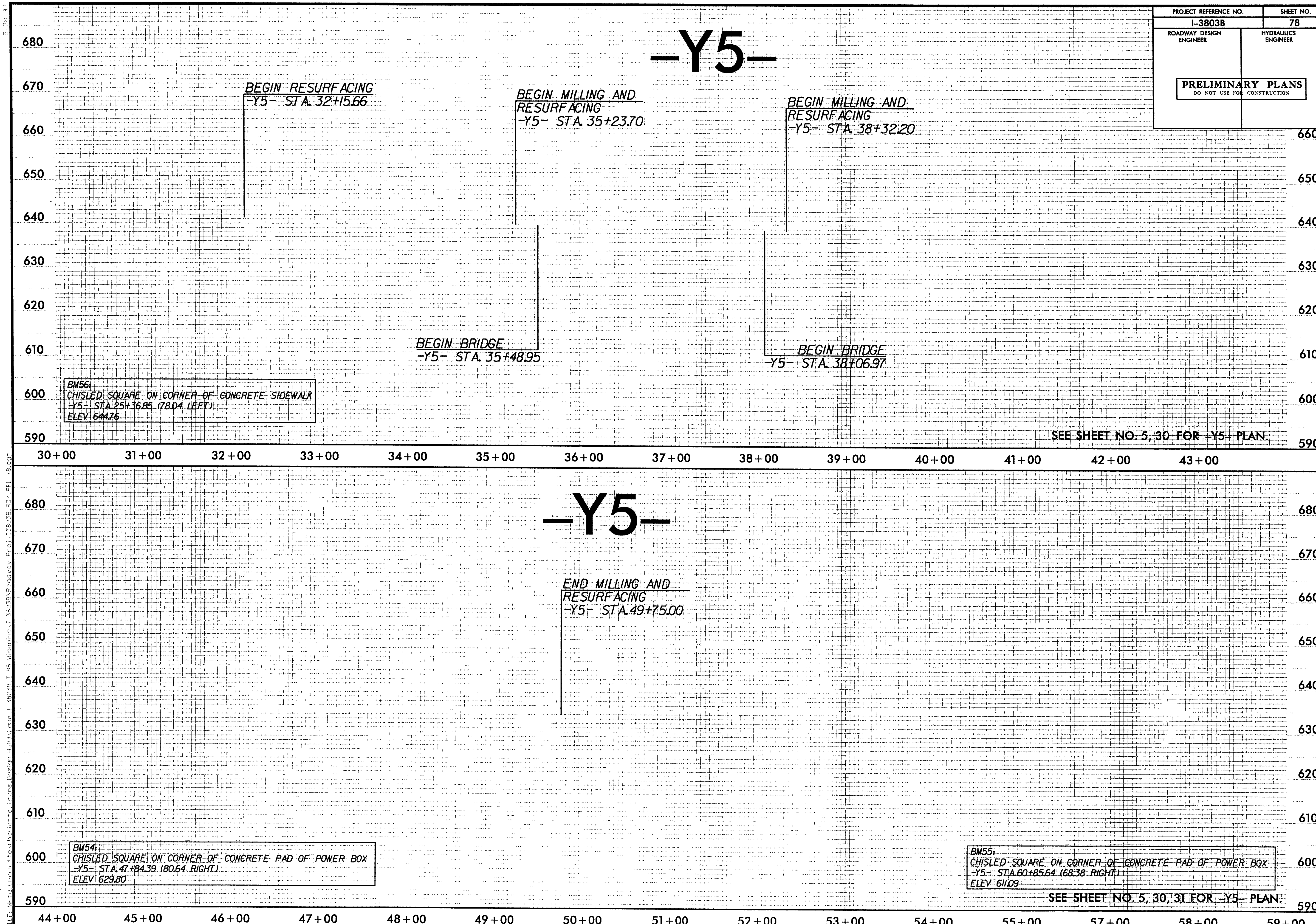
NBL



PROJECT REFERENCE NO.	SHEET NO.
I-3803B	77
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

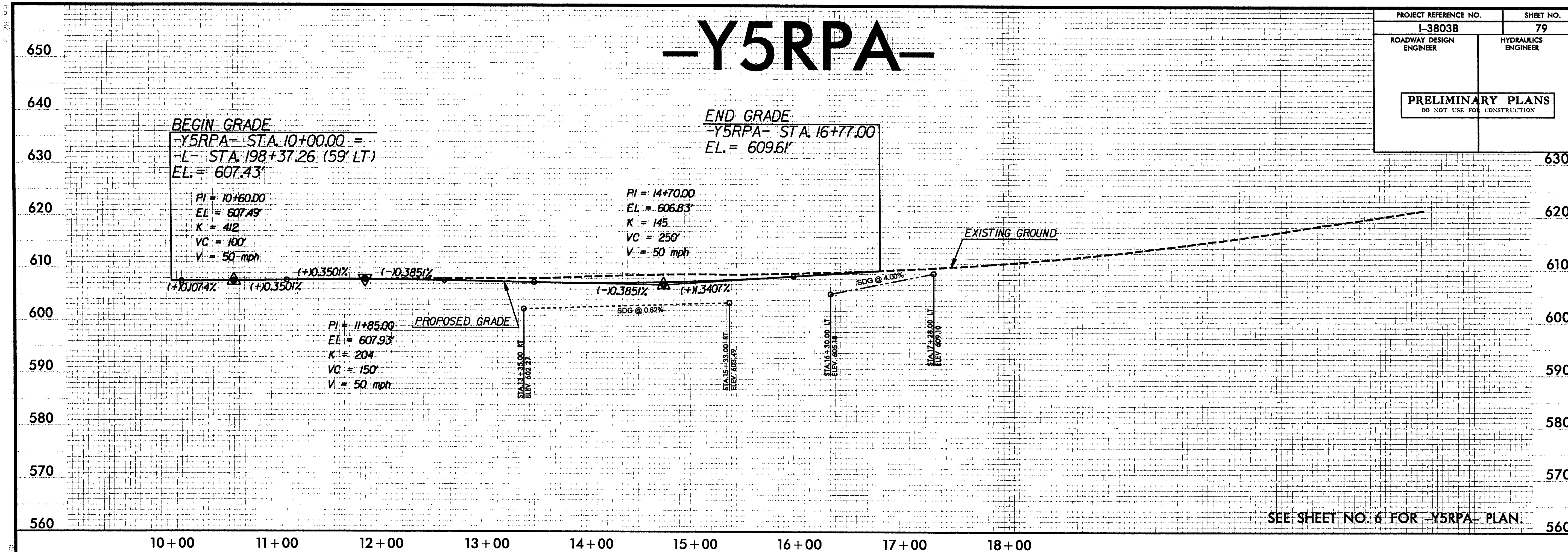



PROJECT REFERENCE NO.
I-3803B
SHEET NO.
78
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
-Y5-
BEGIN RESURFACING
-Y5- STA. 32+15.66
BEGIN MILLING AND
RESURFACING
-Y5- STA. 35+23.70
BEGIN MILLING AND
RESURFACING
-Y5- STA. 38+32.20
BEGIN BRIDGE
-Y5- STA. 35+48.95
BEGIN BRIDGE
-Y5- STA. 38+06.97
BM56:
CHISLED SQUARE ON CORNER OF CONCRETE SIDEWALK
-Y5- STA. 25+36.85 (78.04 LEFT)
ELEV 644.76
SEE SHEET NO. 5, 30 FOR -Y5- PLAN.
680
670
660
650
640
630
620
610
600
590
30+00
31+00
32+00
33+00
34+00
35+00
36+00
37+00
38+00
39+00
40+00
41+00
42+00
43+00
-Y5-
END MILLING AND
RESURFACING
-Y5- STA. 49+75.00
BM54:
CHISLED SQUARE ON CORNER OF CONCRETE PAD OF POWER BOX
-Y5- STA. 47+84.39 (80.64 RIGHT)
ELEV 629.80
BM55:
CHISLED SQUARE ON CORNER OF CONCRETE PAD OF POWER BOX
-Y5- STA. 60+85.64 (68.38 RIGHT)
ELEV 611.09
SEE SHEET NO. 5, 30, 31 FOR -Y5- PLAN.
44+00
45+00
46+00
47+00
48+00
49+00
50+00
51+00
52+00
53+00
54+00
55+00
57+00
58+00
59+00

PROJECT REFERENCE NO.	SHEET NO.
I-3803B	79
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

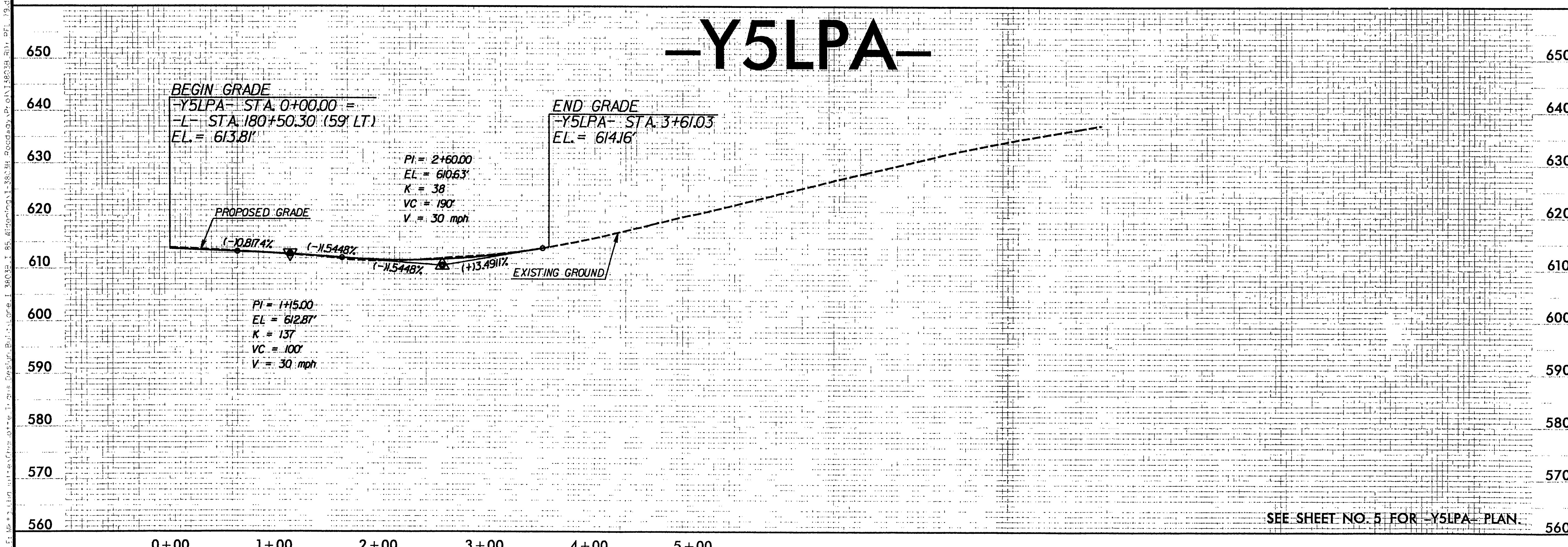
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

-Y5RPA-



SEE SHEET NO. 6 FOR -Y5RPA- PLAN.

-Y5LPA-

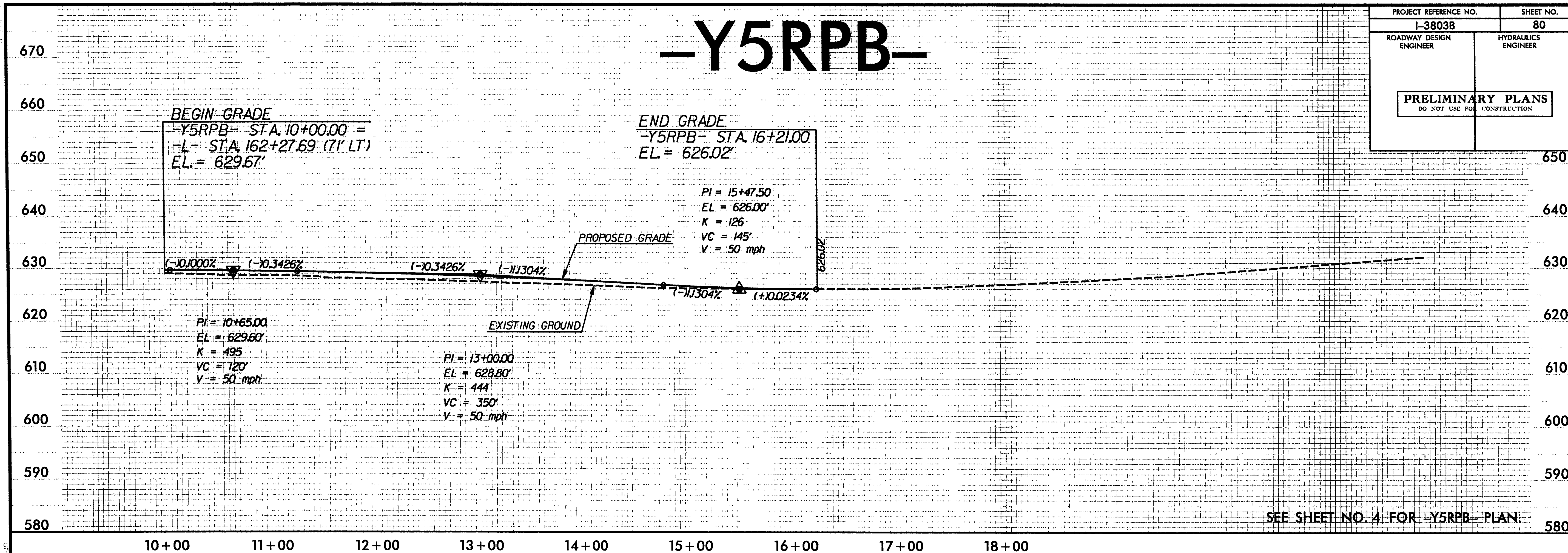


SEE SHEET NO. 5 FOR -Y5LPA- PLAN.

PROJECT REFERENCE NO.	SHEET NO.
I-3803B	80
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

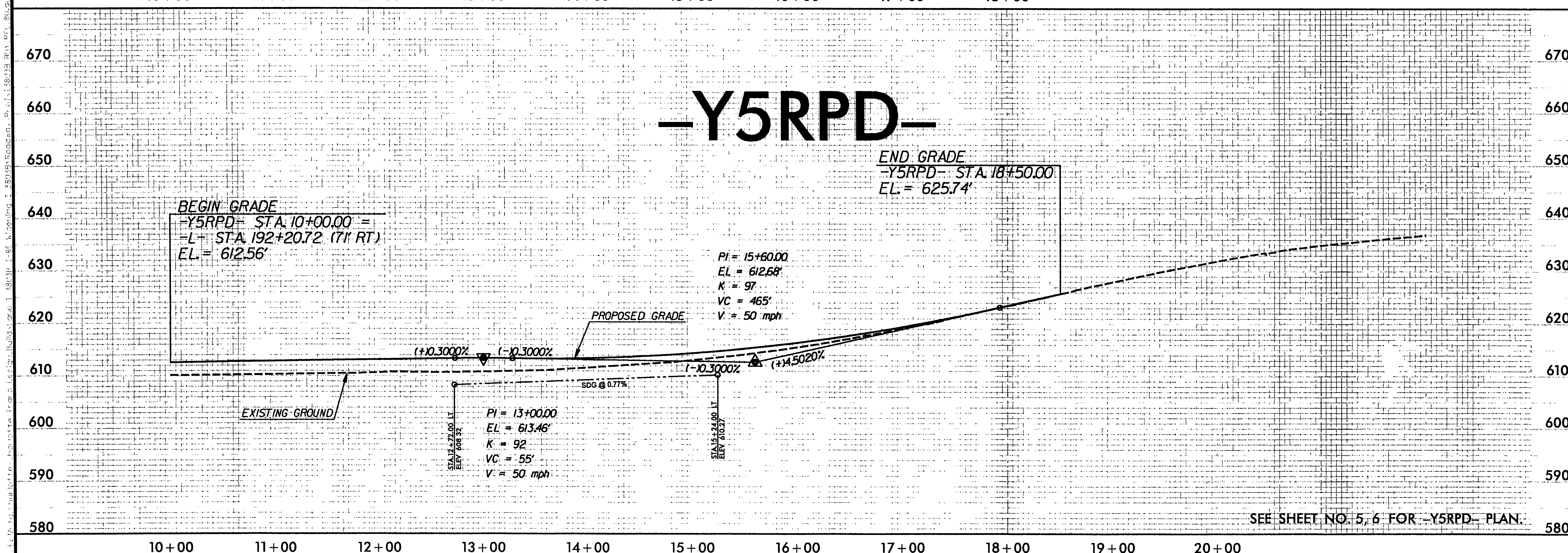
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

-Y5RPB-

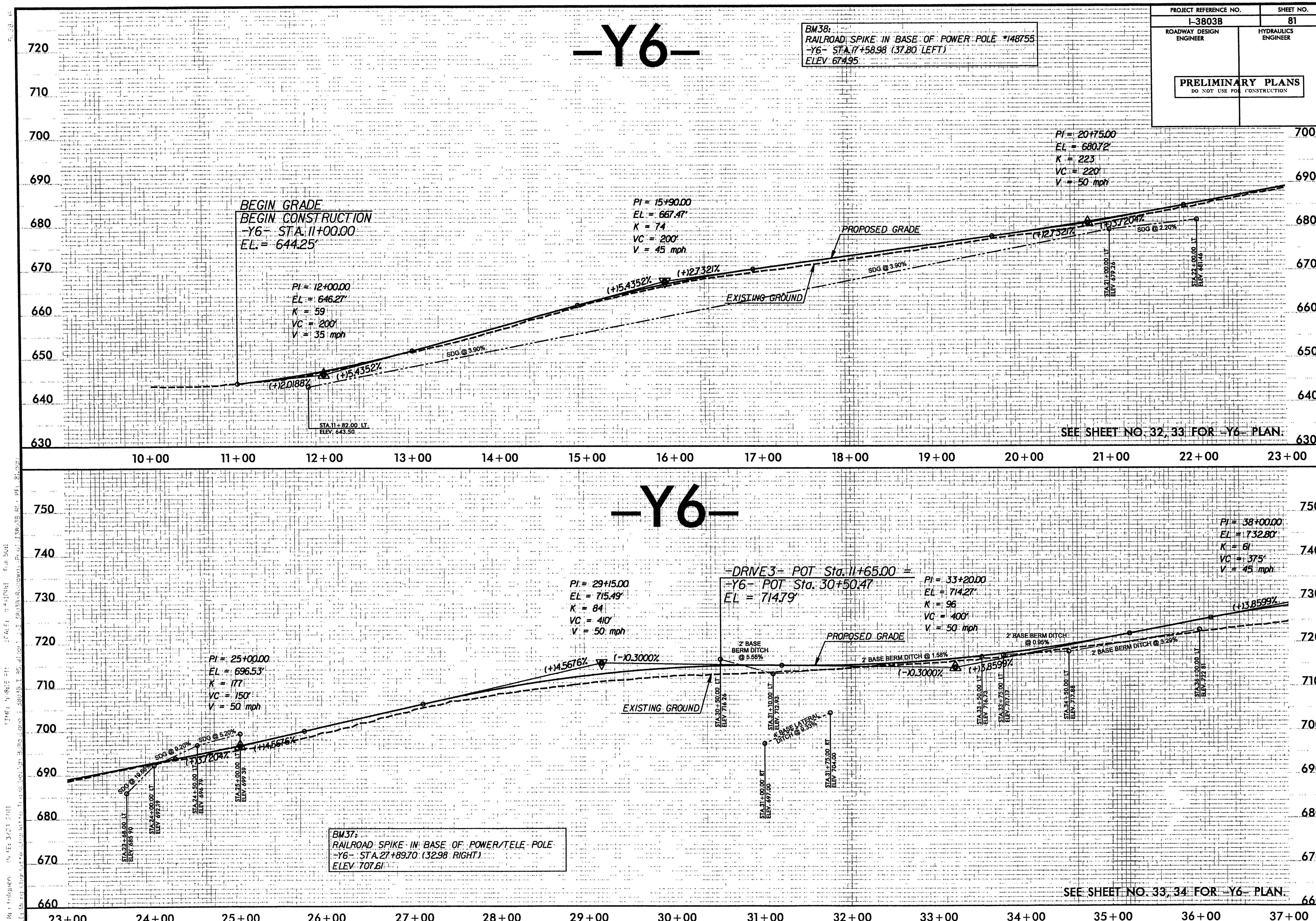


SEE SHEET NO. 4 FOR -Y5RPB- PLAN.

-Y5RPD-

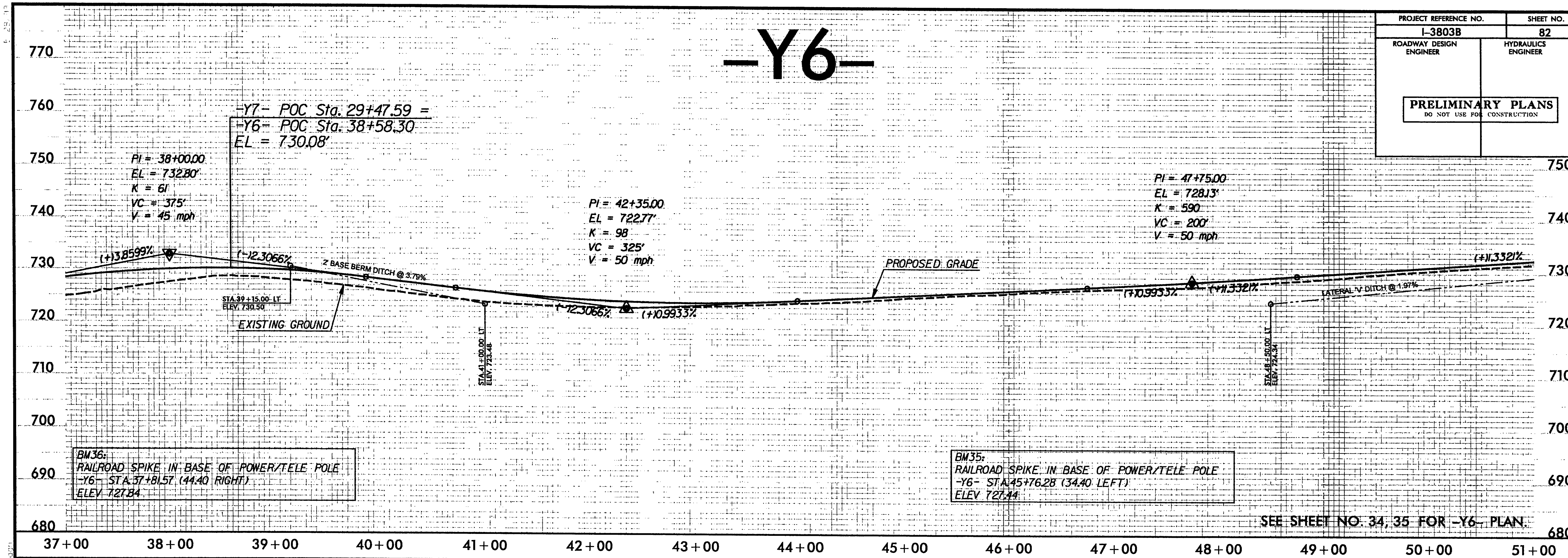


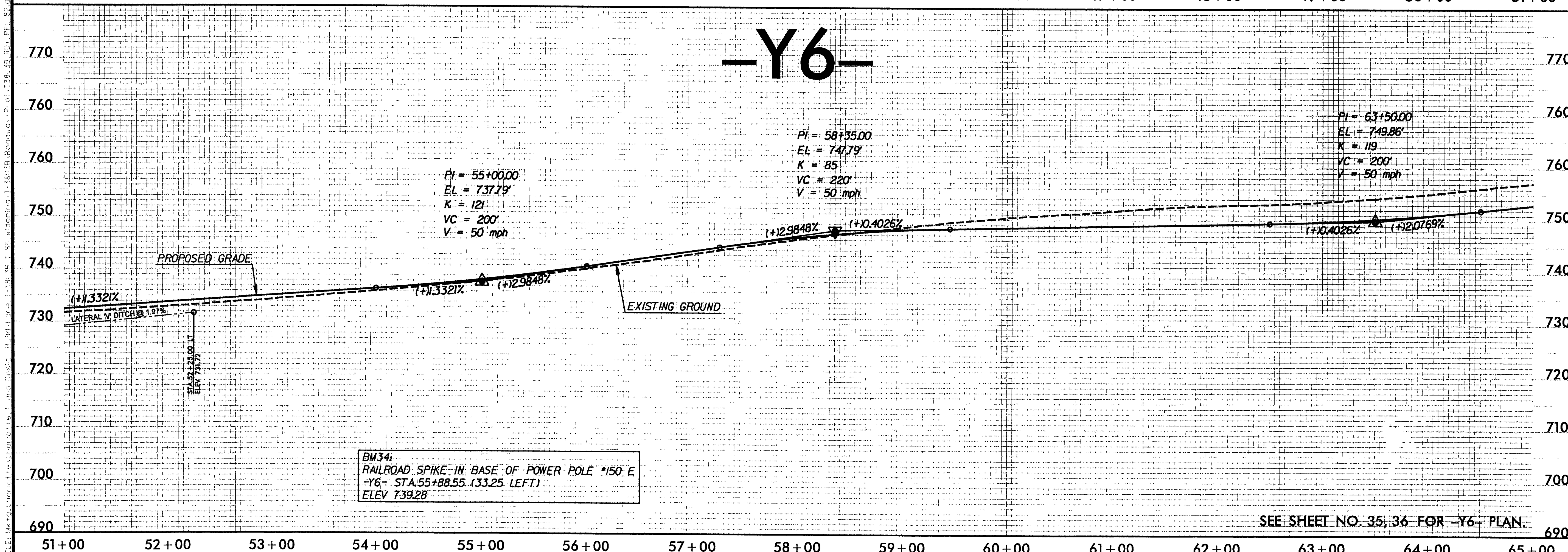
SEE SHEET NO. 5, 6 FOR -Y5RPD- PLAN.


PROJECT REFERENCE NO.
I-3803B
SHEET NO.
81
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
-Y6-
BM38:
RAILROAD SPIKE IN BASE OF POWER POLE #148755
-Y6- STA.17+58.98 (37.80 LEFT)
ELEV 674.95
BEGIN GRADE
BEGIN CONSTRUCTION
-Y6- STA. 11+00.00
EL.= 644.25'
PI = 12+00.00
EL = 646.27'
K = 59
VC = 200'
V = 35 mph
PI = 15+90.00
EL = 667.47'
K = 74
VC = 200'
V = 45 mph
PI = 20+75.00
EL = 680.72'
K = 223
VC = 220'
V = 50 mph
(+)2.0188%
(+)5.4352%
(+)2.7321%
(+)3.7204%
PROPOSED GRADE
EXISTING GROUND
SDG @ 3.90%
SDG @ 2.20%
STA.11+82.00 LT
ELEV. 643.50
STA.21+00.00 LT
STA.22+00.00 LT
SEE SHEET NO. 32, 33 FOR -Y6- PLAN.
10+00
11+00
12+00
13+00
14+00
15+00
16+00
17+00
18+00
19+00
20+00
21+00
22+00
23+00
-Y6-
PI = 25+00.00
EL = 696.53'
K = 177
VC = 150'
V = 50 mph
PI = 29+15.00
EL = 715.49'
K = 84
VC = 410'
V = 50 mph
-DRIVE3- POT Sta. 11+65.00 =
-Y6- POT Sta. 30+50.47
EL = 714.79'
PI = 33+20.00
EL = 714.27'
K = 96
VC = 400'
V = 50 mph
PI = 38+00.00
EL = 732.80'
K = 61
VC = 375'
V = 45 mph
(+)3.7204%
(+)4.5676%
(-)0.3000%
(+)3.8599%
PROPOSED GRADE
EXISTING GROUND
2' BASE BERM DITCH @ 5.55%
2' BASE BERM DITCH @ 1.58%
2' BASE BERM DITCH @ 0.95%
4' BASE LATERAL DITCH @ 5.53%
SDG @ 5.20%
BM37:
RAILROAD SPIKE IN BASE OF POWER/TELE POLE
-Y6- STA.27+89.70 (32.98 RIGHT)
ELEV 707.61
SEE SHEET NO. 33, 34 FOR -Y6- PLAN.
23+00
24+00
25+00
26+00
27+00
28+00
29+00
30+00
31+00
32+00
33+00
34+00
35+00
36+00
37+00

PROJECT REFERENCE NO.	SHEET NO.
I-3803B	82
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

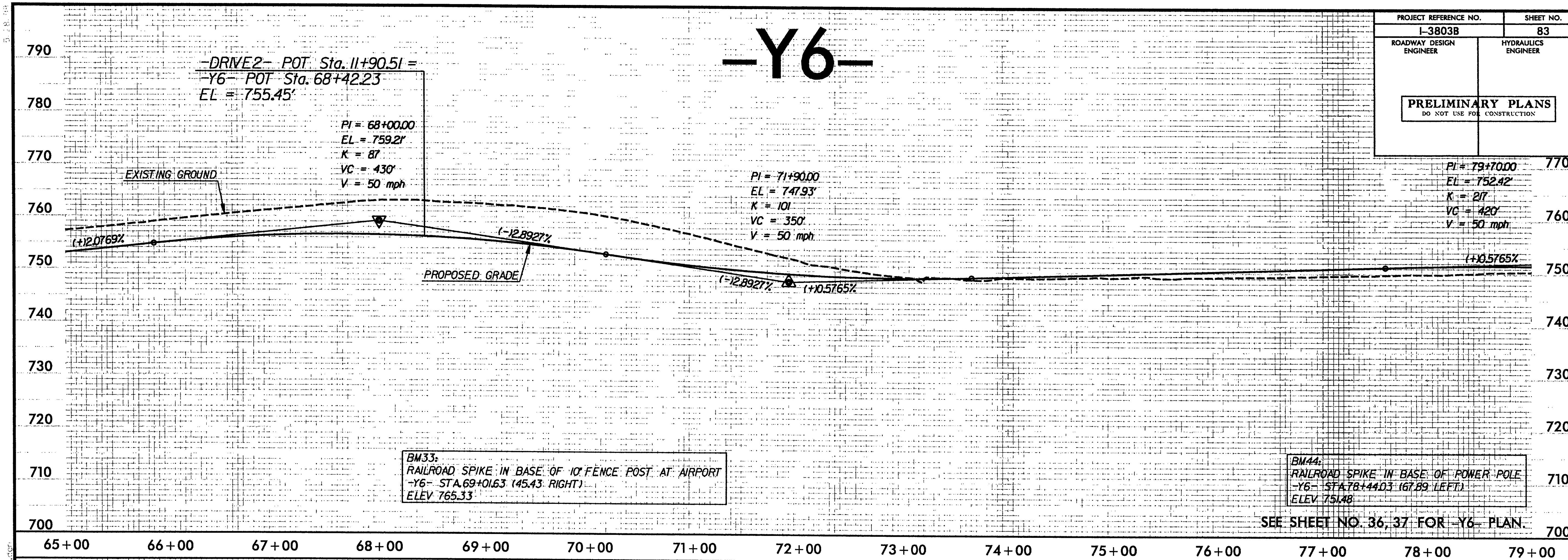
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

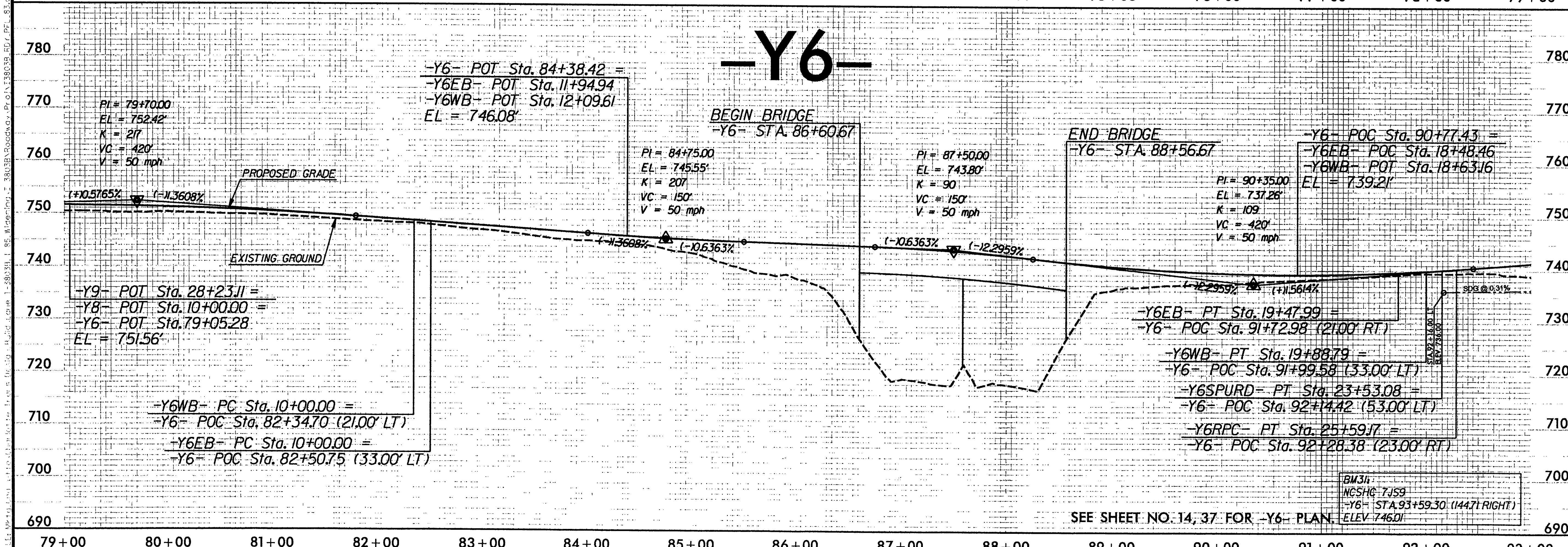




PROJECT REFERENCE NO.	SHEET NO.
I-3803B	83
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

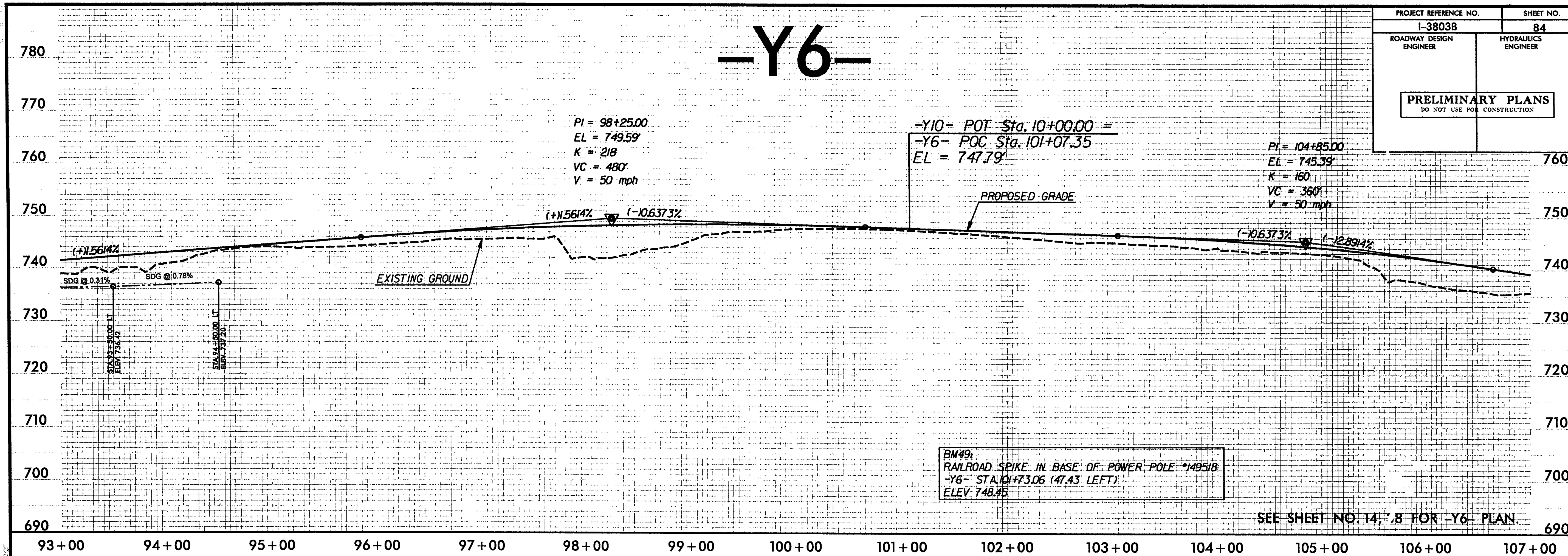
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

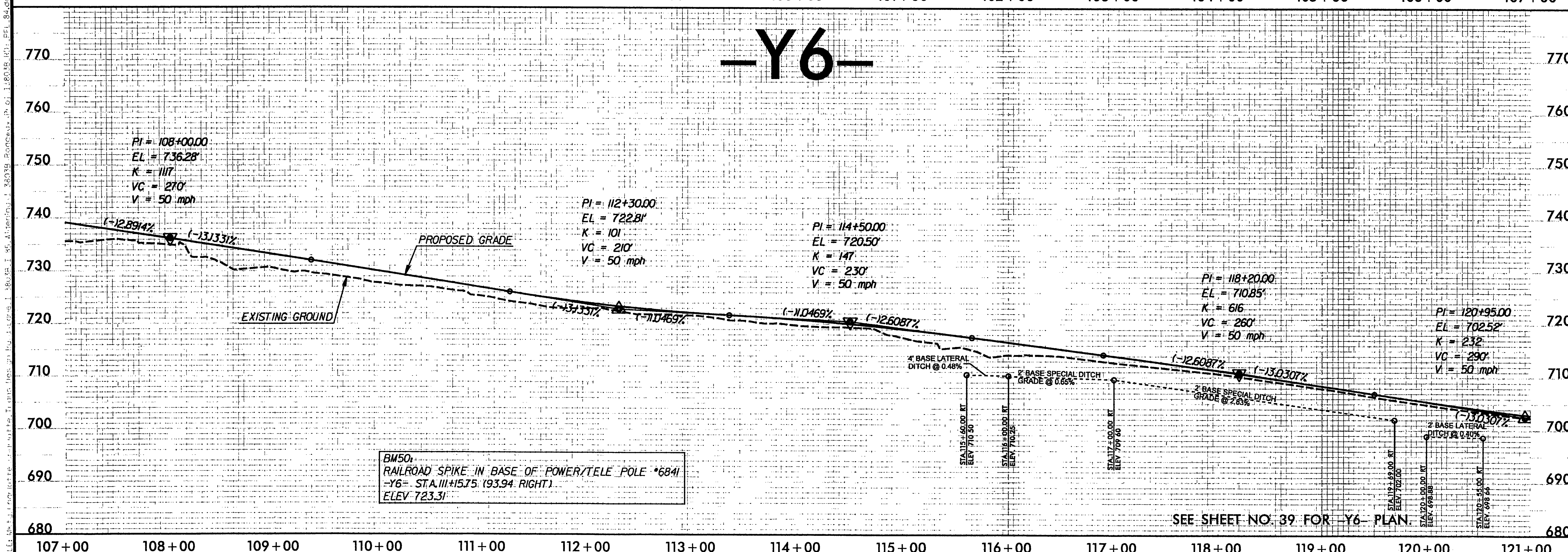




PROJECT REFERENCE NO.	SHEET NO.
I-3803B	84
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

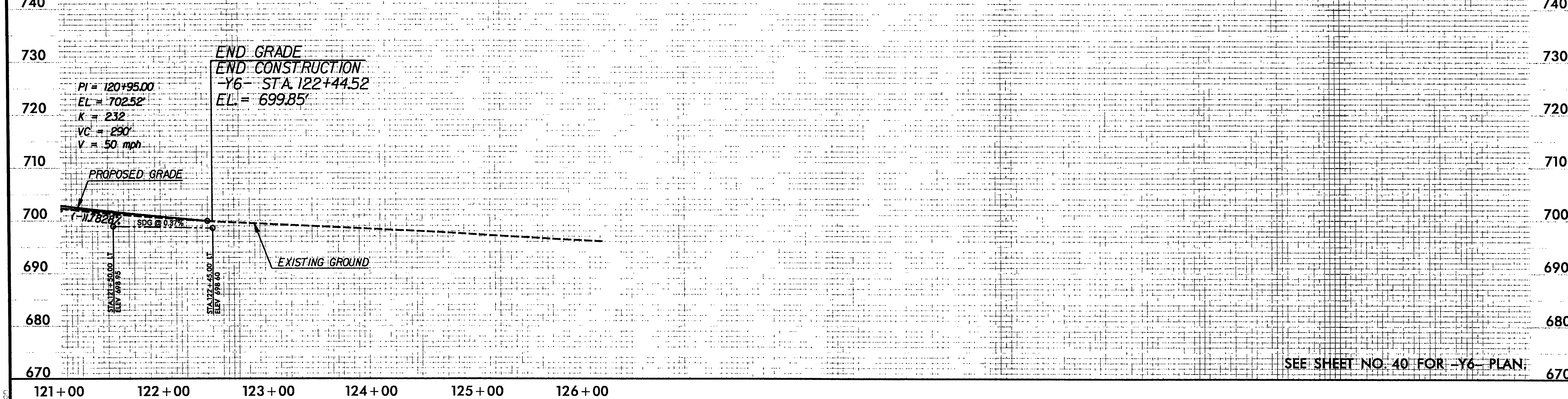




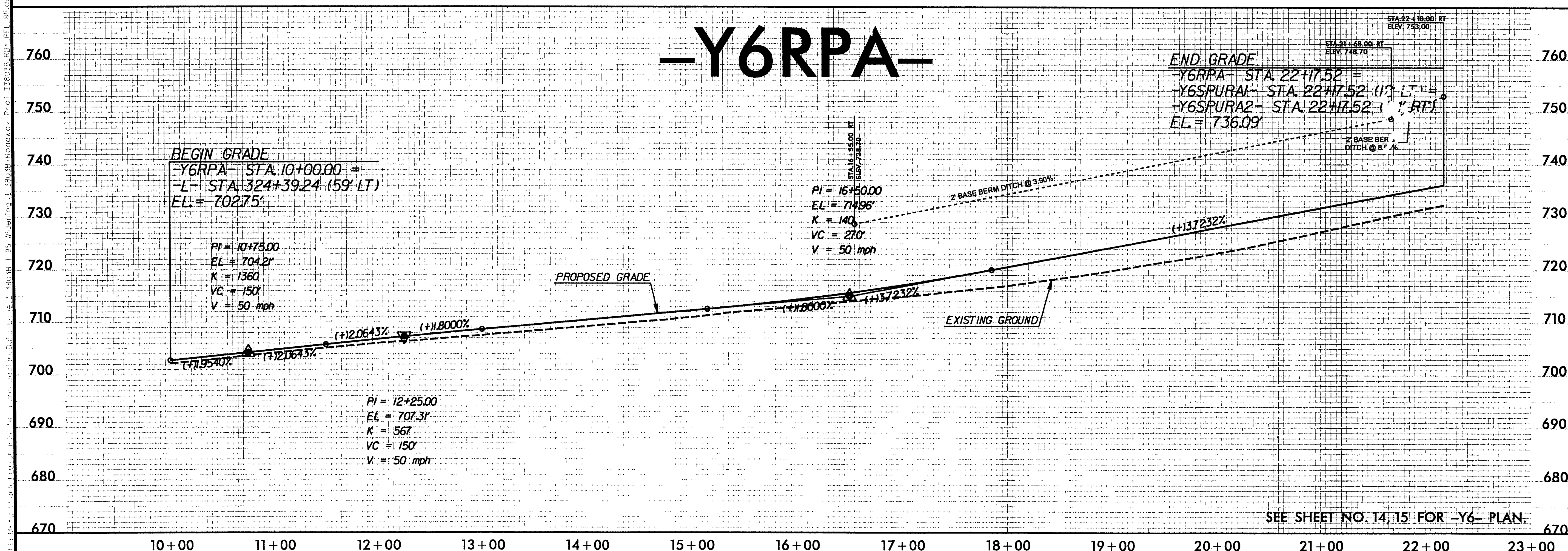
PROJECT REFERENCE NO.	SHEET NO.
I-3803B	85
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

-Y6-

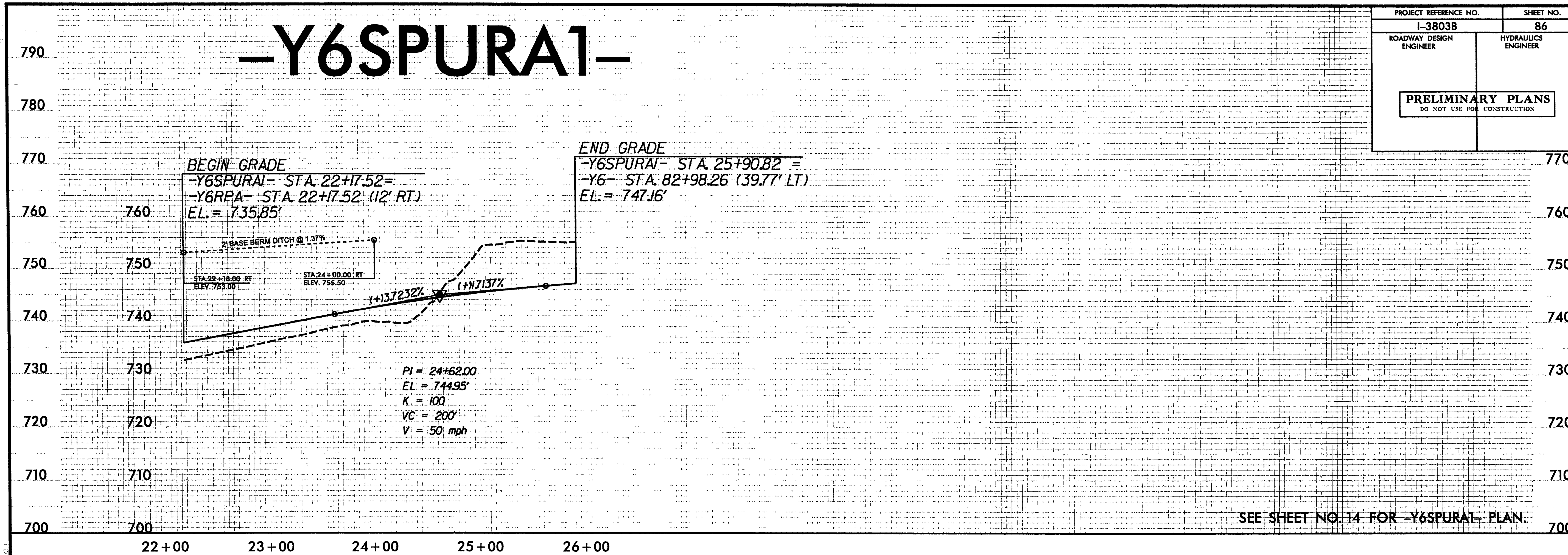


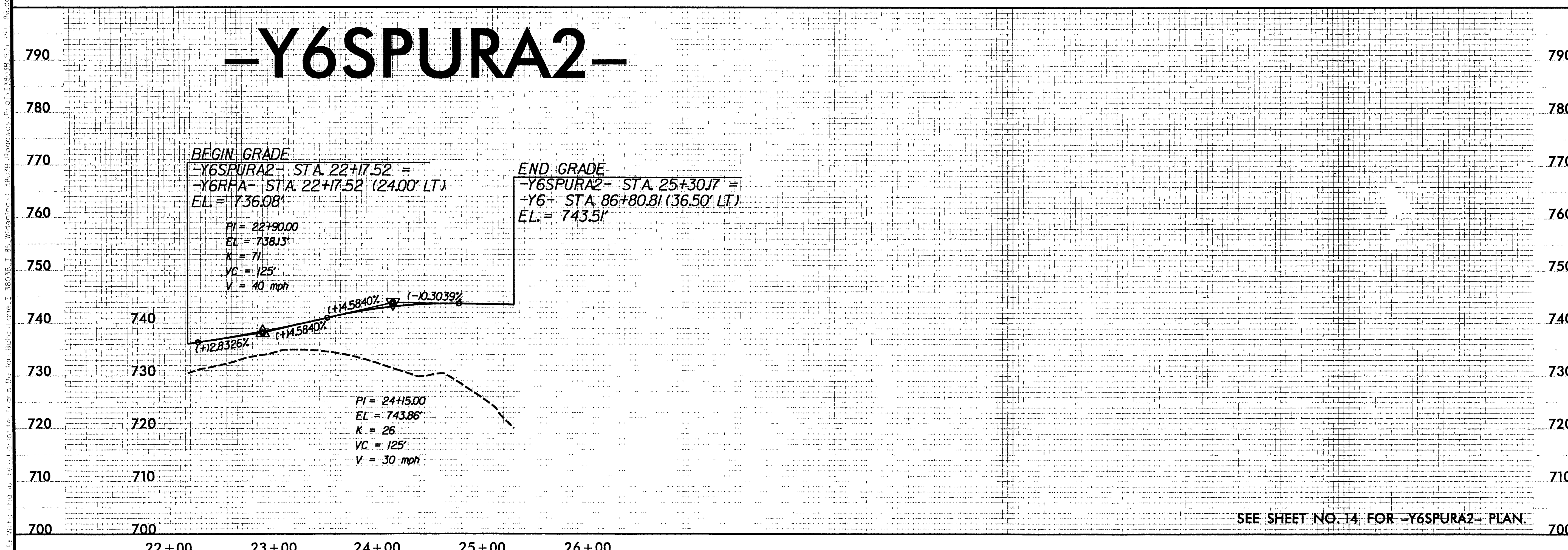
-Y6RPA-



PROJECT REFERENCE NO.	SHEET NO.
I-3803B	86
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

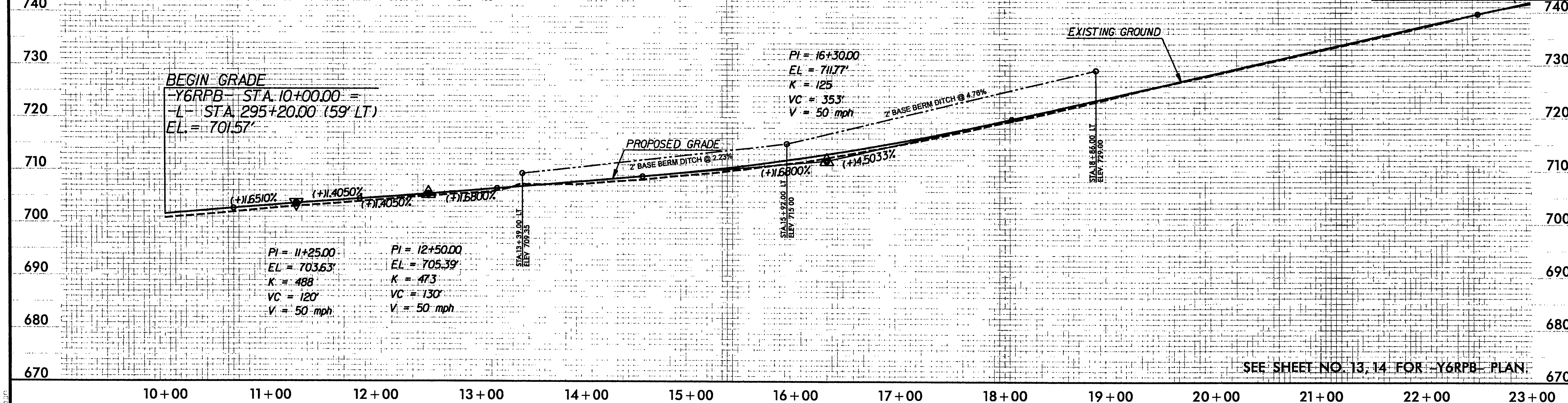
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

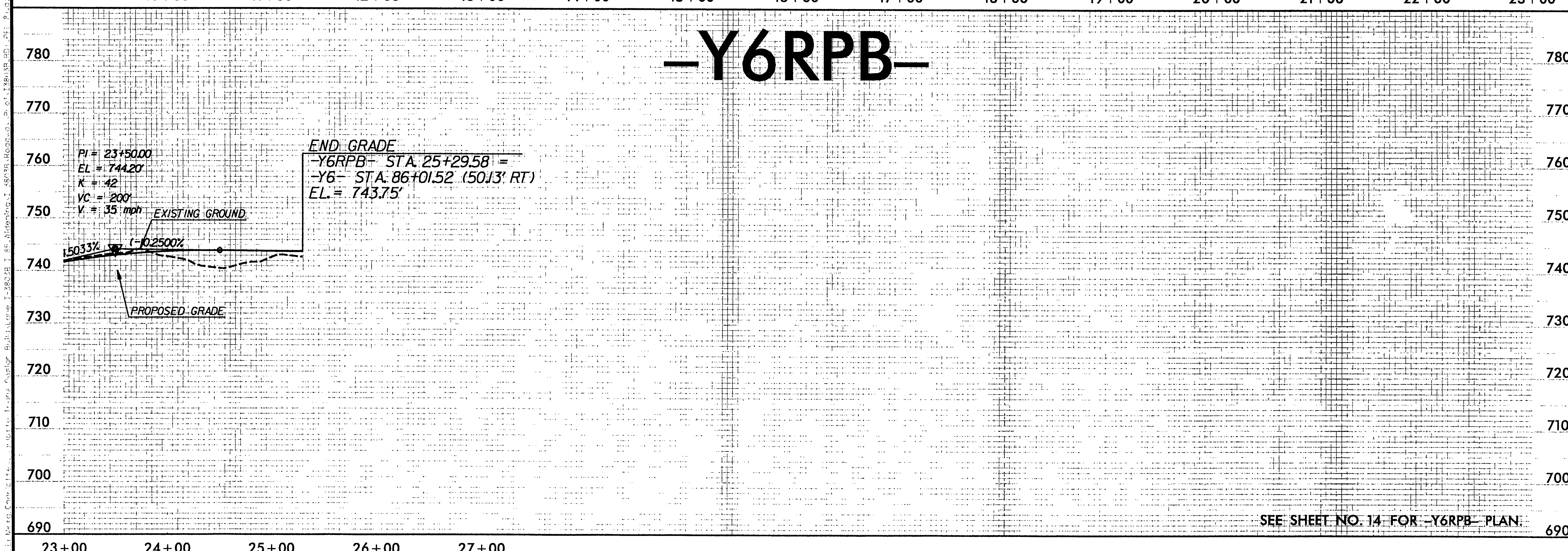




PROJECT REFERENCE NO.	SHEET NO.
I-3803B	87
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

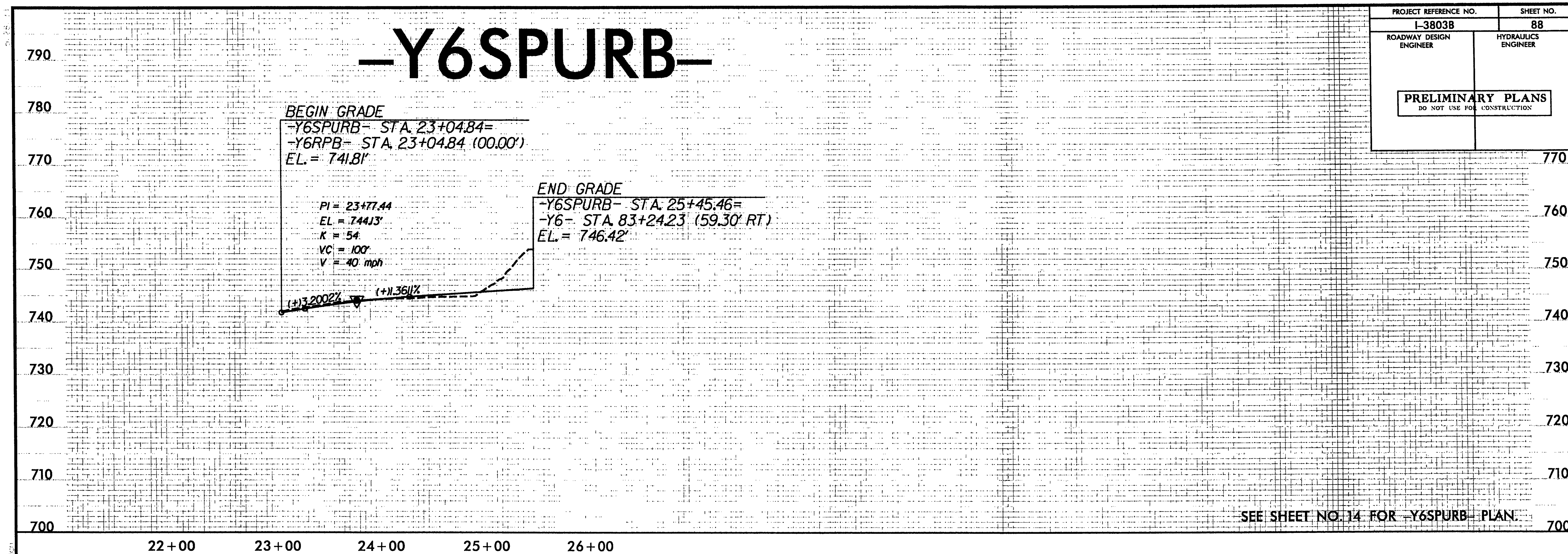
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

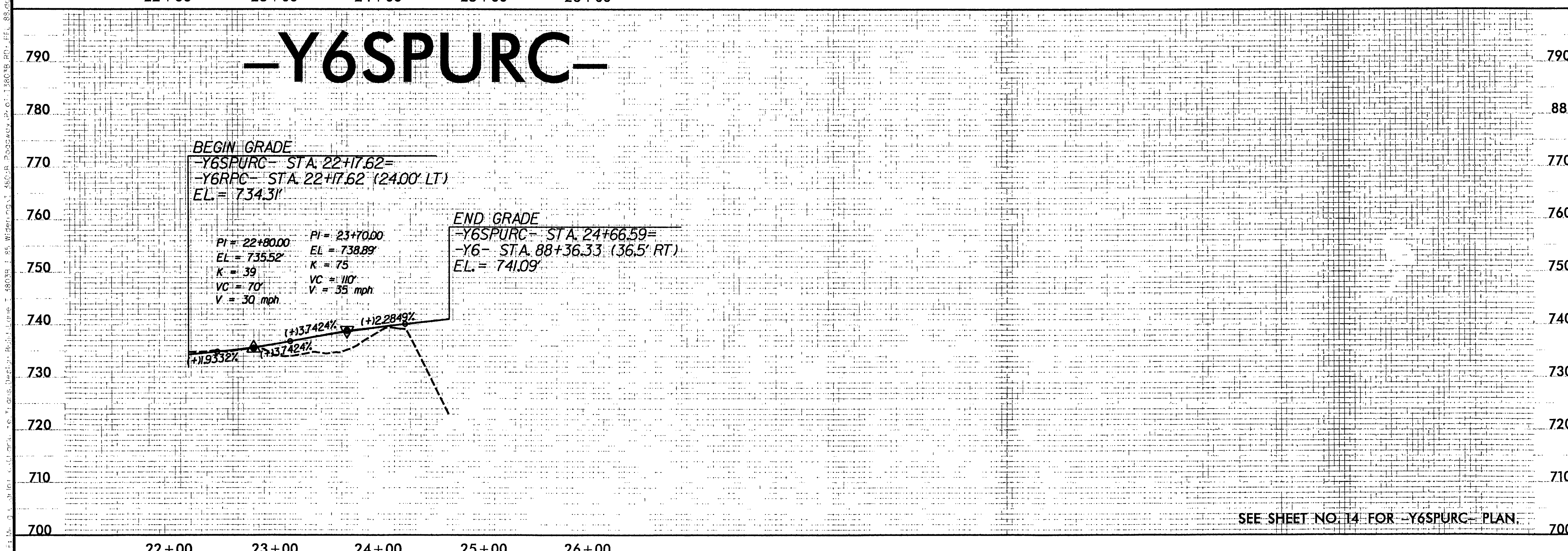




PROJECT REFERENCE NO.	SHEET NO.
I-3803B	88
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

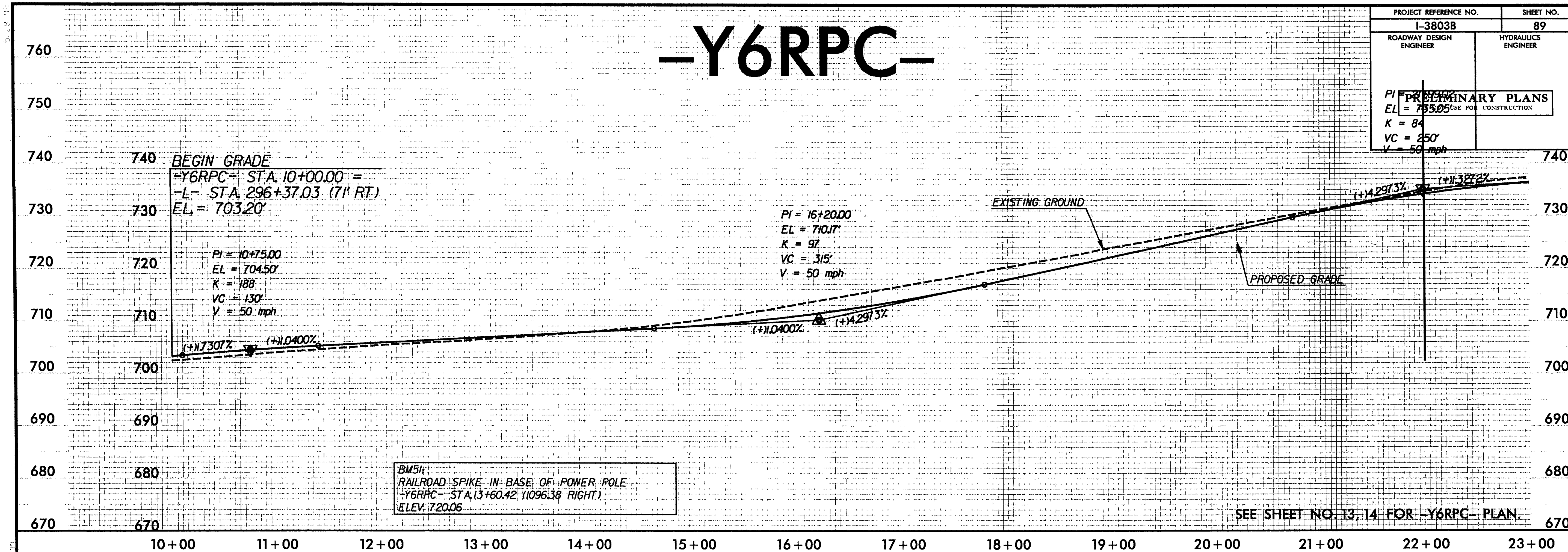
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

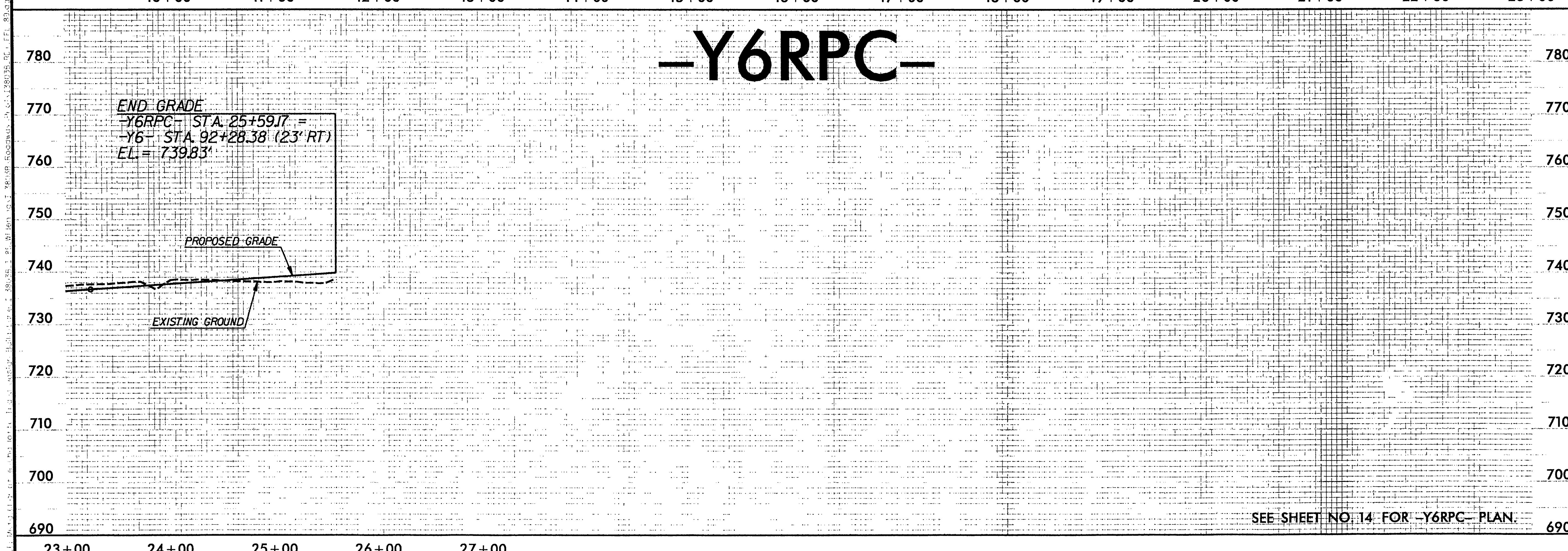


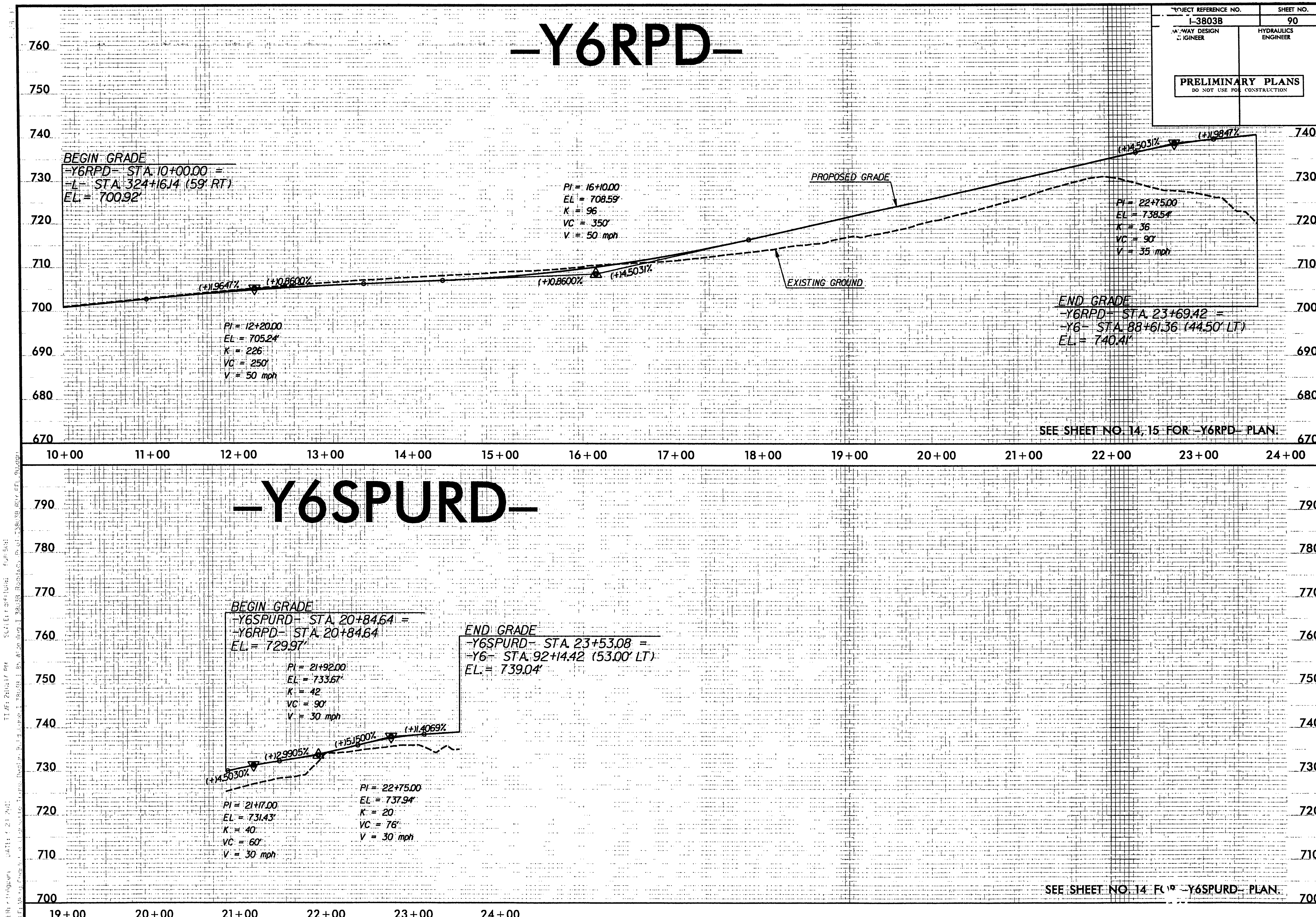


PROJECT REFERENCE NO.	SHEET NO.
I-3803B	89
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS





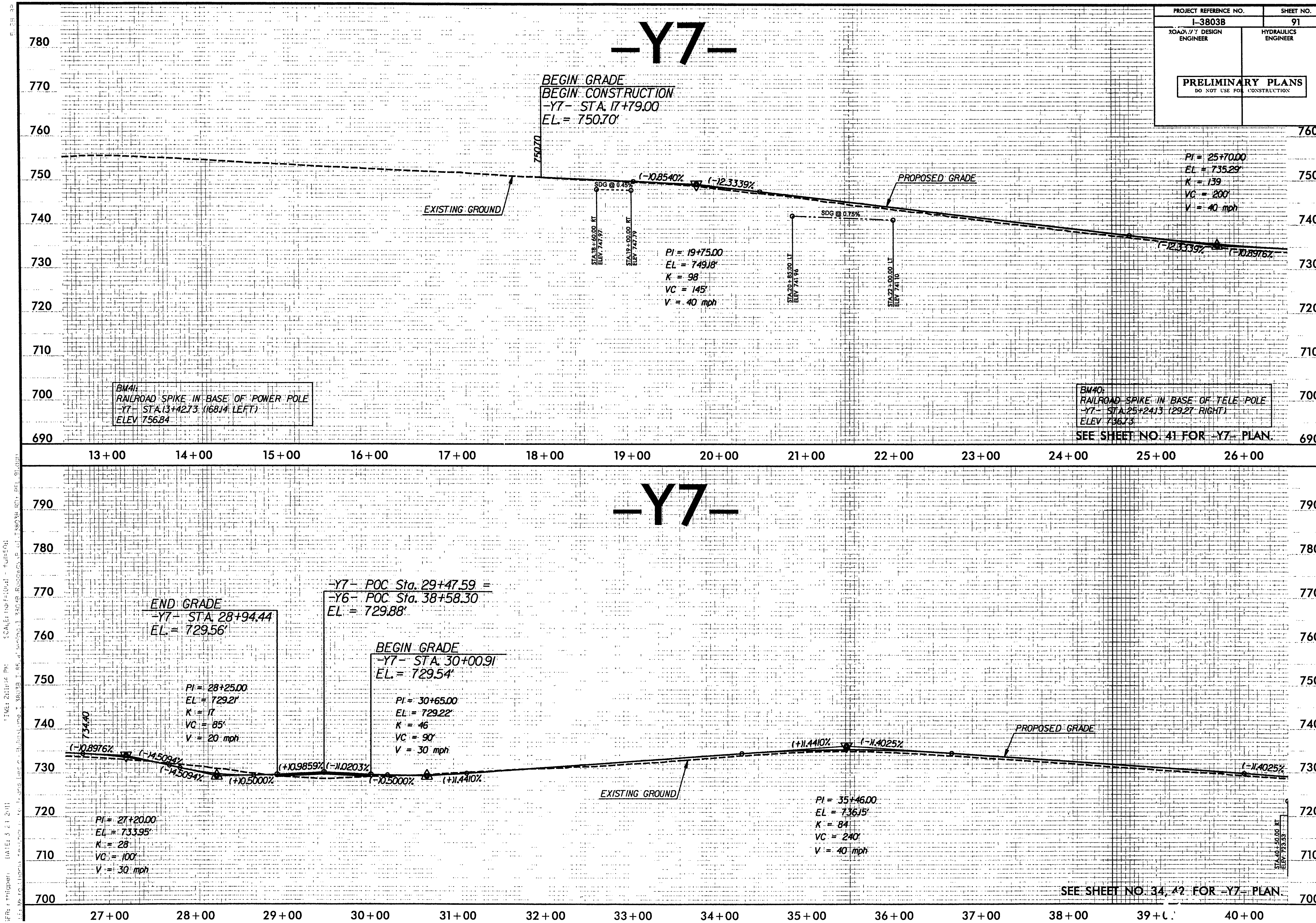

PROJECT REFERENCE NO. I-3803B
SHEET NO. 90
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
-Y6RPD-
BEGIN GRADE
-Y6RPD- STA. 10+00.00 =
-L- STA. 324+16.14 (59' RT)
EL. = 700.92'
PI = 12+20.00
EL = 705.24'
K = 226
VC = 250'
V = 50 mph
(+)1.9647%
(+)0.8600%
PI = 16+10.00
EL = 708.59'
K = 96
VC = 350'
V = 50 mph
(+)0.8600%
(+)4.5031%
PROPOSED GRADE
EXISTING GROUND
PI = 22+75.00
EL = 738.54'
K = 36
VC = 90'
V = 35 mph
(+)4.5031%
(+)1.9847%
END GRADE
-Y6RPD- STA. 23+69.42 =
-Y6- STA. 88+61.36 (44.50' LT)
EL. = 740.41'
SEE SHEET NO. 14, 15 FOR -Y6RPD- PLAN.
10+00 11+00 12+00 13+00 14+00 15+00 16+00 17+00 18+00 19+00 20+00 21+00 22+00 23+00 24+00
670 680 690 700 710 720 730 740 750 760
-Y6SPURD-
BEGIN GRADE
-Y6SPURD- STA. 20+84.64 =
-Y6RPD- STA. 20+84.64
EL. = 729.97'
PI = 21+92.00
EL = 733.67'
K = 42
VC = 90'
V = 30 mph
END GRADE
-Y6SPURD- STA. 23+53.08 =
-Y6- STA. 92+14.42 (53.00' LT)
EL. = 739.04'
(+)4.5030%
(+)2.9905%
(+)5.1500%
(+)1.4069%
PI = 21+17.00
EL = 731.43'
K = 40
VC = 60'
V = 30 mph
PI = 22+75.00
EL = 737.94'
K = 20
VC = 76'
V = 30 mph
SEE SHEET NO. 14 FOR -Y6SPURD- PLAN.
19+00 20+00 21+00 22+00 23+00 24+00
700 710 720 730 740 750 760 770 780 790

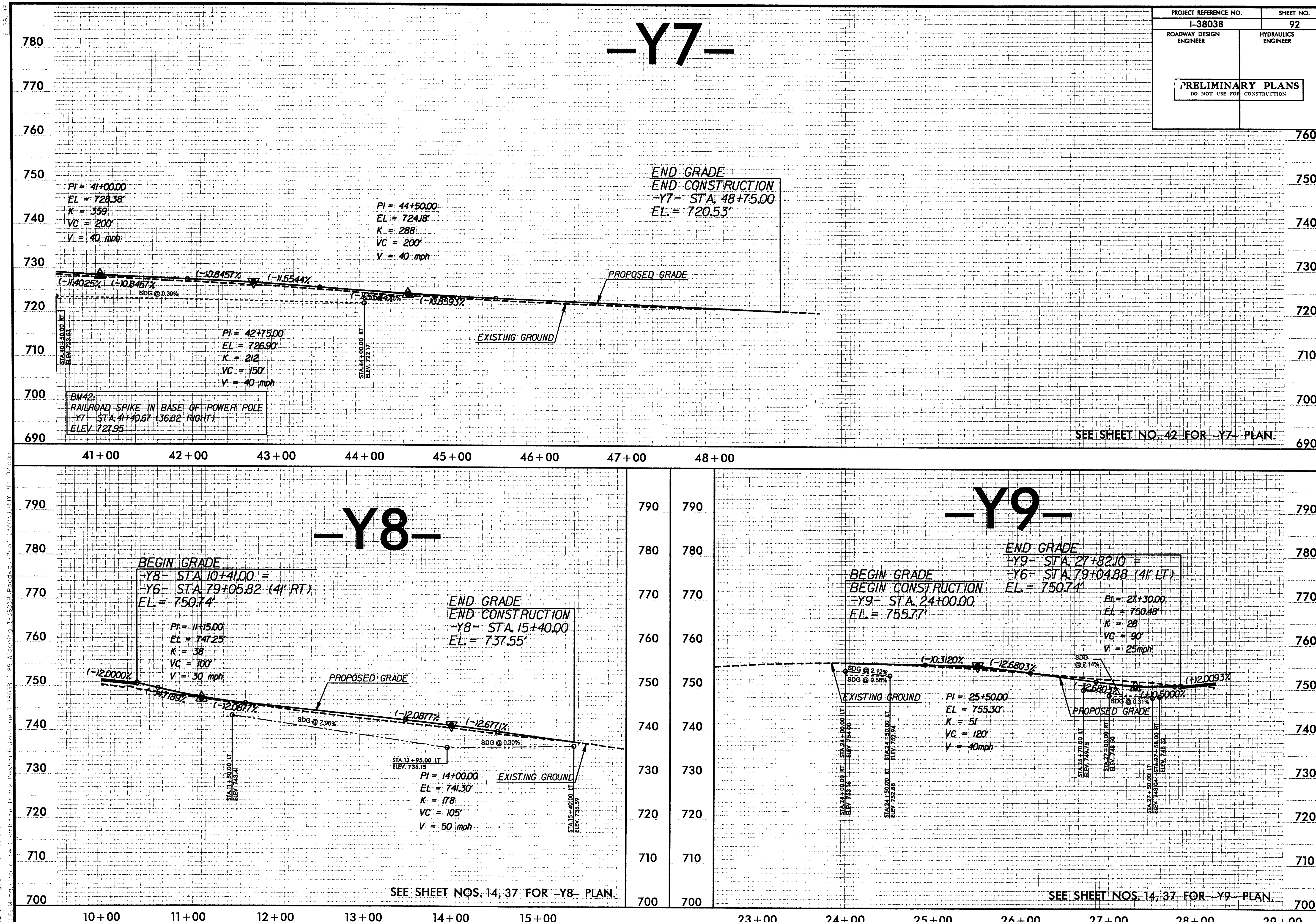
PROJECT REFERENCE NO.	SHEET NO.
I-3803B	91

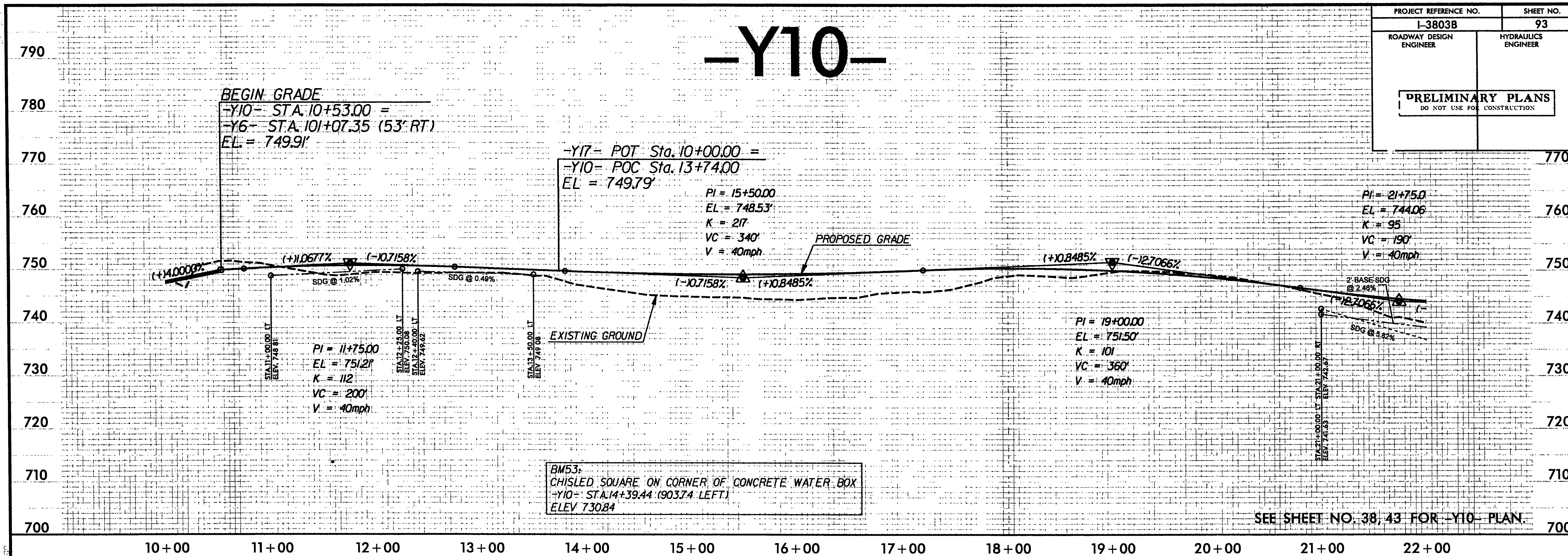
ROADWAY DESIGN ENGINEER

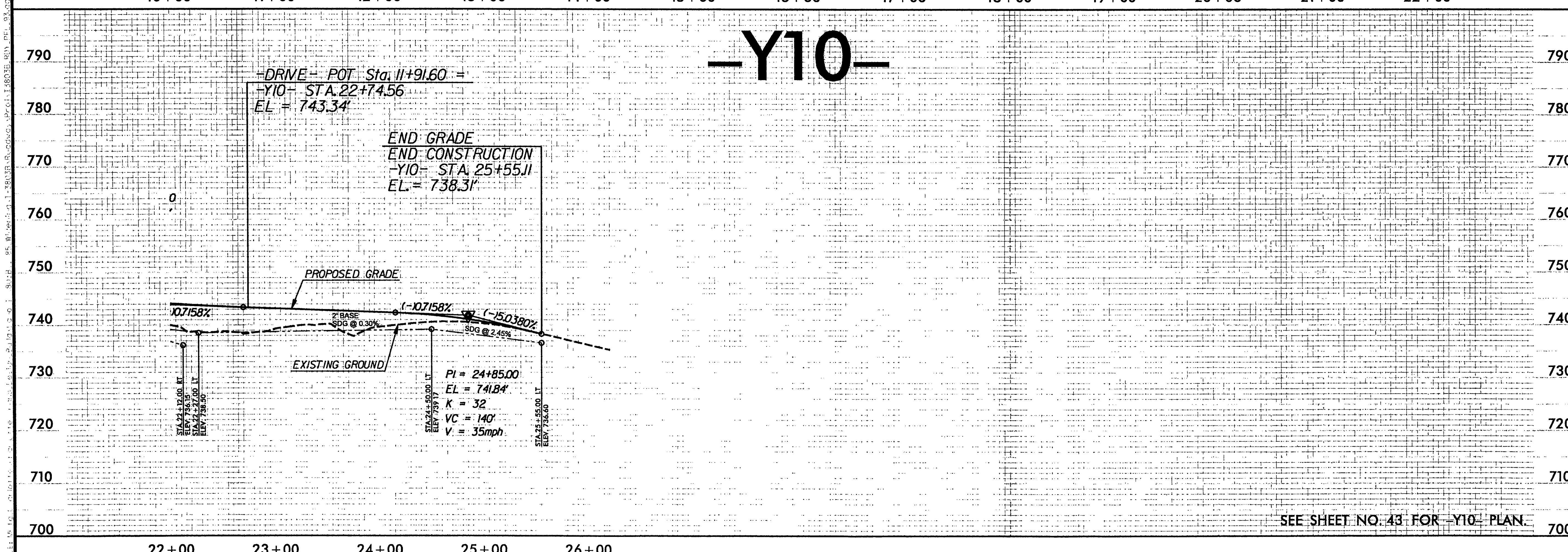
HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



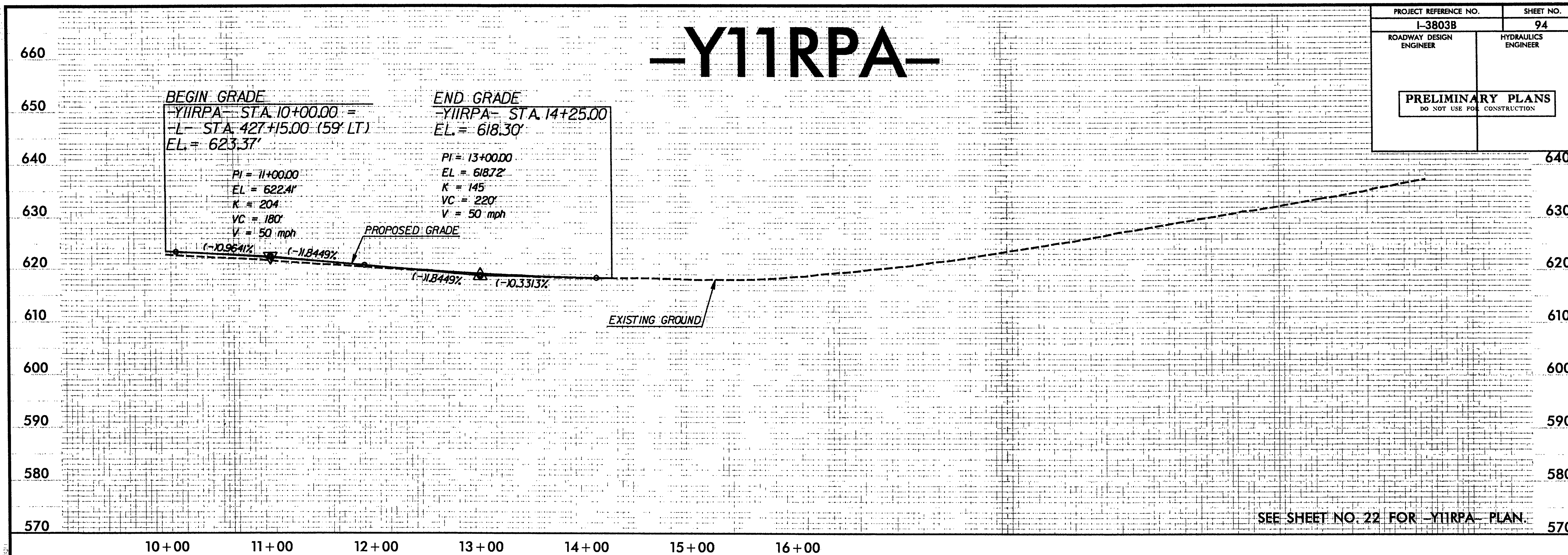

PROJECT REFERENCE NO.
I-3803B
SHEET NO.
92
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
-Y7-
PI = 41+00.00
EL = 728.38'
K = 359
VC = 200'
V = 40 mph
PI = 44+50.00
EL = 724.18'
K = 288
VC = 200'
V = 40 mph
PI = 42+75.00
EL = 726.90'
K = 212
VC = 150'
V = 40 mph
(-)1.4025%
(-)0.8457%
(-)0.8457%
(-)1.5544%
(-)0.8593%
SDG @ 0.38%
PROPOSED GRADE
EXISTING GROUND
END GRADE
END CONSTRUCTION
-Y7- STA. 48+75.00
EL. = 720.53'
STA.40+50.00 RT
ELEV. 723.53
STA.44+00.00 RT
ELEV. 722.17
BM42:
RAILROAD SPIKE IN BASE OF POWER POLE
-Y7- STA.41+40.67 (36.82' RIGHT)
ELEV. 727.95
SEE SHEET NO. 42 FOR -Y7- PLAN.
41+00
42+00
43+00
44+00
45+00
46+00
47+00
48+00
-Y8-
BEGIN GRADE
-Y8- STA. 10+41.00 =
-Y6- STA. 79+05.82 (41' RT)
EL. = 750.74'
PI = 11+15.00
EL = 747.25'
K = 38
VC = 100'
V = 30 mph
END GRADE
END CONSTRUCTION
-Y8- STA. 15+40.00
EL. = 737.55'
(-)2.0000%
(-)4.7189%
(-)2.0877%
(-)2.0877%
(-)2.6771%
PROPOSED GRADE
SDG @ 2.96%
SDG @ 0.30%
STA.13+95.00 LT
ELEV. 736.15
STA.11+50.00 LT
ELEV. 743.41
STA.15+40.00 LT
ELEV. 736.59
PI = 14+00.00
EL = 741.30'
K = 178
VC = 105'
V = 50 mph
EXISTING GROUND
SEE SHEET NOS. 14, 37 FOR -Y8- PLAN.
10+00
11+00
12+00
13+00
14+00
15+00
-Y9-
END GRADE
-Y9- STA. 27+82.10 =
-Y6- STA. 79+04.88 (41' LT)
EL. = 750.74'
BEGIN GRADE
BEGIN CONSTRUCTION
-Y9- STA. 24+00.00
EL. = 755.77'
PI = 27+30.00
EL = 750.48'
K = 28
VC = 90'
V = 25mph
(-)0.3120%
(-)2.6803%
(-)2.6803%
(+)0.5000%
(+)2.0093%
SDG @ 2.12%
SDG @ 0.56%
SDG @ 2.14%
SDG @ 0.31%
EXISTING GROUND
PROPOSED GRADE
PI = 25+50.00
EL = 755.30'
K = 51
VC = 120'
V = 40mph
SEE SHEET NOS. 14, 37 FOR -Y9- PLAN.
23+00
24+00
25+00
26+00
27+00
28+00
29+00

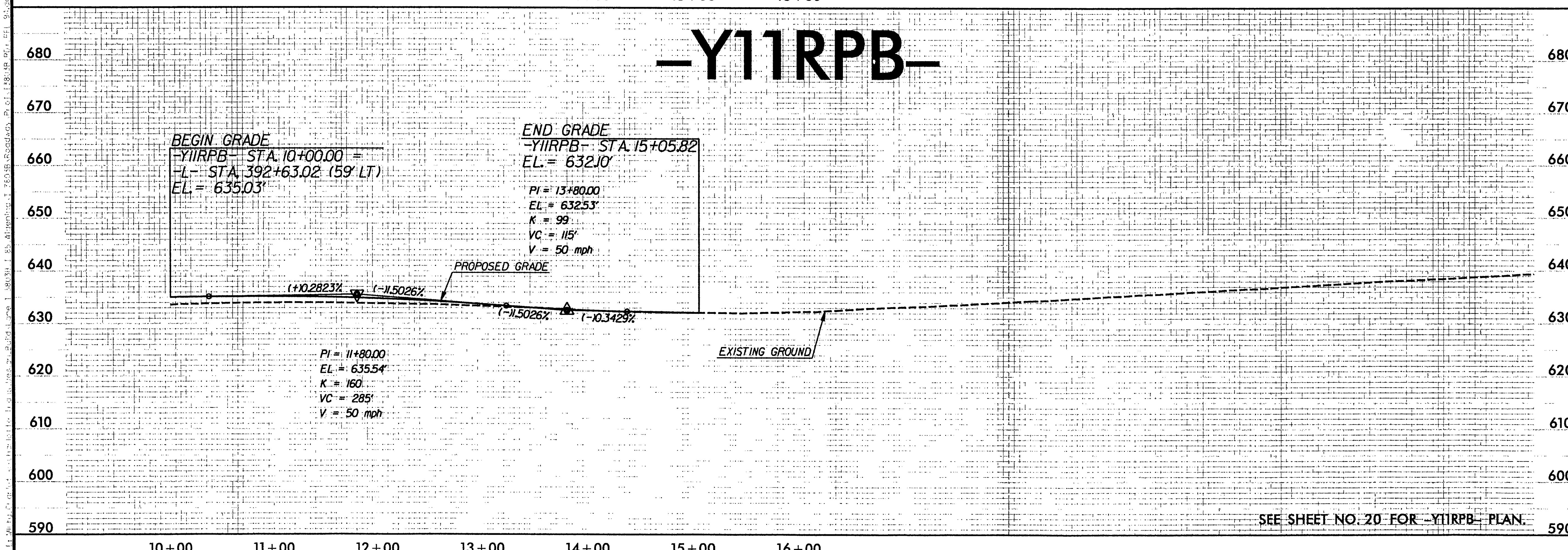

PROJECT REFERENCE NO.
I-3803B
SHEET NO.
93
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
-Y10-
BEGIN GRADE
-Y10- STA. 10+53.00 =
-Y6- STA. 101+07.35 (53' RT)
EL. = 749.91'
-Y17- POT Sta. 10+00.00 =
-Y10- POC Sta. 13+74.00
EL = 749.79'
PI = 15+50.00
EL = 748.53'
K = 217
VC = 340'
V = 40mph
PROPOSED GRADE
PI = 21+75.0
EL = 744.06
K = 95
VC = 190'
V = 40mph
(+)4.0000%
(+)1.0677%
(-)0.7158%
SDG @ 1.02%
SDG @ 0.49%
(-)0.7158%
(+)0.8485%
(+)0.8485%
(-)2.7066%
2' BASE SDG @ 2.46%
(-)2.7066%
SDG @ 5.62%
EXISTING GROUND
PI = 11+75.00
EL = 751.21'
K = 112
VC = 200'
V = 40mph
PI = 19+00.00
EL = 751.50'
K = 101
VC = 360'
V = 40mph
STA.11+00.00 LT
ELEV. 748.81
STA.12+25.00 LT
ELEV. 749.88
STA.12+40.00 LT
ELEV. 749.62
STA.13+50.00 LT
ELEV. 749.08
STA.21+00.00 RT
ELEV. 742.67
STA.21+00.00 LT
ELEV. 741.63
BM53:
CHISLED SQUARE ON CORNER OF CONCRETE WATER BOX
-Y10- STA.14+39.44 (903.74 LEFT)
ELEV 730.84
SEE SHEET NO. 38, 43 FOR -Y10- PLAN.
790
780
770
760
750
740
730
720
710
700
10+00
11+00
12+00
13+00
14+00
15+00
16+00
17+00
18+00
19+00
20+00
21+00
22+00

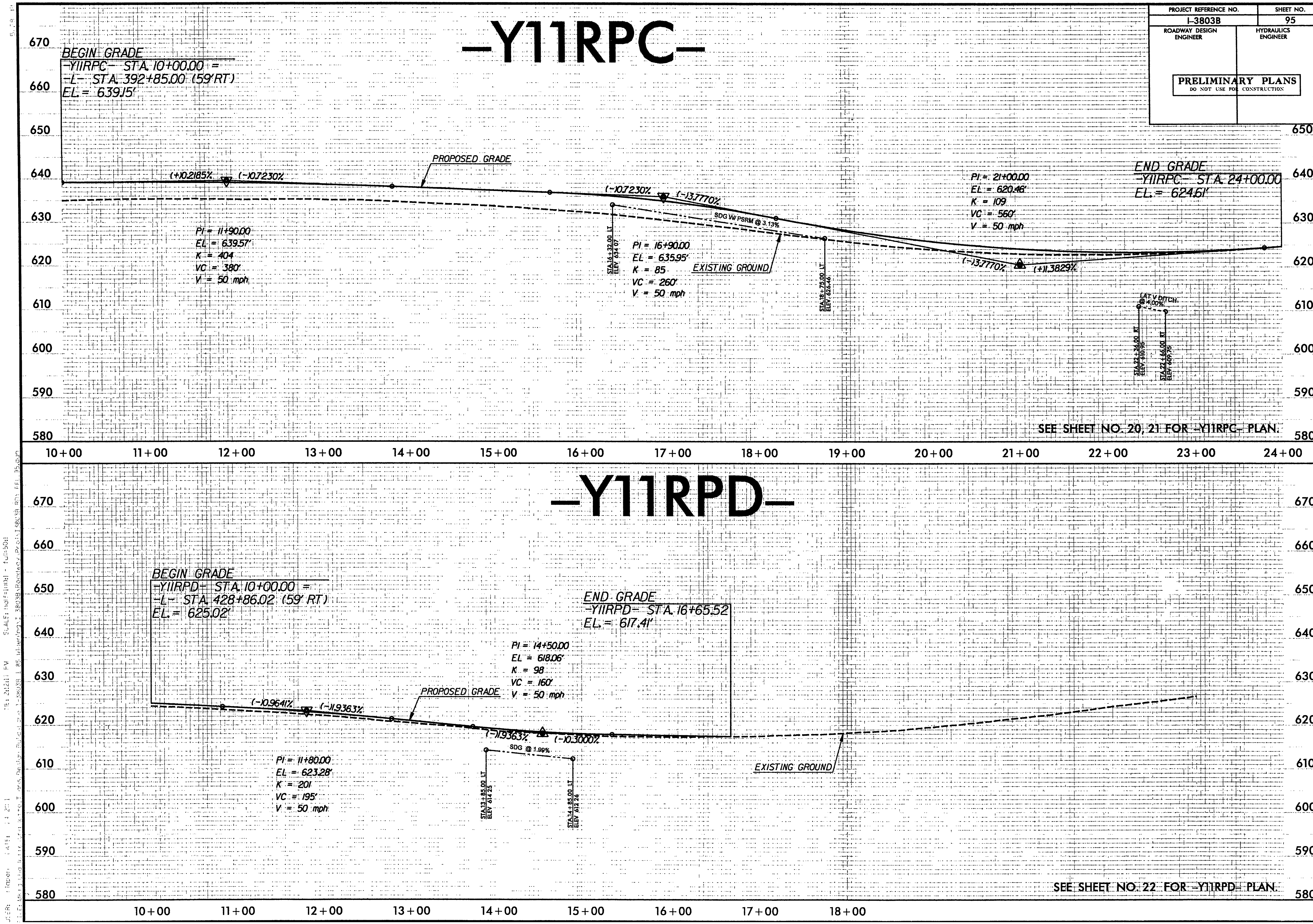

-Y10-
-DRIVE- POT Sta. 11+91.60 =
-Y10- STA. 22+74.56
EL = 743.34'
END GRADE
END CONSTRUCTION
-Y10- STA. 25+55.11
EL. = 738.31'
PROPOSED GRADE
(-)0.7158%
(-)0.7158%
(-)5.0380%
2' BASE SDG @ 0.30%
SDG @ 2.45%
EXISTING GROUND
PI = 24+85.00
EL = 741.84'
K = 32
VC = 140'
V = 35mph
STA.22+12.00 RT
ELEV. 736.16
STA.22+27.00 LT
ELEV. 738.50
STA.24+50.00 LT
ELEV. 739.17
STA.25+55.00 LT
ELEV. 736.60
SEE SHEET NO. 43 FOR -Y10- PLAN.
790
780
770
760
750
740
730
720
710
700
22+00
23+00
24+00
25+00
26+00

PROJECT REFERENCE NO.	SHEET NO.
I-3803B	94
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

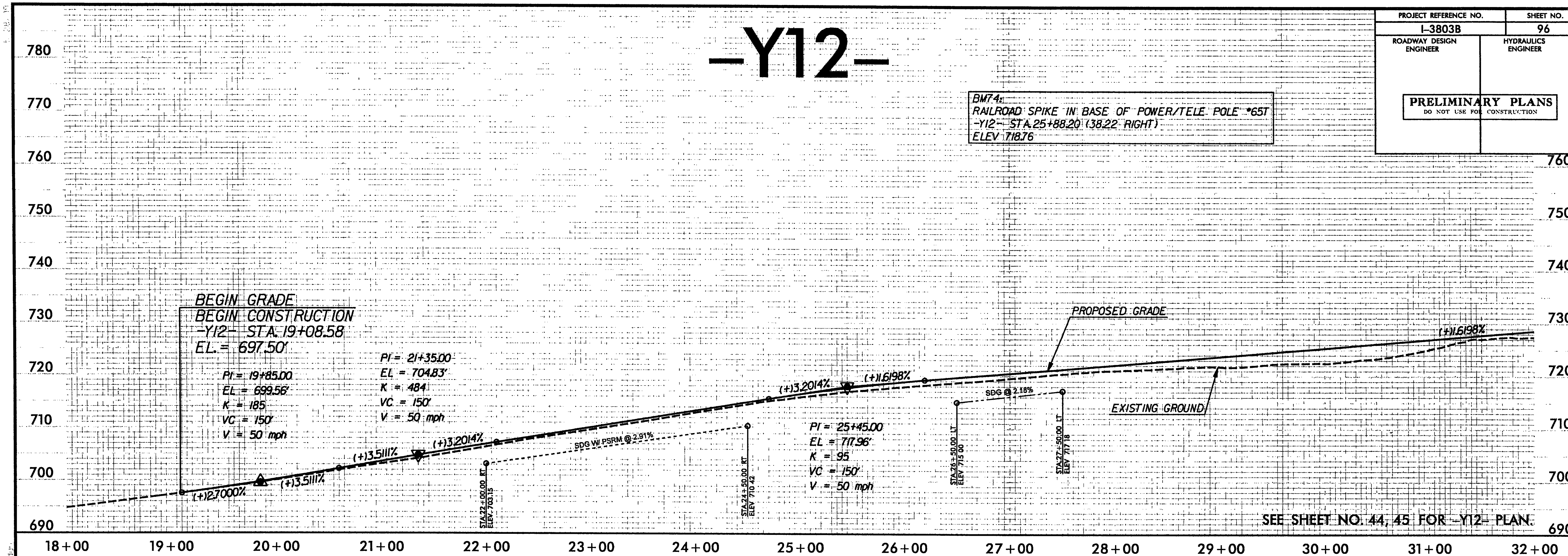


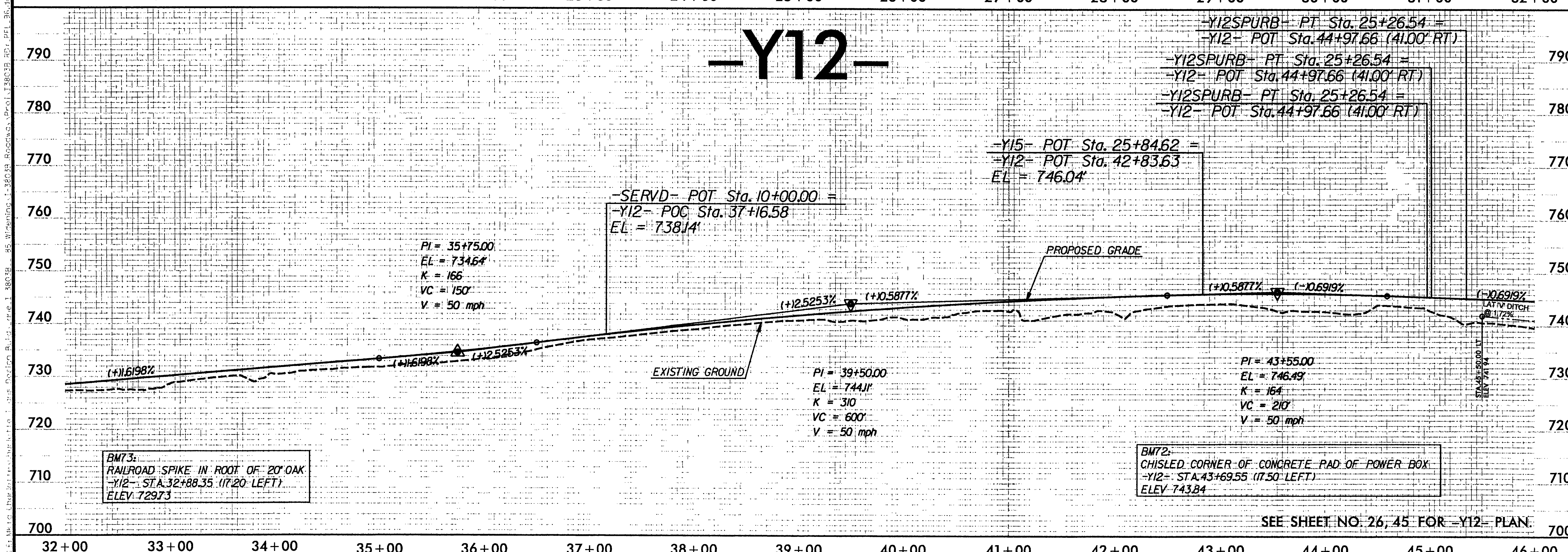



PROJECT REFERENCE NO.
SHEET NO.
I-3803B
95
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
-Y11RPC-
BEGIN GRADE
-YIIRPC- STA. 10+00.00 =
-L- STA. 392+85.00 (59' RT)
EL = 639.15'
PROPOSED GRADE
(+)0.2185%
(-)0.7230%
PI = 11+90.00
EL = 639.57'
K = 404
VC = 380'
V = 50 mph
(-)0.7230%
(-)3.7770%
SDG W/ PSRM @ 3.13%
STA.16+32.00 LT
ELEV 634.07
PI = 16+90.00
EL = 635.95'
K = 85
VC = 260'
V = 50 mph
EXISTING GROUND
STA.18+75.00 LT
ELEV 626.46
PI = 21+00.00
EL = 620.46'
K = 109
VC = 560'
V = 50 mph
(-)3.7770%
(+)1.3829%
END GRADE
-YIIRPC- STA. 24+00.00
EL = 624.61'
LAT V DITCH @ 4.00%
STA.22+36.00 RT
ELEV. 610.95
STA.22+66.00 RT
ELEV. 609.75
SEE SHEET NO. 20, 21 FOR -Y11RPC- PLAN.
670
660
650
640
630
620
610
600
590
580
10+00
11+00
12+00
13+00
14+00
15+00
16+00
17+00
18+00
19+00
20+00
21+00
22+00
23+00
24+00
-Y11RPD-
BEGIN GRADE
-YIIRPD- STA. 10+00.00 =
-L- STA. 428+86.02 (59' RT)
EL = 625.02'
PROPOSED GRADE
(-)0.9641%
(-)1.9363%
PI = 11+80.00
EL = 623.28'
K = 201
VC = 195'
V = 50 mph
PI = 14+50.00
EL = 618.06'
K = 98
VC = 160'
V = 50 mph
(-)1.9363%
(-)0.3000%
SDG @ 1.99%
STA.13+85.00 LT
ELEV 614.25
STA.14+85.00 LT
ELEV 612.26
END GRADE
-YIIRPD- STA. 16+65.52
EL = 617.41'
EXISTING GROUND
SEE SHEET NO. 22 FOR -Y11RPD- PLAN.
670
660
650
640
630
620
610
600
590
580
10+00
11+00
12+00
13+00
14+00
15+00
16+00
17+00
18+00

PROJECT REFERENCE NO.	SHEET NO.
I-3803B	96
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

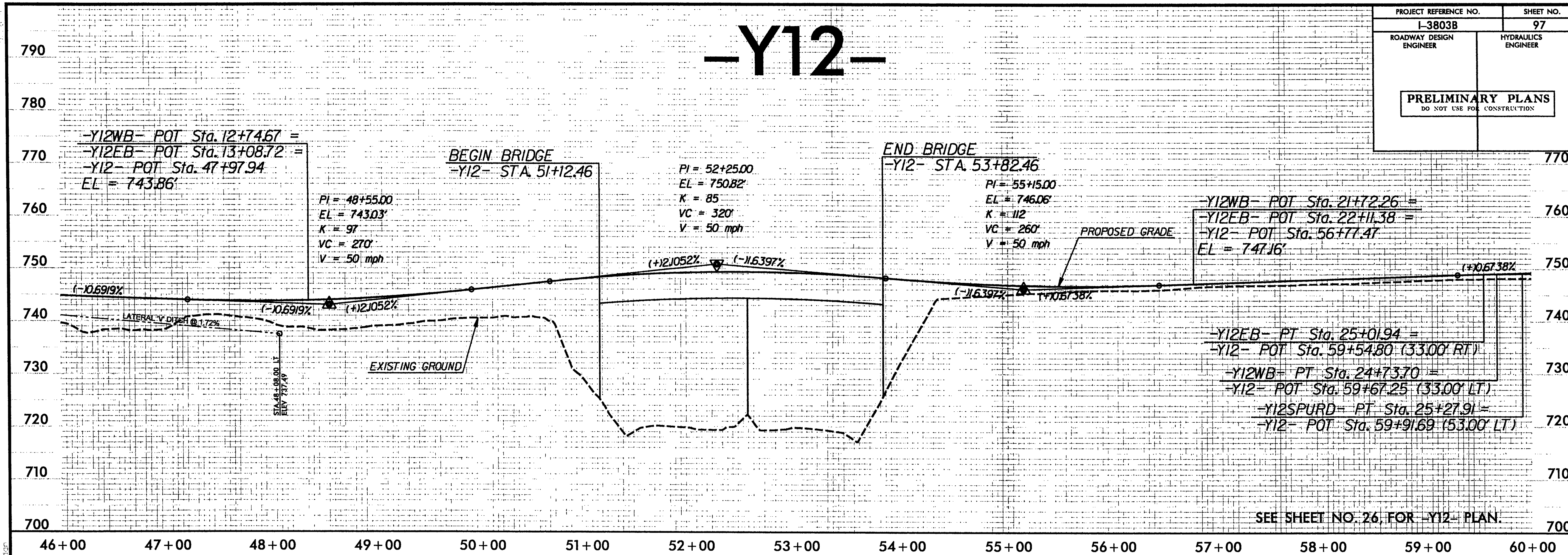
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

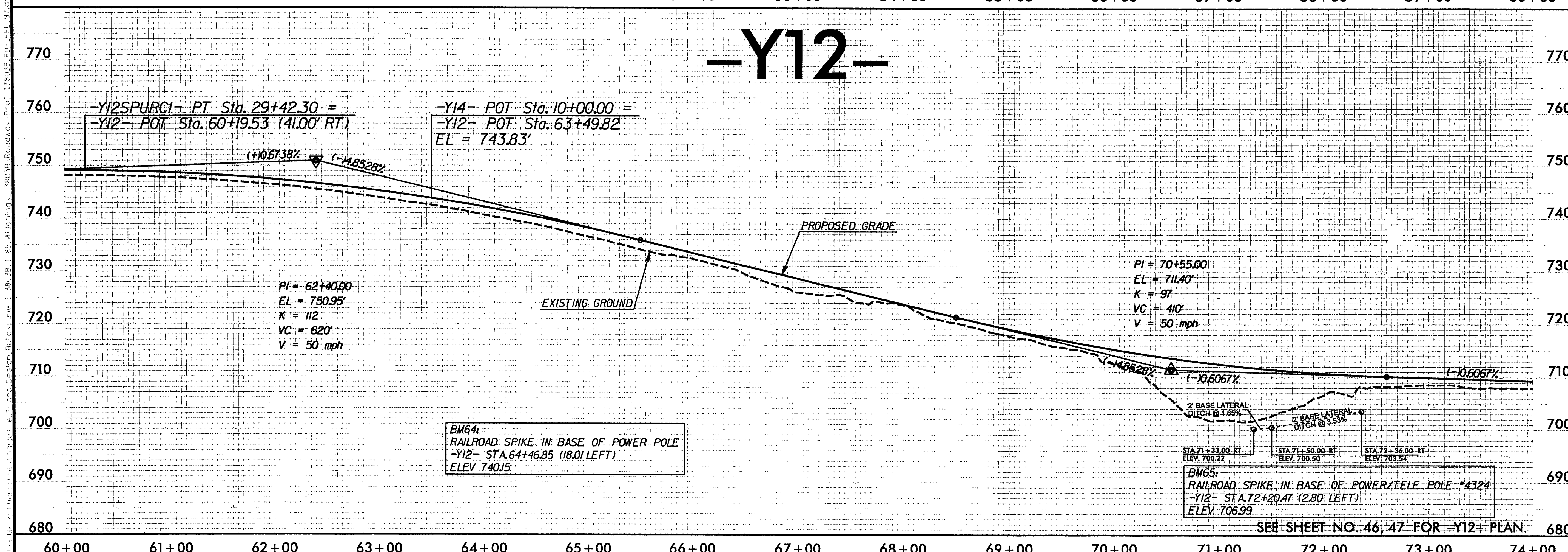




PROJECT REFERENCE NO.	SHEET NO.
I-3803B	97
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

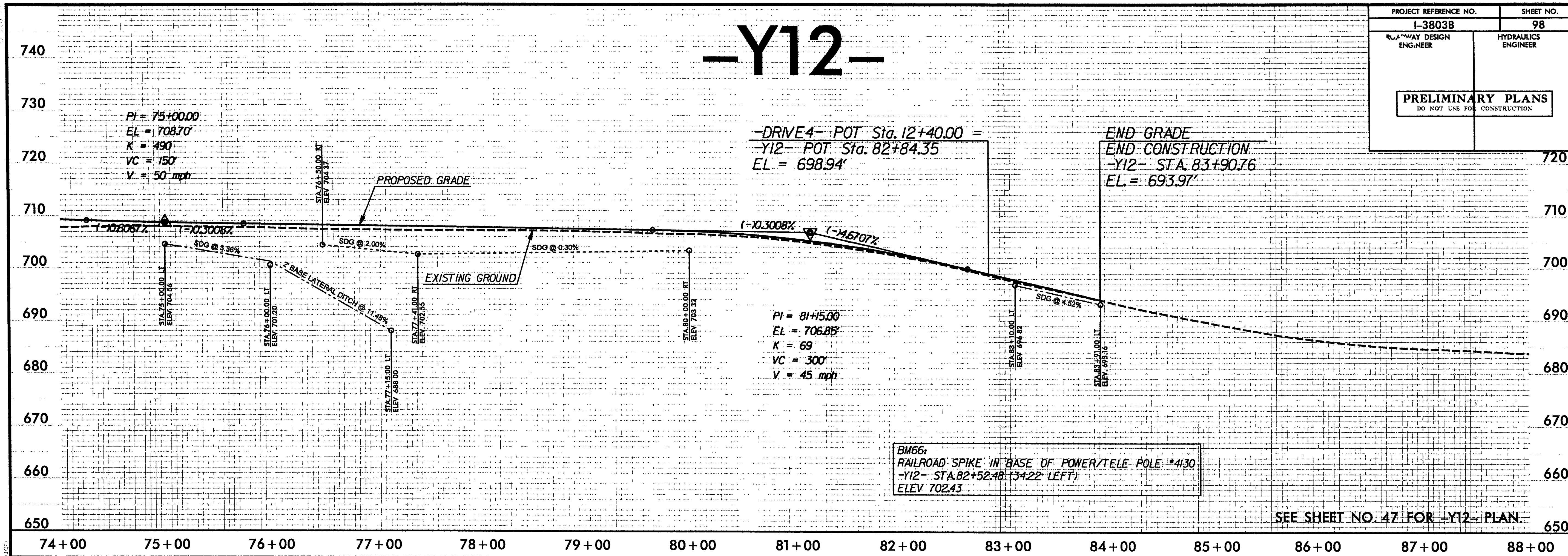
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

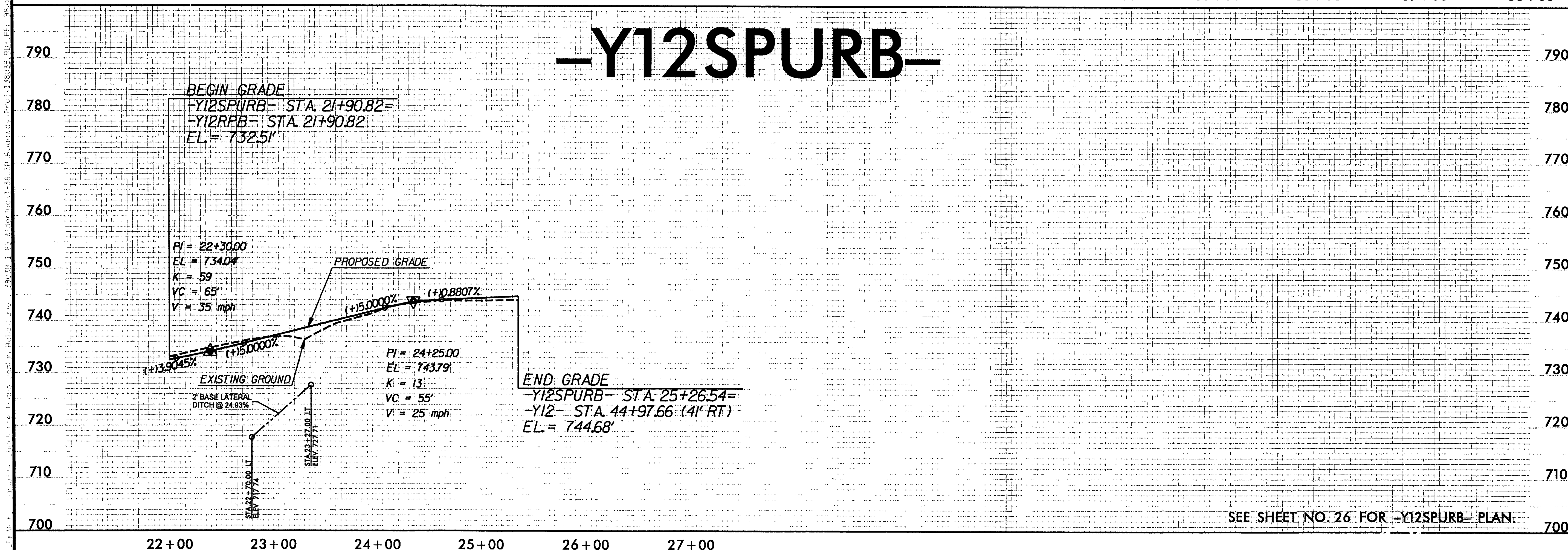




PROJECT REFERENCE NO.	SHEET NO.
I-3803B	98
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

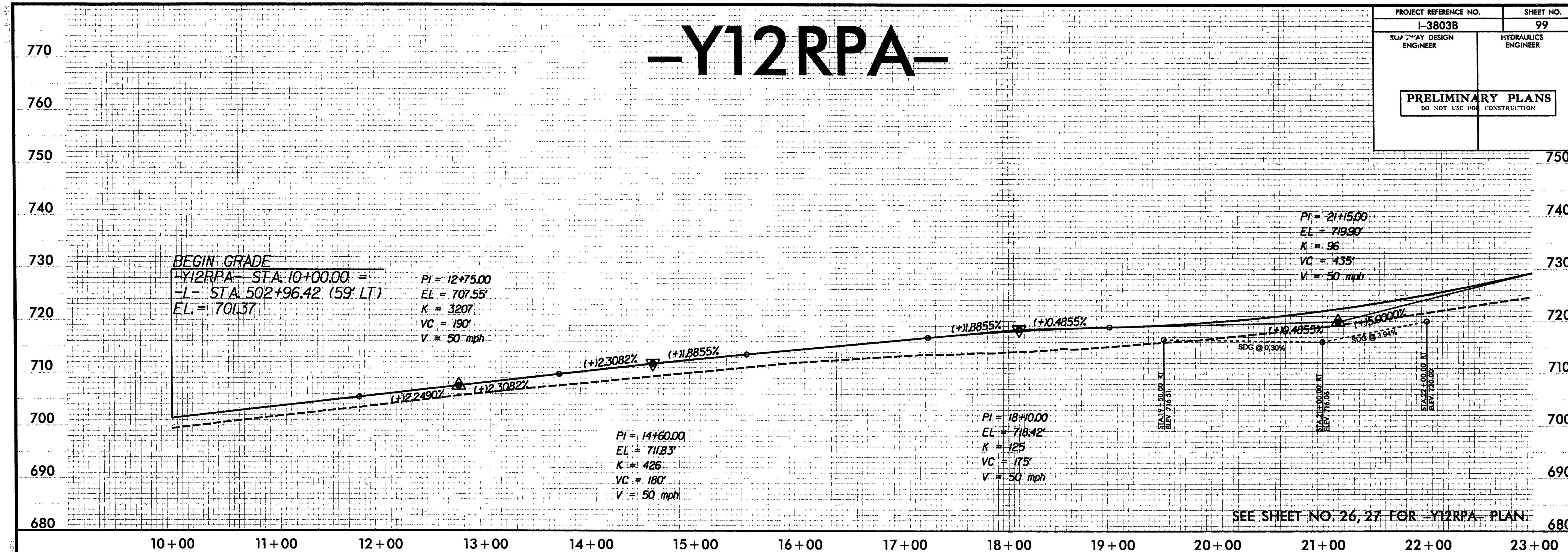
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

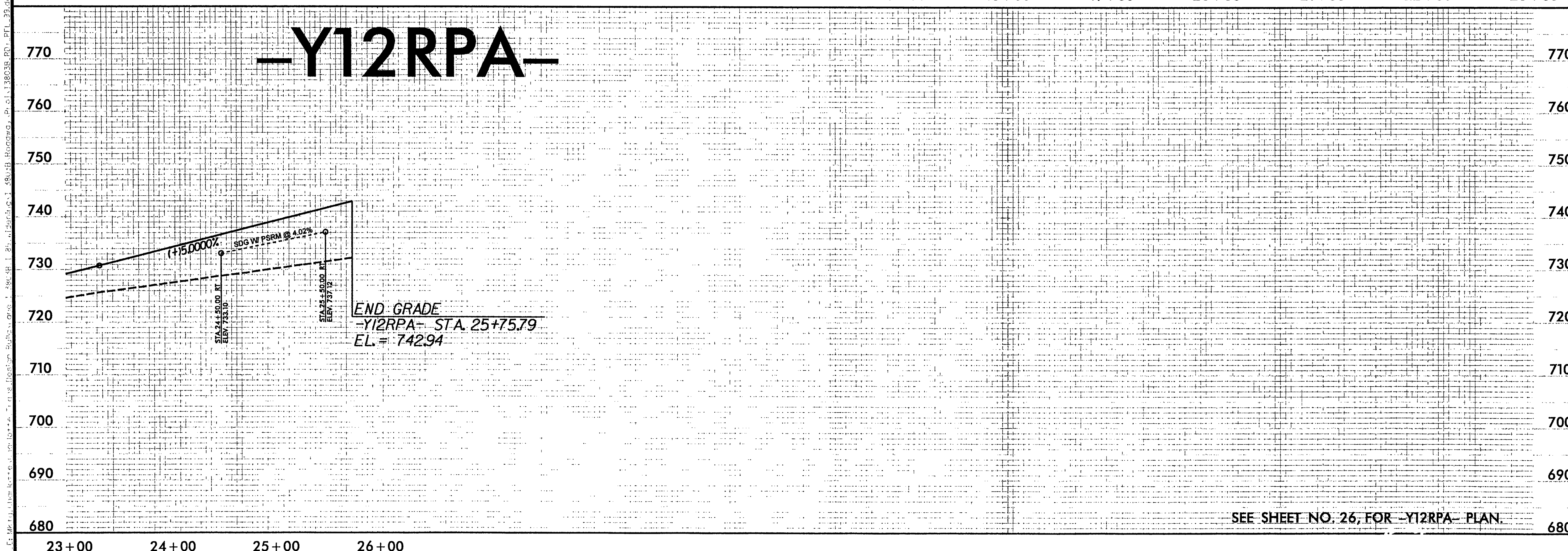




PROJECT REFERENCE NO.	SHEET NO.
I-3803B	99
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

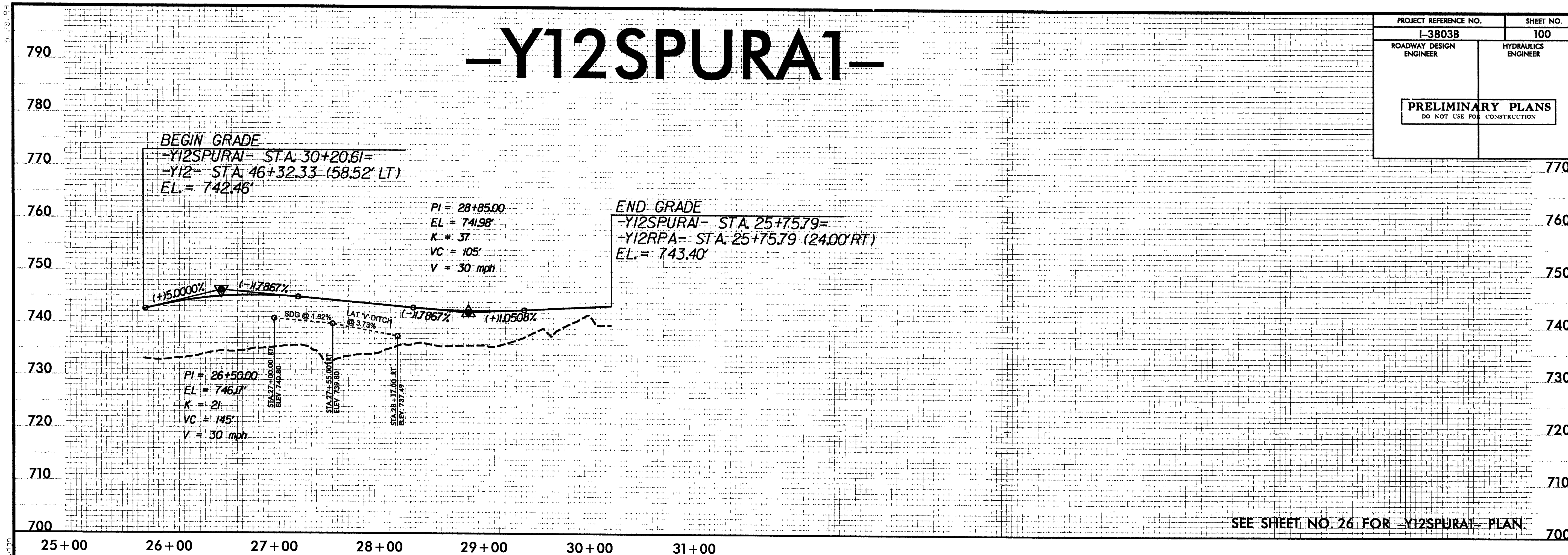
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

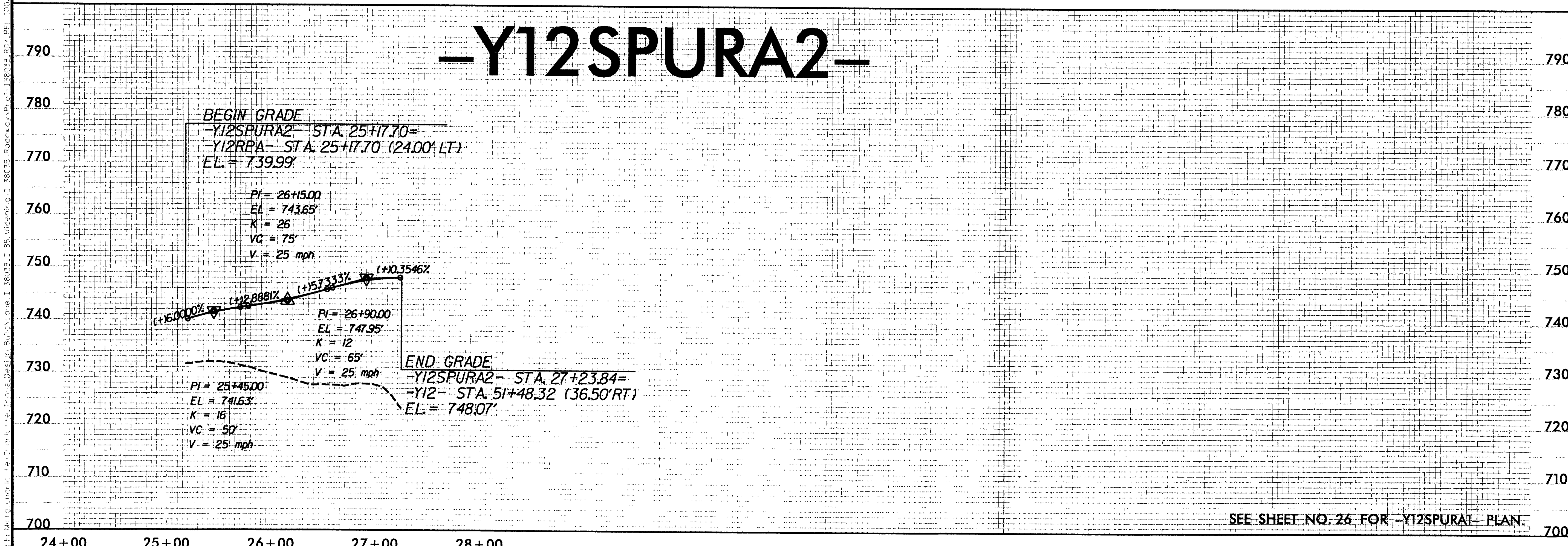


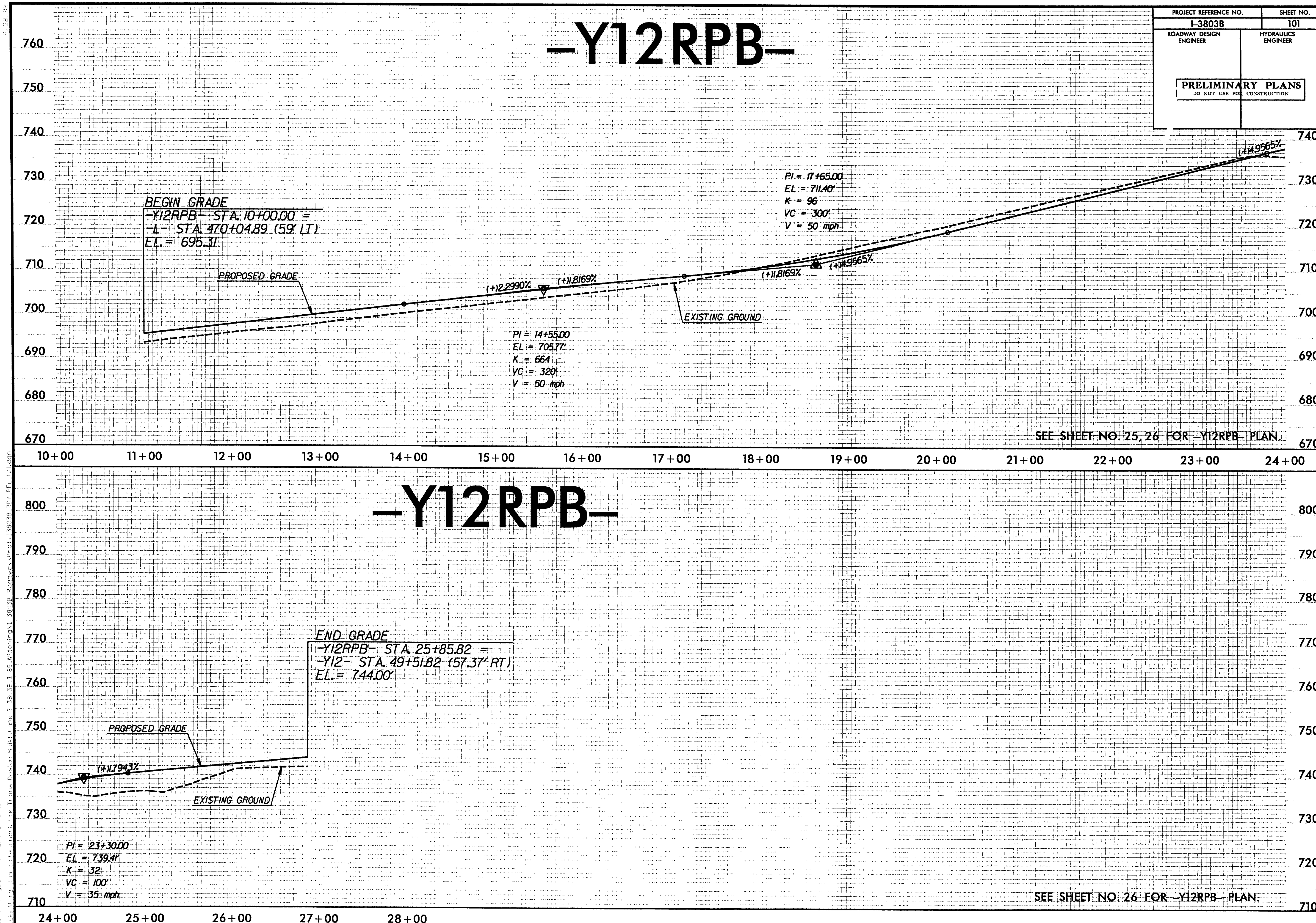


PROJECT REFERENCE NO.	SHEET NO.
I-3803B	100
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



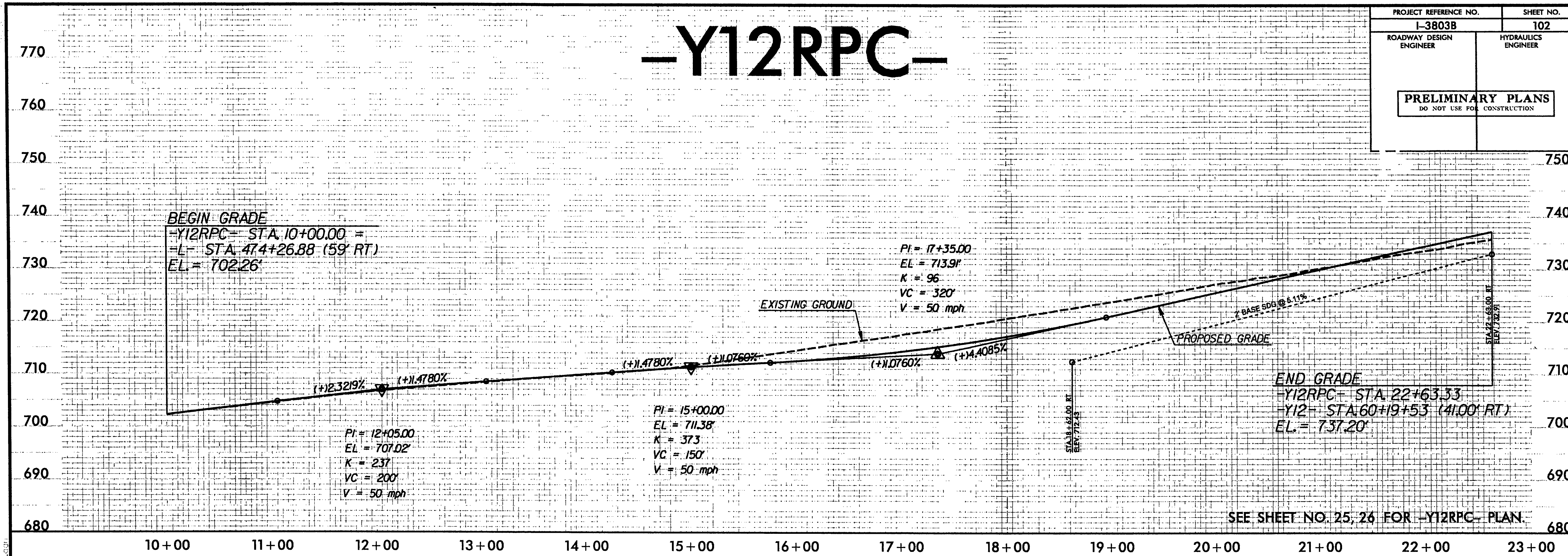



PROJECT REFERENCE NO.
I-3803B
SHEET NO.
101
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
-Y12RPB-
BEGIN GRADE
-Y12RPB- STA. 10+00.00 =
-L- STA. 470+04.89 (59' LT)
EL. = 695.31
PROPOSED GRADE
EXISTING GROUND
(+)2.2990%
(+)1.8169%
(+)1.8169%
(+)4.9565%
(+)4.9565%
PI = 14+55.00
EL = 705.77'
K = 664
VC = 320'
V = 50 mph
PI = 17+65.00
EL = 711.40'
K = 96
VC = 300'
V = 50 mph
SEE SHEET NO. 25, 26 FOR -Y12RPB- PLAN.
760
750
740
730
720
710
700
690
680
670
10+00
11+00
12+00
13+00
14+00
15+00
16+00
17+00
18+00
19+00
20+00
21+00
22+00
23+00
24+00
-Y12RPB-
END GRADE
-Y12RPB- STA. 25+85.82 =
-Y12- STA. 49+51.82 (57.37' RT)
EL. = 744.00'
PROPOSED GRADE
EXISTING GROUND
(+)1.7943%
PI = 23+30.00
EL = 739.41'
K = 32
VC = 100'
V = 35 mph
SEE SHEET NO. 26 FOR -Y12RPB- PLAN.
800
790
780
770
760
750
740
730
720
710
24+00
25+00
26+00
27+00
28+00

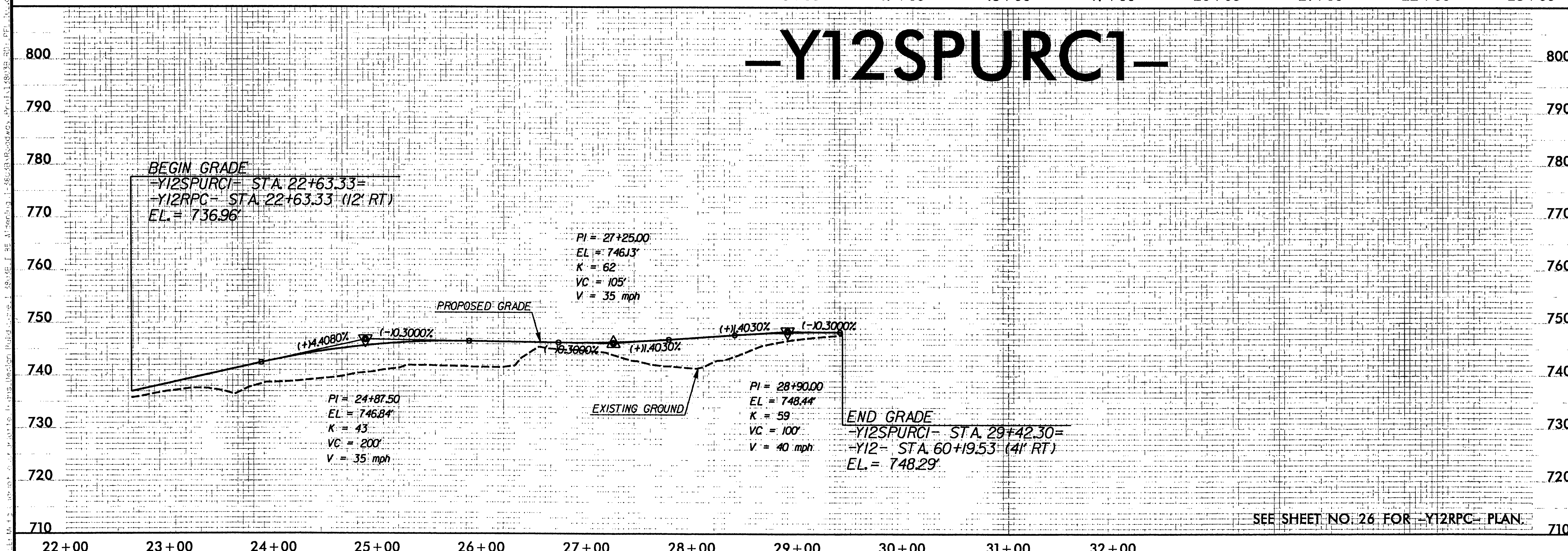
PROJECT REFERENCE NO.	SHEET NO.
I-3803B	102
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

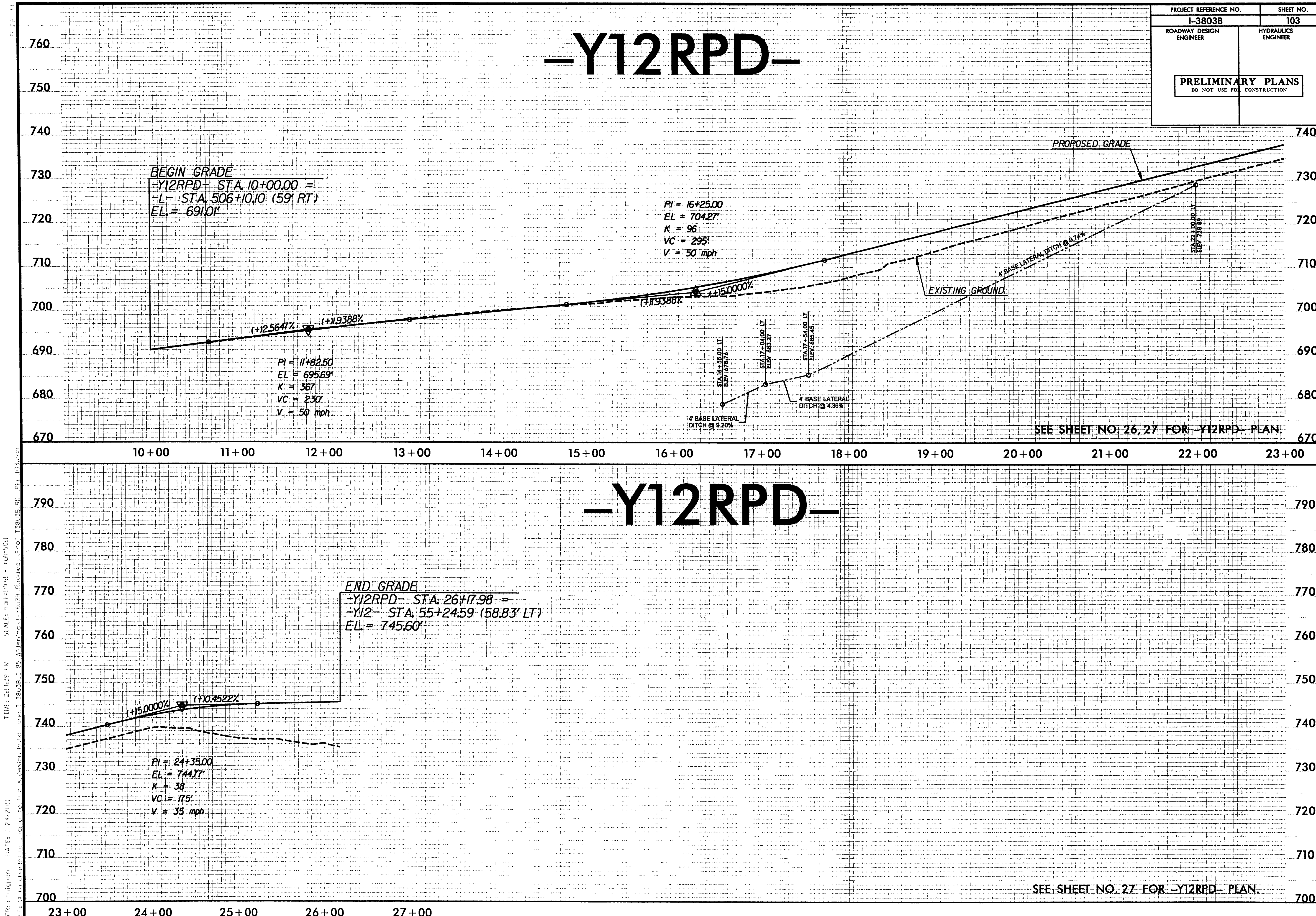
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

-Y12RPC-



-Y12SPURC1-

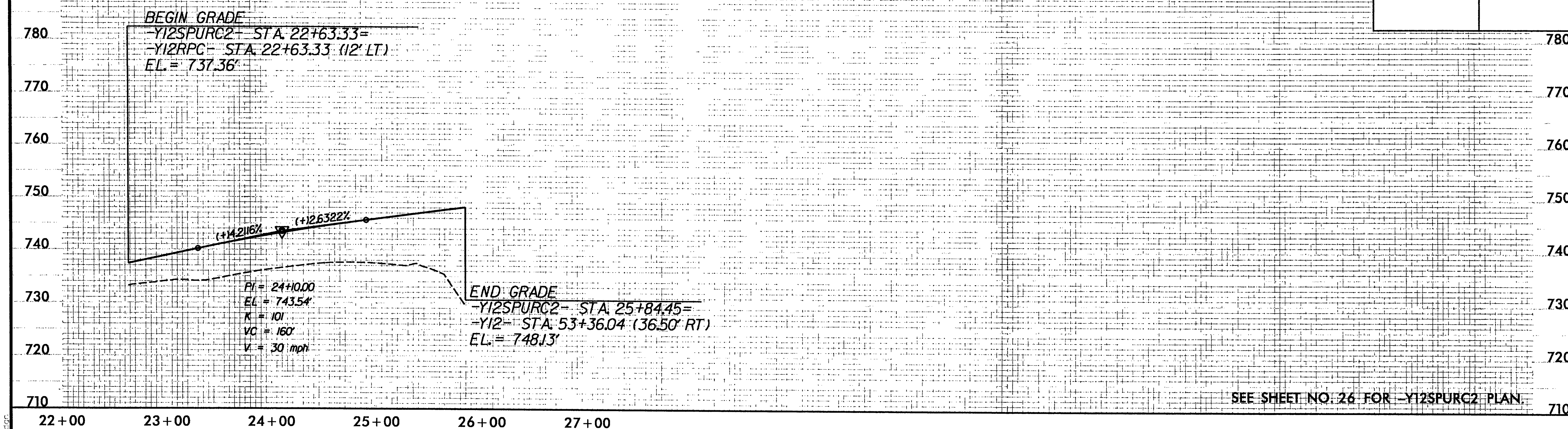



PROJECT REFERENCE NO.
I-3803B
SHEET NO.
103
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
-Y12RPD-
BEGIN GRADE
-Y12RPD- STA. 10+00.00 =
-L- STA. 506+10.10 (59' RT)
EL. = 691.01'
PI = 11+82.50
EL = 695.69'
K = 367
VC = 230'
V = 50 mph
(+)2.5647%
(+)1.9388%
PI = 16+25.00
EL = 704.27'
K = 96
VC = 295'
V = 50 mph
(+)1.9388%
(+)5.0000%
PROPOSED GRADE
EXISTING GROUND
4' BASE LATERAL DITCH @ 9.20%
4' BASE LATERAL DITCH @ 4.36%
4' BASE LATERAL DITCH @ 9.74%
SEE SHEET NO. 26, 27 FOR -Y12RPD- PLAN.
10+00
11+00
12+00
13+00
14+00
15+00
16+00
17+00
18+00
19+00
20+00
21+00
22+00
23+00
-Y12RPD-
END GRADE
-Y12RPD- STA. 26+17.98 =
-Y12- STA. 55+24.59 (58.83' LT)
EL. = 745.60'
(+)5.0000%
(+)0.4522%
PI = 24+35.00
EL = 744.77'
K = 38
VC = 175'
V = 35 mph
SEE SHEET NO. 27 FOR -Y12RPD- PLAN.
23+00
24+00
25+00
26+00
27+00

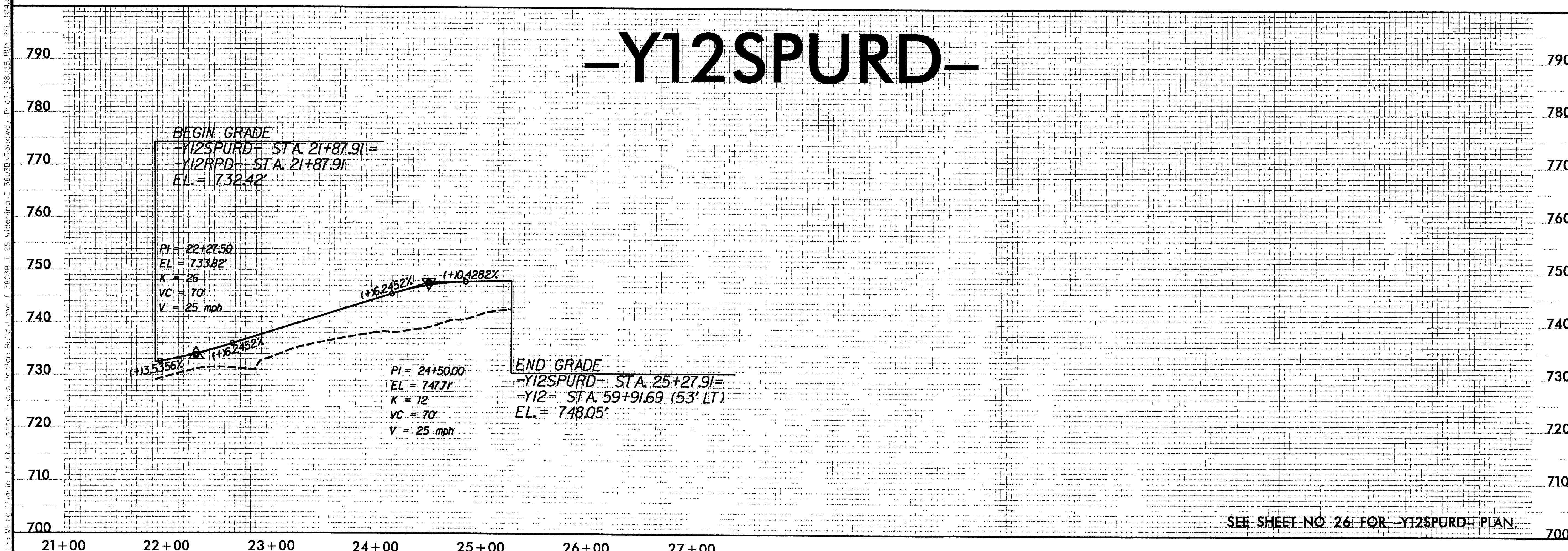
PROJECT REFERENCE NO.	SHEET NO.
I-3803B	104
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

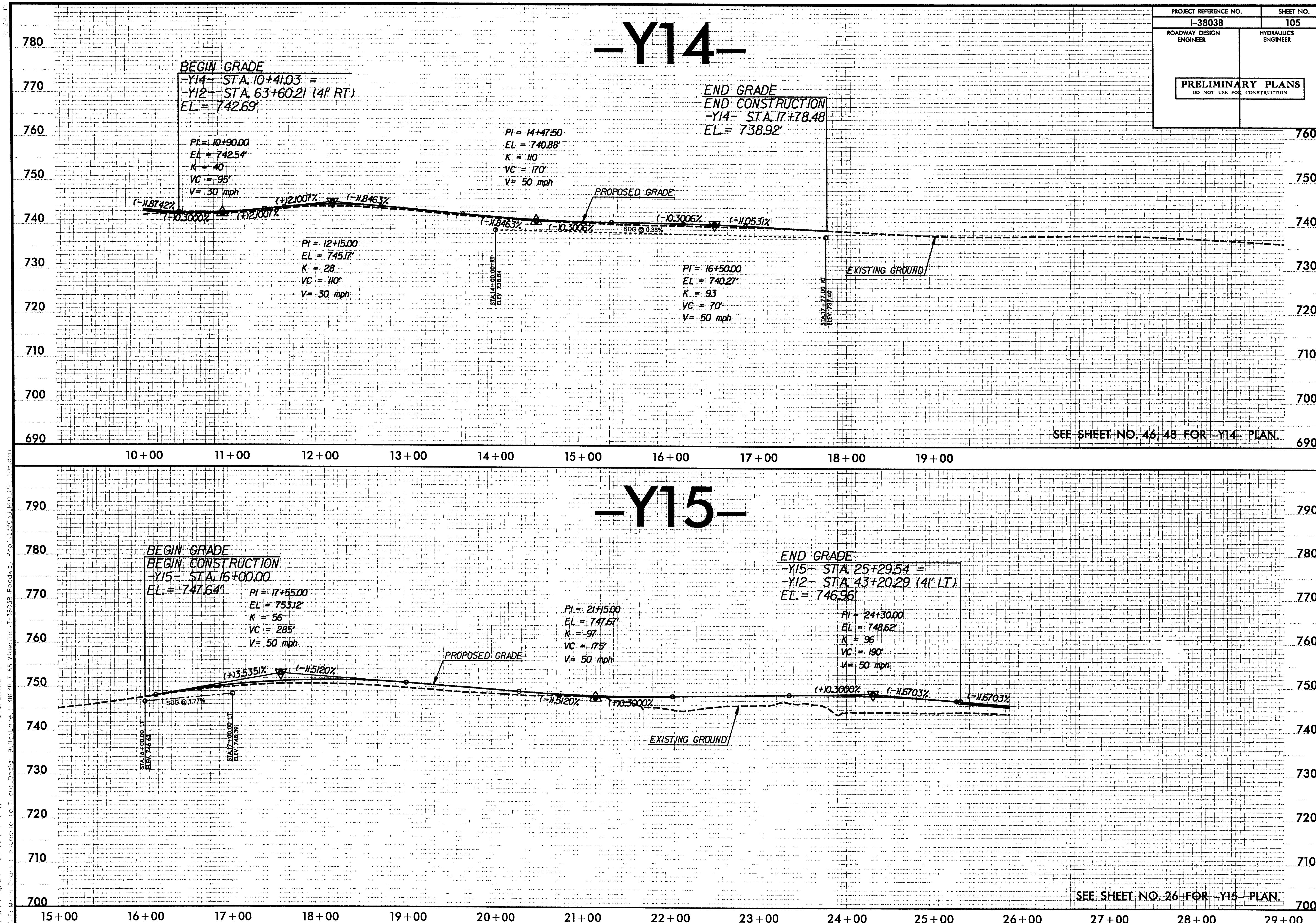
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

-Y12SPURC2-



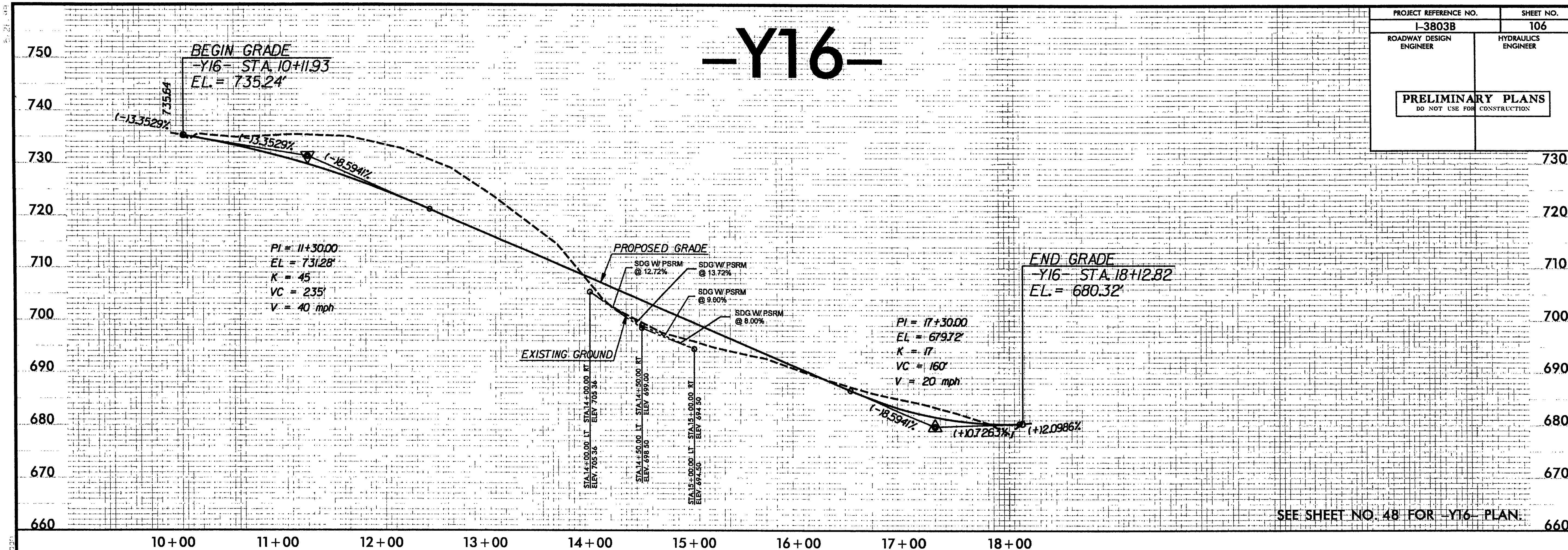
-Y12SPURD-

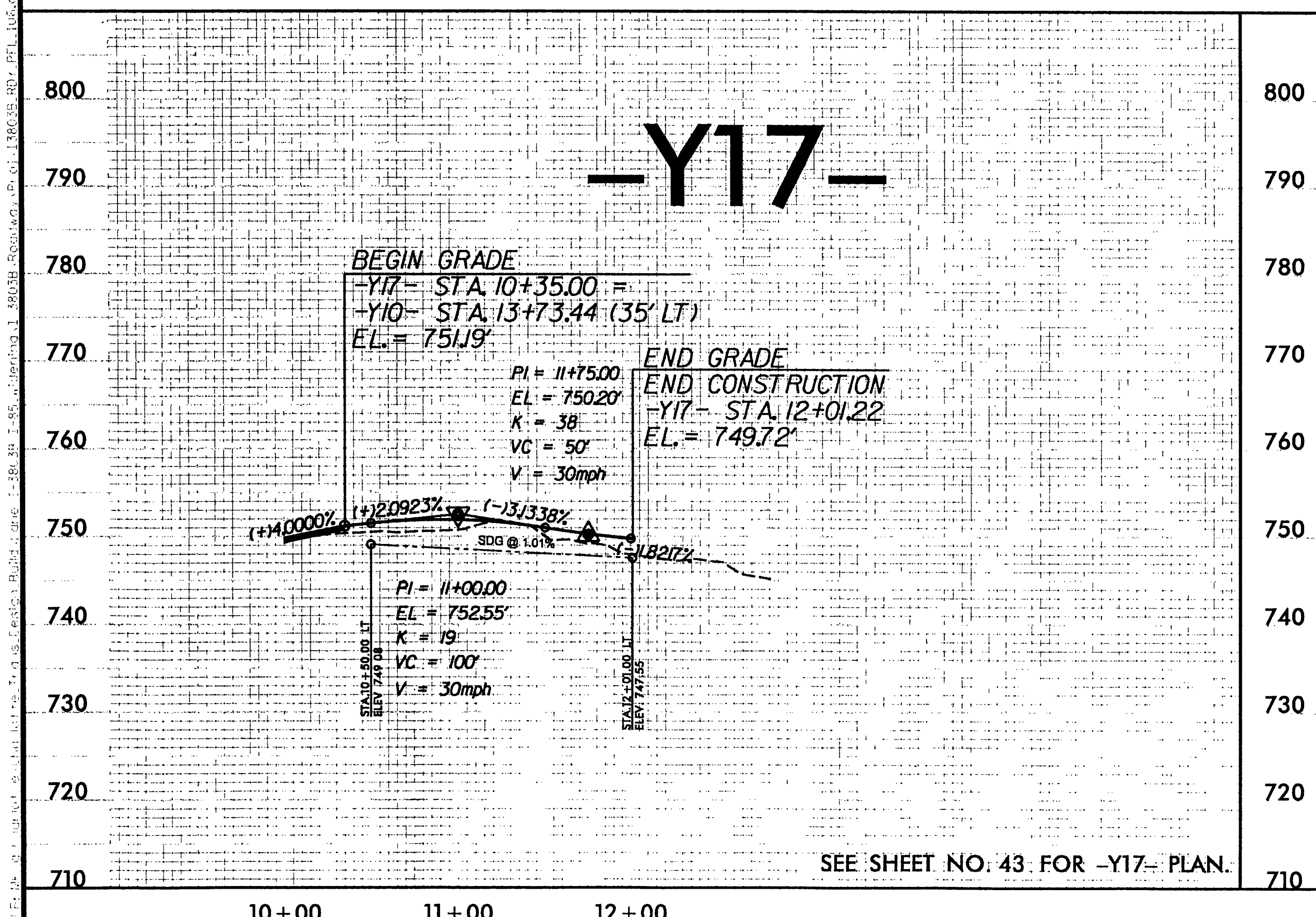


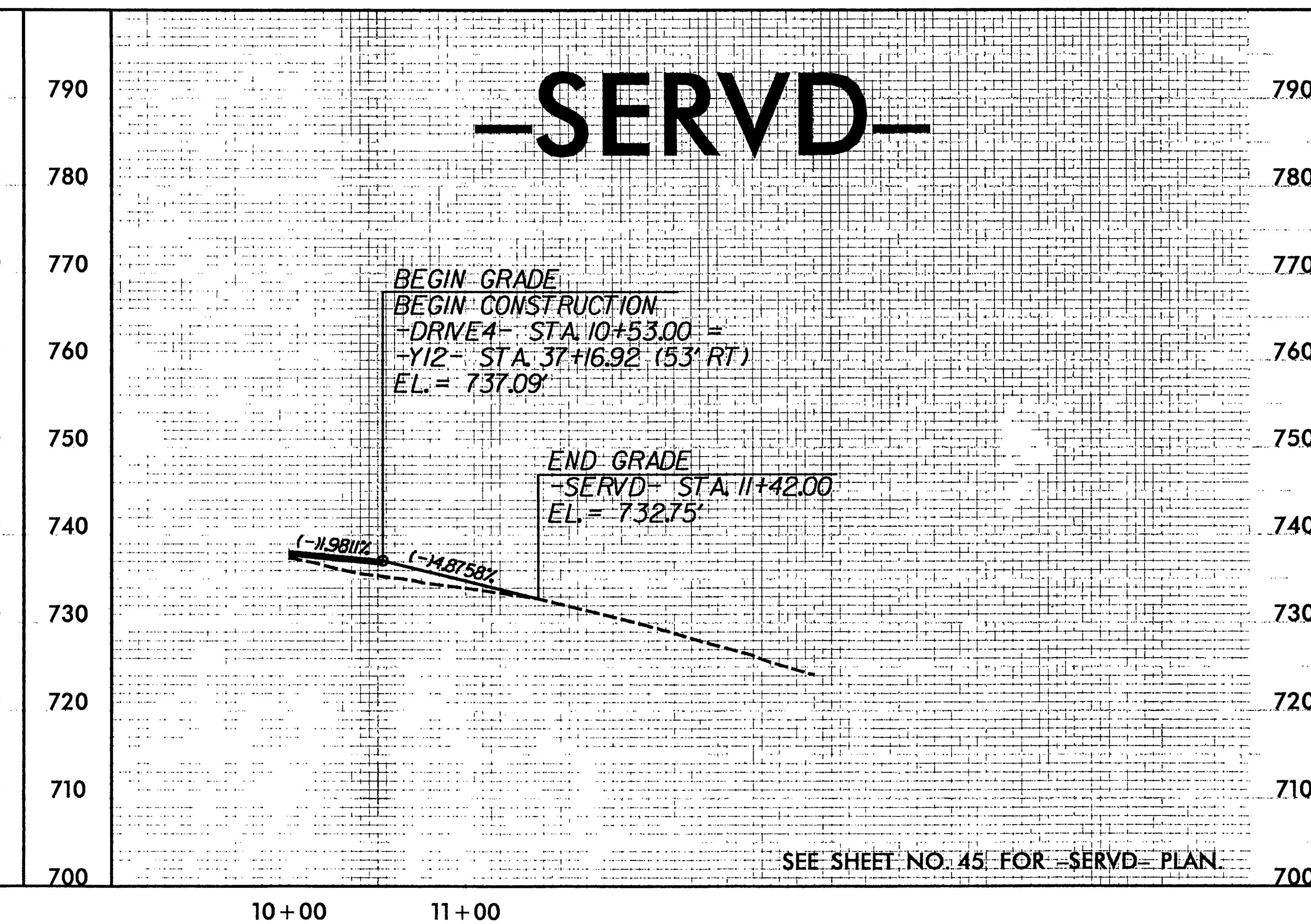

PROJECT REFERENCE NO.
I-3803B
SHEET NO.
105
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
-Y14-
BEGIN GRADE
-Y14- STA. 10+41.03 =
-Y12- STA. 63+60.21 (41' RT)
EL.= 742.69'
PI = 10+90.00
EL = 742.54'
K = 40
VC = 95'
V= 30 mph
PI = 12+15.00
EL = 745.17'
K = 28
VC = 110'
V= 30 mph
PI = 14+47.50
EL = 740.88'
K = 110
VC = 170'
V= 50 mph
PI = 16+50.00
EL = 740.27'
K = 93
VC = 70'
V= 50 mph
END GRADE
END CONSTRUCTION
-Y14- STA. 17+78.48
EL.= 738.92'
(-)1.8742%
(+)0.3000%
(+)2.1007%
(-)1.8463%
(-)0.3006%
(-)1.0531%
SDG @ 0.38%
PROPOSED GRADE
EXISTING GROUND
STA.14+00.00 RT ELEV 738.84
STA.17+77.00 RT ELEV 737.40
SEE SHEET NO. 46, 48 FOR -Y14- PLAN.
10+00
11+00
12+00
13+00
14+00
15+00
16+00
17+00
18+00
19+00
-Y15-
BEGIN GRADE
BEGIN CONSTRUCTION
-Y15- STA. 16+00.00
EL.= 747.64'
PI = 17+55.00
EL = 753.12'
K = 56
VC = 285'
V= 50 mph
PI = 21+15.00
EL = 747.67'
K = 97
VC = 175'
V= 50 mph
PI = 24+30.00
EL = 748.62'
K = 96
VC = 190'
V= 50 mph
END GRADE
-Y15- STA. 25+29.54 =
-Y12- STA. 43+20.29 (41' LT)
EL.= 746.96'
(+)3.5351%
(-)1.5120%
(+)0.3000%
(-)1.6703%
SDG @ 1.77%
PROPOSED GRADE
EXISTING GROUND
STA.16+00.00 LT ELEV 746.62
STA.17+00.00 LT ELEV 748.39
SEE SHEET NO. 26 FOR -Y15- PLAN.
15+00
16+00
17+00
18+00
19+00
20+00
21+00
22+00
23+00
24+00
25+00
26+00
27+00
28+00
29+00

PROJECT REFERENCE NO.	SHEET NO.
I-3803B	106
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION







PROJECT REFERENCE NO.	SHEET NO.
I-3803B	107
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION